## Math Curriculum

## First Grade

| Essential Question(s): How do we solve addition and subtraction sentences to solve real world problems with and without concrete objects? |  |  |  |  |  |
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| 21st Century Theme: Business |  |  |  |  |  |
| 21st Century Skills: Critical Thinking and Problem Solving |  |  |  |  |  |
| Content: Operations \& Algebraic Thinking |  |  |  |  |  |
| Standards: 1. OA |  |  |  |  |  |
| A. Represent and solve problems involving addition and subtraction. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. 1 | *Solve for results unknown: 6- $2=\ldots \text { or } 3+\ldots=8$ <br> *Concrete models to introduce <br> \& solve addition \& subtraction <br> problems. <br> *Picture <br> drawings to solve word problems/and other addition and subtraction problems. *Creation of art projects to depict addition \& subtraction sentences. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills <br> End of the Year Benchmark Assessment <br> Math Software (ex. Study Island) Group \& cooperative work | Flashcard <br> Math word wall <br> Counters (variety) <br> Connecting Cubes <br> Chalkboard <br> Number line <br> Work mats <br> Computer <br> Software <br> SmartBoard <br> Flannel Board <br> Center Games <br> Math CD songs | Art Creating Pictures depicting adding \& subtracting sentences. Writing- Write on addition \& subtraction word problems. | Vertical subtraction \& addition Horizontal addition \& subtraction Fact families Plus Sum <br> Equal <br> In all <br> Addends <br> Difference <br> Minus <br> Subtract <br> Zero <br> Add symbols How Many All together Double Facts Doubles Plus One Facts Digits |

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| 2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. | * Concrete models to solve word problems. <br> *Picture drawings to solve 3 digit addition problems. (ex. $3+2+1=1$ | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment <br>  | Concrete counters and objects | Art-Draw related picture for given word problem. Music- addition or subtraction songs | Count on <br> Addends <br> Sum <br> Equations <br> Missing number |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). | *Use concrete objects to correlate with given number. *Modeling of correct numeral formation. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Various concrete items Numeral formation Flashcards |  | Sets Groups Count |

## Essential Question(s): How do we solve addition and subtraction problems/ sentences?

## 21st Century Theme:

## 21st Century Skills:

| Content: | Operations \& Algebraic Thinking |
| :--- | :--- |
| Standards: | 1. OA |

B. Understand and apply properties of operations and the relationship between addition and subtraction.

| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 3. Apply properties of operations as strategies to add and subtract. 2 Examples: If $8+3=11$ is known, then $3+$ $8=11$ is also known. (Commutative property of addition.) To add $2+6+4$, the second two numbers can be added to make a ten, so $2+6$ $+4=2+10=12$. (Associative property of addition.) | *Concrete models to introduce and solve addition and subtraction sentences. *Picture drawing to solve various addition and subtraction sentences. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills <br> End of the Year Benchmark Assessment <br> Math Software (ex. Study Island) Group \& cooperative work Student produced models | Counters <br> Connecting Cubes <br> Computer <br> Software <br> SmartBoard <br> Chalk Board <br> MiniWhite Boards | Literature: Mission <br> Addition by: Loreen Leedy <br> Subtraction Action by: Loreen Leedy Elevator Magic by: Stuart J. Murphy Science: Using science related items to count (ex. acorns, shells, etc.) | Fact Families <br> (Same as above) |

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## Essential Question(s): How is addition and subtraction related?

## 21st Century Theme:

| Content: | Operations \& Algebraic Thinking |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Standards: | 1. AO |  |  |  |  |
| C. Add and subtract within 20. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2 ). | *Use drawings to solve addition and subtraction problems. <br> *Use models to introduce and practice addition \& subtraction problems. | Formative Assessment <br> Open- ended Problem <br> Self Assessment <br> Teacher Observation <br> Benchmark Assessment <br> Homework Review <br> Class work Review <br> Project-Based Assessment <br> Timed Drills <br> End of the Year Benchmark <br> Assessment <br> Math Software (ex. Study <br> Island) <br>  <br> cooperative work | Number line Manipulatives | Literature: A Bag Full of <br> Pups by: Dick <br> Gackenbach | Counting on counting back |

