

Core Content

Cluster Title: Know number names and the count sequence.
Standard 1: Count to 100 by ones and by tens.
MASTERY Patterns of Reasoning:
Conceptual: Students can count by ones in sequence from 1 to 10. Students can count by ones in sequential progression from 11 to 20. Students can count by ones in sequential progression from 21 to 100. Students can count by tens in sequence from 10 to 100.
Procedural: Students will practice rote counting by ones up to 10. Students will practice rote counting by ones up to 20 and continue in sets of 10 to 100. Students will practice rote counting by tens up to 100.
Representational: Students can use kinesthetic movements to represent counting connections (e.g., clapping, jumping, etc.).

Supports for Teachers

Critical Background Knowledge
Conceptual: Students will be able to rote count to 20.
Procedural: Students will have had multiple opportunities to rote count from 1 to 20.
Representational: This is an auditory and oral skill.

Academic Vocabulary and Notation	
count, ones, tens, order, number names from one to 100	
Instructional Strategies Used	Resources Used
<p>Teacher models sequential counting from one to 10 using a variety of movements to represent oral counting (e.g., teacher models counting from one to 10 using fingers and clapping on ten or other movements while counting). Can continue with numbers from 11 to 100.</p> <p>Teacher uses music, poems, chants, rhymes, or literature to enhance rote counting.</p> <p>Teacher uses opportunities to practice rote counting during transitions.</p> <p>Teacher provides opportunities to count the days of school up to the 100th day of school.</p>	<p>Anno, Mitsumasa. <i>Anno's Counting Book</i>. HarperCollins, 1986.</p> <p>Hutchins, Pat. <i>One Gorilla</i>. Farrar, Straus and Giroux, 1993.</p> <p>Murphy, Stuart J. <i>Every Buddy Counts (MathCounts 1)</i>. HarperCollins, 1997.</p> <p>Richardson, Kathy. <i>Developing Number Concepts, Book 1: Counting, Comparing, and Patterns</i>. Math Perspectives.</p>

Assessment Tasks Used	
<p>Skill-Based Task: Count by ones in sequential order from 1 to 100. Count by tens in order to 100.</p>	<p>Problem Task: Beginning with one, count as far as you can count. Count to 100 by tens.</p>

Core Content

Cluster Title: Know number names and the count sequence.
Standard 2: Count forward beginning from a given number within the known sequence (instead of having to begin at one).
MASTERY Patterns of Reasoning:
Conceptual: Students can count on from a given number with numbers up to 10. Students can count on from a given number with numbers up to 20 and up to 100.
Procedural: Students will practice rote counting by ones from a given number up to 10. Students will practice rote counting by ones from a given number up to 20 and continue to 100.
Representational: Students can use kinesthetic actions to follow the counting sequence (e.g., clapping, holding up fingers, etc.).

Supports for Teachers

Critical Background Knowledge
Conceptual: Students can recite numbers in order from 1-20. Students will understand that numbers come “before” or “after” a given number.
Procedural: Students can recite numbers in order from 1-20 (rote counting).
Representational: This is an oral and auditory skill.

Academic Vocabulary and Notation	
count, number names from 1-100, counting on, order, ones, before, after, in all, how many	
Instructional Strategies Used	Resources Used
<p>Teacher models counting on strategies.</p> <p>Daily number line activities: Count how many days you have been in school.</p> <p>Play a counting game, starting with a number other than one. For example, students start counting from three, and whoever is number 11 must sit down.</p> <p>Question of the day: Answers are grouped in fives and/or tens. Start counting from one set forward.</p> <p>Number of the day: Orally count on from that number to a larger number.</p>	<p>Baratta-Lorton, Mary. <i>Mathematics Their Way</i>. Dale Seymour Publications, 1995.</p> <p>Copley, Juanita. <i>The Young Child and Mathematics</i>. MAEYC/NCTM, 2000.</p> <p>Richardson, Kathy. <i>Developing Number Concepts, Book 1: Counting, Comparing, and Patterns</i>. Math Perspectives.</p>
Assessment Tasks Used	
<p>Skill-Based Task:</p> <p>Have the student orally count from a given number (e.g., “Start at six and count until I tell you to stop”). Have the student stop at 20.</p> <p>Have the student orally count from a given number (e.g., “Start at 34 and count until I tell you to stop”). Have the student stop at 47.</p>	<p>Problem Task:</p> <p>Kwan had 11 marbles. On his birthday his brother gave him 5 more. Count on to determine how many marbles Kwan has all together.</p> <p>Lisa has 25 shirts. She bought 8 more. Count on to see how many shirts she has now.</p>

Core Content

Cluster Title: Know number names and the count sequence.

Standard 3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with zero representing a count of no objects).

MASTERY Patterns of Reasoning:

Conceptual:

- Students will understand the last number counted in a set of 0 to 20 objects identifies the quantity.
- Students can count a number of objects 0 to 20 and associate with a written numeral.
- Students can write numerals from 0 to 20 in sequential order and random order.

Procedural:

- Students can count sets of objects 0 to 20 and associate with a numeral.
- Students can identify a quantity from 0 to 20 with a written numeral name.
- Students can write numerals from 0 to 20.

Representational:

- Students can count sets of objects in quantities from 0 to 20 using the last number counted to name the set.
- Students can count sets of objects in quantities from 0 to 20 using a written numeral to identify the quantity.
- Students will practice writing the numerals from 0 to 20 in sequential order and random order.

Supports for Teachers

Critical Background Knowledge

Conceptual:

- Students will understand that the last number counted in a set of 0 to 10 objects identifies the quantity.
- Students can count a number of objects 0 to 10 and associate with a written numeral.
- Students can write numerals from 0 to 10 in sequential order and random order.

<p>Procedural:</p> <ul style="list-style-type: none"> Students can count sets of objects 0 to 10 and associate with a numeral. Students can identify a quantity from 0 to 10 with a written numeral name. Students can write numerals from 0 to 10. Students will practice writing the numerals from 0 to 10 in sequential order and random order. <p>Representational:</p> <ul style="list-style-type: none"> Students can count sets of objects in quantities from 0 to 10 using the last number counted to name the set. Students can count sets of objects in quantities from 0 to 10 using a written numeral to identify the quantity.
<p>Academic Vocabulary and Notation</p> <p>set, numeral, number, number names zero to twenty, quantity, order</p>

Instructional Strategies Used	Resources Used
<p>Teacher models how to count sets of objects from 0 to 20, and shows how the last number named tells the number of the objects counted.</p> <p>Students practice counting sets of objects from 0 to 20 and identifying the quantity using the last number named.</p> <p>Teacher models how to count sets of objects from 0 to 20 and shows how to associate a written numeral to identify the quantity.</p> <p>Students practice counting sets of objects from 0 to 20 and associating a written numeral to identify the quantity.</p> <p>Teacher models how to use numeral cards to identify random quantities from 0 to 20.</p> <p>Students practice identifying random quantities from 0 to 20 and associating a numeral card to identify the set.</p> <p>Teacher models how to write the numerals from 0 to 20 in sequential and random order.</p>	<p>Variety of concrete manipulatives</p> <p>http://www.uen.org/k-2interactives/math.shtml</p> <p>Variety of pictorial representations</p> <p>Numeral cards from 0 to 20</p> <p>http://www.hubbardscupboard.org/math.html</p>

<p>Students practice writing the numerals from 0 to 20 in sequential and random order.</p>	
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Assessment Tasks Used	
<p>Skill-Based Task: Students will count sets of objects, identify the quantity, and associate a numeral card with the set.</p> <p>Students will begin at zero and write the numbers 0-20 in sequential order.</p>	<p>Problem Task: Students are given several sets of random quantities from 0-20. Students are asked to identify the quantity of each set and match a numeral card to show the value of each set.</p> <p>Students are given a 21-grid to write the numerals 0-20 in sequential order.</p>

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

Core Content

Cluster Title: Count to tell the number of objects.

Standard 4: Understand the relationship between numbers and quantities; connect counting to cardinality. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. Understand that each successive number name refers to a quantity that is one larger.

MASTERY Patterns of Reasoning:

Conceptual:

- Students can develop strategies for keeping track of counted objects.
- Students can accurately count objects with one-to-one correspondence up to 20.
- Students can count various groupings and arrays up to 20.
- Students can identify “how many” objects they counted.
- Students can understand quantities of “one more” up to 20 (e.g., 7 is one more than 6).

Procedural:

- Students can touch, slide, tap, drop, color, etc. to accurately count objects.
- Students can identify the last number counted as the quantity of objects.
- Students can create groups of 10 and some quantity for easier counting of teen numbers.
- Students can create a given number of objects and one more.

