CPSC staff will begin using the 2020 Age Determination Guidelines on June 1st, 2020, at which time the 2020 Guidelines will supersede the 2002 Guidelines.

AGE DETERMINATION GUIDELINES: Relating Consumer Product Characteristics to the Skills, Play Behaviors, and Interests of Children

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CPSC STAFF DOCUMENT

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INTRODUCTION

The 2020 U.S. Consumer Product Safety Commission Staff (CPSC staff) document titled, *Age Determination Guidelines: Relating Consumer Product Characteristics to the Skills, Play Behaviors, and Interests of Children,* supersedes the (2002) *Age Determination Guidelines: Relating Children's Ages to Toy Characteristics and Play Behavior*.

This document presents age-grading information in the form of guidelines for toys and other articles, children's toys, child care articles, and children's products. CPSC staff performs age determinations, in which the various characteristics of a consumer product are matched to the skills, play behaviors, and interests of children in a particular age group. For manufacturers, age grading is an important step in developing, marketing, and labeling consumer products. Using information from the *Age Determination Guidelines* to determine whether a general use product would be appropriate for children is an important consideration for them as well. Once manufacturers determine a target age for a product through age grading, CPSC staff encourages manufacturers to label, promote, and market it to that age group. Accurate age labels provide parents and other consumers with guidance for selecting age-appropriate products for children.

CPSC's regulations have long required that consumer products be constructed to withstand the reasonably foreseeable uses and abuses of children within specified age groups. The Consumer Product Safety Improvement Act of 2008 (CPSIA) imposed new obligations, such as requiring manufacturers of children's products to certify, based on third-party testing, that their products meet CPSC standards. The results of age determinations directly impact the type and severity of mechanical and chemical tests the samples may subsequently undergo to identify potential hazards.

Additions and updates to the age groups for products found in the revised *Age Determination Guidelines* are based on (1) observational research of children's play with products by Child and Family Research at NICHD/NIH under Interagency Agreement CPSC-I-14-0016, (2) public comments received by the CPSC, and (3) age grading by CPSC Human Factors staff. Staff has updated/expanded the *Introduction*, titling the new chapters, *Background,* and *A User Guide to the Age Determination Guidelines*. The *Background* chapter provides an overview of the relevant

statutes, regulations, and standards that are frequently consulted for age grading. The *User Guide* chapter provides a brief history of the *Age Determination Guidelines*, as well as information on how the material is organized.

The guidance found in the following *Background* chapter is provided for convenience and may not necessarily reflect the latest version of the regulations in the CFR or other applicable statutes. Check the applicable statutes and regulations to determine the current requirements for an applicable law. For further guidance, you can also visit CPSC's Business Education website at: https://cpsc.gov/Business--Manufacturing/Business-Education.

The *Age Determination Guidelines* explain how CPSC staff develops its assessment of ages for consumer products. The *Age Determination Guidelines* are not a mandatory rule, and CPSC will not enforce them as such. Rather, they present CPSC staff's views on age grading. Manufacturers and others may use the *Age Determination Guidelines* to help them determine the appropriate age group for their product(s).

BACKGROUND

Established in 1972 by the Consumer Product Safety Act (CPSA),[2] the CPSC is charged with protecting consumers from unreasonable risks of injury associated with consumer products. To accomplish this goal, CPSC develops standards, pursues recalls, and in certain circumstances, issues bans on products that are intended for children of certain ages. Additionally, CPSC enforces numerous regulations under other statutes, some of which apply to products for children within specific age groups. For example, CPSC administers the Federal Hazardous Substances Act (FHSA),[3] under which it has issued certain regulations regarding toys and other articles. The Child Safety Protection Act (CSPA) of 1994 amended sections of the FHSA to require labeling of certain products that pose a choking hazard to children within a specified age range (*e.g.*, small balls, balloons, marbles). The Labeling of Hazardous Art Materials Act (LHAMA),[4][5] amended the FHSA to require labeling of all art materials determined to have a potential chronic hazard for health. One regulation issued under the FHSA with very specific age-specific requirements is the Small Parts Regulation.

Small Parts Regulation[6]

In 1979, the Commission issued a regulation under provisions of the FHSA to ban certain toys and other articles that are intended for use by children under 3 years of age, if they present a choking, aspiration, or ingestion hazard because of small parts. This regulation, known as the Small Parts Regulation, is found in 16 CFR §§ 1500.18(a)(9), 1500.50–.52, and part 1501. Introduction or delivery for introduction into interstate commerce of a banned item is a prohibited act under section 4 of the FHSA and subjects the firm to the penalties described in section 5 of the FHSA. The regulation does not apply to toys or other articles that are solely intended for use by children 3 years of age and older, or to toys and other articles that children

[2] Consumer Product Safety Act (CPSA) of 1972. PL 92-573. Available at https://www.cpsc.gov/s3fs-public/pdfs/blk_media_cpsa.pdf?epslanguage=en
[3] Federal Hazardous Substances Act (FHSA) of 1960. PL 86-613. Available at https://www.cpsc.gov/s3fs-public/pdfs/blk_pdf_fhsa.pdf
[4] Labeling of Hazardous Art Materials Act (LHAMA) of 1988. PL 100-695. Available at: https://www.cpsc.gov/s3fs-public/pdfs/blk_pdf_fhsa.pdf
[5] LHAMA amended the FHSA and adopted ASTM D-4236 as a regulation
[6] This abbreviated description of the Small Parts Regulation does not replace or supersede any requirements published in 16 CFR §§1500.18(a)(9), 1500.50–53, and part 1501.

under 3 years of age might have access to simply because of the products' presence in the household. For a detailed list of toys and other articles covered by, and exempted from, this regulation, *see* 16 CFR part 1501. The Small Parts Regulation specifies the equipment and test method used to determine whether a toy or other article presents a choking, aspiration, or ingestion hazard because the product itself, or any part of the product that could be detached or broken off during normal or reasonably foreseeable use and abuse, is a small part. (*See* 16 CFR §1501.4 for further details.) If the toy or other article being tested fits entirely within the cylinder used for testing, it is considered a small part. If it does not, it is subjected to use and abuse test procedures.

Use and Abuse Testing

CPSC established test procedures to simulate normal or reasonably foreseeable use, damage, or abuse to which toys and other articles intended for use by children may be subjected. These test procedures are found in 16 CFR §§1500.50–53; The regulation at 16 CFR §1500.51 specifies test procedures and forces that simulate use and abuse of toys and other articles intended for use by children 18 months or younger; 16 CFR §1500.52 specifies test procedures and forces that simulate use and abuse of toys and other articles intended for use by children over 18 months old, but not over 36 months of age. Any toy or other article intended for children under 3 years of age that has undergone use and abuse testing with resulting detached or liberated parts that fit entirely within the small parts test cylinder is banned. The regulation at 16 CFR §1500.53 specifies test procedures and forces that simulate use and abuse of toys and other articles intended for use by children over 36 months but not over 96 months of age.

The five use and abuse tests specified in the Small Parts Regulation are impact, torque, tension, flexure, and compression. If these forces cause parts to break off that fit in the cylinder, those parts present a risk of choking, aspiration, or ingestion to children under 3 years of age. Table 1 lists the criteria for each test, depending on the age of child for whom the toy or other article is intended. Except for the tension test, each test method shall be applied to a previously untested sample. The tension test shall be applied to the same sample used in the torque test.

Table 1. Criteria in Small Parts Regulation Tests

	Impact	Flexure	Torque	Tension	Compression
18 Months of Age or Less (16 CFR § 1500.51)	10 drops from 4.5 ft ± 0.5 in	120° Arc 30 Cycles 10 lb ± 0.5 lb	2 lbf-in ± 0.2 lbf-in	10 lb ± 0.5 lb	20 lb ± 0.5 lb
Over 18 but Not Over 36 Months of Age (16 CFR § 1500.52)	4 drops from 3 ft ± 0.5 in	120° Arc 30 Cycles 15 lb ± 0.5 lb	3 lbf-in ± 0.2 lbf-in	15 lb ± 0.5 lb	25 lb ± 0.5 lb
Over 36 but Not Over 96 Months of Age (16 CFR § 1500.53)	4 drops from 3 ft ± 0.5 in	120° Arc 30 Cycles 15 lb ± 0.5 lb	4 lbf-in ± 0.2 lbf-in	15 lb ± 0.5 lb	30 lb ± 0.5 lb

Age Labeling and Determinations

Age labeling provides parents and other consumers guidance for selecting proper products for children. CPSC staff, therefore, encourages age labeling. However, age labeling must be accurate. It is to the manufacturer's or importer's advantage to determine accurately the intended age group for their products, and to label, promote, and market those products to that age group. If CPSC staff tests a toy or other article for small parts when the product is not clearly and conspicuously age-labeled, or is age-labeled inappropriately, CPSC staff performs the most stringent test from the two age groups for children under 3 years of age. For example, if a toy is labeled for children spanning more than one age group under 3 years (*e.g.*, "12 to 24 mos."), CPSC staff subjects it to the most stringent use and abuse tests for children 18 months or less, and over 18 but not over 36 months of age. If CPSC staff determines that the same toy is intended for children under 3 years of age, it is subjected to the Small Parts Regulation, regardless of its age labeling.

For a firm to know whether the Small Parts Regulation applies to a particular toy or other article, the firm must determine the age of the child for whom the product is intended. For the Small Parts Regulation, the factors used to assist in determining which toys and other articles are intended for use by children under 3 years of age are found in 16 CFR § 1501.2(b) and involve evaluating: (1) the manufacturer's stated intent, if reasonable, (2) the advertising, promotion and marketing, and (3) common recognition. A table containing the exact wording of the above criteria appears later in the chapter.

Regarding small parts, CPSC staff performs age determinations in which the various characteristics of a toy or other article are matched to the characteristics of children in a particular age group to determine whether it is intended for children under 3 years of age. For example, children from 12 months through 18 months of age enjoy toys with bright colors, especially yellows and reds, and toys with high contrast and patterns. Therefore, toys with characteristics such as these may be considered appropriate for children of this age. As specified in the Small Parts Regulation, staff also considers how the toy or other article is labeled, marketed, advertised, and promoted. Although small parts that present a hazard are clearly inappropriate for children under 3 years of age, the mere presence of small parts does not preclude the possibility that CPSC staff would determine that product is intended for children under the age of 3. Rather, when evaluating a product for age appropriateness, one ought to consider whether parents and others would purchase the product for children under 3 years of age, based on its characteristics and the characteristics of children of this age.

Consumer Product Safety Improvement Act

In 2008, Congress passed the CPSIA,[7] giving the Commission new regulatory and enforcement tools for addressing mechanical and chemical safety hazards in consumer products that are intended for children. Most notable for age grading, the law (1) mandated the *ASTM F963 Standard Consumer Safety Specification for Toy Safety* as a consumer product safety standard (incorporated by reference in 16 CFR part 1250), and (2) added a definition of "children's product" in the CPSA. A children's product is "a consumer product designed or intended primarily for children 12 years of age or younger." 15 USC 2052(a)(2). The definition states four factors to consider. A manufacturer's statement about intended use is one factor, but is not determinative. The *Age Determination Guidelines* are the fourth criterion to consider when determining what constitutes a "children's product" under the CPSA.

The CPSIA also added requirements that consumer products that are "children's products" must be labeled with tracking labels and have valid Children's Product Certificates (CPCs), based on passing third-party test results from a CPSC-accepted laboratory. According to section 101 of

[7] Consumer Product Safety Improvement Act (CPSIA) of 2008. Pub. L. No. 110-314. Available at: https://cpsc.gov/s3fs-public/pdfs/blk_pdf_cpsia.pdf

CPSIA, children's products cannot contain more than 100 parts per million (ppm) of total lead content (substrate) or 90 ppm of lead in paint or other surface coatings. Additionally, products meeting the "children's toy" or "child care article" definitions are subject to specified phthalates prohibitions in CPSIA section 108 and 16 CFR part 1307. The regulation at 16 CFR part 1307 made some changes to the list of prohibited phthalates in the CPSIA. Table 2 outlines the relevant statutory and regulatory definitions and evaluation criteria that are applicable to age grading.

ASTM F963 Toy Safety Standard

ASTM F963[8] *Standard Consumer Safety Specification for Toy Safety* is a comprehensive safety standard covering performance requirements and test methods for addressing a wide range of safety hazards in toys that are intended for children under 14 years of age (includes 13-year-old children). The status of ASTM F963 as a mandatory standard greatly expanded the scope and need for age grading by CPSC staff, given the myriad age-specific requirements, wider age range, and types of toys covered. The standard contains performance specifications to address a wide range of mechanical safety hazards (*e.g.*, projectiles, batteries, strings and cords, noise, magnets, and expanding materials), as well as chemical hazards (*e.g.*, lead, cadmium, antimony, arsenic, barium, chromium, mercury, and selenium), in toys. Many of the performance requirements in the standard have age limits, which were developed in response to known safety hazards and/or the expected cognitive, physical development, and interests of children in a certain age group. CPSC staff often determines whether a toy meets the following definition in ASTM F963 section 3.1.91: "toy - any object designed, manufactured, or marketed as a plaything for children under 14 years of age." If the product is a toy under the standard, staff may conduct a more extensive evaluation to determine the most appropriate age group. One reference that staff consults is *Annex A1: Age Grading Guidelines* found at the back of ASTM F963. The annex covers the purpose and objectives of age labeling, criteria to consult, sources of information or "tools," and how to factor in safety concerns when age grading. Furthermore, the annex references CPSC's *Age Determination Guidelines* for age grading

[8]ASTM Standard F963, *Standard Consumer Safety Specification for Toy Safety* (2017). ASTM International, West Conshohocken, PA, 2003, www.astm.org.

Table 2. Definitions and Evaluation Criteria

Category	Definition	Evaluation Criteria (Variations in **bold**)	Source(s)
1) Toy or other article for children under 3 years	None	"1) **The manufacturer's stated intent (such as on a label) if it is a reasonable one;** 2) The advertising, promotion, and **marketing** of the article; 3) Whether the article is commonly recognized as being intended for children under 3."	16CFR §1501.2(b)
2) Toy	"Any object designed, manufactured, or marketed as a plaything for children under 14 years of age."	None	ASTM F963-17 §3.1.91
3) Children's toy	"A consumer product designed or intended by the manufacturer for a child 12 years of age or younger, for use by the child when the child plays."	"(i) A statement by a manufacturer about the **intended use** of such product, including a label on such product if such statement is reasonable. "(ii) Whether the product is represented in its **packaging, display,** promotion, or advertising as appropriate for use by children of the ages specified. (iii) Whether the product is commonly recognized **by consumers** as being intended for use by a child of the ages specified. (iv) The Age Determination Guidelines issued by the Commission staff in September 2002 and any successor to such guidelines."	CPSIA §108(b)(3)(e)(1)(B)
4) Child care article	"A consumer product designed or intended by the manufacturer to facilitate sleep or the feeding of children age 3 and younger, or to help such children with sucking or teething."	Same as 3) Children's toy	CPSIA §108(b)(3)(e)(1)(C)
5) Children's product	"A consumer product designed or intended primarily for children 12 years of age or younger."	"(A) **A statement by a manufacturer about the intended use of such product, including a label on such product if such statement is reasonable.** (B) Whether the product is represented in its **packaging**, **display,** promotion, or advertising as appropriate for use by children 12 years of age or younger. (C) Whether the product is commonly recognized **by consumers** as being intended for use by a child 12 years of age or younger. (D) The Age Determination Guidelines issued by the Commission staff in September 2002, and any successor to such guidelines."	CPSA §3(a)(2) 16 CFR §1200.2(b)

Children's Toy

In determining whether the prohibited phthalates requirements apply to a particular product, CPSC staff may evaluate whether the product meets the definition of a "children's toy" under CPSIA section 108(b)(3)(e)(1)(B). The law at § 108(g)(1)(B) defines "children's toy" as "a consumer product designed or intended by the manufacturer for a child 12 years of age or younger, for use by the child when the child plays." Section 108(g)(2) of the CPSIA lists four criteria to determine whether a product meets the definition of "children's toy." Staff applies those criteria in the same manner as the similar four criteria for the definition of "children's product" in section 3(a)(2) of the CPSA.

Child Care Article

In determining whether the prohibited phthalates requirements apply to a particular product, CPSC staff may evaluate whether the product meets the definition of a "child care article" in CPSIA. The term "child care article" is defined in section 108(b)(3)(e)(1)(C) of the CPSIA as a "consumer product designed or intended by the manufacturer to facilitate sleep or the feeding of children age 3 and younger, or to help such children with sucking or teething." Staff uses the same criteria to make determinations of children's toys in section 108 as it uses to identify products as a "child care article."

Children's Products

CPSC staff often evaluates whether a consumer product meets the definition of a "children's product" in section 3(a)(2) of the CPSA, as amended by the CPSIA in 15 USC 2052(a)(2). The law defines a "children's product" as "a consumer product designed or intended primarily for children 12 years of age or younger." Similar to the criteria in the Small Parts Regulation for evaluating age appropriateness of toys and other articles for children under 3 years of age, the first three criteria in the CPSIA definition mention evaluating the manufacturer's stated intent; marketing, advertising, and promotion; and common recognition. Differences between the Small Parts Regulation criteria and the definition of "children's product" under the CPSA include: (1) the addition within the third criterion to make the evaluation based on common recognition *by consumers* that the product is intended for use by a child 12 years of age or younger; and (2) the

addition of a fourth criterion: "the *Age Determination Guidelines* issued by the Commission staff in September 2002, and any successor to such guidelines."

In October 2010, the Commission issued a final interpretive rule providing guidance on the criteria that CPSC considers when evaluating what is deemed a "children's product" under the CPSA in 16 CFR part 1200.[9] The regulation contains a description of common features associated with children's products (*e.g.*, small sizes, exaggerated features, juvenile decals, licensed themes), as well as guidance and examples to assist users in making product determinations.

CPSC staff consults the following definition of "general use product" found in 16 CFR § 1200.2(b)": . . . a consumer product that is not designed or intended primarily for use by children 12 years old or younger. General use products are those consumer products designed or intended primarily for consumers older than age 12. Some products may be designed or intended for use by consumers of all ages, including children 12 years old or younger, but are intended mainly for consumers older than 12 years of age." If a consumer product does not meet the definition of a "children's product," then staff may consider it to be a general use product.

[9] 75 FR 198 (October 14, 2010), accessible at: https://cpsc.gov/s3fs-public/pdfs/blk_pdf_childprod.pdf (docket number CPSC-2010-0029).

A USER GUIDE TO THE AGE DETERMINATION GUIDELINES

History of the Age Determination Guidelines

The CPSC staff document entitled, *Guidelines for Relating Children's Ages to Toy Characteristics*, written in 1985,[10] was the original document used to assist CPSC staff in performing age determinations for toys and other articles to determine the applicability of the Small Parts Regulation. In 2002, the CPSC staff document entitled, *Age Determination Guidelines: Relating Children's Ages to Toy Characteristics and Play Behavior*,[11] superseded the 1985 *Guidelines for Relating Children's Ages to Toy Characteristics.*

In 2014, CPSC entered into an interagency agreement with the Child and Family Research group within NICHD/NIH[12] to conduct research and make updates to the (2002) *Age Determination Guidelines*. The NICHD research team conducted a literature review and a research study to evaluate the age appropriateness of consumer products through child play observations and parent surveys. The NICHD researchers summarized their findings in a written research report.[13] Subsequently, in response to public comments, CPSC Human Factors staff independently age-graded more than 100 of the products from NICHD's study. The *Age Determination Guidelines* now reflect staff's consideration of the NICHD age recommendations, staff's independent age determinations, public comments, and additional follow-up research. The *Age Determination Guidelines* should be viewed as a working document that requires regular updates to ensure continued accuracy and usefulness.

[10]Original document Goodson, B.D. & Bronson, M.B. (1985). *Guidelines for relating children's ages to toy Characteristics* (Contract No. CPSC-85-1089). Prepared for the U.S. Consumer Product Safety Commission, Washington, DC.
[11] Therrell, J. A., Brown, P. -S., Sutterby, J. A., & Thornton, C. D. (2002). *Age determination guidelines: Relating children's ages to toy characteristics and play behavior* (T. P. Smith, Ed.). Prepared for the U.S. Consumer Product Safety Commission, Washington, DC.
[12] CFR (now closed) was located within the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), at the National Institutes of Health (NIH), Department of Health and Human Services (DHHS), 9000 Rockville Pike Bethesda, MD 20854.
[13] Richards, M.N., Putnick, D.L., Suwalsky, J.T.D., & Bornstein, M.H. (2020) *CPSC Toy Guidelines: Research Document*. Prepared for the U.S. Consumer Product Safety Commission, Washington, DC.

Organization of the Age Determination Guidelines

The (2020) *Age Determination Guidelines: Relating Consumer Product Characteristics to the Skills, Play Behaviors, and Interests of Children* recognizes that children's growth involves not only physical and cognitive development, but also emotional and social development. Children's cognitive development, which includes creativity, discovery, language skills, verbal judgment and reasoning, symbolic thought, problem-solving skills, and the ability to focus and control behavior, are all heavily influenced by children's play experiences. Children's emotional development, which is also shaped by their play, includes feelings of happiness, feelings of control over their environment, emotional awareness, sensitivity to others, emotional strength and stability, spontaneity, humor, and feelings about self. Social learning occurs largely during children's play interactions, as children learn to play in larger and larger groups, and as they begin to learn about appropriate behaviors within certain contexts. Considering the physical, cognitive, emotional, and social development of children permits adults to address the well-being of the whole child, as adults design, manufacture, package, sell, or purchase play items, such as toys. The primary content of the *Age Determination Guidelines* is organized into four levels, each representing an increasing level of detail. These levels are play categories, product subcategories, age groups, and product characteristics.

Play Categories

The play category level consists of eight main groups that serve as the primary structure of the *Age Determination Guidelines*. The main groups apply to the various play behaviors in which children engage and how they use products during play. The main play categories are: (1) Exploratory and Practice Play, (2) Building Play, (3) Pretend & Role Play, (4) Game & Activity Play, (5) Sports, Recreational, & Outdoor Play, (6) Media Play, (7) Educational & Academic Play, and (8) Technology Play. These eight categories provide the largest organizational strategy for the *Age Determination Guidelines*, and they essentially represent the "chapters" of the document, as evidenced from the *Contents*. As discussed below, these are apportioned into subcategories of products to permit more specific discussions of the various types of products within each play category.

Technology Play, with two subcategories, is a new category in this latest revision of the *Age Determination Guidelines*, reflecting that today, children are digital natives, with technology present in their lives from infancy through adolescence. A 2017 survey by Common Sense Media revealed that children from birth to 8 years continue to spend more than 2 hours each day with television, DVDs, computers, video games, and mobile devices. Through these devices, children are able to access games, music, programming, as well as fully use features of products that are compatible with these devices. Many of the same factors from traditional products for children (*e.g.*, classic toys and games) relate similarly to age appropriateness of technology play; although there are specific issues to consider that are addressed in that section. Because technology is rapidly evolving, this section needs frequent updates as new technologies enter the market.

Product Subcategories

Each play category is divided into two to five subcategories. These subcategories correspond to general types or groups of products that children use when participating in that play type, and represent the major sections of the *Age Determination Guidelines*, as is evident from the *Contents* and the *Product Subcategory Index*. Table 3 lists the eight play categories, the 21 subcategories, and examples of products that are common within each subcategory.[14]

Age Groups

The information presented in each product subcategory is distributed among the following age groups:

- Birth Through 3 Months
- 4 Through 7 Months
- 8 Through 11 Months
- 12 Through 18 Months
- 19 Through 23 Months
- 2 Years
- 3 Years
- 4 Through 5 Years
- 6 Through 8 Years
- 9 Through 12 Years

[14] Note that some products in certain subcategories are covered by standards other than the mandatory ASTM F963 toy standard.

Table 3. Play Categories, Product Subcategories and Example Toys

Play Category	Product Subcategory	Examples
Exploratory & Practice Play	Mirrors, Mobiles, & Manipulatives	Rattles, squeeze toys
	Push & Pull Toys	Toy with wheels and pull string
Building Play	Blocks	Wood/foam/cardboard blocks
	Interlocking Building Materials	Brick-connecting blocks, model kits
Pretend & Role Play	Dolls & Stuffed Toys	Dolls, stuffed animals, action figures
	Play Scenes & Puppets	Doll houses, pop-up tents
	Dress-Up Materials	Costumes, jewelry
	Small Vehicle Toys	Cars, trucks, trains, planes
	Tools & Props	Cell phones, kitchen sets
Game & Activity Play	Puzzles	Inset frame, jigsaw, 3-D
	Card, Floor, Board, & Table Games	Wood, cardboard
Sports, Recreational, & Outdoor Play	Ride-On Toys	Tricycles, wagons, bicycles, scooters, motorized cars, skates
	Recreational Equipment	Hoops, tents
	Sports Equipment	Football, baseball, tennis, golf
Media Play	Arts & Crafts	Paints, paper, glitter, scissors
	Musical Instruments	Keyboards, tambourines, drums
Educational & Academic Play	Books	Paper, hard, coloring, vinyl
	Learning Products	Press & guess
Technology Play	Smart Toys & Educational Software	Computer-chip based or online
	Audiovisual Equipment	Mp3s, CDs, DVDs
	Computer & Video Games	Handheld/tablet, laptop, desktop

These age groups are partly based on those in the original *Age Determination Guidelines*, and are also modeled after developmental psychology, anatomy, and early childhood literature, particularly from the work of researcher Jean Piaget. The age group names were selected to avoid misinterpretation and the perception of overlap, which can sometimes occur when using the word “to” in age ranges, as in “4 to 8 Months” and “8 to 12 Months.” Hence, “4 Through 7 Months” includes 4-, 5-, 6-, and 7-month-olds. The first 4 years of childhood contain seven of the 10 age groups, and the first year contains three of those groups. This is due to the rapid

progression of motor, speech, and cognitive abilities during the first few years. According to early childhood experts, development is most rapid between birth and 2 years of age; body proportions change drastically, as does the ability to control the body. Because this period of life includes dramatic variation in performance in a relatively short time, considerable space has been dedicated to reviewing this period extensively and comprehensively.

As discussed below, product characteristics and play behaviors are described for each age group first in narrative (text) form and then in chart form. Arrows within the charts indicate that the feature in question is also characteristic of one or more older age groups.

Product Characteristics

Each product subcategory describes characteristics that are based on the skills, play behaviors, and interests of children as they progress through the 10 age groups described earlier. Cognitive abilities, motor skills, visual preferences, and social/emotional interests are among the topics described for each age group.

In the introductory narrative for each subcategory, a bulleted list of primary product characteristics appears. “Primary characteristics” are defined as those that should be given primary emphasis or importance when performing age determinations for a given subcategory of products because they are likely to have the greatest influence on age appropriateness. The order in which these characteristics are presented does not necessarily indicate their importance or priority because this will often change as children learn and develop. These primary characteristics are identified in the charts using asterisks. Secondary characteristics are also discussed within the text and charts for each subcategory. Secondary characteristics act in concert with the primary characteristics to help explain how each age group relates differently to the given subcategory.

In general, all 14 characteristics of products described in the *Age Determination Guidelines* have the potential to be of interest to consumers who are planning to purchase products, and they should be used to analyze features to aid in determining age appropriateness. However, this list of product characteristics is flexible, and other characteristics should be considered when

necessary. These product characteristics include: size, shape, number of parts, interlocking versus loose parts, materials, motor skills required, color/contrast, cause and effect, sensory elements, level of realism/detail, licensed theme, classic, robotic/smart features, and educational. These terms are used where appropriate within the age group discussions for each subcategory. Their definitions are in Table 4, listed in the same order as they appear in the tables at the end of each product subcategory.

Table 4. Definitions of Toy Characteristics

Characteristic(s)	Definition
Size of Parts	The dimensions of a toy or parts of toys. The size of a toy is related to the age of children for which the toy is appropriate. Undeveloped fine motor skills, such as those of younger children, encourage larger toys and parts, while more advanced skills and the desire for challenge in older children encourages smaller and more complicated toys and parts. In addition, ride-on and similar toys will be sized or scaled to the size of the child.
Shape of Parts	The shape of a toy is related to the age of children for which the toy is appropriate. Undeveloped fine motor skills, such as those of younger children, encourage rounded toys and parts.
Number of Parts	The quantity of elements included within the toy as a whole. Differences in children's ages and developmental levels affect their reception of and interaction with toys that have single or multiple parts.
Interlocking/Loose Parts	Whether a toy includes more than one piece, and how those pieces interact. This characteristic largely pertains to building toys, such as blocks and model kits, which include more than one piece that may (interlocking) or may not (loose parts) be connected. Toys with loose versus interlocking parts have different levels of interest among children of various ages, motor skills, and cognitive abilities.
Materials	The substances from which the toy or parts of the toy are constructed (*e.g.*, wood, plastic, vinyl, and foam). This also describes suitable characteristics of these materials since some materials (*e.g.*, metal) are more appropriate for older children than for younger children.
Motor Skills Required	The specific levels of fine- and gross motor skills that are required on average for a child to successfully interact with a toy. Fine motor skills pertain to the ability to control the hands and fingers, including hand/eye coordination. Gross motor skills apply to the large muscle coordination necessary for using a toy. The amount of fine- and gross motor skill required by a toy can play a large role in determining the appropriate age range for a toy.
Color/Contrast	The colors or contrasts used in the toy. The purpose of toy color is predominantly for appeal and marketing. Although some research studies indicate that infants prefer reds to blues and patterns to solids, no literature suggested that such preferences are developmentally based among toddlers, preschoolers, or children in the late early childhood years. Culture factor plays a large role in color appeal.
Cause & Effect	The attributes of toys that respond in some way to children's actions, either through lights, sounds, movement, or change in property. The cause and effect can range from

Characteristic(s)	Definition
	very simple to highly complex and is directly related to the level of cognitive or motor skills required from a child.
Sensory Elements	Those characteristics of toys that appeal to any of the five senses. These elements were considered on the basis of lights, sounds, texture, smell, and taste. Stimulation of the five senses provides different responses from children at different ages. Color/contrast is identified as a separate characteristic of appeal, so it was not considered as a visual sensory element.
Level of Realism/Detail	The visual design of toys and their anticipated use. Level of realism is described in two ways: cartoonish versus real appearance and child versus adult qualities. Cartoonish/Real details pertain to the visual presentation of a toy. Level of maturity, cognitive ability, and motor skills are considered for the child/adult determination. The combination of these realism perspectives (cartoonish vs. real and child vs. adult) works together to affect the appeal and appropriateness of toys.
Licensed Theme	Toys with ties to outside influences—primarily media—contain a licensed theme. Television shows, movies, books, and sports figures are the main sources of licensed toys. Licensed character images try to connect the emotional feelings associated with the media to the toy product. The appeal of the licensed product varies depending on the age of the child and the child's exposure to the media associated with the product.
Classic	Toys that maintain appeal with consumers over generations. Purchasing decisions made by adults are affected by the classic status of particular toys.
Robotic/Smart Features	Toys powered by remote controls (attached or not) or computer chips. Robotic/smart toys have the ability to respond in an interactive fashion with the user. Appropriateness is evaluated in terms of ease of use, remote response, and the level of cognitive sophistication required to use the toy as anticipated.
Educational	Toys designed and marketed specifically for academic gains. The appropriateness of these toys depends on the level of cognitive ability necessary to engage in an expected educational way, and the type of material, size, and number of parts.

A *Product Subcategory Index* appears immediately after the *Contents*. This index provides page numbers for the 21 subcategories, listed alphabetically. The *Product Index*, included at the end of the document, indicates the subcategory under which a specific product is classified and the page on which the subcategory discussion begins. It is especially useful for products for which the reader is unable to determine the appropriate subcategory, or for products that are likely to fall into multiple subcategories.

Children's Basic Abilities and Preferences is a good starting point for distinguishing differences among age groups of children for assessing toy appropriateness. Readers will find it useful for

assessing products that are not specifically addressed in the updated *Age Determination Guidelines* or that do not seem to fit neatly into a particular subcategory.

The primary characteristics within each subcategory are bullet listed in the text and are identified with asterisks in the charts. These characteristics should be given primary emphasis when performing age determinations for that subcategory of products, because they are likely to have the greatest influence on age appropriateness. However, other characteristics discussed within the text and tables should also be considered. In addition, the results of more recent or highly focused scientific research on children's abilities and preferences, especially for specific products, may supersede what is stated in these *Age Determination Guidelines*. Although age grading has implications for what safety requirements apply to a product, the *Age Determination Guidelines* are designed to relate the characteristics of consumer products to the skills, play behaviors, and interests of children across development.

CHILDREN'S BASIC ABILITIES AND PREFERENCES

This section serves as a handy reference guide and starting point for understanding and distinguishing children's basic abilities and preferences as they grow. These abilities and preferences play an important role in attracting and motivating children to interact with products. Developing physically, for example, changes the ways in which children are able to coordinate their gross motor skills. Increased mobility opens up new ways to use products. A higher level of fine motor skill permits greater manipulation of objects. Ultimately, such knowledge helps to identify and distinguish the characteristics of products that are of interest to children at a given age. Although information of this sort is noted throughout the *Age Determination Guidelines* in relation to a specific subcategory of products, this section summarizes average play behaviors, regardless of the product used; and it identifies appropriate product characteristics that are generally consistent among all subcategories of products. With this information, it will be easier for the reader to make an age determination for a given product, even if it is not specifically addressed within the *Age Determination Guidelines.*

Birth Through 3 Months

Object play is limited during this period because learning occurs mostly through the reflexive actions of the child, such as spontaneous kicking or arm movements. They are manipulating objects so that they may explore them, repetitively. Initially, they explore with their eyes and ears only. Newborns can focus best at about 8 inches from their faces, but this increases over time, and they may be able to see objects several feet away by the end of this period. Play objects should fit within their visual field at these distances. They are attracted to bright and vibrant colors, especially yellows and reds, and to objects with high-contrast patterns, like black and white spirals. These children prefer the human face to all other patterns, and will watch faces intently. They will turn their heads in the direction of a sound, and are more attracted to objects that emit a gentle, soothing sound and that move slowly, than to objects that remain still or are too loud, too sudden, or otherwise extreme. Much of children's play at this age involves watching and exploring their own body. They have a reflexive grasp, which only allows them to explore objects briefly; and at 3 months, they begin to swipe or reach toward a dangling object to grasp it. Any object grasped is likely to be explored with their mouth and to be handled with

jerky, unpredictable motions. Therefore, soft, lightweight, washable, easy-to-grip objects with rounded corners are best. The preference for soft-material toys is greatest for 3-month-olds and declines as children reach their first birthday. They start to learn and enjoy toys for which simple actions produce a clear, direct effect; for example, toys that light up, move, or create sound as a result of simple kicking or shaking. Brightly colored and patterned toys that make gentle sounds are both engaging and appropriate for these children.

4 Through 7 Months

Children now actively engage with their environments in systematic ways. Distance vision is more mature, and these children can track moving objects with smooth, efficient eye movements. Bright colors, high contrasts, and complex patterns continue to be of interest. These children learn to differentiate among objects, as evidenced by their ability to group visual stimuli into categories. By 5 months of age, children can roll onto their backs and push up onto their hands and knees. They have mastered the ability to grasp and manipulate a dangling object by 6 months, and they begin to engage in more active play by reaching, grasping, tugging, pushing, patting, shaking, and squeezing objects. At 6 to 7 months, children are sitting independently, which provides them with greater visual capacities for grasping objects or bringing objects to midline for exploration. They can manipulate objects more readily, although their fine motor coordination is still rudimentary. Objects are grasped using a claw-like grip or raking motion, rather than a pincer grasp (*i.e.*, using the thumb and index finger). They can transfer an object from hand to hand, and begin to use both hands independently; for example, one hand may hold an object, while the other hand manipulates it. These children continue to mouth objects, so suitable toys are washable.

Near the end of this period, children develop the ability to recognize oft-repeated words, and some are beginning to crawl and stand with support. At this time, they are also beginning to understand object permanence—that an object that is hidden or partially hidden did not actually disappear, but still exists somewhere. Soft, lightweight, rounded, and textured toys that make gentle sounds are appropriate. Handheld toys should be sized so these children can easily grasp and manipulate them.

8 Through 11 Months

Much of the play during this period focuses on developing gross motor skills as these children exhibit more outwardly oriented movements and become increasingly mobile. They can crawl forward and backward, pull themselves into a standing position, walk with support (*e.g*., along furniture), stand momentarily without support, and complete a couple of unassisted steps. They also begin to climb. These children explore objects in many different ways, such as through grasping, shaking, squeezing, throwing, dropping, passing from hand to hand, and banging. Although they can hold two objects and bang them together, they cannot coordinate the movements of both to use them together. However, when given one object, children in this age span can use both of their hands at the same time, with each hand performing a different, but complementary, action on the object. Usually, one hand is in a supporting or stabilizing role, while the other manipulates or explores the object. They begin to develop a pincer grasp, which is used to pick up small objects between the thumb and fingers. Patterns of exploratory play begin that suggest children near the older end of this age group can make inferences about novel objects. For example, these children may infer what functions may operate beneath the surface of an object. They explore objects from every angle, and this often involves mouthing. Therefore, suitable toys are washable.

Many children in this age group begin to use items in relational patterns; for example, they enjoy dumping items out of a container, putting them back in, and then repeating the process. They repeat pleasurable actions often, and start to show an interest in marking on paper. Basic memory skills are developing, and object permanence becomes more entrenched. When a toy is hidden or not within view, these children know the toy still exists and did not simply disappear. Children of this age can understand simple words related to their immediate context, and need repetition and reinforcement of the words they hear. At the end of this period, these children begin to imitate gestures and the use of products. Sensory toys are highly attractive because these children are beginning to understand simple cause-and-effect relationships. Bright colors, especially yellows and reds, continue their appeal for this age group, as do high contrasts and complex patterns. Pictures that represent familiar objects are also highly attractive. Suitable toys are soft, sturdy, have rounded edges, and are easily grasped or manipulated by the child.

12 Through 18 Months

Increasingly, these children can walk without support. However, they are still unsteady on their feet, and their walking resembles toddling more than mature heel-to-toe walking. Now they want to explore everything; however, their curiosity far outweighs their judgment for predicting outcomes or foreseeing dangers. They are trying out a variety of basic gross and fine motor skills, and are gaining confidence as climbers. They can sing to themselves and will move their bodies to music. Being more mobile, they can self-select toys that were once outside their reach. They find basic grasping easier, and can manipulate toys that require simple twisting, turning, sliding, and cranking. Through trial and error, they continue to explore cause-and-effect relationships like dumping and filling activities and stacking and knocking over objects. Children at this age display a preference for toys that have greater manipulability and sound potential. They enjoy a variety of actions with objects, such as pressing, pushing, pulling, rolling, pounding, beating, shaking, clanging, fitting (for example, inserting a round peg into a round hole), marking, scribbling, carrying, and poking their fingers into objects. They delight in the many effects their actions cause, and enjoy toys that take advantage of this. Children of this age can recognize the names of familiar people, objects, pictures, and body parts. Long-term memory and the development of simple vocabulary using one-word utterances now provide the foundation for make-believe or pretend play. However, these children do not make clear symbolic connections until about 18 months of age. These children often imitate common actions they see—such as talking on the phone, "drinking" from a bottle or cup, stirring a spoon inside a bowl, hugging a stuffed animal, or putting on a hat—but only in brief, sporadic episodes. By 1 year, on average, children are able to show appreciation of sociocultural uses of objects and attend to cause-and-effect relations, which emerges between 13 and 20 months. For example, the child may start to pretend to eat something from a plate. Between 13 and 20 months, they develop greatly in their ability to engage in symbolic play. They can defer imitating something for up to a week, and can also do so across a change in context (for example, from daycare to home). Simple toys that encourage pretend play, such as dress-up materials, dolls, stuffed animals, and small vehicle toys, are appropriate.

19 Through 23 Months

Children in this age group are more confident and stable at walking, and are exploring other skills, such as balancing, jumping, and running. They can pull a toy behind them while walking, climb onto and off of furniture without assistance, walk up and down stairs with assistance, and—by the end of this period—may be able to kick a ball. They can now pick up and manipulate much smaller objects due to their more developed pincer grasp. They like to sort objects, often grouping them into two categories, and can now fit together simple objects. Children in this age group can match angles, which allows them to fit a square peg into a square hole. They can also start to use very simple coupling mechanisms like magnets, large hooks, and hook-and-loop or touch fasteners. At 19 months, children can now engage in true building play.

Representational and symbolic thinking emerges during this timeframe, and children understand that some toys represent other objects. The child’s depiction of representational art, however, is still in its infancy and may seem nonrepresentational to adults. Most of their artistic forays take the form of gestures, or a series of dots may represent, for example, a rabbit hopping. They can use simple phrases, a few active verbs, and directional words, such as “up,” “down,” and “in.” Social play also emerges because children of this age can now communicate with and play alongside each other. These children can role-play a variety of commonly observed actions, such as sleeping and making dolls or stuffed animals assume roles, such as play partners. When playing pretend with children, parents are usually sensitive to the needs of their children, suggesting play at the same or slightly higher level of complexity than their children would normally play. Although they still use trial and error, these children can mentally consider solutions to problems before taking any action. This means they can remember and work with mental representations of familiar objects, pictures, letters, and numbers as they ponder appropriate actions. They are more goal-oriented, and object permanence is more advanced. These children can help dress or undress themselves. Toys with low-to-moderate cause-and-effect features—such as those with push buttons or pull cords that cause actions or sounds—are attractive to these children.

2 Years

Now that pretend play is established, 2-year-olds can perform social roles like mommy, daddy, or baby. Role taking becomes a bigger part of social pretend play, and their pretend play becomes more elaborate as they use a variety of objects to carry out longer episodes. At this age, children need the object to resemble the real item to some degree, so they might use a cloth rather than a shoe to represent a pillow. They understand that pictures can depict pretend objects, and scribbles gradually become more representational pictures during this period, although they are still more interested in the process than the product. They become increasingly interested in color variations and using simple art materials. Children at this age begin to show an interest in television and television characters. They are drawn to familiar cartoon characters from television shows that they can incorporate into their play themes. They often want to know "why," and can start to use simple learning or educational toys. They understand the purpose of numbers in counting objects.

Children have increasing control over basic gross and fine motor skills. Interest in gross motor activity increases with newly found physical strength and basic coordination; and children this age especially enjoy balancing, climbing, running, jumping, throwing, catching, and pushing or pulling objects. They learn these skills separately during this period, and with each passing year, they gradually combine them with other skills as coordinated movement. They can perform somersaults, and like to dance, twirl, and gallop to music. Although their control is still uncertain, they can kick and throw a ball. They can manage simple screwing actions, and can use simple one- or two-turn wind-up mechanisms, provided they are of low tension. Smaller buttons or snaps may be difficult for these children to manipulate, but they can use large hooks, buttons, and buckles. They prefer more realistic toys, so colors other than bright primary colors (*e.g.*, pastels) become attractive. However, these toys do not need to be elaborately detailed.

3 Years

These children like to use replica objects as actors in a story. A doll, for example, might be prepared to attend a birthday party with her doll friends, and they will drive in a car, eat food, and play chase, or dance at the party. Realistic props enhance pretend play at this age, but these children also start to use objects that are unlike the real item, so they might use a shoe to

represent a pillow. They show greater interest in structured games. Television characters, especially gentle, cartoonish characters are important at this age because children use these characters as safe playmates.

These children progress considerably in their gross motor skills. They can tiptoe and balance on one foot, hop, climb, and slide on play structures with ease, kick or catch a large ball thrown from a short distance, and throw and aim at short distances. Children in this age group still spend a substantial amount of their time in object-oriented play. They now have the fine motor skills to take on the challenge of more complex building play, combining smaller pieces, and engaging in a variety of art activities that require fine motor skill.

4 Through 5 Years

Drama and pretend play, also known as symbolic play, are at their zenith. These children like to invent complex and dramatic make-believe scenarios. They can build upon each other's play themes, create and coordinate several roles in an elaborate scenario, and understand story lines better. Many of these children still have difficulty understanding the differences between fantasy and reality. For example, children of this age may believe that monsters are real. They enjoy stepping into roles of power, like a parent, doctor, policeman, lion, or superhero, which helps them to understand these roles better, to make the situations less scary, or to fulfill wishes and express a broad range of emotions. Toys that are based on popular media platforms let children share roles with other viewers of the same program to create a ready-made play script. As their cognitive and fine motor skills improve, they begin to desire objects with more realistic detail; yet, they still are not very concerned about mirroring reality.

These children further master gross and fine motor skills. They enjoy frequent trips outside to run, climb, hop, skip, and chase. Their fine motor skills are much improved over 3-year-olds, allowing them to engage with art materials requiring more precision. Interactive toys are still attractive at this age, although the challenge of non-predictable and random responses from the toy is more attractive and will consume the child's time for longer.

6 Through 8 Years

These children continue their interest in physical play outdoors, seeking to master more specialized physical skills. They are much stronger, have greater endurance, and are ready for more challenges. Their play includes more rough-and-tumble or risk-taking behaviors. They focus more on playing their games and activities by spontaneous or set rules, either of which can be complex. Children in this age group engage in sports of all kinds and common outdoor games. They often want to focus on and develop specific skills, and are adept at a variety of activities requiring great dexterity, such as complex hand games, building, or crafts. They can make small, controlled marks or movements while drawing or writing.

They pay much more attention to detail, which facilitates a desire for collecting. At this stage, they start using logic more often to solve problems, organize, or choose from a variety of alternatives. Their appreciation for simple jokes and riddles grows during this period. Licensed characters based on action superhero themes or friendship themes are very popular early on with this age group.

9 Through 12 Years

Children during this period continue to develop their skills at many of the sports, games, and activities from their early elementary years; however, some games become predictable and boring. Therefore, they are looking for a new range of activities to challenge their more advanced motor skills and thinking. Instead of finished products, they often prefer raw materials for creating their own unique products. These children enjoy a variety of activities at a more complex, exacting level of performance, such as arts and crafts, theater, advanced science projects, and generating computer graphics. They are beginning a stage where they seek to clarify and express more complex concepts, moving from the concrete to the abstract and applying general principles to the particular. Around age 9, they begin to shift their interests away from cartoon characters to more real-life characters, like professional sports stars and real-life television, music, and movie stars.

Children in this age group like to emulate popular teen characters, sports stars, and musicians, by using licensed products in which they are featured. For some children, symbolic play may

continue into this age group; although children may prefer to engage in it in private settings so that they are not embarrassed by appearing too immature.

EXPLORATORY AND PRACTICE PLAY

Exploratory and Practice play toys, such as mirrors, mobiles, manipulatives, push toys, and pull toys, help young children learn about themselves, objects, and the world around them. These toys encourage young children to develop their fine and gross motor skills, as well as their basic cognitive and language skills.

Mirrors, Mobiles, & Manipulatives (p. 31)

- Activity gyms
- Bubbles
- Cloth and plush toys
- Gear spinning toys
- Inflatable toys
- Interlocking plastic rings
- Large beads on rings
- Lightweight balls
- Mirrors
- Mobiles
- Multisensory infant toys
- Multi-textured infant toys
- Nesting, sorting, and stacking toys
- Plastic discs on a ring
- Plastic keys on rings
- Play mats
- Pop-up toys
- Rattles
- Rocking toys
- Roly-poly toys
- Sand and water toys
- Squeeze and squeak toys
- Teething toys

Push & Pull Toys (p. 45)

- Pull toys with handles and cords
- Push and pull toys that resemble real life objects
- Push toys with handles
- Push toys without cords or handles

MIRRORS, MOBILES, & MANIPULATIVES

Exploratory and practice mirrors, mobiles, and manipulatives are most useful for young children, who are first learning about the characteristics of objects, the world, and the self. Children of all ages are interested in mirrors, which develop self-awareness and identity. Children watch, feel, grasp, manipulate, mouth, and otherwise explore these products. Through them, children learn about their senses and how objects and actions affect them. For safety reasons, all these products should be non-breakable and have rounded edges that cannot cut a child. Products that can be grasped should be made safe for mouthing.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of mirrors, mobiles, and manipulatives:

- Color/Contrast
- Motor Skills Required
- Cause & Effect
- Size of Parts

The order of these characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a description of what types of mirrors, mobiles, and manipulatives are appropriate and how children in that age group play with these products.

Birth Through 3 Months

At this age, children learn mostly through reflexes, such as spontaneous kicking and arm movements. At birth, an infant's focus is best at a distance of about 8 inches from the face. Until about 1 month of age, children merely look, listen, suck, and make grasping movements. They generally perform these actions, many of which seem random, independently of one another. Research demonstrates that children can differentiate red from green, even at birth, and that by 2 months of age, all color receptors in the eye are functioning. By 3 months, children prefer yellow and red to blue and green, and prefer patterns to solids. Now they can see objects several feet

away from their faces. They will also smile at their mirror images. At ages 1 through 3-months-old, children begin adapting their reflexes to their environment, including their toys. Their movements become more coordinated and organized; and at 3 months of age, they begin reaching toward and grasping objects. When children can grasp toys, they learn to manipulate them both manually and orally.

Suitable mirrors and manipulative toys for these children fit completely within their visual field, have rounded edges, and are lightweight, but sturdy, if designed to be grasped. Children in this age group prefer brightly colored toys dominated by yellows, reds, and high-contrast patterns; and graspable toys should be washable because children in this age group will mouth them. Cause-and-effect relationships should be simple. For example, a toy that makes sounds when kicked or shaken would be suitable for children in this age group. Sensory elements should not be too loud, too bright, too sudden, or otherwise extreme. Examples of manipulative toys for children in the latter end of this age group include teething toys, rattles, lightweight balls (such as rattle beads on elastic, musical, chiming, grasping, special effects, and textured balls), multi-textured and multisensory infant toys, activity gyms, play mats, cloth toys, and plush toys. Mirrors and activity gyms should attach securely to the crib or wall; or, they should be well-balanced enough to remain standing on the floor as the child interacts with them. Mobiles should be designed for hanging directly above the infant so the suspended elements are oriented toward the infant—rather than at an angle so their profiles are directed toward the infant—and so each element will fit within the infant's visual field. Mobiles should remain outside an infant's reach because they are meant to be watched, not manipulated by the child. Mobiles that have sensory elements other than movement, such as soft sounds or music, are especially attractive.

4 Through 7 Months

At this age, most children are externally oriented, actively engaging with their environments, and repeating simple actions that involve objects like toys, clothing, and other people. Most children now actively handle toys. They are learning to reach, grasp, push, pull, squeeze, pat, poke, and shake. Mouthing and teething are also very characteristic of this age group, although the time spent mouthing varies among children. They can sit unsupported around 6 months of age, so now playing with water/tub toys is appropriate. Children in this age group are fascinated by faces in

general and are amused by their own face reflected in a mirror. By 6 months of age, they begin to recognize their reflected image as their own. Since children of this age can sit up, they can use small handheld mirrors. Children in the latter end of this age group also can hold and shake easily graspable toys.

