

Deer Valley Unified School District Mathematics Curriculum



Kindergarten

Incorporating the 2010 Arizona State Mathematics Standards

2011-2012

Mathematics Curriculum

The Intent and Design of the Common Core State Standards

Toward greater focus and coherence

Mathematics experiences in early childhood settings should concentrate on (1) number (which includes whole number, operations, and relations) and (2) geometry, spatial relations, and measurement, with more mathematics learning time devoted to number than to other topics. Mathematical process goals should be integrated in these content areas.

—Mathematics Learning in Early Childhood, National Research Council, 2009

There are many ways to organize curricula. The challenge, now rarely met, is to avoid those that distort mathematics and turn off students.

— Steen, 2007

Assessing the coherence of a set of standards is more difficult than assessing their focus. William Schmidt and Richard Houang (2002) have said that content standards and curricula are coherent if they are:

articulated over time as a sequence of topics and performances that are logical and reflect, where appropriate, the sequential or hierarchical nature of the disciplinary content from which the subject matter derives. That is, what and how students are taught should reflect not only the topics that fall within a certain academic discipline, but also the key ideas that determine how knowledge is organized and generated within that discipline. This implies that to be coherent, a set of content standards must evolve from particulars (e.g., the meaning and operations of whole numbers, including simple math facts and routine computational procedures associated with whole numbers and fractions) to deeper structures inherent in the discipline. These deeper structures then serve as a means for connecting the particulars (such as an understanding of the rational number system and its properties). (emphasis added)

These Standards endeavor to follow such a design, not only by stressing conceptual understanding of key ideas, but also by continually returning to organizing principles such as place value or the properties of operations to structure those ideas.

In addition, the “sequence of topics and performances” that is outlined in a body of mathematics standards must also respect what is known about how students learn. As Confrey (2007) points out, developing “sequenced obstacles and challenges for students...absent the insights about meaning that derive from careful study of learning, would be unfortunate and unwise.” In recognition of this, the development of these Standards began with research-based learning progressions detailing what is known today about how students’ mathematical knowledge, skill, and understanding develop over time.

How to read the grade level standards

Standards define what students should understand and be able to do.

Clusters are groups of related standards. Note that standards from different clusters may sometimes be closely related, because mathematics is a connected subject.

Domains are larger groups of related standards. Standards from different domains may sometimes be closely related.

Number and Operations in Base Ten

3.NBT

Domain

Use place value understanding and properties of operations to perform multi-digit arithmetic

Standards

1. Use place value understanding to round whole numbers to the nearest 10 or 100.
2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3. Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

Cluster

These Standards are not intended to be new names for old ways of doing business. They are a call to take the next step. It is time for states to work together to build on lessons learned from two decades of standards based reforms. It is time to recognize that standards are not just promises to our children, but promises we intend to keep.

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Counting and Cardinality (CC) <ul style="list-style-type: none"> Know number names and the count sequence. Count to tell the number of objects. Compare numbers. Operations and Algebraic Thinking (OA) <ul style="list-style-type: none"> Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. Number and Operations in Base Ten (NBT) <ul style="list-style-type: none"> Work with numbers 11–19 to gain foundations for place value. Measurement and Data (MD) <ul style="list-style-type: none"> Describe and compare measurable attributes. Classify objects and count the number of objects in categories. Geometry (G) <ul style="list-style-type: none"> Identify and describe shapes. Analyze, compare, create, and compose shapes. 	Mathematical Practices (MP) <ol style="list-style-type: none"> Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics. Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
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In Kindergarten, instructional time should focus on two critical areas: (1) representing, relating, and operating on whole numbers, initially with sets of objects; (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

(1) Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as $5 + 2 = 7$ and $7 - 2 = 5$. (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

(2) Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes or orientations), as well as three-dimensional shapes such as cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

Counting: (Counting and Cardinality)

