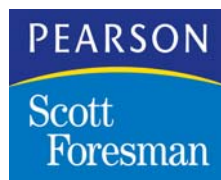


A Correlation of

Scott Foresman
SCIENCE

to the

Indiana
Academic Standards for
Science
Grades K-6



G/S-111

Introduction

This document demonstrates the high degree of success students will achieve when using **Scott Foresman Science** in meeting the objectives of the Indiana Academic Standards for Science. Correlation page references are to the Teacher's Edition and the associated Student Edition

Scott Foresman Science is a Science program that ensures that all children are successful with science. This program was designed to provide teachers and students with:

Comprehensive content:

The authors of **Scott Foresman Science** wrote this series to match the National Science Education Standards as well as align with the numerous state standards and frameworks.

Accessible Science for all students:

Scott Foresman Science enables every student to be successful by giving all students equal access to science content and hands-on activities. **Scott Foresman Science** was written to help students learn how to read in a content area. The use of graphic organizers, authentic text, real-world applications, and appropriate assessment provides students with all the tools they need for successful reading comprehension in science.

Teacher-tested Activities:

Scott Foresman Science offers a wide variety of hands-on opportunities for students.

- Explore Activities provide students with a way to preview the content of lessons and chapters. These inquiry-based activities also provide the teacher with information about the students' prior knowledge about a topic.
- Investigate Activities provide students with a patterned activity that either anticipates content to come or confirms content that they have just learned.
- Experiment Activities provide students with an opportunity to use the science methods in an extended activity.
- Inquiry Activities are provided at grades 3-5 in the Teacher's Edition for those teachers who wish to introduce every lesson with an activity.

The activities in **Scott Foresman Science** work because they were tested extensively. In workshops across the country and at the NSTA's in Las Vegas and Boston, teachers tested each activity in the program. In addition, **Scott Foresman Science** provides unparalleled support for teachers. Activity videos for each Investigate and Experiment Activity accompany the program. Scott Foresman has also established an activity hot-line for teachers with questions or comments on the activities in the program.

Customized Teacher Resources:

Scott Foresman Science provides teachers with all the resources that they need to be successful with science. **Scott Foresman Science** offers a practical, easy-to-use Teacher's Edition that was designed by teachers. The ancillaries support and enhance science content and meet the needs of various teaching and learning styles.

Technology

Activity Videotapes

Video demonstrations of all Investigate and Experiment activities in the Student Edition prepare teachers for the upcoming lessons.

Practice and Assessment CD-ROM

An interactive game gives multiple-choice practice in English and Spanish. An end of game report lets students know what they need to review.

Classroom Audiotapes and Audio CD (K-2)

Children can learn science as they sing educational lyrics from the Children's Television Workshop that reinforces important themes in each chapter.

Audiotext Cassettes and Audio CDs

A complete audio version of the student edition connects those ESL and LEP students with the important science concepts.

Production CD-ROM

Software lets students create their own multimedia presentations. CD-ROM resources include videoclips, photographs, sound effects, artwork, and charts and graphs.

TestWorks

Teachers can customize tests in both free-response and multiple-choice question form using question resources and graphics found on an easy-to-use CD-ROM.

Teacher Resource Planner

A digital format of all the ancillaries in the Teacher's Resource Package allows teachers to plan, customize, and print a science curriculum that meets all classroom needs.

DataWonder

This program helps students organize data from science activities in the following forms: vertical and horizontal bar, line, circle, pictograph, boxplot, scattergram, stem-and-leaf, and histogram graphs.

www.sfscience.com

This on-line community for students and teachers provides frequent updates in science current events and trivia and lets students publish their own thoughts on science in a special section.

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**Scott Foresman Science
to the
Indiana Academic Standards for Science
Kindergarten**

Standard 1—The Nature of Science and Technology

Students are actively engaged in beginning to explore how their world works. They explore, observe, ask questions, discuss observations, and seek answers.*

Scientific Inquiry

K.1.1 Raise questions about the natural world.

viii–ix, xi, xii, A1c–A1d, A2, B1c–B1d, B2, B32, B38, C1c–C1d, C2, D1c–D1d, D2
Your Science Handbook 18–19

The Scientific Enterprise

K.1.2 Begin to demonstrate that everyone can do science.

A1c–A1d, A7, A15, A17, A19, 125, A26, A29, A31, B1c–B1d, B7, B9, B11, B17, B19, B21, B22, B29, B31, B33, C1c–C1d, C7, C9c, C11, C17, C19, C25, C27, C28, C31, D1c–D1d, D7, D9, D11, D17, D19, D21, D27, D29, D30, D33

Standard 2—Scientific Thinking

Students use numbers, pictures, and words when observing and communicating to help them begin to answer their questions about the world.

Computation and Estimation

K.2.1 Use whole numbers*, up to 10, in counting, identifying, sorting, and describing objects and experiences.

A3, A9b, A17b, B17b, B9b, B29b, B33b, C11b, C19b, C25b, C27b, D29b
Your Science Handbook 8–9, 20–21

Communication

K.2.2 Draw pictures and write words to describe objects and experiences.

*In most lessons and activities in **Scott Foresman Science**, children write words and draw pictures in Student Workbooks to describe objects and pictures. These are some of the many examples.*

A7, A9a, A15, A17, A19, A25, A25a, A26, A29, A31, A31a, B7, B9, B11, B11a, B17, B19, B19a, B21, B22, B29, B31, B31a, B33, B33a, C7, C9a, C11, C12, C17, C19, C25, C27, C28, C31, D7, D9, D11, D17, D19, D21, D21a, D22, D27, D29, D30, D33

Standard 3—The Physical Setting

Students investigate, describe, and discuss their natural surroundings. They begin to question why things move.

Matter and Energy

K.3.1 Describe objects in terms of the materials they are made of, such as clay, cloth, paper, etc.

B12, C17a, D10–D11, D11a–D11b, D13, D33b

Your Science Handbook 6–7

Forces of Nature

K.3.2 Investigate that things move in different ways, such as fast, slow, etc.

A7, A7b, A14–A15, A25a, B26–B29, B29a–B29b, B30–B31, B31a–B31b, B32–B33, B33a–B33b, B34–B35

Standard 4—The Living Environment

Students ask questions about a variety of living things and everyday events that can be answered through shared observations.

Diversity of Life

K.4.1 Give examples of plants and animals.

A7, A18–A19, A19a–A19b, A20–A21, A24–A25, A25a–A25b, A28–A29, A30–A31, A31a–A31b, A32–A33

K.4.2 Observe plants and animals, describing how they are alike and how they are different in the way they look and in the things they do.

A4, A6–A7, A15, A15a–A15b, A17, A17a–A17b, A19, A31

Standard 5—The Mathematical World

Students use shapes to compare objects and they begin to recognize patterns.
Shapes and Symbolic Relationships

K.5.1 Use shapes — such as circles, squares, rectangles, and triangles — to describe different objects.

B6, B7, B7b, B12, B21b, D19b, D27b

Your Science Handbook 10–11

Standard 6—Common Themes

Students begin to understand how things are similar and how they are different. They look for ways to distinguish between different objects by observation.

Models and Scale

K.6.1 Describe an object by saying how it is similar to or different from another object.

A8–A9, A25, B6, B7, B7a, B12, B17, C11, D20, D21, D21a–D21b, D23

**Scott Foresman Science
to the
Indiana Academic Standards for Science
Grade One**

Standard 1—The Nature of Science and Technology

Students are actively engaged in exploring how the world works. They explore, observe, count, collect, measure, compare, and ask questions. They discuss observations and use tools to seek answers and solve problems. They share their findings.

Scientific Inquiry

1.1.1 Observe, describe, draw, and sort objects carefully to learn about them.

*In most lessons, investigations, and experiments in **Scott Foresman Science**, children observe, describe, draw and sort objects. These are some of the many examples.*

xiv–xv, A9, A21, A23, A31, A33, A35, A51, B7, B9, B11, B31, B37, B51, B57, B61, B64, C13, C14, C19, C23, C35, C37, C39, C49, C57, D7, D11, D35, D45

1.1.2 Investigate and make observations to seek answers to questions about the world, such as “In what ways do animals move?”

A10–A11, A13, A15, A18–A19, A21, A23, A31, A33, A35, A38–A39, A51, A53, A58–A59, B7, B11, B14, B18–B19, B25, B27, B28–B29, B31, B34, B40–B41, B47, B51, B53, B58–B59, C9, C10, C14–C15, C21, C29, C30–C31, C33, C36–C37, C41, C49, C51, C58–C59, D7, D12–D13, D4–D15, D21, D24–D25, D35, D38

The Scientific Enterprise

1.1.3 Recognize that and demonstrate how people can learn much about plants and animals by observing them closely over a period of time. Recognize also that care must be taken to know the needs of living things and how to provide for them.

