

# Mathematics Curriculum: Kindergarten



The following maps outline the Common Core Standards for Kindergarten mathematics determined by the State Standards Initiative. Below is a list of assessment tools that are recommended for tracking student progress in these areas. In addition, resources that can be used in conjunction with instruction of these standards are provided but not limited to the list below.

**Assessment:**

Formative Assessment	Class-Work Review
Open-Ended Problems	Project-Based Assessment
Self-Assessment	Timed Drills
Teacher Observation	End of Year Assessment
Benchmark Assessment	Math Software (ex. Study Island)
Homework Review	Group & Cooperative Work

**Resources:**

Counters (variety)	Center Games	Tangrams
Flashcards	Ten Frame	Geometric Shapes
Math Word Wall	Blocks	Geo-Board
Connecting Cubes	Calendar	Textbooks
Number Line	100 Chart	Attribute Blocks
Work Mats	Math Songs/Poems	Craft Sticks
Computer Software	Calculators	Wiki-Sticks
SmartBoard	Money/Coins	Pattern Blocks
Flannel Board	Measurement Tools	Three Dimensional Shapes
Center Games	Judy Clock	Fraction Tiles
Concrete Objects	Small Student Clocks	Bar Models
Mini White Boards	Time Bingo	1's, 10's, 100's Bars/Cubes
Manipulatives	Digital Clock	Math Journals
Math/Pocket Charts	Analog Clock	

**Websites:**

<http://www.aplusmath.com>  
<http://www.studyisland.com>  
<http://www.funbrain.com>  
<http://www.songsforteaching.com>

**References:** <http://www.ade.az.gov/standards/math/2010MathStandards>

**Math Curriculum  
Kindergarten**

<b>Essential Question(s): How does counting help us in our everyday lives?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Communication and Collaboration/ Integrating Technology</b>			
<b>Content: Counting and Cardinality</b>			
<b>Standards: K. CC</b>			
<b>A. Know number names and the count sequence.</b>			
<b>Vocabulary: Numbers, more/less, same/different, left/right, sequence, first, second, third, etc. before/after, number vocabulary</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
1. Count to 100 by ones and by tens.	<p>*Model counting using decoding words with and without pictures.</p> <p>*Counting with manipulatives</p> <p>*Clapping out numbers</p> <p>*Calendar</p>	<p>The emphasis of this standard is on the counting sequence.</p> <p>When counting by ones, students need to understand that the next number in the sequence is one more. When counting by tens, the next number in the sequence is “ten more” (or one more group of ten).</p> <p>Instruction on the counting sequence should be scaffolded (e.g., 1-10, then 1-20, etc.).</p> <p>Counting should be reinforced throughout the day, not in isolation.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Count the number of chairs of the students who are absent.</li> <li>• Count the number of stairs, shoes, etc.</li> <li>• Counting groups of ten such as “fingers in the classroom” (ten fingers per student).</li> </ul> <p>When counting orally, students should recognize the patterns that exist from 1 to 100. They should also recognize the patterns that exist when counting by 10s.</p>	<p>Music: Dr. Jean Songs</p> <p>Literature: Reese's Pieces Count by Tens by: Jerry Pallotta.</p>
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	<p>*Ask children to finish sequence when starting with a random number.</p>	<p>The emphasis of this standard is on the counting sequence to 100. Students should be able to count forward from any number, 1-99.</p>	<p>File folder Games Math Stories Activities</p> <p style="text-align: right;">Center</p>