Counting: (Counting and Cardinality)			
Qtr	Cluster	2010 Standard	Correlation (Resources)
1	Know number names and the count.	CC. 1. Count to 100 by ones and by tens.	<u>enVision Topics:</u> 4-1, 4-3, 5-1, 5-4, 5-7, 12-1 to 12-4, 12-6, 12-7 <u>Investigations Unit 1:</u> S1.1, S1.2, S1.3, S1.4, S1.6, S2.1, S2.2, S2.5, S3.1, S3.2, S3.3, S3.4 S3.5, S3.6
		CC. 2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	<u>enVision:</u> 12-8, 5-10, 12-6, 12-10
		CC. 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).	<u>enVision:</u> 4-2, 4-4, 4-5, 5-3, 5-6, 5-9, 12-1 to 12-4, <u>Investigations: Unit 1:</u> S3.2, S3.3, S3.4, S3.5, S3.6
1	Count to tell the Number of Objects.	CC. 4. Understand the relationship between numbers and quantities; connect counting to cardinality. a. 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. b. 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. c. Understand that each successive number name refers to a quantity that is one larger.	<u>enVision:</u> 3-6, 4-1 to 4-5, 5-1, 5-3, 5-4, 5-6, 5-7, 5-9, 12-1 to 12-4, 12-6 <u>Investigations: Unit 1:</u> S1.1, S1.2, S1.3, S1.4, S1.6, S2.1, S2.2, S2.5, S3.1, S3.2, S3.3, S3.4, S3.5, S3.6 <u>Unit 2:</u> S1.1, S1.2, S1.3, S1.5, S1.6, S1.7, S1.8, S1.9, S1.10, S2.3, S2.4, S2.5, S2.6, S2.7, S2.8 <u>Unit 3:</u> S1.3, S2.1, S2.9, S3.2, S3.3, S3.4 <u>Unit 4:</u> S1.2, S1.3, S1.5, S2.1, S2.2, S2.3, S3.1, S4.8 <u>Unit 5:</u> S2.4, S2.5, S2.6, S3.2, S3.3, S3.4, S3.5 <u>Unit 6:</u> S1.4, S1.5, S1.6, S1.7, S1.8, S2.1, S2.2, S2.3, S2.4, S2.5, S2.6, S3.2, S3.3, S3.4, S3.5 <u>Unit 7:</u> S1.1, S1.2, S1.4, S1.6 <u>Weblink-</u> 5 frame from Illuminations-Thinking about numbers using frames of 5 can be a helpful way to learn basic number facts. The four games that can be played with this applet help to develop counting and addition skills. http://illuminations.nctm.org/ActivityDetail.aspx?ID=74 , <u>Weblink-</u> 10 Frame from Illuminations-The four games that can be played with this applet help to develop counting and addition skills. http://illuminations.nctm.org/ActivityDetail.aspx?ID=75 <u>Unit 7:</u> S1.1, S1.2, S1.4, S1.6 Match the number with the correct set- count the objects-
		CC 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.	
1	Compare numbers.	CC. 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	<u>enVision:</u> 4-7, 4-8, 4-9, 6-1, 6-2, 6-3, 6-4, 6-5, 16-1 <u>Investigations: Unit 2:</u> S2.4, S2.5, S2.6, S2.7, S2.8, S2.9, S2.10, S2.11, S2.12, S2.13, S2.14 <u>Unit 4:</u> S3.4, S3.5, S3.6, S3.7 <u>Unit 6:</u> S3.2, S3.3, S3.4
		CC. 7. Compare two numbers between 1 and 10 presented as written numerals.	<u>enVision:</u> 6-1 to 6-4 <u>Investigations: Unit 2:</u> S2.5, S2.6, S2.7, S2.8, S2.9, S2.10, S2.11, S2.12, S2.13, S2.14
Enduring Understanding			Essential Questions
Numerals are symbols used to represent objects and the relationship among them.			What are numbers and how are they useful?
When counting you can begin from any number & count up or down.			When saying any given number, what does the number word mean?
The last number name said tells the number of objects counted.			Can you represent any given number more than one way?
There is a unique symbol that goes with each number word.			Does the number of objects change when rearranged?
Given a pair of numbers, the number that shows more is greater & the number that shows less is smaller.			When do you stop counting and why?

Counting (Counting and Cardinality) STUDENT LEARNING

Knowledge/Vocabulary	Cognitive Demand	Performance	Product
digit, all number words to twenty, zero, whole, 1 more, 1 fewer, 2 more, 2 fewer, count, same as, fewer, part, model, smallest, least, largest, greatest, number line, order, forward, backward, count by 10's, hundred chart, row, column, skip counting	Understand that the next number in a sequence is 1 more or 10 more if counting by 10's	Given 30 objects- ask child to group them by 10 and count them by counting by 10's	30 objects are in groups of 10.
	When counting forward, the numbers get bigger	Count from any number within the sequence 0-100	
	Recognize that a given number of objects can be written as only one number	Count a set of objects- any number 0 to 20 and write the number to represent the set.	Picture of objects with a number next to the picture indicating how many objects were counted.
	Counts with 1 to 1 correspondence.	Count the number of objects in a given set. Spread objects and asked same question.	
	Recognize which number is greater or less	Given 2 numbers, use appropriate vocabulary to tell which number is greater /least.	Student uses correctly vocabulary to describe the greater number.
	Puts 3 numbers in order greatest to least/ or least to greatest	Order 3 numbers from least to greatest or vice versa	Three numbers are written or verbally stated, in order.
Rubric			
Developing	Proficient	Advancing	
Can count from 0 to 100 but only with a starting number of zero.	Can count to 100 from any starting number.	Can count beyond 100 from any starting number.	
Can write or say some numbers from 0 to 20 but not all and not with 100% accuracy without assistance.	Can write and say the numbers 0 to 20, both in and out of order, with 100% accuracy.	Can write and say the numbers greater than 20, both in and out of order, with 100% accuracy without assistance.	
Can count up to 20 objects, spread one way.	Can count up to 20 objects, spread in a variety of ways, with 100% accuracy.	Can count more than 20 objects, spread in a variety of ways, with 100% accuracy.	
For numbers 0-20, child can tell whether a number is greater or less than another number but not with 100% accuracy.	For numbers 0-20, child can tell whether a number is greater or less than another number with 100% accuracy.	For numbers greater than 20, can tell whether a number is greater or less than another number with 100% accuracy.	
Can independently compare sets of 2 or 3 numbers 0 to 20 and order them greatest to least or least to greatest, but not with 100% accuracy.	Can independently compare sets of 2 or 3 numbers 0 to 20 and order them greatest to least or least to greatest with 100% accuracy.	Can independently compare sets of 2 or 3 numbers greater than 20 and order them with 100% accuracy.	
Assessment			
Developing	Proficient	Advancing	
Have child count from 0 to 100, from any starting number.	Have child count from 0 to 100, from any starting number.	Have child count from 0 to 100, and beyond, from any starting number.	
Have child write numbers 0 to 20 and say name of any given number when pointed to.	Have child write numbers 0 to 20 and say name of any given number when pointed to.	Have child write numbers greater than 20 and say name of any given number when pointed to.	
Give child a group of 0-20 objects and ask them to count. Arrange the same objects differently and ask child to count again.	Give child a group of 0-20 objects and ask them to count. Arrange the same objects differently and ask child to count again.	Give child a group of more than 20 objects and ask them to count. Arrange the same objects differently and ask child to count again.	
Give child 2 numbers, from 0-20, and have them verbally tell which number is greater or less.	Give child 2 numbers, from 0-20, and have them verbally tell which number is greater or less.	Give child 2 numbers, greater than 20, and have them verbally tell which number is greater or less.	
Ask child to write numerals 0-20 in or out of order. Child can do this with one or more errors and or assistance.	Child can write numerals 0-20 in and out of sequence independently with no errors. (may have some reversals)	Child can write numerals 0-100 in and out of sequence independently with no errors or reversals.	
Give child two or three numerals from 0-20 orally or in writing and ask them to orally or in writing or with manipulatives order the numerals from greatest to least or from least to greatest.	Give child two or three numerals from 0-20 either orally or in writing and ask them to orally, in writing or with manipulatives order the numerals from greatest to least or least to greatest.	Give child two or three numerals from 0-100 either orally or in writing and ask them to orally, in writing or with manipulatives order the numerals from greatest to least or least to greatest.	