Suitable manipulative toys for children 4 through 7 months of age have characteristics similar to those for younger children. Children can now manipulate objects themselves, so they prefer soft, lightweight toys. Because children in this age group prefer to mouth toys, any toy they grasp will most likely proceed toward their face. Toys with flaps, spinners, and rattling objects for exploration (such as beads on elastic, or a small ball with internal beads) are of interest to children in this age group. Examples of cognitive and motor manipulative toys for 4- through 7-month-olds include teething toys, rattles, lightweight balls (such as musical, chiming, grasping, special effects, and textured balls), multi-textured and multisensory infant toys, manipulative panels, activity gyms, play mats, cloth toys, plush toys, squeeze and squeak toys, plastic discs on a ring, and interlocking plastic rings. The youngest children in this age range may show an interest in mobiles. However, starting at about 5 months of age, when children begin to push up onto their hands and knees, or begin to sit up, mobiles, suspended crib gyms, and similar toys are no longer appropriate because they can pose a strangulation hazard. Mirrors may be attached to a crib or wall. Handheld mirrors should have soft edges and handles that fit into their hands. Other toys for holding may have many graspable handles of appropriate size.

8 Through 11 Months

Children 8 through 11 months of age are increasingly mobile, and their behaviors become more outwardly initiated and goal-oriented. Due to an increase in physical and cognitive development, children of this age are beginning to understand simple cause-and-effect relationships. Some children begin to crawl and stand with support by 8 months of age. Very short tunnels (2 feet or less) with mirrors or viewing panels (top or side) that allow for eye contact with a caregiver may facilitate crawling in some children. The motor skills of grasping and shaking, or patting, combined with the cognitive skill of understanding cause and effect, make multisensory toys highly attractive to this age group. Children in this age group may be introduced to stationary wheeled toys that can be spun by a child’s hand to produce fast spinning movement, lights,

sounds, or music. Children of this age can hold two objects at once, but they are unable to coordinate the different actions of each hand. Because their physical abilities are increasing, but they lack the coordination to completely control their own actions, their potential for getting injured increases. Children in this age group are beginning to show an interest in object displacement, and they practice fine motor skills, such as grasping, pushing, pulling, squeezing, patting, poking, and shaking. Mouthing and teething are still very characteristic of this age group, although the time spent mouthing varies among children. When a toy is hidden or not within view, children in this age group know the toy still exists and did not simply disappear.

Suitable manipulative and mirror toys for children 8 through 11 months old have characteristics similar to those for younger children. Children of this age also enjoy toys with containers because they like to put things into them and then dump out the contents. Exploratory toys with large dials, levers, wood flaps that change color and click and clack, rattle beads on elastic, and press buttons may be introduced. Examples of cognitive and motor manipulative toys for children in this age group include mirrors, teething toys, lightweight balls (such as musical, chiming, grasping, special effects, and textured balls), multi-textured and multisensory infant toys, manipulative panels, activity gyms, cloth toys, plush toys, squeeze and squeak toys, nesting toys, sorting toys, stacking toys, simple cause-and-effect toys, such as pop-up toys and roly-poly toys, large beads on rings, and plastic keys on rings. Manipulative panels and simple manipulative toys that are small and light enough for children to lift, hold, and carry are good choices for this age group. Children in this age group enjoy large and low, wall-mounted mirrors, which allow them to watch themselves sit, crawl, and begin to walk. However, these mirrors must be sturdy enough to withstand banging. Handheld mirrors should be small, have soft edges, and include an appropriately sized handle. Children of this age are actively engaged with simple stacking and sorting. Appropriate cause-and-effect toys are easily activated with simple, direct movements, with the effect immediately following the cause. When the effect is too long, the child cannot connect it to the cause.

12 Through 18 Months

Children from 12 through 18 months of age are increasingly curious and love to explore; this is made easier by children's increasing walking skill. Because of this, children begin to self-select

toys, rather than play with only those items that are within their reach. Although they are becoming more skilled at walking, they are still unsteady on their feet, and they often lose their balance. They are engaged in activities that develop their physical strength. They are developing greater fine motor coordination. They are capable of controlled grasping and releasing, pushing, pulling, squeezing, patting, poking, and shaking, and can twist, turn, slide, and crank toys. Toys that combine these options are especially attractive—such as a squeezable ball with beads interlaced on elastic. A toy like this can be squeezed, shaken, or used for fine motor practice as the child slowly moves the beads across the elastic. They are even more expansively exploring the world through all their senses: seeing, hearing, touching, tasting, and smelling.

Suitable manipulative and mirror toys for children 12 through 18 months old are of a size and weight that is easy to grasp and carry, rounded, and lightweight, but sturdy. Toys that are brightly colored with high contrast are attractive to children in this age group. Toys with simple cause-and-effect relationships, like part of the toy popping up when a button is pressed, are attractive, but sensory elements should not be too loud, too bright, too sudden, or otherwise extreme. Toys are generally washable, soft, and lightweight, because children in this age group can now manipulate objects themselves. They also are likely to taste any toy they grasp because they prefer to mouth objects. Examples of manipulative toys for 12- through 18-month-olds include light-to-medium-weight balls (such as musical, chiming, grasping, special effects, and textured balls for easy grasping), stationary wheeled toys that can be spun by a child's hand, multi-textured and multisensory toys, mirrors, wooden flaps that engage the pincher grasp motor skill and turn left and right, large connecting suction cups, manipulative panels, activity centers, cloth toys, plush toys, squeeze and squeak toys, nesting toys, sorting toys, stacking toys, pop-up toys, rocking toys, short or transparent tunnels (3.5 feet or less and/or viewing panels that allow for eye contact with a caregiver; sometimes tunnels for this age group are attached to open ball pits), and inflatable toys. Children have the fine motor skills needed to grab onto the beads in a bead maze and guide them through a simple path. Cognitive skills in language development at this age will permit the child to label the beads, if they are in the shape of familiar objects, such as cars, dogs, and ducks. Full-length mirrors are suitable because children in this age group are increasingly self-aware. Appropriate handheld mirrors are small, have soft edges, and have handles that fit into the hand of children in this age group. Children in this age group can now

engage more actively with stacking and sorting. They thoroughly enjoy water and sand play and are given many opportunities for exploration through sand, water, and related toys. Adults can blow bubbles for children to watch and to pop. Some children may try to blow bubbles with a simple wand, but they are likely to become frustrated if they cannot produce bubbles on their own. No-spill containers may be introduced to prevent spillage of bubble solution if the child tips the container over, due to still-developing fine motor skills and coordination.

19 Through 23 Months

Representational and symbolic thinking emerges between 19 and 23 months of age. This is also a time of great physical activity as children gain new strengths and skills in their gross motor development. They are becoming more confident and stable in walking, and are exploring other physical skills, such as balancing, jumping, and running. They are becoming more skilled with their fine motor movements. Social play emerges as children can communicate better with each other and begin to play alongside each other.

Suitable manipulative and mirror toys for children 19 through 23 months old have characteristics that are consistent with those for the previous age group. Soft, lightweight toys are preferred, because children like to manipulate objects themselves, and prefer to lift, hold, and carry them. Many children still prefer to mouth objects, and any toy they grasp will most likely be tasted. Examples of manipulative and mirror toys for 19- through 23-month-olds include handheld, wall-mounted, and fun-house mirrors, light-to-medium-weight balls (such as musical, chiming, grasping, special effects, and textured balls), stationary wheeled toys that can be spun by a child's hand, multi-textured and multisensory toys, manipulative panels, gear toys, activity centers, cloth toys, plush toys, squeeze and squeak toys, rocking toys, tunnels (similar features to previous age group), and inflatable toys. Some gear toys are especially exciting to this age group, if the gears have chunky handles and can be moved freely around a surface (for example, using magnetic gears on a magnetic board). This allows children to use their budding fine motor skills to grasp the gears and create a design of their choosing. Some children may use their cognitive skills to sort the gears into different colors. Mirrors that are handheld should be small and have soft edges with a handle that fits into the hand of children in this age group. Children 19 through 23 months old can stack, sort, and nest toys with more skill; so nesting, sorting, and stacking toys

are also appropriate for this age group. Children's abilities to sort and recognize colors means that they can now complete more complex peg-style shape sorters based on colors. Children in younger age groups may haphazardly put the pieces on the pegs without respect to sorting or color. Lacing and stringing toys are also appropriate for children in this age group, but they should have large diameter string with stiff ends.

They thoroughly enjoy water and sand play and are often given many opportunities for exploration through sand, water, and related toys**,** such as sand molds, digging, and pouring toys. Children are starting to blow bubbles, but may find the activity frustrating and still need help from an adult. Sources of frustration can include too frequent dipping of the wand into the bubble container to make the solution too sudsy to produce bubbles, as well as the child's inability to blow into the wand softly enough to produce a bubble. No-spill containers may be introduced to prevent spillage of bubble solution if the child tips the container over, due to still-developing fine motor skills and coordination.

2 Years

Two-year-olds are very interested in representational and symbolic play. This is also a time of great physical activity as children gain strength and practice gross motor skills. They can walk, run, jump, and balance fairly well. They are becoming more skillful with their fine motor movements, and manual dexterity is improving. Social play is seen commonly as children are more able to communicate with each other and begin to interact with each other in buddy and group play. For this and other reasons, children are beginning to grow beyond cognitive and motor Exploratory and Practice toys. Instead, they are increasingly interested in encapsulated spaces, including medium-length tunnels (6 feet or less), life-sized, role-play toys, such as baby dolls (see *Pretend & Role Play: Dolls & Stuffed Toys*), and riding toys, such as life-sized wheeled vehicles (see *Sports, Recreational, & Outdoor Play: Ride-On Toys* and *Sports, Recreational, & Outdoor Play: Recreational Equipment*).

Manipulative and mirror toys for 2-year-old children can have a high level of realism, and yet still have the qualities described for the previous age group. Because toys can look more realistic for children at this age, all colors can be used in toys for this age group. Examples of

manipulative and mirror toys for 2-year-olds include mirrors, lightweight balls (such as musical, chiming, grasping, special effects, and textured balls), electronic stationary wheeled toys with simple learning features that can be spun by a child's hand, multi-textured and multisensory manipulative toys, manipulative panels, activity centers, cloth toys, plush toys, squeeze and squeak toys, nesting toys, sorting toys, stacking toys, inflatable toys, water toys, sand toys, rocking toys, tunnels, and large lacing and stringing toys. Handheld toys with mirrors should be small and have a handle that fits into the hand of children in this age group. Children 2 years of age enjoy stacking, sorting, nesting, and more complicated activity centers and manipulative panels with knobs and latches, peg boards, and pounding toys. They thoroughly enjoy play and exploration with water and sand. Most children can blow bubbles independently, and enjoy doing so; they are starting to use bubble wands and bubble pipes. No-spill containers are best to prevent spillage of bubble solution if the child tips the container over, due to still-developing fine motor skills and coordination.

3 Through 5 Years

After the age of 2, most children engage predominantly in symbolic play, which includes dramatic and building play. There are still some exploratory play materials that will continue to hold interest for this age group—most notably bubble guns with a trigger (both conventionally shaped and those in the shape of an animal or other design). At any younger age, children do not have the strength or gross motor skills to hold up the gun and press the trigger at the same time. Other children lack the strength to press the trigger altogether. Other exploratory toys that older children enjoy are foam clay, and moldable (wet texture) sand for squeezing between their hands and using with molds and for early sculpting activities. Age 3 is the youngest appropriate age, due to the lower incidence of mouthing and ingestion. Younger children are also tempted to stick clay or sand onto inappropriate objects (clothes, shoes). Other toys, like wooden flaps attached with a ribbon that will fold upon themselves and trickle and cascade downward if held correctly, are beginning to be understood in this age group; at any younger age, children try to stack the flaps on top of each other, as if they were blocks. Liquid clocks are interesting exploratory toys for this age group; at any younger age, children do not know that flipping the clock over produces an effect that they can watch for enjoyment purposes. Children also enjoy climbing through long tunnels (9 feet or less) at this age, and may appreciate added features, such as

hanging streamers, fabric doors that swing open and closed, and familiar themes. At younger ages, children may feel scared or intimidated to crawl through long tunnels.

For information on balls for older children, please see *Sports, Recreational, & Outdoor Play: Recreational Equipment* and *Sports, Recreational, & Outdoor Play: Sports Equipment*. For information on mirrors for older children, please see *Pretend & Role Play: Dress-Up Materials*.

EXPLORATORY AND PRACTICE PLAY: **MIRRORS, MOBILES, & MANIPULATIVES**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts*	Fits in visual field		
	Small enough for infant to grasp, if expected to be handled	----------→	----------→
Shape of Parts	Rounded corners/edges	----------→	----------→
	Easy-to-grasp shape, if expected to be handled		
Number of Parts			
Interlocking/Loose Parts			
Materials	Lightweight	----------→	----------→
	Soft	----------→	----------→
	Washable	----------→	----------→
Motor Skills Required*	Reaching	----------→	Increased mobility; scooting, crawling, standing, cruising, and initial walking
	Grasping	----------→	
	Mouthing	----------→	----------→
		Hand-eye coordination	Can grasp & shake
		Able to sit up unsupported around 6 mo.	Practicing fine motor skills such as grasping, pushing, pulling, squeezing, patting, poking, & shaking
		Palmar grasping; raking grip	
		Can transfer objects from hand to hand	Emergence of pincer grasp
Color/Contrast*	Bright, vibrant colors	----------→	----------→
	High contrast patterns	----------→	----------→
	Facial patterns	----------→	----------→
Cause & Effect*	Cannot fully understand cause & effect, but can still enjoy it; prefers simple cause-and-effect relationships	----------→	Beginning to understand cause-and-effect relationship; simple, clear cause-and-effect relationships are still best
Sensory Elements	Visual: objects that move slowly		Pictures of familiar objects
	Multi-textured	----------→	Bouncing, vibrating, & lighting up
	Gentle, soothing sounds & voices	----------→	----------→
	Not too loud, sudden, or extreme	----------→	----------→
Level of Realism/Detail			
Licensed Theme			
Classic			
Robotic/Smart Features			
Educational			

Relevant Play/Behavior	Finds multisensory elements very interesting Enjoys music	----------→	----------→
	Explores objects manually & orally	----------→	----------→
	Learns through reflexes	----------→	----------→
	Able to reach & grasp around 3 months	Increasing interest in surroundings	----------→
	At birth, focus is best about 8 inches from face; by end of this period can see several feet away	Actively handles toys	----------→
		Mouthing & teething	----------→
		Begins pushing onto hands & knees and sitting up around 5 mo.	Can hold 2 objects at once but cannot coordinate between them
		Begins to understand object permanence	Object permanence is more established Interest in object displacement
Examples of Products	Mirrors securely attached to a wall or crib	----------→	----------→
	Mobiles, particularly those with music & movement	Mobiles (prior to 5 mo.)	
	Teething toys	----------→	----------→
	Rattles	----------→	----------→
	Lightweight balls (musical, chiming, grasping, special effects, & textured)	----------→	----------→
	Multi-textured infant toys	----------→	----------→
	Multisensory infant toys	----------→	----------→
	Activity gyms	----------→	----------→
	Play mats	----------→	----------→
	Cloth & plush toys	----------→	----------→
	Toys that make sounds when kicked	Handheld mirrors (starting around 6 mo.)	----------→
		Squeeze & squeak toys	----------→
		Plastic discs on a ring	----------→
		Interlocking plastic rings	----------→
			Sorting & stacking toys
			Pop-up toys
			Roly-poly toys
			Large beads on rings
			Plastic keys on rings
			Very short tunnels (2 feet or less and/or with viewing panels)

* One of the most influential characteristics for these products.

EXPLORATORY AND PRACTICE PLAY: **MIRRORS, MOBILES, & MANIPULATIVES**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years	3-5 Years
Size of Parts*	Small enough to grasp, carry, & manipulate, if expected to be handled	----------→	----------→	----------→
Shape of Parts	Rounded	----------→	----------→	----------→
	Easy-to-grasp shape, if expected to be handled	----------→	----------→	----------→
Number of Parts				
Interlocking/Loose Parts				
Materials	Lightweight (cont'd)	----------→	----------→	----------→
	Soft (cont'd)	----------→	----------→	----------→
	Washable (cont'd)	----------→	----------→	----------→
Motor Skills Required*	Increasingly skilled at walking	----------→	----------→	Moderate degree of fine motor dexterity & control
	Working on fine motor movements like controlled grasping & releasing, pushing, pulling, flapping, squeezing, patting, poking, & shaking, twisting, turning, sliding, & cranking	----------→	----------→	
		New gains in gross motor strength & skills	Gains in gross motor strength & skill	----------→
		More confident & stable walking		
		Exploration of other physical skills such as balancing, jumping, & running	Walk, run, jump, & balance fairly well	----------→
		More skilled at fine motor movement	Fine motor movements & manual dexterity is improving	----------→
			Can move fingers independently of each other	----------→
Color/Contrast*	Bright, vibrant colors (cont'd)	----------→	All colors, including pastels, but dull colors are less attractive	Rich, vibrant colors
	High contrast patterns (cont'd)	----------→		Pale or pastel colors
	Facial patterns (cont'd)			
Cause & Effect*	A clear cause-and-effect relationship (cont'd)	----------→	----------→	Moderately complex cause-and-effect functionality (pushing produces sound, lights)
Sensory Elements	Visual: lights, actions	----------→	----------→	----------→
	Manual	----------→	----------→	----------→
	Sounds	----------→	----------→	----------→
	Not too loud, sudden, or extreme (cont'd)	----------→		
Level of Realism/Detail				
Licensed theme				
Classic				
Robotic/Smart Features				

Educational				
Relevant Play/Behavior	Finds multisensory elements very attractive Like to explore objects manually & orally (cont'd) Increasingly curious & loves to explore Beginning to self-select toys Uses all senses to explore the world: seeing, hearing, touching, tasting, & smelling Short tunnels (3.5 feet or less and/or viewing panels)	----------→ ----------→ ----------→ Can self-select toys ----------→ Social play alongside each other (parallel play) ----------→	----------→ ----------→ ----------→ ----------→ ----------→ Social play (buddy & group) Beginning to grow beyond Exploratory and Practice toys Increasingly interested in encapsulated spaces such as longer tunnels, role-playing, & riding toys	Moderate problem-solving abilities ----------→ ----------→ ----------→
Examples of Products	Mirrors that securely attach to a wall (cont'd) Appropriately sized handheld mirrors (cont'd) Lightweight balls (musical, chiming, grasping, special effects, & textured) (cont'd) Multi-textured toys (cont'd) Multisensory toys (cont'd) Manipulative panels (cont'd) Activity centers (cont'd) Cloth & plush toys (cont'd) Squeeze & squeak toys (cont'd) Sorting, & stacking toys (cont'd) Pop-up toys (cont'd) Bead Mazes Inflatable toys Sand & water toys Rocking toys Bubbles (no spill, may need to be blown by an adult)	All examples from the previous age group Lacing & stringing toys Nesting toys Gear toys	All examples from the previous age group	Bubble guns (both conventially shaped and those in the shape of an animal) Foam clay Wooden flaps attached with a ribbon that will fold upon themselves and trickle downwards if held correctly Liquid clocks (For information on mirrors for older children, please see *Pretend & Role Play: Dress-Up Materials*) (For more on balls for older children, please see Sports, Recreational, & Outdoor Play: Recreational Equipment)

* One of the most influential characteristics for these products.

PUSH & PULL TOYS

Push and pull toys are important for motivating children to crawl or walk. They are often operated with a string or a handle, and almost always travel on wheels of some kind. Most children younger than 6 months cannot sit unsupported, and most are unable to move around until about 7 months of age. Therefore, push and pull toys are generally inappropriate for most children younger than 6 or 7 months. Since toys in this subcategory are most appropriate for the child who is crawling or just beginning to walk, representational push and pull toys are not discussed here. For those types of toys, please see *Pretend & Role Play: Small Vehicle Toys* or *Pretend & Role Play: Tools & Props*.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of push and pull toys:

- Motor Skills Required
- Color/Contrast
- Level of Realism/Detail

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of push and pull toys are appropriate and how a particular age group plays with these toys.

4 Through 7 Months

At this age, most children are externally oriented, actively engaging with their environments, and repeating simple actions that involve objects, including toys, clothing, and other people. Most children now actively handle toys. They are learning to reach, grasp, push, pull, squeeze, pat, poke, and shake. They can sit unsupported around 6 months of age, and some children begin to crawl and stand with support by 8 months of age.

Suitable push toys for 6- and 7-month-olds have rounded edges, are sturdy, and roll steadily and easily along the ground. Children of this age are most interested in push toys that are brightly colored with high contrast, and these toys should be washable. Appropriate cause-and-effect relationships are simple; for example, a toy may make a noise when the infant pulls it. Sensory elements are not too loud, too bright, too sudden, or otherwise extreme. Realistic detail is not preferred at this age, and children in this age group generally lack the fine motor skills to operate toys that use handles and strings.

8 Through 11 Months

As these children become more mobile, their behaviors become more goal-oriented and objects in their environment attract them. Because of their increase in physical and cognitive development, children around this age are beginning to understand simple cause-and-effect relationships. The motor skill of grasping and shaking, combined with the cognitive skill of understanding cause and effect make multisensory toys highly engaging for this age group. They are practicing fine motor skills, such as grasping, pushing, pulling, squeezing, patting, poking, and shaking. Most children within this age group can sit unsupported or crawl while playing with push and pull toys.

Push and pull toys for children 8 through 11 months old generally have characteristics similar to those for younger children. Cause-and-effect toys should activate by simple, direct movements by the child, and the effect should immediately follow the cause. When the effect is too long, the child is unable to connect the cause and the effect. Realistic detail is not preferred at this age. Handles and strings are still not appropriate for this age group because, although they may have the ability to grasp them, they do not have the coordination to manipulate toys with them.

12 Through 18 Months

Children from 12 through 18 months of age are increasingly curious and love to explore, and their increasing walking skill facilitates such traits. Because of this, children begin to self-select toys rather than play with only those items that are within their reach. Although they are

becoming more skilled at walking, they are still unsteady on their feet and often lose their balance. They are often engaged in activities that develop their strength.

In general, push and pull toys for children 12 through 18 months old have characteristics similar to those for younger children. However, children in this age group are also now able to use push toys with high upright handles or rigid rods with large attached handles, especially because they can be used to help stabilize unsteady walkers. Some children at this age may even have advanced enough gross motor skills to walk or run quickly with walkers. They are not yet able to use pull toys with cords if the child must stand to use them, because cords do not provide support. Toys of that kind require more advanced walking and better body skills. In addition, they require the child to look over his or her shoulder while walking to fully enjoy them. Small pull toys with short cords that the child can use while remaining seated are suitable though.

19 Through 23 Months

Representational and symbolic thinking emerges between 19 and 23 months. This is also a time of great physical activity as children gain new strengths and skills in their gross motor development. They are becoming more confident and stable in walking and are exploring other physical skills, such as balancing, jumping, and running. In addition, social play is starting to emerge during this period, as children are more able to communicate with each other and begin to play alongside each other.

Push and pull toys for children 19 through 23 months old can have some realistic detail, and may include rigid handles or cords for pushing or pulling. Their advancing walking skills let them use pull toys with cords. Pull toys that weigh enough to slightly resist a child's pull will help prevent the toy from tipping over during use, as will pull toys with broad bases and low centers of gravity.

2 Years

Two-year-olds are very interested in representational and symbolic play. This is also a time of great physical activity as children gain strength and practice gross motor skills. They can walk, run, jump, and balance fairly well. Social play is seen commonly as children are better able to

communicate with each other and begin to interact with each other in buddy and group play. They are increasingly interested in riding toys, such as wheeled vehicles (see *Sports, Recreational, & Outdoor Play: Recreational Equipment*).

Push and pull toys for 2-year-old children can include realistic details, which means that they can include all colors. These toys are rounded, sturdy, and washable. Suitable cause-and-effect relationships are simple (for example, balls pop when toy is rolled), and sensory elements are not too loud, too bright, too sudden, or otherwise extreme. Toys should be heavy enough so that they are not lifted completely off the ground as children pull them. Those with broad bases and low centers of gravity are more stable and suitable for children in this age group. As children get older and engage in pretend play, push and pull toys can be made to resemble non-toy objects, such as cars, wheelbarrows, and vacuum cleaners. Wheelbarrows require children to be completely stable in standing and walking, because they need to be simultaneously lifted, balanced, pushed, and steered. For more on push and pull toys for pretend play, see *Pretend & Role Play: Small Vehicle Toys*. For more on wheeled vehicles, see *Sports, Recreational, & Outdoor Play: Ride-On Toys*.

EXPLORATORY AND PRACTICE PLAY: **PUSH & PULL TOYS**

Product Characteristics	4 Through 7 Months	8 Through 11 Months
Size of Parts	Easy to grasp & push (5-7 inches)	----------→
Shape of Parts	Rounded corners/edges	----------→
Number of Parts	One	----------→
Interlocking/Loose Parts		
Materials	Soft Washable	----------→ ----------→
Motor Skills Required*	Reaching Grasping Hand-eye coordination Able to sit up unsupported around 6 mo.	Increased mobility; scooting, crawling, cruising, & walking Can grasp & shake Practicing fine motor skills such as grasping, pushing, pulling, squeezing, patting, poking, & shaking
Color/Contrast*	Bright, vibrant colors High contrast patterns	----------→ ----------→
Cause & Effect	A simple, clear cause-and-effect relationship	----------→ Beginning to understand cause-and-effect relationship
Sensory Elements	Visual Manual Auditory: gentle, soothing sounds Not too loud, sudden, or extreme	----------→ ----------→ ----------→ ----------→
Level of Realism/Detail*	Realistic detail not preferred or necessary	----------→

Licensed theme		
Classic		
Robotic/Smart Features		
Educational		
Relevant Play/Behavior	Finds multisensory elements very attractive Enjoy music & sound effects Like to explore objects manually & orally Reflexes more outwardly oriented Actively handles toys Mouthing & teething	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ Can hold 2 objects at once but cannot coordinate between them
Examples of Products	Small, rounded push toys (starting around 6 months) Simple cars or animals on wheels/rollers (starting around 6 months)	----------→ ----------→

* One of the most influential characteristics for these products.

EXPLORATORY AND PRACTICE PLAY: **PUSH & PULL TOYS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts			
Shape of Parts	Rounded corners/edges (cont'd) Broad base Low center of gravity	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Number of Parts	Few	----------→	----------→
Interlocking/Loose Parts			
Materials	Soft (cont'd) Washable (cont'd) Heavy & steady enough to resist tipping	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Motor Skills Required*	Increasingly skilled at walking Working on fine motor coordination, including controlled grasping & releasing, pushing, pulling, squeezing, patting, poking, & shaking, twisting, turning, sliding, & cranking	----------→ ----------→ New gains in gross motor strength & skills More confident & stable walking Exploration of other physical skills such as balancing, jumping, & running More skilled at fine motor movement Can pull toys behind	----------→ ----------→ Gains in gross motor strength & skill Walk, run, jump, & balance fairly well Fine motor movements & manual dexterity is improving Can move fingers independently of each other
Color/Contrast*	Bright, vibrant colors (cont'd) High contrast patterns (cont'd)	----------→ ----------→	All colors, including pastels, but dull colors are less attractive
Cause & Effect	A clear cause-and-effect relationship (cont'd)	----------→	----------→

Sensory Elements	Visual (cont'd) Manual (cont'd) Auditory: gentle, soothing sounds (cont'd) Not too loud, sudden, or extreme (cont'd)	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→
Level of Realism/Detail*	May be recognizable, but realistic detail not necessary	Somewhat realistic, but simple & not detailed	Clearly represents object envisioned to represent, but no elaborate details
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Finds multisensory elements very attractive Likes to explore objects manually & orally (cont'd) Increasingly curious & love to explore Beginning to self-select toys Uses all senses to explore the world: seeing, hearing, touching, tasting, & smelling	----------→ ----------→ ----------→ Self-select toys ----------→ Social play alongside each other (parallel play)	----------→ ----------→ ----------→ ----------→ ----------→ Social play (buddy & group) Increasingly interested in riding toys
Examples of Products	Push toys with handles Pull toys Pull toys with short cords (used while seated)	----------→ ----------→ Pull toys with cords	----------→ ----------→ ----------→ Push & pull toys that resemble real life objects (see *Pretend & Role Play: Small Vehicle Toys* or *Sports, Recreational, & Outdoor Play: Ride-On Toys*)

* One of the most influential characteristics for these products.

BUILDING PLAY

Around 19 months of age, children demonstrate their symbolic understanding of the world through their play, a construct known as representational play. Building play is the use of blocks or other building materials to represent real-world objects, such as castles, bridges, or towers. Although children can grasp blocks during infancy, they begin the early stages of building play at about 19 months, on average. With each passing year, their structures increase in complexity. Around the age of 6 years, interest in building play shifts from blocks to more complex interlocking materials.

Blocks (p. 57)

- Foam cube blocks
- Hollow blocks
- Letter & number blocks
- Magnetic blocks
- Motorized bumble, bounce, and vibrating blocks
- Nesting blocks
- Pillow blocks
- Plastic blocks
- Plastic-coated soft cube blocks
- Problem solving blocks
- Rattle/jingle blocks
- Stacking blocks
- Table blocks
- Talking blocks
- Wooden kindergarten blocks

Interlocking Building Materials (p. 71)

- Brick connecting pieces
- Foam puzzle mats
- Gear blocks
- Holes/slats/casing connecting sets
- Model kits
- Nuts & bolts
- Robotic blocks
- Rod and Spool blocks
- Snap-lock beads
- Suction cup blocks
- Wooden log connecting sets

BLOCKS

Building play contributes to learning and development, and increases the competence of the child. Building play can be characterized by the lack of a single organizational format; the materials largely determine the organization of the play. Simply defined, “building play” involves using materials, such as blocks, to build something. True building play generally begins in early childhood around 19 months of age and continues into adulthood. Younger children advance from simply handling objects and materials, to actively using them for constructing or building with a preconceived plan in mind. They begin to manipulate objects with the intention of creating something, such as towers or houses. Until the age of 19 months, blocks are used primarily as grasping objects in the environment. Most block sets are appropriate for children 19 months and older, with the materials differing most notably in size and weight. Note that larger sets than are developmentally appropriate may be introduced to children where only a portion of the pieces are presented to the child.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of blocks:

- Motor Skills Required
- Number of Parts
- Size of Parts
- Materials
- Cause & Effect
- Sensory Elements
- Shape of Parts

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of blocks are appropriate and how a particular age group plays with these toys.

Birth Through 3 Months

At this age, child play is limited to exercising reflexes. During this phase of infancy, children reflexively open their mouths when their cheeks are brushed, so appropriate blocks are too large to fit into their mouths. Before 3 months, most children do not have the physical abilities to grasp or manipulate objects. During the first months of life, children use visual observation to engage in play. Research studies find that children can differentiate red from green, even at birth, and that by 2 months of age, all color receptors are functioning. By 3 months, children prefer yellow and red over blue and green and highly contrasting patterns over solids. Therefore, bright yellow and red blocks, and those with high visual contrasts and patterns, are more attractive to children in this age group. Blocks made of soft/plush materials (like skinned foam or pillow blocks to prevent liberation of small parts during play) or covered in plastic or cloth are appropriate for these children. Blocks with rounded edges may avoid potential eye injury.

4 Through 7 Months

At this age, movements are progressing from involuntary reflexes to outwardly oriented movements. As the child matures, grasping, reaching, shaking, and pulling become ways to interact with the environment. Grasping is mastered around 6 months, so children can now handle toy blocks. Grasping a block triggers the sucking reflex, so children in this age group will immediately put blocks they can grasp into their mouths. Therefore, blocks should be designed to avoid the possibility of choking. Motor skills are crude at this age; thus, blocks must be designed so children can easily grasp them (*e.g.*, by making them less than 4 inches across). Blocks that are soft or plush are safer for the eyes and faces of children in this age group when they make erratic arm motions. Visually, this age group's abilities are consistent with younger children, preferring red and yellow and patterns. Because 4- through 7-month-old children use blocks in exploratory play rather than true building play, blocks that are appropriate for this age group include those that are made from soft/plush materials like hollow plastic, vinyl, or foam. Larger blocks (more than 3 inches across) with rounded edges are appropriate for children in this age group, as are blocks that are patterned or colored red or yellow.

8 Through 11 Months

From 8 through 11 months, children's behaviors become more outwardly oriented and their hand-eye coordination is becoming more refined. In addition, this age brings the cognitive ability to understand simple cause-and-effect relationships. This, together with the motor skill of shaking, make sensory blocks highly attractive for this age group. Soft blocks with jingle bells or rattles inside, or blocks that squeak when squeezed, are attractive and cognitively stimulating. Additionally, children at this age enjoy battery-operated blocks that bounce, vibrate, or light up when handled. Developing fine motor skills make squeezing a highly engaging activity. Blocks that can be squeezed (*e.g.*, those made from hollow plastic or foam) aid in this development, and those between 3 and 5 inches permit easy grasping and carrying. Blocks are not yet used as building play materials, so providing them as manipulatives to aid in the child's development is appropriate (see *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives*). Children need only a few blocks rather than a wide assortment.

As children's dexterity increases, their potential for injury increases. Children of this age can hold two objects at once, meaning twice as many things are available to choke on or to be hit with as they bang the two things together. Appropriate soft/plush blocks are larger than 3 inches across, have rounded edges, are easily grasped, are colorful, and are multisensory. Children in this age group are particularly attracted to blocks that incorporate sounds. Cube-shaped blocks are easy for them to grasp and bang together. Blocks that include pictures of familiar objects in the environment are also attractive. Generally, wooden blocks are considered too heavy for children in this age group. However, lightweight wooden or plastic blocks are suitable for the child's banging efforts.

12 Through 18 Months

Children's emerging interests in novelty and exploration characterize the 12- through 18-month period. Their curious nature is enhanced by the new ability to walk, which makes many more items available for their reach. However, walking is still unsure and wobbly, and children in this age group may fall as often as they step, particularly early on. Blocks with rounded edges make falls onto them safer. Blocks that are made from soft foam, plush cloth, sponge, or rubber-like materials also work well for meeting this need. These lightweight blocks will be used for

stacking and lining up. However, children in this age group find knocking down is just as important as building. Once a stack of blocks is built, they want to knock it down right away with their hands or feet. Therefore, appropriate blocks are those that are not hazardous to children as they are knocked down. Large, heavy wooden unit blocks—also known as kindergarten blocks—are not appropriate because of their weight, size, and hard corners. Grasping is a much easier task during this phase of life, so smaller blocks (2 to 4 inches) may be appropriate.

Children in this age group are becoming capable of making combinations of two to three objects, which makes nesting blocks engaging. Children have the physical motor and coordination skills necessary to manipulate the nesting task and have the emerging cognitive abilities to understand that the blocks go together in a predetermined way. Although children at this age will not make predetermined structures with magnetic blocks, they find it exciting to click and unclick blocks if they have internal magnets. The exploration interest of children can be incorporated into their blocks, as well. Blocks that have "curiosities" built into them provide children with an exploration toy. For instance, hollow blocks that resemble a cage and have something inside that can be "freed" would be attractive to children in this age group. In this age span, they are starting to solve problems through an active process of trial and error; so blocks that encourage such behavior are appropriate. Simple lightweight wooden or plastic blocks that were appropriate for the 8- through 11-month child are also appropriate for the 12- through 18-month child. Children in this age group can begin to line up lightweight blocks or stack them, or they may attempt to stack or line up blocks in an orderly way. Based on child observations, little to no mastery of fine or gross motor skills was required for stacking or lining up blocks in the set, making it appropriate for children in this age group. Nesting and curiosity blocks are also engaging. A greater number of blocks (15 to 25) is appropriate, but a large number is still unnecessary.

19 Through 23 Months

The cognitive ability for representational or symbolic thinking emerges during the 19- through 23-month time frame. Consequently, children may now start using blocks for true building play, or to stack them onto chunky dowels. Children in this age group are now capable of putting representational thought and imagination into action, so they may use a stack of blocks to

represent a tower. Because their interest in building is starting to grow, sturdier blocks are appropriate. Cardboard blocks and thick foam blocks are both lightweight and easy to stack, so children in this age group can easily build with them. Other attributes that are attractive in their play are shape (rectangular or square) and size (about 2 to 4 inches). Blocks that are too cumbersome or too heavy are of little interest because they are more difficult to manipulate. Children in this age group find knocking down just as important as building. Once a tower of blocks is built, they want to knock it down right away with their hands or feet. Therefore, appropriate blocks are those that are not hazardous to children as they are knocked down, unlike heavy wooden unit blocks or kindergarten blocks. Lightweight wooden or plastic table blocks, however, are appropriate. Working with table blocks uses fine motor coordination skills as they work to stack them into towers. Sets of blocks that include 20 to 40 pieces are sufficient for the building in which children in this age group engage.

2 Years

Building play for 2-year-olds is very much the same as building play for 19- through 23-month-olds. They use their building for symbolic representation, and they enjoy knocking down blocks as much as building with them. Therefore, appropriate blocks for 2-year-old children are the same as those for 19- through 23-month-old children: lightweight wood, cardboard, or foam material, square or rectangular shape, and about 2 to 4 inches across. Sets of 20 to 40 blocks are appropriate for this age group.

3 Years

Block constructions become more advanced by the time children are 3 years old. To reproduce something they have seen, they analyze the component parts and visualize each in relationship to the others. Statements like, “No. That doesn’t go there. It goes over here,” are often heard from children in this age group as they build. They work through problems of relative size, volume, space, and weight. Children in this age group are ready to advance from cardboard to wooden blocks of different sizes and shapes so that they can build things more complex than towers. Wooden unit blocks or kindergarten blocks are now appropriate. The basic unit is usually 3 inches by 3 inches by 1 inch, and the dimensions of other blocks in a set are multiples or

fractions of that basic unit. A complete set often includes unit, double-unit, and quadruple-unit blocks, as well as wedges, triangles, cylinders, half rounds, and others. However, triangles and half-round arches are not highly used at this age. The blocks can be hard- or soft wood, with hardwood being heavier, more durable, and more expensive. Blocks like these are attractive because they are simple geometric forms without complicated structures. This gives children in this age group the opportunity to build garages, airports, houses, barns, rockets, and other objects. An increased number of blocks over previous age groups (60 to 80) is also appropriate.

4 Through 5 Years

During this preschool period, block play is a dominant play activity. Complex structures that began to be enjoyed at 3 years of age with wooden unit blocks are now more accurate and intricate. Dramatic story lines are brought into building play as children add loose parts to their creation. For example, cars are added when making garages, animals are brought in when making farms, and dolls and furniture are used in the structure of a house. Loose parts combined with wooden blocks are attractive because they open the door for richer, more complex play. Suitable blocks for these preschool children tend to be made of wood and come in various sizes, lengths, shapes, and specialized forms, other than just squares or rectangles. Children in this age group can also handle a relatively large number of parts (80 to 100). Larger sets may be introduced to these children, where only a portion of the pieces are used.

6 Through 8 Years

Early elementary age children generally find block building and building play highly attractive. On average, elementary classrooms contain blocks for the children to use. Blocks provide children in this age group with experiences that combine visual and motor skills with the ability to plan ahead and execute their ideas through a series of steps. Fine motor skills, hand-eye coordination, and arm movement control are becoming more refined, so more elaborate and intricate constructions are seen. Because of the developmental level of children in this age group, attractive and appropriate blocks are generally wooden, contain both large and small pieces, include a variety of shapes besides just squares or rectangles, include a variety of lengths, and contain many pieces. Children in this age group can handle sets with 80 to 100 pieces. Attributes

like these provide children in this age group with the materials needed to build at the level of representation for which they are striving.

9 Through 12 Years

By 9 years of age, block building is a fairly uncommon activity. However, children who choose to spend time interacting with blocks, enjoy blocks that have characteristics similar to those for the previous age group, because these characteristics allow intricate structures to be built. Having many parts (100 or more) is also important to keep the appeal level high. Generally, though, this age group's appeal for building play lies with sets that have interlocking pieces, as discussed in the next subcategory, *Interlocking Building Materials*.

BUILDING PLAY: **BLOCKS**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts*	Easy to grasp & explore Too big to fit in mouth	----------→ 3-4 inches	----------→ 3-5 inches
Shape of Parts	Rounded edges	----------→	----------→
Number of Parts*	A few blocks (about 6) are sufficient; child does not need a large array	----------→	----------→
Interlocking/Loose Parts	Loose parts; child not capable of manipulating interlocking blocks	----------→	----------→
Materials	Soft, plush cloth, sponge, or rubber-like materials Squeezable Lightweight Not wood; too sharp	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→
Motor Skills Required*	Grasping Squeezing Shaking	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Color/Contrast	Bright colors, especially yellow & red High visual contrasts & patterns	----------→ ----------→	----------→ ----------→ Pictures of familiar objects on blocks
Cause & Effect*	Enjoys blocks that make noise if shaken or squeezed	----------→	Likes blocks that demonstrate cause-and-effect relationships
Sensory Elements*			Especially enjoy sounds such as jingles, rattles, & squeaks

Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Exercises involuntary reflexes Blocks used for exploration, not building Begins grasping by about 3 months	Performs deliberate, outwardly oriented movements ----------→ Grasping is mastered around 6 months Handles & mouths blocks Crude motor skills; erratic arm motions	----------→ ----------→ Capable of holding 2 objects at once Squeezing & banging often occur More coordinated Understands simple cause-and-effect relationships
Examples of Products	Small sets of plastic-coated soft cubes, foam cube blocks, & pillow blocks	----------→	----------→ Motorized bumble, bounce, & vibrate blocks Rattle/Jingle blocks & plastic air squeak blocks

* One of the most influential characteristics for these products.

BUILDING PLAY: **BLOCKS**

Product Characteristics	**12 Through 18 Months**	**19 Through 23 Months**	**2 Years**
Size of Parts*	2-4 inches	----------→	----------→
Shape of Parts	Rounded edges	----------→ Rectangular & square blocks	----------→ ----------→
Number of Parts*	15-25 pieces A large array of blocks is not needed	20-40 pieces ----------→	----------→ ----------→
Interlocking/Loose Parts	Loose parts; child can stick together blocks with internal magnets	Can start using interlocking sets with simple connecting systems (see *Building Play: Interlocking Building Materials*)	
Materials*	Soft, plush cloth, sponge, or rubber-like materials Lightweight wood or plastic Not heavy wood to ensure safety when knocked over	Sturdier materials for building towers, like cardboard or thick foam blocks ----------→ ----------→	----------→ ----------→ ----------→
Motor Skills Required	Grasping Minor fine motor coordination for manipulating blocks	----------→ Fine motor skills for stacking blocks	----------→ ----------→
Color/Contrast			
Cause & Effect			

Sensory Elements			
Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Emerging interests in novelty & exploration Ability to walk Decreased frequency of mouthing toys Solves problems via trial & error Curious nature Knocking down block structures is a popular activity	Representational & symbolic thinking True building play becomes a way of using blocks. ----------→ ----------→ ----------→	----------→ ----------→ ----------→
Examples of Products	Talking blocks Problem-solving blocks Nesting blocks	Stacking Blocks Table Blocks ----------→ Lightweight blocks for stacking onto chunky dowels	----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

BUILDING PLAY: **BLOCKS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Basic unit block = 3 ½ inches square x 1 ½ inches thick	----------→	----------→	----------→
	Other blocks in set tend to be multiples or fractions of basic unit	----------→	----------→	----------→
		Variety in size & length of blocks	----------→	----------→
Shape of Parts*	Unit, double & quadruple unit	----------→	----------→	----------→
	Wedges, triangles, cylinders, half-rounds	----------→	----------→	----------→
	Simple geometric forms	----------→	----------→	----------→
		More specialized forms	----------→	----------→
Number of Parts*	60-80 pieces	80-100 pieces	----------→	----------→
Interlocking/Loose Parts				
Materials*	Hard or soft wood	----------→	----------→	----------→
	Hard wood is heavier, more durable, & more expensive	----------→	----------→	----------→
Motor Skills Required	Fine motor skills needed to handle heavier blocks	----------→	----------→	----------→
		Arm & body coordination	----------→	----------→
Color/Contrast	No color (blocks only varnished)			
Cause & Effect				

Sensory Elements				
Level of Realism/Detail	No color or complex structures	----------→	----------→	----------→
Licensed theme				
Classic				
Robotic/Smart Features				
Educational				
Relevant Play/Behavior	More advanced constructions than 2-year-olds Analyze component parts of what they want to build Visualize parts in relationship to the others Work through problems of size, volume, space, & weight	Even more progressed structures Dramatic story lines added to constructions. Loose parts combined with blocks	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Examples of Products	Wooden kindergarten blocks Number & letter blocks Table blocks Hollow blocks	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

INTERLOCKING BUILDING MATERIALS

Interlocking building materials foster building play just like wooden, cardboard, and pillow blocks do. Interlocking building materials are similar in nature to blocks because they may be used to build something that represents an item in the physical world. However, they differ from blocks significantly because of their ability to be joined, locked, or stay in a particular placement. Through various connecting styles, pieces are snapped together to make creations that would be impossible with traditional wooden table blocks.

True building play begins around 19 months of age and continues into adulthood. This play is linked to children's development because engaging in building play is evidence of children's progress. Children advance from simply handling objects and materials in their play to actively using them for constructing or building with a pre-conceived plan in mind. They begin to manipulate objects with the intention of creating something, such as a tower or a house. Children younger than 19 months of age generally lack the manipulative skills necessary to use interlocking building materials effectively. Therefore, the discussion in this subcategory starts at 19 months.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of interlocking building materials:

- Interlocking/Loose Parts
- Motor Skills Required
- Number of Parts
- Size of Parts

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of interlocking building materials are appropriate and how a particular age group plays with these toys.

19 Through 23 Months

The cognitive ability for representational or symbolic thinking emerges during the 19- through 23-month time frame, and building play emerges as a result. Because children in this age group can manipulate toys with more ease due to their ever-increasing fine motor skills, interlocking block sets with simple connecting systems are suitable. Sets of large, chunky plastic bricks that can be easily stacked or pressed together in a non-systematic way are often the earliest appropriate interlocking system for children in this age group. Interlocking building sets that are 2 to 4 inches in size and 20 to 30 in quantity are appropriate. Plastic is an appropriate material for these blocks.

2 Years

Play with interlocking building materials for 2-year-olds is very much the same as it is for the previous age group. They participate in symbolic representation with their constructions, so a stack of blocks may represent a tree. Therefore, appropriate interlocking building materials for 2-year-old children are the same as those for 19- through 23-month-old children: 2 to 4 inches across, plastic, and 20 to 30 pieces. Children this age can manage a simple screwing action, but not other types of coordination like fitting a bolt into a flat piece of wood and attaching a nut.

3 Years

Three-year-old children can use interlocking building materials in purposeful ways, which usually takes the form of stacking in an upward direction. They have the fine motor skills necessary to manipulate most simple interlocking building sets that involve snapping, screwing, pressing together or pulling apart, and nesting; so materials like notched log, suction cup connecting blocks, or rod-and-spool connector pieces are appropriate. Children in this age group's motor skills are developed to a sufficient degree to use interlocking bricks that are smaller (2 to 4 inches in length) and simple snap-together building toys. They want their creations to become more realistic looking; so variety in materials that can snap onto these interlocking bricks (for example, wheels, miniature people, and model trees) is appealing. The addition of compatible figurines is appealing to this age group, because they enjoy pretend play that is afforded by these additional accessories. Children at any younger age may lack the fine

motor skills needed to work with the interlocking pieces and may choose to spend their time playing with the figurines.

Suction-cup connecting blocks are often too difficult for children younger than 3 years to assemble, with a fair amount of gross motor skills needed to forcefully stick them together and pull them apart. In addition, children at younger ages are more likely to use the suction cups as a manipulative or as a fun item to chew or suck on. Rod and spool connector pieces also require a fair amount of gross and fine motor skills that emerge around the age of 3--gross motor skills are needed to push and snap them together, and fine motor skills are necessary to align a dowel into the hole of a spool connector. Children may use rod and spool connector pieces to build familiar objects at this age, such as making a lollipop or a set of wheels. However, on average, they lack the cognitive ability to follow assembly directions, so interlocking model kits are not appropriate. Instead, open-ended materials that allow children to create their own ideas are attractive. Plastic and wood are appropriate materials, as are a variety of shapes, and an increasing number of pieces (30 to 50). Very small, detail-oriented pieces that interlock are not yet usable or of interest to children in this age group.

4 Through 5 Years

During this preschool period, building is a dominant play activity. The preschool child is capable of working most types of interlocking building systems, such as notched logs, interlocking cogs, snapping or pressing plastic bricks together, using nuts and bolts, connecting straws, and popping tubes together. At this age, children finally have the gross motor skills and strength to insert flat pieces into slots, as well as the fine motor skills to align them properly. Interlocking building materials that are plastic or wood, and that come in a variety of sizes, shapes, and lengths, are appropriate for children. A larger number of parts (80 to 100) is also appropriate. However, for more complicated tasks, like using nuts and bolts, larger pieces are more suitable. Most children do not understand how to hook up or use battery-powered building sets. However, children are able to work with robotic blocks that create certain effects (*i.e.*, light, movement) when placed in a prescribed order. These children's motor skills are developed to a sufficient degree to use smaller pieces (less than 1 inch in length) and simple snap-together construction toys.

Children will now begin to refer to instructions for help in assembling an interlocking building kit. Picture-based instructions are most helpful at this age due to still-developing reading skills.

6 Through 8 Years, 9 Through 12 Years

Early elementary age children find building with interlocking pieces highly interesting, much more so than building sets that involve non-interlocking blocks. By the time children have reached these ages, they have developed the cognitive abilities to follow directions and to understand multi-step sequences, so working on complex model kits is appropriate. Theme- and movie-based kits hold a high level of appeal, as do kits that produce realistic, detailed models. Fine motor skills are generally well developed, so small pieces present relatively little difficulty. They can build with sets using tiny screws, gears, nuts and bolts, and all-metal parts. The appropriate number of parts varies according to the child and the planned design, but there is essentially no limit to the number of parts for these ages. Generally, 100 pieces or more are needed to provide sufficient material for children in this age group to build their designs. Sets containing parts that vary widely in size (very small pieces less than 1 inch and large pieces 2 to 3 inches) and shape allow more intricate structures to be built, which increases their attractiveness to children in this age group. By age 7 and 8 years, some children can build structures using sets with moving, motorized, or computer chip-based components. Around age 9, model sets that include cement are appropriate. However, adult help may be required to ensure proper use of materials.