<p>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).</p>	<p>*Write numbers for a purpose (Such as taking the lunch count.)</p> <p>*Students will write/form written numerals 0-20</p> <p>*Students illustrate objects based on that number</p> <p>*Count to tell number of objects</p>	<p>Students should be given multiple opportunities to count objects and recognize that a number represents a specific quantity. Once this is established, students begin to read and write numerals (numerals are the symbols for the quantities). The emphasis should first be on quantity and then connecting quantities to the written symbols.</p> <ul style="list-style-type: none"> <li>• A sample unit sequence might include:             <ol style="list-style-type: none"> <li>1. Counting up to 20 objects in many settings and situations over several weeks.</li> <li>2. Beginning to recognize, identify, and read the written numerals, and match the numerals to given sets of objects.</li> <li>3. Writing the numerals to represent counted objects.</li> </ol> </li> </ul> <p>Since the teen numbers are not written as they are said, teaching the teen numbers as one group of ten and extra ones is foundational to understanding both the concept and the symbol that represents each teen number. For example, when focusing on the number “14,” students should count out fourteen objects using one-to-one correspondence and then use those objects to make one group of ten and four extra ones. Students should connect the representation to the symbol “14.”</p>	<p>Songs &amp; number writing poems- <a href="http://www.canteach.ca/elementary/songspoems72.html">http://www.canteach.ca/elementary/songspoems72.html</a></p> <p>Art Center activity: make a number book and illustrate</p> <p>Science: Counting nature objects, pinecones, seeds, etc.</p> <p>Journal writing</p>
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<b>Essential Question(s): What are ways to count objects to tell how many?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Critical Thinking &amp; Problem Solving, Life &amp; Career Skills</b>			
<b>Content: Counting and Cardinality</b>			
<b>Standards: K. CC</b>			
<b>B. Count to tell number of objects.</b>			
<b>Vocabulary: Numbers, more/less, same/different, left/right, sequence, first, second, third, etc. before/after, number vocabulary</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
<p>4. Understand the relationship between numbers and quantities; connect counting to cardinality.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>*Connect counting to cardinality</li> <li>*Pairing objects with number name</li> <li>*Understanding each successive number name refers to a quantity that is one larger</li> </ul>	<p>This standard focuses on one-to-one correspondence and how cardinality connects with quantity.</p> <ul style="list-style-type: none"> <li>For example, when counting three bears, the student should use the counting sequence, "1-2-3," to count the bears and recognize that "three" represents the group of bears, not just the third bear. A student may use an interactive whiteboard to count objects, cluster the objects, and state, "This is three".</li> </ul> <p>In order to understand that each successive number name refers to a quantity that is one larger, students should have experience counting objects, placing one more object in the group at a time.</p> <ul style="list-style-type: none"> <li>For example, using cubes, the student should count the existing group, and then place another cube in the set. Some students may need to re-count from one, but the goal is that they would count on from the existing number of cubes. S/he should continue placing one more cube at a time and identify the total number in order to see that the counting sequence results in a quantity that is one larger each time one more cube is placed in the group.</li> </ul> <p>A student may use a clicker (electronic response system) to communicate his/her count to the teacher.</p>	<p>Science Center: Collecting and counting leaves or other objects from nature</p> <p>Physical Education: Counting jumping jacks, sit ups, etc.</p>

<p>were counted.</p> <ul style="list-style-type: none"> <li>Understand that each successive number name refers to a quantity that is one larger.</li> </ul>			
<p>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.</p>	<p>*Provide opportunities to look at a group of items to determine the quantity</p> <p>*Classify/ sorting objects and then counting</p>	<p>Students should develop counting strategies to help them organize the counting process to avoid re-counting or skipping objects.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>If items are placed in a circle, the student may mark or identify the starting object.</li> <li>If items are in a scattered configuration, the student may move the objects into an organized pattern.</li> <li>Some students may choose to use grouping strategies such as placing objects in twos, fives, or tens (note: this is not a kindergarten expectation).</li> <li>Counting up to 20 objects should be reinforced when collecting data to create charts and graphs.</li> </ul> <p>A student may use a clicker (electronic response system) to communicate his/her count to the teacher.</p>	<p>World Languages: Saying numbers in different languages</p> <p>Science: Classifying and sorting objects from nature ex. Leaves, sea shell, etc.</p>