Place Value (Number and Operations in Base Ten)			
Qtr	Cluster	2010 Standard	Correlation (Resources)
2	Work with numbers 11–19 to gain foundations for place value.	NBT.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.	<p>enVision: 12-1, 12-2, 12-3a, 12-4a, 12-5a-e (reference the on-line version of Envisions)</p> <p>Web-lessons- see Illuminations Lessons 2 through 6-http://illuminations.nctm.org/LessonDetail.aspx?ID=L548 Web-lesson- Great Teacher tool/higher students- Help the alien spaceship move cows into corrals by counting, adding, and subtracting. This activity helps children learn grouping, tally marks, and place value. As they master counting, they can move on to adding and subtracting two-digit numbers.</p> <p>http://illuminations.nctm.org/ActivityDetail.aspx?ID=218, "Good Questions for Math Teaching" by Peter Sullivan and Pat Lilburn (pages 33&34).</p>
		Enduring Understanding	Essential Questions
		The Base Ten Numeration system is organized in groups of ten, using digits 0 to 9.	Is it possible to break apart the numbers 11-19 into a group of 10 and some ones?
		Numbers can be broken apart into groups of ten and ones. ie equations $(10 + 8 = 18)$	Can you decompose numbers 11 - 19 using an equation? ie. $10 + 1 = 11$ or $10 + 3 = 13$

Place Value (Number and Operations in Base Ten) STUDENT LEARNING

Knowledge/Vocabulary	Cognitive Demand	Performance	Product
Number words 11 to 19, group, ones, tens, base ten, compose, decompose, row, column, count by 10's, ten frame, count on, equation, "teen"	Compose a number given a group of objects organized into a group of ten and some ones.	Ask a child to organize 11-19 objects into a bundle of ten with some left over and write the number it represents.	Objects are organized in a bundle of ten with some left over, and number written represents number of objects.
	Translate 11-19 objects, organized into one group of ten and some ones, into an equation.	Ask a child to organize 11-19 objects into a bundle of ten with some left over and write the equation that represents to total.	Objects are organized in a bundle of ten with some left over, and equation written represents total number of objects.
	Decompose numbers 11-19 into groups of 10 ones and some more ones (10 ones and one, two, three, four, five, six, seven, eight or nine more).	Ask child to create a pictorial representation of any number 11 to 19 showing number of tens and number of ones. Child could use a ten frame or some other grouping to show one group of ten and some ones.	Picture shows a number represented by objects grouped in one group of ten and some ones.
Rubric			
Developing		Proficient	Advancing
Can accurately organize 11-19 objects into a bundle of ten with some left over and can only write some of the numbers it represents.		Can accurately organize 11-19 objects into a bundle of ten with some left over and correctly write the number it represents.	Can accurately organize more than 19 objects into bundles of ten with some left over and correctly write the number it represents.
Can accurately organize 11-19 objects into a bundle of ten with some left over and can only write some of the equations it represents.		Can accurately organize 11-19 objects into a bundle of ten with some left over and correctly write the equation it represents.	Can accurately organize more than 19 objects into bundles of ten with some left over and correctly write the equation it represents.
Can decompose some numbers from 11-19 into a bundle of ten and some ones.		Can decompose any number from 11-19 into a bundle of ten and some ones.	Can decompose numbers greater than 19 into a bundle of ten and some ones.
Assessment			
Developing		Proficient	Advancing
Give child 11-19 objects and have them organize them in a bundle of ten and some ones. Ask them to write the number the objects represents.		Give child 11-19 objects and have them organize them in a bundle of ten and some ones. Ask them to write the number the objects represents.	Give child more than 19 objects and have them organize them into bundles of ten and some ones. Ask them to write the number the objects represents.
Give child 11-19 objects and have them organize them in a bundle of ten and some ones. Ask them to write the equation the objects represent.		Give child 11-19 objects and have them organize them in a bundle of ten and some ones. Ask them to write the equation the objects represent.	Give child more than 19 objects and have them organize them in bundles of ten and some ones. Ask them to write the equation the objects represent.
Give child a number from 11-19 and ask them to decompose it into a bundle of tens with some ones left over using manipulatives.		Give child a number from 11-19 and ask them to decompose it into a bundle of tens with some ones left over using manipulatives.	Give child a number greater than 19 and ask them to decompose it into a bundle of tens with some ones left over using manipulatives.