A9, A10–A11, A15, A18, A22–A23, A40–A41, A43a, A46–A47, A52–A53, A54–A55, A56–A57, A58–A59

Technology and Science

1.1.4 Use tools, such as rulers and magnifiers, to investigate the world and make observations.

A35, B19b, B32–B33, B34–B35, B41b, B58–B59, C11a, C32–C33, C33b, D22–D23, D24–D25
Your Science Handbook 7, 51, 52, 53

Standard 2—Scientific Thinking

Students begin to find answers to their questions about the world by using measurements, estimation, and observation as well as working with materials. They communicate with others through numbers, words, and drawings.

Computation and Estimation

1.2.1 Use whole numbers*, up to 100, in counting, identifying, measuring, and describing objects and experiences.

A10–A11, A19a, A48–A49, A22, A30, A39b, A43b, A49, A51, A54, A59b, B15b, B41b, B46, B55b, B59, B59b, C3, C6–7, C11b, C21b, C50, C51b, D3, D22–D23, D24–D25, D29b
Your Science Handbook 12–13

1.2.2 Use sums and differences of single digit numbers in investigations and judge the reasonableness of the answers.

A22, A23b, A39b, A43b, A49, B15b, B55b, C6–C7, C39b

1.2.3 Explain to other students how to go about solving numerical problems.

A49, C7, D23, D25

Manipulation and Observation

1.2.4 Measure the length of objects having straight edges in inches, centimeters, or non-standard units.

A13b, A30, B59b, D22–D23, D24–D25
Your Science Handbook 50

1.2.5 Demonstrate that magnifiers help people see things they could not see without them.

A35, 7, 53

Communication Skills

1.2.6 Describe and compare objects in terms of number, shape, texture, size, weight, color, and motion.

A20–A21, A23, A31, B6–B7, B47, C1d, C8–C9, D7, D12–D13, D35
Your Science Handbook 11

1.2.7 Write brief informational descriptions of a real object, person, place, or event using information from observations.

A2, A9, A11, A13, A15, A19, A21, A23, A31, A33, A35, A39, A51, A53, A59, b7, B11, B15, B19, B25, B27, B31, B35, B41, B47, B51, B53, B55, B59, C9, C11, C15, C21, C29, C31, C33, C37, C41, C49, C51, C59, D7, D13, D15, D21, D25, D35, D39

Standard 3—The Physical Setting

Students investigate, describe, and discuss their natural surroundings. They question why things move and change.

The Earth and the Processes That Shape It

1.3.1 Recognize and explain that water can be a liquid or a solid and can go back and forth from one form to the other. Investigate by observing that if water is turned into ice and then the ice is allowed to melt, the amount of water is the same as it was before freezing.

B8–B9, B16–B17, B40–B41

1.3.2 Investigate by observing and then describing that water left in an open container disappears, but water in a closed container does not disappear.

Related content:

B18–B19

Matter and Energy

1.3.3 Investigate by observing and also measuring that the sun warms the land, air, and water.

C50, C51

Related content:

C32–C33

Forces of Nature

1.3.4 Investigate by observing and then describe how things move in many different ways, such as straight, zigzag, round-and-round, and back-and-forth.

A32–A33, B46–B47, B50–B51, B51a–B51b, B52–B53, B54–B55, B61

1.3.5 Recognize that and demonstrate how things near Earth fall to the ground unless something holds them up.

B50

Your Science Handbook 44

Standard 4—The Living Environment

Students ask questions about a variety of living things and everyday events that can be answered through observations. They become aware of plant and animal interaction. They consider things and processes that plants and animals need to stay alive.

Diversity of Life

1.4.1 Identify when stories give attributes to plants and animals, such as the ability to speak, that they really do not have.

This objective can be introduced and discussed on this page with the story, Frog and Toad.

A19b

Related content:

C54–C55

1.4.2 Observe and describe that there can be differences, such as size or markings, among the individuals within one kind of plant or animal group.

A36–A37, A43, A54–A55

Interdependence of Life

1.4.3 Observe and explain that animals eat plants or other animals for food.

A40–A4, A45

1.4.4 Explain that most living things need water, food, and air.

A10–A11, A12, A14–A15, A18–A19, A24, A40–A41, A45, A50–A51, A52, a58–a59, C18–C19, C50

Standard 5—The Mathematical World

Students apply mathematics in scientific contexts. They begin to use numbers for computing, estimating, naming, measuring, and communicating specific information. They make picture graphs and recognize patterns.

Numbers

1.5.1 Use numbers, up to 10, to place objects in order, such as first, second, and third, and to name them, such as bus numbers or phone numbers.

Related content:

B12–B13, B32–B33, C11b, C51b

1.5.2 Make and use simple picture graphs to tell about observations.

A35b, A53b, C6–C7, C9, C33b, D3, D29b

Your Science Handbook 24–25, 34, 35

Related content:

A19, A19a, A48–A49, A51, B15, A54, A61, B15, b29, C3, C26–C27, C29, D12–13, D14–D15

Shapes and Symbolic Relationships

1.5.3 Observe and describe similar patterns, such as shapes, designs, and events that may show up in nature, such as honeycombs, sunflowers, or shells. See similar patterns in the things people make, such as quilts, baskets, or pottery.

A34

Standard 6—Common Themes

Students begin to understand how things are similar and how they are different. They look for what changes and what does not change and make comparisons.

Models and Scale

1.6.1 Observe and describe that models, such as toys, are like the real things in some ways but different in others.

A39

Your Science Handbook 21

Related content:

A29, A53, B61, C59

Constancy and Change

1.6.2 Observe that and describe how certain things change in some ways and stay the same in others, such as in their color, size, and weight.

A16–17, A42–A43, A58–A59

**Scott Foresman Science
to the
Indiana Academic Standards for Science
Grade Two**

Standard 1—The Nature of Science and Technology

Students are actively engaged in exploring how the world works. They explore, observe, count, collect, measure, compare, and ask questions. They discuss observations and use tools to seek answers and solve problems. They share their findings.*

Scientific Inquiry

2.1.1 Manipulate an object to gain additional information about it.

A17, A18–A19, A36–A37, A51, A61, B9, B15, B47, B49, B53, B54–B55, B57, B61, C16–C17, C21, C48–C49

Your Science Handbook 6–7

2.1.2 Use tools — such as thermometers, magnifiers, rulers, or balances — to gain more information about objects.

51, A18–A19, B3, B11, C28–C29, C30–C31, C32–C33, C36–C37, D38–D39

2.1.3 Describe, both in writing and verbally, objects as accurately as possible and compare observations with those of other people.

A9, A18–A19, A43, A56–A47, B9, B11, B15, B18–B19, B25, B30–B31, B37, B38–B39, B47B49, B51, B53, B57, C7, C13, C16–C17, C21, C29, C32, C40–C41, C49, D7, D12–D13, D14, D23, D24–D25, D35, D38–D39

Your Science Handbook 8–9

2.1.4 Make new observations when there is disagreement among initial observations.

These investigations and experiments provide opportunities for students to apply this objective.

A10–A11, A18–A19, A36–A37, A56–A57B18–B19, B30–B31, B38–B39, B54–B55, C16–C17, C32–C33, C40–C41, C52–C53, D12–D13, D14–D15, D24–D25, D38–D39

The Scientific Enterprise

2.1.5 Demonstrate the ability to work with a team but still reach and communicate one's own conclusions about findings.

A9, A18–A19, A43, A56–A47, B9, B11, B15, B18–B19, B25, B30–B31, B37, B38–B39, B47–B49, B51, B53, B57, B61, C7, C13, C16–C17, C21, C29, C32, C40–C41, C49, D7, D12–D13, D14, D23, D24–D25, D35, D38–D39

Technology and Science

2.1.6 Use tools to investigate, observe, measure, design, and build things.

51, A18–A19, A56–A57, B3, B11, B30–B31, B31a, B31b, B61, B57, B67, C28–C29, C30–C31, C32–C33, C36–C37, C37b, C48–C49, D12–D13, D35, D36–D37

2.1.7 Recognize and describe ways that some materials — such as recycled paper, cans, and plastic jugs — can be used over again.

C20–C21, C22–C23, C64

Standard 2—Scientific Thinking

Students begin to find answers to their questions about the world by using measurement, estimation, and observation as well as working with materials. They communicate with others through numbers, words, and drawings.