Representational:

- Students can color, slide, tap, drop, and move, objects as they count.
- Students can use ten frames, dot cards, domino, dice, or other arrangements to assist counting.
- Students can use cards, dice, dominoes, written numerals, etc. to name quantities.
- Students can demonstrate an understanding of quantities of one more.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual: Students can orally count. Students can use one-to-one correspondence when counting object up to quantities of 10. Students can respond to the question “how many” after counting a set of objects. Students will understand that each number name in sequence from 0-10 means one more.</p> <p>Procedural: Students can touch and count quantities to 10. Students can count objects arranged on a number line.</p> <p>Representational: Students can orally state the number of objects counted.</p>
Academic Vocabulary and Notation
<p>numeral, number, number names, “how many,” count, “one more,” quantity, set, objects</p>

Instructional Strategies Used	Resources Used
<p>Teacher models counting and tracking one-to-one correspondence in various methods.</p> <p>“Make a group of _____. Now show me another way to make that number” (e.g., 2 sets of 3 or a set of 5 and 1 to represent 6).</p> <p>“Count these objects. How many objects are in that set?” (Students should use any of the procedures taught to accurately count the objects with one-to-one correspondence.)</p> <p>“Pick a card and count the correct number of objects.”</p> <p>“Color the correct number of shapes.”</p>	<p>Anno, Mitsumasa. <i>Anno’s Counting Book</i>. HarperCollins, 1986.</p> <p>Baratta-Lorton, Mary. <i>Mathematics Their Way</i>. Dale Seymour Publications, 1995.</p> <p>Copley, Juanita. <i>The Young Child and Mathematics</i>. MAEYC/NCTM, 2000.</p> <p>Hutchins, Pat. <i>One Hunter</i>. Greenwillow Books, 1986.</p> <p>Richardson, Kathy. <i>Developing Number</i></p>

<p>“Draw the number of circles I say.”</p> <p>“Grab a handful of objects.” Students grab a handful of objects and count how many they have.</p>	<p><i>Concepts, Book 1: Counting, Comparing, and Patterns, Grade K-3.</i> Dale Seymour Publications, 1998.</p> <p>Seuss, Dr. <i>10 Apples Up on Top.</i> Random House Books for Young Readers, 1998.</p>
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task:</p> <p>Place a set of objects in front of the student. Ask them to count and tell you how many.</p> <p>Have the student make a group of 12. Then add one more and tell you how many.</p>	<p>Problem Task:</p> <p>I have this many pennies in my pocket. Please count and tell me how many pennies I have. (Teacher places 19 pennies before the students.)</p> <p>Mr. Lincoln needs to borrow 14 erasers. Count out 14 erasers for me to give to him.</p>

Core Content

Cluster Title: Count to tell the number of objects.
Standard 5: Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.
MASTERY Patterns of Reasoning:
Conceptual: Students will understand that a set of 1-20 objects arranged in a line, rectangular array, circle or scattered have a specific count.
Procedural: Students can count objects in a given set from 1-20 in a variety of ways such as a line, rectangular array, or a circle. Students can count objects in a given set from 1-10 in a scattered configuration.
Representational: Students can represent the count of objects in a line, rectangular array or circle.

Supports for Teachers

Critical Background Knowledge
Conceptual: Students will understand that a set of 1-10 objects arranged in a line, rectangular array, circle or scattered have a specific count
Procedural: Students can count objects to answer “how many” in a given set from 1-10. Students can place objects in sequential order on a number line from 0-10. Students can show how to count objects to find the answer “how many” in a set from 1-10.
Representational: Students can show how to place objects one to one, corresponding with the numerals on a number line from 0-10.

Academic Vocabulary and Notation	
count, set, objects, array, number line, scattered, how many, order	
Instructional Strategies Used	Resources Used
<p>Teacher models how to count objects to find the answer “how many” in a set from 1-20.</p> <p>Students will practice how to count objects to find the answer “how many” in a set from 1-20.</p> <p>Teacher models how to count objects using counting strategies (e.g., one-to-one correspondence, crossing out, beginning from left to right and top to bottom, in a line, rectangular array, or a circle).</p> <p>Students will practice how to count objects using counting strategies (e.g., one-to-one correspondences, crossing out, beginning from left to right, and top to bottom, in a line, rectangular array, or a circle).</p> <p>Teacher models how to use counting strategies as listed above to count objects from 1-10 in a scattered configuration.</p> <p>Students will practice a variety of counting strategies to show how to count objects from 1-10 in a scattered configuration.</p>	<p>Richardson, Kathy. <i>Developing Number Concepts Bk1; Counting, Comparing, and Patterns</i>. Math Perspectives</p> <p>http://www.uen.org/k-2interactives/math.shtml</p> <p><i>Hands-on Standards, Pre-K</i>. Learning Resources, Inc., 2006.</p> <p>Forsten, Char. <i>Math Talk: Teaching Concepts & Skills Through Illustrations & Stories</i>. Crystal Springs Books, 2010.</p> <p>Kuhns, Catherine. <i>Building Number Sense: Games & Activities to Practice Combinations to 10</i>. Crystal Springs Books, 2009.</p>
Assessment Tasks Used	
<p>Skill-Based Task:</p> <p>Teacher provides students with concrete and/or pictorial objects to find “how many” in a given set from 1-20.</p> <p>Teacher provides students with concrete and/or pictorial objects arranged in a line, rectangular array or circle from 1-20 in a given set.</p>	<p>Problem Task:</p> <p>Student uses counting strategies to find “how many” concrete objects in a given set from 1-20.</p> <p>Students are given pictorial representation of objects from 1-20 arranged in a line, rectangular array. Students use practiced counting strategies to find “how many” in a given set.</p>

<p>Teacher provides students with concrete and or pictorial objects arranged in a scattered configuration from 1-10 in a given set.</p>	<p>Students are given containers with sets of objects from 1-10. Students are instructed to shake and spill out the objects to make a scattered configuration. Students use counting strategies to find “how many.”</p>
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Core Content

Cluster Title: Compare numbers.

Standard 6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.¹

¹Include groups with up to ten objects.

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand that a group with more is bigger than a group with less.

Students will understand that groups with the same number are equal.

Students will understand “more than,” “greater than,” “less than,” “fewer,” and “equal.”

Procedural:

Students can count out groups of greater, lesser, or equal quantities.

Students can make groups with greater, lesser, or equal quantities.

Students can identify which group has greater, lesser, or equal quantities.

Students can identify how many objects are in each group.

Students can tell which group has more objects.

Students can tell which group has fewer objects.

Students can tell which groups have the same number of objects.

Representational:

Students can draw greater, lesser, or “equal to” sets.

Students can make groups of objects that represent greater, lesser or equal quantities.

Students can make a group that has one more or one less.

Supports for Teachers

Critical Background Knowledge

Conceptual:

Students will understand the concept of number for numerals 1-10.

Students can count with one-to-one correspondence.

Students will understand the relationship of numbers to quantities.

Students will understand the cardinality of a group of objects (e.g., if I count 6 objects, then 6 is the cardinal number.)

Procedural:

Students can count a set of objects.

Students can use one-to-one correspondence.

Students can recognize bigger and smaller groups.

Students can count with one-to-one correspondence.

Representational:

Students can draw a number of objects for numerals 1-10.

Students can count objects with one-to-one correspondence from 1-10.

Academic Vocabulary and Notation

more, less, fewer, same, equal, greater than, less than, most, least

Instructional Strategies Used		Resources Used	
<p>Working with a partner, students each turn over a number card. They state who has more and who has less. "Eight is more than 5." If they have the same number, they say, "Three is equal to 3," and clap hands.</p> <p>Top It! It's war, but whoever has the "more" number gets to keep both cards. If they are the same, students turn over 2 more cards and determine who has more again. The "winner" keeps all the cards.</p> <p>Students will draw a picture of a domino and circle the number of pips (dots) that is more/less dependent upon the teacher's instructions. Use dot dice with partners and identify who has more, less or equal. Use tally marks to keep score.</p>		<p>Hoban, Tara. <i>More, Fewer, Less</i>. Greenwillow Books, 1998.</p> <p>Hutchins, Pat. <i>The Door Bell Rang</i>. Greenwillow Books, 1989.</p> <p>McKissick, Fred. <i>A Million Fish... More or Less</i>. Dragonfly Books, 1996.</p> <p>Richardson, Kathy. <i>Developing Number Concepts, Book 1: Counting, Comparing, and Patterns</i>. Math Perspectives.</p> <p>http://illuminations.nctm.org/ActivitySearch.aspx</p>	
Assessment Tasks Used			
<p>Skill-Based Task:</p> <p>Show the students two groups of cubes and have them identify which group has more and which group has less.</p> <p>Show the students a pictograph and have them identify with group is greater, which group has fewer, and which groups are the same.</p>		<p>Problem Task:</p> <p>Jim has 3 dogs. Marci has 2 dogs. Who has the most dogs? Use a picture or number sentence to show how you came up with the answer.</p> <p>Hyrum has 7 gumballs. Lucy has 6. Mario has 7. Which students have the same number of gumballs? Justify your answer with a picture, with objects, or in writing.</p> <p>Janice ate 4 cookies. Sasha ate 9 cookies. Which child ate fewer cookies? Show how you came up with your answer using objects, a picture, or writing.</p>	