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<b>Essential Question(s): How can we compare and contrast numbers?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Critical Thinking &amp; Problem Solving, Life &amp; Career Skills</b>			
<b>Content: Counting and Cardinality</b>			
<b>Standards: K. CC</b>			
<b>C. Compare Numbers</b>			
<b>Vocabulary: Numbers, more/less, same/different, left/right, sequence, first, second, third, etc. before/after, number vocabulary</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
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.	<p>*Graphing objects to compare numbers</p> <p>*Sorting and comparing objects to determine the relationship between the two</p>	<p>Students should develop a strong sense of the relationship between quantities and numerals before they begin comparing numbers.</p> <p>Other strategies:</p> <ul style="list-style-type: none"> <li>• Matching: Students use one-to-one correspondence, repeatedly matching one object from one set with one object from the other set to determine which set has more objects.</li> <li>• Counting: Students count the objects in each set, and then identify which set has more, less, or an equal number of objects.</li> <li>• Observation: Students may use observation to compare two quantities (e.g., by looking at two sets of objects, they may be able to tell which set has more or less without counting).</li> <li>• Observations in comparing two quantities can be accomplished through daily routines of collecting and organizing data in displays. Students create object graphs and pictographs using data relevant to their lives (e.g., favorite ice cream, eye color, pets, etc.). Graphs may be constructed by groups of students as well as by individual students.</li> <li>• Benchmark Numbers: This would be the appropriate time to introduce the use of 0, 5 and 10 as benchmark numbers to help students further develop their sense of quantity as well as their ability to compare numbers.</li> </ul> <p>Students state whether the number of objects in a set is more, less, or equal to a set that has to 0, 5, or 10 objects.</p>	<p>Science: Comparing quantities of objects from nature</p>

<p>7. Compare two numbers between 1 and 10 presented as written numerals.</p>	<p>* Students use number lines to determine numerals and quantity</p>	<p>Given two numerals, students should determine which is greater or less than the other.</p>	
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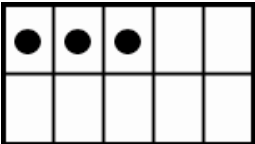


**Math Curriculum  
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<b>Essential Question(s): How can you use objects to solve joining and separating problems?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Critical Thinking and Problem Solving</b>			
<b>Content: Operations and Algebraic thinking</b>			
<b>Standards: K.OA</b>			
<b>A. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</b>			
<b>Vocabulary: Total, in all, how many, together, add, subtract, difference, what's left, plus, minus, is equal to, one more/less, take away, what remains, have enough, still remaining,</b>			
<p>1. Represent addition and subtraction with objects, fingers, mental images, drawings<sup>1</sup>, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.</p>	<p>* Parts to Whole: Take two groups and make them into one whether adding or subtracting by exploring the combinations of numbers</p>	<p>Using addition and subtraction in a word problem context allows students to develop their understanding of what it means to add and subtract.</p> <p>Students should use objects, fingers, mental images, drawing, sounds, acting out situations and verbal explanations in order to develop the concepts of addition and subtraction. Then, they should be introduced to writing expressions and equations using appropriate terminology and symbols which include "+," "-", and "=".</p> <ul style="list-style-type: none"> <li>• Addition terminology: add, join, put together, plus, combine, sum</li> <li>• Subtraction terminology: minus, take away, separate, difference, compare</li> </ul> <p>Students may use document cameras or interactive whiteboards to represent the concept of addition or subtraction. This gives them the opportunity to communicate their thinking.</p>	<p>Literature: Domino Addition by: Lynette Long</p> <p>Elevator Magic by: Stuart J. Murphy</p> <p>Language Arts: Write a sentence about the number sentence.</p> <p>Dramatic Play: Act out addition and subtraction problems</p>