Computation and Estimation

2.2.1 Give estimates of numerical answers to problems before doing them formally.

xiv, A11b, A23b, A56–A57, B3, B47

Your Science Handbook 12–13

2.2.2 Make quantitative estimates of familiar lengths, weights, and time intervals and check them by measurements.

xiv, A11b, A56–A57, B3, B47, C48

Your Science Handbook 12–13

Related content:

A23b, B3

Estimation can be introduced during these measurement lessons and activities:

A17, A43, B18–B19, C35, C37, C39, C48–C49, D14–D15, D35

2.2.3 Estimate and measure capacity using cups and pints.

B19b, 28–29

This objective can also be introduced during these activities:

B15, C13, C16–C17, C21, C32–C33, C39, C40–C41, D27

Manipulation and Observation

2.2.4 Assemble, describe, take apart, and/or reassemble constructions using such things as interlocking blocks and erector sets. Sometimes pictures or words may be used as a reference.

B57, B61, C1a–C1b, C29, D25b

Communication Skills

2.2.5 Draw pictures and write brief descriptions that correctly portray key features of an object.

A9, A12–A13, A15, A25, A29, A41, A64, B25, B27, B37, B64, C1d, C8–C9, C45, C48–C49, C52–C53, D17

Standard 3—The Physical Setting

Students investigate, describe, and discuss their natural surroundings. They wonder why things move and change.

Earth and the Processes That Shape It

2.3.1 Investigate by observing and then describe that some events in nature have a repeating pattern, such as seasons, day and night, and migrations.

C48–C49, C50–C51, C52–C53

2.3.2 Investigate, compare, and describe weather changes from day to day but recognize, describe, and chart that the temperature and amounts of rain or snow tend to be high, medium, or low in the same months every year.

C26–C27, C34–C35, C36–C37, C37b, C42–C43

2.3.3 Investigate by observing and then describe chunks of rocks and their many sizes and shapes, from boulders to grains of sand and even smaller.

C10–C12, C11–C13, C13b

2.3.4 Investigate by observing and then describe how animals and plants sometimes cause changes in their surroundings.

C12–C13

Matter and Energy

2.3.5 Investigate that things can be done to materials — such as freezing, mixing, cutting, heating, or wetting — to change some of their properties. Observe that not all materials respond in the same way.

B12–B13, B16–B17, B18–B19, B30–B31

2.3.6 Discuss how people use electricity or burn fuels, such as wood, oil, coal, or natural gas, to cook their food and warm their houses.

B28–B29, B58–B59

Forces of Nature

2.3.7 Investigate and observe that the way to change how something is moving is to give it a push or a pull.

B46–B47, B61

2.3.8 Demonstrate and observe that magnets can be used to make some things move without being touched.

B50–B51, B52–B53, B54–B55, B55b

Your Science Handbook 16–17

Standard 4—The Living Environment

Students ask questions about a variety of living things and everyday events that can be answered through observations. They consider things and processes that plants and animals need to stay alive. Students begin to understand plant and animal interaction.

Diversity of Life

2.4.1 Observe and identify different external features of plants and animals and describe how these features help them live in different environments.

A11a–A11b, A14–A15, A16–A17, A18–A19b, A20–A21, A23a–A23b, A38–A39, A42–A43, A43a–A43b

Interdependence of Life

2.4.2 Observe that and describe how animals may use plants, or even other animals, for shelter and nesting.

This objective can be introduced during this lesson.

A40–A41

2.4.3 Observe and explain that plants and animals both need to take in water, animals need to take in food, and plants need light.

A1c–A1d, A8–A9, A10–A11, A16–A17, A40–A41

2.4.4 Recognize and explain that living things are found almost everywhere in the world and that there are somewhat different kinds in different places.

Related content:

A6–A7, A28–A29, A38–A39

2.4.5 Recognize and explain that materials in nature, such as grass, twigs, sticks, and leaves, can be recycled and used again, sometimes in different forms, such as in birds' nests.

C20–C21, C22–C23, C64

Human Identity

2.4.6 Observe and describe the different external features of people, such as their size, shape, and color of hair, skin, and eyes.

*This objective is addressed in Grade 1. **Scott Foresman Science Grade 2** explores and investigates human systems.*

2.4.7 Recognize and discuss that people are more like one another than they are like other animals.

*This objective is addressed in Grade 1. **Scott Foresman Science Grade 2** explores and investigates human systems.*

2.4.8 Give examples of different roles people have in families and communities.

*This objective is addressed in Grade 1. **Scott Foresman Science Grade 2** explores and investigates human systems.*

Standard 5—The Mathematical World

Students apply mathematics in scientific contexts. They use numbers for computing, estimating, naming, measuring, and communicating specific information. They make picture and bar graphs. They recognize and describe shapes and patterns. They use evidence to explain how or why something happens.

Numbers

2.5.1 Recognize and explain that, in measuring, there is a need to use numbers between whole numbers*, such as 2½ centimeters.

A11b, B39b

Your Science Handbook 28–29

This objective can be introduced during these activities and investigations.

A11b, A56–A57, 12–13

2.5.2 Recognize and explain that it is often useful to estimate quantities.

A11b, A23b

Your Science Handbook 12–13

This objective can be introduced during these activities.

A23b, B15, C32–C33, D27

Shapes and Symbolic Relationships

2.5.3 Observe that and describe how changing one thing can cause changes in something else, such as exercise and its effect on heart rate.

B27, B38–B39, B44–B45, C12–C13, C14–C15, D14–D15, D22–D23, D34–D35, D40–D41

Reasoning and Uncertainty

2.5.4 Begin to recognize and explain that people are more likely to believe ideas if good reasons are given for them.

C20–C21, C22–C23, D15b, D22–D23, D40–D41, D45, D46–D47, D48

2.5.5 Explain that some events can be predicted with certainty, such as sunrise and sunset, and some cannot, such as storms. Understand that people aren't always sure what will happen since they do not know everything that might have an effect.

C14–C15, C36–C37, C42–C43, C48–C49, C52–C53

2.5.6 Explain that sometimes a person can find out a lot (but not everything) about a group of things, such as insects, plants, or rocks, by studying just a few of them.

A17, A18–A19, C10–C11, C13, D24–D25

Standard 6—Common Themes

Students begin to observe how objects are similar and how they are different. They begin to identify parts of an object and recognize how these parts interact with the whole. They look for what changes and what does not change and make comparisons.

Systems

2.6.1 Investigate that most objects are made of parts.

Systems, as well as objects, are included in these citations.

A14–A15, B57, B61, D6–D7, D10–D11, D14–D15, D16, D26–D29, D30, D43

Your Science Handbook 20–21

Models and Scale

2.6.2 Observe and explain that models may not be the same size, may be missing some details, or may not be able to do all of the same things as the real things.

C17, 20–21

This objective can also be discussed on the following pages.

A41, B27, B57, B61, C7, C13, C59b, D29b

Constancy and Change

2.6.3 Describe that things can change in different ways, such as in size, weight, color, age, and movement. Investigate that some small changes can be detected by taking measurements.

A16–A17, A32–A33, A34–A35, B16–B17, B47, C12–C13, C14–C15, C16–C17, C21

**Scott Foresman Science
to the
Indiana Academic Standards for Science
Grade Three**

Standard 1—The Nature of Science and Technology

Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal forms.

The Scientific View of the World

3.1.1 Recognize and explain that when a scientific investigation is repeated, a similar result is expected.

xiii; Your Science Handbook 22–23

Scientific Inquiry

3.1.2 Participate in different types of guided scientific investigations, such as observing objects and events and collecting specimens for analysis.

A6–A7, A12–A13, A18–A19, A30–A31, A40–A41, A56, A64–A65, A77–A79, A84–A85, A100–A101, B6, B14–B15, B20–B21, B25–B27, B32, B42–B43, B52–B53, B58, B68–B69, B80–B81, B86, B92–B93, B98–B99, C6, C18–C19, C32, C46–C47, C51–C53, C58, C64–C65, C72–C73, C86, C92–C93, C98–C99, D6, D22–D23, D28–D29, D34, D44–D45, D55–D57

3.1.3 Keep and report records of investigations and observations* using tools, such as journals, charts, graphs, and computers.

A12–A13, A18–A19, A40–A41, A64–A65, A77–A79, A84–A85, A100–A101, B14–B15, B20–B21, B25–B27, B42–B43, B52–B53, B68–B69, B80–B81, B92–B93, B98–B99, C18–C19, C46–C47, C51–C53, C64–C65, C72–C73, C92–C93, C98–C99, D22–D23, D28–D29, D34, D44–D45, D55–D57

3.1.4 Discuss the results of investigations and consider the explanations of others.

A6–A7, A18–A19, A30–A31, B6, B25–B27, B32, B58, B86, C6, C32, C51–C53, C58, C98–C99, D55–D57

The Scientific Enterprise

3.1.5 Demonstrate the ability to work cooperatively while respecting the ideas of others and communicating one's own conclusions about findings.