Addition (Operations and Algebraic Thinking)

Qtr	Cluster	2010 Standard	Correlation (Resources)
3, 4	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	0A.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 problems. This applies wherever drawings are mentioned in the Standards.)	enVision: 4-6, 4-8, 4-9, 6-4, 10-1 to 10-7 Investigations: Unit 4: S2.2, S2.3, S2.4, S2.5, S3.2, S3.3, S3.4, S3.5, S3.6, S3.7, S4.2, S4.4, S4.5 Unit 6: S1.1, S1.2, S1.3, S1.4, S2.1, S2.2, S2.4, S3.1, S3.2, S3.3, S3.4, S3.5, S3.6, S3.7, S4.1, S4.2, S4.3, S4.4, S4.5, S4.6 Weblink- this site lets you select the numbers for the addition problem & then an animation shows the children how to solve the problem http://www.dositey.com/2008/addsub/addbasicml.htm
		0A.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	enVisions: 2-6, 10-1 to 10-7 Investigations: Solve addition and subtraction word problems, and add Session Coverage Unit 4: S2.2, S2.3, S2.4, S2.5, S3.2, S3.3, and subtract within 10, e.g., by using objects or drawings to S3.5, S4.2, S4.5 represent the problem. Unit 6: S3.1, S3.3, S3.4, S3.5, S3.6, S3.7 Weblink- higher level- "How many are under the shell?" Can be used with addition or subtraction- http://illuminations.nctm.org/ActivityDetail.aspx?ID=198
		0A.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 $5 = 4 + 1$).	enVision: 4-6, 4-7a, 5-2, 5-4a, 5-5, 5-7a, 5-8, 5-10a Investigations: Unit 4: S4.2, S4.3, S4.4, S4.5, S4.6, S4.7, more than one way, e.g., by using objects or drawings, and S4.9 record each decomposition by a drawing or equation (e.g., $5 =$ Unit 6: S1.1, S1.2, S1.3, S1.4, S1.6, S1.7, S4.1, S4.2, S4.3, S4.4, $2+3$ and $5=4+1$). S4.5, S4.6
		0A.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.	enVision 5-8: Hiding Bears Game (p. 77), Feet Under the Table (p. 86) "Teaching Number Sense Kindergarten" by Chris Confer, Chapter 6, January: Addition and Subtraction, "First-Grade Math: A Month by Month Guide" by Vicki Bachman (Foreward by Marilyn Burns).
		0A.5. Fluently add and subtract within 5.	enVision: 10-1 to 10-7 Investigations: Unit 6: S3.1; S3.2, S3.3, S3.4, S3.5, S3.6, S3.7, S4.1, S4.2, S4.3, S4.4, S4.5 Weblink- adding bricks, solving the problem- shows objects and equation- http://www.harcourtschool.com/activity/adding_bricks_k/ Weblink- go to Game 4 on this site-5 frame from Illuminations-Thinking about numbers using frames of 5 can be a helpful way to learn basic number facts. http://illuminations.nctm.org/ActivityDetail.aspx?ID=74 , Weblink- 10 Frame from Illuminations- addition game. http://illuminations.nctm.org/ActivityDetail.aspx?ID=75
Enduring Understanding			Essential Questions
Joining parts to make a whole is one interpretation of addition.			What is the difference between compose and decompose?
A plus sign (+) is a symbol which shows two or more parts put together equals a whole.			How can the information be organized to help solve a problem?
			How can models, charts, and pictures help us solve problems?
			How do you decide what operation to use to solve a problem?