<p>2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</p>	<p>* Model addition and subtraction stories using real objects, next play objects, then counters, and lastly numbers.</p>	<p>Using a word problem context allows students to develop their understanding about what it means to add and subtract.</p> <p>Sample learning sequence:</p> <ul style="list-style-type: none"> <li>• Students make sense of a word problem, such as, “Mia had 3 apples. Her friend gave her 2 more. How many does she have now?” <ul style="list-style-type: none"> <li>○ A student’s “think aloud” of this problem might be, “I know that Mia has some apples and she’s getting some more. So she’s going to end up with more apples than she started with.”</li> </ul> </li> <li>• Students develop the concept of addition/subtraction by modeling the actions in the word problem using: <ul style="list-style-type: none"> <li>○ objects, fingers, mental images, drawings, sounds, acting out situations, and/or verbal explanations. Students may use different representations based on their experiences, preferences, etc.</li> </ul> </li> <li>• Students connect their conceptual representations of the situation using symbols, expressions, and/or equations.</li> <li>• Students may represent addition/subtraction equations with word problems. <ul style="list-style-type: none"> <li>○ For example, given the equation <math>8 - 2 = 6</math>, a student makes up a word problem such as, “José had 8 markers and he gave 2 away. How many does he have now?”</li> </ul> </li> </ul> <p>Note that in context, there are two types of subtraction problems: separate (take-away) and compare. These two types are very different when modeled.</p> <ul style="list-style-type: none"> <li>• Example: <math>8 - 2 = 6</math> <ul style="list-style-type: none"> <li>○ Separate (take-away) example: “José had 8 markers and he gave 2 away. How many does he have now?” When modeled, a student would begin with 8 objects and remove two to get the result.</li> <li>○ Comparison example: “José had 8 marbles and Zia had 2. How many more marbles does José have than Zia?” When modeled, a student would make a set of 8 objects and a set of 2 objects and compare the two sets.</li> </ul> </li> </ul> <p>Students may use a document camera or interactive whiteboard to demonstrate addition or subtraction strategies. This gives them the opportunity to communicate and justify their thinking.</p>	<p>Language Arts: Students write their own math story.</p> <p>Art: Students illustrate their math story</p>
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<p>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., <math>5 = 2 + 3</math> and <math>5 = 4 + 1</math>).</p>	<p>* Whole to part: Recognize 2 groups of numbers that will equal 10. Provide students with a total of 10 objects to be broken into 2 groups.</p>	<p>This standard focuses on number pairs which add to a specified total, 1-10. These number pairs may be examined either in or out of context.</p> <p>Students may use objects such as cubes, two-color counters, square tiles, etc. to show different number pairs for a given number. For example, for the number 5, students may split a set of 5 objects into 1 and 4, 2 and 3, etc.</p> <p>Students may also use drawings to show different number pairs for a given number. For example, students may draw 5 objects, showing how to decompose in several ways.</p> <p style="text-align: center;"> <math>x \ x \ x \ x \ x \ 5 \text{ objects}</math>  <math>\boxed{x \ x} \ \boxed{x \ x \ x} \ 5 = 2 + 3</math>  <math>\boxed{x \ x \ x \ x} \ \boxed{x} \ 5 = 4 + 1</math> </p> <p>Sample unit sequence:</p> <ul style="list-style-type: none"> <li>• A contextual problem (word problem) is presented to the students such as, "Mia goes to Nan's house. Nan tells her she may have 5 pieces of fruit to take home. There are lots of apples and bananas. How many of each can she take?"</li> <li>• Students find related number pairs using objects (such as cubes or two-color counters), drawings, and/or equations. Students may use different representations based on their experiences, preferences, etc.</li> <li>• Students write equations such as: <ul style="list-style-type: none"> <li>○ Equations that equal 5: <ul style="list-style-type: none"> <li>• <math>5=4+1</math></li> <li>• <math>3+2=5</math></li> <li>• <math>2+3=4+1</math></li> </ul> </li> </ul> </li> </ul> <p>This is a good opportunity for students to systematically list all the possible number pairs for a given number. For example, all the number pairs for 5 could be listed as <math>0+5</math>, <math>1+4</math>, <math>2+3</math>, <math>3+2</math>, <math>4+1</math>, and <math>5+0</math>. Students should describe the pattern that they see in the addends, e.g., each number is one less or one than the previous addend.</p>	<p>Science: Classify number groups of scientific items by their characteristics (eg. Group of bugs into spiders and butterflies)</p>
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<p>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>* Whole to part: Provide students with a number group of objects to be broken into 2 groups (# 2-10)</p>	<p>The number pairs that total ten are foundational for students' ability to work fluently within base-ten numbers and operations. Different models, such as ten-frames, cubes, two-color counters, etc., assist students in visualizing these number pairs for ten.</p> <p>Example 1: Students place three objects on a ten frame and then determine how many more are needed to "make a ten." Students may use electronic versions of ten frames to develop this skill.</p>  <p>Example 2: The student snaps ten cubes together to make a "train."  <ul style="list-style-type: none"> <li>• Student breaks the "train" into two parts. S/he counts how many are in each part and record the associated equation (<math>10 = \underline{\quad} + \underline{\quad}</math>).</li> <li>• Student breaks the "train into two parts. S/he counts how many are in one part and determines how many are in the other part without directly counting that part. Then s/he records the associated equation (if the counted part has 4 cubes, the equation would be <math>10 = 4 + \underline{\quad}</math>).</li> <li>• Student covers up part of the train, without counting the covered part. S/he counts the cubes that are showing and determines how many are covered up. Then s/he records the associated equation (if the counted part has 7 cubes, the equation would be <math>10 = 7 + \underline{\quad}</math>).</li> </ul> </p> <p>Example 3: The student tosses ten two-color counters on the table and records how many of each color is facing up.</p>	<p>Art: Make a flower fact family.</p>
<p>5. Fluently add and subtract within 5.</p>	<p>* Frequently ask students questions throughout the day that foster addition and subtraction.</p>	<p>This standard focuses on students being able to add and subtract numbers within 5. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.</p> <p>Strategies students may use to attain fluency include:</p> <ul style="list-style-type: none"> <li>• Counting on (e.g., for <math>3+2</math>, students will state, "3," and then count on two more, "4, 5," and state the solution is "5")</li> <li>• Counting back (e.g., for <math>4-3</math>, students will state, "4," and then count back three, "3, 2, 1" and state the solution is "1")</li> <li>• Counting up to subtract (e.g., for <math>5-3</math>, students will say, "3," and then count up until they get to 5, keeping track of how many they counted up,</li> </ul>	<p>Music: Ex. 5 Little Monkeys Ask a question during each subject/period or classroom activity. (ex. John needs three pencils he only has two how many more does he still need.)</p>