A6–A7, A12–A13, A18–A19, A30–A31, A40–A41, A56, A64–A65, A77–A79, A84–A85, A100–A101, B6, B14–B15, B20–B21, B25–B27, B32, B42–B43, B52–B53, B58, B68–B69, B80–B81, B86, B92–B93, B98–B99, C6, C18–C19, C32, C46–C47, C51–C53, C58, C64–C65, C72–C73, C86, C92–C93, C98–C99, D6, D22–D23, D28–D29, D34, D44–D45, D55–D57

Technology and Science

3.1.6 Give examples of how tools, such as automobiles, computers, and electric motors, have affected the way we live.

B72, B78

Your Science Handbook 47–48

3.1.7 Recognize that and explain how an invention can be used in different ways, such as a radio being used to get information and for entertainment.

Your Science Handbook 48

3.1.8 Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

A96–A98

Standard 2—Scientific Thinking

Students use a variety of skills and techniques when attempting to answer questions and solve problems. They describe their observations accurately and clearly, using numbers, words, and sketches, and are able to communicate their thinking to others.

Computation and Estimation

3.2.1 Add and subtract whole numbers* mentally, on paper, and with a calculator.

A57, B7, B59, C87

Manipulation and Observation

3.2.2 Measure and mix dry and liquid materials in prescribed amounts, following reasonable safety precautions.

B20–B21, B25–B27, C46–C47, C51–C53, C86

3.2.3 Keep a notebook that describes observations and is understandable weeks or months later.

Students record observations, predictions, and results from investigations and experiments in the Lab Manual.

3.2.4 Appropriately use simple tools, such as clamps, rulers, scissors, hand lenses, and other technology, such as calculators and computers, to help solve problems.

A6, A12–A13, A18–A19, A30, A77–A79, B14–B15, B25–B27, C6, C32, 646–C47, D6, D22–D23

3.2.5 Construct something used for performing a task out of paper, cardboard, wood, plastic, metal, or existing objects.

A64–A65, A100–A101, B42–B43, B52–B53, B68–B69, B80–B81, B92–B93, C92–C93, D22–D23

Communication Skills

3.2.6 Make sketches and write descriptions to aid in explaining procedures or ideas.

Critical Response Skills

A6–A7, A12–A13, A18–A19, A30–A31, A40–A41, A56, A64–A65, A77–A79, A84–A85, A100–A101, B6, B14–B15, B20–B21, B25–B27, B32, B42–B43, B52–B53, B58, B68–B69, B80–B81, B86, B92–B93, B98–B99, C6, C18–C19, C32, C46–C47, C51–C53, C58, C64–C65, C72–C73, C86, C92–C93, C98–C99, D6, D22–D23, D28–D29, D34, D44–D45, D55–D57

Your Science Handbook 8–9

3.2.7 Ask “How do you know?” in appropriate situations and attempt reasonable answers when others ask the same question.

A6–A7, A18–A19, A30–A31, B6, B25–B27, B32, B58, B86, C6, C32, C51–C53, C58, C98–C99, D55–D57

Your Science Handbook 8–9

Standard 3—The Physical Setting

Students observe changes of Earth and the sky. They continue to explore the concepts of energy and motion*.*

The Universe

3.3.1 Observe and describe the apparent motion of the sun and moon over a time span of one day.

C64–C65, C66–C71, C72–C73

3.3.2 Observe and describe that there are more stars in the sky than anyone can easily count, but they are not scattered evenly.

C78–C81

3.3.3 Observe and describe that the sun can be seen only in the daytime.

C66–C71

3.3.4 Observe and describe that the moon looks a little different every day, but looks the same again about every four weeks.

C74–C75

Earth and the Processes That Shape It

3.3.5 Give examples of how change, such as weather patterns, is a continual process occurring on Earth.

C8–C13, C18–C19, C20–C23, C24–C27, C88–C91, C94–C97, C100–C105

3.3.6 Describe ways human beings protect themselves from adverse weather conditions.

C100–1105

3.3.7 Identify and explain some effects human activities have on weather.

A94–A99

Matter* and Energy

3.3.8 Investigate and describe how moving air and water can be used to run machines like windmills and waterwheels.

B60–B63

Forces of Nature

3.3.9 Demonstrate that things that make sound do so by vibrating, such as vocal cords and musical instruments.

B86, B88–B91, B94–B97, B98–B99, B100–B105

Standard 4—The Living Environment

Students learn about an increasing variety of organisms. They use appropriate tools and identify similarities and differences among them. Students explore how organisms satisfy their needs in typical environments.

Diversity of Life

3.4.1 Demonstrate that a great variety of living things can be sorted into groups in many ways using various features, such as how they look, where they live, and how they act, to decide which things belong to which group.

xiv, A6, A12–A13, A27c, A33–A35, A36–A39, A42–A45, A58–A63, A66–A69, A70–A73, A74–A76

Your Science Handbook 10–11

3.4.2 Explain that features used for grouping depend on the purpose of the grouping.
A27c

3.4.3 Observe that and describe how offspring are very much, but not exactly, like their parents and like one another.
A32–A35

Interdependence of Life and Evolution

3.4.4 Describe that almost all kinds of animals' food can be traced back to plants.
A42–A47, A53c, A70–A73, A102–A103

3.4.5 Give examples of some kinds of organisms that have completely disappeared and explain how these organisms were similar to some organisms living today.
A74–A76, A90–A93

Human Identity

3.4.6 Explain that people need water, food, air, waste removal, and a particular range of temperatures, just as other animals do.
A102–A105

3.4.7 Explain that eating a variety of healthful foods and getting enough exercise and rest help people stay healthy.
D34, D36–D43

3.4.8 Explain that some things people take into their bodies from the environment can hurt them and give examples of such things.
D50–D54

3.4.9 Explain that some diseases are caused by germs and some are not. Note that diseases caused by germs may be spread to other people. Also understand that washing hands with soap and water reduces the number of germs that can get into the body or that can be passed on to other people.
D46–D49

Standard 5—The Mathematical World

Students apply mathematics in scientific contexts. Students make more precise and varied measurements when gathering data. Based upon collected data, they pose questions and solve problems. Students use numbers to record data and construct graphs and tables to communicate their findings.

Numbers

3.5.1 Select and use appropriate measuring units, such as centimeters (cm) and meters (m), grams (g) and kilograms (kg), and degrees Celsius (°C).

B7, B8–B13, B59, B67

Your Science Handbook 4–5

3.5.2 Observe that and describe how some measurements are likely to be slightly different, even if what is being measured stays the same.

B8–B13

Shapes and Symbolic Relationships

3.5.3 Construct tables and graphs to show how values of one quantity are related to values of another.

B112, D35, C87

3.5.4 Illustrate that if 0 and 1 are located on a line, any other number can be depicted as a position on the line.

A57

Reasoning and Uncertainty

3.5.5 Explain that one way to make sense of something is to think of how it relates to something more familiar.

A30, A100–A101

Standard 6—Common Themes

Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Systems

3.6.1 Investigate how and describe that when parts are put together, they can do things that they could not do by themselves.

B18, C62, C96–C97, D6, D8–D13, D14–D21

Your Science Handbook 40–41

3.6.2 Investigate how and describe that something may not work if some of its parts are missing.

D6, D14–D21

Models and Scale

3.6.3 Explain how a model of something is different from the real thing but can be used to learn something about the real thing.

xv, A53c, C18–C19, C29c

Your Science Handbook 20–21

Constancy and Change

3.6.4 Take, record, and display counts and simple measurements of things over time, such as plant or student growth.

A1c–A1d, A18–A19, A40–A41, A77–A79

3.6.5 Observe that and describe how some changes are very slow and some are very fast and that some of these changes may be hard to see and/or record.

A1c–A1d, A18–A19, A40–A41, A77–A79

**Scott Foresman Science
to the
Indiana Academic Standards for Science

Grade Four**

Standard 1—The Nature of Science and Technology

Students, working collaboratively, carry out investigations. They observe and make accurate measurements, increase their use of tools and instruments, record data in journals, and communicate results through chart, graph, written, and verbal forms.