Addition (Operations and Algebraic Thinking) STUDENT LEARNING

Knowledge/Vocabulary	Cognitive Demand	Performance	Product
number story, join, in all, altogether, addition sentence, add, plus sign, equal sign, sum, whole, part, more, fewer, same as, *number words 0-20, order, number line, forward, backward	Make models of addition number sentences with sums to 10.	Give each child 2 dice. Child rolls dice and writes a number sentence using the two numbers rolled.	When given a number 2-10, student will use 2 different colored unifix cubes to show the given number in 2 different ways-(ex: 7=2 red 5 blue or 3 red 4 blue). Read a story problem to child and they will draw/act out/write the number sentence.
	Draw or act out a picture to solve an addition problem	Ask child to draw/act out an addition problem then write the numerical representation..	Drawing shows objects in two parts and equation is written next to drawing.
	Choose an appropriate model to help solve a story problem	When reading a story problem, students will model/write the addition sentence	Model or addition sentence is drawn or written for the given story problem
	Represent a number up to 10 with an addition problem in several ways.	When given a number write 2 ways to make that whole (ex: 2+3=5 and 4+1=5)	2 equations are written next to number.
Rubric			
Developing		Proficient	Advancing
Can write 1 equation correctly with a sum between 0 and 10		Can write 2 equations correctly with a sum between 0 and 10.	Can write at least 2 equations correctly with a sum between 0 and 120.
Correctly represents some of the numbers, 0-10, with a drawing or manipulatives.		Correctly represents a given number, 0-10, with a drawing or manipulatives.	Correctly represents numbers greater than 10 with a drawing or manipulatives.
Student draws or uses manipulatives to model addition problems with sums to 10 only with assistance.		Independently represents addition problems with sums to 10 with or without using manipulatives.	Student can create and solve addition problems beyond sums of 10.
Assessment			
Developing		Proficient	Advancing
Write 2 or more addition number sentences with sums of 10.		Write 2 or more addition number sentences with sums of 10.	Write 2 or more addition number sentences with sums of more than 10.
When given a group of manipulatives, ask the child to independently model addition problems with sums equal to 10.		When given a group of manipulatives, ask the child to independently model addition problems with sums equal to 10.	When given a group of manipulatives ask the child independently solve addition problems with sums beyond 10.
Read a word problem to the child and ask the child to draw a picture to represent the addition equation for sums to 10.		Read a word problem to the child and have them draw a picture that represents the addition problem for sums of 10.	Read a word problem to the child and have them draw a picture that represents the addition problem.

Subtraction (Operations and Algebraic Thinking)

Qtr	Cluster	2010 Standard	Correlation (Resources)
3, 4	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	0A.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 problems. This applies wherever drawings are mentioned in the Standards.)	enVision: 6-4, 11-1 to 11-7 Investigations: Unit 4: S2.4, S2.5, S3.2, S3.3, S3.4, S3.5, S3.6,S3.7, S4.2, S4.4, S4.5 Unit 6: S1.1, S1.2, S1.3, S1.4, S2.1, S2.2, S2.4, S3.1, S3.2, S3.3, S3.4, S3.5, S3.6, S3.7, S4.1, S4.2, S4.3, S4.4, S4.5, S4.6
		0A.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	enVision: 2-6, 11-1 to 11-7 Investigations: Unit 4: S3.5, S4.2, S4.5 Unit 6: S3.1, S3.3, S3.4, S3.5, S3.6, S3.7 Weblink- higher level- "How many are under the shell?" Can be used with addition or subtraction- http://illuminations.nctm.org/ActivityDetail.aspx?ID=198
		0A.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 $5 = 4 + 1$)	enVision: 4-6, 4-7a, 5-2, 5-4a, 5-5, 5-7a, 5-8, 5-10a Investigations: Unit 4: S4.2, S4.3, S4.4, S4.5, S4.6, S4.7, S4.9 Unit 6: S1.1, S1.2, S1.3, S1.4, S1.6, S1.7, S4.1, S4.2, S4.3, S4.4, S4.5, S4.6
		0A.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.	enVision: 5-8
		0A.5. Fluently add and subtract within 5.	enVision: 11-1 to 11-7 Investigations: Unit 6: S3.1; S3.2, S3.3, S3.4, S3.5, S3.6, S3.7, S4.1, S4.2, S4.3, S4.4, S4.5 Weblink- subtraction problems- with objects and equation- children type in solution http://www.harcourtschool.com/activity/day_at_beach_k/ Weblink- this site has subtraction practice with equation- http://www.primarygames.com/takeaway/question%201.htm
Enduring Understanding			Essential Questions
Subtraction is not commutative.			How do you decide what operation to use to solve a problem?
Problems can be solved using addition and subtraction equations or by representing in a drawing.			How can the information be organized to help solve the problem?
A subtraction sign (-) is a symbol which shows two or more parts put together equals a whole.			How can models, charts, and pictures help us solve problems?
			How can the information be organized to help solve a problem?
			How can models, charts, and pictures help us solve problems?