BUILDING PLAY: **INTERLOCKING BUILDING MATERIALS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*		2-4 inches	----------→
Shape of Parts		Brick blocks; thus, square & rectangular shapes	----------→
Number of Parts*		20-30 pieces	----------→
Interlocking/Loose Parts*		Interlocking; simple connecting systems that can be easily stacked or snapped together in a non-systematic way	----------→ Simple screwing action systems
Materials		Plastic	----------→
Motor Skills Required*	Fine motor skills are more developed, but child is still incapable of manipulating objects to join interlocking pieces	Child continually increases fine motor skills; can manage simple connecting systems	----------→ Child can handle simple screwing motions
Color/Contrast			
Cause & Effect			
Sensory Elements			
Level of Realism/ Detail			
Licensed Theme			

Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Emerging interests in novelty & exploration Solves problems via trial & error Fine motor skills more developed, but not ready for joining connectors.	Representational & symbolic thinking Building play becomes a way of using building materials More refined fine motor skills	----------→ ----------→ ----------→ Can handle simple screwing action, but not other types of coordination such as fitting a bolt in a flat piece of wood & attaching a nut
Examples of Products	Generally not appropriate	Snap-lock beads Large, chunky interlocking bricks/blocks	----------→ Large interlocking bricks/blocks Interlocking foam puzzle mats

* One of the most influential characteristics for these products.

BUILDING PLAY: **INTERLOCKING BUILDING MATERIALS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	2-3 inches <1 inch for simple designs like bricks	2-3 inches for more complicated designs like nuts & bolts ----------→	Variety of very small (<1"), small (1-2") & large (2-3") pieces allow more intricate structures to be built	----------→
Shape of Parts	Variety of shapes	----------→	----------→	----------→
Number of Parts*	30-50 pieces	80-100 pieces	100 pieces or more	----------→
Interlocking/Loose Parts	Simple interlocking designs: snapping, screwing, press together, rod & spool connectors, notched logs, suction cups, & nesting	----------→ Interlocking cogs, slot inserts, large nuts & bolts, connecting straws, popping tubes together	----------→ ----------→ Tiny screws, nuts, gears, bolts	----------→ ----------→ ----------→
Materials	Plastic or wood. Variety in materials, such as wheels, textures, miniature people, and model trees are appealing	----------→ ----------→	----------→ ----------→ All-metal parts	----------→ ----------→ ----------→
Motor Skills Required*	Children of this age have the fine motor skills necessary to manipulate most interlocking designs	----------→	----------→ Small pieces present relatively little difficulty	----------→ ----------→
Color/Contrast				
Cause & Effect				
Sensory Elements				
Level of Realism/Detail	Want their creations to become more realistic-looking	----------→	Want kits that produce realistic, detailed models	----------→
Licensed Theme			Theme & movie based kits hold a high level of appeal	----------→

Classic	Classic building sets that use notched logs or rods & connectors	----------→	----------→ Snap-together model car kits	----------→ Cement-based model car kits.
Robotic/Smart Features		Cannot understand how to hook up &/or use battery powered building sets	By age 7-8, capable of sets that have moving, motorized, &/or computer chip-based components Can work with robotic blocks that create certain effects (*i.e.*, light, movement) when placed in a prescribed order	----------→
Educational				
Relevant Play/Behavior	Uses interlocking materials in anticipated ways, which usually involves stacking in an upward direction Has the fine motor skills necessary to manipulate most interlocking designs Lacks the cognitive ability to follow model kit assembly directions. Enjoys open-ended materials that allow them to create their own ideas Enjoys realistic-looking materials for their creations	Building play is a dominant activity ----------→ Will begin to refer to directions when looking for help in how to assemble a building kit, even if just studying pictures ----------→	Finds building with interlocking pieces highly interesting, much more so than non-interlocking building sets ----------→ Has cognitive abilities to follow directions & step sequence in model kits Enjoys realistic, detailed models & theme/movie based kits	----------→ ----------→ ----------→ ----------→
Examples of Products	Snap-lock beads Smaller interlocking bricks Notched logs Sets using rods/dowels and spool-like connector pieces Work Bench Screws	----------→ ----------→ ----------→ Large nuts & bolts	All examples from 4 Through 5 Years Sets using irregularly shaped or swiveling connector pieces Sets that build realistic, detailed, or transforming models Sets that teach concepts of simple machines like wheels & axles, gears, levers, and pulleys Snap-together model car kits Small nuts, bolts, & screws	----------→ ----------→ ----------→ ----------→ Cement-based model car kits ----------→

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY

As young children develop memory and begin to make symbolic connections between a toy and a real-life object or person, they are laying the foundation for pretend and role-play. On average, children begin rudimentary pretend and role-play with toys around 19 months of age. Such play peaks in the pre-school years and gradually fades as children progress through their elementary years, although role-playing may become important for some older school-aged children.

Dolls & Stuffed Toys (p. 83)

- Action figures
- Life-sized and oversized dolls and accessories (*e.g.*, baby dolls)
- Life-sized and oversized stuffed animals
- Miniature dolls & stuffed animals
- Peg dolls
- Small dolls & stuffed animals

Play Scenes & Puppets (p. 99)

- Dollhouses & thematic play scenes
- Marionettes
- Playhouses
- Pop-up scenes
- Sock, finger, hand, arm puppets

Dress-Up Materials (p. 109)

- Accessories (*e.g.*, fake teeth, hats, jewelry, masks, scarves, ties, wigs)
- Costumes (*e.g.*, army, astronaut, firefighter, holiday, police)
- Make-up and fingernail kits
- Media characters and superheroes

Small Vehicle Toys (p. 121)

- Boats
- Cars
- Motorcycles
- Planes
- Remote controlled vehicles
- Tracks, slopes, launchers for vehicles
- Trains
- Wind-up toys

Tools & Props (p. 135)

- Buckets
- Cash registers & money
- Decorative guns, holsters, helmets
- Hammers
- House cleaning tools
- Kitchen/cooking sets
- Medical kits & equipment
- Mobile communication devices (*e.g.*, cellular phones, pagers)
- Plastic construction tools
- Rakes
- Shovels & Trowels
- Telephones
- Vacuums & lawnmowers

DOLLS & STUFFED TOYS

Dolls and stuffed toys can be appropriate for children of all ages. Often they become a child's first sensory objects. Children sometimes become attached to dolls and stuffed toys to feel a sense of security or to show affection. Such attachment may last through preschool and into the elementary school years. As cognitive abilities increase, dolls, action figures, and stuffed toys, serve an important symbolic function in helping children learn to pretend and role-play. Older children collect their favorite dolls, action figures, or stuffed toys.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of dolls & stuffed toys:

- Level of Realism/Detail
- Cause & Effect
- Size of Parts
- Licensed theme
- Color/Contrast

The order of these characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of dolls and stuffed toys are appropriate and how a particular age group plays with these toys.

Birth Through 3 Months

Children this age mostly enjoy sensing and feeling objects. They lack fine motor control, so dolls and stuffed toys that are very lightweight (½ to 2 ounces) and have an easy-to-grip size—for example, with limbs ¼-inch thick and lengths of 4 to 8 inches—are appropriate. They are more appealing when they have a soft, felt-like texture, like plush toys, have highly contrasting colors (for example, black and white) or basic contrasting patterns and faces, or have rich, vibrant colors. Because children in this age group mouth most objects, dolls and stuffed toys should be easily cleanable, with no hair or fur, no removable clothing or accessories, and no projecting

parts, like eyes or snouts. Clothing and moving eyes are not particularly appealing to this age group, and stuffed animals should have facial features that are sewn. Dolls and stuffed toys with very basic, one-piece construction are appropriate, and should be sturdy enough not to break or pull apart.

4 Through 7 Months

Dolls and stuffed toys remain soft, lightweight, and simple in design for this age group. Besides those characteristics described for younger children, children in this age group begin to appreciate highly contrasting facial features. A high degree of realism or detail is not recommended. Children in this age group enjoy toys with simple cause-and-effect features; for example, dolls or stuffed toys with rattles inside them. They can best handle lightweight toys that weigh no more than 2 ounces. Toys that are 4 to 12 inches in length are appropriate. Children in this age group tend to mouth most objects, so dolls or stuffed toys with buttons, whiskers, bells, ribbons, yarn wigs, or other such features are generally not appropriate. As they approach 8 months, children start to recognize words that are repeated. Such word recognition ability makes dolls and stuffed toys that say single words or a set of single words most attractive to those children. They also begin to recognize and become attracted to characters from familiar media, like books and television.

8 Through 11 Months

While the same characteristics appeal as with younger children, children in this age group become attracted to small dolls and stuffed animals that have a low degree of realistic detail, especially facial features. They can most easily handle dolls and stuffed toys that weigh up to 3 to 6 ounces and are within 8- to 12-inches in length. Because children in this age group are rolling around, crawling more, and learning to walk, musical plush toys and others with a wind-up key or projecting surfaces are inappropriate.

12 Through 18 Months

The soft, simple, cuddly dolls and stuffed animals that were appropriate for children in the prior age group are also appropriate for children ages 12-18 months. During this period, children start

to engage actively in imitative play with dolls and stuffed toys based on familiar family relationships like mother and baby, or from watching television and other media. They are attracted to mid-size (10 to 16 inches) dolls and stuffed animals that offer simple cause-and-effect functions, such as push buttons that produce simple sounds or phrases, lights, and actions. For the same reasons, children in this age group like manipulating extremities or heads to create different postures and looks.

Because young children have a low degree of fine motor dexterity and control, dolls and stuffed toys are best when they are easy to grip (for example, limbs ½ inch thick) and weigh no more than 4 to 8 ounces. Additionally, appropriate dolls and stuffed toys generally lack removable, loose, or projecting parts. Hand-sewn eyes with high contrast are commonly used over movable eyes. Because children in this age group still mouth toys a great deal, appropriate toys are washable or easily cleaned. Suitable dolls tend to have only molded hair, if any, and stuffed animals lack fur.

19 Through 23 Months

Children at this age still imitate a great deal, basing such play mostly on familiar domestic and media themes. They are attracted to dolls and stuffed toys that have a low-to-moderate level of cause-and-effect functionality. For example, they enjoy pushing buttons or areas on a doll or stuffed toy to produce combinations of sound, lights, or action. They like to make simple manipulations of extremities or heads, and create different postures and looks (see also the *Exploratory and Practice Play* category). They can appreciate a low-to-moderate level of realistic detail and rich vibrant colors. Vinyl or rubber dolls with simple accessories, like a toy baby bottle or blanket are appropriate. At this age, children have the gross motor skills needed to stand and push strollers, and have also cognitively reached a stage where they can pretend to take dolls and stuffed animals on “walks” using the stroller. As they approach 2 years of age, children have a simple set of basic words and phrases and can engage in simple pretend episodes. Therefore, dolls and stuffed toys that speak simple phrases or sentences are appropriate.

Because children in this age group still mouth toys, appropriate dolls do not have hair and appropriate stuffed animals do not have long fur. Also for this reason, dolls and stuffed toys are

washable or easily cleaned. They are easily grasped and supported in the air. They may be slightly heavier than those appropriate for younger children (6 to 12 ounces). Children in this age group also enjoy playing with small peg dolls (see *Pretend & Role Play: Play Scenes & Puppets*).

2 Years

Although they still imitate a great deal, children in this age group increasingly recognize the symbolic connections between toys and the real world, and they start to pretend more often than younger children. This pretend play also occurs in more complex ways. Children in this age group have a low-to-moderate degree of fine motor dexterity and control and can handle slightly larger (12 to 18 inches) and heavier (8 to 16 ounces) dolls and stuffed toys. Soft, rounded, pliable, and cuddly dolls and stuffed toys are most attractive. Pale or pastel colors also begin to attract this age group. Dolls and stuffed toys may have a small number (about two to four) of familiar toy accessories, such as a pet carrier, bone, blanket, stroller, or baby bottle. Children will also pretend to feed a doll with a baby bottle at this age. Bottles with faux liquid inside, which disappears when flipped over, may be introduced to this age group due to children's familiarity with baby bottles.

Appropriate dolls and stuffed toys are easily carried, non-threatening, and familiar-looking with a friendly appearance. Characteristics like these are important for children in this age group to initiate pretend episodes and to practice being friends or caring partners. As children in this age group approach 3 years of age, dolls become more appealing when they have a low-to-moderate level of realistic details in their facial features, hair, clothing, and accessories. This is especially true for baby dolls. Children of this age also begin to appreciate eyes that move, like baby dolls that sleep and wake up. Dolls and stuffed toys that are stiffly posed or elaborately detailed (*e.g.*, those with fine lace or intricate patterns on clothing, or those with facial wrinkles) are not as appealing.

Two-year-olds are attracted to dolls and stuffed toys that have a low-to-moderate level of cause-and-effect, such as toys that produce sounds, lights, or other actions when pushed, or ones that permit simple manipulations of the heads or extremities. Children in this age group will squeeze

dolls and stuffed toys in various places to see if they can cause some kind of effect. Single, predictable interactions with talking dolls and stuffed toys activated by a button press begin to foster a sense of control and mastery, especially if they are associated with familiar characters the child recognizes from various media, books, or family and everyday contexts. Familiarity and captivating cause-and-effect features can help to balance out less cuddly forms, dull colors, and other less desirable features. Interactive or talking toys that require sequential actions to use them are less appealing. Additionally, any sound that is too loud, sudden, or extreme could cause the child to avoid the toy.

Because they desire independent functioning, children of this age enjoy dolls and stuffed toys that are easy to take care of and dress; so those with simple hats or with vests that have large arm holes would be appropriate. Children in this age group also enjoy toys with usable pockets or ones with easy-to-use pull strings and push buttons that initiate various actions. Two-year-olds can remove clothing, but may have difficulty redressing, if clothing uses buttons or snaps. Fasteners that are more easily usable by children in this age group include large buttons, hooks, and hook-and-loop or touch fasteners. They like simple dress-me dolls (with easy to remove clothing) and will pretend to bathe dolls, especially ones that are washable and submersible. Smaller dolls, as well as life-sized dolls, and accessories (*e.g.*, baby dolls with grooming supplies) also appeal to this age group, as do wooden or plastic peg dolls. Children in this age group will pull on the limbs, head, and fur of the toy, and may brush a doll's hair. Doll hair and stuffed animal fur, if they are firmly rooted and tangle free, are less likely to be pulled out by the brushing or pulling actions of children in this age group.

Medium-sized stuffed toys (12 to 16 inches in length), like teddy bears and other animals, are more appealing when in tandem, like a mother and baby combination, because this offers the child greater pretend possibilities. They also enjoy larger or life-sized stuffed toys that they can drag around, climb on, and cuddle. They become more aware of dolls and stuffed toys that are licensed, and this begins to influence their preferences and ultimate enjoyment of these toys.

3 Years

Three-year-olds have a moderate degree of dexterity and fine motor control, and begin to enjoy low-to-moderately-complex cause-and-effect in their pretend play. They like to push buttons and to use devices that produce sound, lights, or action, and more specialized, realistic features like talking, crying, sucking, wetting, and walking. Bottles with faux liquid inside that disappears when the bottle is flipped over add to the detail in pretend play accessories that children begin to seek in this age group. They prefer dolls and stuffed toys with about a dozen diverse, easy-to-manipulate loose parts, and moving eyes. These children possess the cognitive skills to create pretend-play scenes with dolls that come with props and accessories, such as using a doll with doctor supplies to take care of other dolls or animals. If the doll portrays a familiar media character, children may act out familiar scenes that they have seen with the character in books or television. These children have greater fine motor skills for manipulating doll accessories.

They become more adept at identifying and enjoy licensed fantasy characters like robots and superheroes, and they begin to develop an interest in simple collectibles. They also enjoy a moderate level of realistic detail, preferring dolls and stuffed animals that have accurate proportions and anatomy, moderately authentic parts, and body parts that can move in multiple directions. These children may be introduced to action figures with simple folding, or one- to two-step transformations. Given children's budding cognitive skills that allow them to pretend at this age, children may use dolls or figurines to engage in behaviors typical of that figure. For example, if given a toy dinosaur or bird, a child may pretend to make it fly or flap its wings. Children in this age group can manipulate clothing with large openings that allow easy dressing and undressing, as well as those with large buttons, hooks, and hook-and-loop or touch fasteners. Children in this age group are also able to handle slightly heavier (12 to 18 ounces) and larger (16 to 20 inches) dolls and stuffed animals than younger children can.

4 Through 5 Years

Children in this age group enjoy moderately to highly detailed, familiar, realistic dolls and stuffed toys to incorporate into their moderately to highly complex pretend play. Dolls and stuffed animals designed for moderately to highly complex cause-and-effect appear to promote more complex and longer periods of pretend play. Since they have moderate problem-solving

abilities and have developed richer symbolic meanings in their toys, 4- and 5-year-olds prefer fashion, military, and other thematic dolls (*e.g.*, 1:6 scale dolls with various outfits or accessories), action figures about 4 to 8 inches in length, and stuffed toys that become the major characters for enacting diverse, often extended stories, during pretend or role-play. Children in this age group can manipulate the parts of a foldable action figure so that it transforms from one form into another over the course of two or more steps (whichever version it was not in when given to the child).

The dolls and stuffed toys that offer the greatest degree of interest to children in this age group are often based on licensed characters and on themes from various experiences at home, school, and through the media (television, videos, computer games, movies, and books). They are attracted more to dolls and stuffed animals that are collectible, as well as larger or oversized ones. They enjoy well-defined facial features, dressing dolls and stuffed toys with simple outfits, and choosing among many loose parts like grooming supplies. Such toys may also have moderately to highly complex cause-and-effect, such as animatronic interactive animals with multi-directional rotation of body parts, multiple functions, or multiple voice, light, sound, movement responses to buttons pushed, or smart-chip accessories that are plugged-in. At this age, children have the socioemotional capabilities of envisioning interactions between two dolls or stuffed toys. Toys that move, bounce, sing, talk, or dance with a button press or voice activation may result in some children trying to make one interactive doll or stuffed toy to talk to another. Animatronic animals and other figurines or dolls that can customize their responses to users are appealing in this age group because of the level of realism they afford. Children can set up scenarios where the doll interacts with other objects in the room to create a more complex play scene, a strong desire that peaks around age 4, when children are at the height of using their imaginations. At any younger age, children may focus too much on the toy's interactive qualities in a non-representational way (*i.e.*, spending time fiddling with the toy's moving ears or legs without any pretense). They also are attracted to smart, robotic dolls and stuffed toys that feature various reactions to different stimuli or a lack of stimuli, and begin to master these toys (see *Technology Play: Smart Toys & Educational Software*).

6 Through 8 Years

Young school-aged children engage in fewer pretend episodes than preschoolers, so structured activities become more attractive. Their pretend play becomes more drama-oriented with longer, more complex scenes and plays. Because they can readily transform symbolic meanings and have moderate-to-high problem-solving abilities as they mature through this period, 6- through 8-year-olds enjoy using dolls and stuffed animals in their diverse, often extended stories. Children in this age group enjoy life-sized or oversized dolls and stuffed animals that have many accessories. Thematic18-inch dolls with realistic additional parts are appealing at this age because they are often one of the few dolls that older children will no longer consider too "babyish." The large variety of accessories and clothing available for these dolls portrays them in real-life, mature activities that the child may have experienced or may wish to do when they get older (gymnastics, swimming, ice skating, soccer). These varied accessories allow children to create different types of play scenes that are no longer solely based on nurturance (*e.g.*, feeding, tucking doll into crib), but rather, activities that are enjoyed at this age. They also enjoy miniature dolls (*e.g.*, 1:6 scale) that are more fashion oriented. Children of this age have a keen awareness of, and interest in, licensed characters and collectibles that are popularized mostly by mass media. They enjoy diverse opportunities to engage with the accessories that typically go with many dolls and stuffed toys. In addition, their dexterity, fine motor control, and gross motor skills allow children in this age group to manipulate most small parts, such as fingers that move and small levers or buttons that activate features. Foldable figurines that can morph into two separate characters are of interest at this age. The ability to change the character in their play scene adds a layer of complexity that appeals to this age group. Foldable figurines also allow for children to exercise their fine motor skills when gripping the tiny pieces that need to be held when changing the character.

9 Through 12 Years

Older school-agers mostly prefer to collect dolls and stuffed toys that are highly detailed, highly functional, authentic, and unique. Such toys include fashion or miniature dolls that are also used as decorative pieces, especially dolls with ornate costumes. They are often licensed and come with numerous licensed accessories.

PRETEND & ROLE PLAY: **DOLLS & STUFFED TOYS**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts*	Length 4-8 inches Ultra-lightweight, no more than 0.5-2 ounces Easily grasped & supported in the air	Length 4-12 inches Ultra-lightweight, no more than 2 ounces ----------→	Length 8-12 inches Lightweight, no more than 3-6 ounces ----------→
Shape of Parts	Very basic 1-piece construction Sturdy: toy will not break or pull apart Thick, round edges; no hard corners or projecting parts	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Number of Parts			
Interlocking/Loose Parts	No removable, loose parts, or clothing	----------→	----------→
Materials	Soft, felt-like, pliable, & cuddly No hair (unless molded), clothing, fur, bells, buttons, ribbons or whiskers Washable or easily cleaned	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Motor Skills Required	Lack fine- or gross motor control	Stronger with small degree of fine- & gross motor control	----------→
Color/Contrast*	Highly contrasting color (*e.g.*, black & white) &/or basic patterns Rich, vibrant colors	----------→ ----------→	----------→ ----------→
Cause & Effect*	Small degree of cause-and-effect functionality (*e.g.*, shaking produces sound)	Small degree of cause-and-effect functionality (*e.g.*, shaking produces sound or basic words & phrases)	----------→
Sensory Elements	Soft textures Soft sounds (*e.g.*, rattles, music)	----------→ ----------→	----------→ More diverse sounds, lights, & actions

Level of Realism/Detail*	Friendly looking features, especially face Highly contrasting facial features, or hand-sewn No eyes that move	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Licensed theme*		Start to recognize familiar characters from media & domestic context	----------→
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	High tendency to mouth objects Sensing & feeling objects	----------→ ----------→ Begins sitting & later crawling Begins to recognize oft-repeated words	----------→ ----------→ Established crawlers & climbers Beginning walkers Awareness of object permanence & symbolic representation
Examples of Products	Small dolls (baby, bean bag, rag dolls) Small stuffed or plush animals Music dolls & stuffed toys Grab-on soft toys	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY: **DOLLS & STUFFED TOYS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Length 10-16 inches Lightweight, up to 4-8 ounces	----------→ Lightweight, up to 6-12 ounces	Length 12-18 inches Moderate weight, up to 8-16 ounces
	Easily grasped & supported in the air (cont'd)	----------→	----------→
Shape of Parts	Very basic 1-piece construction (cont'd) Sturdy (toy will not break or pull apart) (cont'd) Thick, round edges; no hard corners or projecting parts (cont'd)	----------→ ----------→	----------→ ----------→
Number of Parts			2-4
Interlocking/Loose Parts	No removable, loose parts, or clothing (cont'd)	Doll bottle or blanket	Doll bottle, blanket, stroller, or bone
Materials	Soft, felt-like, pliable, & cuddly No hair (unless molded), clothing, fur, bells, buttons, ribbons or whiskers Washable or easily cleaned	----------→ ----------→ ----------→	----------→ ----------→ Pliable & large openings in clothing for ease of dressing & undressing Large buttons, hooks, and hook-and-loop or touch fasteners
Motor Skills Required	Low degree of fine motor dexterity & control Easy rotation of body parts	----------→ ----------→	Low to moderate degree of fine motor dexterity & control. ----------→
Color/Contrast*	Rich, vibrant colors	----------→	----------→ Pale or pastel colors
Cause & Effect*	Pays close attention to simple cause-and-effect functionality (*e.g.*, pushing produces sound, lights or action)	Enjoys low to moderate level of cause-and-effect functionality (*e.g.*, pushing produces sound, lights, action, or simple manipulations of extremities or heads)	Toys activated by button press

Sensory Elements	Soft textures (cont'd) More diverse sounds, lights, & actions (cont'd)	----------→ ----------→	----------→ ----------→
Level of Realism/Detail*	Friendly looking features, especially face (cont'd) Highly contrasting facial features, or hand-sewn (cont'd) No eyes that move (cont'd)	----------→ ----------→ ----------→	----------→ ----------→ Eyes that move or blink
Licensed theme*	Start to recognize familiar characters from media & domestic context (cont'd)	----------→	Increased recognition of licensed forms
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	High tendency to mouth objects (cont'd) Sensing & feeling objects (cont'd) Very simple imitative & pretend play Established sense for object permanence Babbles with some spoken words & word comprehension	Mouth objects to lesser degree ----------→ Simple pretend & imitative of domestic- & media-based themes More aware of symbolic connections Some spoken words & phrases, & word comprehension	----------→ ----------→ More, increasingly complex pretend Increased recognition of symbolic connections Increasing spoken words, phrases, sentences & word comprehension
Examples of Products	Small dolls (baby, bean bag, rag) (cont'd) Small stuffed or plush animals (cont'd) Music dolls & stuffed toys (cont'd) Washable rubber baby dolls	----------→ ----------→ ----------→ ----------→ Peg dolls Doll stroller	----------→ ----------→ Simple dress-me dolls ----------→ Combinations like mother & baby ----------→

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY: **DOLLS & STUFFED TOYS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Toy & Parts*	Length 16-20 inches Weighing no more than 12-18 ounces	Larger or oversized About 1:6 scale thematic dolls	----------→ ----------→	----------→ ----------→
Shape of Parts				
Number of Parts	Numerous, about a dozen	10-20	----------→	
Interlocking/Loose Parts	Diverse	----------→	----------→	----------→
Materials	Soft, felt-like, pliable, & cuddly Pliable & large openings in clothing for ease of dressing & undressing (cont'd) Large buttons, hooks, and hook-and-loop or touch fasteners (cont'd)	----------→ ----------→ ----------→		
Motor Skills Required	Moderate degree of fine motor dexterity & control Easy to manipulate accessories, loose parts (*e.g.*, baby dolls with grooming supplies), buttons, & joy sticks	Moderate degree of dexterity, strength, fine motor & gross motor skills	Moderate to high degree of dexterity, strength, & gross motor skills	High degree of dexterity, strength, & gross motor skills
Color/Contrast*	Rich, vibrant colors (cont'd) Pale or pastel colors (cont'd)	Rich, vibrant colors, as well as realistic colors (*e.g.*, black, beige) Well-defined facial features	----------→	----------→
Cause & Effect*	Enjoys moderately complex cause-and-effect functionality (pushing produces sound, lights or action producing more specialized, realistic features like talking, crying, sucking & wetting)	Moderate to high level of complex cause-and-effect (multiple functions, multi-directional rotating body parts, numerous light, voice/sound, or movement responses to buttons, joy sticks, or smart-chip accessories)	----------→	----------→
Sensory Elements				

Level of Realism/Detail*	Moderate level of realistic detail (accurate proportions & anatomy of forms, moderately authentic loose parts, multi-directional rotation of body parts)	Moderate to highly realistic details (well-defined facial features, removable outfits)	Highly functional & realistic or minute details	----------→ Authentic looking
Licensed theme*	Licensed forms popularized by mass media	Greater appeal of licensed forms popularized by mass media	Uses & adapts themes from experience at home, school, & various media (television, videos, computer games, movies, & books)	----------→
Classic	Beginning interest in simple collectibles	Continuing interest in collectibles	Strong interest in collectibles	----------→
Robotic/Smart Features	Simple buttons, joystick, or hand-held device	More advanced joystick and hand-held devices	----------→	----------→
Educational				
Relevant Play/Behavior	Low to moderately complex pretend play More adept at making symbolic connections Low to moderate level of partner or group interactions	Moderately to highly complex pretend play Moderate problem-solving abilities Extensive level of partner or group interactions	More structured, goal-oriented dramatic role-play Moderate to high problem-solving abilities Moderate to high level of independent functioning	Long, complex, structured dramatic performances Advanced problem-solving abilities
Examples of Products	Dolls with doctor supplies Doll bottles with faux disappearing liquid Wooden & plastic peg dolls Simple action figures	Fantasy character/action figures ----------→ Life-sized dolls & accessories Life-sized stuffed animals ----------→ Fashion, military, & other thematic dolls (about 1:6 scale) Animatronic interactive animals Foldable action figure	----------→ ----------→ ----------→ ----------→ Oversized dolls & stuffed toys Unusual, unique dolls & stuffed toys ----------→ 18-inch thematic dolls with realistic accessories Foldable figurines that can morph into two separate characters.	----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

PLAY SCENES & PUPPETS

Play scenes and puppets help children to imitate and recreate familiar contexts, and to pretend and role-play as they construct dramatic scenes and stories. Children about 12 months of age may enjoy plush animal puppets that are also used as stuffed animals, although this is not considered true puppet play. Until children reach about 19 months of age, adults may model play with puppets or play scenes. At 19 months, children develop a greater capacity for making the symbolic connections that support pretend play, and they start to engage in simple pretend activities with play scenes and puppets. Preschool is the time of peak interest in play scenes and puppets. School-age children enjoy more diverse and complex play scenes and puppetry. Play scenes include miniature models, play sets, dollhouses, and pop-up scenes, all of which may come with characters, small vehicles, props, or a variety of accessories. Puppets start off as simple sock-like designs and evolve into elaborate hand puppets and marionettes, which may be used in conjunction with stages and scenery.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of play scenes and puppets:

- Motor Skills Required
- Level of Realism/Detail
- Interlocking/Loose Parts

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of play scenes and puppets are appropriate and how a particular age group plays with these toys.

12 Through 18 Months

This age group may use a soft plush animal puppet, like a stuffed animal: cuddling and carrying it. They may also explore short, simple, sock-like puppets. Sizes tend to range from 8 to 12 inches, and they typically weigh 4 to 8 ounces. Puppets that portray familiar characters or have

simple detail and contrasting facial features—especially eyes—are appealing to children in this age group. The openings should be large enough for easy hand access. Because this age has only limited dexterity and fine motor control, puppets with arms or long hand/arm puppets are not appropriate, and will not be suitable until the child is about 3 years old. Although children in this age group are not yet ready for true pretend play with objects, they may enjoy handling and carrying around small people and animals, or putting people into cars. As with puppets, these small figures need not be minutely detailed.

19 Through 23 Months

At 19 months, children start to have enough fine motor control and cognitive ability to manipulate simple sock-puppets and play scenes, as well as large accessories (2 to 4 inches), as they conduct simple pretend play. They begin to enjoy simple, realistic (though not detailed), familiar play sets and miniature models with easy access to one or two large areas with about two to six people, animals, vehicles, or accessories. Examples include simple kitchens, farms, gas stations, airplanes, pop-up scenes like fire trucks, and play sets that have vehicles with small figures like peg people. Although children in this age group do not need the small figures to have moving parts or elaborate detail, they do prefer ones with salient features, such as painted faces, plastic hair, or hats. Children in this age group are more capable of carrying play scenes that are constructed from lightweight plastic or wood, and that weigh 8 to 12 ounces.

2 Years

Two-year-olds become better at making simple symbolic connections and at controlling fine motor movements that allow them to position a few (two to six) large pieces (2 to 4 inches). They continue to prefer the same simple play scenes, yet with a low-to-moderate degree of realistic detail. They are attracted to simple moving parts, like cranks or doors that they can slide or open via hinges with a basic pincer grip.

As they approach 3 years, children become attracted to simple sock and mitten puppets in which operation of the mouth encourages opening and closing with the thumb opposing the four

fingers. Openings at the base of the puppet should permit entry of their fist. They also begin to enjoy finger puppets as they practice fine motor control.

3 Years

Most 3-year-olds are primed for exploring and pretending with play scenes and puppets. They are much more adept than 2-year-olds at making symbolic connections and working with their fingers and hands. They prefer play scenes and puppets of moderate complexity and realistic detail. They enjoy dollhouses and other familiar play scenes that have easy access to a few large areas with about a dozen loose parts that are easily positioned and repositioned. They also enjoy small playhouses or pop-up scenes where they can step in and take charge of their pretend episodes.

Three-year-olds use sock, mitten, hand, arm, and finger puppets for pretend play more than 2-year-olds do. As they approach 4 years of age, children in this age group are attracted to puppets with mouth and arm openings for simple thumb and finger manipulations. Other than well-defined puppet faces, they do not require extensive detail.

4 Through 5 Years

Their moderate degree of dexterity and fine motor control allow children in this age group to enjoy dollhouses and play scenes that have 10 to 20 loose parts of most sizes. They can manipulate most working mechanisms with screw actions and sections with multiple parts, and can manipulate pieces ½-inch in size. Licensed play scenes start to become important to children in this age group. They are attracted to action/adventure sets and military forts that have moderate-to-highly-realistic details and that come with a wide variety of realistic accessories. They enjoy the challenge of positioning small objects in small rooms or areas. Besides thematic appeal, playhouses also appeal to children in this age group for the relatively private space they provide so children can carry out intensive pretend play.

Children’s interest in puppetry reaches its zenith with 4- and 5-year-olds. Children in this age group enjoy the same puppets as before, yet they display more finger and fine motor skills to manipulate these puppets with greater effect. Hence, their puppets can be slightly more complex

to operate. They place greater emphasis on telling stories and conducting plays that use simple puppet theaters.

6 Through 8 Years

Children in this age group are attracted to highly realistic, minutely detailed, and highly functional play scenes. They enjoy elaborate dollhouses with miniature figures and animals so they can incorporate familiar themes (*e.g.*, home or outer space) into their more structured, goal-oriented dramatic play. This age group develops a keen awareness of licensed characters and collectibles. They exhibit a moderate-to-high level of dexterity and fine motor skills as they manipulate a wide variety of accessories of mostly smaller sizes. Although their interest in playhouses subsides during this period, they still occasionally like the larger, more realistically detailed and functional ones.

Children in this age group enjoy operating puppets that are more complex and jointed, and ones that have hard heads and painted faces. They are attracted to puppets that have a high degree of realistic detail, function, and elaborate costumes, accessories, or scenery. They now can start manipulating simple string puppets or marionettes. At this age, children are able to master the use of puppets, where one hand controls the mouth, and the other controls a rod that manipulates the puppet's arm. Gross motor skills needed to hold up the puppet, as well as coordination between both of the children's hands to fully control the puppet are not yet developed until this age group. Children in this age group enjoy operating thematic puppet theaters with curtains for acting out extended stories.

9 Through 12 Years

Interest in play scenes wanes during this period; however, some children are still interested and are attracted to dollhouses and other scenes that have authentic and detailed furnishings or accessories. Because they can readily transform and manipulate symbolic meanings and manipulate objects with a high degree of dexterity and fine motor control, 9- through 12-year-olds enjoy more complex hand puppets, string puppets, and marionettes. Puppets also appeal for their scrupulous attention to detail and authenticity, closely resembling adult versions of real-life

equipment. They desire their puppet theaters to have authentic staging mechanisms and elaborate scenery.

PRETEND & ROLE PLAY: **PLAY SCENES & PUPPETS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts	Puppets with large enough openings for easy hand access Puppets of length 8-12 inches Lightweight puppets, up to 4-8 ounces Lightweight play scenes for carrying, up to 8-12 ounces	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ Small parts at least 2-4 inches in size
Shape of Parts		Easy access to 1 or 2 large areas	----------→
Number of Parts		2-6	----------→
Interlocking/Loose Parts*			Simple moving parts like cranks or doors that they can slide or open via hinges
Materials	Soft textures	----------→	----------→
Motor Skills Required*	Limited dexterity & fine motor control Can handle and carry lightweight play scenes and figures	Low degree of dexterity & fine motor control Ability to manipulate simple play scenes & sock-puppets	Low to moderate degree of dexterity & fine motor control Controlling fine motor movements that permit placement of a few large pieces Opening & closing basic pincer grip
Color/Contrast	Contrasting facial features, especially eyes	----------→	----------→
Cause & Effect			
Sensory Elements			

Level of Realism/Detail*	Puppets & figures are familiar characters or animals Familiar play sets & miniature models Simple, realistic (though not much detail)	----------→ ----------→ ----------→	----------→ ----------→ Low to moderate level of realistic detail
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Simple imitative play Not yet ready for true pretend play	Simple pretend play with domestic & media-based themes	Better at making simple symbolic connections
Examples of Products	Simple sock-like puppets Small, simple play scenes like kitchens, farms, gas stations, airplanes Simple pop-up scenes like fire trucks Simple play sets like those that have vehicles with small figures	----------→ ----------→ ----------→ ----------→	Simple sock, mitten, & finger puppets ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY: **PLAY SCENES & PUPPETS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts	Puppets with large enough openings for easy hand access (cont'd)	Small play scene pieces around 0.5 inch	Accessories of mostly smaller sizes	----------→
	Easy access to a few large areas	Small rooms or areas	----------→	----------→
Shape of Parts				
Number of Parts	About a dozen	10-20	----------→	
Interlocking/Loose Parts*	Simple moving parts like cranks or doors that they can slide or open via hinges (cont'd)	More complex, like screw actions & sections with multiple parts	----------→	----------→
		Wide variety of accessories	----------→	----------→
Materials	Soft textures (cont'd)	----------→		
Motor Skills Required*	Moderate degree of dexterity & fine motor control	----------→	Moderate to high degree of dexterity & fine motor skills	High degree of dexterity & fine motor skills
	Much better at working with their fingers & hands than 2-year-olds	Able to manipulate most working mechanisms	----------→	
	Positioning & repositioning of small pieces	----------→	----------→	----------→
Color/Contrast				
Cause & Effect				
Sensory Elements				

Level of Realism/Detail*	Puppets are familiar characters or animals (cont'd) Moderate level of realistic detail Well-defined facial features	----------→ Moderate to highly realistic details ----------→	Highly functional & realistic or minute details Elaborate costumes, accessories, & scenery	----------→ ----------→ Authentic looking
Licensed theme		Licensed play scenes start to become important	Keen awareness of licensed characters & collectibles	----------→
Classic				
Robotic/Smart Features				
Educational				
Relevant Play/Behavior	Low to moderately complex pretend play More adept at making symbolic connections than 2-year-olds	Moderately to highly complex pretend play More adept at pretend than 3-year-olds Telling stories, conducting plays	More structured, goal-oriented dramatic play	Long, complex, structured dramatic performances
Examples of Products	Sock, mitten, hand, arm, & finger puppets Puppets with mouth & arm openings for simple thumb & finger manipulations Simple dollhouses & miniature play sets of familiar themes Pop-up scenes (cont'd) Playhouses	Slightly more complex sock, mitten, hand, arm, & finger puppets ----------→ Simple puppet theaters More detailed dollhouses & miniature play sets of familiar themes ----------→ ----------→ Action/adventure & military sets	Hand, arm, finger, jointed, or simple string puppets & marionettes Puppets with hard heads & painted faces Thematic puppet theaters with curtains Elaborate dollhouses with miniature figures, animals, & accessories Familiar themes like home or outer space ----------→ ----------→ Puppets with rod to control arm	----------→ String puppets & marionettes ----------→ Authentic puppet theaters ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

DRESS-UP MATERIALS

Dress-up materials include costumes, accessories, jewelry, and dress-up kits that appeal to children of all ages, except infants. These materials also include related crafts, such as jewelry-making, bead-stringing, weaving, and braiding kits. As children develop greater cognitive awareness and manual dexterity, they can use dress-up materials in more sophisticated ways of pretending. They use experiences with various media (primarily television, videos, computers, and books), family, and friends to perform imitatively or to live out fantasies of their own construction.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of dress-up materials:

- Level of Realism/Detail
- Licensed theme
- Materials
- Motor Skills Required

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a description of what types of dress-up materials are appropriate and how a particular age group plays with these products.

12 Through 18 Months

Children around 12 months use very simple forms of imitation and pretend play with objects and others, including imitation of adults and older peers. As they approach 18 months, they progress toward more basic forms of pretend and imitation with dress-up materials in conjunction with learning babbling and simple words. Although they do not pretend play much until they are closer to 18 months, young children do begin to enjoy basic dress-ups and costumes like easy-to-put-on, one-piece bracelets and hair accessories. Although they may need help, older children in

this age group like easy-to-put-on, sleeveless, slip-on costumes without fasteners and with large openings for arms and legs.

Children in this age group often enjoy putting on necklaces, but this can present a strangulation hazard. Therefore, suitable necklaces for this age group are designed so they let children easily put them on and take them off without posing a strangulation hazard (*e.g.*, through the use of a break-away design). Children in this age group mouth objects and do not have the fine motor skills to use the materials in make-up kits or to use materials with sharp edges or points. Appropriate accessories have thick, rounded edges.

19 Through 23 Months

Children 19 through 23 months of age become more aware that costumes and accessories are symbolic for other characters, many of them licensed. Around 19 months, the appeal of dress-up materials starts to increase along with the child's increase in fine motor dexterity and control, such as the use of a pincer grasp between thumb and forefinger. They become more adept at undoing hook-and-loop or touch fasteners, though they still have some difficulty re-matching these types of fasteners. They continue to enjoy the same materials as before, but they also enjoy lacing objects with simple purposes in mind, such as lacing cubes or boards with large holes or thick blunt spindles, wood or plastic materials, and braided or plastic string, and stringing large beads (see also *Media Play: Arts & Crafts*).

Children in this age range are attracted to a variety of basic dress-up materials like shoes, hats, headscarves, other hair accessories, snap-on ties, bracelets, and necklaces. They prefer a simple level of detail like basic non-elaborate shapes and rich, vibrant colors. They continue putting necklaces and other items around their neck, so toys of this kind must not present a strangulation hazard. Suitable jewelry is easy to put on and take off, such as elastic bracelets, and has thick, rounded edges. Children in this age group enjoy wearing costumes or accessories that remind them of characters from television programs or movies.

2 Years

At age 2, children start to pretend-play more often and in more complex ways, preferring dress-up materials that have a low degree of realistic detail. They are learning to appreciate and enjoy the symbolic transformations that dress-up materials allow like becoming mother or baby and playing house. As they grow closer to 3 years of age, they have little difficulty becoming the characters that their costume suggests, acting out common behaviors and expressions of characters and pets, especially those from television and other media. They are developing greater dexterity, and around 30 months of age they become more adept at matching hook-and-loop or touch fasteners, and using large buttons, buckles, or hooks as on frames and cubes. They enjoy independently putting on simple costumes (*e.g.*, dresses, hats, and gloves) and accessories like elastic bracelets and simple wigs. They also enjoy playing with dress-me dolls, lacing cards or shoes, and stringing beads. Handheld mirrors, especially those with a familiar fantasy theme like princesses, appeal to children in this age group for role-playing purposes. Easy-to-put-on jewelry, such as elastic bracelets and long necklaces that do not require the child to hook or latch them and do not pose a strangulation hazard, are likely to appeal to this age. Earrings or short necklaces that cannot be viewed by the child are of less interest.

3 Years

Three-year-olds look forward to pretending with costumes, accessories, and kits of moderately realistic detail in rich, vibrant colors or pastel colors. Due to their increased dexterity, fine motor control, and problem-solving abilities, children in this age group are better able to put on and take off costumes and accessories. They enjoy costumes and dress-up materials with themes, such as superheroes, identifiable professions like doctor, police, and firefighter, and accessories like wigs and masks. Jewelry, like bracelets, necklaces, rings and earrings, appeal when they have a moderate level of realistic detail in form and function. With some degree of success, they can work with simple snaps and with relatively large buttons, hooks, lacing, and buckles. They can use longer string with a stiff end, and start to create simple sequential or repeated patterns of beads, like red and blue.

They enjoy playing with smaller beads for stringing, and with simple weaving toys, sewing cards, looper looms, and simple sewing kits (see also *Media Play: Arts & Crafts*). Although they

still have some difficulty exercising fine motor control with manicure, make-up, and disguise kits, children in this age group understand better how to use these kits safely and appropriately for dress-up play. These have a basic understanding of the dynamics of good and evil, and begin to enjoy games like cops and robbers. They also enjoy other simple story lines that involve exploration, dinosaurs, pets, and family contexts. Three-year-old children are better able to remove a necklace from around their neck, but require large hooks or other fasteners that can be easily separated or undone.

4 Through 5 Years

This age group demonstrates more expansive conceptualizations of symbolic meanings and moderate problem-solving abilities. Children 4 and 5 years old develop greater sophistication in their pretend play and more often enact extended stories. They enjoy more elaborate, detailed costumes (*e.g.*, superheroes and identifiable professions), accessories (*e.g.*, rings, earrings, bracelets, necklaces, wigs, hats, ties, and gloves), and kits (*i.e.*, manicure, make-up, and disguise kits) that increase their opportunities for independently developing and extending more complex dramas and fantasies. Adult coaching helps children in this age group to extend their pretend play. Their dexterity and fine motor skills are moderately developed to the point where they can handle adult-size snaps, buttons, buckles, hooks, and lacing challenges better. Bows are a more difficult, although acceptable challenge.

Children in this age group can copy longer, sequential patterns and create simple multiple-order patterns when using smaller beads for stringing. They enjoy simple weaving and sewing kits, sewing cards, and looper looms, and they start to master simple bows by the time they reach 6 years of age. The dress-up materials that interest them to the greatest degree are based on themes from various experiences and media (*e.g.*, television, videos, computer games, movies, and books), including doctor, house/family, school, police, military, fire fighters, dinosaurs, pets, and spaceships.

6 Through 8 Years

The surrounding media culture, the immediate community, and their school, peers, and experiences have a significant impact on school-age children. These play a larger role in the fantasy themes and dress-up materials that appeal to their interests and impact their choices. Children 6, 7, and 8 years old display a deeper interest in themes that promote chase games (*e.g.*, cops and robbers and the military), rough and tumble play (*e.g.*, wrestling and king-of-the-mountain), movie reenactments, and comic book characters. Appealing costumes, accessories, and kits are more realistic looking in size, detail, and function, and may include small beads for stringing jewelry, hand looms, hand sewing to make clothes for dolls and puppets, spool knitting, braiding, and simple needlepoint. Children in this age group have the fine motor dexterity to tie multiple knots, like what would be needed for macramé, braiding, and knitting. They can work a basic loom, twist plastic strands, string small beads, and use fragile art media, like glass and pottery beads or shrinkable colored plastic, to make their own accessories (*e.g.*, friendship bracelets, necklaces, and pins) and costumes, and enjoy doing so. Toward the end of this age range, children prefer semi-structured group drama performances or staged plays. Typical themes include major historical events, fairy tales, adventures in space and elsewhere, cops and robbers, battles of all kinds, ballet, circus, school, house and fire fighter, involving various accessories and kits like jewelry, wigs, make-up, hair, and disguise kits, and manicure sets. By 9 years of age, children use unfinished materials, accessories, and kits to customize and design their own outfits, costumes, and disguises.

9 Through 12 Years

Although dramatic play for 9- through 12-year olds employs themes from the early school-age years to a lesser and lesser degree with age, such play becomes highly structured and centers on broader historical themes like wars, major national or regional transitions, and scientific advances, domestic themes, such as family and health issues, cleaning, cooking, and sewing, and the accessories for activities like more complex hand looms, or sewing, knitting, embroidery, needle point, plastic braiding, and leather kits. Children in this age group have a greater interest in dramatic activities, sports and other competitive activities, and various professions. They have also developed the ability to perform more difficult skills, like applying make-up or set

construction. Therefore, these older children start to prefer costumes and clothing that represent real-life roles, such as hunter, ballerina, athlete, doctor, and soldier. They also enjoy the accessories that bring these roles to life, like realistic wigs, guns, specialized shoes, sports equipment, unfinished materials, and relevant decorations. Children in this age group place a greater and greater premium on authenticity with all costumes, accessories, and kits that closely resemble adult versions.

PRETEND & ROLE PLAY: **DRESS-UP MATERIALS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts			
Shape of Parts	Thick, round edges Non-elaborate shapes for jewelry Sleeveless, slip-on costume design	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Number of Parts			
Interlocking/Loose Parts			
Materials*	Wood or plastic beads	----------→ Easy on & off hook-and-loop fasteners	----------→ ----------→ Large buttons, buckles & hooks for costumes
Motor Skills Required*	Very little dexterity or fine motor control	Low degree of dexterity & fine motor control Able to string large beads & holes with pincer grasp Able to guide arms & legs through large openings	Low to moderate degree of dexterity & fine motor control ----------→ ----------→
Color/Contrast	Rich, vibrant colors	----------→	----------→
Cause & Effect			
Sensory Elements	Soft textures	----------→	----------→
Level of Realism/Detail*			Low degree of realistic detail

Licensed theme*		Licensed costumes & accessories begin to appeal	Stronger connection with licensed costumes & accessories
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Imitative Very simple pretend & symbolic thinking Babbles, some words Exploring Feeling textures Mouths objects most of the time	----------→ Simple pretend & symbolic connections Words & short phrases ----------→ ----------→ Mouths objects much of the time	----------→ More, increasingly complex symbolic transformations Increase in vocabulary Values independent functioning Some mouthing of objects
Examples of Products	Very simple costumes Necklaces, bracelets with low tension elastic, no rings/earrings Hair accessories (scarves, clips) Braided or plastic “string” Beads (up to 10)	Simple costumes ----------→ ----------→ ----------→ Shoes, hats, snap-on ties Beads (up to 20) Lacing cubes or boards with thick blunt spindles	----------→ ----------→ Handheld mirrors with fantasy theme Simple wigs ----------→ ----------→ Dresses, hats, gloves, shoes, snap-on ties Beads (up to 20) Simple dress-me dolls Frames & cubes for buttoning, snapping, lacing, hooking, & buckling Lacing cards & shoes

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY: **DRESS-UP MATERIALS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts	Smaller beads (around 0.5 inch)	Beads around 0.25 inch	Realistic size & function of dress-up materials	----------→
	Necklaces with large hooks or easy-to-separate fasteners	----------→	----------→	
Shape of Parts				
Number of Parts				
Interlocking/Loose Parts				
Materials*	Smaller easy on & off hook-and-loop or touch fasteners	----------→	----------→	----------→
	Mid-size buttons, buckles & hooks	Adult-size buttons, snaps, lacing, buckles & hooks	----------→	----------→
	Simple, large snaps		Pottery & glass beads	----------→
Motor Skills Required*	Moderate degree of dexterity & fine motor control	----------→	Moderate to high degree of dexterity (can make clothes for dolls & puppets with sewing needle)	----------→
	Simple lacing	Basic lacing & tying challenges	Making simple dress-up materials	Making somewhat elaborate costumes
	Independent dressing with simple costumes	----------→	Putting on basic adult-type costumes	Putting on somewhat elaborate costumes
	Snapping, buttoning, buckling, hooking	----------→	----------→	Precise application of make-up
Color/Contrast	Rich, primary colors & bright pastel colors	----------→		
Cause & Effect				
Sensory Elements	Soft textures (cont'd)	----------→		
Level of Realism/Detail*	Moderate level of realistic detail	Moderate to high level of realistic detail	High level of realistic detail	Very high level of realistic detail Premium on authenticity
Licensed theme*	More appeal of licensed costumes	Keen interest in licensed costumes	----------→	----------→
Classic				

Robotic/Smart Features				
Educational				
Relevant Play/Behavior	Much greater emphasis on pretend Low to medium problem-solving abilities Starts to engage in simple sequential patterns like red & blue	More, sophisticated pretend play More expansive conceptualizations of symbolic meanings Moderate problem-solving abilities Can copy more complex orders in bead stringing Able to create simple multiple-order sequences	More structured, goal-oriented dramatic role-play Moderate to high problem-solving abilities Moderate to high degree of customized dress-up	Highly structured, goal-oriented dramatic role-play High degree of problem-solving abilities High degree of customized dress-up
Examples of Products	Low to moderately complex costumes All types of jewelry Simple wigs (cont'd) Hair accessories (scarves, clips) Dresses, hats, gloves, shoes, snap-on ties (cont'd) Small beads Dress-me dolls (cont'd) Frames & cubes for buttoning, snapping, lacing, hooking, & buckling (cont'd) Lacing cards & shoes (cont'd)	Moderately complex costumes Low to moderately complex kits (manicure, make-up, jewelry, braiding, disguises) ----------→ ----------→ Simple bows ----------→ Looper looms ----------→ ----------→ ----------→ Simple sewing kits ----------→	Unfinished materials for making costumes ----------→ More realistic wigs Complex hair accessories More complex bows ----------→ Looper & hand looms Beads of all sizes Spool knitting Simple needlepoint	----------→ Adult-like jewelry, manicure, make-up, ties, disguises, hair, sewing, braiding, knitting, needle point, embroidery ----------→ ----------→ ----------→ More complex hand looms ----------→ ----------→ Leather & plastic braiding Decorative guns & equipment

* One of the most influential characteristics for these products.