		<p>stating that the solution is “2”)</p> <ul style="list-style-type: none"><li>• Using doubles (e.g., for <math>2+3</math>, students may say, “I know that <math>2+2</math> is 4, and 1 more is 5”)</li><li>• Using commutative property (e.g., students may say, “I know that <math>2+1=3</math>, so <math>1+2=3</math>”)</li><li>• Using fact families (e.g., students may say, “I know that <math>2+3=5</math>, so <math>5-3=2</math>”)</li></ul> <p>Students may use electronic versions of five frames to develop fluency of these facts.</p>	
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**Math Curriculum  
Kindergarten**

<b>Essential Question(s): How can we show numbers 11 to 19 with objects?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Critical Thinking and Problem Solving, Life &amp; Career Skills</b>			
<b>Content: Number and Operations in Base Ten</b>			
<b>Standards: K. NBT</b>			
<b>A. Work with numbers 11-19 to gain foundations for place value.</b>			
<b>Vocabulary: Place value chart, regroup, add, subtract, compare, doubles, estimate, difference, sum</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
<p>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 (such as <math>18 = 10 + 8</math>); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.</p>	<p>* Provide students with objects that represent ones and tens.</p> <p>*Have students display numbers 11 to 19 using objects. Can use one blocks and ten frames as well.</p>	<p>Special attention needs to be paid to this set of numbers as they do not follow a consistent pattern in the verbal counting sequence.</p> <ul style="list-style-type: none"> <li>• Eleven and twelve are special number words.</li> <li>• “Teen” means one “ten” plus ones.</li> <li>• The verbal counting sequence for teen numbers is backwards – we say the ones digit before the tens digit. For example “27” reads tens to ones (twenty-seven), but 17 reads ones to tens (seven-teen).</li> <li>• In order for students to interpret the meaning of written teen numbers, they should read the number as well as describe the quantity. For example, for 15, the students should read “fifteen” and state that it is one group of ten <i>and</i> five ones and record that <math>15 = 10 + 5</math>.</li> </ul> <p>Teaching the teen numbers as one group of ten and extra ones is foundational to understanding both the concept and the symbol that represent each teen number. For example, when focusing on the number “14,” students should count out fourteen objects using one-to-one correspondence and then use those objects to make one group of ten ones and four additional ones. Students should connect the representation to the symbol “14.” Students should recognize the pattern that exists in the teen numbers; every teen number is written with a 1 (representing one ten) and ends with the digit that is first stated.</p> <ul style="list-style-type: none"> <li>• Associative Property: Recognizing that the associative property does not work for subtraction is difficult for students to consider at this grade level as it is challenging to determine all the possibilities.</li> </ul>	<p>Chart the days in school and/or days in the month</p>