The Scientific View of the World

4.1.1 Observe and describe that scientific investigations generally work the same way in different places.

A72–73, C89–C91, D18–D19

Scientific Inquiry

4.1.2 Recognize and describe that results of scientific investigations are seldom exactly the same. If differences occur, such as a large variation in the measurement of plant growth, propose reasons for why these differences exist, using recorded information about investigations.

A1c–A1d, A66, C89–C91

The Scientific Enterprise

4.1.3 Explain that clear communication is an essential part of doing science since it enables scientists to inform others about their work, to expose their ideas to evaluation by other scientists, and to allow scientists to stay informed about scientific discoveries around the world.

A6, A36, A72–A73, B62

4.1.4 Describe how people all over the world have taken part in scientific investigation for many centuries.

C70–C75, C114–C117, History of Science 48–59

Technology and Science

4.1.5 Demonstrate how measuring instruments, such as microscopes, telescopes, and cameras, can be used to gather accurate information for making scientific comparisons of objects and events. Note that measuring instruments, such as rulers, can also be used for designing and constructing things that will work properly.

A24–A25, B2–B3, B20–B21

4.1.6 Explain that even a good design may fail even though steps are taken ahead of time to reduce the likelihood of failure.

B1c–B1d

Your Science Handbook 22–29

4.1.7 Discuss and give examples of how technology, such as computers and medicines, has improved the lives of many people, although the benefits are not equally available to all.

A127, C66–C67

4.1.8 Recognize and explain that any invention may lead to other inventions.

B2–B3, D2

4.1.9 Explain how some products and materials are easier to recycle than others.

A90–A91, A117, C58–C59

Standard 2—Scientific Thinking

Students use a variety of skills and techniques when attempting to answer questions and solve problems. They describe their observations accurately and clearly, using numbers, words, and sketches, and are able to communicate their thinking to others. They compare, explain, and justify both information and numerical functions.*

Computation and Estimation

4.2.1 Judge whether measurements and computations of quantities, such as length, area*, volume*, weight, or time, are reasonable.

B12–B15, B16–B19, B20–B21, D7

4.2.2 State the purpose, orally or in writing, of each step in a computation.

D7

Manipulation and Observation

4.2.3 Make simple and safe electrical connections with various plugs, sockets, and terminals.

B59c, B67, B72–B73

Communication Skills

4.2.4 Use numerical data to describe and compare objects and events.

A24–A25, A29–A31, B55–B57

4.2.5 Write descriptions of investigations, using observations and other evidence as support for explanations.

A24–A25, A29–A31, A72–A73, B46–B47, B62, B72–B73

Critical Response Skills

4.2.6 Support statements with facts found in print and electronic media, identify the sources used, and expect others to do the same.

A128

4.2.7 Identify better reasons for believing something than “Everybody knows that ...” or “I just know,” and discount such reasons when given by others.

B6, B34, B46–B47, B62, B72–B73, B85–B87

Your Science Handbook 8–9

Standard 3—The Physical Setting

Students continue to investigate changes of Earth and the sky and begin to understand the composition and size of the universe. They explore, describe, and classify materials, motion, and energy*.*

The Universe

4.3.1 Observe and report that the moon can be seen sometimes at night and sometimes during the day.

C102–C105

Earth and the Processes That Shape It

4.3.2 Begin to investigate and explain that air is a substance that surrounds us and takes up space, and whose movements we feel as wind.

C3c, C12–C15

4.3.3 Identify salt as the major difference between fresh and ocean waters.

C84–C88, C89–C91

4.3.4 Describe some of the effects of oceans on climate.

C78–C83

4.3.5 Describe how waves, wind, water, and glacial ice shape and reshape Earth’s land surface by the erosion* of rock and soil in some areas and depositing them in other areas.

C44–C47, C82–C83

4.3.6 Recognize and describe that rock is composed of different combinations of minerals.

C50–C51, C54–C55, Science Reference Section 34

4.3.7 Explain that smaller rocks come from the breakage and weathering of bedrock and larger rocks and that soil is made partly from weathered rock, partly from plant remains, and also contains many living organisms.

C50–C53

4.3.8 Explain that the rotation of Earth on its axis every 24 hours produces the night-and-day cycle.

C8–C9

4.3.9 Draw or correctly select drawings of shadows and their direction and length at different times of day.

C8–C9

Matter* and Energy

4.3.10 Demonstrate that the mass* of a whole object is always the same as the sum of the masses of its parts.

B8–B11

4.3.11 Investigate, observe, and explain that things that give off light often also give off heat*.

B23

4.3.12 Investigate, observe, and explain that heat is produced when one object rubs against another, such as one's hands rubbing together.

B62, B64–B65

4.3.13 Observe and describe the things that give off heat, such as people, animals, and the sun.

B44, B94–B97

4.3.14 Explain that energy in fossil fuels* comes from plants that grew long ago.

C56–C59

Forces of Nature

4.3.15 Demonstrate that without touching them, a magnet pulls all things made of iron and either pushes or pulls other magnets.

B74–B77, B78–B79, B85–B87

Your Science Handbook 28–29

4.3.16 Investigate and describe that without touching them, material that has been electrically charged pulls all other materials and may either push or pull other charged material.

B62, B64–B67

Standard 4—The Living Environment

Students learn about an increasing variety of organisms – familiar, exotic, fossil, and microscopic. They use appropriate tools in identifying similarities and differences among them. They explore how organisms satisfy their needs in their environments.

Diversity of Life

4.4.1 Investigate, such as by using microscopes, to see that living things are made mostly of cells.

A24–A25

Interdependence of Life and Evolution

4.4.2 Investigate, observe, and describe that insects and various other organisms depend on dead plant and animal material for food.

A68–A71, A77–A81, A82

4.4.3 Observe and describe that organisms interact with one another in various ways, such as providing food, pollination, and seed dispersal.

A19–A23, A68–A71

4.4.4 Observe and describe that some source of energy is needed for all organisms to stay alive and grow.

A26–A28, A74–A76, A77–A81

4.4.5 Observe and explain that most plants produce far more seeds than those that actually grow into new plants.

A8–A14, A19–A23

4.4.6 Explain how in all environments, organisms are growing, dying, and decaying, and new organisms are being produced by the old ones.

A26–A28, A68–A71, A82–A89

Human Identity

4.4.7 Describe that human beings have made tools and machines, such as x-rays, microscopes, and computers, to sense and do things that they could not otherwise sense or do at all, or as quickly, or as well.

B120–B121, C70–C75, C114–C117

4.4.8 Know and explain that artifacts and preserved remains provide some evidence of the physical characteristics and possible behavior of human beings who lived a very long time ago.

*The topic of these pages is evidence of animal life long ago:
Science Reference Section 36–37*

4.4.9 Explain that food provides energy and materials for growth and repair of body parts. Recognize that vitamins and minerals, present in small amounts in foods, are essential to keep everything working well. Further understand that as people grow up, the amounts and kinds of food and exercise needed by the body may change.

D8–D12

4.4.10 Explain that if germs are able to get inside the body, they may keep it from working properly. Understand that for defense against germs, the human body has tears, saliva, skin, some blood cells, and stomach secretions. Also note that a healthy body can fight most germs that invade it. Recognize, however, that there are some germs that interfere with the body’s defenses.

*On these pages, students discuss keeping a healthy body:
D36–D39, D40–D45, D46–D55*

See also Grade 5, Unit D, Chapter 2.

4.4.11 Explain that there are some diseases that human beings can only catch once. Explain that there are many diseases that can be prevented by vaccinations, so that people do not catch them even once.

*On these pages, students discuss keeping a healthy body:
D36–D39, D40–D45, D46–D55*

See also Grade 5, Unit D, Chapter 2.

Standard 5—The Mathematical World

Students apply mathematics in scientific contexts. Their geometric descriptions of objects are comprehensive. They realize that graphing demonstrates specific connections between data. They identify questions that can be answered by data distribution.

Numbers

4.5.1 Explain that the meaning of numerals in many-digit numbers depends on their positions.

B12–B15

4.5.2 Explain that in some situations, “0” means none of something, but in others it may be just the label of some point on a scale.

A37, A97, D29

Shapes and Symbolic Relationships

4.5.3 Illustrate how length can be thought of as unit lengths joined together, area as a collection of unit squares, and volume as a set of unit cubes.

B8, B12–B15

4.5.4 Demonstrate how graphical displays of numbers may make it possible to spot patterns that are not otherwise obvious, such as comparative size and trends.

B93, B111, C125, D62, D29

Reasoning and Uncertainty

4.5.5 Explain how reasoning can be distorted by strong feelings.

Your Science Handbook 14–15

Standard 6—Common Themes

Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Systems

4.6.1 Demonstrate that in an object consisting of many parts, the parts usually influence or interact with one another.

A68–A71, C50–C51

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Science Reference Section 42–43

4.6.2 Show that something may not work as well, or at all, if a part of it is missing, broken, worn out, mismatched, or incorrectly connected.