Subtraction STUDENT LEARNING			
Knowledge/Vocabulary	Cognitive Demand	Performance	Product
Subtraction sentence, take away, minus sign, separate, left, difference, subtract, whole, part, more, fewer, same as, minuend	Make models of subtraction sentences with differences within 10.	Give each child 2 dice. Child rolls dice and writes a subtraction sentence using the two numbers rolled.	Model of subtraction sentence is written to match numbers on die.
	Draw or act out a picture to solve an subtraction problem	Ask child to draw/act out a subtraction problem then write the numerical representation. When reading a story problem, students will model/write the subtraction sentence.	Drawing shows objects in two parts and equation is written next to drawing.
	Write a number sentence to help solve a story problem	When reading a story problem, students will write the subtraction sentence	Subtraction sentence is written for the given story problem
	Represent a number within 10 with a subtraction problem in several ways.	Give the student several manipulatives. Ask them to model the equation $9-4=5$.	Various manipulatives used model the equation $9-4=5$.
Rubric			
Developing		Proficient	Advancing
The student can create one model of the given equation with assistance.		The student can one model the given equation correctly and independently.	The student can create multiple models of the given equation.
The student requires support to be able to model the given word problem.		The student can model the given word problem correctly and independently.	The student can independently create a subtraction story with minuend greater than 10 for and then model it correctly and independently.
The student can write an equation to help solve a story problem with assistance.		The student can independently write a mathematical equation using the correct signs (minus and equal) for the subtraction story:	The student can independently create a subtraction story with minuend greater than 10 for and then write a mathematical equation using the correct signs.
The student can write 2 subtraction number sentences with a difference of 2, with assistance.		The student can write 2 subtraction number sentences with a difference of 2, independently.	The student can write more than 2 subtraction number sentences with a difference of 2, independently, and use a minuend greater than 10.
Assessment			
Developing		Proficient	Advancing
Give the student a variety of manipulatives. Ask them to model the equation $9-4=5$.		Give the student a variety of manipulatives. Ask them to model the equation $9-4=5$.	Give the student a variety of manipulatives. Ask them to create multiple models with a difference of 5.
Give the student 10 cubes. Ask them to model the subtraction story, "There are 10 apples on the tree. I picked 4 apples. How many apples are left on the tree?"		Give the student 10 cubes. Ask them to model the subtraction story, "There are 10 apples on the tree. I picked 4 apples. How many apples are left on the tree?"	Ask student to create a story with minuends greater than 10 and then to model it.
Ask the student to write an equation for the following subtraction problem: "There were 9 dogs in the yard. 2 dogs ran away. How many dogs are still in the yard?"		Ask the student to write an equation for the following subtraction problem: "There were 9 dogs in the yard. 2 dogs ran away. How many dogs are still in the yard?"	Ask student to create a story with minuends greater than 10 and then to write an equation for it.
Write 2 or more addition number sentences with a difference of 2.		Write 2 or more addition number sentences with a difference of 2.	Write 2 or more addition number sentences with a difference of 2.

Geometry			
Qtr	Cluster	2010 Standard	Correlation (Resources)
2	Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).	G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.	enVision: 1-5, 2-1 to 2-6, 7-1, 7-2, 7-6 Investigations: Unit 1: S2.2, S2.3, S2.4, S3.4 Unit 3: S1.2 Unit 5: S1.1, S1.2, S1.3, S1.5, S1.6, S2.1, S3.1, S3.3 This link shows objects in the real world and lets children match them with 3 dimensional shapes- http://www.harcourtschool.com/activity/loading_shapes/ Math and Nonfiction by Jamee Petersen pg. 110 The Wing On A Flea
		G.2. Correctly name shapes regardless of their orientations or overall size.	enVision: 7-1, 7-2, 7-4, 7-6, 7-7a Investigations: Unit 1: S2.4, S3.4 Unit 3: S1.2 Unit 5: S1.2, S1.3, S1.4, S1.5 "Cubes, Cones, Cylinders and Spheres" by Tana Hoban, lesson found in "Math and Non-Fiction: Grades K-2" (pages 42-50), by Jamee Petersen.
		G.3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	enVision: 7-1, 7-2, 7-6, 7-8 Investigations: Unit 5: S1.1, S1.2, S1.3, S1.4, S1.5, S1.6, S2.1, S2.2, S2.3, S2.4, S2.5, S2.6, S3.1, S3.2, S3.3, S3.4, S3.5, S3.5, S3.6
2	Analyze, compare, create, and compose shapes.	G.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).	enVision: 7-1, 7-2, 7-4a, 7-7a, 7-7, 7-8 Investigations: Unit 5: S1.1, S1.2, S1.3, S1.4, S1.5, S2.1, S2.2, S2.3, S2.4, S2.5, S2.6, S3.1, S3.2, S3.3, S3.4, S3.5, S3.6, S3.7, S3.8
		G.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	enVision: 7-8 Investigations: Unit 5: S1.2, S1.3, S1.4, S1.5, S1.6, S2.1, S2.5, S3.4, S3.7
		G.6. Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"	enVision: 7-3, 7-4a Investigations: Unit 5: S2.2, S2.3, S2.4, S2.5, S2.6, S3.6, S3.7
Enduring Understanding			Essential Questions
Recognize and describe shapes, regardless of position.			What are shapes?
2 dimensional shapes have length and width, 3 dimensional shapes are not flat, have height.			How are shapes different or similar?
Smaller shapes can be combined to form another shape.			Which way, how far, how big is the shape?
			Where can we find shapes?