**Math Curriculum  
Kindergarten**

<b>Essential Question(s): How is measurement used in the real world?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Critical Thinking and Problem Solving, Life and Career Skills</b>			
<b>Content: Measurement and Data</b>			
<b>Standards: K. MD</b>			
<b>A. Describe and compare measurable attributes.</b>			
<b>Vocabulary: Long, short, heavy, light, tall, small, big, little, heavier, shorter, taller, lighter, smaller than, taller than, bigger than, same size, different size</b>			
<b>*We are using standard use of measurement to provide exposure to standard forms of measurement, but students are not expected to master the skill of using the standard form of measurement.</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	<p>*Provide opportunities for children to measure objects ex.</p> <p>*Using measuring cups, rulers, scales, etc. and non-standard units of measurement</p> <p>*Develop a background for measurement by using standard and nonstandard units of measurement</p>	<p>In order to describe attributes such as length and weight, students must have many opportunities to informally explore these attributes.</p> <ul style="list-style-type: none"> <li>Students should compare objects verbally and then focus on specific attributes when making verbal comparisons for K.MD.2. They may identify measurable attributes such as length, width, height, and weight. For example, when describing a soda can, a student may talk about how tall, how wide, how heavy, or how much liquid can fit inside. These are all measurable attributes. Non-measurable attributes include: words on the object, colors, pictures, etc.</li> </ul> <p>An interactive whiteboard or document camera may be used to model objects with measurable attributes.</p>	<p>Literature: Inchworm and a Half by: Elinor J. Pinczes</p> <p>How Big is a Foot by: Joan Sweeny</p>
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. <i>For example, directly compare the heights of two children and describe one child as taller/shorter.</i>	<p>* Encourage children to measure and compare objects eg. Which container can hold more water for watering the plants in the classroom?</p> <p>*Compare lengths and heights using non-standard units. Eg.</p> <p>*Measure Hunt- Give students a piece of yarn cut to the length of an object in the classroom and students need to find the item in the classroom that has the same length as the yarn.</p>	<p>When making direct comparisons for length, students must attend to the “starting point” of each object. For example, the ends need to be lined up at the same point, or students need to compensate when the starting points are not lined up (conservation of length includes understanding that if an object is moved, its length does not change; an important concept when comparing the lengths of two objects).</p> <p>Language plays an important role in this standard as students describe the similarities and differences of measurable attributes of objects (e.g., shorter than, taller than, lighter than, the same as, etc.).</p> <p>An interactive whiteboard or document camera may be used to compare objects with measurable attributes.</p>	<p>Literature: Three Little Bears</p> <p>Social Studies: Compare the sizes of cities or states on a map</p> <p>Science: Compare the heights of trees outside</p> <p>Social Studies: Walking tour outside to compare the size of buildings and cars</p>

**Math Curriculum  
Kindergarten**

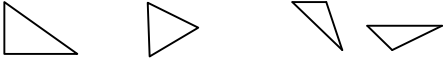
<b>Essential Question(s): How does measurement relate to addition and subtraction?</b>			
<b>21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy</b>			
<b>21st Century Skills: Critical Thinking and Problem Solving, Life and Career Skills</b>			
<b>Content: Measurement and Data</b>			
<b>Standards: K. MD</b>			
<b>B. Classify objects and count the number of objects in each category.</b>			
<b>Vocabulary: Classify objects and count the number of objects in each category.</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	<p>*Ask children to classify within the daily routine (e.g. child is responsible for creating a chart each day with different lunch options listed.</p> <p>*Create a picture graph using results from data collected to record, count and compare columns.</p> <p>*Sort and classify objects using 1 or 2 attributes</p>	<p>Possible objects to sort include buttons, shells, shapes, beans, etc. After sorting and counting, it is important for students to:</p> <ul style="list-style-type: none"> <li>• explain how they sorted the objects;</li> <li>• label each set with a category;</li> <li>• answer a variety of counting questions that ask, “How many ...”; and compare sorted groups using words such as, “most”, “least”, “alike” and “different”.</li> </ul>	<p>Social Studies: Chart members of the family</p>