Core Content

Cluster Title: Compare numbers.
Standard 7: Compare two numbers between 1 and 10 presented as written numerals.
MASTERY Patterns of Reasoning:
<p>Conceptual: Students will understand that two numerals between 1 and 10 represent quantities that can be compared.</p> <p>Procedural: Students can compare two numerals from 1 to 10 presented as written numerals.</p> <p>Representational: Students can model the comparison of two numerals from 1 to 10 presented as written numerals.</p>

Supports for Teachers

Critical Background Knowledge
<p>Conceptual: Students will know the difference between letters, numbers and other symbols.</p> <p>Procedural: Students can visually identify or count to determine which of two sets has more objects from 1-5. Students can recognize the difference between letters, numbers, and other symbols.</p> <p>Representational: Students can represent which of two sets has more objects from 1-5. Students can sort letters, numbers and symbols into their categories.</p>
Academic Vocabulary and Notation
numeral, identify, visually, symbol, more, less, compare, sets, greater than, less than, more, less

Instructional Strategies Used	Resources Used
<p>Teacher will model how to use a number line to visually compare two numerals from 1 to 10.</p> <p>Students will be given opportunities to use objects and number lines to visually compare numbers.</p> <p>Students will use two numeral cards to practice identifying the greater or lesser numeral.</p>	<p>Murphy, Stuart J. <i>Seaweed Soup</i>. HarperCollins, 2001.</p> <p>http://www.uen.org/k-2interactives/math.shtml</p> <p><i>Hands-on Standards, Pre-K</i>. Learning Resources, Inc., 2006.</p> <p>Richardson, Kathy. <i>Developing Number Concepts, Book 1: Counting, Comparing, and Patterns</i>. Math Perspectives.</p>

Assessment Tasks Used													
<p>Skill-Based Task: Students will be provided with a teacher-generated numeral comparison grid.</p> <table border="1" data-bbox="285 857 417 1084"> <tr><td>2</td><td>5</td></tr> <tr><td>9</td><td>7</td></tr> <tr><td>10</td><td>1</td></tr> <tr><td>6</td><td>4</td></tr> <tr><td>8</td><td>3</td></tr> <tr><td>5</td><td>6</td></tr> </table>	2	5	9	7	10	1	6	4	8	3	5	6	<p>Problem Task: Students will identify the specified numeral. Students will touch or draw a circle around the numeral determined by teacher direction (e.g., circle the greater numeral, touch the lesser numeral).</p>
2	5												
9	7												
10	1												
6	4												
8	3												
5	6												

Core Content

<p>Cluster Title: Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).</p>
<p>Standard 1: Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above</i>, <i>below</i>, <i>beside</i>, <i>in front of</i>, <i>behind</i>, and <i>next to</i>.</p>
<p>MASTERY Patterns of Reasoning:</p>
<p>Conceptual: Students will understand that objects in the environment have a shape. Students will understand positional words (such as <i>above</i>, <i>below</i>, <i>beside</i>, <i>in front of</i>, <i>behind</i>, and <i>next to</i>).</p> <p>Procedural: Students can identify the shape of an object in their environment. Students can use positional words to describe shapes in the environment. Given an object in the environment, students can describe its shape</p> <p>Representational: Given a positional word, students can correctly place objects. Given an object in the environment, students can describe its shape.</p>

Supports for Teachers

<p>Critical Background Knowledge</p>
<p>Conceptual: Students will understand basic shapes. Students will understand that shapes can differ in size. Students will understand that objects have shapes.</p> <p>Procedural: Students can recognize shapes regardless of size. Students can identify shapes in their environment.</p>

<p>Representational: Students can find an object that is a given shape. Students can identify the shape of an object.</p>
<p>Academic Vocabulary and Notation above, below, under, on top, around, near, beside, in front of, behind, between, next to, square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere</p>

Instructional Strategies Used	Resources Used
<p>Teacher holds up a shape and asks students if they can find an object in the environment that is similar in shape. “The (object shown) is a (name of shape).” Complete this activity with both 2-D and 3-D shapes.</p> <p>Teacher calls on a student to pick an object from the classroom to show to the class. Class names the shape of the object.</p> <p>Using a box and a puppet, the teacher models positional words by placing the box and puppet in different situations. Students then use boxes and puppets (or like materials) to model the positional words given by the teacher.</p> <p>Teacher will have a few students come up to the front of the classroom and act out positional words. Teacher can then call on other students to use positional words to describe the students’ placement.</p>	<p>Burns, Marilyn. <i>The Greedy Triangle (Scholastic Bookshelf)</i>. Scholastic Paperbacks, 2008.</p> <p>Gowler Greene, Rhonda. <i>When a Line Bends... A Shape Begins</i>. Sandpiper, 2001.</p> <p>Hoban, Tana. <i>Cubes, Cones, Cylinders, and Spheres</i>. Greenwillow Books, 2000.</p> <p>Hoban, Tana. <i>Shapes, Shapes, Shapes</i>. Greenwillow Books, 1996.</p> <p>Pluckrose, Henry. <i>Shape (Mathcounts)</i>. Children’s Press, 1995.</p> <p>Stoll Walsh, Ellen. <i>Mouse Shapes</i>. Harcourt Children’s Books, 2007.</p> <p>Objects from the environment that have distinct shapes.</p>

Assessment Tasks Used	
Skill-Based Task: Teacher gives a student a box and a puppet. Student demonstrates a positional word using the box and puppet. Teacher gives a student an object, and students identify the shape of the object.	Problem Task: Students are given a sheet of paper with a table drawn on it. Teacher gives directions to draw balls in different colors using positional words (for example, "Draw a yellow ball under the table"; "Draw a blue ball next to the table").

Core Content

Cluster Title: Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

Standard 2: Correctly name shapes regardless of their orientations or overall size.

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand that shape does not change regardless of its size.

Students will understand how the facets on three-dimensional shapes are two-dimensional shapes (squares make cubes; triangles and a square make a pyramid, etc.).

Procedural:

Students can find shapes of various sizes and orientations in their environment.

Students can manipulate two- and three-dimensional shapes (flip, slide, rotate, turn, etc.).

Students can describe the attributes of two- and three-dimensional shapes.

Students can use and name other shapes to make different shapes (e.g., triangles to make a hexagon).

Representational:

Students can make pictures with two- and three-dimensional shapes (using blocks, attribute blocks, or pattern blocks).

Students can build with blocks and identify basic shapes.

Supports for Teachers

Critical Background Knowledge	
<p>Conceptual: Students will know names of shapes regardless of orientation (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres). Students will have exposure to two-dimensional and three-dimensional shapes.</p> <p>Procedural: Students can manipulate shapes by turning, flipping, and rotating orientations. Students can search class, school and home environments for shapes. Students can name the shapes regardless of orientation (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres). Students can identify shapes found in the environment.</p> <p>Representational: Students can draw two-dimensional shapes.</p>	
Academic Vocabulary and Notation	
flip, rotate, turn, triangle, square, circle, rectangle, hexagon, cone, cylinder, cube, sphere, attribute, large, small, medium, describe, facet (the flat side of a three-dimensional shape), vertices (where facets join)	
Instructional Strategies Used	Resources Used
Show and Teach: Have the students bring an object that matches the shape you identify and describe the attributes.	Hoban, Tana. <i>Shapes, Shapes, Shapes</i> . Greenwillow Books, 1996.
Feel and Tell: Students reach in to a hiding box/bag/can. They describe the shape they feel. Other students guess what shape the student is describing.	Mickelthwait, Lucy. <i>I Spy Shapes in Art</i> . Greenwillow Books, 2004.
Sort and Name: Students work with partners as they sort and name a set of shapes. Cross-check with your partner.	Stoll Walsh, Ellen. <i>Mouse Shapes</i> . Harcourt Children’s Books, 2007.
Acka Backa Soda Cracker: Use the chant and play the game. Students	

<p>sit in a circle and pass various shapes around in rhythm with the chant. "Acka backa soda cracker, acka backa boo. Acka backa soda cracker, pass to you. Please name the shape that was passed to you!"</p> <p>String Shapes: Give the students a long piece of string and have the students work in small groups to create the shape you call. They stretch the string to make circles, squares, etc.</p> <p>Students use geoboards to make the shapes.</p>	
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: Show the students a set of shapes with different sizes and orientations. Ask them to name them.</p> <p>Ask the students to describe the attributes of specified two- or three-dimensional shape. "Describe a cone. Tell me the attributes of a triangle."</p>	<p>Problem Task: Joey has a shape with 4 corners and 4 equal sides. What shape does he have? Explain your answer with a picture, with objects or in writing.</p> <p>Esperanza wants to wrap her teddy bear. Which shapes of wrapping paper could she use? Explain what shape you chose and why.</p>

Core Content

Cluster Title: Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).
Standard 3: Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).
MASTERY Patterns of Reasoning:
Conceptual: Students will understand that there are flat and solid shapes. Students will understand the differences between flat and solid shapes. Students will understand two-dimensional and three-dimensional shape vocabulary.
Procedural: Students can identify shapes as either flat or solid.
Representational: Students can represent two-dimensional shapes with drawings.