Geometry STUDENT LEARNING			
Knowledge/Vocabulary	Cognitive Demand	Performance	Product
Square, rectangle, circle, triangle, rhombus, same size, same shape, sphere, cube, cone, cylinder, vertex, vertices (corners), edge, side, roll, stack, slide, flat surface, same, different, over, under, on, inside, outside, top, middle, bottom, before, after, left, right, sorting rule.	Recognize shapes in the classroom, nature, or at home.	Sort these shapes according to one or more attributes and state sorting rule. Draw an example of each shape.	Pictures of shapes, grouped by attributes. Student should be able to state orally or in writing what the various shapes are and why they are grouped together.
	Shapes have dimensions. (pictures are 2 dimensional, solids are 3 dimensional.	Choose an object, in the real world, that is an example of each three dimensional shape; cube, cone, cylinder, and sphere)	Pictures from magazines of each three dimensional shape; cube, cone, cylinder and sphere
	Shapes can be combined to form other shapes.	Model with clay, one or more shapes being combined into another shape. Example: triangles to rhombus	Clay models of smaller shapes combined together.
Rubric			
Developing		Proficient	Advancing
Child can identify some shapes but not all without assistance.		Child can identify all given shapes without assistance.	Child can identify, draw, create & label all shapes regardless of format or medium.
Child can describe how 2 shapes are alike or different with support.		Child can describe how a group of shapes are alike or different; sizes, corners/vertices, sides, etc.	Child can describe how a group of shapes are alike or different; sizes, corners/vertices, sides, and can give real life examples.
Child can draw some shapes without support but not all; square, circle, triangle, rectangle, hexagon.		Child can draw all shapes without assistance; square, circle, triangle, rectangle, hexagon. Knows they are 2 dimensional.	Child can draw examples of shapes correctly & child can produce many examples of real world items that resemble that shape.
Child can identify some three dimensional shapes but not all; cubes, cones, cylinders, and spheres.		Child can identify all three dimensional shapes; cubes, cones, cylinders, and spheres. Can label or identify orally or in writing.	Child sees relationship between two and three dimensional shapes & can state what happens when a shape is flipped or slid or turned
Child attempts to describe how two or more shapes can be used to create another shape. ie; with pattern blocks- 2 green triangles can be used to make one blue rhombus.		Child can describe how two or more shapes can be used to create another shape. ie; with pattern blocks- 2 green triangles can be used to make one blue rhombus.	Child can use various shapes to make new shapes. ie. using triangles to make other shapes & they can state how many shapes it takes to make the new shape.
Assessment			
Developing		Proficient	Advancing
Child can identify shapes with assistance but is unable to name or sort all without support.		Child can take a group of shapes, name the shapes and sort them according to a chosen attribute. Child can label shapes orally or in writing.	Child produces a book or journal of shapes. For each shape child creates individual shape and examples of the shape from the real world. Pictures used can be from the computer, magazines or original drawings. Book or journal also includes attributes of each shape. ie. this shape has 3 sides and 3 corners/vertices & is a closed shape.
Child cannot state how 2 shapes are the similar or different, they recognize that they are different but cannot state why or how they are different.		Child can identify examples of two & three dimensional shapes that appear in the real world. Child can label their examples orally or in writing.	Child can produce an original drawing or project and label the various shapes, 2 and 3 dimensional shapes, used in their drawing or project.
Child can reproduce shapes with assistance but mixes up various shapes and needs a model to make shapes correctly. Makes attempt to combine smaller shapes into a larger shape.		Child can use shapes to make other shapes with confidence & without assistance. ie- if given triangles child can use them to create a rhombus or a trapezoid	Students interact with many types of shapes beyond the basic circles, triangles, and rectangles. Student describes the number of sides, number of vertices, curved/straight sides, size, etc.
			Child can state multiple attributes of various shapes & child can discuss how groups of two and three dimensional shapes are similar and different using more than one attribute. Child can produce a shape independently when given just the attributes of the shape. ie.. "Produce a shape that has 4 sides, where all the sides are equal in length."

Measurement and Data			
Qtr	Cluster	2010 Standard	Correlation (Resources)
2	Describe and compare measurable attributes.	MD.1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	enVision: 9-1 to 9-10 Investigations: Unit 2: S2.1, S2.2, S2.3 Unit 4: S1.1, S1.2, S1.3, S1.4, S1.5 object. Unit 6: S2.3, S2.4, S2.5, S2.6
		MD.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.	enVision: 9-1, 9-2, 9-3, 9-5, 9-6, 9-8 Investigations: Unit 2: S2.1, S2.2, S2.3, S2.4, S2.6, S2.7, S2.8, S2.9, S2.10, S2.11, S2.13, S2.14 "Sizing Up Measurement: Activities for Grades k-2 Classrooms" by Vicki Bachman (the activities in this book will be suitable for most standards in the Measurement and Data domain) "A Pig is Big" by Douglas Florian, found in "Math and Literature" by Marilyn Burns and Stephanie Sheffield (page 54).
2	Classify objects and count the number of objects in each category.	MD.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10).	enVision: 1-1 to 1-5, 5-11, 16-3, 16-4, 16-5, 16-7 Investigations: Unit 1: S3.1, S3.3, S3.4, S3.5, S3.6, S3.7 Unit 2: S2.1, S2.2, S2.3 Unit 7: S1.1, S1.2, S1.3, S1.4, S1.5, S1.6, S2.6, S3.1, S3.2, S3.3, S3.4, S3.5 Math and Literature by Marilyn Burns and Stephanie Sheffield pg. 11 "The Button Box"
Enduring Understanding			Essential Questions
Compare objects using tools of measurement.			How can we compare objects? How are they similar and different?
Compare objects using attributes and classify objects into categories.			What are different ways to measure the same object?
Categories can be sorted by counting.			Can we use counting to sort or group our objects?