A68–A71

Your Science Handbook 30

Models and Scale

4.6.3 Recognize that and describe how changes made to a model can help predict how the real thing can be altered.

A3c, A33c, A66, C93c, C106–C107, D3c

Your Science Handbook 20–21

Constancy and Change

4.6.4 Observe and describe that some features of things may stay the same even when other features change.

A1c–A1d, C76–C77

**Scott Foresman Science
to the
Indiana Academic Standards for Science**

Grade Five

Standard 1—The Nature of Science and Technology

Students work collaboratively to carry out investigations. They observe and make accurate measurements, increase their use of tools and instruments, record data in journals, and communicate results through chart, graph, written, and verbal forms. Students repeat investigations, explain inconsistencies, and design projects.

The Scientific View of the World

5.1.1 Recognize and describe that results of similar scientific investigations may turn out differently because of inconsistencies in methods, materials, and observations*.

A135–A137, B69–B71, B96–B97

Scientific Inquiry

5.1.2 Begin to evaluate the validity of claims based on the amount and quality of the evidence cited.

A67–A69, B69–B71

The Scientific Enterprise

5.1.3 Explain that doing science involves many different kinds of work and engages men, women, and children of all ages and backgrounds.

A60–A66, B9, B11, C111, C113, C130–C131

Technology and Science

5.1.4 Give examples of technology, such as telescopes, microscopes, and cameras, that enable scientists and others to observe things that are too small or too far away to be seen without them and to study the motion of objects that are moving very rapidly or are hardly moving.

A38, A62, B18, B30, C129–C135, D11, D34–D35

5.1.5 Explain that technology extends the ability of people to make positive and/or negative changes in the world.

B93, C106, C118, C129–C131, D40

Your Science Handbook 30

5.1.6 Explain how the solution to one problem, such as the use of pesticides in agriculture or the use of dumps for waste disposal, may create other problems.

C51–C53, C54–C55, C64–C67

5.1.7 Give examples of materials not present in nature, such as cloth, plastic, and concrete, that have become available because of science and technology.

B20–B21

Standard 2—Scientific Thinking

Students use a variety of skills and techniques when attempting to answer questions and solve problems. Students describe their observations accurately and clearly using numbers, words, and sketches, and are able to communicate their thinking to others. They compare, contrast, explain, and justify both information and numerical functions.

Computation and Estimation

5.2.1 Multiply and divide whole numbers* mentally, on paper, and with a calculator.

A11, A32, A83, B7, B11, B30, B66

5.2.2 Use appropriate fractions and decimals when solving problems.

A26, A39, B7, A61, B57, B81, C9

Manipulation and Observation

5.2.3 Choose appropriate common materials for making simple mechanical constructions and repairing things.

B60–B61, B84–B85, B107c, B128–B129, B136–B137, C126–C127, D14–D15

5.2.4 Keep a notebook to record observations and be able to distinguish inferences* from actual observations.

Students record observations, predictions, and results from investigations and experiments in the Lab Manual.

5.2.5 Use technology, such as calculators or spreadsheets, in determining area and volume from linear dimensions. Find area*, volume*, mass*, time, and cost, and find the difference between two quantities of anything.

C1c–C1d, D6

Communication Skills

5.2.6 Write instructions that others can follow in carrying out a procedure.

All Investigate and Explore activities include a section named Inquire Further, which asks students to make a plan for answering an inquiry based on the activity. The following is a list of Investigate and Explore activities.

A6, A22–A23, A38, A48–A49, A58–A59, A67–A69, A74, A88–A89, A96–A97, A108, A116–A117, A135–A137, B6, B22–B23, B38–B39, B44, B54–B55, B60–B61, B69–B71, B76, B84–B85, B96–B97, B103–B105, B110, B118–B119, B128–B129, B136–B137, C6, C12–C13, C28–C29, C35–C37, C42, C54–C55, C68–C69, C74, C82–C83, C88–C89, C108, C126–C127, C136–C137, D6, D14–D15, D25–D27, D32, D56–D57

5.2.7 Read and follow step-by-step instructions when learning new procedures.

A6, A22–A23, A38, A48–A49, A58–A59, A67–A69, A74, A88–A89, A96–A97, A108, A116–A117, A135–A137, B6, B22–B23, B38–B39, B44, B54–B55, B60–B61, B69–B71, B76, B84–B85, B96–B97, B103–B105, B110, B118–B119, B128–B129, B136–B137, C6, C12–C13, C28–C29, C35–C37, C42, C54–C55, C68–C69, C74, C82–C83, C88–C89, C108, C126–C127, C136–C137, D6, D14–D15, D25–D27, D32, D56–D57

Critical Response Skills

5.2.8 Recognize when and describe that comparisons might not be accurate because some of the conditions are not kept the same.

A135–A137, B44

Standard 3—The Physical Setting

Students continue to investigate changes of Earth and the sky. They explore, describe, and classify materials, motion, and energy*.*

The Universe

5.3.1 Explain that telescopes are used to magnify distant objects in the sky, including the moon and the planets.

C129–C135

5.3.2 Observe and describe that stars are like the sun, some being smaller and some being larger, but they are so far away that they look like points of light.

C118–C125

5.3.3 Observe the stars and identify stars that are unusually bright and those that have unusual colors, such as reddish or bluish.

C122–C123

Earth and the Processes That Shape It

5.3.4 Investigate that when liquid water disappears it turns into a gas* (vapor) mixed into the air and can reappear as a liquid* when cooled or as a solid* if cooled below the freezing point of water.

C74

5.3.5 Observe and explain that clouds and fog are made of tiny droplets of water.

C76–C81

5.3.6 Demonstrate that things on or near Earth are pulled toward it by Earth's gravity*.

B51, B56–B59, B68, C113

5.3.7 Describe that, like all planets and stars, Earth is approximately spherical in shape.

C86

Matter and Energy

5.3.8 Investigate, observe, and describe that heating and cooling cause changes in the properties of materials, such as water turning into steam by boiling and water turning into ice by freezing. Notice that many kinds of changes occur faster at higher temperatures*.

B29–B31, C76–C81

5.3.9 Investigate, observe, and describe that when warmer things are put with cooler ones, the warm ones lose heat* and the cool ones gain it until they are all at the same temperature. Demonstrate that a warmer object can warm a cooler one by contact or at a distance.

C71c, C74, C76–C77

5.3.10 Investigate that some materials conduct* heat much better than others, and poor conductors can reduce heat loss.

B116–B117

Forces of Nature

5.3.11 Investigate and describe that changes in speed* or direction of motion of an object are caused by forces*. Understand that the greater the force, the greater the change in motion and the more massive an object, the less effect a given force will have.

B44, B46–B48, B49–B53, B54–B55, B62–B68, B76

5.3.12 Explain that objects move at different rates, with some moving very slowly and some moving too quickly for people to see them.

B46–B48

5.3.13 Demonstrate that Earth's gravity pulls any object toward it without touching it.

B51, B56–B59

Standard 4—The Living Environment

Students learn about an increasing variety of organisms – familiar, exotic, fossil, and microscopic. They use appropriate tools in identifying similarities and differences among these organisms. Students explore how organisms satisfy their needs in their environments.

Diversity of Life

5.4.1 Explain that for offspring to resemble their parents there must be a reliable way to transfer information from one generation to the next.

A45–A47, A50–A57, A60–A66

5.4.2 Observe and describe that some living things consist of a single cell that needs food, water, air, a way to dispose of waste, and an environment in which to live.

A8–A15

5.4.3 Observe and explain that some organisms are made of a collection of similar cells that benefit from cooperating. Explain that some organisms' cells, such as human nerve and muscle cells, vary greatly in appearance and perform very different roles in the organism.

A14–A15

Interdependence of Life and Evolution

5.4.4 Explain that in any particular environment, some kinds of plants and animals survive well, some do not survive as well, and some cannot survive at all.

A83–A87, A90–A95

5.4.5 Explain how changes in an organism's habitat are sometimes beneficial and sometimes harmful.

A76–A82, A94, A100–A101

5.4.6 Recognize and explain that most microorganisms do not cause disease and many are beneficial.

A22–A23

5.4.7 Explain that living things, such as plants and animals, differ in their characteristics, and that sometimes these differences can give members of these groups (plants and animals) an advantage in surviving and reproducing.

A16–A21, A24–A27, A28–A33

5.4.8 Observe that and describe how fossils can be compared to one another and to living organisms according to their similarities and differences.