Supports for Teachers

Critical Background Knowledge
Conceptual: Students will understand basic shapes. Students will understand that shapes can differ in size. Students will understand that objects have shapes.
Procedural: Students can recognize shapes regardless of size. Students can identify shapes in their environment. Students can find an object that is a given shape. Students can identify the shape of an object.

<p>Representational: Students can find an object that is a given shape. Students can identify the shape of an object. Students can use manipulatives to represent given shapes.</p>
<p>Academic Vocabulary and Notation</p>
<p>flat, solid, two-dimensional, three-dimensional, squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres</p>

Instructional Strategies Used	Resources Used
<p>Present the class with a set of solid and flat shapes. Ask the students to identify the name of each shape.</p> <p>Hold up all the flat shapes and ask students what they have in common.</p> <p>Hold up all the solid shapes and ask students what they have in common.</p> <p>Focus on the fact that solids have an extra dimension.</p> <p>Point to different shapes and have students identify the shape as either solid or flat.</p> <p>Have students come up to the front and pick a shape. Have the class identify it as either solid or flat.</p> <p>When mentioning flat and solid shapes, introduce the terms <i>two-dimensional</i> and <i>three-dimensional</i> to widen students' vocabulary.</p> <p>Note to teacher: When identifying an object as a shape, three-dimensional vocabulary should be used (for example, a ball is now a <i>sphere</i>, not a <i>circle</i>).</p>	<p>Senisi, Ellen B. <i>A 3-D Birthday Party (Rookie Read-About-Math)</i>. Children's Press, 2007.</p> <p>Thong, Roseanne. <i>Round Is a Mooncake: A Book of Shapes</i>. Chronicle Books, 2000.</p> <p>flat shapes (use paper models of shapes)</p> <p>solid shapes</p>

Assessment Tasks Used	
Skill-Based Task: Given a group of shapes, students can identify the flat and solid shapes.	Problem Task: Given a shape, students can identify the shape as either flat or solid.

Core Content

Cluster Title: Analyze, compare, create, and compose shapes.

Standard 4: Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).

MASTERY Patterns of Reasoning:

Conceptual:

- Students will understand that shapes are defined by the number of sides and vertices/corners.
- Students will understand that squares have sides of equal length.
- Students will understand that common attributes are used to compare shapes.
- Students will understand that orientation does not change the name of the shape.

Procedural:

- Students can count and tell the number of sides/vertices of each shape.
- Students can describe the similarities and differences between shapes (2-D to 2-D, 3-D to 3-D, and 2-D to 3-D).
- Students can list the attributes of a single shape.
- Students can recognize the same shape in different orientations.
- Students can analyze and compare two- and three-dimensional shapes.
- Students can use informal language to describe shapes' similarities, differences, parts and other attributes.

Representational:

- Given two shapes, students can describe how they are the same and different (2-D to 2-D, 3-D to 3-D, and 2-D to 3-D).
- Students can recognize the similarities and differences of shape, regardless of size and/or orientation.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <ul style="list-style-type: none">Students will begin to recognize basic shapes in drawings and objects.Students will understand that objects are described by shape.Students will understand that objects can be grouped by similarities. <p>Procedural:</p> <ul style="list-style-type: none">Students can identify basic shapes.Students can count lines.Students can identify shapes of objects and shapes in pictures.Students can sort objects according to given attributes. <p>Representational:</p> <ul style="list-style-type: none">Students can sort objects according to given attributes.
Academic Vocabulary and Notation
compare, similarities, differences, size, orientation, attribute, part, side, point/corner/vertex, straight, round, curved, shape, square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere

Instructional Strategies Used	Resources Used
<p>Teacher should present two shapes to be compared and discussed. Students should describe both the similarities and the differences of the two shapes. The discussion should focus on size, orientation, parts, and other attributes that define shapes (not arbitrary attributes such as color, texture, etc.).</p> <p>When analyzing and comparing shapes, use:</p> <ul style="list-style-type: none"> • 2-D and 2-D Examples: <ul style="list-style-type: none"> ○ Shapes with different number of sides/vertices (e.g., squares and triangles) ○ Shapes with same number of sides but other attribute(s) different (e.g., square and rectangles) ○ Same shapes, but with different sizes and orientations (e.g., triangles of different sizes, orientations, and angles) <ul style="list-style-type: none"> ▪ All examples of triangles should not be equilateral. Teachers should use other kinds of triangles as well (e.g., right triangles, scalene triangles, obtuse triangles). Students need not identify the type of triangle, but do need to know that any shape with 3 sides is a triangle. • 3-D and 3-D Examples: <ul style="list-style-type: none"> ○ Shapes with apparent differences, such as straight/curved sides (e.g., cubes and spheres) ○ Shapes with similar bases/faces (e.g., cones and cylinders) ○ Shapes in different sizes and orientations (e.g., cylinder standing on base and cylinder lying on side) • 2-D and 3-D Examples: <ul style="list-style-type: none"> ○ Shapes with apparent similarities (e.g., squares and cubes, circles and spheres) ○ Shapes with apparent differences (e.g., triangles and spheres) 	<p>Burns, Marilyn. <i>The Greedy Triangle (Scholastic Bookshelf)</i>. Scholastic Paperbacks, 2008.</p> <p>Murphy, Stuart J. <i>Captain Invincible and the Space Shapes (MathStart 2)</i>. HarperCollins, 2001.</p> <p>shape manipulatives</p> <p>solid shapes</p> <p>flat shapes made of paper</p> <p>NOTE: It is important to begin to expose students to shapes in different orientations and sizes. Do not limit student experience to regular polygons (i.e., all sides and angles of equal measure).</p>

Assessment Tasks Used	
<p>Skill-Based Task: When presented with a variety of shapes, students can find common/different attributes, including dimensions.</p> <p>When given two shapes, students can identify the similarities and differences of the two shapes.</p> <p>Students can count the number of corners, sides, etc., on a shape.</p>	<p>Problem Task: Given a piece of paper with different shapes drawn on it, students can circle or color all examples of the same shape, regardless of size or orientation.</p> <p>When given a list of attributes describing a shape, students can point to the correct shape.</p>

Core Content

Cluster Title: Analyze, compare, create, and compose shapes.
Standard 5: Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
MASTERY Patterns of Reasoning:
Conceptual: Students will understand how to build shapes found in the world from materials (e.g., sticks, clay). Students will understand how to draw shapes found in their world.
Procedural: Students can build shapes found in their world. Students can draw shapes found in their world.
Representational: Students can model building shapes from their environment. Students can model drawing shapes found in their environment.

Supports for Teachers

Critical Background Knowledge
Conceptual: Students will understand how to identify a shape by its attributes. Students will understand how to distinguish between two-dimensional and three-dimensional shapes. Students will understand how to compare shapes and find their similarities and differences.
Procedural: Students can identify models of shapes in the world.
Representational: Students can model verbal or pictorial identification of given shapes.