**Math Curriculum  
Grade Two**

<b>Essential Question(s): How do we describe and manipulate the shapes we find as we investigate our environment?</b>
<b>21st Century Theme: Global Awareness</b>
<b>21st Century Skills: Creativity &amp; Innovation, Critical Thinking and Problem Solving</b>
<b>Content: Geometry</b>
<b>Standards: K. G</b>
<b>A. Identify and describe shapes (square, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).</b>
<b>Vocabulary: Square, circle, triangle, hexagon, cubes, cones, cylinders, spheres, above, below, besides, in front of, next to, corner, edge, sides, two dimensional shapes, three dimensional shapes</b>

<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
<p>1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above, below, beside, in front of, behind, and next to.</i></p>	<p>* Walk and identify shapes in the school and the community</p> <p>*Create a classroom map and ask the students to describe where items are in relation to other items</p> <p>*Create obstacle course and have children crawl under, step over, walk on, etc..</p>	<p>Examples of environments in which students would be encouraged to identify shapes would include nature, buildings, and the classroom using positional words in their descriptions.</p> <p>Teachers should work with children and pose four mathematical questions: Which way? How far? Where? And what objects? To answer these questions, children develop a variety of important skills contributing to their spatial thinking.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Teacher holds up an object such as an ice cream cone, a number cube, ball, etc. and asks students to identify the shape. Teacher holds up a can of soup and asks, "What shape is this can?" Students respond "cylinder!"</li> <li>• Teacher places an object next to, behind, above, below, beside, or in front of another object and asks positional questions. Where is the water bottle? (water bottle is placed behind a book) Students say "The water bottle is behind the book."</li> </ul> <p>Students should have multiple opportunities to identify shapes; these may be displayed as photographs, or pictures using the document camera or interactive whiteboard.</p>	<p>Literature: Shapes, Shapes, Shapes by: Tana Hoban</p> <p>Art: Construction Paper shapes</p> <p>Physical Education: Obstacle course</p> <p>Social Studies: Create a classroom map</p>

<p>2. Correctly name shapes regardless of their orientations or overall size.</p>	<p>* Take photos and let children explain the position and shape in photo          *Use pattern blocks and maneuver orientation</p>	<p>Students should be exposed to many types of triangles in many different orientations in order to eliminate the misconception that a triangle is always right-side-up and equilateral.</p>  <p>Students should also be exposed to many shapes in many different sizes.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Teacher makes pairs of paper shapes that are different sizes. Each student is given one shape and the objective is to find the partner who has the same shape.</li> </ul> <p>Teacher brings in a variety of spheres (tennis ball, basketball, globe, ping pong ball, etc) to demonstrate that size doesn't change the name of a shape.</p>	<p>Social Studies:          Identify the shapes in the community</p>
<p>3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").</p>	<p>*Make flat shape pictures (drawing)          * Build 3-dimensional art with recyclable shapes</p>	<p>Student should be able to differentiate between two dimensional and three dimensional shapes.</p> <ul style="list-style-type: none"> <li>• Student identifies a picture of a shape as two dimensional because it is flat and can be measured in only two ways (length and width).</li> <li>• Student identifies an object as three dimensional because it is not flat (it is a solid object/shape) and can be measured in three different ways (length, width, height/depth).</li> </ul>	