A71c, A102–A103, C33–C34

Human Identity

5.4.9 Explain that like other animals, human beings have body systems.

D8–D13, D16–D19, D20–D24

Standard 5—The Mathematical World

Students apply mathematics in scientific contexts. They make more precise and varied measurements in gathering data. Their geometric descriptions of objects are comprehensive, and their graphing demonstrates specific connections. They identify questions that can be answered by data distribution, e.g., “Where is the middle?” and their support of claims or answers with reasons and analogies becomes important.

Numbers

5.5.1 Make precise and varied measurements and specify the appropriate units.

A1c–A1d, A48–A49, C6, C35–C37, D6

Shapes and Symbolic Relationships

5.5.2 Show that mathematical statements using symbols may be true only when the symbols are replaced by certain numbers.

B7, D33

5.5.3 Classify objects in terms of simple figures and solids.

C81, C82–C83

5.5.4 Compare shapes in terms of concepts, such as parallel and perpendicular, congruence*, and symmetry.

A71c

5.5.5 Demonstrate that areas of irregular shapes can be found by dividing them into squares and triangles.

C1c

5.5.6 Describe and use drawings to show shapes and compare locations of things very different in size.

C12–C13

Reasoning and Uncertainty

5.5.7 Explain that predictions can be based on what is known about the past, assuming that conditions are similar.

A48–A49, A74, A96–A97, A135–A137, B38–B39, B84–B85, B96–B97, B118–B119, C126–C127, D14–D15

5.5.8 Realize and explain that predictions may be more accurate if they are based on large collections of objects or events.

A48–A49, A74, A96–A97, A135–A137, B38–B39, B84–B85, B96–B97, B118–B119, C126–C127, D14–D15

5.5.9 Show how spreading data out on a number line helps to see what the extremes are, where they pile up, and where the gaps are.

A99

5.5.10 Explain the danger in using only a portion of the data collected to describe the whole.

A22–A23, A48–A49, A135–A137, B60–B61, B96–B97, B118–B119, C54–C55

Standard 6—Common Themes

Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result.

Systems

5.6.1 Recognize and describe that systems contain objects as well as processes that interact with each other.

A110–A115

Models and Scale

5.6.2 Demonstrate how geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories can be used to represent objects, events, and processes in the real world, although such representation can never be exact in every detail.

A3c, A35c, A58–A59, A96–A97, A105c, B76, C6, C12–C13, C82–C83, C88–C89, C108, D3c, D14–D15, D29c

5.6.3 Recognize and describe that almost anything has limits on how big or small it can be.

A105c

Constancy and Change

5.6.4 Investigate, observe, and describe that things change in steady, repetitive, or irregular ways, such as toy cars continuing in the same direction and air temperature reaching a high or low value. Note that the best way to tell which kinds of changes are happening is to make a table or a graph of measurements.

A8–A10, A43, A48–A49, A77, A91

**Scott Foresman Science
to the
Indiana Academic Standards for Science

Grade Six**

Standard 1—The Nature of Science and Technology

Students design investigations. They use computers and other technology to collect and analyze data; they explain findings and can relate how they conduct investigations to how the scientific enterprise functions as a whole. Students understand that technology has allowed humans to do many things, yet it cannot always provide solutions to our needs.

The Scientific View of the World

6.1.1 Explain that some scientific knowledge, such as the length of the year, is very old and yet is still applicable today. Understand, however, that scientific knowledge is never exempt from review and criticism.

A10, A12, A13, A84–A85, B42, B94, B122, B132, C18–C19, C128–C133

Scientific Inquiry

6.1.2 Give examples of different ways scientists investigate natural phenomena and identify processes all scientists use, such as collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses* and explanations, in order to make sense of the evidence.

A13, B42, B94, B104, C50

6.1.3 Recognize and explain that hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.

A13, B42, B104, C50

The Scientific Enterprise

6.1.4 Give examples of employers who hire scientists, such as colleges and universities, businesses and industries, hospitals, and many government agencies.

B42, C102, C105, C122, D37

6.1.5 Identify places where scientists work, including offices, classrooms, laboratories, farms, factories, and natural field settings ranging from space to the ocean floor.

A10, A13, A84–A85, B42, C102, D37

6.1.6 Explain that computers have become invaluable in science because they speed up and extend people’s ability to collect, store, compile, and analyze data; prepare research reports; and share data and ideas with investigators all over the world.

C30–C31, C100–C105

Technology and Science

6.1.7 Explain that technology is essential to science for such purposes as access to outer space and other remote locations, sample collection and treatment, measurement, data collection and storage, computation, and communication of information.

A10–A12, C8–C10, C18–C25, C30–C31, C100–C105

6.1.8 Describe instances showing that technology cannot always provide successful solutions for problems or fulfill every human need.

C10

6.1.9 Explain how technologies can influence all living things.

C8–C10

Standard 2—Scientific Thinking

Students use computers and other tools to collect information, calculate, and analyze data. They prepare tables and graphs, using these to summarize data and identify relationships.

Computation and Estimation

6.2.1 Find the mean* and median* of a set of data.

This topic can be investigated in conjunction with the following activity:

A38

6.2.2 Use technology, such as calculators or computer spreadsheets, in analysis of data.

Throughout the Teacher Edition, there are suggestions for using computers to study a variety of science topics.

Manipulation and Observation

6.2.3 Select tools, such as cameras and tape recorders, for capturing information.

Science Reference Section: 40–41

6.2.4 Inspect, disassemble, and reassemble simple mechanical devices and describe what the various parts are for. Estimate what the effect of making a change in one part of a system is likely to have on the system as a whole.

A109c, A112, A122–A123

Communication Skills

6.2.5 Organize information in simple tables and graphs and identify relationships they reveal. Use tables and graphs as examples of evidence for explanations when writing essays or writing about lab work, fieldwork, etc.

A13, A19, A23, A38, C3, C47, C137, D18–D19

6.2.6 Read simple tables and graphs produced by others and describe in words what they show.

B144, D64

6.2.7 Locate information in reference books, back issues of newspapers and magazines, CD-ROMs, and computer databases.

C6

6.2.8 Analyze and interpret a given set of findings, demonstrating that there may be more than one good way to do so.

In all Explore and Investigate activities, students analyze and interpret their findings. These are some of the many examples.

A6, A14–A15, A24–A25, A38, A60–A61, A68–A69, A74, A98–A99, A106–A107, A112, A122–A123, A146–A147, B6, B18–B19, B26–B27, B32, B48–B49, B60–B61, B76, B100–B101, B110–B111, B116, B130–B131, B152–B153, C6, C26–C27, C42, C52–C53, C66–C67, C80, C98–C99, C110, C126–C127, D6, D18–D19, D34, D42–D43

Critical Response Skills

6.2.9 Compare consumer products, such as generic and brand-name products, and consider reasonable personal trade-offs among them on the basis of features, performance, durability, and costs.

On these pages, students use critical thinking skills when considering consumer products.

A135, A143, B62–B63, B98

Standard 3—The Physical Setting

Students collect and organize data to identify relationships between physical objects, events, and processes. They use logical reasoning to question their own ideas as new information challenges their conceptions of the natural world.

The Universe

6.3.1 Compare and contrast the size, composition, and surface features of the planets that comprise the solar system, as well as the objects orbiting them. Explain that the planets, except Pluto, move around the sun in nearly circular orbits.

C82–C86

6.3.2 Observe and describe that planets change their position relative to the background of stars.

C82–C83

This standard is also covered in Grade 5, Unit C, Chapter 4.

6.3.3 Explain that Earth is one of several planets that orbit the sun, and that the moon, as well as many artificial satellites and debris, orbit around Earth.

C82–C86

Earth and the Processes That Shape It

6.3.4 Explain that we live on a planet which appears at present to be the only body in the solar system capable of supporting life.

C82–C83

6.3.5 Use models or drawings to explain that Earth has different seasons and weather patterns because it turns daily on an axis that is tilted relative to the plane of Earth's yearly orbit around the sun. Know that because of this, sunlight falls more intensely on different parts of Earth during the year (the accompanying greater length of days also has an effect) and the difference in heating produces seasons and weather patterns.

C84

6.3.6 Use models or drawings to explain that the phases of the moon are caused by the moon's orbit around Earth, once in about 28 days, changing what part of the moon is lighted by the sun and how much of that part can be seen from Earth, both during the day and night.

C84–C86

6.3.7 Understand and describe the scales involved in characterizing Earth and its atmosphere. Describe that Earth is mostly rock, that three-fourths of its surface is covered by a relatively thin layer of water, and that the entire planet is surrounded by a relatively thin blanket of air.