SMALL VEHICLE TOYS

Children up through 18 months, particularly those younger than 1 year, use small vehicle toys, mostly for exploration and simple imitation purposes, rather than for representational purposes. Therefore, simple vehicle-like toys appropriate for children under 12 months of age are discussed within *Exploratory and Practice Play: Push & Pull Toys*. After 18 months, children start to use small vehicles more for pretend play. Three- and 4-year-olds pretend the most with small vehicles as they construct dramatic scenes and stories. Children are not meant to ride on the vehicles in this subcategory; for ride-on vehicles, please see *Sports, Recreational, & Outdoor Play: Ride-On Toys*.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of small vehicle toys:

- Size of Parts
- Level of Realistic Detail
- Motor Skills Required
- Licensed theme
- Color/Contrast
- Cause & Effect

The order of the above characteristics does not necessarily indicate priority, because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of small vehicle toys are appropriate and how a particular age group plays with these toys.

12 Through 18 Months

Because they have been closely observing adults and older peers at home and see small vehicles being used on TV and in other media, these children start actively engaging in imitative play with substitutes of these objects. As children progress through this period, they are establishing object permanence, simplistic symbolic thinking, and can babble with some words and

understand many more words. Young children can be helped to develop their ability to imitate with small vehicles by watching adults or older peers, although such modeling is not necessary for children in this age group to play with these vehicles. Examples of small vehicle toys for this age group include small boats for the bathtub, simple cars, motorcycles, trucks, trains without tracks, and flying machines. Plastic, hard rubber, or lightweight wood are suitable materials for these toys.

Children in this age group are mostly attracted to rich, vibrant colors with simple details that may be realistic or fantasy-oriented in nature. Children in this age group enjoy small vehicle toys that are simple, easy to recognize, and of one-piece construction, although the wheels may spin. Because children in this age group tend to mouth objects and demonstrate a low degree of fine motor dexterity and control, appropriate small vehicles do not have removable or loose parts. Young children also enjoy small vehicle toys with a low degree of cause and effect, such as vehicles on wheels that spin (see also *Exploratory and Practice Play: Push & Pull Toys*) or vehicles with push buttons that produce simple sounds, lights, and actions. Children in this age group can use small vehicle toys that are activated by shaking or that move after inserting a driver figure into a seat. Small vehicle toys for children in this age group are large enough for easy grasping and pushing (about 4 to 8 inches in size), and children find it easier to use these toys if they have at least one section that fits a small pincer or full hand grip (about ¼ to ½ inch). This, however, is not necessary. If the toy is to be picked up during use, children in this age group will find it easier to manipulate if it weighs no more than 3 ounces. Suitable toys have thick, rounded edges and are sturdy enough so the toy will not break or pull apart.

Simple trains, constructed of molded plastic or wood, and capable of being rolled on either fixed or easy turning wheels, start to appeal to this age group. Because children in this age group have great difficulty negotiating tracks or manipulating and maintaining train or track connections, trains with tracks or small coupling mechanisms are generally not appropriate. As children approach 18 months, they can use simple coupling devices like large hooks or magnets.

19 Through 23 Months

Around 19 months of age, children begin very simple pretend play with small vehicle toys, mostly imitating domestic and predominant media themes, such as the family car, or popular cartoons that have vehicles. Children in this age group enjoy small vehicle toys that have a low-to-moderate level of cause-and-effect functionality, like pushing buttons to produce sounds, lights, or movements, or pulling on a cord. Children at this age enjoy small vehicles that are battery operated and can perform simple tricks (*e.g.*, tumbling, rotating, and bump-and-go motions when a button is pressed on them). At any younger age, children may not have the cognitive skills to move out of the way to allow the vehicle to pass and complete its action. They enjoy relatively large, simple, workable parts—like hinged doors or hoods, dumpers, hoses, sails, rudders, ladders, and propellers—as long as they require only a low degree of fine motor dexterity and control and are easily manipulated with a pincer grasp. As steadier walking develops, they enjoy pulling small vehicles on a cord (see *Exploratory and Practice Play: Push & Pull Toys*). They find appealing small vehicles that have a low-to-moderate level of realistic detail and rich vibrant colors. Suitable small vehicle toys for these children may include boats for the bathtub, cars, motorcycles, fantasy vehicles, trucks, trains, and flying machines. On average, wind-up vehicles are not appropriate for these children.

These children begin simpler pretend play with small vehicle toys as they approach 2 years. Vehicles should be washable or easily cleaned, and should be large enough for easy grasping, gripping, or pushing. Vehicles that are 6 to 12 inches are appropriate, as well as those that fit a pincer or full hand grip. These toys typically weigh no more than 4 ounces if they are expected to be picked up during use. For safety reasons, these toys should be of sturdy construction so that they do not break or pull apart, and have thick, rounded edges.

Boats, cars, motorcycles, fantasy vehicles, and trucks may have slightly more detail, although this is not necessary to appeal to this age group. Trains appeal, but this age group can handle greater challenges. As they approach 2 years, children in this age group are more adept at pushing buttons, manipulating parts, and operating simple remote devices. As with trains for younger children, tracks are not appropriate, but children in this age group do enjoy manipulating

and maintaining simple coupling mechanisms, such as magnetic or large-hook couplings. Two- to four-car trains appeal to this age group.

2 Years

Children at age 2 start to pretend more often given their increased recognition of the symbolic connections between toys and the real world. Such pretend play also occurs in more complex ways than is the case with younger children. They are attracted to small vehicle toys that have a low-to-moderate level of cause-and-effect functionality, as when their pushing produces sound, lights, or movement; when they pull vehicles on a cord; or when they use an intuitive remote control with a couple large push buttons, or turn a steering wheel to produce basic actions. At this age, children have the fine and gross motor skills to hold a remote control and press buttons simultaneously; any younger age child may have difficulty combining these two actions. For more pretend opportunities, children in this age group enjoy several movable parts, like doors, hoods, dumpers, hoses, sails, rudders, propellers, and simple levers that are large and simple for easy pincer grasp. They enjoy small vehicles with low-to-moderately realistic detail and rich vibrant colors or bright pastels. They also enjoy vehicles that require a low-to-moderate degree of fine motor dexterity and control, including boats in the bathtub, cars, motorcycles, trucks, trains, fantasy vehicles, and flying machines. Children in this age group can soon use simple, one- or two-turn, wind-up mechanisms of low tension with a progressively higher rate of success as they progress towards 3 years of age.

Small vehicle toys may be smaller (2 to 4 inches), or larger (10 to 18 inches) for pushing purposes. As they approach 30 months of age, they are increasingly aware of vehicles featuring licensed characters, which starts to play a role in their preferences and ultimate enjoyment of these toys. They also start to enjoy small vehicles that incorporate the most basic educational purposes, such as a few voice-activated numbers and letters in tandem with relevant configurations. Children in this age group may find it difficult to manipulate toys that are not easily grasped or that weigh more than 4 to 6 ounces, if designed to be picked up during use (for example, an airplane). Appropriate toys are constructed to prevent them from breaking or pulling apart, and are typically made with thick, rounded edges. Washable or easy-to-clean toys are desirable.

Children in this age group enjoy large trucks with relatively large, simple working parts, handles, and wheels, because they can be used easily for more purposeful activities like carrying, dumping, or rescuing. Due to the larger size of these trucks, hard plastic is often preferred over metal to keep the toys from getting too heavy. The same trains that are appropriate for younger children are also appropriate here, but their cars can be smaller, and moving wheels are much more appealing than fixed ones. As they approach 3 years, children in this age group enjoy connecting simple hooking, snapping, or interlacing tracks with ample width for error as they push and pull a compatible car, train, or other vehicle along, or watch it go down a slope. They also enjoy manipulating, and are more successful at connecting and maintaining, simple coupling mechanisms with multiple cars that easily fasten and detach.

3 Years

Three-year-olds display a moderate degree of dexterity and fine motor control, and low-to-moderately complex, cause-and-effect functionality in their pretend play. They enjoy small vehicles that produce sounds or talking, lights, or movement by pushing buttons on the toy or on a remote control to produce basic actions. Small vehicle toys are attractive to this age because they are used increasingly in cooperative contexts that have a low-to moderate-level of social interactions, especially as they approach age 4. Children in this age group are attracted to both smaller (1 to 8 inches) and larger (12 to 24 inches) vehicles of more complexity and detail. They prefer vehicles in basic coordinated sets (*e.g.*, miniature die-cast cars and vehicles approximately 1:60 to 1:64 scale) and those with relevant figures and accessories.

Boats, cars, motorcycles, fantasy vehicles, trucks, and flying machines begin to appeal to 3-year-olds when they are more detailed, so they are attracted to materials like die-cast metal or plastics that capture more detail. They begin to prefer a moderate level of realistic detail like proportional design, loose parts, functionality, decorations, and printed words. They enjoy rich vibrant colors and bright pastel colors. They are attracted to simple remote devices that have easy to manipulate buttons, joysticks, or handheld controllers. Children in this age group also like to use pull-back-and-release mechanisms or simple, multiple-turn winding mechanisms that have a large key and

low tension. They enjoy pretending with numerous movable parts, like doors, hoods, dumpers, hoses, sails, rudders, propellers, simple levers, with large workable parts for easy pincer grasp. Small vehicles that feature licensed characters popularized by various media appeal to children in this age group. If the toy is designed to be picked up during use, lightweight vehicles (no more than 6 to 8 ounces) are more appropriate.

Preferred trains have multiple cars that fasten and detach. As with the previous age group, large simple tracks with easy connections appeal to children in this age group because they derive a sense of completion and accomplishment when putting objects together. These children are capable of aligning a die-cast car onto a compatible track, pulling on a lever to move the car up a hill, and watching it travel down a slope at a high rate of speed. Track sets with garages, lifts, launchers, ramps, or manual elevators that are compatible with die cast cars are appropriate.

4 Through 5 Years

Children in this age group immensely enjoy small vehicle toys because they can incorporate them into their moderately to highly complex pretend play. More complex small vehicles promote more complex and longer periods of pretend play. Because they develop richer symbolic meanings than 3-year olds and have moderate problem-solving abilities, 4- and 5-year olds use small vehicle toys as aids or pivots for enacting diverse, often extended stories with a friend or group.

Children in this age group enjoy rich, vibrant colors and more realistic colors, as well as a moderate-to-high level of realistic detail, including proportional design, movable parts, functionality, and more detailed decorations or wording. Children ages 4-5 will spend more time with cars that are highly detailed in their illustration than with those that are not. Boats, cars, motorcycles, fantasy vehicles, and trucks are especially appealing to this age group when they have enough detail to be identified by make or model. They are attracted to materials like die-cast metal or plastics that can capture more detail. They enjoy low-to-moderately complex cause-and-effect functionality, such as pull-back-and-release mechanisms, launchers, and toys with numerous loose parts that they can manipulate to produce moderately complex actions. Small or large workable parts, like doors, hoods, dumpers, hoses, sails, rudders, propellers, and levers,

also appeal to this age group. They enjoy playing with trucks that have large parts, such as cranks and levers, especially on earth-moving trucks and road machinery. They enjoy medium-to-small-size keys on low-to-medium tension wind-up toys. They are attracted to familiar small vehicles that feature licensed characters popularized by various media, and those that come with removable characters. This is also the age at which children begin to develop an interest in collectible vehicles. Appropriate small vehicles that are expected to be picked up during use, generally weigh no more than 10 ounces. Children in this age group prefer both smaller (1 to 12 inches) and larger (24 to 36 inches) vehicles, as well as numerous loose parts of all sizes.

More detailed and realistic trains are preferred. These trains have multiple cars that fasten and detach, and large tracks with easy-to-hook-up, snap-on, or lock-type connections. They enjoy playing with heavier trains that they can readily maneuver, or operating simple electric trains with an adult. Children in this age also can manage track sets with dozens of interchangeable pieces that can be used to perform stunts or race two or more die-cast cars.

6 Through 8 Years

These school-age children are attracted to small vehicles that are highly realistic, minutely detailed, highly functional, and unique in shape, parts, and color. They also enjoy small vehicle toys with numerous accessories and that are highly complex in cause-and-effect functionality, such as push buttons, joysticks, and handheld controllers that produce multiple sounds, lights, or actions. At this age, children have the cognitive skills to become creative in their play with these types of vehicles and may develop unique paths in a room for the vehicle to drive—for example, navigating a remote-controlled vehicle underneath a table and behind a couch is a challenging, yet exciting task. They prefer more complex, highly detailed flying machines that may have a small key for medium-tension wind ups. They have a keen interest in those small vehicles with age-appropriate licenses popularized by various media, including a somewhat sophisticated interest in collectibles as they approach the end of this period. Their moderate degree of strength and dexterity let them use vehicles weighing about 12 ounces, if the vehicles are designed to be picked up during use.

Children in this age group prefer highly elaborate small- or medium-sized cars and motorcycles of all sizes with moderately complex configurations for basic tracks or electric tracks for racing. At this age, vehicle tracks that can quickly launch cars using cranking mechanisms are especially appealing. At this age, children are able to use their gross motor skill strength to operate the crank. Interest in operating trucks declines as racing and collecting interests become paramount for this age group. During this period, children enjoy operating electric trains with multiple cars that have couplings of moderate complexity to fasten and detach, and with smaller tracks that use a variety of straightforward connections that children in this age group can easily set up on their own.

9 Through 12 Years

Older school-age children gradually focus on collecting sets of small vehicle toys that are elaborately detailed, although not necessarily realistic. Their small vehicles may be highly functional and complex, often resembling authentic adult versions. They are attracted to unique or licensed vehicles that are popularized by various media. They enjoy flying machines with small key, high-tension wind ups, or that are air-pressure propelled (see also *Sports, Recreational, & Outdoor Play: Recreational Equipment*). They can handle all sizes of vehicles, and those that are expected to be picked up during use might weigh up to 1 pound. Their interest in racing and collecting cars, motorcycles, and trucks can wax or wane during this period, while their interest in complex, elaborately detailed trains and track configurations is mostly maintained and deepened.

PRETEND & ROLE PLAY: **SMALL VEHICLE TOYS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Large for easy grasping, gripping, or pushing	Large simple workable parts	----------→
	4-8 inches in length & fits pincer or full hand grip	6-12 inches in length & fits pincer or full hand grip	Smaller (2-3 inches), or larger (12-18 inches) for pushing purposes
	May have section(s) 0.25 to 0.5 inch thick	----------→	May have section(s) 0.5 inch thick
	Weight no more than 3 oz if designed to be picked up during use	Weight no more than 4 oz if designed to be picked up during use	Weight no more than 4-6 oz if designed to be picked up during use
Shape of Parts	No removable or loose parts	----------→	----------→
	Thick, rounded edges	----------→	----------→
	One-piece construction (but wheels may spin)	----------→	----------→
	Sturdy	----------→	----------→
Number of Parts	1 or 2 train cars	2-4 train cars	2-6 train cars
		1-3 loose/movable parts	1-8 loose/movable parts
Interlocking/Loose Parts	Large, simple hooks or magnetic coupling devices for trains	----------→	Large & simple hooking, snapping or interlacing tracks that have ample width for given vehicle
Materials	Plastic, hard rubber, or light wood	----------→	----------→
	Washable or easily cleaned	----------→	----------→
Motor Skills Required*	Low degree of fine motor dexterity & control	----------→	Low to moderate degree of fine motor dexterity & control
			Able to use simple remote controls & devices
		Start to fasten & detach simple coupling mechanisms (magnetic or large-hook)	----------→
			One- or two-turn wind-up mechanisms of low tension
Color/Contrast*	Rich, vibrant colors	----------→	----------→
Cause & Effect*	Pays close attention to simple cause-and-effect functionality (pushing produces sound, lights or action)	Pushing produces sound, lights, movement, &/or voice activation	----------→
		Pulling on cord produces effect(s)	----------→
		Pushing buttons on simple remote control produces simple effect(s)	----------→
Sensory Elements	Sound or lights	----------→	----------→

Level of Realism/Detail*	Simple realistic detail or fantasy details Some recognizable details	Low level of realistic detail	Low to moderate level of realistic detail (doors, hoods, dumpers, hoses, sails, rudders, propellers, simple levers)
Licensed theme*		Starts to recognize licensed vehicles	Readily recognizes several licensed vehicles
Classic			
Robotic/Smart Features	Able to use simple remote controls & devices (controlled by rattles or large buttons)	----------→	----------→
Educational			
Relevant Play/Behavior	Imitative play	More imitative of domestic & media-based themes	----------→
	Observe adults & older peers, or watch TV & other media		
	Established sense for object permanence	Simple pretend with more awareness of symbolic connections	More, increasingly complex pretend
	Simplistic symbolic thinking		Increased recognition of symbolic connections
	Babbles with some spoken words & word comprehension	Some spoken words & phrases, & word comprehension	Some spoken words & phrases, simple sentences, & word comprehension
	Often helped by adults or older peers through modeling toy usage	----------→	----------→
	Mouthing objects	Mouth objects to lesser degree	Some mouthing of objects
		Enjoys low to moderate level of cause-and-effect functionality	----------→
Examples of Products	Boats (mostly for bath)	----------→	----------→
			Large trucks
	Push cars, motorcycles, & trucks	----------→	----------→
	Simple trains without tracks	----------→	Trains with 2-6 cars that fasten & detach
		Flying machines (no wind ups)	Flying machines with simple wind ups
		Simple remote-control vehicles	----------→
			Fantasy vehicles with simple wind ups
			Tracks that allow child to watch cars go down a slope

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY: **SMALL VEHICLE TOYS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Smaller working parts	Both small & large working parts	----------→	----------→
	Small (1-8 in.) or large (12-24 in.) for pushing	Small (1-12 in.) or large (24-36 in.)	All sizes	----------→
	No more than 6-8 oz. if designed to be picked up during use	No more than 10 oz. if designed to be picked up during use	No more than 12 oz. if designed to be picked up and used	No more than 1 lb if designed to be picked up during use
Shape of Parts			Unique shapes & part	----------→
Number of Parts	Multiple train cars	----------→	----------→	----------→
Interlocking/Loose Parts	Large & simple hooking, snapping, or interlacing tracks that have ample width for given vehicle (cont'd)	Large tracks with easy to hook-up, snap-on, or lock-type connections	Smaller tracks with a variety of straightforward connections	Complex track connections & configurations
Materials	Die-cast metal or plastics that capture more detail	----------→	----------→	----------→
Motor Skills Required*	Moderate degree of fine motor dexterity & control	Able to manipulate small pieces effectively	Moderate to high degree of dexterity, & fine motor skills	----------→
	More adept at using buttons & joy sticks	Begins to master most remote devices	Masters most remote devices	
	More adept at using simple couplings	Able to use more complex couplings	Couplings of moderate complexity to fasten & detach	----------→
	Simple multiple-turn winders with large key & low tension	Medium to small keys on low to medium tension wind ups	Small key for medium tension wind-ups	Small key, high tension wind ups
Color/Contrast*	Rich, vibrant colors (cont'd)		Standard & unique colors	----------→
	Bright pastel & realistic colors	----------→		
Cause & Effect	Pushing buttons on simple remote control produces more complex effects			
Sensory Elements				
Level of Realism/Detail*	Moderate level of realistic detail	Moderate to high level of realistic detail as in proportional design, functionality, loose parts, printed words, & more detailed decorations	Highly realistic, minutely detailed	----------→ Elaborate & authentic

Licensed theme*	Licensed vehicles & characters, as popularized by various media, begin to appeal more	----------→	Keen interest in licensed vehicles.	----------→
Classic		Beginning interest in collecting classic vehicles	Somewhat sophisticated interest in classic vehicles near the end of this period	
Robotic/Smart Features	More adept at using buttons & joy sticks	Begins to master most remote devices	Masters most remote devices	
Educational				
Relevant Play/Behavior	Low to moderately complex pretend play	Moderately to highly complex pretend play; longer periods of pretend play	More structured, goal-oriented dramatic role-play	----------→
	Moderately adept at making symbolic connections	Develops richer symbolic meanings Object substitution	Readily transform symbolic meanings	----------→
	Low to moderate level of social & cooperative friend or group interactions	Extensive social & cooperative friend or group interactions.	Uses & adapts themes from experience at home, school, & various media (television, videos, movies, books, etc.)	----------→
		Moderate problem-solving abilities	Moderate to high problem-solving abilities	----------→
Examples of Products	Large trucks (cont'd)	----------→	Cars, motorcycles, & trucks with moderately complex standard or electric tracks for racing	Cars, motorcycles, trucks with highly complex standard or electric tracks for racing
	Vehicles with simple tracks & launchers	Vehicles with simple to moderately complex tracks		
	Miniature die-cast cars	----------→		
	Trains with multiple cars	Trains with multiple cars that fasten & detach	Electric trains with multiple cars that fasten & detach	----------→
	Trains with simple, easily connecting tracks	----------→	Trains with small tracks that are moderately easy to connect	Trains with small tracks that are somewhat difficult to connect
	Flying machines with simple wind ups (cont'd)	Flying machines with large- to medium-size key, low-tension wind ups	Flying machines with small key, medium-tension wind ups	Flying machines with small key, high-tension wind-ups or air-pressure propelled
	Remote-control vehicles	----------→	----------→	----------→
	Fantasy vehicles with simple wind ups (cont'd)	----------→	Vehicle tracks that can quickly launch cars using cranking mechanisms	

* One of the most influential characteristics for these products.

TOOLS & PROPS

Tools and props for pretend and role-play start to appeal to children about 12 months old. This is about the time when they figure out that many objects can be used to imitate adults and older peers. Around 19 months, tools and props will help them to role-play domestic themes. By age 3, children are performing simple dramatic scenes and stories. Many of the simpler toys in this subcategory may also be found in the *Exploratory and Practice Play* category, where children of younger ages use such toys.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of tools and props:

- Cause & Effect
- Size of Parts
- Level of Realism/Detail
- Color/Contrast

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of tools and props are appropriate and how a particular age group plays with these toys.

12 Through 18 Months

Although young children do not make clear symbolic connections until they are closer to 18 months, children about 12 months of age will start to actively engage in imitative play with simple and chunky-shaped substitutes of objects they see adults and older peers using. For example, regardless of whether realistic detail is present, young children hold toy telephones (wired and cellular) to their ear because they often see their elders do so. Soon they begin to imitate a phone conversation with babbling and later with words. Children will spend a fair amount of their time repeatedly pressing buttons on a simple toy telephone (including those with fake touchscreen square “app” buttons), camera, remote, or other interactive props, such as a

teapot, or small vacuum, to hear the electronic sounds it produces. They like the cause-and-effect stimuli from pushing buttons and making sounds (see also *Exploratory and Practice Play*).

An imitative response is starting to emerge with other tools and props that they have seen adults perform around the house (*e.g.*, drinking, talking on the phone). They can use sets with up to six separate parts. Rounded toys that are constructed from cleanable, thick, and sturdy materials and structure—so children cannot break or pull them apart—are appropriate. They also prefer toys with rich, vibrant colors. These toys are easier to use if they fit the child's small opposable grip or full hand grip (handles about ½-inch thick) and weigh no more than 3 ounces if expected to be picked up by the child during play. Other examples of toys appropriate for 12- through 18-month olds, in roughly the same order as they would be purchased as the child matures through this period, include rakes, shovels and trowels, and buckets.

19 Through 23 Months

Children 19 through 23 months old are becoming more aware that tools and props represent other objects. A symbolic response may be seen with tools and props, such as kitchen toys and dishes, a teapot with cups and saucers, toy house-cleaning tools (*e.g.*, brooms, mops, dustpans, and carpet sweepers), and lawnmower-like toys. Adults may encourage these actions to stimulate pretend play. Compared to younger children, children in this age group are attracted to slightly more complex (*i.e.*, less chunky and more realistic) tools and props, including cash registers, medical kits, low-power water guns, along with toy cameras and telephones (wired phones, cellular phones, and pagers). They enjoy cellular phones that are modeled after those with traditional buttons and will continue to use those with fake touchscreen square "app" buttons. These children can use toy cameras during pretend-play episodes (*e.g.*, holding up to eye and pretending to take a picture).

Children in this age group are just learning to push wheeled tools and props, such as a toy vacuum, while standing. Care should be taken to ensure that these props are lightweight, and in the case of lawnmowers and vacuums, easy to balance. Children in this age group begin to develop a greater interest in toy shovels and trowels, rakes, wheelbarrows (see also *Exploratory and Practice Play: Push & Pull Toys*), and buckets for sand and water play.

They can use sets with up to 10 separate parts, and enjoy toys with low-to-moderate, cause-and-effect features, such as toys when pushed produce sounds, lights, or other actions. Appropriate tools and props have a low level of realistic detail, rich, vibrant colors, thick and rounded edges, and require only a low degree of fine motor dexterity and control.

2 Years

Two-year-olds start to pretend more often because they increasingly recognize the symbolic connections between role-play and the real world. This pretend play is more frequent and occurs in more complex ways than with younger children. Children in this age group are attracted to the same tools and props as 19-23-month olds, but they should have a level of cause and effect that responds to the child's actions in a simple way that is conducive to their limited motor and cognitive skills (*i.e.*, button pressing continues to be appropriate at this age), be a bit more realistic (still somewhat cartoonish instead of very realistic) in detail, have rich, vibrant colors, and require a moderate degree of fine motor dexterity and control. Children in this age group can also readily incorporate into their pretend play, a simple light-up wand that is short and lightweight, as well as all tools and props for younger children. Tools and props that come in sets and tend to have no more than 10 pieces are appropriate.

As children grow closer to 3 years, they get better at substituting less realistic items for tools and props, and they can handle slightly bigger and heavier (8 ounces or ½ pound) tools and props. Suitable toys for older children are made of thick, sturdy, cleanable, rounded material and structure so children cannot break or pull them apart.

3 Years

Three-year-olds have a moderate degree of dexterity, fine motor control, and ability to pretend. They enjoy using moderately to highly detailed, realistic looking, and slightly fragile tools. Lightweight (no more than 8 ounces) props permit easier manipulations. Children in this age group are attracted to props that exhibit a cause-and-effect stimulus to help support various simple dramatic themes. Children can readily imitate actions that they have seen adults perform when trying to encourage pretend play, such as pushing a toy vacuum with realistic features

(*e.g.*, hose attachments, weak suction, visualizing or picking up pretend dirt particles) or waving around a wand/sword, or spinning novelty toy with flashing lights and music. Sets generally have no more than 10 pieces. Children in this age group also begin to have more interest in realistic colors like black, white, beige, and gray.

They retain an interest in toy tools with a moderate-to-high level of realistic detail, including shovels, trowels, rakes, buckets for sand and water play, vacuums, lawnmowers, kitchen toys and dishes, tea sets, cleaning tools (*e.g.*, brooms, mops, dustpans, and carpet sweepers), cash registers and play money, medical kits, play telephones and mobile communication devices, toy guns, holsters, helmets, low-power water guns, and small bow and arrow sets with suction-cup-tipped ends. In this age group, children can also begin to use play food appropriately (*e.g.*, mimic eating and imitate chewing, but not actually trying to bite, suck, or mouth the play food—a common occurrence at younger ages). Children now also have the fine motor skills needed to put together play food with multiple pieces and parts (*e.g.*, putting together a sandwich using a kit that has a small piece of hook and loop to connect the pieces together), as well as incorporate a tea set (teapot and sugar bowl with lids, creamer, cups and saucers) into a make-believe tea party (*e.g.*, tilts handle to simulate pouring, picks up cup by handle, replaces lid). Such toys are increasingly used in cooperative contexts, especially as they get closer to 4 years old. Children in this age group, because of their newly acquired level of speech and their desire to be more social and cooperative, are very attracted to telephones and mobile communication devices that have bright colors with moderately realistic details and somewhat complex functionality. For example, children in this age group enjoy phones with buttons that, when pressed, ask questions or make comments with basic language that they can understand.

4 Through 5 Years

Children in this age group also enjoy moderately to highly detailed, realistic tools and props to incorporate into their pretend play. Because they develop richer symbolic meanings and have moderate problem-solving abilities, 4- and 5-year-olds use tools and props to initiate and support role-play characters and to enact diverse, often extended stories. Their moderate degree of dexterity, strength, and gross motor skills allow them to begin handling lightweight (up to about 10 ounces), realistic, working hammers and similar tools for practicing construction skills.

The tools and props that interest children in this age group most are based on themes from various experiences at home, school, and through the media (television, videos, computer games, movies, and books). These include props like cash registers and play money, medical kits, kitchen/cooking sets, cameras, telephones, mobile communication devices, toy guns, holsters, helmets, low-power water guns that have a moderate degree of realistic detail, and small bow and arrow sets whose arrows are tipped with suction-cups. Sets of tools and props typically have no more than 10 pieces.

Tools and props designed for more complex cause and effect appear to promote more complex and longer periods of pretend play. For example, 4- and 5-year olds seek realistic detail and prefer telephones and mobile communication devices with different buttons that produce various realistic functions. For example, the phone may beep and have a dial tone, voice response, or text messaging. Children in this age group do not prefer fantasy functions, like songs that play, as much as they did when they were younger. Cameras with a viewfinder function (such as a kaleidoscope lens) can also be used at this age because children know to hold it to their eye, peek through a viewfinder hole, and push down a pretend button. Looking through a viewfinder and pointing out objects is appealing. At younger ages, children lack the cognitive skills to understand which side of the camera is the proper side to look through.

6 Through 8 Years

Young school-age children produce fewer pretend episodes than pre-school children as they delve into more structured games. Their pretend play becomes more dramatic with longer, more complex structured scenes and plays. They are attracted to highly realistic, detailed tools and props to incorporate into their dramatic play. Because they can readily transform symbolic meanings and develop moderate-to-high problem-solving abilities as they mature through this period, 6- through 8-year olds employ tools and props to initiate and support role-play characters to enact diverse, often extended stories. Children in this age group rely almost totally on the cause and effect that a given tool or prop produces. Thus, the appeal of such toys is primarily based on their high degree of realistic detail and function, although the toys themselves are the same as those listed for 3- to 5-year-olds.

Their moderate-to-high degree of dexterity, strength, and gross motor skills allow them to handle lightweight (up to about 12 ounces), realistic, working hammers and similar tools for construction purposes. The tools and props that interest them most are based on themes from various experiences at home, school, and through the media (television, videos, computer games, movies, and books).

9 Through 12 Years

Older school-age children produce few pretend episodes. Their dramatic play is more complex and structured than younger children; they are elaborately staged and of lengthy duration. The tools and props that interest them to the greatest degree are based on themes from various experiences at home, school, and through the media (television, videos, computer games, movies, and books). They are attracted to highly functional, realistic, detailed tools and props to incorporate into their dramatic play.

Because they can readily transform and manipulate symbolic meanings and develop advanced problem-solving abilities as they mature through this period, 9- through 12-year olds use tools and props to support both dramatic and constructive efforts. They rely less on the cause and effect that a given tool or prop produces, and can mime without the tool or prop present. The appeal of toy cash registers and play money, medical kits, kitchen/cooking sets, telephones and mobile communication devices, guns, holsters, helmets, medium-power water guns, and bow and arrow sets with low tension and blunt safety tips, is based primarily on their high degree of authenticity. Children in this age group are most interested in props with realistic detail and function that closely resemble adult versions. Their relatively high degree of dexterity, strength, and gross motor skills allow them to handle authentic-looking, working hammers and similar tools (weighing up to 1 pound) for constructing a wide variety of projects.

PRETEND & ROLE PLAY: **TOOLS & PROPS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Size fits pincer or full-hand grip (handles 0.5 inch thick) Weighs no more than 3 oz. if designed to be picked up & used	----------→ Weighs no more than 4 oz. if designed to be picked up & used	----------→ Weighs no more than 4-6 oz. if designed to be picked up & used
Shape Parts	Sturdy (toy will not break or pull apart) Thick, round edges (no sharp edges)	----------→ ----------→	----------→ ----------→
Number of Parts	1-6	2-10	----------→
Interlocking/Loose Parts	Loose	----------→	Tools that easily fit into “work” holster
Materials	Easily cleaned Mostly plastic	----------→ ----------→	----------→ ----------→
Motor Skills Required	Low degree of fine motor dexterity & control	----------→	Low to moderate dexterity & fine motor control
Color/Contrast*	Rich, vibrant colors	----------→	----------→
Cause & Effect*	Pays close attention to simple cause-and-effect functionality (pushing produces sound, lights or action), or turning & pounding produce a given result	Low to moderate level of cause-and-effect functionality (pushing produces sound, lights or action)	----------→
Sensory Elements			
Level of Realism/Detail*	Low level of realistic detail	----------→	Low to moderate level of realistic detail
Licensed theme			

Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Imitative Very simple pretend & symbolic thinking Babbles, some words Exploring Mouthing objects	----------→ Simple pretend & symbolic connections Sand & water play ----------→ Mouthing objects less	----------→ More, increasingly complex symbolic transformations ----------→ Values independent functioning Some mouthing
Examples of Products	Rakes, shovels, buckets & trowels Small lawnmower-like toys House cleaning tools Kitchen/cooking & tea sets Cell phones and mobile devices modeled after those with traditional buttons as well as those with fake touchscreen 'app' buttons.	----------→ Vacuums & lawnmowers ----------→ ----------→ Telephones & mobile communication devices (cell phones, pagers) with pull out keyboards Cash registers & money Medical kits Construction tools Wheelbarrows Wands	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

PRETEND & ROLE PLAY: **TOOLS & PROPS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Toy & Parts*	Size fits pincer or full-hand grip (handles 0.5 inch thick) (cont'd) Weighs no more than 6-8 ounces if designed to be picked up & used	Size fits pincer or full-hand grip (handles 0.75 inch thick) Weighs no more than 10 ounces if designed to be picked up & used	----------→ ----------→	Size fits pincer or full-hand grip (handles 0.75 to 1.25 inches thick) Weighs no more than 1 lb if designed to be picked up & used
Shape of Parts	Will not easily break or pull apart into small pieces Somewhat thick, round edges (no sharp edges)	----------→ ----------→		
Number of Parts	2-10 (cont'd)	----------→		
Interlocking/Loose Parts	Tools that easily fit into "work" holster (cont'd)	----------→		
Materials	Easily cleaned (cont'd) Mostly plastic (cont'd)	----------→ ----------→	 Plastic, wooden, or metal	 ----------→
Motor Skills Required	Moderate degree of fine motor dexterity & control	Moderate degree of dexterity, strength, & gross motor skills	Moderate to high degree of dexterity, strength, & gross motor skills	High degree of dexterity, strength, & gross motor skills
Color/Contrast*	Rich, vibrant colors (cont'd) Realistic (*e.g.*, black, white, beige, gray)	 ----------→	 ----------→	 ----------→
Cause & Effect*	Moderate level of complexity in cause-and-effect functionality (pushing produces sound, lights, &/or action)	Moderate to high level of complexity in cause-and-effect functionality	High level of complexity in cause-and-effect functionality (pushing, etc. produces conversation, lights, &/or action)	High level of complexity in cause-and-effect functionality
Sensory Elements				
Level of Realism/Detail*	Moderate level of realistic detail	Moderate to highly realistic detail & function	Highly realistic detail & function	Highly realistic details & function resembling authentic adult-versions

Licensed theme		Use themes from experience at home, school, & various media (television, videos, computer games, movies, & books)	----------→	----------→
Classic				
Robotic/Smart Features				
Educational				
Relevant Play/Behavior	Greater ability to pretend	Develop richer symbolic meanings	----------→	----------→
	More, increasingly complex symbolic transformations	----------→	----------→	----------→
	Low to moderate problem-solving abilities	Moderate problem-solving abilities	Moderate to high problem-solving abilities	----------→
	Some partner or group interactions	Extensive partner or group interactions	----------→	----------→
Examples of Products	Rakes, shovels, buckets, & trowels	----------→		
	Vacuums & lawnmowers (cont'd)	----------→		
	House cleaning tools (cont'd)	----------→		
	Kitchen cooking props (cont'd)	----------→	----------→	----------→
	Telephones, cell phones, pagers (cont'd)	----------→	----------→	----------→
	Cash registers & money (cont'd)	----------→	----------→	----------→
	Medical kits (cont'd)	----------→	----------→	----------→
	Construction tools (cont'd)	----------→	----------→	----------→
	Toy guns, holsters, helmets, & bow & arrow sets with suction cups	----------→	----------→	----------→
	Play food	Light hammers	----------→	----------→ Authentic, adult-like tools & props

* One of the most influential characteristics for these products.

GAME & ACTIVITY PLAY

Children begin to enjoy certain types of puzzles around the age of 1 and games around the age of 2 when they start interacting with toys in more symbolic, logical ways. Game play takes off in the elementary years, when games with rules dominate children's play. Many games have educational elements or cultural traditions, and these make them appealing to parents and children.

Puzzles (p. 149)

- Cardboard puzzles
- Inset or fit-in puzzles
- Jigsaw puzzles
- Magnetic puzzles
- Three-dimensional puzzles
- Wooden puzzles

Card, Floor, Board, & Table Games (p. 159)

- Activity games
- Backgammon
- Bingo games
- Card games
- Checkers
- Chess
- Chinese checkers
- Cooperative games
- Dice games
- Dominoes
- Fantasy adventure games
- Lotto games
- Matching games
- Mazes
- Pattern memory games
- Pick-up-sticks
- Table games
- Trivia games
- Word games

PUZZLES

Children enjoy puzzles of various types and styles. Puzzle play can be a solitary or group activity. Puzzles are often seen as a solitary activity for young children; however, children are also keen observers and interested in watching others finish puzzles. In general, puzzles are appropriate for children starting at 12 months of age. Children younger than this can only use pre-puzzles, which are meant for exploratory or practice play, rather than fitting pieces together. Therefore, these are considered under *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives*.

Puzzles require three major skills: fine motor skill to pick up and place the pieces, visual discrimination to identify if the pieces fit, and some cognitive skill to organize and plan the placing of pieces. As children develop, their fine motor skills increase, visual discrimination improves, and cognitive abilities for trying different puzzle strategies improve. Children who have more experience with puzzles can try more complex puzzles at an earlier age than children who have little experience. Puzzles are important for the problem-solving process, because children learn new strategies for completing puzzles as they try new puzzles. Research indicates that working with puzzles and other closed-ended materials encourages persistence in children because they are expecting a solution for fitting the pieces together.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of puzzles:

- Number of Parts
- Licensed theme
- Motor Skills Required
- Size of Parts
- Interlocking/Loose Parts

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a

description of what types of puzzles are appropriate and how a particular age group plays with these products.

12 Through 18 Months

Children in this age group have very little interest in true puzzle-type activities. They can rarely focus on the visual discrimination cues required to finish a puzzle. Puzzles with simple frames, large pieces with easy to grip knobs, and large distinctly shaped wells that can accommodate a few shapes, animals, or vehicles may be introduced to this age group, but these children are still primarily focusing on sensory-motor experiences so they approach puzzles by grasping them, mouthing them, banging them, and throwing the pieces.

19 Through 23 Months

Nineteen-month-old children are interested in putting together objects that fit. Children at this age work these activities through trial and error, rather than use systematic strategies for completing puzzles. However, as they approach 2 years of age, they are beginning to recognize puzzle shapes and angles and are able to fit a square piece into a square well. These puzzles have smooth surfaces, are washable, and are designed to be mouthed. Children 19 through 23 months old are getting better at the visual discrimination skills needed to work inset or other fit-in type puzzles.

2 Years

Two-year olds have developed the fine motor skills and visual discrimination that are required to do inset puzzles. The simplest puzzles have pieces that give obvious visual and physical cues that a piece is in place (some puzzles may repeat the name of the object put in the well if it has electronic features), and that have only one clear solution. Inset puzzles based on familiar pictures and characters, as well as abstract shapes, should also be very simple. At younger ages, children's still developing cognitive skills may struggle with aligning the puzzle pieces correctly into the wells. Cognitively, ordering by size is emerging at this age, and these children are better at sorting and ordering pieces in a meaningful way. They continue to approach puzzles through trial and error rather than systematic strategies. Because of this, puzzle pieces need to be close-

ended so that the pieces fit in only one orientation. For example, frames that have individual places for each piece can be used. Knobs on the puzzles allow the child to rotate the puzzle piece in place without having to move their fingers. Appropriate inset puzzles have individual pieces with distinctive shapes to emphasize visual cues. Puzzle pieces with smooth edges that are made from wood or another lightweight material like plastic are suitable.

3 Years

Three-year-olds have developed greater fine motor skill and visual discrimination. Although they have greater physical dexterity, they may still require knobs on the puzzle pieces and an inset form or frame for placing them. If there are no knobs, a magnetic connection between the puzzle piece and a magnetic wand to pick up the piece (*e.g.*, a fishing puzzle) will suffice. At age 3, children's fine motor skills are developed enough to align the magnetic wand with the metal in the puzzle piece to grab and maneuver the puzzle piece to where it belongs. Younger age groups may have trouble aligning the two magnets with enough precision to complete the puzzle. Three-year olds are interested in licensed characters based on popular age-appropriate cartoons or television characters; so pictures of common objects and licensed characters are appropriate for this age. Parents prefer characters that are non-violent or non-threatening (also known as "safe harbor characters"), and these may come from popular cartoons or children's books. Because of their greater cognitive ability, 3-year olds can work puzzles with up to 26 pieces. Cardboard puzzles may be introduced to children in this age group because they are less likely to mouth the pieces and thus ruin the fit.

4 Through 5 Years

Four-year-olds have sufficient fine motor skill to work puzzles without knobs. Four- to five-year-old children are also developing more systematic strategies for approaching puzzles, although they often still rely on trial and error. Their increased cognitive ability allows them to do puzzles with up to 60 pieces. Although children in this age group may prefer insets, some 4- and 5-year-olds are beginning to work non-inset jigsaw type puzzles with medium wooden or cardboard pieces. These children are becoming more interested in licensed themes involving action or fashion oriented characters.

6 Through 8 Years

Six-year-olds have developed the cognitive ability to work jigsaw type puzzles. They can identify pieces based on where they go in the puzzle, can sort pieces, and have more systematic methods of testing pieces for the puzzle. They generally are not interested in inset puzzles. They will continue to do frame-type puzzles if they are complex enough and have enough pieces. They can do puzzles with up to 100 pieces. Six- through eight-year-olds may require puzzle pieces to be at least an inch across until they have developed the fine motor skills to handle smaller pieces. Simple three-dimensional puzzles begin to interest children more as they approach 8 and 9 years of age.

9 Through 12 Years

Nine- through 12-year-old children are interested in highly complex puzzles. They can follow directions for puzzles with three dimensions, and they now have the fine motor skills required to handle small, abstract, or interlocking pieces. Nine-year-olds can complete jigsaw puzzles with up to 500 pieces, and 10- through 12-year-olds enjoy the challenge of puzzles with up to 2000 pieces.

GAME & ACTIVITY PLAY: **PUZZLES**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*		Inset puzzles with large pieces	----------→
Shape of Parts		Smooth edges	Smooth edges
Number of Parts*		No more than 3-5 pieces	No more than 5-12 pieces
Interlocking/Loose Parts*		Pieces fit together without interlocking	----------→
Materials		Plastic, solid wood	----------→
Motor Skills Required*	Use shape sorters in exploratory ways	Pieces fit together easily & only in one way	Child can put together simple inset puzzles, knobs make puzzles easier to complete
Color/Contrast		Bright colors	----------→
Cause & Effect			
Sensory Elements		Interesting textures increases appeal	----------→
Level of Realism/Detail		Abstract shapes more than realistic detail	Interested in realistic-looking objects
Licensed theme*			Some interest in licensed television characters
Classic			
Robotic/Smart Features			

Educational			Parents often buy puzzles for their educational value
Relevant Play/Behavior		Will put together simple pieces that fit together	Beginning interest in simple puzzles Ability to do puzzles increases depending on experience with puzzles
Examples of Products	Chunky figurine puzzles with distinctly shaped wells that fit the figurines	Form boards	----------→ Inset puzzles with knobs & large pieces Puzzles that repeat the name of the object put in the well if it has electronic features Peg-style shape sorters based on colors

* One of the most influential characteristics for these products.

GAME & ACTIVITY PLAY: **PUZZLES**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Able to use smaller parts; still need parts to be about 2" in size to facilitate placement	----------→	Able to do puzzles with smaller pieces (<2")	Able to do puzzles with pieces less than an inch across
Shape of Parts	Smooth edges (cont'd)	----------→		
Number of Parts*	8-12 pieces	Age 4: 12-18 pieces Age 5: Up to 35 pieces	Up to 100 pieces	Age 9: 100-500 pieces Age 10: 500+ pieces
Interlocking/Loose Parts*	Inset puzzles without interlocking pieces	Basic Jigsaw type puzzles	Interlocking jigsaw pieces & 3-dimensional puzzles	----------→
Materials	Cardboard	----------→	Paper	----------→
Motor Skills Required*	Increasing level of visual discrimination & fine motor skills	----------→	----------→	----------→
Color/Contrast	Bright colors & pastels	----------→	Any color	----------→
Cause & Effect				
Sensory Elements				
Level of Realism/Detail	Increasing interest in realistic details	----------→	Like puzzles with photographs or other scenes	----------→

Licensed theme*	Like puzzles with popular gentle cartoon characters	Like puzzles with popular cartoon characters	Like puzzles with popular cartoon characters, sports stars, & television stars	----------→
Classic				
Robotic/Smart Features				
Educational	Parents buy puzzles for educational purposes	----------→	----------→	----------→
Relevant Play/Behavior	Trial & error placement of pieces. Pieces need to fit together clearly Puzzles that do not go together easily cause frustration	More systematic placement of pieces, beginning to plan puzzle strategies Have attention necessary to complete puzzle in a few minutes	Able to plan puzzle completion & able to put a puzzle together systematically Can pay attention to a puzzle for an hour or return to a puzzle for a second sitting	Able to put together a puzzle systematically Able to do puzzles that require several days to complete
Examples of Products	Inset puzzles with knobs Wooden puzzles Magnetic puzzles with connection between a wand and a puzzle piece (*e.g.*, a 'fishing' or 'bug catching' puzzle)	Inset puzzles Floor puzzles Simple jigsaw puzzles	Paper & cardboard puzzles 100-piece puzzles Simple 3-dimensional puzzles	3-dimensional puzzles Age 9: Jigsaw puzzles with 100-500 pieces Age 10-12: Puzzles with 500 or more pieces Abstract puzzles Puzzles with instructions

* One of the most influential characteristics for these products

CARD, FLOOR, BOARD, & TABLE GAMES

Board and card games have an ancient history with deep traditional roots. Because games are social in nature, they are very appealing to children. Games also appeal to children because they have a cognitive element, and give children an opportunity to interact with and learn from adults. Infants and toddlers, however, have not developed the cognitive and motor skills required to take part in structured games. Although they enjoy participating in social situations, 2-year-olds cannot focus on game rules.

The games covered under this category include card games, lotto and bingo games, dominoes, dice games, floor games, table games, and similar games. Games come in great varieties and have a number of different permutations. By definition, games have a number of rules that regulate how the players are expected to participate. Games may have different methods of taking turns, and are based on randomness, strategy, or a combination of the two. Parents like games because they can directly or indirectly teach cognitive and academic skills. Parents also like traditional or classic board games because they enjoyed them as children.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of card, floor, board, and table games:

- Motor Skills Required
- Content Complexity
- Length of Time Required to Play
- Educational
- Classic

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a description of what types of card, floor, board, and table games are appropriate and how a particular age group plays with these games.

2 Years

Two-year-olds have developed rudimentary problem-solving skills, such as simple matching or differentiation, but they do not have the cognitive skills or attention span required to participate in true game play that involves rules or requires taking turns. Instead, children in this age group will often use games of this sort as learning or educational toys (see *Technology Play: Learning Products* and *Smart Toys & Educational Software*). Simple matching or lotto-type games, in which the matching is based on pictures, shapes, or colors, rather than more abstract letters or numbers, may be enjoyed by children in the latter half of this age group. Dominoes—especially giant ones—also may be enjoyed by children in this age group. Based on observational data, although 2-year-olds are attracted to magnetic fishing games, most do not possess adequate fine-motor skills to be successful. These children may enjoy simple action games that involve pressing a lever or flipping a marker into a hole. Play with these games may involve one other child or adult, but children of this age will often choose to play with the game alone in exploratory ways.

3 Years

Games for 3-year-olds must be very simple, with no more than five or six pieces involved, and involve few rules. Three-year-olds can take turns and understand simple rules. They can follow a plan of action by moving a piece from start to finish. Although 3-year-olds can concentrate on a game, games for 3-year-olds should move quickly and not require too much time between turns. In general, 3-year-olds cannot count to more than 10. They can recognize simple ABCs and 123s in games, but cannot use reading for any part of the game. For this age group, using cards or spinners is preferred to using dice as a method of moving, although a single die may be used.

Because 3-year-olds have little or no understanding of game strategies, suitable games are based on chance. Most appropriate for 3-year-olds are activity games that do not have a final winner or loser and are not goal directed. Children in this age group are unable to consider both an opponent’s pieces and their own, so games should not require “blocking” an opponent. Children also enjoy active movement games and cooperative games. Games for 3-year-olds best incorporate some sort of physical participation, rather than cognitive strategies. Games for this age group include simple lotto games, matching games, dominoes, magnetic fishing games, and

simple board games using cards or spinners to indicate movement. Based on observational data, children appear to struggle with magnetic fishing-type games at any younger ages. They enjoy matching and memory games that require them to follow a set of actions in a pattern. For example, children in this age group now have the memory skills to flip over an object with a shape on it, turn it back over, and be able to relocate the shape. Appropriate card games require only simple matching and do not require children to hold cards in their hands.