Academic Vocabulary and Notation	
square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere, two-dimensional, three-dimensional, flat, solid sides, same, alike, different	
Instructional Strategies Used	Resources Used
<p>Students find objects in their classroom and name the objects' shapes (e.g., the globe is in the shape of a sphere, the tissue box is in the shape of a cube).</p> <p>Students match a given shape to an object in their environment.</p> <p>When given a shape, students use that shape as the basis to draw an object found in their environment.</p> <p>Using linking cubes, students create a variety of shapes.</p>	<p>Bryant, Megan E. <i>Shape Spotters (Penguin Young Readers, L2)</i>. Penguin Young Readers, 2002.</p> <p>Fries, Marcia. <i>I See Shapes</i>. Creative Teaching, 1996.</p> <p>Hoban, Tana. <i>Shapes, Shapes, Shapes</i>. Greenwillow Books, 1996.</p> <p>Pluckrose, Henry. <i>Shape (Mathcounts)</i>. Children's Press, 1995.</p>

Assessment Tasks Used	
<p>Skill-Based Task: Teacher dictates a specific shape, and students draw the shape and its attributes correctly (students only need to draw two-dimensional shapes).</p>	<p>Problem Task: Students choose a shape to model and use play dough to create it.</p> <p>Extend: Students choose a three-dimensional shape to create with play dough.</p>

Core Content

Cluster Title: Analyze, compare, create, and compose shapes.
Standard 6: Compose simple shapes to form larger shapes. (For example, “Can you join these two triangles with full sides touching to make a rectangle?”)
MASTERY Patterns of Reasoning:
<p>Conceptual: Students will understand how larger shapes can be composed of smaller shapes.</p> <p>Procedural: Students can practice forming different shapes using simple shapes. Students can practice creating simple shapes using media and basic drawing tools. Students can practice combining simple shapes to create a different or larger shape. Students can compose (build) simple shapes into different or larger shapes. Students can combine (add to) simple shapes to create different or larger shapes.</p> <p>Representational: Students can compose (build) simple shapes into different or larger shapes with manipulatives. Students can combine (add to) simple shapes to create different or larger shapes.</p>

Supports for Teachers

Critical Background Knowledge
<p>Conceptual: Students can describe simple two- and three-dimensional shapes. Students can create simple shapes using media (play dough, blocks, art supplies etc.) and basic drawing tools. Students can explore combining simple shapes to create new shapes. Students will understand how to create simple shapes using media (play dough, blocks, art supplies etc.) and basic drawing tools.</p> <p>Procedural: Students can practice describing simple two- and three-dimensional shapes using concrete objects. Students can create simple shapes using play dough/clay, blocks, art supplies etc.</p>

Students can use exploration in combining simple shapes to create new shapes (e.g., attribute blocks, building blocks, etc.).

Representational:

Students can demonstrate understanding by describing basic two- and three-dimensional shapes.

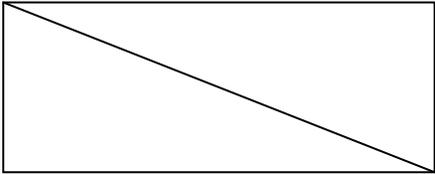
Students can create simple shapes using a variety of media.

Students can create new shapes through the exploration of combining simple shapes.

Academic Vocabulary and Notation

create, compose, explore, combine, different, larger, simple shape (e.g., square, rectangle, triangle)

Instructional Strategies Used	Resources Used
<p>Teacher models how to compose simple shapes to form different or larger shapes by using attribute blocks, pattern blocks, etc. (e.g., two triangles combine to make a rectangle, four small squares combine to make a larger square).</p> <p>Students will be given practice to compose simple shapes to form different or larger shapes through exploration using a variety of concrete shapes.</p> <p>Extension: Teacher models how to use attribute blocks to show composition of complex shapes (e.g., two trapezoids combine to make a hexagon, three parallelograms combine to make a hexagon).</p>	<p>Gowler Greene, Rhonda. <i>When a Line Bends... A Shape Begins</i>. Sandpiper, 2001.</p> <p>Hoban, Tana. <i>Shapes, Shapes, Shapes</i>. Greenwillow Books, 1996.</p> <p>Pluckrose, Henry. <i>Shape (Mathcounts)</i>. Children’s Press, 1995.</p> <p>UEN Math website for grades K-2: http://www.uen.org/k-2interactives/math.shtml</p> <p>shape songs and poems</p>

Assessment Tasks Used	
<p>Skill-Based Task: Students will show how to compose simple shapes to form different and or larger shapes.</p> <p>Can you show me a rectangle using square pattern blocks? Using square pattern blocks (4), show me how to make a larger square.</p> <p>Show me how to combine these two triangles to make a rectangle.</p> 	<p>Problem Task: Students are given a variety of materials (e.g., attribute blocks, pipe cleaners, Popsicle sticks, shape cutouts) to use in composing the following shapes: square, rectangle, and triangle.</p> <p>Extension: hexagon, trapezoid, parallelogram and rhombus.</p>

Core Content

Cluster Title: Describe and compare measurable attributes.
Standard 1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
MASTERY Patterns of Reasoning:
<p>Conceptual: Students will understand that objects differ in their attributes (length, width, capacity and weight). Students will understand that objects can be measured using different attributes.</p> <p>Procedural: Students can identify the different attributes of an object (length, width, and weight). Students can use measurement vocabulary. Students can identify what attributes of an object can be measured. Students can describe measurable attributes of objects, such as length or weight. Students can describe several measurable attributes of a single object.</p> <p>Representational: Students can tell the teacher what attributes can be measured when given an object. Students can use measurement vocabulary when talking about an object. Students can represent measurable attributes with drawings or manipulatives.</p>

Supports for Teachers

Critical Background Knowledge
<p>Conceptual: Students will understand that objects have different measurable attributes (size, length, weight).</p> <p>Procedural: Students can use a basis measurement vocabulary (e.g., length [long/short], weight [heavy/light], size [big/small], and distance [near/far]). Students can compare objects using measurable attributes (e.g., length [long/short], weight [heavy/light], size [big/small], and distance [near/far]).</p>

<p>Representational: Students can represent the comparison of objects by size (big/small).</p>	
<p>Academic Vocabulary and Notation length, width, capacity, weight, measuring, size, attribute, measurable</p>	
<p>Instructional Strategies Used</p>	
<p>Teacher will show an object and ask students to describe the object.</p> <p>Teacher will ask the students if there is anyway to measure the object, discussing different attributes that are measurable.</p> <p>Teacher will pair students up and given them an object. Students will discuss and draw the measurable attributes of the object.</p>	
<p>Resources Used</p> <p>Boxes and other objects that differ in their attributes for students to discuss.</p> <p>Pluckrose, Harry. <i>Length (Math Counts)</i>. Children’s Press, 1995.</p> <p>Pluckrose, Harry. <i>Weight (Math Counts)</i>. Children’s Press, 1995.</p>	
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: When given an object, the student can show/tell the teacher at least two ways of measuring the object.</p>	<p>Problem Task: Students can pick an object in the classroom and describe the measurable attributes of the object.</p>

Core Content

<p>Cluster Title: Describe and compare measurable attributes.</p>
<p>Standard 2: Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (For example, directly compare the heights of two children and describe one child as taller/shorter.)</p>
<p>MASTERY Patterns of Reasoning:</p>
<p>Conceptual: Students will understand that two objects can be compared with common measurable attributes. Students will understand comparing vocabulary.</p> <p>Procedural: Students can identify the tallest/shortest object. Students can identify which group has more or less. Students can describe the differences between two objects.</p> <p>Representational: Students can use comparing/measuring vocabulary to compare two objects. Students can represent the comparison of objects that have measureable attributes with drawings, or use of other indications such as pointing or drawing a ring around the larger/smaller.</p>

Supports for Teachers

<p>Critical Background Knowledge</p>
<p>Conceptual: Students will understand that objects can be compared through their different attributes (size, length, weight).</p> <p>Procedural: Students can use a basis measurement vocabulary (e.g., length [long/short], weight [heavy/light], size [big/small], and distance [near/far]).</p>

<p>Students can compare objects using measurable attributes (e.g., length [long/short], weight [heavy/light], size [big/small], and distance [near/far]).</p> <p>Students can tell why the objects were ordered in a given way.</p> <p>Representational: Students can order objects based on measurable attributes (size, length, weight).</p>
<p>Academic Vocabulary and Notation</p> <p>more of, less of, taller/shorter, heavier/lighter, compare, attributes, measuring, height</p>

Instructional Strategies Used	Resources Used
<p>Teacher shows students two objects and asks students what they notice about each object, then asks students to compare the objects and explain their thinking.</p> <p>Teacher will stop to explain vocabulary words as they come up in discussion.</p> <p>Teacher will have students pair up and get two objects from the classroom to compare using newly acquired vocabulary words.</p> <p>Teacher will gather students back together and call up two students at a time for the class to compare the students' attributes (with the exception of weight).</p> <p>Teachers will then transfer the skill of comparing two objects to comparing two groups of objects. The teacher will show the class two groups of the same object and ask students to compare the groups of objects.</p>	<p>http://pbskids.org/clifford/games/measuring_up.html</p> <p>http://pbskids.org/toopyandbinoo/index.php?ID=MAGC1JEU1</p> <p>http://pbskids.org/curiousgeorge/games/count_your_chickens/count_your_chickens.html (reviews counting, then moves to comparing groups of chicks)</p> <p>http://www.ixl.com/math/kindergarten/fewer-more-comparing-groups</p> <p>http://www.ixl.com/math/kindergarten/fewer-equal-more</p> <p>Albee, Sarah. <i>The Dragon's Scales (Step Into Reading, Step 3)</i>. Random house Books for Young Readers, 1998.</p> <p>Jenkins, Steven. <i>Actual Size</i>. Houghton Mifflin Books for Children, 2004.</p>