**Math Curriculum  
Kindergarten**

<b>Essential Question(s): How do we analyze, compare, model, and compose shapes in our environment?</b>			
<b>21st Century Theme: Global Awareness</b>			
<b>21st Century Skills: Creativity &amp; Innovation, Critical Thinking and Problem Solving</b>			
<b>Content: Geometry</b>			
<b>Standards: K. G</b>			
<b>B. Analyze, compare, create, and compose shapes.</b>			
<b>Vocabulary: Corners, rolls, vertices, slanted, edges, number of sides, shape, squares (cubes), circles (sphere), triangle, rectangles (rectangle prism), hexagons, cylinders, slide, roll, stack</b>			
<b>Skills</b>	<b>Instructional Procedures</b>	<b>Explanations and Examples</b>	<b>Interdisciplinary Connections</b>
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).	*Explore two & three dimensional shapes Using pictures and actual objects to question the dimensionality	Students analyze and compare two- and three-dimensional shapes by observations. Their visual thinking enables them to determine if things are like or different based on the appearance of the shape. Students sort objects based on appearance. Even in early explorations of geometric properties, they are introduced to how categories of shapes are subsumed within other categories. For instance, they will recognize that a square is a special type of rectangle.  Students should be exposed to triangles, rectangles, and hexagons whose sides are not all congruent. They first begin to describe these shapes using everyday language and then refine their vocabulary to include sides and vertices/corners. Opportunities to work with pictorial representations, concrete objects, as well as technology helps student develop their understanding and descriptive vocabulary for both two- and three- dimensional shapes.	Science: Shapes around the us- students analyze the different shapes outside and indoors
5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	* Modeling the construction of shapes  *Use shapes to create a picture	Because two-dimensional shapes are flat and three-dimensional shapes are solid, students should draw two-dimensional shapes and build three-dimensional shapes. Shapes may be built using materials such as clay, toothpicks, marshmallows, gumdrops, straws, etc.	

<p>6. Compose simple shapes to form larger shapes. <i>For example, "Can you join these two triangles with full sides touching to make a rectangle?"</i></p>	<p>*Compose simple shapes to form larger shapes</p>	<p>Students use pattern blocks, tiles, or paper shapes and technology to make new two- and three-dimensional shapes. Their investigations allow them to determine what kinds of shapes they can join to create new shapes. They answer questions such as "What shapes can you use to make a square, rectangle, circle, triangle? ...etc."</p> <p>Students may use a document camera to display shapes they have composed from other shapes. They may also use an interactive whiteboard to copy shapes and compose new shapes. They should describe and name the new shape.</p>	<p>Art- Use basic shapes to create larger shapes</p> <p>Literature: Not Enough Room! by: Joanne Rocklin</p>
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**Course: Grade K Mathematics**  
**Curriculum Map**  
**Textbook: Math in Focus, Marshall Cavendish, 2010**

<b>Month</b>	<b>Topic/Chapter</b>	<b>Assessments</b>
September	Chapter 1 – Numbers to 5	Chapter 1 Assessment
October	Chapter 2 – Numbers to 9	Chapter 2 Assessment
November	Chapter 3 - Order Chapter 4 – Counting 0 to 10	Chapter 3 Assessment Chapter 4 Assessment
December	Chapter 5 – Size and Pattern Chapter 6 – Numbers to 20	Chapter 5 Assessment Chapter 6 Assessment
January	Chapter 7 – Solid and Flat Shapes Chapter 8 – Count by 2 and 5	Chapter 7 Assessment Chapter 8 Assessment
February	Chapter 9 - Comparing	Chapter 9 Assessment
March	Chapter 10 – Ordinal Numbers Chapter 11 Calendar	Chapter 10 Assessment Chapter 11 Assessment
April	Chapter 12 – Counting On Chapter 13 – Patterns Chapter 14 – Counting on to 15	Chapter 12 Assessment Chapter 13 Assessment Chapter 14 Assessment
May	Chapter 15 – Length and Height Chapter 16 – Classifying Chapter 17 – Addition Stories	Chapter 15 Assessment Chapter 16 Assessment Chapter 17 Assessment
June	Chapter 18 – Subtraction Stories Chapter 19 – Measurement Chapter 20 - Money	Chapter 18 Assessment Chapter 19 Assessment Chapter 20 Assessment Add and Subtract Facts to 5 End of Year Test