4 Through 5 Years

Children 4 through 5 years old have a greater interest in games, but they still lack the ability to understand complex rules and strategies. Although most 4- and 5-year-olds are developing their reading abilities, they generally cannot use written directions. Words and numbers can be used as part of the game, if they are not needed for complex actions. Children of this age group are interested in number- and letter-recognition games; and activity games with a physical component are still very popular. Four- and five-year-olds do not have the fine motor skill to hold more than a few cards at a time. Children in this age group are developing the fine motor skills; pick-up-sticks, games that require balancing pieces on one another, and similar games are appealing. They may enjoy handheld games filled with water with a large button with the goal of launching small balls into baskets. Younger children may flip the handheld game over to move the balls around, instead of using the strategy of button pressing. These children may be introduced to simple, clear plastic, three-dimensional balls with a marble and wide track maze inside (3-D maze balls), but they are still developing the fine motor skills that are required to maneuver a marble along a pathway or conquer obstacles. At younger ages, children lacking these motor and cognitive skills may be more likely to use a 3-D maze ball functionally (*e.g.*, by throwing or kicking it around).

Cognitively, they can remember a few rules and one or two strategies. They are egocentric, so they are not very good at anticipating another player's actions; and they like games based on random factors. Therefore, as with 3-year-olds, games should not require "blocking" an opponent. Children of this age group like dominoes, card matching, and lotto-type games. Parents often buy children of this age group traditional or nostalgic games, such as Old Maid and

similar games that have been around since their own childhood. Parents are also very attracted to games that offer some sort of educational benefit, like letter and number recognition.

6 Through 8 Years

Children 6 through 8 years of age are very interested in all types of games. They enjoy playing traditional card games, board, and floor and table games. They have the cognitive ability to understand game technique and strategy, especially as they approach the latter end of this age range. They have a great desire to play games because games are social. Some children are very competitive and enjoy competing with others. They can anticipate moves and focus on more than one rule at the same time. They can remember a number of moves and can use reading as part of the activity. In addition, light and sound pattern pads are usable by children at this age, because they have the cognitive skills to follow a pattern for multiple steps in sequence. When given a light and sound pattern pad, children at younger ages are unable to wait for the prompts, and they keep pressing the buttons without regard to the pattern. They can use traditional cards and dominoes, and they can use reading and language as part of the game; however, they do not have the ability to read and interpret the directions to the game without help. Children at this age can make the fine motor movements needed to navigate labyrinth or maze games (including 3-D maze balls) that require maneuvering a marble along a track or pathway to conquer obstacles. In addition, they can strategize cognitively to figure out how to get the ball through the maze most efficiently.

Parents often buy children in this group nostalgic or traditional games—that is, games that have been around since their childhood. Children enjoy games based on popular licensed television characters or cartoons. They are beginning to have an interest in simple fantasy, adventure-type games that do not require extensive memory of detail. They also have the gross motor skills required to participate in balancing and body movement activity games.

9 Through 12 Years

Nine- through 12-year-olds are very interested in all types of games, especially those that can be played with peers. They can use abstract concepts and content area knowledge in playing games.

Complex games of strategy are popular with this age group, and they have an extended attention span, so they can play games that do not end in a single sitting. They have developed sufficient fine motor coordination for complex labyrinth or maze games that require the careful shooting or aiming of markers or marbles. Children at this age can make the fine motor movements needed to navigate intricate 3-D maze balls that require maneuvering a marble along a narrow track to conquer a large number of obstacles, as well as strategize how to get the marble through the maze most efficiently. They are interested in educational topics and games like trivia games. Children 9 through 12 years old are very interested in collecting, especially cards based on popular cartoons or other licensed characters, music and fashion figures from popular culture. Games that combine this age group's interest in collecting and gaming are very popular. Children in this age group also become interested in themes; so fantasy and adventure games are appealing. They are also beginning to show more interest in adult topics, like war, fashion, popular music, and movies.

GAME & ACTIVITY PLAY: **CARD, FLOOR, BOARD, & TABLE GAMES**

Product Characteristics	2 Years	3 Years
Size of Parts	Parts are large enough to handle easily	Parts are large enough to handle easily
Shape of Parts		
Number of Parts		
Interlocking/Loose Parts		
Materials		Sturdy pieces
Motor Skills Required*	Can manage magnetic fishing-rod games Can press a lever and flip a marker into a hole	Difficulty holding cards
Color/Contrast	Bright, primary colors	
Cause & Effect		
Sensory Elements		Games can have sound elements, like music or beeping
Level of Realism/Detail		
Licensed theme		Enjoy popular cartoon characters
Classic		Parents like to buy classic or nostalgic games
Robotic/Smart Features		

Educational*	Parents like games that teach simple concepts, such as colors, shapes, & pictures	Parents like educational games like letter & number-recognition games
Relevant Play/Behavior*	Will play alone in exploratory ways, or can play with one other person Can match simple colors, shapes, & pictures Vocabulary allows for naming pictures Lacks the cognitive skills & attention span necessary to participate in true game play with rules or turn-taking	Little understanding of games & strategies Unaware of other players Can only use simple ABCs & numbers in games
Examples of Products	Simple matching or lotto-type games Giant picture dominoes Simple action games Magnetic fishing games	Matching games Matching dominoes with pictures rather than dots Games based completely on chance Activity games that include physical movement, dance, or drawing Simple board games that use spinners or cards

* One of the most influential characteristics for these products.

GAME & ACTIVITY PLAY: **CARD, FLOOR, BOARD, & TABLE GAMES**

Product Characteristics	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials			
Motor Skills Required*	Can hold 4 cards or less Can move small pieces	Can hold a hand of cards	----------→ Good eye-hand coordination Speedy responses
Color/Contrast			
Cause & Effect			
Sensory Elements	Games can have sound elements, like music or beeping (cont'd)	----------→	Popular music
Level of Realism/Detail			
Licensed theme	Interested in popular cartoon & action characters	Interested in action characters & sports figures	----------→
Classic*	Parents like to buy classic or nostalgic games (cont'd)	----------→	----------→
Robotic/Smart Features			

Educational*	Parents like educational games like reading & mathematics games	Interested in learning games like science & nature games Interested in collecting games	Interested in adult topics, trivia & historical games ----------→
Relevant Play/Behavior*	Some interest in games Unaware of other players, cannot block other players Short attention span, can play no more than about 30 minutes Can use words on games but cannot read directions Can manage games involving balancing objects	Very interested in games Can use simple strategies, aware of other player moves because better at perspective taking Games usually last an hour or less Have difficulty reading directions but can follow complex rules Enjoy social nature of games	Interested in adult topics like war, dating & fashion Can use complex strategies Can use academic content area knowledge in games Interested in collecting Can play games over several days Can read & interpret directions Enjoy social nature of games
Examples of Products	Memory or matching games Number & letter recognition games Games based completely on chance (cont'd) Activity games like dancing or drawing Pick-up-sticks Simple board games that use spinners or cards (cont'd) Dominoes with dots Simple card games like Old Maid Handheld games filled with water with a large button with the goal of launching small balls into baskets	Traditional card games Card games that involve counting & sorting cards Chess, Checkers, Backgammon, Chinese checkers Strategy games Activity games Simple word games Dice games Collector card games Fantasy adventure games Memory games that require adherence to actions and patterns	Interactive games Simulation games Sports games Abstract & academic content area games ----------→ Trivia games ----------→ ----------→ Labyrinth games and 3 D mazes

* One of the most influential characteristics for these products.

SPORTS, RECREATIONAL, & OUTDOOR PLAY

Children enjoy sports and recreational play because it is social in nature and often pursued outdoors. Children around the age of 12 months begin to enjoy recreational play, including ride-on toys. As children enter the preschool and elementary years, they become more interested in organized activities like sports. Parents frequently encourage sports and recreational play and enjoy participating with children in these activities.

Ride-On Toys (p. 171)

- Bicycles
- Motorized vehicles
- Rocking horses
- Scooters
- Skateboards
- Tricycles

Recreational Equipment (p. 181)

- Aerobic dance materials
- Air guns
- Ball guns
- Ball pits
- BB guns
- Beach balls
- Climbers
- Cork guns
- Creative movement equipment (bean bags, hoops, umbrellas, ribbons)
- Dart guns
- Diving toys
- Floor launchers
- Flying disks
- Goggles & flippers
- Gymnastics equipment
- Helicopter type projectiles
- Hiking equipment
- Horseshoes
- Ice skates
- Inflated bouncers
- Inline skates
- Jump ropes
- Marbles
- Mechanical swings
- Overhead equipment
- Parachutes
- Photography equipment
- Playground equipment
- Pools
- Projectiles from action figures
- Propelled rockets
- Rafts and boats
- Roller skates
- Scarves
- See-saws (teeter-totters)
- Skis
- Sleds
- Slides
-
- Snorkels
- Sprinklers
- Swings
- Table hockey
- Table tennis equipment
- Toboggans
- Trampolines
- Tunnels
- Weightlifting equipment
- Yoyos

Sports Equipment (p. 197)

- Bats, clubs, and mitts
- Bowling games
- Croquet sets
- Nets and goals
- Racquets
- Replica sports equipment
- Sports balls

RIDE-ON TOYS

Ride-on toys allow a child to propel him or herself, either under his or her own power or through the use of an electric or gasoline motor. Ride-on toys are very popular with children, who enjoy both the sense of movement that they get from wheeled toys and the pretend element that wheeled toys give them as they imitate the important adults in their lives. Ride-on toys are important for developing a sense of balance, physical fitness, and coordination. The ride-on toys covered under this category include sit-on riders, motorized vehicles, bicycles, skateboards, scooters and tricycles, and rocker toys.

Several physical factors determine the age level for using ride-on toys. The first factor is balance. Depending on the vehicle, more or less balance is required to use the vehicle. In general, wide-spaced wheels and more wheels make the vehicle easier to balance. The second factor is the rotational speed of the wheels. Wheels that turn very easily can move faster, and speed of movement increases the difficulty level. The final factor is the method of propulsion. A wheeled vehicle that relies on children pushing with their feet will move slowest, while wheeled vehicles propelled by pedaling, or that use gears can attain greater speeds. Motorized vehicles can be set at different speeds, with increased speed requiring greater physical skill. Children under the age of 1 year cannot use ride-on toys because they require a sense of balance to operate. The balance that is required to use a ride-on toy usually develops when a child begins to walk with some steadiness. In general, ride-on toys are not recommended for use without proper protective gear, especially helmets.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of ride-on toys:

- Size of Parts (or of toy itself)
- Motor Skills Required
- Licensed theme
- Level of Realism/Detail

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics

of these toys and the characteristics of children in various age groups. This includes a description of what types of ride-on toys are appropriate and how a particular age group plays with these toys.

12 Through 18 Months

Children become capable of using ride-on toys that are straddled and propelled by their feet only after they learn to walk with some steadiness. Children in this age group, especially the youngest in this age group, may not be able to alternate their feet when pushing ride-on toys. They cannot yet pedal, and instead, they will propel the ride-on toy by pushing with both feet simultaneously. For safety reasons, ride-on toys must be stable, and vehicles with four or more wheels tend to be more stable than three- or two-wheeled vehicles. For this age group, appropriate ride-on toys have wheels that are spaced relatively wide apart to be stable, but not so wide apart that it is difficult for children to swing their legs over the seat. The toy should be low for easy mounting and dismounting, and the children's feet should be flat on the floor when they are seated.

For maneuverability, recessed wheels make it easier for the child to push herself or himself along without banging their feet or legs into the wheels. Castors or wheels are appropriate. For the youngest children in this age group, castors may be preferable, because they allow the toy to move in any direction without tipping. A child's first ride-on toys does not need to have steering mechanisms because young children may not be able to use them effectively. Simple rocking horses may be introduced. Suitable rocking horses are small and mounted and dismounted easily to reduce the risk of falling. Children's feet should touch the floor or the base of the horse when they are seated, and the horse should have a confined rocking arc.

19 Through 23 Months

Children 19 through 23 months old can operate ride-on toys in which they sit inside and propel the toy by pushing with their feet. However, these are more difficult to use than the straddle ride-on toys because they are harder to steer and maneuver. Features that make ride-on toys more attractive to children include bright colors, special sound effects, like beeping horns, or noises produced by vehicle movement, and that come with covered compartments or storage bins.

Children at this age are interested in cause-and-effect actions that produce sounds or reveal hidden items. Children in this age group are also interested in carrying and collecting items that they can put in storage bins or compartments. Wagons are appropriate. Suitable rocking horses are small and easily mounted to reduce the risk of falling. Children's feet should touch the floor or the base of the horse when they are seated, and the horse should have a confined rocking arc. Features that make rocking horses popular include their realistic or nostalgic (like those popular for previous generations of children) appearance, and their ability to make sounds. With adult supervision, some children may be capable of making a slow-moving motorized vehicle stop and go; but children in this age group are unlikely to have the steering skills needed to avoid obstacles and hazards.

2 Years

Children 2 years old enjoy the same characteristics and features of ride-on toys as younger children. Pretend play begins to appear around this age, so vehicles that are realistic, like pretend fire engines, are popular. Parents are also interested in encouraging pretend play and are very likely to buy realistic-looking vehicles for this age group. Children of this age group have increased coordination and balance, so they can maneuver a ride-on toy that requires them to bounce up and down in the seat. Slow-moving, three-wheeled scooters with wide standing platforms also become attractive to children in this age group. They are learning to pedal, and some children may start using tricycles with pedals—especially during the latter half of this age group. However, they have not mastered this skill yet. Battery-operated vehicles appeal to parents and children for this age group. Although children in this age group are physically capable of steering vehicles of this type, most 2-year-olds lack the steering skills needed to control slow-moving motorized vehicles and to avoid hazards.

3 Years

Children at age 3 have developed the ability to pedal, and have the coordination required to use a steering wheel or handlebar. They can use three-wheeled scooters, but they have not developed the balance required to operate two-wheeled scooters and bicycles. Children in this age group enjoy tricycles and four-wheeled vehicles propelled by pedaling. Tricycles should be sized to the

child, and 12- or 13-inch wheels are about the right size for children in this age group. They can use a small bicycle with training wheels, but foot brakes are preferred because children in this age group cannot yet use hand brakes. Children at age 3 can steer a slow-moving, battery-operated vehicle.

4 Through 5 Years

Children 4 and 5 years old are interested in vehicles used by older peers. They have little interest in the types of ride-on toys that are commonly used by younger children, and prefer the bicycles and scooters used by older peers. They begin to show an interest in skateboards. They can use battery-operated vehicles, and depending on experience, most children by the age of 5 have the balance and coordination to use two-wheeled scooters and bicycles without training wheels. However, children in this age group do not understand the risks of riding in areas with cars, and are at a very high risk of falling and injuring themselves. Therefore, adult supervision is a must, and protective equipment like helmets, knee, and elbow pads should be used for these activities.

6 Through 8 Years

Most children by the age of 6 have the physical ability to ride a bicycle without training wheels. They also have developed some understanding of the consequences of riding in areas shared by cars and pedestrians. Six-year-olds have developed the coordination to use hand brakes, and appropriately sized bicycles allow them to stand and straddle the bicycle with both feet on the ground. Children of this age group are very interested in popular wheeled vehicles like scooters and skateboards, and can operate slow-moving motorized vehicles, particularly those with four wheels.

9 Through 12 Years

Children 9 through 12 years old are very capable bicycle and scooter riders, and they can use bicycles with hand gears for different speeds. Bicycles and skateboards that are from licensed brand names, or used by popular extreme sports riders, are popular with this age group. They are usually fairly aware of traffic laws, but they are very likely to engage in high-risk behaviors like riding in traffic and stunt riding. Generally, 9- through 12-year-old children can operate a

motorized wheeled vehicle that does not exceed 10 miles per hour and has gear shifting. Faster-moving motorized bicycles and scooters are generally not appropriate even for 12-year-olds because of difficulty associated with both balancing and steering the vehicle while moving.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **RIDE-ON TOYS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Not too large for child's size Of a size that is easy to mount Narrow enough to not hinder leg movement & wide enough for comfortable seating. Child can touch ground with both feet when seated	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→
Shape of Parts	Smooth edges	----------→	----------→
Number of Parts			
Interlocking/Loose Parts			
Materials	Plastic, solid wood	----------→	----------→
Motor Skills Required*	Uses both feet together Unable to steer	Begins to alternate feet Unable to steer effectively Can pull a wagon	Can bounce up & down on seat Able to steer Learning to pedal
Color/Contrast	Bright colors	----------→	----------→
Cause & Effect	Like vehicles that make sounds when moved or when pushed Like containers with doors for holding objects	----------→ ----------→	----------→ ----------→
Sensory Elements	Like vehicles with beeping horns or that make clicking noises	----------→	----------→

Level of Realism/Detail*	Not interested in realistic vehicles	----------→	Beginning interest in realistic vehicles
Licensed theme*	Not interested in licensed characters	----------→	----------→
Classic			Parents like classic vehicles
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Enjoy ride-on toys Like vehicles with doors, compartments for carrying toys	----------→ ----------→	Beginning dramatic play Interested in animals
Examples of Products	Non-pedal ride on toys Simple, low rocking horses	----------→ Rocking horses Wagons	----------→ ----------→ ----------→ Slow-moving 3-wheeled scooters with large standing platforms Appropriately sized tricycles with pedals

* One of the most influential characteristics for these products.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **RIDE-ON TOYS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Tricycle is sized to child 12” to 13” wheels about right size for this age group	----------→	Child can touch ground with both feet	Adult-size bicycles
Shape of Parts				
Number of Parts				
Interlocking/Loose Parts				
Materials				
Motor Skills Required*	Able to pedal	Able to use foot brakes Able to stand on & use scooters & skateboards by 5	Able to use hand brakes Able to stand on & use scooters & skateboards	Able to shift gears & use hand brakes Able to use stunt type skateboards, scooters, & bicycles
Color/Contrast				
Cause & Effect	Less interest in vehicles with compartments			
Sensory Elements				
Level of Realism/Detail*	Like realistic-looking vehicles like fire engines, tractors, & motorcycles	----------→	Less interested in realistic-looking vehicles	
Licensed theme*	Like wheeled toys with popular cartoon characters	Like wheeled toys with popular cartoons & action figures	Like wheeled toys with popular action figures	Like bicycles & skateboards that have licenses from popular athletes, companies

Classic	Parents like classic vehicles and wagons	----------→	Less interest in classic vehicles	
Robotic/Smart Features				
Educational				
Relevant Play/Behavior	Able to pedal Able to steer slow moving battery-operated vehicles	Able to balance on bicycle with training wheels Can use skateboards & 2-wheeled scooters by 5, but may not use this type of vehicle safely Able to operate a motorized vehicle	Usually able to balance on 2 wheels Generally have the balance required to operate skateboards & scooters ----------→	Enjoy bicycling for fitness Interested in stunt riding of skateboards, bicycles, & scooters ----------→ Motorized scooters & bicycles require cognitive skills & motor skills that usually develop after age 12
Examples of Products	Wagons Tricycles (including low-slung versions) Slow moving battery-operated vehicles Rocking horses Slow-moving 3-wheeled scooters	----------→ ----------→ 3-wheeled scooters 2-wheeled scooters by age 5 Skateboards by age 5 Bicycles with training wheels	Bicycles with hand brakes ----------→ ----------→ Motorized 4-wheel vehicles	Bicycles with gears Stunt bicycles Go carts ----------→ ----------→ Motorized bicycles and scooters at age 12+ Motorized vehicles with gears at age 12+

* One of the most influential characteristics for these products.

RECREATIONAL EQUIPMENT

Recreational equipment differs from sports equipment in that recreational equipment generally is not associated with competitive activities. Rather, recreational equipment is used for leisure activities. The main areas covered under recreational equipment include playground equipment, water play equipment, winter sports equipment, creative movement equipment and small equipment leisure games, like beach balls, marbles, horseshoes, and flying disks. Other equipment that falls under this subcategory includes skates, projectile toys, backyard play equipment, and gear for adult-play activities. Recreational activities are popular for adults and children. Adults and children enjoy participating in many of the same recreational activities to spend time together and keep fit. Due to the wide variety of equipment under this category, a number of cognitive and physical skills are required to use recreational equipment. Therefore, except for tot swings and soft play equipment, this equipment is inappropriate for children under 2 years of age. For younger children, please see the *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives*. For safety guidelines and more information on playground equipment, please refer to CPSC's *Handbook for Public Playground Safety*.[15]

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of recreational equipment:

- Classic
- Motor Skills Required
- Size of Parts

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a description of what types of recreational equipment are appropriate and how a particular age group plays with such equipment.

[15] Available at https://www.cpsc.gov/s3fs-public/325.pdf.

Birth Through 3 Months

Children at this age enjoy the movement associated with slow-moving mechanical swings, but cannot sit upright and generally remain lying on their backs. Therefore, appropriate swings must completely support the child.

4 Through 7 Months

Children at this age can generally sit supported and enjoy the movement associated with slow-moving mechanical swings. By 6 or 7 months, children begin to sit unsupported and enjoy being pushed in a swing. Appropriate swings for this age group entirely support the child.

8 Through 11 Months

Children usually begin to crawl and walk at this age. They begin to climb, and they enjoy soft play climbers like pads and ramps. Very short tunnels (2 feet or less) with mirrors or viewing panels (top or side) that allow for eye contact with a caregiver may facilitate crawling in some children. Children of this age enjoy bouncing activities and swinging. Appropriate swings for this age group entirely support the child. Appropriate equipment does not have protrusions and is washable because children in this age group frequently mouth objects.

12 Through 18 Months

Children ages 12 through 18 months are gaining confidence as climbers and walkers, and most children in this age group have learned to walk. Children in this age group can climb heights, but they lack an awareness of the consequences of falling. Soft play equipment is very enjoyable for children of this age, including very short slides and small tunnels (3.5 feet or less), ramps, and ball pits. Children may need adult assistance using slides at first, because some children may need to be taught how to enter the slide from the correct direction and slide down. Children may not yet have the cognitive skills to realize that a slide is not meant for use as a ramp for crawling up. Children of this age enjoy bouncing, throwing, and chasing after balls. Lightweight balls are best for children with limited gross motor skills at this age. However, large balls are necessary because most children will grasp and catch with both hands. At this age, children especially delight in balls that light up or make noise when bounced. These balls should be light-to-medium

in weight and easy to throw (*i.e.*, have a raised, textured surface, *e.g.*, spiky balls) given children's limited strength at this age. They should also be made of a soft material, such as rubber, because children at this age lack the inhibition to refrain from throwing the ball at people or fragile objects.

19 Through 23 Months

Children now begin to walk and climb with confidence. However, they do not understand cause-and-effect and lack an awareness of the consequences of falling. Children at this age enjoy tot swings and can sit without support, but they should be entirely enclosed by the swing. Soft play equipment such as tunnels and ramps continues to be popular. Children in this age group also are interested in balls that make a sound when shaken, squeezed or thrown. Their ability to kick and throw is improved, so balls should be soft and light-to-medium-weight.

2 Years

By 2 years of age, children are interested in some types of outdoor playground equipment. Most 2-year-olds can climb steps and short ladders, and may get themselves to the top of a climbing structure only to find that they cannot get back down. They enjoy sliding and swinging, and they are increasingly interested in crawling through medium-length tunnels (6 feet or less). Appropriate swings for this age group entirely support the child. Appropriate playground equipment has rounded edges and is free of protrusions. Loose ropes and straps can form a noose around the child's neck, and therefore, present a risk of strangulation. Around 2 years of age, children start to take an interest in creative movement activities. They enjoy moving to music, repeating song lyrics, and participating in finger games. Materials for creative movement at this age are generally limited to parachutes, played under adult supervision, in which children pull the parachute back and forth and up and down to create waves and sounds. As they near 3 years of age, children in this age group are developing the necessary balance and cognitive abilities to stand on and use skates. However, they will find skates difficult to use, unless the wheels can lock, roll in only one direction, or limit movement to keep them from sliding out from under the child. Customarily, water sports activities are not appropriate because children of this age usually cannot swim and are at a very high risk of drowning.

3 Years

Children by 3 years of age enjoy most types of playground equipment, including open swings, slides, and climbers. Children at this age also are interested in inflatable bouncers. Backyard playground equipment may involve swings, slides, climbers, and overhead equipment. By the age of 3, children have developed the balance and cognitive abilities to use skates more effectively, although limited wheel movement is still important for most children. Children at this age are interested in creative movement and can use materials like beach balls, scarves, ribbons, parachutes, and plastic hoops in their creative movement. Children also enjoy climbing through long (9 feet or less) enclosed tunnels at this age; at younger ages, they may feel too scared or intimidated to crawl through. Although 3-year-olds enjoy being in the water with adult supervision, water sports can be very risky at this age, because children this age usually cannot swim. Sprinklers and water play are popular with this age group.

4 Through 5 Years

By the age of 4, children generally have the balance to use four-wheeled, non-inline skates. Playground equipment for 4- and 5-year-olds may contain overhead ladders and fire poles, slides, climbers, and swings. They can pump a swing, climb a rope ladder, and climb up an inclined board. They also begin to become interested in acrobatics. Children usually learn to swim around age 4 or 5, depending on their experience with water; however, they require constant supervision. Children at this age continue to enjoy sprinklers and other water-play toys. They can use rafts and other support devices for the water. Children in this age group can use water guns, but suitable ones are small and low powered because children of this age may be unaware of the consequences of using water as a projectile. Children by the age of 4 begin to show an interest in small equipment for recreational purposes. They have sufficient fine- and gross motor skills to include materials like beanbags and umbrellas in their creative movement activities. Children enjoy free and creative movement activities with these materials. Four-year-olds can use marbles, flying disks, and throw soft plastic horseshoes and bean bags towards targets.

Many children at the start of this age group are attracted to winter sports like skiing, ice skating and sledding. These can be hazardous due to the speed created on ice and snow. Therefore,

children should wear proper protection when participating in these activities. Children of this age are interested in projectile toys, but they have immature judgment and do not have the cognitive understanding of consequences. Consequently, they may do dangerous things with projectiles or other equipment. Soft and very lightweight projectiles, including those on action figures and that do not fly more than 12 inches, are appropriate for this age.

Balls are enjoyed by all ages; however, small balls, especially hard ones, are not appropriate for young children because of the high likelihood that children this age mouth small objects. High-bounce balls rebound forcefully and travel at speeds generally too fast for children under 5 years of age. They are not usually considered appropriate for children under 5 because this age group overzealously throws them, and unable to anticipate the ball's careening trajectories, endanger themselves, bystanders, and property.

6 Through 8 Years

Children ages 6 through 8 are accomplished players on playground equipment. They can use flexible climbers, ring treks, and other complicated apparatus. They enjoy climbing, swinging, and chasing on playgrounds. However, children this age may use playground equipment in unexpected ways. By the age of 6, children generally have the balance to stand using in-line skates. Children 6 through 8 years old can begin using trampolines; however, trampoline use can be hazardous without experience and adult supervision. Children have the ability to throw a flying disk by the age of 6. At this age, children are starting to jump rope, and this interest increases as they gain skill with this activity. Children in this age group are developing independence as swimmers, and sometimes participate in organized swimming and water sports activities. They enjoy diving for objects in the water and can use goggles, snorkels, and flippers. By this age, children can handle larger and more powerful water guns.

Six- through 8-year-olds continue to use small equipment for recreational activities. Children in this age group begin to lose interest in creative movement activities as they take more interest in organized movement activities like dance and gymnastics. Photography is popular with this age group as they take an interest in photography equipment. They enjoy multiplayer activities, such as bowling, horseshoes, and bean bag games, where they can employ specific strategies to win.

Children in this age group enjoy throwing bean bags toward pockets with assigned shapes or high point values, as well as keeping track of points. They are very interested in winter sports, like skiing and skating. Most children are capable of learning to ski, ice skate, and sled with exposure to training. Children in this age group are also interested in projectile toys. They have a greater understanding of the consequences of projectiles, but do not have the physical control needed to expel high-speed projectiles. They can use soft or lightweight projectiles, like table tennis balls, soft darts, and foam projectiles, and they can also use helicopter-type projectiles. These children can manage projectile toys that fly farther and at a faster speed. Air-propelled floor launchers with soft foam projectiles that are activated when a child steps on a pumping pad are appropriate for this age group. Children in this age group are starting to play table-based games, such as ping pong, foosball, and various forms of hockey (air- and lever-based). They have the fine motor skills needed to align figurines with a puck using levers (including coordinated pushing and twisting actions), if the table is set to an appropriate height for them.

9 Through 12 Years

Children in this age group are very accomplished on playground equipment, but often use the equipment in unintended ways. They are also outgrowing playground equipment and moving on to more organized sports. They start to become interested in athletics for their own sake. Children in this age group begin to take an interest in weightlifting equipment, as well as aerobic exercise and dance. Depending on experience, they can be accomplished skaters and frequently take risks when using skates. Children in this age group can use all types of in-line skates. They are strong swimmers, if they have had appropriate training in water sports. They can participate in water sports and activities like water polo.

Children at this age are interested in small equipment for recreational purposes. They enjoy traditional games like horseshoes and can be proficient with adult-sized equipment. They are also interested in more adult-like activities, such as collecting, hiking, nature studies, and photographic equipment. Nine- through 12-year-olds are very interested in winter sports. Depending on experience, many children can ski, ice skate, and sled. Children in this age group are developing some understanding of projectiles. They can use air-propelled projectiles like

rockets, cork guns, and small plastic disks. Products like BB guns, which fire penetrating projectiles, are inappropriate for children in this age group.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **RECREATIONAL EQUIPMENT**

Product Characteristics	**Birth Through 3 Months**	**4 Through 7 Months**	**8 Through 11 Months**
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials			Soft vinyl
Motor Skills Required*	Cannot sit unsupported	Infant sits unsupported	Begins walking & climbing
Color/Contrast	Bright colors	----------→	----------→
Cause & Effect			
Sensory Elements	Enjoy rocking motion of swings	----------→	----------→ Enjoy different textures & soft materials
Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			

Relevant Play/Behavior	Do not have the motor skills required to actively use recreational equipment	Crawling, sitting up Enjoys movement	Beginning to walk and climb Little fear of heights; at risk of falling Mouth objects, all equipment should be washable Interested in exploring environment
Examples of Products	Mechanical swings that completely support the child	Mechanical swings	----------→ Soft play ramps & pads Large soft balls like beach balls Ball pits and small tunnels (2 feet or less)

* One of the most influential characteristics for these products.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **RECREATIONAL EQUIPMENT**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials	Vinyl & plastic for equipment, rubber	----------→	----------→
Motor Skills Required*	Throwing, chasing & kicking soft balls Walking & climbing for playground equipment	----------→ ----------→	----------→ ----------→ Able to stand on skates as they approach 3 years of age
Color/Contrast	Bright colors		
Cause & Effect			
Sensory Elements			
Level of Realism/Detail	Equipment can be abstract	Beginning to show interest in realistic playground equipment	Interest in playground equipment, which promotes pretend play May find skates difficult to use unless wheels lock or have limited movement
Licensed theme			
Classic			

Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Walking & climbing Exploring environment Mouths objects; all equipment should be washable Little fear of heights; at risk of falling	----------→ ----------→ ----------→ ----------→ Interested in water; great risk of drowning	----------→ ----------→ ----------→ ----------→ ----------→ Interested in group movement activities
Examples of Products	Soft play climbers Slides with rails Tot swings Large soft balls like beach balls Ball pits Playground balls Short tunnels (3.5 feet or less)	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ Parachutes Wading pools (with adult supervision) Skates with locking or limited-movement wheels (near 3 years) ----------→

* One of the most influential characteristics for these products.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **RECREATIONAL EQUIPMENT**

Product Characteristics	3 Years	4 Through 5 Years
Size of Parts*	Child-size equipment	----------→
Shape of Parts		
Number of Parts		
Interlocking/Loose Parts		
Materials	Wood & metal	----------→
Motor Skills Required*	Able to throw & catch with both hands Able to use skates with limited wheel movement Able to climb & swing unsupported	Beginning to learn to swim Beginning to be able to skate & ski Able to use overhead equipment & fire poles
Color/Contrast		
Cause & Effect		
Sensory Elements		
Level of Realism/Detail	Interested in realistic-looking playground equipment	Less interest in realistic-looking playground equipment
Licensed theme		Interested in licensed theme of cartoon characters
Classic*		Parents introduce winter sports activities
Robotic/Smart Features		
Educational		
Relevant Play/Behavior	Little understanding of rules & strategies Interested in free movement activities rather than organized sports Interested in water play	Increasing confidence in the water; learning to swim Interest in winter sports

Examples of Products	Pools (with adult supervision) Sprinklers Low-movement roller skates (not inline skates) Inflatable bouncers Playground equipment like climbers, slides, & unsupported swings Creative movement materials, hoops, scarves, beach balls, ribbons, parachutes, flying disks Sleds Long tunnels (9 feet or less)	----------→ Low-movement roller skates and double runner ice skates Playground equipment including overhead equipment and fire poles Creative movement materials, bean bags, umbrellas Small-size ski equipment Sleds: disks, toboggans, plastic sheets Soft, very lightweight projectiles that fly less than 12 inches Marbles Soft horseshoes Flying disks

* One of the most influential characteristics for these products.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **RECREATIONAL EQUIPMENT**

Product Characteristics	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Begin to be able to use adult-size equipment	Adult-size equipment
Shape of Parts		
Number of Parts		
Interlocking/Loose Parts		
Materials	Wood & metal (cont'd)	----------→
Motor Skills Required*	Able to swim Able to skate & ski Able to use gymnastics equipment like rings & trampolines	Strong swimmer Strong skills for winter sports Able to use all gymnastic equipment
Color/Contrast		
Cause & Effect		
Sensory Elements		
Level of Realism/Detail		
Licensed theme	Interested in licensed theme of professional athletes	----------→
Classic*	Interested in traditional activities like horseshoes & marbles	----------→
Robotic/Smart Features		
Educational		
Relevant Play/Behavior	Usually able to swim Do not have the cognitive understanding to understand high speed projectiles	Take risks on skates, bicycles, & playground equipment Developing understanding of consequences of projectiles; mature understanding for some projectiles will not develop until after age 12 Interested in fitness & fitness equipment Interested in organized recreational activities

Examples of Products	Water play equipment, diving equipment, flippers, goggles, snorkels	Air propelled rockets, & other projectiles
	Roller skates, inline skates	Kites
		Hiking equipment
	Gymnastics equipment, rings, trampolines	Weightlifting equipment
		Aerobic & dance activities
	Sleds with steering mechanisms, hand brakes, toboggans, skis, single runner skates	
	Water guns	
	Soft, lightweight projectiles like table tennis balls, soft darts, & soft foam projectiles; also helicopter-type projectiles	Cork guns and other guns that shoot smaller projectiles, high pressure water guns
	Air powered floor launchers with soft projectiles activated when child steps on a pumping pad	Darts, BB guns, Air guns at 12+
		Combustion type rockets for ages 12+
	Table sports with levers or pushers to manipulate puck	
	Bean bag games that involve aiming for targets (shape, or point value pockets)	
	Cameras	
	Jump ropes	
	Marbles (cont'd)	
	Horseshoes	
	Flying disks (cont'd)	

* One of the most influential characteristics for these products.

SPORTS EQUIPMENT

Children, especially those between 6 and 12 years of age, enjoy playing games and sports. Sports encourage movement and combine the elements of strategy and physical skills. They also provide opportunities for children to show their skills and to test their ability as they confront others in game play. This category includes equipment for traditional sports like football, baseball, basketball, racquet sports, golf, hockey, soccer, and net sports. Most of these sports have long historical, cultural, and traditional foundations, which add to their appeal as parents teach sports to their children that they played themselves. Active sports and games also frequently have professional athletes that children can watch and emulate.

Sports generally require specialized equipment and a place to play. Sports can require specialized physical skills, like swinging a bat at a ball, and generalized skills like moving through space without running into other players. Before children can fully take part in organized activities like sports, they must understand the rules. However, children enjoy interacting with sports equipment to develop their physical skills before they understand the rules needed to participate in an organized sport, and children use specialized equipment starting at 12 months. The cognitive ability to play sports effectively usually develops around age 6. Children in this age group have an interest in playing games with rules and have the cognitive ability to strategize about games. Balls for exploratory play that are also associated with active sports and games are also included in *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives* and *Sports, Recreational, & Outdoor Play: Recreational Equipment*.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of sports equipment:

- Classic
- Size of Parts
- Licensed theme
- Motor Skills Required

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics

of these products and the characteristics of children in various age groups. This includes a description of what types of sports equipment are appropriate and how a particular age group plays with such equipment.

12 Through 18 Months

Although gross motor skills are still rudimentary at this age, specialized sporting equipment can be appealing for children in this age group. Replica toys with sporting features that come with easy-to-hold balls can teach children new skills. At this age, children may be introduced to small combination sport centers (*e.g.*, a basketball hoop soccer net with climber). These children are learning to place balls into hoops or nets.

19 Through 23 Months

Children's interests and abilities are similar to those at 12-18 months, but they need equipment that is bigger to accommodate their growth. Stand-alone basketball hoops with adjustable heights and come with soft balls are appropriate. Due to improvements in gross motor skills, these children are better able to place balls into hoops or nets from a standing or moving position.

2 Years

Two-year-old children are developing the gross motor skills that are used in games and sports. These include running, climbing, and balancing. Children can grasp, kick, and throw a ball. They are also interested in balls that make a sound when shaken, squeezed, or thrown. Two-year-old children are still learning cause-and-effect relationships and have very uncertain control of their movements. Therefore, sports equipment for this age tends to be soft. Parents may be interested in purchasing replica sports equipment for children of this age. Examples include lightweight bowling sets (cloth or plastic), which are especially appealing because throwing a ball and seeing objects fall down is exciting for this age group. At younger ages, children may try to knock over the pins using their hands or feet instead of coordinating with a ball. As their coordination and gross motor skills develop, these children are starting to throw or kick a ball towards a target such as a basketball hoop or soccer net.

3 Years

Children at the age of 3 begin to take a more active interest in sports skills. They begin to develop fundamental motor skills like kicking, striking, throwing, catching, collecting, carrying, and dribbling. They can now put a ball in a basket or target from 4 to 5 feet away. Most 3-year-olds can participate in collective games that have few rules. Children in this age group begin to show interest in a variety of throw-and-catch activities. At this age, children can use pad mitts with hook-and-loop fasteners that can “catch” a ball with a similar hook-and-loop surface, because they finally have the coordination needed to align a mitt with a ball that is coming their way. They enjoy free movement and non-directive activities. Squishy yoyos with a bouncing string mechanism are also mastered at this age. Children at younger ages may use the squishy yoyo and bounce it up and down without putting their finger through the loop due to lack of fine motor skills. They also may not understand the concept of a yoyo, and thus, only use the toy as a ball. Younger children will also be tempted to bite and chew on the yoyo material. Sports equipment for this age includes smaller-sized balls and games, soft balls, bats and clubs, bowling games, and goals or nets.

4 Through 5 Years

Starting at the age of 4, children can participate in organized sports activities like tee ball, kick ball, and soccer. However, they require modified equipment and rules. Children at this age enjoy throwing or kicking to goals, nets, or other targets. Parents frequently begin enrolling children in this age group in youth sports activities. Also popular for parents at this age are child-sized versions of adult equipment, like golf clubs and tennis racquets.

Children at the age of 4 have a limited attention span for organized sports, so rules are often modified to reduce any reliance on strategy. Four-year-olds are egocentric or unaware of the participation of other players. Smaller-sized balls, bats, and gloves are appropriate for this age. Four-year-olds begin to develop the skill of hitting a moving ball with a bat or racquet. Because children in this age group are still developing coordination, soft or padded bats and balls are preferable.

6 Through 8 Years

Six-year-olds are very interested in active sports. They can understand most rules of a game or sport and have the physical skills needed to participate in most sports, including baseball, softball, and football. Children at the age of 6 are developing the strength needed to handle full-size equipment, including basketballs, footballs, and soccer balls. However, smaller-sized equipment is generally preferred over adult-sized equipment. For basketball, the ball tends to be lighter and the nets lower for younger children. Net games like volleyball require more advanced physical skills and are not introduced until age 7 or 8. Children have developed an ability to skate by the age of 6, and so they can participate in games of street or ice hockey. Children in this age group can swing a racquet and hit a moving object, but they require lightweight equipment. Many children at this age are introduced to golf using modified clubs. Other mallet games like croquet are also popular.

9 Through 12 Years

Nine- through 12-year-olds are very interested in organized sports. They have all the physical skills required to participate in active sports and games, and they understand the rules and strategies of these games. Children at this age enjoy training equipment that promotes skills like throwing at targets. They can also handle adult-sized equipment.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **SPORTS EQUIPMENT**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Small size for grasping or large for holding with 2 hands	----------→	----------→
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials	Soft materials, cloth, rubber, foam, plastic	----------→	----------→
Motor Skills Required*	Able to grasp a large ball with 2 hands Able to throw towards a target Able to kick a ball Able to hit a stationary ball with a bat or club	----------→ ----------→ ----------→ ----------→ Able to grasp a small soft ball with 1 hand	----------→ ----------→ ----------→ ----------→ ----------→
Color/Contrast	Bright colors Colors that mimic adult sports equipment	----------→ ----------→	----------→ ----------→
Cause & Effect	Interested in balls that whistle or squeak	----------→	----------→
Sensory Elements	Enjoy balls of different textures	----------→	----------→
Level of Realism/Detail	Replica sports equipment	----------→	----------→
Licensed theme			

Classic*	Parents begin to emphasize classic or traditional sports	----------→	----------→
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Able to throw and kick Fundamental movement phase No understanding of rules or game strategies Little interest in organized activities Prefer free-movement activities	----------→ ----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→ ----------→ Able to catch
Examples of Products	Soft balls Soft, replica sports equipment Targets, nets or goals for throwing Small-size basketball, soccer goals	----------→ ----------→ ----------→ Larger basketball hoops Light up or noisemaking balls when bounced	----------→ ----------→ ----------→ Bowling sets ----------→ Large balls about 10” in diameter Soft bats or clubs

* One of the most influential characteristics for these products.

SPORTS, RECREATIONAL, & OUTDOOR PLAY: **SPORTS EQUIPMENT**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Small size for grasping or large for holding with 2 hands (cont'd)	----------→	Progressing from child-size to adult-size equipment	Able to use adult-size sports equipment
Shape of Parts				
Number of Parts				
Interlocking/Loose Parts				
Materials	Soft cloth, rubber, foam, or plastic (cont'd)	----------→	Leather, hard balls & bats, wood, metal	----------→
Motor Skills Required*	Can kick a ball hard Can catch a large ball Can throw a ball about 10 ft	Able to bounce a ball Can hit a moving ball with a bat or racquet Strong overhand throw Can kick a moving ball	Greater ease and control of bodily movement Able to catch a small ball Can bounce ball effectively Can play racquet and club sports	Developing adult like sports skills Can play net games like volleyball
Color/Contrast				
Cause & Effect	Interested in balls that whistle or squeak (cont'd)	Less interest in cause & effect		
Sensory Elements	Enjoy balls of different textures (cont'd)	Less interest in sensory elements		
Level of Realism/Detail			Interested in real sports equipment	----------→
Licensed theme*		Interested in licensed cartoon figures	Interested in licensed sports figures	----------→

Classic*	Parents begin to emphasize classic or traditional sports	----------→	Children begin to be more interested in classic or traditional sports	----------→
Robotic/Smart Features				
Educational				Interested in skill-training equipment
Relevant Play/Behavior	Little understanding of rules	----------→	Growing understanding of rules & strategies	Understanding of complex rules & strategies
		Often enrolled in youth sports like tee ball, junior golf & soccer	Very interested in youth sports	----------→
Examples of Products	Soft balls	----------→	----------→	----------→
	Balls of all shapes & sizes	----------→	Child-size sports balls (Footballs, baseballs, basketballs, soccer balls)	Adult-size sports balls (Footballs, baseballs, basketballs, soccer balls)
	Large balls about 10” in diameter	----------→		
	Replica sports equipment that is soft	----------→		
	Soft bats or clubs	----------→	Child-size racquets, bats, & clubs	Adult-size racquets, bats, & clubs
	Targets, nets, or goals for throwing	----------→		
	Small-size basketball, soccer goals	----------→	Child-size nets & goals	Net or goal game equipment like basketball, volleyballs, badminton, table tennis
	Hook-and-loop pad mitts and compatible balls			
	Squishy yoyos		Croquet equipment Bowling sets	----------→

* One of the most influential characteristics for these products.

MEDIA PLAY

Media Play involves children in the production of art or music through media of all types.

Arts & Crafts (p. 209)

- All scissors
- Balloons
- Blunt-end scissors
- Camera and photography equipment
- Carving, bookbinding, block printing, flower pressing, calligraphy, sketching
- Chalk, chalkboard
- Clay or play dough, molds
- Coloring books
- Crayons, markers, brushes, color pencils
- Crochet, embroidery, knitting, needlepoint, sewing machines
- Easels
- Finger painting
- Glitter, yarn, pom-poms
- Kits (*e.g.*, jewelry, beading, soap, basket, candle, and modeling)
- Large beads on shoelace string
- Large size art or construction paper
- Large size or spherical crayons and markers
- Leatherwork and tools
- Magnetic shaving art boards
- Metal working
- Mosaic, ceramic
- Non-toxic tempera paint and large brushes
- Pastels, water colors
- Plaster of Paris and papier-mâché
- Pop beads
- Pre-gummed paper and scissors
- Printing equipment
- Puppetry, doll-making
- Sewing activities and kits, mini looms
- Smaller beads and string
- Stamps and non-toxic ink
- Tools for clay work
- Wood burners, screwdrivers, pliers

Musical Instruments (p. 223)

- Blocks (scraping and tapping), triangles, rhythm sticks, cymbals
- Button activated electronic music makers and instruments
- Drums, electronic drum pads, bongos, tambourines
- Flute, recorder
- Horns, harmonica, whistle
- Musical interactive and smart toys (see also *Educational & Academic Play: Learning Products* and *Technology Play: Smart Toys & Educational Software*)
- Musical mobiles and gyms (see also *Exploratory and Practice Play*)
- Small, light tambourines
- CD/DVDs (see also *Technology Play: Audiovisual Equipment*)
- Ukulele, violin, autoharp
- Wrist, ankle, and handheld bells
- Wrist, ankle, and handheld chimes
- Wrist, ankle, and handheld rattles
- Xylophones, keyboards, pianos, accordions, floor pianos

ARTS & CRAFTS

Arts and crafts are an integral part of children's total development. Nourishing the creative and expressive self is important to instilling self-assurance and enhancing both creative thinking and problem solving. This can be accomplished through activities in which the child can work with different types of artistic media and materials. Arts and crafts are generally not appropriate until about the age of 12 months. Beginning in toddlerhood, many children are given opportunities for free expression through art materials. Crafts play an important part in learning skills that are more work related, such as sewing, knitting, block printing, bookbinding, and doll making.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of arts and crafts:

- Cause & Effect
- Sensory Elements
- Size of Parts
- Color/Contrast

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a description of what types of arts and crafts are appropriate and how a particular age group plays with these media.

8 Through 11 Months

From 8 through 11 months of age, infants become more mobile and their behaviors become more coordinated and outwardly initiated. Because of this increase in physical and cognitive development, infants around this age are beginning to understand simple cause-and-effect relationships. This makes art materials somewhat attractive for children of this age, but only in a functional/exploratory way. These children can grasp large, easy-to-grip crayons and markers and can make marks on a piece of paper. However, these children do not generally draw or

scribble until they reach 1 year old. Since children of this age have a propensity for exploring objects orally, paints are not recommended.

12 Through 18 Months

Children from 12 through 18 months of age are increasingly curious and love to explore, traits that are facilitated by their increasing walking skills. They have increasingly good balance at this age, and may begin making marks on the wall or an easel. They are working on fine motor coordination and can perform many manual functions, including controlled grasping and releasing. They may even exhibit a preference for a dominant hand at close to 18 months of age. They are even exploring the world more expansively through all their senses: seeing, hearing, touching, tasting, and smelling. They are still interacting with the art materials in a functional/exploratory way and have very short attention spans. They scribble either by imitation or spontaneously, and can make circular marks.

Suitable materials are appropriately sized to children's grips, and are lightweight but sturdy. Large easy-to-grip crayons and markers are appropriate for children in this age group, and large sheets of art and construction paper are best. Crayons in the shape of spheres, and markers in the shape of chunky animals, are easy for children to grip at this age. At this age, children's fine motor skills are rudimentary, but they are able to scribble with these chunky writing utensils, instead of playing with crayons and markers as manipulative play objects as they might at younger ages. Children who can remain in a standing position can use easels. Finger painting with washable and non-toxic paint is appropriate at this age. Children can also hold tablets in their lap that have gel or particles inside, and they can make marks or other designs with their finger because this only requires limited fine motor skills.

19 Through 23 Months

Representational and symbolic thinking emerges between 19 and 23 months; however, representational art is only in its infancy, even as they approach 2 years of age. Although their drawings look nonrepresentational and are not recognized as representational by adults, they represent something to children in this age group. By 2 years of age, some can draw simple

angles. The fine motor movements of children in this age group are becoming more skillful. Their behaviors are goal-directed, and they like to experiment. Art, in general, and scribbling, in particular, provides them with a non-verbal means of expression. Furthermore, scribbling assists children in developing muscle control, which is needed for the next stage of development.

Suitable materials are appropriately sized to children's grips, and are lightweight but sturdy. Large easy-to-grip crayons and markers are appropriate for children in this age group, and large sheets of art and construction paper are best. Some children will choose easels for artwork. Because children this age have a propensity for exploring objects orally, paints are not recommended for this age. As they approach 2 years, children can string large beads on shoelace string.

2 Years

Two-year-olds are very interested in representational and symbolic play. Their fine motor movements are becoming more skillful, and their manual dexterity is improving. They also begin to represent through their art at this age. The range of art materials available to them greatly increases because of cognitive and physical developments, although they may still put objects in their mouth. They also love the texture of materials and will use their hands to handle materials whenever possible. They love to finger paint. Use of non-toxic and washable, or mess-free finger paint (*i.e.*, clear gel that activates special paper), is appropriate at this age. Children are beginning to use a chunky stylus to make marks or designs on a tablet with gel or black particles inside. They can make color distinctions, move fingers independently of each other, and may be beginning to cut with blunt-end scissors. They can scribble, draw circular marks, some vertical lines, copy circles, and crosses. Between 24 and 30 months, they can add two parts to a human outline, after which this increases to three parts. The process of creating art is more important to them than the final art product.