<p>Teacher will introduce the vocabulary words <i>more/less of</i>.</p> <p>Teacher will put students into small groups to compare two groups of objects using their newly acquired vocabulary words.</p> <p>Teacher will gather students back together and group students by similar attributes, then ask the class to identify which group has more/less of a particular attribute (e.g., shoe color, shirt color, long or short hair).</p>	<p>Murphy, Stuart J. <i>The Best Bug Parade (MathStart 1)</i>. HarperCollins, 1996.</p> <p>Rohmann, Eric. <i>My Friend Rabbit</i>. Roaring Brook Press, 2002.</p> <p>Rex, Michael; Ling, Bettina; and Burns, Marilyn. <i>The Fastest, Tallest, Biggest Snowman Ever (Hello Math Reader! Level 3, Grades 1 & 2)</i>. Cartwheel, 1997.</p>
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<p>Assessment Tasks Used</p>	
<p>Skill-Based Task:</p> <p>Shown two objects, students will be able to identify the tallest/shortest.</p> <p>Shown two groups of objects, students can identify which group has more and which group has fewer objects.</p> <p>Students will be able to compare themselves with a classmate on common measurable attributes.</p> <p>Students can build an object that is either taller/shorter or more/less than a given object/model.</p>	<p>Problem Task:</p> <p>Students will bring in a teddy bear to compare with a friend's teddy bear. Students can compare the height, weight, and size of bears. Bears can be sorted by similar sizes or colors into groups. These groups can then be compared to see which group has more or less of a particular attribute. Students will discuss their findings.</p> <p>Make a "sorting by length" station at which students sort objects as longer, shorter, or about the same as a specified object. Change the reference object as needed.</p> <p>Give pairs of students a strip of tagboard, a stick, a length of rope, or other object with a length dimension. Ask students to find five things in the room that are shorter than, longer than, or about the same length as their object. Students can draw pictures or write the names of the things they find.</p>

Core Content

Cluster Title: Classify objects and count the number of objects in each category.

Standard 3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by number.*

*Limit category counts to be less than or equal to 10.

MASTERY Patterns of Reasoning:

Conceptual:
 Students will understand how to classify or group objects into categories.
 Students will understand how to count the number of objects in each category (up to 10).
 Students will understand how to classify objects given a category/attribute.
 Students will understand how to compare groups.
 Students will understand how to sort categories by number.

Procedural:
 Students can compare groups (i.e., which group has more/less).
 Students can group objects by similar attributes.
 Students can count the number of objects in each category (up to 10).
 Students can classify objects given a category/attribute.
 Students can sort categories by number.

Representational:
 Students can use representations such as pointing or drawing rings around identified groups having more/less and most/least.

Supports for Teachers

Critical Background Knowledge

Conceptual:
 Students will understand what a category/attribute is.
 Students will understand how to compare objects.

<p>Procedural: Students can group objects by a category attribute. Students can correctly count a group of objects up to 10.</p> <p>Representational: Students can represent sorting a group by a common attribute.</p>
<p>Academic Vocabulary and Notation</p> <p>classify, sort, attribute, groups, categories, count</p>

Instructional Strategies Used	Resources Used
<p>The teacher will call up six students and sort them into two groups based on a common attribute (girls/boys, hair color, shirt color, shoes, etc.). The teacher will ask the class to identify the attribute the groups were sorted by. Repeat until students grasp the concept.</p> <p>Invite a student up to the front of the class to call students up and sort them into two groups. The student who can correctly identify the attribute by which the groups were sorted comes up next.</p> <p>Use one of the website to practice sorting.</p> <p>Divide students into groups to sort objects. Have them tell you the attribute they sorted by, and which group had most/least of the particular attribute. Encourage students to sort by many different attributes.</p>	<p>Clifford’s Sorting by Color: http://www.scholastic.com/clifford/play/sortitout/sortitout.htm</p> <p>Oscar the Grouch Trash Sorting (by color): http://www.sesamestreet.org/game_player/-/pgpv/gameplayer/0/6759e8da-163b-11dd-98c7-b9f43dcf5330</p> <p>Sorting objects into two groups (can pick own attribute): http://www.sesamestreet.org/game_player/-/pgpv/gameplayer/0/ee4e481c-2356-11dd-9784-93aface31f69</p> <p>Zoey Pet Shelter (sorting animals): http://www.sesamestreet.org/game_player/-/pgpv/gameplayer/0/f1d9ed8b-163d-11dd-98c7-b9f43dcf5330&t=1233332286828&</p> <p>Jenkins, Emily. <i>Five Creatures</i>. Farrar, Straus and Giroux, 2005.</p> <p>Pluckrose, Henry Arthur. <i>Sorting (Math Counts)</i>. Children’s Press, 1995.</p>

Assessment Tasks Used	
<p>Skill-Based Task: Given objects, students will sort them by an attribute and name the attribute.</p> <p>Given groups or objects sorted by an attribute, students can count each group and identify the group with the most/least of the attribute.</p>	<p>Problem Task: Divide students to small groups, and have them remove their shoes. Have each group pick a common attribute and sort the shoes accordingly (laces/no laces, color, type, etc.). Have students explain their attributes and identify how many shoes are in each group. Students should identify the groups with the most and least shoes.</p>

Core Content

Cluster Title: Work with numbers 11-19 to gain foundations for place value.

Standard 1: Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

MASTERY Patterns of Reasoning:

Conceptual:

- Students will understand that numbers 11-19 can be represented by a group of ten ones and some more ones.
- Students will understand that numbers 11-19 have one group of ten and some more ones.
- Students will understand that the numbers 11-19 are made up of two digits.
- Students will understand that numbers can be written in an equation.

Procedural:

- Students can represent a number from 11-19 using objects, such as linking cubes.
- Students can represent a number from 11-19 by drawing a picture.
- Students can compose and decompose numbers from 11-19.
- Students can organize objects into a group of ten and some more ones to show a given number from 11-19.

Representational:

- Students can write the numbers 11-19.
- Students can represent the concept of place value with a picture for a given number from 11-19.
- Students can write an equation for a given number from 11-19.
- Students can write the numbers 11-19.
- Students can represent a number from 11-19 using objects, such as linking cubes.
- Students can represent a number from 11-19 with a drawing.

Supports for Teachers

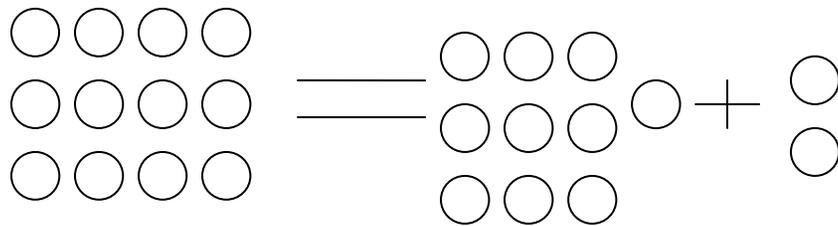
Critical Background Knowledge
<p>Conceptual: Students will have an understanding of the numbers 1-10. Students will have an understanding of counting and one-to-one correspondence.</p> <p>Procedural: Students can count to 20. Students can write the numbers 1-10. Students will understand that the last number name said tells the number of objects counted. Students can count objects with one-to-one correspondence. Students can identify the numbers 1-10. Students can compose and decompose numbers from 1-10.</p> <p>Representational: Students can count orally from 1-10. Students can write the numbers 1-10. Students can correctly count a given set of objects ranging from 1-10.</p>
Academic Vocabulary and Notation
<p>place value, tens, ones, digits, number, decompose, compose, equation, equal, plus, number words 1-19, grouping</p>

Instructional Strategies Used	Resources Used
<p>Teacher will have students use manipulatives to build representations of numbers from 1-10.</p> <p>Teacher will introduce the numbers 11-19.</p> <p>Teacher will model how to use manipulatives to build representations of the numbers 11-19. Students will make each number after the teacher.</p>	<p>Manipulatives (use objects that can and cannot be linked), ten frames</p> <p>http://nlvm.usu.edu/en/nav/category_g_1_t_1.html</p> <p>http://www.ictgames.com/placeValue.htm</p>

Teacher will focus on organizing objects into a group of ten ones and some more ones.

The teacher will next need to transfer the skill of building numbers to drawing pictures of the numbers 11-19. Teacher will model how to group pictures by circling a group of 10. Pictures can also be used to show how to compose and decompose the numbers 11-19.