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| 6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10 . Use strategies such as counting on; making ten (e.g., $8+6=8+2+4=10+4$ $=14$ ); decomposing a number leading to a ten (e.g., 13-4 = $13-3-1=10-1=9$ ); using the relationship between addition and subtraction (e.g., knowing that $8+4=12$, one knows $12-8=4$ ); and creating equivalent but easier or known sums (e.g., adding 6 +7 by creating the known equivalent $6+6+1=12+1=$ 13). | *Use songs, chants, rhymes related to addition/ subtraction to enhance fluency. <br> *Continue to use concrete models, picture drawings to solve addition \& subtraction problems. | Formative Assessment <br> Open- ended Problem <br> Self Assessment <br> Teacher Observation <br> Benchmark Assessment <br> Homework Review <br> Class work Review <br> Project-Based Assessment <br> Timed Drills <br> End of the Year Benchmark <br> Assessment <br> Math Software (ex. Study <br>  <br> cooperative work | Math CD songs Addition charts Adding and subtracting website for songs: http://songsfortea ching.com/math/a dditionsubtractions ongs.htm | Literature: Have students write their own addition/ subtraction rap. |  |
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| Essential Question(s): | How do we determine if number sentences are true or false? |  |  |  |  |
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| 21st Century Theme: |  |  |  |  |  |
| Content: | Operations and Algebraic Thinking |  |  |  |  |
| Standards: | 1.0A |  |  |  |  |
| D. Work with addition and subtraction equations. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6=$ $\begin{aligned} & 6,7=8-1,5+2=2+5,4+1 \\ & =5+2 . \end{aligned}$ | Concrete modeling to introduce equal/not equal concepts. Picture drawings to show equal and not equal sets. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Concrete <br> objects/manipulati <br> ve <br> Number lines <br> Counting Cubes <br> SmartBoart <br> Chalkboard <br> Computer <br> Software | Language Arts: Have students create their own problems for center time. | Equal Signs <br> True <br> False <br> Correct <br> Incorrect <br> Equals <br> "Equal To" <br> Symbol <br> Equal Sets <br> Unequal sets |

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| 8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8+$ ? $=11,5=$ _ $-3,6+6=$. | Use concrete models, pictures or drawings to solve addition and subtraction problems. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Math CD songs Center games Counting Cubes and other manipulative counters | Have students write addition and subtraction equations related to problems in the classroom. Ex. I have 3 pieces of paper and 6 students, how many more do I need? $3+\ldots=6$ | ```Missing addends Vertical addition/subtractio n Unknown number``` |
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## Essential Question(s):

| 21st Century Theme: |  |  |  |  |  |
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| Content: | Numbers \& Operations in Base Ten |  |  |  |  |
| Standards: | 1. NBT |  |  |  |  |
| B. Understand place value. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones - called a "ten." <br> The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. The numbers $10,20,30,40$, $50,60,70,80,90$ refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). | *Understand that the two digits of a two digit number represent amounts of tens and ones. <br> *Write number sentences to represent the place value. <br> *Use money to represent place value. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Ten frame <br> Number line <br> Blocks <br> Computer software <br> A+Math (website) <br> Study Island <br> Calendar <br> Word Wall <br> Connecting Cubes <br> 100 Chart <br> Songs <br> Poems <br> Calculators <br> Flash Cards | Literature: Monster Math by: Anne Miranda A Dozen Dogs by: Harriet Ziefert | Ones <br> Tens <br> Grouping <br> Fact Families <br> Facts <br> Doubles <br> Counting on <br> Left/ Right <br> Vertical <br> Horizontal <br> Columns <br> Alignment |
| 3. Compare two -digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>,=$, and $<$. | *Compare and order whole numbers to 100. <br> *Use <, >, = to compare whole numbers. | Same as previous standard. | Coins <br> Money <br> Counters | Literature: Just Enough Carrots by: Stuart J. Murphy | More <br> Greater Than Less Than Equal Estimate |


| Essential Question(s): |  |
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| 21st Century Theme: |  |
| Content: $\quad$ Numbers \& Operations in Base Ten |  |
| Standards: $\quad$ 1.NBT |  |
| C. Use place value understanding and properties of operations to add and subtract. |  |