As with materials for younger age groups, suitable materials are appropriately sized to children's grips, and are lightweight but sturdy. Large easy-to-grip crayons and markers are appropriate for 2-year-old children, as are soft modeling clay and similar substances. Non-toxic tempera paints and large brushes work well for children in this age group; and large sheets of art and

construction paper are still best for this age. Some children will choose easels for artwork. They can use blunt-end scissors and string large beads, and finger painting is also a popular art activity. Finally, although children at this age are too young to use conventional stickers (they may get put in the mouth and require dexterity to use), children can use pre-gummed sticker pads and attach large, easy-to-grip items to them.

3 Years

Children 3 years of age refer to the symbolic aspects of their art when they talk about their art. They will make the same shapes and scribbles repeatedly, practicing and exploring through art. They are highly attracted by art materials that produce interesting effects and are tactually stimulating. They are less likely to mouth art and craft materials, making scented materials more appropriate. They are learning to handle scissors and glue, and their fine motor control continues to improve. They can add four to five parts to the outline of a person, and can copy circles and squares. They can perceive distinctions in sizes. Some can use pop beads in expected ways.

Suitable materials are appropriately sized to children's grips, and are lightweight but sturdy. Three-year-old children enjoy using large crayons (and may begin transitioning to thinner crayons), markers, and brushes that are easy to grip. Non-toxic tempera and regular or pigmented finger paints are more appropriate for children 3 years of age and above, because children in this age group are less likely to lick or swallow paint. They can use varying sizes and colors of art and construction paper. Children in this age group may be introduced to coloring books with large simple outlines and ample coloring space. However, these children do not have the appropriate fine motor skills to follow an outline, particularly with standard-sized crayons. These children also lack the inhibitory control to keep working on a single picture—they may flip through each page of the book and scribble something on each picture. They can now begin to use clay and similar materials with molds to make shapes; whereas, at younger ages, children may have only used the clay for manipulation, instead of trying to make a specific shape using a mold. Children enjoy working at easels. Now that they are beginning to use round-nosed scissors and non-toxic glue, they can make collages and create scrapbooks. They can use pre-gummed paper pieces, stickers, glitter, yarn pieces, and small pom-poms in their creations. They can also string beads, manipulate (foam) clay, modeling dough, moldable (wet texture) sand, and write or

draw on chalkboards with chalk. At this age, children are also good at manipulating boards with magnetic shavings controlled by knobs to make designs. Fine motor skills at this age allow children to maneuver both knobs at the same time. Magnetic drawing boards (black and white or color) with a thin diameter stylus and a few stamps in common shapes (*e.g.*, triangle, square, and circle) are appropriate for this age group.

4 Through 5 Years

At 4 and 5 years of age, children's art starts to resemble what it is meant to represent. Four-year-olds can add as many as seven parts to the outline of a human figure. They can string small beads and can copy bead order when stringing beads. They can cut along a line with scissors, and can copy squares, divided rectangles, ladder designs, letters, and numbers. As children approach the age of 5, their art is better defined and can represent either reality or fantasy. They are highly attracted by materials that create interesting effects and are tactually stimulating. Their drawings become more realistic looking and more elaborate, including more details than ever before. They can copy circles, crosses, divided rectangles, triangles, and letters and numbers. Five-year-olds can now add nine parts to a human form.

Suitable materials are appropriately sized to children's grips, and are lightweight but sturdy. Four- and five-year-old children enjoy using standard-sized crayons, markers, brushes, and art and construction paper of all sizes. They also can use coloring books and follow the outlines when using standard-sized crayons. Non-toxic tempera, finger, and watercolor paints work well for children in this age group, as do easels. Now that they can use round-nosed scissors and non-toxic glue or tape with skill, they can make collages and create scrapbooks. They can use pre-gummed paper pieces, glitter, pieces of yarn, and small pom-poms in their creations. They can manipulate clay and modeling dough, use craft sticks and plastic tools for the clay, and write or draw on chalkboards with chalk. They can also string beads, complete simple sewing activities, use simple miniature looms, and both stamps and non-toxic ink. At about 5 years of age, children can begin to use thinner-diameter, adult-sized crayons and color pencils.

6 Through 8 Years

Children 6 through 8 years of age are most interested in experimenting with and exploring through art. They find a high level of realism appealing and enjoy opportunities for arts and crafts with various materials. They are still highly attracted by materials with which they can produce complicated and interesting effects. Children about 8 years of age can follow directions included in a kit to complete an activity. At this age, arts and crafts for children become more adult-like, product-oriented, and mastery-oriented. Children become interested in craft projects that were previously thought of as folk art or work-related crafts, such as simple woodworking or sewing (with large needles). They become interested in photography and simple jewelry making, like beadwork. They can now use color pencils, art chalk, pastels, water colors, sketch pads, stencils, sharper scissors, all kinds of art papers, printing equipment, cameras, miniature looms, plaster of Paris, papier-mâché, leather strips, and model-making, in addition to everything used by younger children. Children also have the patience and fine motor skills in this age group to use a loom properly, which requires them to lace a string of yarn through teeth on a loom. Children can line up the yarn on the teeth and create a design. When children at younger ages wrap yarn around the loom, they often disregard the importance of putting the yarn in the teeth and are unable to complete the task. These children can begin to use looms with small loops for weaving as well. Their fine motor skills allow them to put small loops onto a loom and arrange them in an appropriate way to make bracelets and other items.

Suitable materials are appropriately sized to children's grips, and are sturdy. Children in this age group are most interested in materials that are open-ended; that is, materials that do not dictate to children how their art should look. Early elementary-aged children enjoy using crayons, markers, brushes, colored pencils, and art and construction paper of all sizes. Easels and tempera or watercolor paints work well for children in this age group. They use scissors and non-toxic glue or tape expertly, and can make collages and create scrapbooks. Stencils, pre-gummed paper pieces, glitter, pieces of yarn, and small pom-poms are still popular art materials at this age. They can manipulate clay and modeling dough (including self-hardening and polymer clays), use craft sticks and plastic tools for clay, and engage in simple pottery activities. They can write or draw on chalkboards with 6-through 8-year-olds can also string beads, complete simple sewing kits, use miniature looms, and use stamps and non-toxic ink. Balloons are inappropriate without direct

supervision for children less than 8 years old because of the choking hazard. Children in this age group can use kits that involve jewelry making, soap making, candle making, paper doll making, and copper enameling, but they may be unable to complete the activities as planned until they are closer to the age of 8 or 9 years. Children find other arts and craft activities, such as basketry, block printing, bookbinding, carving, leather working, braiding, weaving, photography, and flower pressing very enjoyable.

9 Through 12 Years

Children 9 through 12 years of age are ready for technical training in art, if they wish. They are also more capable of engaging in detail-oriented art techniques. By this time, their fine motor skills are approaching those of adults, so they can engage in activities that require more meticulous work and attention. Their interests expand to include the activities listed above, and arts and crafts, such as calligraphy, sketching, crocheting, embroidery, knitting, needlepoint, puppetry, doll making, metalworking, mosaics, and ceramics. There is decreasing emphasis on hazards because children in this age group are more capable of preventing injury to themselves, as compared to younger children, and because involvement in the types of activities discussed here sometimes cannot avoid the use of sharp instruments and tools. They can use machines and tools, such as sewing machines, wood burners, screwdrivers, and pliers.

MEDIA PLAY: **ARTS & CRAFTS**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts*			Appropriate for size of hand (large crayons and markers) Large sheets of paper
Shape of Parts			Rounded, no sharp edges
Number of Parts			Few
Interlocking/Loose Parts			
Materials			Lightweight Sturdy
Motor Skills Required			Grasping Hand-eye coordination developing Can put large crayons & markers to paper
Color/Contrast*			High contrast
Cause & Effect*			A clear cause-and-effect relationship
Sensory Elements*			Visual Manual
Level of Realism/Detail			

Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior			Like to explore objects manually & orally Can make marks on paper, but does not actively scribble or draw
Examples of Products			Large, easy-to-grip crayons & markers Large sheets of art & construction paper

* One of the most influential characteristics for these products.

MEDIA PLAY: **ARTS & CRAFTS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Appropriate for size of hand (large crayons & markers) (cont'd) Large sheets of paper (cont'd)	----------→ ----------→	----------→ ----------→
Shape of Parts	Rounded, no sharp edges (cont'd)	----------→	----------→
Number of Parts	Few (cont'd)	----------→	----------→
Interlocking/Loose Parts			
Materials	Lightweight (cont'd) Sturdy (cont'd)	----------→ ----------→	----------→ ----------→
Motor Skills Required	Grasping (cont'd) Hand-eye coordination (cont'd) Standing Balancing	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→ Can move fingers independently of each other
Color/Contrast*	High contrast (cont'd)	----------→	Can make color distinctions
Cause & Effect*	A clear cause-and-effect relationship (cont'd)	----------→	----------→
Sensory Elements*	Visual (cont'd) Manual (cont'd)	----------→ ----------→	----------→ ----------→
Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			

Relevant Play/Behavior	Like to explore objects manually & orally (cont'd) Likes to scribble	----------→ ----------→ Representational & symbolic play emerges More skillful at fine motor coordination Behaviors are goal-directed Need non-verbal means of expression Can draw simple angles Can draw what adults consider to be non-representational drawings	----------→ ----------→ Representational & symbolic play continues, & manifests in art Continual improvement in fine motor skill ----------→ ----------→ Can draw circular & vertical lines Can copy circles & crosses Can use blunt-end scissors Can add 2-3 parts to human outline Process of art is more important than art product
Examples of Products	Large, easy-to-grip crayons & markers (cont'd) Large sheets of art & construction paper (cont'd) Easels for those who can stand Spherical crayons Animal shaped chunky markers Pads with gel that record impressions using a stylus or the child's hand/finger	----------→ ----------→ ----------→ Approaching 24 months; can string large beads on shoelace string	----------→ ----------→ ----------→ ----------→ Blunt-end scissors Soft modeling clay or dough Non-toxic finger paints Pre-gummed sticky pads for large items to be stuck to

* One of the most influential characteristics for these products.

MEDIA PLAY: **ARTS & CRAFTS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Large, easy-to-grip crayons, markers, & brushes Various sizes of paper	----------→ Adult-sized crayons, markers, color pencils, & brushes at 5 Smaller beads at about 5	All sizes	----------→
Shape of Parts	Rounded, no sharp edges (cont'd)	----------→	Various	----------→
Number of Parts	Enough to provide a choice of materials & colors	----------→	----------→	----------→
Interlocking/Loose Parts				
Materials	Lightweight (cont'd) Sturdy (cont'd)	----------→ ----------→	 ----------→	 ----------→ Can be of professional quality and detail
Motor Skills Required	Improving hand-eye coordination Can move fingers independently of each other (cont'd)	----------→ ----------→ Uses adult grip Good fine motor coordination	 ----------→ ----------→	Fine motor skills increasingly adult-like ----------→
Color/Contrast*	A variety of colors	----------→	----------→	----------→
Cause & Effect*	A clear cause-and-effect relationship (cont'd)	----------→	Can understand delayed cause & effect	----------→
Sensory Elements*	Visual (cont'd) Manual (cont'd) Scented (cont'd)	----------→ ----------→ ----------→	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Level of Realism/Detail			High level of realism appeals to this age group	----------→
Licensed theme				
Classic				
Robotic/Smart Features				
Educational				

Relevant Play/Behavior	Repeat shapes & scribbles Can string large beads Can use pop beads as anticipated Can cut, paste, & make collages Likes to manipulate clay & dough Can copy circle (cont'd) Can copy square Develops size perception	Art begins to resemble what it is meant to represent Can cut along a line Can draw a human figure & add 7 parts to figure Can copy square, divided rectangle, ladder design, some letters & numbers Can thread small beads 5's art is more well-defined, more realistic-looking & elaborate 5's can copy triangles as well 5's can weave simple items 5's can add 9 parts to human form	Experiment & explore through art Attracted to materials that produce complicated & interesting effects Prefer open-ended materials Become interested in woodworking, sewing (with large needle), photography, simple jewelry-making, pottery activities 8's can complete kits independently Art activities are more adult-like, product-oriented, & mastery-oriented	Ready for technical training Engage in detail-oriented art techniques
Examples of Products	Large crayons, markers, brushes Various sizes, colors, types of paper Finger & tempera paints Easels (cont'd) Non-toxic glue Blunt-end scissors Modeling clay or dough with molds Pop beads Large beads & shoestring (cont'd) Chalk & chalkboard Pre-gummed paper & stickers Glitter, yarn, pom-poms Boards with magnetic shavings Coloring books with large simple outlines	Smaller crayons, markers, brushes, & color pencils at 5 All papers ----------→ Watercolors ----------→ ----------→ ----------→ ----------→ Beads & string ----------→ ----------→ ----------→ Tools for clay work Simple sewing with plastic needle Miniature looms with loops Stamps & non-toxic ink pads Coloring books	Crayons, markers, brushes, & color pencils ----------→ ----------→ Pastels ----------→ Various scissors Self-hardening & polymer clay Beading/jewelry kits Soap, candle, basket kits ----------→ ----------→ ----------→ ----------→ Sewing kits, sewing with large needle Camera & photography equipment Yarn looms ----------→ Printing equipment Plaster of Paris, papier-mâché, & pottery activities Modeling kits Balloons (8 years) Leatherwork & tools Carving Book binding Block printing Flower pressing	All those for 6-9 Years Calligraphy Sketching Crochet Embroidery Knitting Needlepoint Puppetry Doll-making Metal working Mosaic Ceramic Sewing machines Wood burners Screwdrivers Pliers

* One of the most influential characteristics for these products.

MUSICAL INSTRUMENTS

Music is an integral part of human life. Music and musical experiences are believed to enhance children's physical and psychological development through their creation of, responses to, and interaction with music. The learning skills that are developed with musical instruments are thought to transfer to other types of learning. It can teach children self-control through practice and can build self-esteem. Musical and rhythm instruments can be appropriate for children of all ages.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of musical instruments:

- Cause & Effect
- Materials
- Size of Parts
- Number of Parts

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of musical instruments are appropriate and how a particular age group plays with these products.

Birth Through 3 Months

Children enjoy music at all ages. Musical instruments appropriate for children of this age range are rattles, bells, and chimes that can be strapped to the wrist or ankle when the child is unable to grasp them. Musical toys that make sounds when they are kicked are also suitable for this age. As they approach 4 months of age, children can grasp small-scale tambourines, handheld rattles, bells, and chimes. Appropriate musical instruments are small enough for the infant to handle, have rounded edges, and are both washable and sturdy. They can be brightly colored with a high degree of contrast to help children perceive them. Cause-and-effect relationships should be simple (*e.g.*, a bell rings when an arm is waved), and sensory elements should not be too loud,

too bright, too sudden, or otherwise extreme. Rhythm instruments are most appropriate for this age. Musical mobiles and gyms are also appropriate (see *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives* for more on mobiles and gyms).

4 Through 7 Months

At this age, movements progress from reflexes to outwardly oriented movements. Most children are now actively engaged with their environments, repeating actions that involve external objects. Most children now actively handle toys. Mouthing and teething are also very characteristic of this age group; although the time spent mouthing varies among individual children. They can sit unsupported at around 6 months of age.

Appropriate musical instruments for children of this age range include rattles, bells, chimes, and small-scale tambourines that fit in children's grasps. They are small and light enough for the infant to handle, have rounded edges, and are both washable and sturdy. They can be brightly colored with a high degree of contrast to help children perceive the instruments. Cause-and-effect relationships are simple (*e.g.*, a rattle makes a noise when shaken), and sensory elements are not too loud, too bright, too sudden, or otherwise extreme. Rhythm instruments are most appropriate for this age. At around 5 months of age, musical mobiles and gyms are no longer appropriate because children of this age can push up onto their hands and knees (see *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives*). Children in this age group are also are very interested in interactive toys and smart toys that have musical features (see *Educational & Academic Play*).

8 Through 11 Months

Children in this age group are becoming increasingly mobile as they progress through scooting, crawling, cruising, and walking. Their behaviors become more outwardly initiated and goal-oriented. Because of this increase in physical development and an increase in cognitive development, children around this age begin to understand simple cause-and-effect relationships. The motor skills of grasping and shaking, combined with the cognitive skill of understanding cause and effect, make musical instruments highly appealing for this age group. Children in this

age range can hold two objects at once, but are unable to coordinate the different actions of each appendage. They are practicing fine motor skills like grasping, pushing, pulling, squeezing, patting, poking, and shaking, and can be provided with musical instruments that fit these characteristics. Mouthing and teething are still very characteristic of this age group, although the time spent mouthing varies among individual children.

Suitable musical instruments for this age group have characteristics similar to the previous group. Mobiles are not appropriate. Musical instruments that are appropriate for children in this age range include handheld rattles, bells, chimes, and small tambourines that will fit appropriately in children's grasps. Children in this age group are also very interested in interactive toys and smart toys that have musical features (see the *Educational & Academic Play* category).

12 Through 18 Months

Children from 12 through 18 months of age are increasingly curious and love to explore, traits that are facilitated by their increasing walking skills. Because of this, children are beginning to self-select toys, rather than play with the items put within their reach. Although they are becoming more skilled at bipedal movement, they are still unsteady on their feet, and they frequently lose their balance. They are working on fine motor coordination and are capable of controlled grasping and releasing, pushing, pulling, squeezing, patting, poking, and shaking. They can also twist, turn, slide, and crank instruments. They are even exploring more expansively the world through all their senses: seeing, hearing, touching, tasting, and smelling. Musical developments include children moving their bodies to the music and playing with musical instruments in functional/exploratory ways.

Musical instruments appropriate for children in this age range include handheld egg shakers, rattles, bells, chimes, and small-scale tambourines that will fit appropriately into children's grasps. They are small and light enough for the toddler to handle, have rounded edges, and are washable and sturdy. Cause-and-effect relationships should be simple, and sensory elements should not be too loud or otherwise extreme. Rhythm instruments, such as xylophones, are appropriate for this age because they provide an exciting cause-and-effect functionality and are

easy to activate with limited fine motor skills. Children of this age are also very interested in interactive toys and smart toys that have musical features, such as a plastic guitar activated by button pressing, which is easier for children with limited fine motor skills to operate at this age than a conventional guitar with strings (see also *Educational & Academic Play*). They can use instruments or simple sets that they can use in functional/exploratory ways, such as pounding on drums or bongos. At this age, children may be introduced to chunky whistles. They may blow short bursts of air to generate sound on a whistle, or may mimicking a whistle sound with their voice. These children are likely to suck in air as much as they are to blow it out.

19 Through 23 Months

Children from 19 through 23 months of age are still curious and love to explore. Representational and symbolic thinking emerges during this time. This is also a time of great physical activity as children gain new strengths and skills in their gross motor development. They are becoming more confident and stable in walking, and are exploring other physical skills like balancing, jumping, and running. Their fine motor skills are also becoming more skillful. Social play is starting to emerge as children are more capable of communicating with each other and beginning to play alongside each other. Their fine and gross motor coordination continues to improve. Appropriate musical instruments for children in this age group are similar to those described in the previous age group, and include instruments (or sets up to 6 pieces) that can be used in functional/exploratory ways (*e.g.*, pounding), such as drums or bongos. Children in this age group are still learning to blow into a whistle to produce sound and are likely to mimic sounds.

2 Years

Music is related to other cognitive skills for all children. For the 2-year-old child, music is inseparable from movement, and children at this age react to music by moving their bodies and parts of their bodies to music. Children are interested in the sounds different musical instruments make, and they can perceive changes in volume and recognize simple melodies. Children of this age like to sing phrases of songs and repeat their favorite songs often. They also enjoy rhythm instruments, and because their manual dexterity is improving, a whole new range of instruments

is appropriate for them. By this age, children have more interest in novelty horns (without functional buttons) and whistles, and are more capable of producing longer and stronger bursts of air. Appropriate musical instruments are small and light enough for the toddler to handle (plastic or wood), have rounded edges, are brightly colored, and washable and sturdy. Children in this age group can use music sets with up to a dozen pieces. As they approach 30 months of age, they are increasingly aware of musical instruments featuring licensed characters, which starts to play a role in their preferences and enjoyment. Sensory elements that are too loud, bright, or otherwise extreme are inappropriate. The cause-and-effect relationships should be simple. Rhythm instruments are most appropriate for this age. They can also effectively use shakers of all kinds, tambourines, bells, drums and bongos, blocks (by scraping and tapping), triangles, and rhythm sticks.

3 Years

Three-year-old children learn through movement and have increased gross and fine motor skills. They can shake and tap instruments, and they keep faster tempos better than slow ones. They can sense the mood of musical pieces, can sing simple songs on their own key because of their limited vocal range, and they like to repeat songs.

Appropriate musical instruments are properly sized for the 3-year-old preschooler to handle, have rounded edges, and are sturdy. Multisensory elements and cause-and-effect relationships are very appealing. Musical instruments that 3-year-olds can use effectively include shakers of all kinds, tambourines, bells, drums and bongos, blocks (by scraping and tapping), triangles, rhythm sticks, and novelty musical instruments such as horns (with up to three buttons). Children at younger ages may have trouble using a multistep horn that involves blowing and pressing buttons to change the tone. Additionally, children in this age group can use music sets with more components (up to one dozen).

At age 3 years, children now have the cognitive skills needed to be able to follow along in a symbol booklet, which tells them what keys to press on a piano. They are able to follow the necessary steps to operate electronic drum pads, which allow the user to set the tempo first, and then follow the beat. Children in younger age groups are able to beat on drums, but they may not

have the cognitive skills needed to engage in the auxiliary functions, such as rhythm-setting, which the electronic drum pad affords. Floor pianos also become appealing at this age, because children have the cognitive skills needed to understand that the floor pad is supposed to be stepped on to make individual notes. These children may use their feet to produce sound in an exploratory fashion or for activating pre-recorded songs.

4 Through 5 Years

Four- and five-year-olds may begin taking music lessons. Four-year-olds can copy simple rhythmic patterns, play steady beats while moving or marching, sing with others, imitate simple songs, and play an instrument along with simple music. Most 5-year-olds use instruments imaginatively, can recognize melody and reproduce it, have a more extensive vocabulary, can recite words rhythmically, maintain a steady beat while moving, express musical ideas in many different ways, and are involved in more musical improvisation. However, they cannot perform harmony yet. Children of this age also appreciate a high level of realism.

Suitable musical instruments are properly sized for the 4- and 5-year-old child to handle, have rounded edges, and are sturdy. Multisensory elements and cause-and-effect relationships are very appealing. Children this age also prefer adult-quality instruments over instruments made of plastic. Musical instruments (often packaged together as a set with 10 to 20 components) can be used effectively by children in this age group and include shakers of all kinds, maracas, castanets, tambourines, bells, drums and bongos, blocks (by scraping and tapping), triangles, kazoos, harmonicas, rhythm sticks, novelty musical instruments, cymbals, xylophones, keyboards, and pianos. Small guitars or ukuleles become appealing at this age because children this age have the fine motor skills to strum the strings properly, as well as possess the coordination needed to cradle the instrument properly in their arms while playing it. Children of this age also enjoy wind-up music boxes, mp3s, and CDs (see *Technology Play: Audiovisual Equipment*).

6 Through 8 Years

Children in the early elementary years from 6 through 8 years old have developed rhythmic discrimination, are better at remembering melodies than younger children, can read music when instructed, prefer to play real instruments, show interest in formal music lessons, and can sing in groups. At around 8 years of age, the ability to keep harmony develops, and they begin to create musical forms through improvisation. Children of this age also appreciate a high level of realism.

Suitable musical instruments are appropriately sized for the 6- through 8-year-old elementary school child to handle. Children this age prefer adult quality instruments. Musical instruments that children in this age group can use effectively include shakers of all kinds, maracas, castanets, tambourines, bells, drums and bongos, blocks (by scraping and tapping), triangles, rhythm sticks, cymbals, xylophones, keyboards, and pianos. Accordions with two motions (button pressing and pulling apart), are also mastered at this age. Younger children may not have the combination of gross motor skills (pulling) and fine motor skills (button pressing) needed to activate the accordion. Children are more skilled at using their feet to play songs on a floor piano. They are also able to play more complicated instruments, such as the autoharp, ukulele, flute, violin, horns, and the harmonica. Children of this age enjoy wind-up music boxes, mp3s, and CD/DVDs (see also *Technology Play: Audiovisual Equipment*).

9 Through 12 Years

Children ages 9 years and up have developed rhythmic discrimination, are good at remembering melodies, can generally read music well, prefer to play real instruments, can take formal music lessons, can sing in groups, are continuing to improvise musically, and can keep harmony. Children of this age prefer adult-quality instruments. Musical instruments that 9- through 12-year-olds can use effectively include shakers of all kinds, maracas, castanets, tambourines, bells, drums and bongos, blocks (by scraping and tapping), triangles, rhythm sticks, cymbals, xylophones, keyboards, and pianos. They are also able to play more complicated instruments, such as the autoharp, ukulele, flute, violin, horns, and the harmonica. Children of this age enjoy wind-up music boxes, and CD/DVDs (see also *Technology Play: Audiovisual Equipment*).

MEDIA PLAY: **MUSICAL INSTRUMENTS**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts*	Small enough for infant to handle, if expected to be grasped	----------→	----------→
Shape of Parts	Rounded, no sharp edges	----------→	----------→
Number of Parts*	Few pieces or parts (<3)	----------→	----------→
Interlocking/Loose Parts			
Materials*	Lightweight Soft Sturdy Washable	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→
Motor Skills Required	Reaching Grasping	----------→ ----------→ Hand-eye coordination Able to sit up unsupported around 6 months	Increased mobility (scooting, crawling, cruising, walking) Can grasp & shake Practicing fine motor skills such as grasping, pushing, pulling, squeezing, patting, poking, & shaking
Color/Contrast	Brightly-colored with high contrast	----------→	----------→
Cause & Effect*	A simple, clear cause-and-effect relationship	----------→	----------→ Beginning to understand cause-and-effect relationship
Sensory Elements	Auditory Visual Manual	----------→ ----------→ ----------→	----------→ ----------→ ----------→

Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Finds multisensory elements very appealing Enjoy music Like to explore objects manually & orally Learn through reflexes Able to reach & grasp around 3 mo. At birth, focus is best about 8 inches from face; by end of this period can see several feet away	----------→ ----------→ ----------→ Increasing interest in surroundings Actively handles toys Mouthing & teething	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ Can hold 2 objects at once but cannot coordinate between them
Examples of Products	Musical mobiles & gyms (see *Exploratory and Practice Play*) Wrist, ankle, & handheld rattles & shakers Wrist, ankle, & handheld bells Wrist, ankle, & handheld chimes Small, light tambourines Instruments that makes sounds when kicked	Mobiles (prior to 5 months) Rattles & shakers Bells Chimes Small, light tambourines Musical interactive & smart toys (see *Educational & Academic Play: Learning Products* and *Technology Play: Smart Toys & Educational Software*)	----------→ ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

MEDIA PLAY: **MUSICAL INSTRUMENTS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts*	Small enough for a toddler to handle	----------→	----------→
Shape of Parts	Rounded, no sharp edges (cont'd)	----------→	----------→
Number of Parts*	Few pieces or parts (cont'd)	----------→	----------→
Interlocking/Loose Parts			
Materials*	Lightweight (cont'd)	----------→	----------→
	Soft (cont'd)	----------→	----------→
	Sturdy (cont'd)	----------→	----------→
	Washable (cont'd)	----------→	----------→
Motor Skills Required	Increasingly skilled at walking	----------→	----------→
	Working on fine motor coordination (controlled grasping & releasing, pushing, pulling, squeezing, patting, poking, & shaking, twisting, turning, sliding, & cranking)	----------→	----------→ Can move fingers independently of each other
Color/Contrast	High contrast (cont'd)	----------→	All colors
Cause & Effect*	A clear cause-and-effect relationship (cont'd)	----------→	----------→
Sensory Elements	Auditory (cont'd)	----------→	----------→
	Visual (cont'd)	----------→	----------→
	Manual (cont'd)	----------→	----------→
Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			

Relevant Play/Behavior	Finds multisensory elements very appealing	----------→	----------→
	Likes to explore objects manually & orally (cont'd)	----------→	Music is related to other cognitive skills
	Increasingly curious & love to explore	----------→	Music is inseparable from movement
	Beginning to self-select toys	Can self-select toys	Interested in the sounds different musical instruments make
	Uses all senses to explore the world: seeing, hearing, touching, tasting, & smelling	----------→	Can perceive changes in volume Can recognize simple melodies
	Functional/exploratory play with musical instruments	----------→	Can sing phrases of songs
	Can move bodies to music	----------→	----------→ Repeats favorite songs Enjoys rhythm instruments
Examples of Products	Rattles & shakers(cont'd)	----------→	----------→
	Bells (cont'd)	----------→	----------→
	Chimes (cont'd)	----------→	----------→
	Small, light tambourines (cont'd)	----------→	----------→
	Musical interactive & smart toys activated by button pressing such as a guitar (see *Educational & Academic Play: Learning Products* and *Technology Play: Smart Toys & Educational Software*) (cont'd)	----------→	----------→
	Drums	----------→	----------→
	Bongos	----------→	----------→
	Xylophones	----------→	----------→
	Simple music sets	----------→	----------→ Tambourines Blocks (scraping and tapping) Triangles Rhythm sticks Novelty musical instruments (including multistep horns and chunky whistles)

* One of the most influential characteristics for these products.

MEDIA PLAY: **MUSICAL INSTRUMENTS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts*	Sized for the preschooler to handle All except for very large portable instruments	----------→ ----------→	All sizes	----------→
Shape of Parts	Rounded, no sharp edges (cont'd)	----------→	Various	----------→
Number of Parts*	Many	----------→	----------→	----------→
Interlocking/Loose Parts				
Materials*	Lightweight (cont'd) Sturdy (cont'd)	----------→ ----------→	 ----------→ Prefers adult-quality instruments	 ----------→ ----------→
Motor Skills Required	Improving hand-eye coordination Can move fingers independently of each other (cont'd)	----------→ Uses adult grip Good fine motor coordination	 ----------→ ----------→	 Fine motor skills increasingly adult-like
Color/Contrast	A variety of colors	----------→		
Cause & Effect*	A clear cause-and-effect relationship (cont'd)	----------→	Can understand delayed cause & effect	----------→
Sensory Elements	Auditory (cont'd) Visual (cont'd) Manual (cont'd)	----------→ ----------→ ----------→	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Level of Realism/Detail		Prefers high level of realism	----------→	----------→
Licensed theme				
Classic				
Robotic/Smart Features				
Educational				

Relevant Play/Behavior	Learns through movement Can shake & tap instruments Keeps faster tempos better Can discern affective mood of musical pieces Limited vocal range Can sing simple songs on own key Likes to repeat songs	May begin taking music lessons Can coordinate large and small muscle movements Can copy simple rhythmic patterns Can play steady beats while moving or marching Can sing with others Can imitate simple songs Can play instrument along with simple music 5's can use instruments imaginatively 5's can recognize melody & reproduce it 5's have more vocabulary 5's can recite words rhythmically 5's can maintain steady beat while moving 5's can express musical ideas in many different ways 5's are involved in more improvisation 5's cannot perform harmony yet	Rhythmic discrimination Better at remembering melodies than younger children Can read music Play real instruments Show interest in formal music lessons Can sing in groups By 8 years, create musical forms through improvisation At around 8 years, the ability to keep harmony develops	----------→ Good at remembering melodies Can read music well ----------→ Can take formal music lessons Can sing in groups Musical improvisation continues Able to keep harmony
Examples of Products	Rattles & shakers (cont'd) Bells (cont'd) Chimes (cont'd) Small, light tambourines (cont'd) Musical interactive & smart toys (see *Educational & Academic Play: Learning Products* and *Technology Play: Smart Toys & Educational Software*) (cont'd) Drums (cont'd) Bongos (cont'd) Xylophones (cont'd) Tambourines (cont'd) Blocks (scraping & tapping) (cont'd) Triangles (cont'd) Rhythm sticks (cont'd) Novelty musical instruments (including horns & whistles with buttons) (cont'd) Electronic drum pads	All examples in previous age group Cymbals Keyboards Pianos Wind up music boxes CD/DVDs, mp3s, streaming videos (see *Technology Play: Audiovisual Equipment*) Kazoos Harmonicas Pianos with symbol booklets with instructions for what keys to press Ukuleles Floor pianos Accordions	All examples in previous age group Autoharp Flute Violin Horns	All examples in previous age group

* One of the most influential characteristics for these products.

EDUCATIONAL & ACADEMIC PLAY

Children's cognitive development may be fostered through various media and particular toys that are provided for children's play with the goal of cognitive gain. Educational and academic play is seen with books, science kits, and press and guess games. Toys designed for this type of play require specific levels of knowledge and motor skill, so most toys in this category are recommended for children 19 months and older. However, some parents may believe their children are advanced, or may desire to give their children a "head start" over others. Consequently, educational and academic toys might be given to children at younger ages than described in the *Age Determination Guidelines*, even if they are inappropriate for children in this age group for developmental or safety reasons.

Books (p. 239)

- ABC & number
- Chapter
- Cloth- or plastic-covered
- Coloring
- Information
- Interactive
- Nursery rhymes
- Picture
- Pop-up
- Rhyming
- Simple stories
- Tactile
- Vocabulary

Learning Products (p. 253)

- Abacuses
- Architecture kits
- Binoculars
- Cameras
- Chemistry sets
- Circuit boards
- Colors & shapes
- Electronic teacher toys
- Felt play boards
- Flashcards
- Machine building kits
- Magnetic letters & numbers
- Microscopes
- Press & guess toys
- Science sets
- Telescopes
- Wipe-off educational mats

BOOKS

Research strongly indicates that a child's success in reading largely hinges on early experiences with literature, particularly during preschool years at home and the first few years of school. Unless positive attitudes toward reading are developed during the early years, a child is unlikely to grow into an adult who enjoys reading.

Books are appropriate for children of most ages, but they are not used independently by children as sources of information or stories until they are around the age of 19 months. Before that, books serve as objects in the environment that are likely to be handled roughly (*i.e.*, mouthed, carried, ripped), or used by someone else to read them a story. Recent research indicates that reading to children as early as 1 month old can be beneficial to their auditory perception skills, emotional balance, and language comprehension and development. Some studies even encourage in-utero reading. Reading is a skill that comes to fruition around the ages of 5 to 7 years; so until that time, children interact with picture books by visually exploring the details of illustrations. They are not constrained by the written words, often making sounds that correspond to the pictures, naming objects, and inventing stories.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of books:

- Number of Parts (pages)
- Materials (plastic/foam, cloth, cardboard, paper)
- Size of Parts
- Sensory Elements
- Level of Realism/Detail
- Color/Contrast

The order of the characteristics listed above does not necessarily indicate priority, because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of books are appropriate, and how a particular age group plays with books. These descriptions, however, do not apply to books read to children by

parents, teachers, or older peers because in those cases, the child is not handling the book or reading on their own. These descriptions apply only to the interactions between children and books.

Birth Through 3 Months

Emerging research encourages parents to talk and to read to their children, even in-utero. However, children ages birth through 3 months lack the physical, cognitive, and visual abilities necessary for interacting with books.

4 Through 7 Months

At this age, children's movements are progressing from involuntary reflexes to deliberate outwardly oriented movements. As the children mature, grasping, reaching, shaking, and pulling become ways in which they can interact with the environment. Grasping is mastered around 6 months. Because of children's emerging abilities, caregivers can give children ages 4 through 7 months of age books. Appropriate books have relatively few pages (no more than five) that are easy to turn, portray a simple, familiar image on each page, and have bright colors and high visual contrasts. Children use visual skills to engage in play. Research studies indicate that children prefer yellow and red, to blue and green, and favor patterns rather than solids by 3 months of age. Therefore, when they are given books by 4 months old, books that have bright yellow and red pictures with high visual contrasts and patterns, these books are likely to be more appealing to children in this age group. Infants can handle books that are small (no more than around 4 to 8 inches in any direction) and light, yet sturdy. Once a book is grasped, it is likely to be mouthed immediately. Therefore, books for children in this age group are usually made to endure wetness without tearing or falling apart, such as books made from cloth or non-toxic plastic. Cloth and light plastic books are suitable for children 6 months and older; cardboard may be too heavy and unwieldy for children in this age group. Motor skills are crude at this age; so books provided for the child must be large enough for them to grasp easily (around 4 to 8 inches). Soft books will make any erratic arm motions safer for their eyes and faces.

8 Through 11 Months

The behaviors of 8- through 11-month-olds become more deliberately outwardly oriented, and fine motor skills are becoming more controlled. Children at this age can easily turn pages in books, but their lack of motor control may result in torn pages. This age brings the cognitive ability to understand simple cause-and-effect relationships, and this makes interactive books highly appealing. Books with things to lift, open, or slide are appealing and cognitively stimulating. Children in this age group can handle books that are less than 6 or 8 inches in any direction, are lightweight, yet sturdy, and are washable, with no more than five easily turned pages. The pictures in these books are simple and clear, with bright colors and high contrast. The pictures typically represent familiar objects, animals, or people to aid language development; and each page includes only one or a few objects. Cloth and light plastic books are suitable for children in this age bracket, but cardboard may be too heavy and unwieldy.

12 Through 18 Months

Children's emerging interests in novelty and exploration characterize the 12- through 18-month period. Tactile books, much like the cause/effect books described above, are appealing for this age group because children can interact with the book in ways not possible with regular books. This is also a time of growing language capabilities; consequently, books that have rhymes, rhythm, and repetition are suitable for aiding in their developing skills. Children in this age group enjoy looking at books as a solitary activity, and will do so frequently given the opportunity. Cardboard, fabric, and non-toxic plastic are appropriate materials for books. They are colorful and contain simple pictures of things the child recognizes from the world around them, such as cats, dogs, and birds. Picture/vocabulary books, simple picture/story books, nursery rhyme books, and simple ABC and number books are pleasing to children. As children's one-word utterances expand during this age group, they will enjoy pointing to these familiar objects in books and labeling them aloud. Books containing five to seven pages are manageable for this age group.

19 Through 23 Months

During this period, the child develops concepts of how to care for books. They can turn pages carefully and work to avoid tearing them. The child realizes that the book has a front and back, and that pictures have a top and a bottom. Cognitive abilities are developed to the point that they can understand that the pictures tell a story and that what the adult is doing is called “reading.” They now regularly name and point to familiar objects in books, and particularly enjoy listening to nursery rhymes and repeating them with adults. Therefore, picture books with simple stories, nursery rhymes, ABCs, and number books are appropriate. By around 19 months, children are ready for “touch me” and other tactile books, and books with heavy paper pages. Books containing 7 to 10 pages are appropriate.

2 Years

Children at this age love to hear the same story read repeatedly. They memorize the stories and then will use them to “read” the story to themselves later. Predictable story lines are appropriate because they lend themselves easily to the memorization tendency the children have toward stories. By age 30 months, they begin to ask questions about what is being read to them. Two-year-olds enjoy simple pictures with few details and clear color, and are particularly interested in rhymes and repetition. Children in this age group like having and looking at their own books, and now can use books with 10 to 12 pages. Pop-up and “dress me” books are highly fascinating with this age group as well. Large, colorful pictures and story lines of familiar objects and events are appropriate. Children this age also enjoy books with pictures hidden behind windows or doors, and these books reinforce object permanence comprehension. By age 2, children begin to show an awareness of print; they now recognize that something else appears on the page with the pictures.

3 Years

Three-year-old children enjoy listening to stories that pertain to events with which they are familiar. Their expanding attention span—now up to about 20 minutes—allows them to enjoy hearing the same story multiple times, but they insist on hearing it the same way each time. If

there is any deviation from the story line, they will correct the reader. They want to respond to questions about the stories, offer comments and observations, and ask “why” questions.

Humor is becoming more refined, so wildly silly stories are appealing. Children in this age group delight in jokes, humorous stories, nonsense rhymes, tall tales, and stories about adventures, the here and now, information, animals—particularly animals that act like people—and places like the zoo, fire station, and park. They prefer stories that involve familiar objects like telephones, trucks, and dogs, to help them assimilate their own experiences. They like complex illustrations rich with detail. They enjoy fantasy stories, even though the lines between life and fantasy are still fuzzy for this age group. The characters in the stories are interpreted as real, and the events in the story may make them feel happy, sad, or angry. Three-year-olds enjoy making up their own stories and enjoy making books with adults. They are interested in violent stories that include death, killing, and objects that crash, fall down, or break. They tell stories describing how they beat up the bad guy that came into their house, with them emerging as the hero. Ghosts and witches are also frequently present in their stories.

Children of this age also tend to mark in books. Because of this, coloring books or other books in which marking is acceptable may be introduced. For personal interactions with books, appropriate attributes include: more complicated illustrations than present in books for 2-year-old children, more pages (10 to 15), and a few more words on each page. Children of this age are generally farsighted and are still developing their binocular vision. Therefore, children in this age group will find larger print easier to read than smaller print.

4 Through 5 Years

Children 4 and 5 years old enjoy hearing stories time and time again. Topics of great interest include “here and now” themes, reality-based story lines, poetry, comics, seasonal/holiday stories, and animals with human traits. Dramatic play is a high-frequency behavior in these years, and it emerges in their literacy activities. They enjoy acting out their favorite stories or making up ones with their peers. This age group finds stories that teach them something, like new words and their meanings, to be valuable. Exaggerated and fantasy stories are not valued as much at this age because those stories are not “true.”

Like 3-year-olds, children of this age generally are farsighted and are still developing their binocular vision. Therefore, larger print is more appropriate than smaller print in books. Literacy skills are emerging as children enter preschool and kindergarten during these years. Books that contain simple phonetic structure words and two to four sentences per page allow children to practice their reading with success and relatively little frustration. About 10 pages are sufficient for beginning literacy books.

6 Through 8 Years

Page numbers, size of books, and book contents gradually become more complex as the child's reading fluency increases. During these years, children learn to read with increasing fluency, and develop individual reading habits and preferences. Once literacy skills are acquired and mastered, children set their own pace for reading.

Children from 6 through 8 years have different topic interests in the stories they choose. Individual literacy skills are becoming more frequent among children of this age bracket, and they derive great pleasure in choosing their own books from library stacks, although they still enjoy being read to by an adult. Some topics enjoyed in the preschool years are still enjoyed by children over 6 years, like poetry and comics; but children in this age group have a new interest in fantasy, which largely dominates over the pleasure of reading about reality. Stories about good magic, heroes, myths, legends, and fairy tales are popular with 6- and 7-year-olds. They enjoy stories about reality, if they are sensational, dramatic, or funny. They also enjoy non-fiction books about children, nature, science, and the Earth's elements.

Once children in this age group reach about 8-years-old, they have become more capable of navigating components of more complex books, like the table of contents, index, and glossary. Eight- and nine-year-olds are interested in books about travel, adventure, geography, and ancient times; thus, they find pleasure in stories about people who live far away, or who lived long ago. Topics that surround humanity, such as situational humor, biographies, folk tales, and legends, are highly appealing to children of this age. Mystical elements, like superstition and luck, become more favorable to read about than stories of magic. Comics and humor continue to be appealing.

9 Through 12 Years

By ages 9 and 10, most children have a favorite “something” that they prefer to read. Some children may prefer reading about a particular animal, such as horses or dolphins, while other children may be interested in a particular author, books related to a specific television or movie series, or a specific genre of book, like westerns, romances, and mysteries. Regardless of their preference, which may be not to read at all, the significant point is individual taste. Books for this age group largely resemble adult books, typically being made up of chapters and more than 50 pages. Smaller books are deemed childish, boring, or stupid.

The subject-interest guidelines below are general and may not reflect all individual preferences. Popular topics for ages 10 through 12 include:

- Adventure – exploration, frontier life, pirate and sailing stories, westerns, pioneers
- Fantasy – Greek and Roman myths, but not fairy tales
- Biography and historical fiction – sports figures, pirates, cowboys, explorers
- Mysteries – detectives, action/excitement, suspense, but without horror and murder
- Westerns – good guy wearing white hat always saves the day
- Sports – stories of school athletics, emphasis on teamwork and fair play
- Animal stories – information on both wild and domestic animals, but not fantasy
- Scientific discovery – lives of inventors and their discoveries
- Information and how-to-books
- Media-based – stories tied to characters seen on television shows, movies, or videos.

EDUCATIONAL & ACADEMIC PLAY: **BOOKS**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts*		Easy to grasp (4-8 inches); no more than 6 or 8 inches in any direction	----------→
Shape of Parts			
Number of Parts*		No more than 5 pages	----------→
Interlocking/Loose Parts			
Materials*		Light but sturdy Washable; can endure wetness without tearing or falling apart Cloth & light plastic	----------→ ----------→ ----------→
Motor Skills Required		Grasping & page turning	----------→ Fine motor skills are becoming more controlled so turning pages in a book is a task handled with ease
Color/Contrast*		Bright yellow & red pictures Pictures with high visual contrasts & patterns	----------→ ----------→
Cause & Effect			Understand simple cause-and-effect relationships, which makes interactive books appealing. Books with things to lift, open, or slide are attractive & cognitively stimulating
Sensory Elements			

Level of Realism/Detail		Pictures are simple & clear; they represent familiar objects, animals, or people	----------→
Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Lack physical, cognitive, & visual abilities necessary for interacting with books	Movements progressing to deliberate outwardly oriented movements, such as reaching, grasping, shaking, & pulling Use visual skills to engage in play Color receptors present; prefers red, yellow, & patterns Sucking reflex Crude motor skills; erratic arm motions	----------→ Understand simple cause-and-effect relationships Controlled fine motor skills
Examples of Products	Not appropriate	Plastic-coated foam books Cloth books Simple picture books Nursery rhymes Simple ABC and number books	----------→ ----------→ ----------→ ----------→ ----------→ Interactive books

* One of the most influential characteristics for these products.

EDUCATIONAL & ACADEMIC PLAY: **BOOKS**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts			
Shape of Parts			
Number of Parts*	Books containing 5-7 pages	Books containing 7-10 pages	Books containing 10-12 pages
Interlocking/Loose Parts			
Materials*	Books made from cardboard, fabric, or plastic	----------→ Heavy paper pages	----------→ ----------→
Motor Skills Required	Page turning; child has the fine motor skills to perform this task	Turns pages carefully; works to not tear them	----------→
Color/Contrast*	Colorful pictures	----------→	Large, colorful pictures with few details & clear color
Cause & Effect*	Interactive books	----------→	----------→ "Dress Me" books are highly fascinating
Sensory Elements*	Tactile books with which the child can interact & explore are appealing	----------→ "Touch Me" books	Enjoy books with pictures hidden behind windows or doors ----------→ Pop-Up Books
Level of Realism/Detail	Pictures are simple & of things the child recognizes	----------→	----------→
Licensed theme			

Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior	Emerging interests in novelty & exploration Growing language capabilities Looking at books as a solitary activity is a high frequency behavior No notice is given to print	Develops concepts of good care of books Realizes books have a front & back and that pictures have a top & bottom Understand that pictures tell a story & that the adult is "reading" Regularly name & point to familiar objects in books Enjoy listening to nursery rhymes & repeating them with adults	Love to hear same story over & over Memorize stories to repeat later Ask questions about the story Enjoy simple pictures with few details They like having & looking at their own books ----------→ Enjoy pop-up books & books with pictures hidden behind windows & doors Show an awareness of print (something else on the page with the pictures)
Examples of Products	Tactile books; interactive books Books that have rhymes, rhythm, & repetition Picture books Simple vocabulary/story books Nursery rhymes Simple ABC and number books	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ "Touch Me" books	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ Predictable stories Pop-up books "Dress Me" books Hidden picture books

* One of the most influential characteristics for these products.

EDUCATIONAL & ACADEMIC PLAY: **BOOKS**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts				
Shape of Parts				
Number of Parts*	10-15 pages	About 10 pages for literacy-development books Increase according to child's literacy abilities & preferences in books	----------→	Largely resemble adult-type books, made up of chapters, about 50 pages
Interlocking/Loose Parts				
Materials				
Motor Skills Required				
Color/Contrast				
Cause & Effect				
Sensory Elements*	Binocular vision is still developing & children are generally farsighted, so larger print is more appropriate.	----------→	Standard/normal-sized print	----------→
Level of Realism/Detail*	Prefer complex illustrations rich with detail	----------→	By age 8, able to use table of contents, index, & glossary	----------→
Licensed theme				
Classic				
Robotic/Smart Features				
Educational				

Relevant Play/Behavior	Enjoy stories about familiar events	Enjoy acting out stories	Different topic interests in books	----------→
	Want to hear stories multiple times, same way each time	----------→	Literacy skills more frequently found in children	----------→
	Want to answer questions, share comments, ask why	Prefer true, reality-based stories to fantasy	Derive great pleasure in choosing books from library	----------→
	Humor becoming refined; like fantasy		Enjoy being read to by an adult	By age 10, most have a favorite "something" about which they prefer to read
	Like complex illustrations; tendency to mark in books		By age 8, ability to navigate table of contents, index, & glossary	May prefer to not read at all
	Generally farsighted; developing binocular vision	----------→		Small books are seen as childish
	Enjoy making up own stories	----------→		
Examples of Products	Enjoy topics of jokes, tall tales, animals that act like humans, adventures, the here & now, information, places, & fantasy.	----------→	Enjoy topics of: poetry, comics, fantasy, heroes, fairy tales, legends, good magic, myths, children, nature, sensational/dramatic/ funny stories of reality, Earth elements, superstition & luck.	----------→
	Wildly silly stories, humorous stories, & nonsense rhymes	----------→		
	Picture books	----------→	Prefer information books, particularly science.	----------→
	Predictable books	----------→		
	Nursery rhymes	----------→	8-9-year-olds enjoy books on geography, travel, adventure, & ancient past.	----------→
	Coloring books with large simple outlines	----------→		Also enjoy topics of: adventure, sports, scientific discovery, media-based stories, how-to books
	Self-created story books	Coloring books		
		Also enjoy topics of here-and-now themes, reality-based story lines, poetry, comics, seasonal/holiday stories, and animals with human traits.	Books that tell about humanity, such as situational humor, biographies, folk tales & legends.	Series books to continue child's favorite "something" to read about: animal, author, TV/movie, genre, etc.
		Information stories that teach new concepts like words & meanings.	Chapter books & adolescent/juvenile novels	----------→

* One of the most influential characteristics for these products.

LEARNING PRODUCTS

Cognitive abilities, those higher-order mental processes, like reasoning and problem solving, through which humans try to understand the world, are present at birth. Cognitive activity is particularly high with young children who are learning all-new information. Cognition is gained through sensory experiences with the environment first, then later through abstract reasoning and thought. However, just because learning occurs as early as birth, learning products are not necessarily appropriate for newborn children. Learning products have anticipated uses, specific goals, and particular types of learning objectives. Thus, learning products are appropriate only for older children who are cognitively ready for such elements of play.