Lastly, the teacher will take the pictorial representations of the numbers and help students write an equation for the given number. For example:



$$12 = 10 + 2$$

Tang, Greg. *Math Fables: Lessons That Count*. Scholastic Press, 2004.

Assessment Tasks Used	
<p>Skill-Based Task: Students will correctly model the numbers 11-19 using objects and pictorial representations.</p> <p>Students will write an equation for a given number from 11-19.</p> <p>Students will be able to count from 1-19.</p>	<p>Problem Task: Draw a circle around ten Xs. Write the total number of Xs.</p> <p style="text-align: center;"> X X X X X X X X _____ </p> <p style="text-align: center;"> X X X X X X </p> <p>Notice how the student counts, circles, and writes the number. Does the student correctly circle a group of ten Xs? Does the student write the correct number? Does the student find the total by (1) counting by ones, (2) counting on from ten (10, 11, 12, ...), (3) counting the four “extras” and writing 14, or (4) writing 14 by visualizing 10 and 4 (no counting)?</p> <p>Sue has 16 teddy bears. Draw a picture to represent the number 16. Circle the group of 10. Write an equation representing your picture.</p> <p>Randy has 13 cars. Show the number of cars Randy has using the base ten blocks.</p>

Core Content

Cluster Title: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Standard 1: Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

*Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand that addition is “putting together and adding to.”

Students will understand that addition is the joining of two sets to create a larger set.

Students will understand that subtraction is “taking apart and taking from.”

Students will understand that subtraction is the separation of a larger set into two smaller sets.

Procedural:

Students will represent addition problems with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations to join sets.

Students will represent subtraction problems with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations to take apart sets.

Representational:

Students will model addition and subtraction using objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual: Students will understand that the last number name said tells the number of objects counted. Students will understand that, when counting objects, each successive number name refers to a quantity one larger (K. CC4). Students will understand that the number of objects in one group is greater than, less than, or equal to the number of objects in another group (K. CC6).</p> <p>Procedural: Students can count how many objects are in a set.</p> <p>Representational: Students can represent a given number with objects</p>
Academic Vocabulary and Notation
<p>join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart</p>

Instructional Strategies Used	Resources Used
<p>Teachers can tell a story using addition or subtraction to introduce the topic.</p>	<p>Base, Graeme. <i>Uno's Garden</i>. Abrams Books for Young Readers, 2006.</p>
<p>Teachers can use students to role-play addition and subtraction problems.</p>	<p>Jonas, Ann. <i>Splash</i>. Greenwillow Books, 1997.</p>
<p>Teachers may begin instruction by using objects, fingers, mental images, drawings, sounds, acting out situations, or verbal explanations.</p>	<p>Maccarone, Grace. <i>Monster Math (Level 1) (Hello Reader, Math)</i>. Cartwheel, 1995.</p> <p>Maccarone, Grace. <i>Monster Math Picnic</i>. Cartwheel, 1998.</p>

	<p>Raffi. <i>Over In The Meadow</i>. Rounder, 1979.</p> <p><u>Music:</u> Do an Internet search for the following composers if you are interested in music for this standard. Jack Hartman Shari Sloane Dr. Jean Raffi</p>
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: Teacher distributes linking cubes to students. Teacher reads an addition story problem and has students act out the problem using the linking cubes.</p> <p>Teacher distributes linking cubes to students. Teacher reads a subtraction story problem and has students act out the problem using the linking cubes.</p>	<p>Problem Task: Students create their own addition or subtraction story problem using objects, fingers, mental images, drawings, sounds, acting out situations, or verbal explanations.</p>

Core Content

Cluster Title: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Standard 2: Solve addition and subtraction word problems, and add and subtract within 10 (e.g., by using objects or drawings to represent the problem).

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand that addition is the joining of two sets.

Students will understand that subtraction is decomposing a set.

Students will understand that each set in an addition problem is represented by a number, and when the numbers are joined together they make a new set.

Students will understand that the set in a subtraction problem is represented by a number, and when the numbers are separated they make two sets.

Procedural:

Students can solve addition and subtraction story problems using objects and drawings.

Students can add by joining and subtract by separating.

Representational:

Students can use objects and drawings to represent addition and subtraction problems.

Supports for Teachers

Critical Background Knowledge

Conceptual:

Addition is the joining of two sets to create a larger set.

Subtraction is the separation of a larger set into two smaller sets.

Procedural:

Solve addition and subtraction problems with objects, fingers, mental images, drawings, sounds acting out situations, verbal explanations, expressions, or equations to join sets.

<p>Representational: Model addition and subtraction using objects, fingers, mental images, drawings, sounds acting out situations, verbal explanations, expressions, or equations.</p>	
<p>Academic Vocabulary and Notation join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare</p>	
<p>Instructional Strategies Used</p> <p>In a whole-group setting, teacher dictates a story problem while students create a representation with manipulatives.</p> <p>In partners, students create and solve story problems using manipulatives.</p> <p>In a whole-group setting, teacher and students create and solve word problems using pictures.</p> <p>Individually, students create and solve word problems pictorially.</p> <p>Word problems include addition.</p> <p>Word problems include subtraction.</p>	<p>Resources Used</p> <p>Hutchins, Pat. <i>Ten Red Apples</i>. Greenwillow Books, 2000.</p> <p>Long, Lynette. <i>Domino Addition</i>. Charlesbridge Pub., Inc., 1997.</p> <p>Murphy, Stuart J. <i>Elevator Magic (MathStart Subtracting)</i>. HarperCollins, 1997.</p> <p><u>Music:</u> (Do an Internet search for these composers if you are interested in music for this standard) Jack Hartman Shari Sloane Dr. Jean Raffi</p>
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: Teacher dictates an addition story problem. For example: Olivia has 3 lollipops and her friend Sophie 2 lollipops. How many lollipops do they have all together? Students draw a picture to solve the problem.</p>	<p>Problem Task: Teacher creates number cards 1 -5. Students will draw two number cards from the pile. Students will create an addition/subtraction problem and solve using illustrations.</p>

Core Content

Cluster Title: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Standard 3: Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand how to separate numbers (less than or equal to 10) into number pairs.

Students will understand how to show number pairs with objects or drawings.

Students will understand how to write number pairs with drawings or equations.

Students will understand how to use the symbols (+, -, =) of addition and subtraction to write an equation.

Procedural:

Students can identify and name the number pairs of a given number.

Students can record the number pairs of a given number with drawings.

Students can record the number pairs of a given number with equations.

Students can correctly use the symbols of addition/subtraction when writing an equation.

Representational:

Students can model the number pairs of a given number with objects.

Students can model the number pairs of a given number with drawings.

Students can model the number pairs of a given number with equations.

Students can model the correct use of addition/subtraction symbols when writing an equation.

Supports for Teachers

Critical Background Knowledge

Conceptual:

Students can write numbers 0-10.

Students will understand that the last number name said tells the number of objects counted.

When counting objects, students will understand that each successive number name refers to a quantity one larger (K. CC4).

Students will understand that the number of objects in one group is greater than, less than, or equal to the number of objects in another group (K. CC6).

Procedural:

Students can count the number of objects in a set and write the corresponding numeral.

Representational:

Students can represent the number of objects with a written numeral (K. CC3).

Students can model the number of objects in a set and write the corresponding numeral.

Students can correctly represent a written numeral with objects.

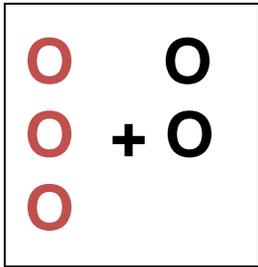
Academic Vocabulary and Notation

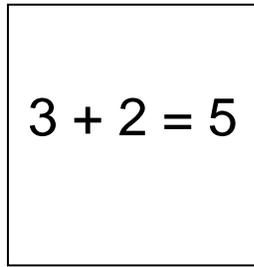
join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart

Instructional Strategies Used	Resources Used
<p>Teacher can model decomposition of numbers with story problems on the board and in pictures to introduce the topic.</p> <p>Students use two-sided counters in a container to “shake out” different number combinations (e.g., students are given a cup, five two-sided counters, and a paper with five blank five-frames on it. They shake and toss out their counters, and record by coloring on their five-frames the various number combinations).</p> <p>The teacher can model with students different number combinations of friends in their class (e.g., have five students come up, discuss the different combinations such as girls/boys, laced shoes/non-laced shoes, long hair/short hair, etc.).</p> <p>Play games involving decomposing numbers (e.g., “The Bears Went Over the Mountain,” “Hide Bears in the Cave,” “Math Story Maps,” “Math Mountains”).</p> <p>Sing various songs (e.g., “Five Speckled Frogs,” “Five Little Monkeys,” “Five Little Ducks”).</p>	<p>Harvey, Jayne. <i>Cat Show (All Aboard Math Reader)</i>. Grosset & Dunlap, 2003.</p> <p>O’Brady, Terry. <i>Count the Animals (Windows on Literacy)</i>. National Geographic School Publishing, 2002.</p> <p>Jenkins, Emily. <i>Five Creatures</i>. Farrar, Straus and Giroux, 2005.</p> <p>Crews, Donald. <i>Ten Black Dots</i>. Greenwillow Books, 2010.</p> <p>Sturges, Philemon. <i>Ten Flashing Fireflies</i>. North-South/Night Sky Books, 1997.</p> <p><u>Music:</u> (Do an Internet search for these composers if you are interested in music for this standard.)</p> <p>Shari Sloane Dr. Jean Raffi Jack Hartman</p>

Assessment Tasks Used**Skill-Based Task:**

Teacher will participate in a matching card activity. See example below.