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| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
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| 4. Add within 100 , including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10 , using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. | *Solve multi-digit addition and subtraction problems using models and number sentences. *Use fact families and related facts to illustrate the properties. *Teach the relationship between number sentences through ordinary objects. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Flash Cards <br> Counters <br> Available Objects | Social Studies: Relate fact families to students' families | Sum <br> Difference <br> Carry on (move it over) Math <br> Fact <br> Flip <br> Digits <br> Fact Families <br> Selected Facts |
| 5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. | Use mental strategies to add and subtract. |  |  |  |  |

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| 6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10 90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. | Using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. |  |  |  |  |
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## Essential Question(s): How can measurements be used to solve problems?

21st Century Theme: Global Awareness

## 21st Century Skills: Critical Thinking and Problem Solving

Content: Measurement and Data
Standards: 1.MD

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| A. Measure lengths indirectly and by iterating length units. |  |  |  |  |  |
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| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 1. Order three objects by length; compare the lengths of two objects indirectly by using a third object. | *Using SmartBoard or models students will order objects from short to shortest and long to longest. <br> *Understand the inverse relationship between the size of an unit and the number of units. *Students will organize classroom objects. | Formative Assessment <br> Open- ended Problem <br> Self Assessment <br> Teacher Observation <br> Benchmark Assessment <br> Homework Review <br> Class work Review <br> Project-Based Assessment <br> Timed Drills <br> End of the Year Benchmark <br> Assessment <br> Math Software (ex. Study <br> Island) <br>  <br> cooperative work | SmartBoard Assorted measuring tools | Literature: How Big is a Foot? By: Rolf Myller Language Arts: Grammar lesson on the use or er and est endings. Students can write stories using words with these endings. | Length <br> Inch <br> Foot <br> Yard <br> Meter <br> Centimeter <br> Short -er, -est <br> long -er, -est |

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| 2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of samesize length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or | Model measuring a desk with a pencil or other available nonstandard use of measurement. <br> *Demonstrate the need for exactness. *Discuss how and why measurements differ. *Introduce standard units of measurement. <br> *If students are ready introduce rulers. | Formative Assessment <br> Open- ended Problem <br> Self Assessment <br> Teacher Observation <br> Benchmark Assessment <br> Homework Review <br> Class work Review <br> Project-Based Assessment <br> Timed Drills <br> End of the Year Benchmark <br> Assessment <br> Math Software (ex. Study <br> Island) <br>  <br> cooperative work | Funbrain.com (website) | Literature: The Biggest Fish by: Shelia Keenan | Measure end to end |
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## First Grade

| Essential Question(s): Why do we need to tell time? |  |  |  |  |  |
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| 21st Century Theme: Health Literacy |  |  |  |  |  |
| 21st Century Skill: Life and Career Skills |  |  |  |  |  |
| Content: | Measurement \& Data |  |  |  |  |
| Standards: | 1.MD |  |  |  |  |
| B. Tell and write time. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 3. Tell and write time in hours and half-hours using analog and digital clocks. | *Use the Judy Clock or <br> SmartBoard to demonstrate telling time to the hour and half hour. Model how to write time properly using both analog and digital units. <br> *Play bingo game match analog to digital time. <br> *Have children practice telling time in small groups using small clocks. <br> *Survey <br> class to gather data about times they eat dinner, go to sleep, wake up, etc. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills <br> End of the Year Benchmark <br> Assessment <br> Math Software (ex. Study Island) Group \& cooperative work | Judy Clocks <br> Smart Boards <br> Small Clocks for the <br> students <br> Time Bingo Game <br> Digital Clock <br> Analog Clock | Literature: The Grouchy Ladybug by: Eric Carle Social Studies: Create a time line of the students day. <br> Science: Sun rise and sun set <br> Health: How much sleep is needed? Physical Education: Use of the stopwatch. | Hour <br> Minute <br> Second <br> Half Hour <br> Clock Face <br> Minute hand <br> Hour Hand <br> Second Hand <br> Analog <br> Digital |

## First Grade

## Essential Question(s): How can the collection, organization, interpretation, and display of data be used to answer questions?