Children do not use learning products for true learning (*i.e.*, as tools for gaining information or strengthening cognitive skills) on an independent level until they are around the age of 2 to 3 years. For example, "learning products" are more appropriately considered "exploratory toys" or "activity toys," and they mainly serve as objects with which children can learn about their senses, develop their motor skills, and learn about cause and effect (see *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives*). Therefore, giving a true learning product to children younger than 2 years of age is often inappropriate because children of that age lack the physical, cognitive, and visual abilities necessary for interacting with the product in most anticipated ways. Therefore, discussion for this subcategory begins with age 2 years. Computer learning software/applications are not included in this subcategory; these and other educational software topics are discussed in the next subcategory, *Smart Toys & Educational Software*.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of learning products:

- Level of Realism/Detail
- Educational
- Materials

The order of these characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these products and the characteristics of children in various age groups. This includes a

description of what types of learning products are appropriate and how a particular age group plays with these products.

2 Years

Two-year-olds are cognitively and physically capable of interacting with simple learning products. They have developed the ability to remember past events up to a day, to concentrate and focus on one task for a limited time, and to attend to as many as three directions at once. The cause-and-effect relationships they began to understand at 12 months are now fully developed, so toys using this skill are engaging. Children in this age group can use four- or five-word sentences. They can recognize and identify almost all common objects and pictures, and enjoy matching or naming objects and shapes. Activities like these strengthen their visual discrimination skills. They also can understand the physical relationships between objects, such as knowing that something is "on" or "under" another object. The purpose of numbers in counting objects is starting to become understood, so they can now understand the concept of "two." Cognitively, the early math skill of ordering by size has developed (it emerges around 19 months of age), and by 2, children can readily sort and order nesting cups in a meaningful way. This is different from previous age groups, which may have used the cups out of order to build or stack. Children in this age group are also beginning to understand simple time concepts, such as knowing that one thing comes after another. Asking questions, generally in the form of "why," is a high-frequency behavior for this age group. Due to advances in cognitive development that allow for symbolic connections, simple electronic-teacher and other learning products that teach colors, shapes, animals, letters and sounds, and numbers are suitable. For example, children in this age group may engage in simple learning with a stationary wheeled toy that is activated by buttons or spun by a child's hand.

3 Years

Like 2-year-olds, 3-year-olds often ask "why" things are as they are. They have mastered some basic rules of grammar and can speak in sentences of five or six words. They can name most familiar objects and now understand the concepts of "same" and "different." They can correctly

name some colors. Children in this age group understand the concept of counting and may know a few numbers. Suitable learning products teach colors, shapes, letters and sounds, and numbers.

4 Through 5 Years

Preschool children are ready for learning products and all the cognitive goals they bring. Literacy skills are beginning to emerge around 5 years. Children in this age group understand the way in which the toy should be used, can decipher the meanings of the words used (if the learning toy is electronic), and know how to interact with the toy. Learning products that pertain to various domains of knowledge are appropriate: colors, letter and sound recognition, letter writing, number identification, counting, matching quantities to numerals, shapes, comparison, directionality (concepts such as back/front, over/under, and in/on) and scientific thought, such as space or biology. Preschool children can mentally work through problems and questions and enjoy practicing their intellectual abilities and acquiring facts. Fine motor skills are well developed, so small pieces present relatively little challenge.

Appropriate learning products for the preschool child include toys that teach colors and shapes, and simple letter and number concepts. For example, alphabet magnets and abacuses are appropriate. At this age, children will often search for the first letter of their name, or if they have practiced, may be able to spell their own name with alphabet magnets. At this age, children have the cognitive skills to enjoy counting and will slowly move beads on an abacus to practice numbers. At any younger age, children look at an abacus as a bead toy or maze (something that should be manipulated rather than counted). They also enjoy science materials, such as magnets, color-mixing equipment, magnifying glasses, flashlights, prisms, thermometers, scales, stethoscopes, speedometers, pedometers, compasses, models of the solar system, rock/shell collections or kits, animal habitats, telescopes, binoculars, see-through clocks with visible gears, simple calculators, alphabet ink stamps, and functioning toy keyboards. Science experiments with a few steps are manageable at this age group, as children are able to follow along with directions starting in this age group. Cameras with a viewfinder function can also be used properly at this age. They can use introductory microscopes with focus-free, dual lenses and large plates for viewing objects (no slides), as well as toys that resemble a microscope for viewing nature scenes and listening to science lessons. Looking through the viewfinder and

pointing out objects is appealing. At younger ages, children lack the cognitive skills to understand which side of the camera is the proper side to look through.

6 Through 8 Years

Learning products for elementary-age children are very much the same as those for preschoolers. The only difference is the level of complexity. Elementary-age children, particularly upper elementary, find realistic-looking learning products more appealing than those that look like children's toys. They prefer to interact with real-world objects, rather than plastic replicas. Children in this age group are ready for skill-specific toys, rather than those that focus on broad concepts used by the preschoolers. Literacy is an emerging skill during these years; so toys that reinforce reading are appropriate. At age 6, children are still establishing the foundation of reading; by age 8 and 9, most are reading fluently and reading for content (see *Educational & Academic Play: Books*). Growing math skills include simple addition and subtraction in the early grades, and multiplication, division, and fractions in the later grades.

Children in this age group can use more sophisticated science and chemistry sets, microscopes (with slides and dissecting accessories), telescopes, and binoculars. They are interested in their own anatomy and elements in the world, so scientific exploration sets that allow dissecting and examining slides are highly attractive. Adult supervision is warranted, depending on the child, the type of equipment, and the particular use of the equipment (such as sharp edges/blades or chemicals in science sets). They may also find toys that focus on astronomy and the solar system, geography, or history interesting, such as educational mats with wipe-off crayons. Children at younger ages may only use mats with wipe-off crayons as coloring spaces rather than to absorb the content.

9 Through 12 Years

Skills that were being introduced in the prior age group are largely mastered by ages 9 through 12. Most children can read fluently, add, subtract, multiply, and divide. Their skills are approaching adult levels with increasing frequency. Nine-year-olds are realistic, able to plan, responsible, self-conscious, and competitive. They are interested in things beyond their

environment, like people's biographies, ancient times, and other cultures. In addition, they are capable of independent, critical thinking. Similarly, 10-year-olds enjoy learning new things and memorizing facts. During this time, they begin to establish definite preferences for subject matter and reading material, largely due to subjects being explored more in-depth at school. By age 11, definite preferences emerge for some school subjects over others. This trend continues through age 12, when their thinking is more adult-like. Abilities to generalize and theorize are present, as are abilities to conduct scientific experiments.

In general, materials that were appropriate for 6- through 8-year-olds remain appropriate for 9- through 12-year-olds. Realistic items are preferred over those that resemble toys. Standard calculators are acceptable.

EDUCATIONAL & ACADEMIC PLAY: **LEARNING PRODUCTS**

Product Characteristics	2 Years	3 Years
Size of Parts	Small enough to handle, if expected to be grasped	
Shape of Parts	Rounded, no sharp edges	
Number of Parts		
Interlocking/Loose Parts		
Materials*	Lightweight Sturdy Washable	
Motor Skills Required	Can push buttons	
Color/Contrast		
Cause & Effect		
Sensory Elements	Visual Manual Auditory	
Level of Realism/Detail		
Licensed theme		
Classic		
Robotic/Smart Features		

Educational*	Matching colors, shapes, & pictures Naming objects, shapes, & pictures Basic physical & temporal relationships between objects Basic counting	Matching colors, shapes, & pictures (cont'd) Naming objects, shapes, pictures, & colors Basic rules of grammar Basic physical & temporal relationships between objects (cont'd) Numbers & counting
Relevant Play/Behavior	Cognitively & physically capable of interacting with simple learning products Finds multisensory elements very appealing Can remember past events, concentrate & focus on tasks, & to attend to as many as 3 directions at once Fully developed understanding of cause-and-effect relationship Ask lots of "why" questions Can use 4- & 5-word sentences Can recognize, identify, & name common objects, pictures, & shapes Understands "on" & "under" Begins to understand purpose of numbers Understands the concept of "two" Begins to understand simple time concepts; *e.g.*, "after"	Ask lots of "why" questions Understands basic rules of grammar Can use 5- & 6-word sentences Can name most familiar objects, pictures, shapes, & colors Understands purpose of numbers; may name a few Understands concepts of "same" & "different"
Examples of Products	Simple electronic-teacher toys Learning products that teach colors, shapes, picture/object names, animals, letters & sounds, & numbers activated by buttons or child's hand Matching games	Simple electronic-teacher toys Learning products that teach colors, shapes, letters & sounds, numbers & counting ----------→

* One of the most influential characteristics for these toys.

EDUCATIONAL & ACADEMIC PLAY: **LEARNING PRODUCTS**

Product Characteristics	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials			
Motor Skills Required			
Color/Contrast			
Cause & Effect			
Sensory Elements			
Level of Realism/Detail*		Prefer realistic-looking toys Prefer real-world objects to plastic replicas	----------→ ----------→
Licensed theme			
Classic			
Robotic/Smart Features			
Educational*	Understands concepts of: color, letter & sound recognition, letter writing, number identification, counting, matching quantities to numerals, shapes, comparison, science, & directionality	Ready for skill-specific toys such as literacy & math Interested in scientific exploration in anatomy, biology, chemistry and astronomy	Most read fluently & have mastered simple math computation skills Develop subject-specific preferences & aversions Capable of critical thinking

Relevant Play/Behavior	Literacy skills begin around age 5 Understand meaning of words used by toys Can mentally work through problems & questions Enjoy practicing intellectual abilities & acquiring facts Fine motor skills are well developed	Desires more complex & realistic-looking learning products, rather than plastic replicas Ready for skill-specific toys Literacy & math calculations are emerging skills	9-year-olds are realistic, responsible, self-conscious & competitive; interested in biographies, ancient times & other cultures At 10, enjoy learning new things & memorizing facts; establish preferences for subjects At 11, preferences for subject matter is definite At 12, thinking is more adult-like; able to generalize and theorize; able to conduct scientific experiments
Examples of Products	Simple electronic teacher toys (cont'd) Learning products that teach colors, shapes, letters & sounds, numbers & counting (cont'd) Magnets, flashlights, scales, focus-free microscopes, magnifying glasses & prisms Color mixing equipment, alphabet ink stamps Thermometers & stethoscopes Speedometers/pedometers Models of solar system; rock/shell collections or kits, animal habitats Telescopes, binoculars See-through clocks Simple calculators Functioning toy keyboards Science experiments with few steps Cameras with view finder function Alphabet magnets Abacuses	All examples from previous age group Learning products that teach literacy, numeracy, & science Astronomy models Science kits: chemistry sets, weather forecasting kits Microscopes with slides & dissecting accessories Measuring tools like rulers, protractors, & compasses Educational mats/crayons with content about solar system, geography, history	All examples from previous age group History Geography Standard keyboards & calculators

* One of the most influential characteristics for these products

TECHNOLOGY PLAY

Today, children are digital natives, with technology present in their lives from infancy through adolescence. In 2017, it was estimated that children between the ages of 0-8 years old spend more than 2 hours each day with television, DVDs, computers, video games, and mobile devices. It is through these devices that children are able to access games, music, programming, as well as fully use features of toys that are compatible with these devices.

It should be noted that the 2016 American Academy of Pediatrics (AAP) guidelines suggest that children under the age of 18 months should not use screen media (*i.e.*, mobile devices, television, computers, or video games), except for video chatting (AAP, 2016a). Furthermore, it is suggested that children 18-24 months should consume high-quality programming only with a parent present. As such, parents should be prudent in regulating the amount of time that children spend with screens. Likewise, for children ages 5-18 years old, the 2016 American Academy of Pediatrics guidelines suggest that parents should ensure that their child exercises for an hour a day and sleeps 8-12 hours a night, and to make sure that media use does not cut into those two essential activities. They also suggest that children and adolescents avoid screen use before bedtime or in the bedroom, and encourage parents to be involved in their child's online habits to prevent online predators.

Technology is rapidly changing. For example, between 2011 and 2017, the number of families with a tablet jumped from 8 percent to 78 percent. In 2011, 38 percent of 0- to 8-year-olds had used a smart mobile device, and in 2017, this statistic was 95 percent (Common Sense Media, 2017). As such, we recommend that this section be updated frequently as new technologies enter the market.

Smart Toys & Educational Software (p. 265)

- Academic software
- Computer games
- Digital manipulatives
- Interactive pets
- Internet connections

Audiovisual Equipment (p. 277)

- CDs/mp3s of lullabies or nursery rhymes
- Children's movies
- Children's CD players
- Folk/cultural, pop/rock, classical music
- Karaoke machines
- Music boxes

- Portable CD Players & headphones
- Silly songs/word plays/finger plays
- Sing-a-longs
- Television shows/streaming programming

Computer & Video Games (p. 293)

- Cartridge type consoles
- Hand held computers
- Internet games
- Mobile apps on touchscreen devices
- Software
- Traditional computer platforms

SMART TOYS & EDUCATIONAL SOFTWARE

The technology boom has brought to the market a new kind of toy: an interactive, electronic, computerized, "smart" toy. This technology has fostered a new kind of play. Smart toys are toys that can respond to the user's play actions through sound, voice recognition, visual effect, or movement. This new line of toys has various levels of sophistication, but essentially a smart toy is computer chip-based. Unlike simple battery-operated toys from past generations, smart toys and educational software/applications interact in more creative ways with the user. They also connect to computers through an Internet connection, or a cord right into the computer, for increased personalization and ability to respond to the user.

Cognitive abilities, those higher-order mental processes, like reasoning and problem solving, are present at birth. At first, understanding is gained through sensory experiences with the environment, then later, through abstract reasoning and thought. However, even though learning begins at birth, it does not mean that smart toys and computer software/applications are appropriate for newborn children. Some smart toys that record the child's voice and pass this information along to remote servers may create security concerns and should be taken into consideration during the product design phase. Like learning products, smart toys and educational software/applications have anticipated uses, specific goals, and particular types of play objectives. They are appropriate only for children who have reached an appropriate level of cognition for such elements of play. Children younger than 2 years of age lack the physical, cognitive, and visual abilities necessary to interact with toys or computer software/applications in expected ways; toys for those children are discussed in *Exploratory and Practice Play: Mirrors, Mobiles, & Manipulatives* or *Technology Play: Computer & Video Games*.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of smart toys and educational software/applications:

- Sensory Elements
- Motor Skills Required
- Education
- Level of Realism/Detail
- Materials

The order of the characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of smart toys and educational software/applications are appropriate and how a particular age group plays with these toys.

2 Years

Two-year-olds are cognitively and physically capable of interacting with simple smart toys and software programs/applications. They have developed the ability to remember past events up to a day, to concentrate and focus on one task for a limited time, and to attend to as many as three directions at once. The cause-and-effect relationships they began to understand at 12 months are now fully developed, so toys using this skill are engaging. Children in this age group can use four- or five-word sentences. They can recognize and identify almost all common objects and pictures, and enjoy matching or naming objects and shapes. Activities like these strengthen their visual discrimination skills. They also can understand the physical relationships between objects, like knowing that something is “on” or “under” another object. The purpose of numbers in counting objects is starting to become understood, so they can now comprehend the concept of “two.” Children in this age group are also beginning to understand simple time concepts, such as knowing that one thing comes after another. Asking questions, generally in the form of “why,” is a high-frequency behavior for this age group. Children in this age group find enjoyable simple smart toys and software/applications that teach colors, shapes, animals, letters and sounds, and numbers.

Lovable characters from video and television are popular mobile applications or software packages for children in this age group because children in this age group have developed the ability to remember events. Children enjoy listening to simple stories at this age, so software or mobile applications that incorporate story lines are engaging. They also enjoy having an experience repeatedly, as such predictability provides a sense of security. Appropriate software or mobile applications for this age group include a great deal of music and visual engagement opportunities. Their interest is held longer when the software/application is energetic and rich with sensory elements, such as music, moving characters, blinking lights, and speech. Mobile

applications that offer real-time, contingent feedback to the child are even more engaging and can help the child learn content from the screen. Software programs and mobile applications that have big, bright-colored animation and require simple responses from the child (*e.g.*, using the space bar only, or touching large areas on a touchscreen) are appropriate. Hand-eye coordination is still developing, so software that employs a large, slow cursor or arrow indicator with a large margin of error for pointing accurately may be usable by children in this age group. However, it is best if children can access the software on a touchscreen device, which is easier for children to manipulate at this age.

Children of this age are interested in animals, vehicles, and places like the beach or the zoo. Software and applications that have heavy emphasis on traditionally formal academic areas (*e.g.*, literacy and numeracy) are inappropriate, but visual discrimination skills, such as matching colors and shapes, are age appropriate. Children in this age group are generally farsighted and are still developing their binocular vision. Therefore, they can view more easily larger print and pictures. Because children prefer red and yellow colors, suitable visuals for these toys are bright and based on primary colors. Children's attention spans are short, so appropriate visuals in software are those that offer variety in what they are presenting the child through the use of lots of movement, large characters, or energetic sound effects. Children stand to learn more new skills from a character onscreen if they initially bond with that character through the use of a plush toy (or a smart toy personalized for the child.

3 Years

Like 2-year-olds, 3-year-olds often ask "why" things are as they are. They have mastered some basic rules of grammar and can speak in sentences of five or six words. They can name most familiar objects and now understand the concepts of "same" and "different." They can correctly name some colors. Children in this age group understand the concept of counting and may know a few numbers. Suitable smart toys, software, and mobile applications teach colors, shapes, letters and sounds, and numbers.

Children in this age group also find lovable characters from video and television appealing, so software packages/applications associated with those characters tend to be popular. In this age

group, children will often prefer an item with a licensed character than an unbranded item. Children in this age group enjoy software that incorporates story lines, and they enjoy having an experience repeated. As with 2-year-olds, children in this age group enjoy software and applications that allow for music and visual engagement opportunities. Their interest is held longer when the software is energetic and rich with sensory elements, such as music, moving characters, blinking lights, and speech. Software programs/applications that have big, brightly colored animation and require simple responses from the child are appropriate. Programs that can offer an immediate contingent response to the child's input are most appealing. Hand-eye coordination is still developing, so software that employs a large, slow cursor or arrow indicator with a large margin of error for pointing accurately may be usable by children in this age group. However, it is best if children can access the software on a touchscreen device, which is easier for children to manipulate at this age. Children of this age are commonly interested in animals, vehicles, and places like the beach or the zoo. As with younger children, software or applications that have heavy emphasis on traditionally formal academic areas (*e.g.*, literacy and numeracy) are inappropriate; but visual discrimination skills, such as matching or naming colors and shapes, are age appropriate. Learning this type of content at this age has been found to be aided by a robot with a smart phone plugged into its head that is able to control the robot's movements to be more contingent to the child's input. Three-year-olds are generally farsighted and are still developing their binocular vision. Therefore, children in this age group can view more easily larger print and pictures. Due to children's limited attention spans, appropriate software visuals offer them variety in what they present through the use of lots of movement, large characters, or energetic sound effects.

4 Through 5 Years

Preschool children are ready for smart toys and software/applications and all the cognitive goals and requirements they bring. Children in this age group can understand how the smart toy should be used, and they know how to interact with the toy. However, they may not turn to the smart toy for help with problem solving and can become irritated by inappropriate or looped feedback. Dramatic play is at a high level, so interactive toys are appealing in that they "participate" in the play scenario. When playing with an electronic smart dog, about two-thirds of children in this age group attributed mental states, social report, and moral standing to the dog. Fine motor skills

are well developed, so small pieces that come with the toy present relatively little challenge. It should be noted that smart toys that connect to online services through computing networks should be checked for privacy concerns. Children will blindly disclose information to technology because they trust anthropomorphic toys, and children at this age have a poor understanding of what privacy means.

Formal academic skills are beginning to emerge around 5 years of age, so software that pertains to various domains of knowledge is appropriate. Concepts that are consistent with this age group's development include: colors, letter and sound recognition, letter writing, number identification, counting, matching quantities to numerals, shapes, comparison, directionality (concepts such as back/front, over/under, and in/on) and scientific thought about topics like space or biology. However, it should be noted that when parents read books to their children at this age, child comprehension of book content is often higher in a traditional paper format than an electronic format on a tablet. Preschool children can mentally work through problems and questions, so programs designed to have the user engage in logical thinking and classification are enjoyed. Children in this age group like to practice their intellectual abilities and acquire facts. Art-related software or applications are appealing. Drawing, coloring, and designing are largely enjoyed. Some programs for preschoolers may be aimed at familiarizing the child with the computer keyboard, or teaching musical concepts. Applications aimed at developing fine motor skills among this age group, however, have proved to be less effective than practicing with real objects that may help develop fine motor skills, such as scissors, threading, and lacing.

Preschoolers' interests are held longer when the software/application is energetic and rich with sensory stimulation like music, moving characters, blinking lights, contingent feedback, and speech. Software tied to television and movie media are enjoyed. Hand-eye coordination is well developed, so mouse use is appropriate. Like 3-year-olds, 4- and 5-year-olds are generally farsighted and are still developing their binocular vision. Therefore, children in this age group can view more easily larger print and pictures included in the software program. Viewing images can be different today, because a child could use the camera on a touchscreen tablet to look at a toy, and then "play" with the toy on a touchscreen device through a process called augmented

reality. At this age, children are able to master this type of application and enjoy playing with the game and will spend most of their time pointing, responding, and exploring.

6 Through 8 Years

Smart toy and educational software/application use with elementary-age children is very much the same as it is for preschoolers. The only difference is the level of complexity. Elementary-age children, particularly upper elementary, find realistic-looking smart toys more appealing than those that look like plastic toys for younger children. They prefer to interact with real-world objects rather than plastic replicas. At this age, children prefer smart toys that they can ask their own questions because they are aware when the toy appears to be repetitive or responding with looped audio.

Similar appeal applies to computer software and mobile device applications. The percentage of children in this age group using the Internet is growing; so software that has Internet tie-ins is appealing to them. Social interaction is a priority for elementary-age children; so software and applications that include friends, such as multiplayer games, are popular. Movies and music videos are high-interest items; so software/applications that include "trendy" and pop-culture elements are also desirable to children in this age group. Around age 7 or 8, many children develop a strong interest in competitive sports and games. Thus, computer sports games are appropriate. Children in this age group also have the fine motor skills and hand-eye coordination necessary for successfully participating in this type of software play.

Children in this age group are ready for skill-specific software programs/applications, rather than ones that focus on broad concepts used by preschoolers. Literacy is an emerging skill during these years, so software and applications that reinforce reading skills are appropriate. At age 6, children are still establishing the foundation of reading; by age 8, most are reading fluently and reading for content. Story-writing programs offer another option for developing literacy skills, but most word processing programs are too difficult for children in this age group to use. Simple programs/applications for learning to type are appropriate. Growing math skills include simple addition and subtraction in the early grades, multiplication, division, and fractions in the later grades. Software/applications aimed at working on math skills typically focus on these

mathematical functions. In addition, logical thinking, graphics, and music-writing programs are appropriate for the children who hold interests in these areas. If a child is interested in electronics and computer functioning, low-complexity software programs that teach the design of computing machines and familiarize the child with basic programming will be of interest.

9 Through 12 Years

Smart toys, mobile applications, and software that is appropriate for 6- to 9-year-olds remain appropriate for 9- through 12-year-olds. Most children in this age group can read fluently, add, subtract, multiply, and divide. With increasing frequency, their skills are approaching adult levels. Nine-year-olds are interested in things beyond their environment, like people's biographies, ancient times, and other cultures. In addition, they are capable of independent critical thinking. Similarly, 10-year-olds enjoy learning new things and memorizing facts. During this time, they begin to establish definite preferences for subject matter and reading material, largely due to subjects being explored more in-depth at school. By 11, definite preferences emerge for some school subjects over others. This trend continues through age 12, at which point their thinking is more adult-like. Software that expands on their specialized interests holds high levels of appeal. Abilities to generalize and theorize are present as well.

Children in this age group can use simple word processing programs. Special subject computer programs on spelling, geography, or political science may also interest them. High interests in computers may be addressed through software dealing with programming languages.

TECHNOLOGY PLAY: **SMART TOYS & EDUCATIONAL SOFTWARE**

Product Characteristics	2 Years	3 Years
Size of Parts	Small enough to handle, if expected to be grasped	
Shape of Parts		
Number of Parts		
Interlocking/Loose Parts		
Materials*	Computers running software are electric; adult supervision is needed	----------→
Motor Skills Required*	Software or application that requires simple responses from the child (like large spaces for input on a tablet or using the space bar only on a traditional computer) is appropriate	----------→
	Hand-eye coordination is still developing, so mouse use should be kept at a minimum	----------→
Color/Contrast	Big, brightly colored animation; preference for red & yellow colors (primary colors)	----------→
Cause & Effect	Understanding the cause-and-effect relationship is fully developed, so programs utilizing this skill are engaging and provide contingent feedback to children's input	----------→
Sensory Elements*	Interest held longer when software, application, or smart toy is energetic & rich with sensory elements like music, moving characters, blinking lights, & speech	----------→
	Includes a great deal of music & visual engagement	----------→
Level of Realism/Detail		
Licensed theme	Lovable characters from video & TV are popular software and mobile application packages	----------→
	If children can bond with a character through the use of a plush toy (or a smart toy personalized for the child) before seeing them present content onscreen, children stand to learn more new skills from that character onscreen	Children will sometimes prefer an item with a media character on it than a plain, undecorated item
Classic		

Robotic/Smart Features	Cognitively & physically capable of interacting with simple smart toys & software programs	----------→ Learning is aided by a robot with a smart phone plugged into its head that is able to control the robot's movements to be more contingent to the child's input
Educational*	Matching colors, shapes, & pictures Naming objects, shapes, & pictures Basic physical & temporal relationships between objects Basic counting	----------→ Naming objects, shapes, pictures, & colors ----------→ Numbers & counting Basic rules of grammar
Relevant Play/Behavior	Developed ability to remember past events, to concentrate & focus on tasks, & to attend to as many as 3 directions at once Fully developed understanding of cause-and-effect relationship Interested in animals, small vehicle toys, & places (like beaches & zoos) Generally farsighted, still developing binocular vision Short attention spans Enjoy listening to stories Enjoy having experiences repeated over & over	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ Enjoys repeating experiences Understands basic rules of grammar Understands numbers & knows a few
Examples of Products	Visual discrimination programs Simple smart toys Sing-along software Software and applications that teach colors, shapes, letters & sounds, & numbers Matching games/software Story-line software Software and applications that are related to transportation, animal, & place themes	----------→ ----------→ Software that teaches colors, shapes, picture/object names, letters & sounds, & numbers ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

TECHNOLOGY PLAY: **SMART TOYS & EDUCATIONAL SOFTWARE**

Product Characteristics	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials	Computers running software are electric; adult supervision is needed (cont'd)	----------→	
Motor Skills Required*	Fine motor skills are well developed, so small pieces with smart toy present relatively little challenge	----------→	----------→
	Hand-eye coordination is well developed, so mouse use is appropriate	----------→	----------→
Color/Contrast			
Cause & Effect	Understanding the cause-and-effect relationship is fully developed, so programs utilizing this skill are engaging and provide contingent feedback to children's input (cont'd)		
Sensory Elements*	Interest held longer when software, application, or smart toy is energetic & rich with sensory elements like music, moving characters, blinking lights, & speech (cont'd)	----------→	
	Includes a great deal of music & visual engagement (cont'd)	----------→	
Level of Realism/Detail*	A child could use the camera on a touchscreen tablet to look at a toy, and then 'play' with the toy on touchscreen device through a process called augmented reality	Find realistic-looking toys appealing	----------→
		Prefer real-world objects to plastic replicas	----------→
Licensed theme	Lovable characters from video & TV are popular software and mobile application packages (cont'd)	----------→	----------→
Classic			

Robotic/Smart Features	Capable of understanding the way in which the smart toy should be used & knowing how to interact with it Can become irritated by inappropriate or looped feedback. Begin to attribute mental states, social report, and moral standing to smart toys Smart toys that connect to online services through computing networks should be checked for privacy concerns. Children will disclose information to technology blindly because they trust anthropomorphic toys, and children at this age have a poor understanding of what privacy means	Capable of physically handling the components needed for playing software games, like sports activities ----------→ Prefer smart toys that they can ask their own questions because they are aware if the toy appears to be repetitive or responding with looped audio	----------→ ----------→
Educational*	Capable of concepts of: color, letter & sound recognition, letter writing, number identification, counting, matching quantities to numerals, shapes, comparison, science, & directionality	Ready for skill-specific software such as literacy (reading & writing) & math (addition, subtraction, multiplication, etc.) Interested in scientific exploration in anatomy, biology, chemistry, & astronomy	Most read fluently & master math skills Develop subject-specific preferences & aversions Capable of independent, critical thinking
Relevant Play/Behavior	Literacy skills begin around 5 Understand meaning of words used by toys & software Can mentally work through problems & questions Enjoy practicing intellectual abilities & acquiring facts Fine motor skills are well developed Dramatic play is at a high level	Percentage of children in this age group using the Internet is growing Social interaction is a priority Strong interest in competitive sports & games (around age 7-8) Desire more complex & realistic-looking learning products, rather than plastic replicas Ready for skill-specific toys Literacy & math calculations are emerging skills	9-year-olds are interested in biographies, ancient times, & other cultures 10-year-olds enjoy learning new things & memorizing facts; have preferences for subjects 11-year-olds' preferences for subject matter are definite 12-year-olds' thinking is more adult-like; able to generalize &theorize; able to conduct scientific experiments
Examples of Products	Interactive pets Digital manipulatives Programs that have the user engage in logical thinking & classification. Action based (boys) & animal/ human based software/applications (girls) Art related software/applications (drawing, coloring, designing); music Computer keyboard orientation software	Internet tie-in software/applications Software/applications that include friends, such as games & sports ----------→ Programs that teach: literacy, numeracy, science, writing, keyboard use, & music. Story writing programs ----------→	All examples for previous age group Basic word processing programs Software/applications extending specialized interests Subject-specific computer programs on spelling, geography, or political science. Software/applications teaching programming languages for sports, games, & software

* One of the most influential characteristics for these products

AUDIOVISUAL EQUIPMENT

Children play with audiovisual equipment differently, depending on their age. The volume level, length of the video program, visual images, language presentation, and content/theme represented in the music or show, determine the age for whom the audio and video elements are appropriate. Audiovisual equipment can be appropriate for children of all ages, but parents must operate this equipment for younger children. The following discussion describes in detail how various age groups engage in audio/video play and what types of music and visuals are appropriate for those ages. These descriptions do not, however, apply to computer or video games. Those types of visuals are addressed in the *Computer & Video Games* subcategory.

One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of audio/video equipment:

- Sensory Elements
- Length of Video or Audio Track
- Level of Realism/Detail
- Level of Complexity

The order of the above characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of audiovisual equipment are appropriate and how a particular age group plays with this equipment.

Birth Through 3 Months, 4 Through 7 Months

Much research has been conducted to discover what newborn children can hear. Children react with distressful behaviors to loud and sudden noises and to changes in the volume of audio/video equipment. Young children prefer to listen to sounds that fall within the frequency range of the human voice, so they will prefer listening to a human voice over a bell. Low tones are found to be more effective in quieting children, whereas higher tones tend to distress them. Children

especially enjoy gentle repeated rhythms and exaggerated speech sounds. For example, children less than 3 months old enjoy “heartbeat” rhythms.

Children use their discriminative sensitivities to distinguish speech sounds as early as 1 month of age. Between the ages of 3 and 6 months, the infant can localize sounds, babble, and make singing sounds with adults. Children between 4 and 7 months of age can tell the difference between a lullaby and an adult-directed song, even when the song and lullaby came from a foreign culture. Seven-month-olds can distinguish sentence tunes, imitate sounds and sound sequences, and make singing sounds to music. Therefore, audio equipment with soft, rhythmic, or human voices are more appropriate than audio equipment with loud, jarring sounds. Audio equipment that includes language that children can imitate or accompany is appropriate. Children in this age group are attracted to Internet streaming audio, mp3s, CDs, or other audio sources of lullabies, simple songs, rhythms or nursery rhymes that have gentle, predictable sounds and are played at low volumes. Music boxes wound by an adult are also appropriate.

A newborn’s visual acuity is about 20/400 to 20/800, which means that a newborn sees the same level of detail at 20 feet that a normal-vision adult can see at 400 to 800 feet. By 3 months of age, acuity improves to around 20/100. Children younger than 1 month old have eye lenses that do not vary in their focus on distance, a process called visual accommodation. Rather, their lenses seem to be fixed for optimal focus at a distance of about 8 inches. Visual accommodation improves between 1 and 3 months of age and is almost adult-like by the time children are 6 months old. Research studies also explain that children can differentiate red from green—even at birth—and that by 2 months of age, all color receptors are functioning. By 3 months, children prefer yellow and red to blue and green and favor patterns over solids. Due to children developing vision capabilities and limited range of vision, video play is generally not appropriate. However, these children will watch television and videos that are geared toward them.

8 Through 11 Months

Eight- through 11-month-olds enjoy participating in finger-play, sing-song games, such as “So Big,” “This Little Pig,” and “Pat-a-Cake.” Audio equipment that includes language that children

can imitate or accompany is appropriate. Internet streaming audio, mp3s, CDs, and other audio sources of lullabies, simple songs, rhythms or nursery rhymes that have gentle, predictable sounds and are played at low volumes are appealing. Music boxes wound by an adult are also appropriate.

12 Through 18 Months, 19 Through 23 Months

Children in this age group become increasingly mobile. Once they start walking, they start dancing; at earlier ages, this is mostly in the form of bouncing. With time, bouncing to music develops into running, twirling, hopping, clapping, and foot stamping. Children enjoy upbeat music that stimulates their internal drive to move, bounce, rock, and dance. Dancing also helps them develop physical coordination, balance, muscle strength, and dexterity. They enjoy moving to music, which makes finger-play songs, “point-to” songs, and rhythm instruments popular.

Children in this age group’s sensitivity to sounds has now improved to adult levels. While younger children can hear better at low than high frequencies, the auditory sensitivity of children in this age group has improved more for higher than for lower sounds and is as good as an adult’s. Therefore, increasing the range of auditory stimuli is appropriate during this age. Around 12 months of age, children try to sing to themselves and can listen to rhymes and jingles. As they approach 2 years, they try to repeat nursery rhymes. Just as they were in infancy, children are interested in sounds and repetition. Children have developed the fine motor skills necessary to operate a hand-cranked music box, but they cannot manipulate wind-up models.

At this age, children are very interested in visual screens. They begin to learn how to use and manipulate the buttons on a mobile touchscreen device, and depending on the size of the device, are able to hold it in their hands to access programming. At this age, children especially enjoy the contingent interaction of video chatting.

2 Years

Two-year-olds enjoy participating in vocal activities, particularly singing. Although their efforts are often off-pitch, they try to sing along in nursery rhymes and songs. Audio play continues to be a time for them to dance, swing, run, gallop, twirl, bounce, clap, play instruments, and

experiment with their voices. They like to perform by doing dances, somersaults, and "tricks." They frequently seek attention for their dance moves by first saying, "Watch this!" They love music and playing along with rhythm instruments. They also enjoy simple stories read from picture books or CDs, Internet streaming audio, and mp3s.

Exposing children to a wide range of music styles is suitable to help them develop preferences and tastes. This is also a time of growing language capabilities; so music that has lyrical rhymes, simple rhythmic tunes, and repetitions of words and beats are appropriate to aid in their developing skills. Nursery and other simple rhymes CDs, Internet streaming audio, and mp3s are also appropriate. Children in this age group often listen to music and dance as a social activity; so appropriate music is danceable (*i.e.*, it has simple rhythms to move to), lyrical, and has a range of high and low frequencies.

Visual play for children is very much connected to their auditory play. Appropriate programs (available through broadcast television, streaming services, and DVDs) for this age group include a great deal of music and movement opportunities. Mobile touchscreen devices make access to these programs especially simple because they are portable and easy for children to hold and operate. Through these devices, children can access a wealth of audio and visual content through Internet streaming and subscription-based video and music services. Children may prefer red, yellow, and other primary colors, but suitable visuals can include pastels and other colors. Attention spans are short for children; so appropriate visual play media offer variety in what they are presenting the child. For example, they may have the child spend some time moving, some time listening, and some time singing. Children have developed the ability to remember events, so media programming often focuses on lovable characters for children in this age group. These licensed characters are often available on toy store shelves, which is highly appealing to these children. Reading books based on these characters also becomes a favorite form of visual play. At this age, children enjoy listening to simple stories and looking at books by themselves, so these toys are appropriate (see *Educational & Academic Play: Books*). Children at this age love to watch the same program or video repeatedly, finding the predictability a security of their environment. They like to sing along with the show and will frequently sing the songs to themselves.

3 Years

During the preschool years, children are developing greater skills related to audiovisual play; consequently, they have a greater range of interests than younger children. Their sense of hearing is well developed by this age, but their ability to perceive subtle phonological distinctions in sounds, such as consonant blends (this is necessary for mastering the phonetic combinations of language), is not developed until about age 6 in most children. This is why words are frequently mispronounced, even with repeated correction by adults.

Music play is beneficial for children's developing auditory/language skills. Songs that have rhymes and word plays help them hear words in a variety of ways, and with repeated exposure, they can self-correct their mispronunciation. Preschool children enjoy listening to songs that pertain to familiar events, and they enjoy hearing them repeatedly. Three-year-old children enjoy playing with words and silly rhymes and can remember the words of many songs.

Singing, dancing, and playing instruments along with music are highly appealing activities. Preschoolers enjoy rhythm instruments and like dressing up for dancing. In addition, their sense of humor is becoming more refined, so silly songs are appealing. Folk songs, finger plays, rhythmic music, music for dancing, and recorded stories about animals, adventures, and other places are popular among this age group. Preschoolers are cognitively and physically capable of operating simple mobile applications to play music, CD/mp3 players, and radios designed for children. Microphones and blank CDs for personal recordings are highly appealing as well. Children at this age will enjoy singing tunes that they already know. Although these pieces of audio equipment are attractive and appropriate, children in this age group may use these toys inappropriately as they experiment with and investigate their use. For example, children in this age group might bang the toy on other surfaces, pry open compartments on the toy, or try inserting other objects into the toys. Preschool children have the fine motor skills necessary to manipulate wind-up music boxes, but adults must consider the appropriateness of individual music boxes because some are fragile and more suitable for older children.

Video play for preschoolers is very similar to that of younger children. They enjoy watching familiar programming that stars their favorite character. Three-year-olds' attention spans have

increased, and they incorporate their love of music into their visual play. Appropriate shows use music as a primary way of communicating with these young viewers. Video programming targeted at this age group is leaning toward more academic content like counting, vocabulary, alphabet, and abstract concepts such as opposites. Three-year-olds enjoy repeating words to the characters they are watching and retelling what they watched, which strengthens comprehension and memory skills.

4 Through 5 Years

Four-year-olds can play simple singing games, can recognize and sing songs in their entirety, show an increase in voice control, and are more able to sing on pitch than younger children. Four-year-olds also find dramatic songs appealing and will make up songs during their play. They love to move to music and may give dramatic performances. Five-year-olds can recite or sing rhymes, jingles, television commercials, and other songs using a microphone; enjoy the mastery of melodies and tunes; sing well, work together, and follow the beat of music; act out a story in dance form and enjoy dressing up while dancing.

This age group enjoys watching familiar video programming that stars their favorite character. Their attention span has increased, so visual things can move a little slower. Appropriate shows use music as a primary way of communicating with these young viewers. Video programing targeted at 4- and 5-year-olds leans more toward academic content, such as counting, vocabulary, alphabet, and abstract concepts like opposites. Four- and five-year-olds enjoy problem-solving questions presented during the shows. Action-based shows are highly popular, and action heroes who are victorious over the “bad guys” and can be personified in dramatic play carry a great deal of appeal. Video equipment related to video games is discussed in *Technology Play: Computer & Video Games*.

6 Through 8 Years, 9 Through 12 Years

Elementary-age children have qualitatively different music preferences than preschoolers. Appropriate music for children in this age group depends on their tastes, although lyric consideration is warranted. By 6 and 7 years of age, interest shifts from nursery-rhyme, sing-a-

long-type music, to pop/rock music, rhythm band activities, and singing in a group. Songs sung in kindergarten classrooms are considered “babyish” to first graders, who are largely interested in the latest pop star’s music or more adult-appropriate varieties of music. This trend continues, although music tastes and preferences tend to change throughout childhood. Individual preferences in music are the rule; some children like popular music, some like classical music, some like folk music, some like musical comedies, some like “introduction to orchestra” music, and some like none. They all, however, largely enjoy dancing. Because they now have the cognitive capabilities for abstract thought, they can participate in interpretive dance, like representing fire, storm, and birds, through their movements. Other forms of appealing music are also connected to dance: folk songs for folk dance, songs with clapping and shouting, and fast music for skipping, galloping, and step clapping. Music or dance lessons and exposure to different kinds of music may affect the child’s interest.

Plastic audio players are replaced with “real” equipment, including digital music players, CD players, headphones, and stereos. Karaoke machines with CD, microphone, and visual display screens are highly appealing as well. The development of reading and social skills allows these children to make use of printed lyrics shown on a screen. Digital recording and playback capabilities for children to record their own stories, songs, instrument playing, or variations of all three, are also appealing. Children in this age bracket are cognitively and physically capable of operating audio equipment to make their own recordings. For general audio play, children in this age group can operate digital or Internet-connected music players. Instruction by adults may be necessary for more complicated systems.

Books and long recorded stories are also appealing because children at this age still enjoy being “read” a story (see also *Educational & Academic Play: Books*). Listening to these recordings is beneficial because it increases their auditory perception abilities and their auditory receptivity; that is, being able to remember things they hear rather than see. Appealing books for them to listen to are often based on themes. Fairy tales and make-believe are popular with the early elementary-grade children, while topics of magic, the world, animals, mysteries, and “kids just like them” are appealing to older elementary-grade children.

As with music, video play varies according to children's interests. The television and movie industry provide age ratings for their products according to the age appropriateness of content; but like music, adult supervision is necessary to determine age appropriateness. Viewing preferences with school-age children tend to move from animation to actors and from cartoons to humans. Content matter also changes. They enjoy watching adventure-based stories, situational comedies/dilemmas, and characters close to their own ages. Children in this age group can operate televisions, streaming services, and DVD player systems with proper adult instruction. See the *Technology Play: Computer & Video Games* for video equipment related to video games.

TECHNOLOGY PLAY: **AUDIOVISUAL EQUIPMENT**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts			
Materials			
Motor Skills Required			
Color/Contrast	By 3 months, children prefer yellow & red to blue & green; prefer patterns to solids	----------→	----------→
Cause & Effect			
Sensory Elements*	Prefer sounds that fall within the frequency range of the human voice Low tones are effective in quieting babies; high tones are distressful Enjoy gentle repeated rhythms, like heartbeats, & exaggerated speech sounds React in distressful behaviors to changes in volume & sudden loud noises	----------→ ----------→ Can differentiate between a lullaby & an adult-directed song (even if from foreign culture)	----------→ ----------→ Can differentiate sentence tunes, imitate sounds & sound sequences
Level of Realism/Detail			

Licensed theme			
Classic			
Robotic/Smart Features			
Educational			
Relevant Play/Behavior*	Sensitive to sounds due to fluid in middle ear. Capable of distinguishing speech sounds as early as 1 mo. Beginning to localize sounds, babble, & make singing sounds with adults by 3 mo. Visual acuity at birth is 20/400-20/800; by 3 mo. improves to around 20/100 At birth, focus is best about 8 inches from face; by end of this period can see several feet away By 2 mo., all color receptors (blue, red, & green) are functioning.	----------→ Fully capable of localizing sounds, babbling, & making singing sounds with adults. Visual accommodation is almost adult-like by 6 mo.	 Can discriminate sentence tunes, imitate sounds, & sound sequences. Makes singing sounds to music; enjoys finger-plays & sing-songs.
Examples of Products	Audio that includes language that can be imitated Lullabies, simple songs, rhythms, nursery rhymes Gentle, predictable sounds played at low volumes Music boxes (wound by adults) Video equipment not appropriate but will watch television & videos	----------→ ----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→ ----------→

* One of the most influential characteristics for these products.

TECHNOLOGY PLAY: **AUDIOVISUAL EQUIPMENT**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts			
Shape of Parts			
Number of Parts			
Interlocking/Loose Parts	Loose parts that can be used in their dancing & singing (like instruments)	----------→	----------→
Materials	Enjoy having a variety of materials to use in their audio play like rhythm instruments	----------→	----------→
Motor Skills Required	Has the fine motor skill needed to operate a hand-cranked music box, but not the wind-up kind	----------→	----------→
Color/Contrast	Prefers red & yellow; visuals are bright & based on primary colors		
Cause & Effect			
Sensory Elements*	Enjoys upbeat music that stimulates their internal drive to move, bounce, rock, & dance	----------→	----------→
	Hearing capabilities are at adult levels, so increasing range of auditory stimuli appropriate	----------→	----------→
	Interested in sounds & repetition	----------→	----------→
	Auditory elements need to be present in visual play	----------→	----------→
Level of Realism/Detail			
Licensed theme	Children have developed the ability to remember events, so they desire toys representing characters from video & TV programming	----------→	----------→
Classic			

Robotic/Smart Features			
Educational			
Relevant Play/Behavior*	Emerging mobility = dancing/bouncing	Dancing = bouncing, running, twirling, hopping, clapping, foot stamping	Likes to perform dances & somersaults
	Enjoy finger-play & “point to” songs	----------→	----------→
	Rhythm instruments are appealing to include in play	----------→	----------→
	Around 13 months they try to sing to self	----------→	Sings along in nursery rhymes & songs
	Listens to rhymes & jingles	----------→	----------→
	Interested in sounds & repetition	----------→	Enjoys vocal activities, particularly singing
	Can physically manage hand-cranked music box	----------→	----------→
	Growing language capabilities	----------→	----------→
	Visual play connected to auditory play	----------→	----------→
	Capable of remembering events	----------→	----------→
	Enjoy listening to simple stories & looking at books by themselves	----------→	----------→
	Want to watch the same program repeatedly; find predictability as a security	----------→	----------→
	Begin to learn how to use and manipulate the buttons on a mobile touchscreen device	----------→	----------→
Examples of Products	Danceable, lyrical music that has a range of high & low frequencies	----------→	----------→
	Simple recorded stories	----------→	----------→
	Hand-cranked music box	----------→	----------→
	Musical rhythm instruments	----------→	----------→
	Sing-a-longs, nursery rhymes & lullabies	----------→	----------→
	Videos that feature “lovable” characters	----------→	----------→

* One of the most influential characteristics for these products.

TECHNOLOGY PLAY: **AUDIOVISUAL EQUIPMENT**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts				
Shape of Parts				
Number of Parts				
Interlocking/Loose Parts	Loose parts: instruments, music boxes, portable equipment	----------→	----------→	----------→
Materials				
Motor Skills Required	Has the fine motor skills necessary to manipulate wind up music boxes Physically capable of operating CD/DVD players, digital music players/ applications, & radios	----------→ ----------→	----------→ ----------→	----------→ ----------→
Color/Contrast				
Cause & Effect				
Sensory Elements*	Hearing is well developed Inability to perceive subtle phonological distinctions in sounds, such as consonant blends	----------→ ----------→	----------→ Able to perceive subtle phonological distinctions	----------→ ----------→
Level of Realism/Detail*			Prefer “real” equipment & live actors	----------→
Licensed theme	Popular TV & video characters	----------→	Popular TV, video, movie, music stars	----------→
Classic				
Robotic/Smart Features				

Educational				
Relevant Play/Behavior*	Enjoy singing, dancing, & playing instruments Sense of humor; enjoy word play & silly rhymes Capable of operating simple CD or digital music players & microphones Enjoy repeated exposure to songs & videos Remember the words of many songs Develop favorite characters in shows Increased attention span Repeat & retell events; enjoy repeating words to characters on TV/video Understand commercial advertising	----------→ ----------→ ----------→ ----------→ ----------→ Can play simple singing games; find dramatic songs appealing Can recognize, recite, & sing songs, rhymes, TV commercials, jingles, etc., in their entirety Enjoy the mastery of melodies & tunes Show an increase in voice control & are more capable of singing on pitch than younger children Make up songs during play Love to move to music, act out a story in dance form, & give dramatic performances Follow beat of music; enjoy dressing up while dancing Like to answer problem-solving questions on video programming	Shift in music interests Capable of abstract thought, so can perform interpretive dance Desire "real" audio equipment. Enjoy books on tape Movies, TV & music videos are appealing Enjoy watching adventure-based stories, situational comedies/dilemmas, & characters close to their own ages Capable of operating television, streaming video, & DVD systems Enjoy dancing	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→
Examples of Products	Folk/cultural music Silly songs, word plays, finger plays, action songs Recorded stories Simple CD players & radios Microphones & blank CDs, karaoke Musical instruments, wind up music boxes Performance costumes Public television shows, classic children's movies, cartoons Action-based shows	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→	All examples in previous age group Pop/rock, rhythm band, & group singing music Audio books Portable CD/digital music players & headphones Interpretive dance costumes Situational comedies, music videos, live actors Digital recording and playback capabilities, for children to record their own stories, songs, instrument playing, or variations of all three, are also appealing	All examples in previous age group

* One of the most influential characteristics for these products.

COMPUTER & VIDEO GAMES

Computer-based products are very popular for adults and children, and those designed for children are evolving quickly. Therefore, the guidelines for these particular toys may require regular updates and include information on both current and potential applications of computer technology. As of 2016, the American Academy of Pediatrics (AAP) suggested that children under the age of 18 months should not use screen media (*i.e.*, mobile devices, television, computers, or video games), except for video chatting (AAP, 2016a). Furthermore, they suggested children 18-24 months consume high-quality media programming only with a parent, and children older than age 2 not consume more than an hour of screen time each day. With that said, children's products and toys in this category for infants and toddlers will continue to exist, and as such, we have included some guidelines here.

Computers are often used to play games, but they also can be used to produce a wide variety of responses, such as playing digital music and films, as well as playing with a wide range of software. All are attractive to a wide age range of children. Because computer technology is changing rapidly, these guidelines define a computer rather broadly to cover the wide range of potential computer uses for children. A computer consists of three basic elements: an input device, an output device, and a processor to adjust the output based on the input, all of which can be part of a single device like a tablet, or multiple, separate parts, like a computer with a separate monitor, keyboard, and mouse.

An input device for a desktop or laptop computer is typically a keyboard and mouse. Input devices for a touchscreen tablet or mobile device are the user's fingers and hands. However, computers are easily modifiable to adjust to nearly all users. Extremely sensitive input devices that detect small movements exist to make computers accessible for all ages. For example, an input device incorporated into an infant's pacifier can detect sucking and change the output, depending on whether the sucking has started or stopped. Input devices for computers can be in remote locations away from the computer and can take a number of forms, like a plush animal or figurine. For more complex activities, the input device will be more sophisticated. Keyboards, joysticks, and handheld controllers allow for more complex input. These become more appropriate for older children who have the physical and cognitive skills required to use them.