This standard is covered in detail in Grade 5, Unit C, Chapter 1.

6.3.8 Explain that fresh water, limited in supply and uneven in distribution, is essential for life and also for most industrial processes. Understand that this resource can be depleted or polluted, making it unavailable or unsuitable for life.

C119–C125

This standard is also covered in detail in Grade 5, Unit C, Chapter 2.

6.3.9 Illustrate that the cycling of water in and out of the atmosphere plays an important role in determining climatic patterns.

C119

This standard is also covered in detail in Grade 5, Unit C, Chapter 3.

6.3.10 Describe the motions of ocean waters, such as tides, and identify their causes.

This standard is covered in Grade 5, Unit C, Chapter 3. It is covered in greater detail in Grade 4, Unit C, Chapter 3.

6.3.11 Identify and explain the effects of oceans on climate.

This standard is covered in Grade 5, Unit C, Chapter 3. It is covered in greater detail in Grade 4, Unit C, Chapter 3.

6.3.12 Describe ways human beings protect themselves from adverse weather conditions.

C8–10, C37

6.3.13 Identify, explain, and discuss some effects human activities, such as the creation of pollution, have on weather and the atmosphere.

C130–C131

This standard is also covered in detail in Grade 5, Unit C, Chapter 2.

6.3.14 Give examples of some minerals that are very rare and some that exist in great quantities. Explain how recycling and the development of substitutes can reduce the rate of depletion of minerals.

C117, C120–C121

This standard is also covered in Grade 5, Unit C, Chapter 2.

6.3.15 Explain that although weathered* rock is the basic component of soil, the composition and texture of soil and its fertility and resistance to erosion* are greatly influenced by plant roots and debris, bacteria, fungi, worms, insects, and other organisms.

C54–C56

6.3.16 Explain that human activities, such as reducing the amount of forest cover, increasing the amount and variety of chemicals released into the atmosphere, and farming intensively, have changed the capacity of the environment to support some life forms.

C112–C114, C115–C116

Matter* and Energy*

6.3.17 Recognize and describe that energy is a property of many objects and is associated with heat, light, electricity, mechanical motion, and sound.

B8–B13, B20–B25, B56–B57, B60–B61

6.3.18 Investigate and describe that when a new material, such as concrete, is made by combining two or more materials, it has properties that are different from the original materials.

B50–B59, B60–B61

6.3.19 Investigate that materials may be composed of parts that are too small to be seen without magnification.

B40–B47

6.3.20 Investigate that equal volumes* of different substances usually have different masses as well as different densities*.

B3c, B14–B17, B18–B19

Forces of Nature

6.3.21 Investigate, using a prism for example, that light is made up of a mixture of many different colors of light, even though the light is perceived as almost white.

B132–B139

6.3.22 Demonstrate that vibrations in materials set up wavelike disturbances, such as sound and earthquake waves*, that spread away from the source.

B140–B151, B152–B153

6.3.23 Explain that electrical circuits* provide a means of transferring electrical energy from sources such as generators to devices in which heat, light, sound, and chemical changes are produced.

This standard is covered in Grade 5, Unit B, Chapter 3.

Standard 4—The Living Environment

Students recognize that plants and animals obtain energy in different ways, and they can describe some of the internal structures of organisms related to this function. They examine the similarities and differences between humans and other species*. They use microscopes to observe cells and recognize cells as the building blocks of all life.

Diversity of Life

6.4.1 Explain that one of the most general distinctions among organisms is between green plants, which use sunlight to make their own food, and animals, which consume energy-rich foods.

A22–A23

6.4.2 Give examples of organisms that cannot be neatly classified as either plants or animals, such as fungi and bacteria.

A9, A28

6.4.3 Describe some of the great variety of body plans and internal structures animals and plants have that contribute to their being able to make or find food and reproduce.
A28–A30, A76–A77

6.4.4 Recognize and describe that a species comprises all organisms that can mate with one another to produce fertile offspring.
A78–A79, A80–A83, A84–91

6.4.5 Investigate and explain that all living things are composed of cells whose details are usually visible only through a microscope.
A14–A15, A16–A19, A40–A45

6.4.6 Distinguish the main differences between plant and animal cells, such as the presence of chlorophyll* and cell walls in plant cells and their absence in animal cells.
A14–A15, A20–A23

6.4.7 Explain that about two-thirds of the mass of a cell is accounted for by water. Understand that water gives cells many of their properties.
A16–A19

Interdependence of Life and Evolution

6.4.8 Explain that in all environments, such as freshwater, marine, forest, desert, grassland, mountain, and others, organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter. Note that in any environment, the growth and survival of organisms depend on the physical conditions.
A88–A91, A92–A97, A114–A121, A124–A129, A130–A135, A148–A153

6.4.9 Recognize and explain that two types of organisms may interact in a competitive or cooperative relationship, such as producer*/consumer*, predator*/prey*, or parasite*/host*.
A87, A114–A121

6.4.10 Describe how life on Earth depends on energy from the sun.
A22–A23, C87–C88

Human Identity

6.4.11 Describe that human beings have body systems for obtaining and providing energy, defense, reproduction, and the coordination of body functions.
D8–D13, D14–D17, D20–D23, D24–D26

6.4.12 Explain that human beings have many similarities and differences and that the similarities make it possible for human beings to reproduce and to donate blood and organs to one another.

The standard can be introduced in relationship with the concepts in Grade 5, Unit D, Chapter 2.

6.4.13 Give examples of how human beings use technology to match or exceed many of the abilities of other species.

A10–A12, C8–C10, C18–C25, C30–C31, C100–C105

Standard 5—The Mathematical World

Students apply mathematics in scientific contexts. They use mathematical ideas, such as relations between operations, symbols, shapes in three dimensions, statistical relationships, and the use of logical reasoning in the representation and synthesis of data.

Numbers

6.5.1 Demonstrate that the operations addition and subtraction are inverses and that multiplication and division are inverses of each other.

B7

6.5.2 Evaluate the precision and usefulness of data based on measurements taken.

A38, A39

Shapes and Symbolic Relationships

6.5.3 Explain why shapes on a sphere* like Earth cannot be depicted on a flat surface without some distortion.

C82–C86

6.5.4 Demonstrate how graphs may help to show patterns — such as trends, varying rates of change, gaps, or clusters — which can be used to make predictions.

A13, A19, A23, A38, B144, C3, C47, C137, D18–D19, D64

Reasoning and Uncertainty

6.5.5 Explain the strengths and weaknesses of using an analogy to help describe an event, object, etc.

A71c, C39c, C40, C77c, D31c

6.5.6 Predict the frequency of the occurrence of future events based on data.

D6, D18–D19

6.5.7 Demonstrate how probabilities and ratios can be expressed as fractions, percentages, or odds.

A95, B11, D7, D17

Standard 6—Historical Perspectives

Students gain understanding of how the scientific enterprise operates through examples of historical events. Through the study of these events, they understand that new ideas are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and grow or transform slowly through the contributions of many different investigators.

6.6.1 Understand and explain that from the earliest times until now, people have believed that even though countless different kinds of materials seem to exist in the world, most things can be made up of combinations of just a few basic kinds of things. Note that there has not always been agreement, however, on what those basic kinds of things are, such as the theory of long ago that the basic substances were earth, water, air, and fire. Understand that this theory seemed to explain many observations about the world, but as we know now, it fails to explain many others.

This standard is covered in Grade 5, Unit C, Chapters 1 and 2.

6.6.2 Understand and describe that scientists are still working out the details of what the basic kinds of matter are on the smallest scale, and of how they combine, or can be made to combine, to make other substances.

B34–B39, B40–B47, B50–B59

6.6.3 Understand and explain that the experimental and theoretical work done by French scientist Antoine Lavoisier in the decade between the American and French Revolutions contributed crucially to the modern science of chemistry.

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Standard 7—Common Themes

Students use mental and physical models to conceptualize processes. They recognize that many systems have feedback mechanisms that limit changes.

Systems

6.7.1 Describe that a system, such as the human body, is composed of subsystems.

D8–D13, D14–D17, D20–D23, D24–D26

Models and Scale

6.7.2 Use models to illustrate processes that happen too slowly, too quickly, or on too small a scale to observe directly, or are too vast to be changed deliberately, or are potentially dangerous.

C39c, C40, C77c, D31c

Constancy and Change

6.7.3 Identify examples of feedback mechanisms within systems that serve to keep changes within specified limits.

A120–A121, A128–A129, A130–A135, D11, D25–D26