## 21st Century Theme: Global Awareness

| 21st Century Skills: Critical Thinking and Problem Solving, Information Literacy |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Content: Measurement \& Data |  |  |  |  |  |
| Standards: 1.MD |  |  |  |  |  |
| C. Represent and interpret data. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. | *Guide students to collect data and discuss how to represent as a graph. Crate class graph. In journal, write a sentence that describes the data. <br> *Ask students questions about data, or have students formulate their own questions in their journals to ask their classmates. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Graph Pocket Chart <br> Clipboards <br> Math Journals | Science: Graph the weather Language Arts- Journal results into sentences Health: Graph Healthy Foods Physical Education: Graph number of jumping jack, how far can everyone kick a ball, etc. | Graph <br> -picture <br> -bar <br> Most <br> Greatest <br> Least <br> More <br> Less |

## First Grade

| Essential Question(s): How do we use shapes and attributes in the real world? |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 21st Century Theme: Global Awareness |  |  |  |  |  |
| 21st Century Skills: Communication and Collaboration, Critical Thinking and Problem Solving, Creativity and Innovation |  |  |  |  |  |
| Content: Geometry |  |  |  |  |  |
| Standards:1.G |  |  |  |  |  |
| A. Reason with shapes and their attributes. |  |  |  |  |  |
| Skills | Instructional Procedures | Assessment | Resources | Interdisciplinary Connections | Vocabulary |
| 1. Distinguish between defining attributes (e.g., triangles are closed and threesided) versus non-defining attributes (e.g., color, orientation, overall size) ; build and draw shapes to possess defining attributes. | *Identify real world two dimensional shapes. <br> *Identify and describe attributes and properties of two dimensional shapes *Sort and classify two dimensional shapes *Identify real world three dimensional shapes *Sort and classify three dimensional shapes *Recognize shapes from different perspectives *Tally shapes in the neighborhood | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment <br> Math Software (ex. Study Island) Group \& cooperative work | Tangrams <br> Geometric Shapes <br> Geo-Board <br> District Specific <br> Texts Computer <br> Software <br> Attribute Blocks <br> Craft Sticks <br> Blocks <br> Wiki-Sticks <br> Pattern Blocks |  <br> Engineering: Read the Three Little Pigs then have students build houses in small groups, using different shapes. They are building houses for the little pigs that the wolf can't blow down. (Teachers can use the blow dryer to simulate the wolf blowing.) | Triangles <br> Quadrilaterals <br> Pentagons <br> Hexagons <br> Cubes <br> Sort <br> Classify <br> Alike <br> Different <br> Rectangular Prism <br> Cone <br> Cylinder <br> Sphere <br> Pyramid <br> Face (How many <br> faces does the <br> shape have?) <br> Two-dimensional |

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| 2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, halfcircles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. 1 | *Look at incomplete shapes and identify what the should be. <br> *Compose and decompose two dimensional shapes. <br> *Understand that three dimensional shapes are made up off two dimensional shapes. *Compose and decompose three dimensional shapes. <br> *Identify two dimensional in three dimensional shapes. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Blocks <br> Tangrams <br> Geoboards <br> Three-dimensional <br> Shapes <br> Wiki-Sticks <br> SmartBoards | Art/Engineering: Have students create threedimensional transportation using recyclable materials in small groups. Have students present their creation to the class. | Make <br> Break apart <br> Trapezoid <br> Half Circle <br> Quarter Circle <br> Right Rectangular <br> prisms <br> Right Circular Cones <br> Right Circular <br> Cylinders |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 3. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. | *Develop initial understanding of congruence and symmetry. <br> *Using paper create two shapes that are equal size. <br> *Have children use the <br> SmartBoard to "cut" real world items in halves and quarters. <br> *Walk around the school and identify fractions in the school environment. | Formative Assessment Open- ended Problem Self Assessment Teacher Observation Benchmark Assessment Homework Review Class work Review Project-Based Assessment Timed Drills End of the Year Benchmark Assessment Math Software (ex. Study Island) Group \& cooperative work | Fraction Tiles SmartBoard Bar Modeling | Art: Lines of Symmetry Science: Explore Butterflies and the explore the symmetry | Half of Quarter of Halves Quarters Equal Shares Fourth of Cut into |