The output device is typically a screen (for visual output) or speakers (for audio output). The processor for a computer generally is based on the software or mobile applications in use on the computer. Software and applications for children may include simple cause-and-effect activities, games, observational programs, and educational software.

Computer-based products appeal to many ages. They are interactive and multisensory, so they will appeal to children in a number of ways. Some scholars argue that a touch-screen tablet device has most of the features of traditional toys (*i.e.*, they can respond to something the child has done, they can promote joint attention between child and parent, and they are highly portable). The scholars also mention that a touchscreen tablet has features that traditional toys do not usually have (*i.e*., they are tailorable to the child's needs and preferences, and the child can stop playing and easily arrive where he/she left off). Additionally, some parents view certain computer-based products as educational, which appeals to parents who want their children engaged in an activity that can promote learning. One should place primary emphasis or importance on the following characteristics when determining the age appropriateness of computer and video games:

- Sensory Elements
- Cause & Effect
- Licensed theme
- Motor Skills Required
- Educational

The order of these characteristics does not necessarily indicate priority because this can change with age. The remaining discussion describes the relationship between the characteristics of these toys and the characteristics of children in various age groups. This includes a description of what types of computer and video games are appropriate and how a particular age group plays with these games. Parental supervision is generally required for children under 3 years of age because most computers have been designed for use by adults, not by children.

Birth Through 3 Months

At this age, children learn mostly through reflexes, such as spontaneous kicking and arm movements. Input devices that can detect the movements and reflex actions of this age group—like arm and leg movements, sucking, or sounds like crying—can be used to adjust output devices. Output for this age group could include sound systems that play recorded sounds like the mother's voice or other soothing sounds based on reception from the input device. Other appropriate output could include projection screens that display slow-moving, distinct-colored patterns in the infant's visual range—about 8 inches from the face in the first month, and several feet away by the end of this age period—or that focus and un-focus, depending on the actions of the infant. The most appealing projection patterns would emphasize high-contrast colors that children birth through 3 months of age can differentiate, such as red and green, or black and white. Faces also are especially attractive to children in this age group. Appropriate output devices are limited to one or two events to let children make the connection between their actions and the response of the output device.

4 Through 7 Months

Children ages 4 through 7 months are engaging with the environment in more systematic ways. Their movements are also much more sophisticated, which allows for a greater range of input devices. Input devices that allow for patting, grasping, pulling, and squeezing can be appropriate for this age. These input devices can be embedded in plush toys; such a device could adjust a screen, turn on lights, or play recorded sounds. Mouthing is also a characteristic of this age group, so input devices that can detect and react to mouthing are appropriate for this age group. A low number of output events will minimize confusion about cause-and-effect relationships for children in this age group.

8 Through 11 Months

Computers could be designed to take advantage of the increased mobility of 8 through 11 month-old children. These children can hold and shake an input device. Devices that adjust their response, depending on the child's input, can challenge an infant to be persistent in trying new action schemes on the device. Mouthing is still common at this age, so appropriate input devices

are designed to be mouthed and may even respond to mouthing. Children of this age are beginning to understand cause-and-effect relationships. Therefore, the number of potential output events can be increased, so individual changes in input can be associated with individual outputs. For example, banging may bring a sound, while shaking may cause the projection of different patterns of colors. Children in this age group can sit unsupported and stand with support, so projection screens can be moved to the vertical position.

12 Through 18 Months

Children 12 through 18 months of age are very curious and are interested in exploring their environment. Most children begin walking unsupported at this age and can approach popular and familiar objects, which could include computer projection screens. Input devices for this age group can have multiple buttons that produce different responses when pressed. Suitable input devices are durable and are able to withstand heavy use. Vertical screens are appropriate for this age, as are output devices that produce sound and movement.

19 Through 23 Months

Children 19 through 23 months of age are more coordinated walkers. They have mastered cause-and-effect responses and are very interested in coordinated multisensory responses, including sound, movement, and visual responses. Symbolic play begins to emerge at this age, which allows for computer outputs that have some sort of pretend element. Computer characters that talk and act, based on inputs, are appropriate for this age. Children are becoming aware of familiar licensed characters and will respond to them. A child at this age may also be able to respond to simple commands from the computer. For example, if the input device is a turtle, the computer could request, “Pat the head of the turtle.” The child could then respond to this action. Children in this age group are also comfortable using touchscreen devices and are able to respond easily to touch-sensitive areas on a screen.

2 Years

Two-year-old children are increasingly social, so interactive programs that can respond to children’s actions are appropriate. Children in this age group can recognize and are attracted to

popular characters from television and movies. They can follow simple instructions from an interactive computer. In addition, they enjoy watching projected stories and can use input devices to start and restart story-reading programs, mobile applications, and CD/DVDs. Children at this age can insert CD/DVDs into desktop and laptop computers, but the program needs to self-start because, on average, the2-year-olds will not be able to complete more than two or three simple commands on the computer, and cannot perform sequential actions. Because children interact with computers without concern for consequences, software for children should not allow the child to reset computer settings. Children in this age group continue to be able to use touchscreen tablet devices and are able to use their fingers to provide input.

3 Years

Three-year-olds are beginning to take an interest in computer games. They enjoy looking at action on the screen. Computer games that involve reading are generally inappropriate because most 3-year-olds cannot read. Children in this age group can use a mouse, but double- and triple-clicking or differentiating right and left mouse-button clicking is difficult for this age group. However, children in this age group can activate touchscreen devices with ease using their fingers as an input device. In general, 3-year-olds cannot use a traditional keyboard to input information into the computer, other than having the keyboard respond to all key presses in the same way. Three-year-olds understand basic rules of games, like turn taking. However, activity games without a specific goal are best for this age group. Painting and drawing games are popular as well. Book reading programs and simple matching games are also appropriate for this age. Children at this age are interested in cause-and-effect games like “what happens when I push this button.” Most children can interact with simple academic-type games at this age, although children in this age group do not prefer them. Games based on popular licensed characters are also appealing. Parents prefer characters that are based on “safe harbor characters,” which are non-violent, non-sexual, and are often based on children’s cartoons or books.

4 Through 5 Years

Four- to five-year-old children have a growing interest in computers. Four-year-olds exhibit greater skills with the mouse and can recognize simple icons like “page turning” and “quit” to

navigate a program. Although most 4- and 5-year-olds are developing their reading abilities, they generally cannot use written directions. Activity games with a physical component are still very popular with this age group. Four- and five-year-olds can use keyboards, along with a mouse, to navigate, but this is often a slow method of input. Touchscreen devices, as input devices, continue to be easier to use than a computer with a keyboard and mouse. Children in this age group remain interested in simple painting and drawing programs, book-reading programs, and simple multimedia development. Prototypical toys show children in this age group enjoy interacting with a laptop, if a toy goes along with it as the input device (*e.g.*, an RFID tag inserted into the toy that would activate the images on the laptop), with children intrigued by the immediate contingency of the plush toys to something onscreen. This age group is interested in the creative aspect of computers, like drawing or painting; and they are also interested in the fantasy or pretend element computers offer, like interacting with story characters. Children at this age have the fine motor skills and visual discrimination to use simple console and handheld computer games, but they find it difficult to coordinate movement between their two hands; they can focus on only one hand and one aspect at the same time.

6 Through 8 Years

Computer games for children in this age group are increasingly sophisticated. Children in this age group can use a joystick or handheld controller to avoid moving objects, and can use both nested navigational systems and exploratory programs. Six- through 8-year-olds are very attracted to console and handheld games. They can use both hands to use separate functions on the computer, and they can focus on more than one element at a time. Games that have multiple players are also popular with this age group. Children in this age group continue to enjoy creative games like drawing and painting and multimedia creation. They enjoy technological games and narrative games with a pretend or fantasy element, especially action characters and games based on popular licensed characters from cartoons. They also enjoy traditional games converted to computer play, like chess and checkers. Research suggests that comprehension of new facts at this age is the same, regardless of whether the child played the game on a touchscreen tablet application or face-to-face with a researcher. Children in this age group are beginning to learn to navigate the Web, so games with Web elements may be appropriate.

9 Through 12 Years

Nine- through 12-year-olds are interested in complex games with complex subjects. This age group is interested in fashion, art- and music-creation games, and educational games, like multimedia activities. They enjoy games based on popular sports and activities, like skating, and complex fantasy games. They can navigate the Web easily, and depending on their experience, can have very sophisticated computer skills. Children 9 through 12 years old can use adult-type software, like word-processing and multimedia-development software.

TECHNOLOGY PLAY: **COMPUTER & VIDEO GAMES**

Product Characteristics	Birth Through 3 Months	4 Through 7 Months	8 Through 11 Months
Size of Parts	Small enough for infant to handle, if expected to be grasped	----------→	----------→
Shape of Parts	Rounded, no sharp edges	----------→	----------→
Number of Parts			
Interlocking/Loose Parts			
Materials	Lightweight Soft Sturdy Washable	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→
Motor Skills Required*	Reaching Grasping Mouthing/Sucking	----------→ ----------→ ----------→ Hand-eye coordination Able to sit up unsupported around 6 months Palmar grasping Can pass objects from hand to hand	Increased mobility (scooting, crawling, cruising, walking) ----------→ Practicing fine motor skills such as grasping, pushing, pulling, squeezing, patting, poking, & shaking Can grasp & shake Emergence of neat pincer grasp (thumb & index finger)
Color/Contrast	Brightly-colored with high contrast (*e.g.*, black & white, red & green)	----------→	----------→
Cause & Effect*	Cannot fully understand cause & effect, but can still enjoy it; prefers simple cause-and-effect relationships	----------→	Beginning to understand cause-and-effect relationship; simple, clear cause-and-effect relationships are still best

Sensory Elements*	Visual Manual Auditory	----------→ ----------→ ----------→	----------→ ----------→ ----------→
Level of Realism/Detail			
Licensed theme			
Classic			
Robotic/Smart Features			
Educational*	Programs that claim cognitive benefits (*e.g.*, classical music, foreign languages) appeal to parents	----------→	----------→
Relevant Play/Behavior	Finds multisensory elements very appealing Enjoys music Likes to explore objects manually & orally At birth, focus is best about 8 inches from face; by end of this period can see several feet away Learns through reflexes Interested in faces Able to reach & grasp at around 3 months	----------→ ----------→ ----------→ Increasing interest in surroundings Actively handles toys Mouthing & teething ----------→	----------→ ----------→ ----------→ ----------→ ----------→ ----------→ ----------→ Can hold 2 objects at once but cannot coordinate between them
Examples of Products	Simple cause-and-effect programs Screens with slowly moving patterns Input devices using a movement sensor or related to children natural reflexes, like sucking Music & language programs Horizontal projections	----------→ Push buttons that create responses Remove input devices embedded in a plush toy or crib toy ----------→ Horizontal & vertical screens	Cause-and-effect programs using either sound or visual ----------→ ----------→ Vertical screens

* One of the most influential characteristics for these products.

TECHNOLOGY PLAY: **COMPUTER & VIDEO GAMES**

Product Characteristics	12 Through 18 Months	19 Through 23 Months	2 Years
Size of Parts	Small enough for a toddler to handle	----------→	----------→
Shape of Parts	Rounded, no sharp edges (cont'd)	----------→	----------→
Number of Parts			
Interlocking/Loose Parts			
Materials	Lightweight (cont'd) Soft (cont'd) Sturdy (cont'd) Washable (cont'd)	----------→ ----------→ ----------→ ----------→	----------→ ----------→ ----------→ ----------→
Motor Skills Required*	Increasingly skilled at walking Working on fine motor coordination Can push buttons	----------→ ----------→ Can push buttons on keyboard if all have same response Can activate input areas on touchscreen device	----------→ ----------→ ----------→ Can move a mouse; may have trouble clicking on small objects ----------→
Color/Contrast	High contrast (cont'd)	----------→	All colors
Cause & Effect*	A clear cause-and-effect relationship (cont'd)	----------→	----------→
Sensory Elements*	Visual (cont'd) Manual (cont'd) Auditory (cont'd)	----------→ ----------→ ----------→	----------→ ----------→ ----------→

Level of Realism/Detail			
Licensed theme*		Awareness of familiar licensed characters	Interest in familiar licensed characters
Classic			
Robotic/Smart Features			
Educational*	Parents are attracted to programs that offer educational benefits such as word recognition	Parents are attracted to programs that encourage engagement with the computer for educational benefits	----------→
Relevant Play/Behavior	Finds multisensory elements very appealing Like to explore objects manually & orally (cont'd) Increasingly curious & loves to explore Uses all senses to explore the world: seeing, hearing, touching, tasting, & smelling	----------→ ----------→ ----------→ ----------→ Social play; aware of others' interest in computer	----------→ ----------→ ----------→ ----------→ Social play; interest in play with parents & peers on computer Beginning to grow beyond Exploratory and Practice toys
Examples of Products	Simple cause-and-effect programs with characters Can have multiple responses to interactions Input device is remote from the screen	----------→ ----------→ Can use a keyboard if all keys create the same response Interactive programs that ask for specific responses Touchscreen devices	----------→ ----------→ ----------→ ----------→ Simple story-reading programs ----------→

* One of the most influential characteristics for these products.

TECHNOLOGY PLAY: **COMPUTER & VIDEO GAMES**

Product Characteristics	3 Years	4 Through 5 Years	6 Through 8 Years	9 Through 12 Years
Size of Parts				
Shape of Parts				
Number of Parts				
Interlocking/Loose Parts				
Materials	Can interact with traditional computer equipment	----------→	----------→	----------→
Motor Skills Required*	Can use a mouse	----------→	----------→	----------→
			Can use both hands at the same time	----------→
		Able to right/left click and multiple click	----------→	----------→
	Can activate input areas on touchscreen device (cont'd)	----------→	----------→	----------→
Color/Contrast				
Cause & Effect*	Enjoy point & click games	----------→	Less interested in point & click games	
Sensory Elements*	Enjoy music & sound games	----------→	Bright lights, sounds	Popular music
Level of Realism/Detail				
Licensed theme*	Enjoy popular cartoon characters	Interested in popular cartoon & action characters	Interested in action characters & sports figures	----------→
Classic				
Robotic/Smart Features		Enjoy interacting with a laptop if a toy goes along with it as the input device instead (*e.g.*, an RFID tag inserted into the toy it that would activate the images on the laptop), with children intrigued by the immediate contingency of the plush toys to something onscreen.		

Educational*	Parents like educational games like letter & number recognition	Parents like educational games like reading & mathematics games	Interested in learning games like science & nature software Can use encyclopedia software to search for information Comprehension of new facts at this age is the same regardless of whether the child played the game on a touchscreen tablet app or face to face with a researcher.	Interested in adult topics, trivia & historical games ----------→
Relevant Play/Behavior	Understands input devices like joysticks, handheld devices, & computer mice Difficulty navigating, can get lost in a program Cannot use reading other than simple ABCs	Can use a keyboard to input Able to navigate, but avoid multiple layers of navigation Reading is difficult Enjoys hand held games Has some understanding of rules	Very proficient with input devices Can use a map to navigate a game Can read & follow complex instructions ----------→ Understands rules & game strategy Can play multi-player games Can navigate the internet Interested in sports, fantasy, & adventure games	----------→ ----------→ ----------→ ----------→ Enjoys multi-player games ----------→ ----------→ Interested in hidden features of games Enjoys sophisticated long-term games
Examples of Products	Drawing & painting software Book reading programs Exploratory non-goal-oriented games Simple cause-and-effect games Games on touchscreen devices	----------→ Simple multimedia-development software ----------→ Beginning interest in more sophisticated goal-oriented games Simple hand held or console games ----------→	Adult software like word processing, photo, & multimedia-processing software Adventure games Sports games Board-game software like chess & checkers Sophisticated handheld or console games ----------→	----------→ ----------→ ----------→ ----------→ Interactive games Simulation games ----------→ ----------→

*One of the most influential characteristics for these products

REFERENCES

A parent's guide to imaginative block play: Why blocks are still one of America's favorite toys. https://files.eric.ed.gov/fulltext/ED415007.pdf

Ace Toys. (2001). Home page [On-line]. Available: http://www.acetoys.com/

Action Figure Times. (2001). Home page [On-line]. Available: http://www.aftimes.com/

Adams, R. J. (1989). Newborns' discrimination among mid- and long-wavelength stimuli. *Journal of Experimental Child Psychology, 47,* 130-141.

Almqvist, B. (1994). Educational toys, creative toys. In J. Goldstein (Ed.), *Toys, play and child development* (pp. 46-66). Cambridge: Cambridge University Press.

Amazon.Com (2019). Home page [On-line]. Available: https://www.amazon.com/

Amazon.Com/Toys-R-Us. (2001). Home page [On-line]. Available: http://www.amazon.com/exec/obidos/tg/browse/-/171280/103-1981190-3906217

American Academy of Pediatrics (AAP) (2016a). Media and young minds. *Pediatrics, 138,* e2 0162591.

American Academy of Pediatrics (AAP) (2016b). Media use in school-aged children and adolescents. *Pediatrics, 138,* e2 0162592.

Amory, A., Naicker, K., Vincent, J., Adams, C. (1999). The Use of Computer Games as an Educational Tool: Identification of Appropriate Game Types and Game Elements. *British Journal of Educational Technology, 30* (4), 311-321.

ASTM International. (2017). *Standard consumer safety specification for toy safety* (ASTM Standard No. F963-17). Available for purchase at: https://www.astm.org/Standards/F963.htm.

Auerbach, S. (1998). *Dr. Toy's smart play: How to raise a child with a high play quotient.* NY: St. Martin's Press.

Azoulay, J. (2001). Striking a balance on the toy market see-saw: High tech, low tech, edutainment and licensing. *Children's Business, 16* (2), 30-34, 104-107.

Back to basics toys: Games and hobbies (2000). One Memory Lane, Ridgely, MD 21685.

Bagley, D. & Chaille, C. (1996). Transforming play: An analysis of first-, third-, and fifth-graders play. *Journal of Research in Childhood Education, 10* (2), 134-142.

Bailey, R. (2000). Movement development and the primary school child. In R. Bailey and T. Macfadyen, (Eds.), *Teaching physical education,* (pp. 5-11). London: Continuum.

Barnes & Noble (2019). Home page [On-line]. Available https://www.barnesandnoble.com/

Bartlett, T., Cardinale, D., Gordon, M., Au, A., & McMillen, C. (2000). *2000-2001 Toy industry fact book: Toy manufacturers of America, Inc.*

Big Lots (2019). Home page [On-line]. Available https://www.biglots.com/

Botermans, J., Burrett, T., van Delft, P., & van Splunteren, C. (1989). *The world of games: Their origins and history, how to play them, and how to make them.* New York: Facts on File.

Bower, B. (1999). Minds on the move: Babies extend their reach into a world of thought and action. *Science News, 155* (12), 184-86.

Brazelton, B. (1994). *Touchpoints the essential reference: Your child's emotional and behavioral development, 3rd edition*. Reading, MA: Addison Wesley.

Bronson, M. (1995). *The right stuff for children birth to 8.* Washington, DC: National Association for the Education of Young Children.

Brosterman, N. (1997). *Inventing kindergarten*. New York: Harry N. Abrams.

Brown, P., Thornton C. & Sutterby, J. A. (2001). *Kids getting older younger: The adultification of children's play*. The Child's Right to Play, Hofstra University, Hempstead, NY.

Brownell, C. & Brown, E. (1992). Peers and play in infants and toddlers. In V. Van Hasselt and M. Hersen (Eds.) ®*Handbook of social development: A lifespan perspective*. New York: Plenum Press.

Buchman, D., Funk, J. (1996). Video and computer games in the '90s: Children's time commitment and game preference. *Children Today, 1,* 12-15, 31.

Burroughs, E. & Murray, S. (1992). The influence of play material on discourse during play. *Journal of Childhood Communication Disorders, 14* (2), 119-128.

Buy Buy Baby (2019). Home page [On-line]. Available https://www.buybuybaby.com/

Byrne, C. (2001). Toy story 2001: The business grows up as the days of logo slapping products disappears. *The Licensing Book, 18* (4), 37-46.

Caldera, Y. & Sciaraffa, M. (1998). Parent-toddler play with feminine toys: Are all dolls the same? *Sex Roles: A Journal of Research, 39* (9/10), 657-668.

Calvert, S., Richards, M., & Kent, C. (2014). Personalized interactive characters for toddlers' learning of seriation from a video presentation. *Journal of Applied Developmental Psychology, 35,* 148-155.

Campenni, C. E. (1999). Gender stereotyping of children's toys: A comparison of parents and nonparents. *Sex Roles: A Journal of Research, 40* (1-2), 121-138.

Carpenter, C. & Huston-Stein, A. (1980). Activity structure and sex-typed behavior in preschool children. *Child Development, 51,* 862-872.

Castle, K. (1985). Toddlers and tools. *Childhood Education, 61* (5), 352-355.

Christakis, D.A. (2014). Interactive media use at younger than the age of 2 years: Time to rethink American Academy of Pediatrics guideline? *JAMA Pediatrics, 168,* 399-400.

Christensen, K., Stockdale, D. F. (1991). Predictors of toy selection criteria of preschool children's parents. *Children's Environments Quarterly, 8* (1), 25-36.

Clemens, S. G. (1991). Art in the classroom: Making every day special. *Young Children, 46* (2), 4-11.

Collector's Compass (2000). *Barbie doll: Your resource for building and caring for a collection*. Bothell, WA: Martingale & Co.

Consumers Union (1990). *Selling to America's kids: Commercial pressures on kids of the 90's.* https://advocacy.consumerreports.org/press_release/selling-americas-kids-commercial-pressures-on-kids-of-the-90s-part-one/

Cook, A. M. & Cavalier, A. R. (1999). Young children using assistive robotics for discovery and control. *Teaching Exceptional Children, 31* (5), 72-78.

Corter, C., & Jamieson, N. (1977). Infants' toy preferences and mothers' predictions. *Developmental Psychology, 13,* 413-414.

Costco (2019). Home page [On-line]. Available https://www.costco.com/

Creative Kidstuff: Whimsical, wonderful, wildly imaginative playthings (2000), (Vol. 6).

Cross, G. (1997). *Kids' stuff: Toys and the changing world of American childhood.* Cambridge, MA: Harvard University Press.

Curtner-Smith, M. (1996). Using games invention with elementary children—teaching for understanding: Tactical approaches to teaching games. *Journal of Physical Education, Recreation and Dance, 67* (3), 33-37.

Damast, A.M., Tamis-LeMonda, C.S., & Bornstein, M.H. (1996). Mother-child play: Sequential interactions and the relation between maternal beliefs and behaviors. *Child Development, 67,* 1752-1766.

Danovitch, J.H. & Mills, C.M. (2017). The influence of familiar characters and other appealing

images on young children's preference for low-quality objects. *British Journal of Developmental Psychology,* n.p. (e-publication ahead of print).

Darlin, D. (1993). Highbrow hype. *Forbes, April 12,* 126-127.

Dell, S. J. & McNerney, P. (1997). *Toys for all children: Selecting toys for children with vision or motor challenges.* (ED 437751).

DiGangi, J. (Oct. 1997) *Lead and cadmium in vinyl children's products: A Greenpeace expose.* (ED414034)

Dodge, D. T. & Heroman, C. (1999). *Building your baby's brain: A parent's guide to the first five years = Como estimular el cerebro infantil: Una guia para padres de familia.*

E-toys. (2001). Home page [On-line]. Available: http://www.etoys.com

Eckler, J. A., & Weininger, O. (1989). Structural parallels between pretend play and narratives. *Developmental Psychology, 25,* 736-743.

Elder, J.L., & Pederson, D.R. (1978). Preschool children's use of objects in symbolic play. *Child Development, 49,* 500-504.

Entertainment Software Rating Board. (2001). ESRB video and computer game ratings. Entertainment Software Rating Board website. http://www.esrb.org/.

Fallon, M.A., Harris, M.B. (1989). Factors influencing the selection of toys for handicapped and normally developing preschool children. *Journal of Genetic Psychology, 150* (2), 125-134.

Fat Brain Toys. (2019). Home page [On-line]. Available: https://www.fatbraintoys.com/

FAO Schwartz. (2001). Home page. [Online]. Available: http://www.fao.com

Federman, A. N. & Edwards, S. (1997). Interactive, collaborative science via the 'net: Live from the Hubble space telescope. *T.H.E. Journal, 24* (10), 20-22.

Fennick, J. (1999). *The collectible Barbie doll: An illustrated guide to her dreamy world.* Philadelphia: Courage Books.

Fenson, L., Kagan, J., Kearsley, R.B., & Zelazo, P.R. (1976). The developmental progression of manipulative play in the first two years. *Child Development, 47,* 232-236.

Fischman, M. G., Moore, J. B., Steele, K. H. (1992). Children's one-hand catching as a function of age, gender, and ball location. *Research Quarterly for Exercise and Sport, 63* (4): 349-355.

Fisher-Price Manufacturers (2001). Home page [On-line]. Available: http://www.fisher-price.com/us/

Fisher-Thompson, D. (1993). Adult toy purchases for children: Factors affecting sex-typed toy selection. *Journal of Applied Developmental Psychology, 14*(3), 385-406.

Fisher-Thompson, D., Sausa, A., & Wright, T. F. (1995). Toy selection for children: Personality and toy request influences. *Sex Roles, 33* (3-4), 239-255.

Fleishman (1964). *The structure and measurement of physical fitness*. Englewood Cliffs, NJ: Prentice Hall.

Fleming, D. (1997). *Powerplay: Toys as popular culture*. Manchester, England: Manchester University Press.

Frost, J., Wortham, S. & Reifel, S. (2001). *Play and child development.* Upper Saddle River, NJ: Merrill Prentice Hall.

Frost, R. (2000). Building robots brick by brick. *The Times Educational Supplement, 4363,* p. 25.

Funk, J. (1993). Reevaluating the impact of video games. *Clinical Pediatrics, 32* (2), 86-90.

Funk, J., & Buchman, D. (1996). Violent video and computer games and adolescent self-concept. *Journal of Communication, 46* (2), 19-32.

Furby, L., & Wilke, M. (1982). Some characteristics of infants' preferred toys. *The Journal of Genetic Psychology, 140,* 207-219.

Gabbard, C. (1998). Windows of opportunity for early brain and motor development. *Journal of Physical Education, Recreation, and Dance, 69* (8), p. 54-55.

Gallahue, D. (1989). *Understanding motor development: Infants, toddlers, adolescents, 2nd edition.* Indianapolis, IN: Benchmark Press.

Gelber, S. (1999). *Hobbies: Leisure and the culture of work in America.* New York: Columbia University Press.

Geraci, J. (2001). *How children are spending their money and time.* Paper presented at the American International Toy Fair, New York.

Get Real Girl. (2001). Home page [On-line]. Available: http://www.getrealgirl.com/

Ginc¸ A., Mistry, J., Mosier, C. (2000). Cultural variations in the play of toddlers. *International Journal of Behavioral Development, 24* (3), 321-329.

Gockel, S. (2000). Intro to licensing. International Licensing Manufacturers' Association. http://www.licensing.org/intro/frameset.html

Gola, A.A.H., Richards, M.N., Lauricella, A.R., & Calvert, S.L. (2013). Building meaningful parasocial relationships between toddlers and media characters to teach early mathematical skills, *Media Psychology, 16,* 1-22.

Goldsmith, Jill. (2000). The licensing game: It's not child's play, *Variety, 379* (4), 3.

Gredlein, J.M., & Bjorklund, D.F. (2005). Sex differences in young children's use of tools in a problem-solving task: The role of object-oriented play. *Human Nature, 16,* 211-232.

Greene, P. J. (2000). LEGO mindstorms: Software review. *Learning and Leading with Technology, 27* (8), 56-8.

Greenfield, P., Yut, E., Chung, M., Land, D., Kreider, H., Pantoja, M., Horsley, K. (1990). The program length commercial: A study of the effects of television toy tie-ins on imaginative play. *Psychology of Marketing, 7* (4), 237-255.

Guzman, R. (2000). Play time!: Stores deliver hot toys for Christmas. *San Antonio Express News,* Nov. 10, S. A. Life. 1F, 12F.

Hasbro Manufacturers. (2001). Home page [On-line]. Available: http://www.hasbro.com

Hays, C. (1999). The road to toyland is paved with chips. *New York Times,* Feb. 17, Business/Finance. C1-C12.

Healy, J. (1994). *Your child's growing mind*. New York: Doubleday.

Height, W. L., & Miller, P. J. (1993). *Pretending at home: Early development in a sociocultural context*. Albany: State University of New York Press.

Hirsch, E. (Ed.) (1996). *The block book 3rd edition.* Washington DC: National Association for the Education of Young Children.

Hoffman, D. (1996). *Kid stuff: Great toys from our childhood.* San Francisco: Chronicle Books.

Howes, C. (1985). Sharing fantasy: Social pretend play in toddlers. *Child Development, 56,* 1253-1258.

Howes, C., Unger, O., Seidner, L. B. (1989). Social pretend play in toddlers: Parallels with social play and solitary pretend. *Child Development, 60,* 77-84.

Humphrey's Corner. (2001). *Licensing Today Worldwide, 8* (3), 18-19.

Humphry, R., Jewell, K., Rosenberger, R. C. (1995). Development of in-hand manipulation and relationship with activities. *American Journal of Occupational Therapy, 49* (8), 763-771.

Hung, P.C.K., Fantinato, M., & Rafferty, L. (2016). A study of privacy requirements for smart toys. *Pacific Asia Conference on Information Systems Conference Proceedings 2016,* n.p.

International Organization for Standardization. (2016). *Safety of toys – Part 8: Age determination guidelines* (ISO/TR Standard No. 8124-8:2016). Available for purchase at: https://www.iso.org/standard/68561.html.

Jacob, S. (1991). *Your baby's mind.* Holbrook, MA: Bob Adams, Inc.

Jacobson, J. L. (1981). The role of inanimate objects in early peer interaction. *Child Development, 52,* 618-626.

Jeffree, D. M. & McConkey, R. (1976). An observation scheme for recording children's imaginative doll play. *Journal of Child Psychology and Psychiatry, 17,* 189-197.

Jukes, J. A. (1991). Children and aggressive toys: Empirical studies of toy preference. London: National Toy Council and British Toy and Hobby Association.

Kahn, P.H., Jr., Friedman, B., Perez-Granados, D.R., & Freier, N.G. (2006). Robotic pets in the lives of preschool children. *Interaction Studies, 7,* 405-436.

Kara, N. Aydin, C.C., & Cagiltay, K. (2014). Design and development of a smart storytelling toy. *Interactive Learning Environments, 22,* 288-297.

Kauffman, G. B. & Mayo, I. (1998). The thermobile: A nitinol-based scientific toy. *Journal of Chemical Education, 75* (3), 313-14.

Kelly, K. (2000). False promise: Parking your child in front of the computer may seem like a good idea, but think again. *U.S. News and World Report, Sept, 25,* 48-55.

Kelly-Byrne, D. (1989). *A child's play life: An ethnographic study.* NY: Teachers College Press.

Kim, Y. & Smith, D. (2017). Pedagogical and technological augmentation of mobile learning for young children interactive learning environments. *Interactive Learning Environments, 25,* 4-16.

Kimmerle, M., Mick, L.A., & Michel, G.F. (1995). Bimanual role-differentiated toy play during infancy. *Infant Behavior and Development, 18,* 299-307.

Kirkorian, H. L., Pempek, T. A., Murphy, L. A., Schmidt, M. E., & Anderson, D. R. (2009). The impact of background television on parent-child interaction. Child Development, 80, 1350- 1359.

Klein, A. (1993). Classic toys for today's kids. *Better Homes and Gardens: A Guide to Children's Products, Special Edition,* 68-69.

Kline, S. (1993). *Out of the garden: Toys, tv, and children's culture in the age of marketing.* London: Verso.

Kolbe, U. (1997). Clay and children: More than making pots. Springfield, VA: ERIC Document Reproduction Service No. ED414041.

Koster, J. B. (1999). Clay for little fingers. *Young Children, 54* (2), 18-22.

Krcmar, M., & Cingel, D.P. (2014). Parent-child joint reading in traditional and electronic formats. *Media Psychology, 17,* 262-281.

Kurnit, P. (2001). *Kids, toys, time and money.* Paper presented at the Toy Fair, New York.

Kuznets, L. (1999). Taking over the doll house: Domestic desire and nostalgia in toy narratives. In B. Clark & M. Higonnet (Eds.), *Girls, Boys, Books, Toys* (pp. 142-153). Baltimore: Johns Hopkins Press.

Kwok, K., Ghrear, S., Li, V., Haddock, T., Coleman, P. & Birch, S.A.J. (2016). Children can learn new facts equally well from interactive media versus face to face interaction. *Frontiers in Psychology, 7,* n.p.: article 1603.

Labbo, L. D. (1996). A semiotic analysis of young children's symbol making in a classroom computer center. *Reading Research Quarterly, 31* (4), 356-385.

Langendorfer, S. & Bruya, L. (1995). *Aquatic readiness: Developing water competence in young children.* Chamaign, IL: Human Kinetics.

Lego (2020). Home page [On-line]. Available: https://www.lego.com.

Le Normand, M. T. (1986). A developmental exploration of language used to accompany symbolic play in young, normal children (2-4 years old). *Child: Care, Health, and Development, 12,* 121-134.

Levy, R., & Weingartner, R. (1990). *Inside Santa's workshop.* New York: Henry Holt and Company.

Liebeck, L. (2001). Techucational toys gain momentum. *License: The idea marketplace for the licensing industry, 4* (1), 78-79.

Lillard, A. S. (2015). The development of play. *Handbook of Child Psychology and Developmental Science, Vol. 3: Cognitive Development.* L. Liben and U. Mueller (Eds.), Lerner, R., Editor-in-Chief, p. 425-468. New York: Wiley-Blackwell.

Lin, L., Cherng, R., & Chen, Y. (2017). Effect of touch screen tablet use on fine motor development of young children. *Physical and Occupational Therapy in Pediatrics.* n.p. (e-publication ahead of print).

Lindfors, J. (1999). *Children's inquiry: Using language to make sense of the world*. New York: Teachers College Press.

Logsdon, B., Alleman, L., Straits, S., Belka, D., & Clark, D. (1997). *Physical education unit plans for preschool-kindergarten*. Champaign, IL: Human Kinetics.

Luckin, R., Connolly, D., Plowman, L., & Airey, S. (2003). Children's interactions with interactive toy technology. *Journal of Computer Assisted Learning, 19,* 165-176.

Lyytinen, P. (1991). Developmental trends in children's pretend play. *Child: Care, Health, and Development, 17*, 9-25.

MacNaughton, G. (1996). Is Barbie to blame?: Reconsidering how children learn gender. *Australian Journal of Early Childhood, 21* (4), 18-24.

Magic cabin dolls: Childhood's purest treasures, holiday (2000). 1950 Waldorf NW, Grand Rapids, MI 49550.

Maldonado, N. (1996). Puzzles: A pathetically neglected, commonly available resource. *Young Children, 51* (4), 4-10.

Malone, T. (1983). Guidelines for designing educational computer programs. *Childhood Education, 59* (4), 241-247.

Martin, F., Mikhak, B., Resnick, M., Silverman, B. & Berg, R. (2000). To mindstorms and beyond: Evolution of a construction kit for magical machines. In A. Druin and J. Hendler, (Eds.), *Robots: Exploring new technologies for learning for kids*. San Francisco, CA: Morgan Kaufmann Publishers.

Martin, S., Brady, M. & Williams, R. (1991). Effects of toys on the social behavior of preschool children in integrated and nonintegrated groups: Investigation of a setting event. *Journal of Early Intervention, 15* (2), 153-161.

Mattel (2020). Home page [On-line]. Available: https://www.mattel.com/en-us.

May, W. T. (1987). Student response to media: Implications for elementary art curriculum. *Studies in Art Education, 28* (2), 105-117.

Mayer, C. E. (2001). Panel deems vinyl toys safe. *The Washington Post*. Washington D. C.: 2.

McCall, R.B. (1974). Exploratory manipulation and play in the human infant. *Monographs of the Society for Research in Child Development, 39*, 1-88.

McCarty, M. E. & Ashmead, D. H. (1999). Visual control of reaching and grasping in infants. *Developmental Psychology, 35* (3), 620-31.

McClary, A. (1997). *Toys with nine lives: A social history of American toys*. North Haven, CN: Linnet Books.

McClure, E. R., Chentsova-Dutton, Y. E., Holochwost, S. J., Parrott, W. G. and Barr, R. (2017), Look At That! Video Chat and Joint Visual Attention Development Among Babies and Toddlers. Child Development.

McReynolds, E., Hubbard, S., Lau, T., Saraf, A., Cakmak, M., & Roesner, F. (2017). Toys that listen: A study of parents, children, and internet-connected toys. *CHI Conference on Human Factors in Computing Conference Proceedings 2017.* n.p.

Melissa & Doug (2020). Home page [On-line]. Available: https://www.melissaanddoug.com/.

Merriam-Webster Collegiate Dictionary. (2001). Merriam-Webster website. https://www.merriam-webster.com/.

Michaels. (2019). Home page [On-line]. Available: https://www.michaels.com/

Miglino, O., Lund, H. H., & Cardaci, M. (1999). Robotics as an educational tool. *Journal of Interactive Learning Research, 10* (1), 25-47.

Miller, S. E. (1999). Balloons, blankets, and balls: Gross motor activities to use indoors. *Young Children, 54* (5), 58-63.

Montano, D. R. (1996). Keyboards as a pathway to the standards. *Teaching Music, 3*(6), 38-39.

Montopoli, L. (1999). Building minds by block building. ERIC Document Reproduction Service No. ED431528.

Morrison, G. (2000). *Early childhood education today, 8th edition.* Upper Saddle River, NJ: Merrill Prentice Hall.

Muehling, D., Carlson, L. & Laczniak, R. (1992). Parental perceptions of toy-based programs: An exploratory analysis. *Journal of Public Policy and Marketing, 11* (1), 63-71.

Mueller, E., & Brenner, J. (1977). The origins of social skills and interaction among playgroup toddlers. *Child Development, 48,* 854-861.

Nelson-Rowe, S. (1994). Ritual, magic, and educational toys: Symbolic aspects of toy selection. In J. Best (Ed.), *Troubling children: Studies of children and social problems* (pp. 117-131). New York: Walter de Gruyter.

Nichols, B. (1986). *Moving and learning: The elementary school physical education experience.* St. Louis, MO: Times Mirror/Mosby College Publishing.

Oltman, D. L. (1990). *Pennsylvania Classroom Guide to Safety in the Visual Arts.* Harrisburg, PA, Pennsylvania State Department of Education.

Opie, I. (1993). *The people in the playground.* Oxford: Oxford University Press.

Oppenheim, J. (1993). *The best toys, books and videos for kids*. New York: Harper Collins.

Oriental Trading. (2019). Home page [On-line]. Available: https://www.orientaltrading.com/

Paley, V. (1981). *Wally's stories.* Boston, MA: Harvard University Press.

Perzov, A., Kozminsky, E. (1989). The effect of computer game practice on the development of visual perception skills in kindergarten children. *Computers in the Schools, 6*(3-4), 113-122.

Phelps, P. & Hanline, M. F. (1999). Let's play blocks!: Creating effective learning experiences for young children. *Teaching Exceptional Children, 32* (2), 62-7.

Piaget, J. (1962). *Play, dreams, and imagination in childhood.* New York: Norton.

Pica, R. (1995). *Experiences in movement with music, activities and theory.* Albany, NY: Delmar Publishers, Inc.

Perfectly Safe Product Catalog: Fall (2000). North Canton, OH: Perfectly Safe.

Perzov, A.; Kozminsky, E. (1989). The effect of computer games practice on the development of visual perception skills in kindergarten children. *Computers in the Schools, 6* (3-4), 113-122.

Pratt, M. W. (1999). The importance of infant/toddler interactions. *Young Children, 54* (4), 26-29.

Qualley, C. A. (1986). *Safety in the artroom*. Worcester, MA: Davis Publications, Inc.

Quay, L. C., Weaver, J. H., Neel, J. H. (1986). The effects of play materials on positive and negative social behaviors in preschool boys and girls. *Child Study Journal, 16* (1), 67-76.

Raag, T., & Rackliff, C. L. (1998). Preschoolers' awareness of social expectations of gender: Relationships to toy choices. *Sex Roles, 38* (9-10), 685-700.

Radio flyer product catalog (2001). Chicago, IL: Radio Flyer.

Ramey, C. T., & Ramey, S. L. (1999). *Right from birth: Building your child's foundation for life. Birth to 18 Months*. Goddard Parenting Guides. New York: Goddard Press.

Randel, J. (1992). The effectiveness of games for educational purposes: A review of recent research. *Simulation & Gaming, 23* (3), 261-276.

Reifel, S. (1984). Symbolic representation at two ages: Block buildings of a story. *Discourse Processes, 7,* 11-20.

Reifel, S., & Greenfield, P. M. (1983). Part-whole relations: Some structural features of children's representational block play. *Child Care Quarterly, 12* (1), 144-150.

Reifel, S., & Yeatman, J. (1991). Action, talk, and thought in block play. In B. Scales, M. Almy, A. Nicolopoulou, and S. Ervin-Tripp (Eds.), *Play and the social context of development in early care and education* (pp. 156-172). New York: Teachers College, Columbia University.

Resnick, M., Eisenberg, M., Berg, R. & Martin, F. (1999). Learning with digital manipulatives: A new generation of Froebel gifts for exploring "advanced" mathematical and scientific concepts. Proposal to the National Science Foundation, May.

Richards, M.N. & Calvert, S.L. (2015). Toddlers' judgments of media character source credibility on touchscreens. *American Behavioral Scientist.*

Richards, M.N. & Calvert, S.L. (2017). Measuring Young Children's Parasocial Relationships: Towards the creation of a child self-report survey. *Journal of Children and Media.*

Rideout, V. (2017). *The Common Sense census: Media use by kids age zero to eight.* San Francisco, CA: Common Sense Media.

Robinson, C. & Jackson, R. (1987). The effects of varying toy detail within a prototypical play object on the solitary pretend play of preschool children. *Journal of Applied Developmental Psychology, 8,* 209-220.

Roseberry, S., Hirsh-Pasek, K. and Golinkoff, R. M. (2014), Skype Me! Socially Contingent Interactions Help Toddlers Learn Language. Child Development, 85: 956–970. doi:10.1111/cdev.12166

Rosenberg, J. (2001). Brand loyalty begins early. *Advertising Age, 72* (7), s2.

Rost, D. & Hanses, P. (1994). The possession and use of toys in elementary-school boys and girls: Does giftedness make a difference? *Educational Psychology, 14* (2), 181-194.

Rubin, K. H., Fein, G. G., & Vandenberg, B. (1983). Play. In P. H. Mussen & E. M. Hetherington (Eds.), *Handbook of child psychology (Vol. 4),* (pp. 693-774). New York: Wiley.

Samuels, G. (1996). Mystique marketing. *Forbes, October 21,* 276-277.

Sanders, S. (1992). *Designing preschool movement programs*. Champaign, IL: Human Kinetics Publishers.

Scarlett, W.G. (2005). *Children's Play*. Thousand Oaks, CA: SAGE Publications, Inc.

Schmuckler, E. (1995). Toys & TV: An incestuous connection? *Brandweek, 36*, 36-37.

Schulz, L.E., & Bonawitz, E.B. (2007). Serious fun: Preschoolers engage in more exploratory play when evidence is confounded. *Developmental Psychology, 43*, 1045-1050.

Seefeldt, C. (1999). *Art for young children.* Springfield, VA: ERIC Document Reproduction Service No. ED436459.

Seiter, E. (1993). *Sold separately: Children and parents in consumer culture.* Brunswick, NJ: Rutgers University Press.

Sheff, D. (1993). *Game over: How Nintendo zapped an American industry, captured your dollars, and enslaved your children.* New York: Random House.

Shelov, S.P. & Hannemann, R.E., Eds. (1994). *Caring for Your Baby and Young Child: Birth to Age 5.* New York: Bantam Books.

Shopping Excite. (2001). Home page [On-line]. Available: http://shopping.excite.com/toys_and_games/

Silberg, J. (1996). *More games to play with toddlers.* Beltsville, Maryland: Gryphon House.

Sinker, M. (1986). *Toys for growing: A guide to toys that develop skills.* Chicago: Year Book Medical Publishers.

Smart Tech Toys. (2001). Home page [On-line]. Available: http://smarttechtoys.com/

Smith, N. R., Fucigna, C., Kennedy, M., Lord, L. (1993). *Experience and art: Teaching children to paint.* New York: Teachers College Press.

Smith, E.D., & Lillard, A.S. (2012). Play on: Retrospective reports of the persistence of pretend play into middle childhood. *Journal of Cognition and Development, 13,* 524-549.

Spodek, B., Saracho, O. N., Davis, M. D. (1987). *Foundations of early childhood education*. Englewood Cliffs, NJ, Prentice-Hall.

Sridhar, P.K. & Nanayakkara, S. (2017). Towards understanding of play with augmented toys. *CHI Conference on Augmented Human Conference Proceedings 2017.* n.p.

Stinson, S. C. (1979). Chemistry sets face uncertain future. *Chemical and Engineering News, 57* (50), 40-48.

Stringer, R., Labounskia, I., Santillo, D., Johnston, P., Siddorn, J., Stephenson, A. (1997). *Determination of the composition and quantity of phthalate ester additives in PVC children's toys.*

Sutterby, J. (2001). *The rhetoric of toys.* Austin: Unpublished presentation.

Tamis-LeMonda, C. S., & Bornstein, M. H. (1991). Individual variation, correspondence, stability, and change in mother and toddler play. *Infant Behavior and Development, 14*, 143-162.

Target. (2019). Home page [On-line]. Available: https://www.target.com/

Taylor, S. I. (1997). Toy safety and selection. *Early Childhood Education Journal, 24* (4), 235-38.

Teachers Resisting Unhealthy Children's Environments. (2001). *Media violence and children: A call to action!* West Somerville, MA, Teachers Resisting Unhealthy Children's Environments.

Teare, S. W. (1998). The telescopes in education program at Mount Wilson. *Mercury, 27* (3), 22-25.

Todé, C. (2001). Evolution of tweens' tastes keeps retailers on their toes. *Advertising Age, 72* (7), s6.

Tosa, M. (1997). *Barbie: Four decades of fashion, fantasy and fun*. New York: Harry N. Abrams, Inc.

Toy safety shopping tips (2001). [Web Document]. Consumer Product Safety Commission.

Toys to grow on (toy catalog) (2000), (Vol. 4). PO Box 17, Long Beach, CA, 90801.

Toy play in infancy and early childhood: Normal development and special considerations for children with disabilities. ERIC Document Reproduction Service No. ED386900.

Tracy, D. (1987). Toys, spatial ability, and science and mathematics achievement: Are they related? *Sex roles, 17* (3/4), 115-138.

Trawick-Smith, J. (1990). The effects of realistic versus non-realistic play materials on young children's symbolic transformation of objects. *Journal of Research in Childhood Education, 5* (1), 27-36.

Trawick-Smith, J. (1993). Effects of realistic, non-realistic, and mixed realism play environments on young children's symbolization, social interaction, and language. Paper presented at the annual meeting of the American Educational Research Association, Atlanta.

Troll learn and play: Early holiday (2000). 1950 Waldorf NW, Grand Rapids, MI 49550.

Troseth, G.L., Saylor, M.M., & Archer, A.H. (2006). Young children's use of video as a source of socially relevant information. *Child Development, 77,* 786-799.

Troster, H. & Brambring, M. (1994). The play behavior and play materials of blind and sighted infants and preschoolers. *Journal of Visual Impairment & Blindness, 88* (5), 421-32.

Tsui, B. (2001). Toymakers are geared up to showcase tween tech. *Advertising Age, 72* (7), s8.

Tunnicliffe, S. D., & Reiss, M. J. *What sense do children make of three-dimensional life-sized "Representations" of animals?* ED433213. EDRS Availability: Microfiche [$1.42 card(s)], Paper.

Tunnicliffe, S. D. (1999). It's the way you tell it! What conversations of elementary school groups tell us about the effectiveness of animatronic animal exhibits. *Journal of Elementary Science Education, 11* (1), 23-37.

Upitis, R. (1992). Technology and music - An intertwining dance. *Computers and Education, 18* (1-3): 243-250.

Vaughter, R., Devyani, S., Vozzola, E. (1994). Sex similarities and differences in types of play in games and sports. *Psychology of Women Quarterly, 18,* 85-104.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wagner, S. P. (1999). Robotics and children: Science achievement and problem-solving. *Information Technology in Childhood Education Annual,* 101-45.

Waldrop, C. S. and Scarborough, A. M. (1990). Ideas: Crayons and markers. *Dimensions, 18* (4): 15-18.

Walmart. (2019). Home page [On-line]. Available: https://www.walmart.com/

Walsh, M. (1995). Plush endeavors: An analysis of the soft-toy industry. *Business History Review, 66,* 637-670.

Ward, C., D. (1990). Computers in preschools: Possibilities at their fingertips. *Dimensions, 18* (4), 7-9.

Warner, L. (1990). Basic musical concepts for preschoolers. *Dimensions, 18* (4), 13-14.

Weikart, P. S. (1998). Facing the challenge of motor development. *Child Care Information Exchange, 121,* 60-2.

Weintraub, R. (2000). *Trouble in toyland: The 2000 PIRG survey of dangerous toys,* National Association for State Public Interest Research Groups.

Weiss, K. (1997). Let's build! *Scholastic Early Childhood Today, 12,* 30-2.

Wellner, A. (1997). *Americans at play: Demographics of outdoor recreation and travel.* Ithaca: NY: New Strategist Publications.

Wetton, P. (1997). *Physical education in the early years.* London: Routledge.

White, D. (2000). PG-13 movies in the late-Bond era. *The Washington Post.* Washington D.C.: C4.

Williams, R. C. (1988). Ideas: Using musical instruments. *Dimensions, 17,* 15-18.

Yilmaz, R.M. (2016). Educational magic toys developed with augmented reality technology for early childhood education. *Computers in Human Behavior, 54,* 240-248.

Zany Brainy: Holiday gift guide (2000). 2520 Renaissance Blvd., King of Prussia, PA 19406.

Zelazo, P. R. (1998). McGraw and the development of unaided walking. *Developmental Review, 18* (4), 449-71.

Zwillich, Todd. (1999). Tally of the dolls. *Family Practice News, 29,* 59.

PRODUCT INDEX

This index has been expanded to cover most major types of products and to lead the reader to the product subcategory that most closely fits that product type. Although products may be used in a wide variety of contexts and in different ways for multiple purposes and benefits, each subcategory was chosen because it is most representative of how the product appeals to, and is used by, children. Some products are cross-listed because they represent two subcategories in significant ways.