A rectangular box containing the equation $3 + 2 = 5$.

Problem Task:

Students will be given seven two-sided counters and will be asked to show a minimum of three combinations of seven. Students will record their results with a drawing or equation.

Core Content

<p>Cluster Title: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</p>
<p>Standard 4: For any number from 1 to 9, find the number that makes 10 when added to the given number (e.g., by using objects or drawings), and record the answer with a drawing or equation.</p>
<p>MASTERY Patterns of Reasoning:</p>
<p>Conceptual: Students will understand how to use drawings to make 10 when given a smaller number. Students will understand how to use equations to make 10 when given a smaller number.</p> <p>Procedural: Students can add on to make 10 starting from a given number by using objects. Students can add on to make 10 starting from a given number by using drawings. Students can add on to make 10 starting from a given number by using equations.</p> <p>Representational: Students can model adding on to make 10 by drawing or writing an equation.</p>

Supports for Teachers

<p>Critical Background Knowledge</p>
<p>Conceptual: Students will understand how to count forward beginning from a given number within the known sequence (K. CC2). When counting objects, students will understand that each successive number name refers to a quantity one larger (K. CC4). Students will understand how to decompose numbers less than 10 into number pairs (K. OA3).</p> <p>Procedural: Students can count forward from a given number instead of beginning at 1.</p>

Students can decompose numbers less than 10 into number pairs using objects, drawings, and or equations.
 Students can rote count up to 10 starting at a number other than 1.

Representational:

Students can represent the decomposition of numbers less than 10 into number pairs using objects, drawings, and or equations.

Academic Vocabulary and Notation

in, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart

Instructional Strategies Used

Teacher distributes ten frames and two-sided counters to students.
 Teacher will model how to find the missing addend using the ten-frame.
 For example: Teacher will ask students to place six counters of one color on the ten frame. Then students will count to find how many are missing to get to the number 10.

Students will be given a ten unit and ten unit blocks from a base 10 unit (subtraction bar model). Using the 10 unit as a base, students will build a given number adjacent to the 10 unit. Students will use the comparison model to determine the partner addend.

Using ten-frame cards, student will play “Go Fish” (e.g., “I have an eight, I need a two. Do you have a two?”).

Resources Used

Crews, Donald. *Ten Black Dots*. Greenwillow Books, 2010.

Duke, Kate. *One Guinea Pig Is Not Enough*. Puffin, 2001.

Sturges, Philemon. *Ten Flashing Fireflies*. North-South/Night Sky Books, 1997.

Music:

(Do an Internet search for these composers if you are interested in music for this standard.)

Dr. Jean
 Shari Sloane
 Jack Hartman
 Raffi

Assessment Tasks Used	
<p>Skill-Based Task: Students have ten beans, with the sides of the beans colored different colors. Students will shake and spill the beans. They will count how many beans they have of one color and record their answers on using a worksheet with ten circles. Then they will count how many beans they have of another color and then record their answers on the worksheet.</p> <p>Examples for assessment:</p> <ol style="list-style-type: none"> Students draw the number of colored circles they have using an equation. For example: $***** + ***** = *****$ <ol style="list-style-type: none"> Students write the equation using numerals. $5 + 5 = 10$	<p>Problem Task: Students choose a number from 0-9 and then, using a ten frame, draw circles or write how many more they need to get to 10. Repeat the activity for a total of four work samples.</p>

Core Content

Cluster Title: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Standard 5: Fluently add and subtract within 5.

MASTERY Patterns of Reasoning:

Conceptual:

Students will have automaticity with addition facts to 5.

Students will have automaticity with subtraction facts to 5.

Students will understand when and how to use addition and subtraction appropriately, and have skill in performing them flexibly, accurately and efficiently.

Procedural:

Students can use the following strategies to attain fluency with facts to 5:

- Counting on (e.g., for $1 + 3$ student will count on from 1 three more: “2, 3, 4”)
- Counting back (e.g., for $3 - 2$ students will count back from 3 two less: “2, 1”)
- Counting up to subtract (e.g., for $4 - 2$ students will say “two” first and then count up until they get to 4, keeping track of how many numbers they count up)
- Using doubles (e.g., for $3 + 2$ students will say, “ $2 + 2 = 4$ and 1 more is 5”)
- Using commutative property (e.g., students may say, “I know that $3 + 1 = 4$, so $1 + 3 = 4$ ”)
- Using fact families (e.g., students may say, “I know $1 + 3 = 4$, so $4 - 1 = 3$ ”)

Students will, within a given amount of time, fluently solve addition and subtraction facts within 5. This can be done orally and or in written form.

Representational:

Represent addition and subtraction facts with in 5.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <p>Students will understand how to count forward from a given number within the known sequence (instead of beginning at 1) (K. CC2).</p> <p>Students will understand how to write the numbers correctly from 0-20 (K. CC3).</p> <p>Students will understand the representation of the symbols used in addition and subtraction.</p> <p>Procedural:</p> <p>Students can count forward from a given number.</p> <p>Students can write the numbers 0-20 correctly.</p> <p>Students can identify the correct symbols used in addition and subtraction equations.</p> <p>Students can perform the appropriate tasks indicated by addition and subtraction symbols.</p> <p>Representational:</p> <p>Students can place and use equation symbols when solving addition or subtraction word problems.</p>
Academic Vocabulary and Notation
<p>add, subtract, equation, sum, difference, equal sign, plus, minus</p>

Instructional Strategies Used	Resources Used
<p>Students need to be taught the following strategies to fluently add and subtract within 5:</p> <ul style="list-style-type: none"> • Counting on (e.g., for $1 + 3$ students will count on from 1 three more: “2, 3, 4”) • Counting back (e.g., for $3 - 2$ students will count back from 3 two less: “2, 1”) • Counting up to subtract (e.g., for $4 - 2$ students will say “two” first and then count up until they get to 4, keeping track of how many numbers they count up) • Using doubles (e.g., for $3 + 2$ students will say, “$2 + 2 = 4$ and 1 more is 5”) 	<p>Arizona Academic Content Standards: http://www.azed.gov/standards</p> <p>Baker, Keith. <i>Quack and Count</i>. Sandpiper, 2004.</p> <p>Pallotta, Jerry. <i>The Hershey’s Kisses Addition</i>. Scholastic, 2001.</p> <p>Thompson, Lauren. <i>Little Quack Hide and Seek</i>. Simon & Schuster Books for Young</p>

<ul style="list-style-type: none"> Using commutative property (e.g., students may say, “I know that $3 + 1 = 4$ so $1 + 3 = 4$”) Using fact families (e.g., students may say, “I know $1 + 3 = 4$ so $4 - 1 = 3$”) <p>To increase fluency, the teacher can use the following activities:</p> <ol style="list-style-type: none"> Teacher can give students a problem and have students write the answer on their whiteboards and flash their answers. Students can practice matching the expression with the sum or difference (card games, teacher-made materials with magnets and flash card). Teachers can use a practice sheet with addition facts or subtraction facts and a timer to familiarize students with timed testing. During the day, teachers can use addition or subtraction problems (oral responses) as exit tickets. 	<p>Readers, 2004.</p> <p><u>Music:</u> (Do an Internet search for these composers if you are interested in music for this standard.)</p> <p>Dr. Jean Shari Sloane Raffi Jack Hartman</p>
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Assessment Tasks Used	
<p>Skill-Based Task: Ask the students to solve addition and subtraction problems within ten mentally. Then have them tell you the strategy they used. This can be done on an individual basis or as a whole group.</p>	<p>Problem Task: Give the student a problem in context, such as the problem below, and ask him/her to solve it using mental strategies. Then have him/her tell you the strategies he/she used.</p> <p>Peter has 4 puppies and Marina has 2 puppies. How many puppies do they have together?</p>