Measurement and Data STUDENT LEARNING

Knowledge/Vocabulary	Cognitive Demand	Performance	Product
same (alike), graph, different, sort, does not belong, sorting rule, empty, full, longest, measure, size, as long as, tallest, shortest, large, larger, largest, small, smaller, smallest, medium, big, bigger, biggest, as short as, as tall as, longer than, shorter than, taller than, estimate, check, holds more, holds less, about the same, heavier, lighter, balance, weigh, weighs more, weighs less, most, least, real graph, picture graph, bar graph, fewest	Measuring helps describe an object.	Give the child an object and have them measure that object using "Unifix" cubes.	"Trains" of Unifix cubes, representing objects that were measured.
	Objects can be compared based on their measurements.	When given 2 objects/items, student will use words to describe similarities/differences of the two items (Student 1 is taller than student 2. Student 2 is shorter than student	Charts showing comparisons of objects.
	Sort objects into categories by counting objects.	Describe and compare attributes of objects (length, weight, size, shape, etc.). Describe several measurable attributes of a single object. Classify objects into categories. Sort categories by count less than or equal to 10.	Charts, Bar Graphs, etc. displaying different categories of objects.
Rubric			
Developing	Proficient	Advancing	
Student will describe at least 2 measurable attributes of a single object, with assistance.	Student will describe at least 3 measurable attributes (ex. weight, height, length) of a single object.	Students will describe more than 3 measurable attributes of a single object (ex. weight, height, length, etc.).	
Student will compare two objects with a common attribute and identify more/less of the attribute with assistance.	Student will compare two objects with a common attribute and identify independently which object has more or/less of that attribute.	Student will compare more than two objects with a common attribute and identify independently which object/objects have more or less of that attribute.	
Student needs assistance sorting and classifying by counting.	Student will sort and classify objects by attribute into groups and identify groups by count (identify more/less).	Student will independently sort and classify objects by multiple attributes into groups, describe/identify the attributes and identify groups by count (identify more/less).	
Assessment			
Developing	Proficient	Advancing	
Give student a classroom object, such as a book. Student will answer questions about length, width and/or weight, with prompting. (ex: Tell which sides are longer/shorter).	Give student a classroom object, such as a book. Student will independently tell 3 attributes of the object (ex: length of sides-2 shorter than the other 2, heavy/light, thick or thin).	Give the student a book and they will tell more than 3 attributes and explain each attribute and their reasoning. (ex. 2 sides are longer than the other 2 sides; the book is thick because...; this book is heavier because...)	
Give the student 2 books, with assistance the student will state which book is short, taller, tallest/heavy, light, lighter/thick, thin, thicker.	Give the student 2 books, the student will independently state which book is short, taller, tallest/heavy, light, lighter/thick, thin, thicker. Student will explain their answer and sort books according to the stated attribute.	Give the student 3 books. Student will independently state which book is short, taller, tallest/heavy, light, lighter/thick, thin, thicker. Student will explain their answer and sort books according to the stated attribute.	
Given multiple books, students will ask who likes which book, then categorize by counting how many students like a certain book.	Given multiple books, students will ask who likes which book, then categorize by counting how many students like a certain book.	Given multiple books, students will ask who likes which book, then categorize by counting how many students like a certain book.	

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Introduce	<p><i>Know number names and the count sequence.</i> K.CC.1. Count to 100 by ones and by tens.</p>	<p><i>Know number names and the count sequence.</i> K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).</p>	<p><i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</i> K.OA.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 problems. This applies wherever drawings are mentioned in the Standards.)</p>	ALL STANDARDS ARE INTRODUCED PRIOR TO 4TH QUARTER	Introduce
	<p><i>Know number names and the count sequence.</i> K.CC.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><i>Work with numbers 11-19 to gain foundations for place value.</i> K.NBT.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.</p>	<p><i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</i> K.OA.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><i>Count to tell the number of objects</i> K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality. (See part a, b, and c below)</p>	<p><i>Identify and describe shapes (squares, circle, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres.)</i> K.G.3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).</p>	<p><i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</i> K.OA.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 $5 = 4 + 1$).</p>		

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Introduce	<p>a. 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.</p> <p>b. 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.</p>	<p><i>Analyze, compare, create, and compose shapes.</i></p> <p>K.G.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).</p>	<p><i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</i></p> <p>K.OA.5. Fluently add and subtract within 5.</p>	ALL STANDARDS ARE INTRODUCED PRIOR TO 4TH QUARTER	Introduce
	<p>c. Understand that each successive number name refers to a quantity that is one larger.</p>	<p><i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</i></p> <p>K.OA.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><i>Count to tell the number of objects</i></p> <p>K.CC.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><i>Describe and compare measurable attributes.</i></p> <p>K.MD.1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</p>			

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Introduce	<p><i>Compare numbers.</i> K.CC.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. (Include groups with up to ten objects)</p>	<p><i>Describe and compare measurable attributes.</i> K.MD.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>		ALL STANDARDS ARE INTRODUCED PRIOR TO 4TH QUARTER	Introduce
	<p><i>Compare numbers.</i> K.CC.7. Compare two numbers between 1 and 10 presented as written numerals.</p>	<p><i>Identify and describe shapes (squares, circle, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres.)</i> K.G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.</p>			
	<p><i>Classify objects and count the number of objects in each category.</i> K.MD.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10).</p>	<p><i>Identify and describe shapes (squares, circle, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres.)</i> K.G.2. Correctly name shapes regardless of their orientations or overall size.</p>			
		<p><i>Analyze, create, compare, and compose shapes.</i> K.G.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.</p>			

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Introduce		<i>Analyze, create, compare, and compose shapes.</i> K.G.6. Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"		ALL STANDARDS ARE INTRODUCED PRIOR TO 4TH QUARTER	Introduce
	Indicates Mastery in 1st Semester				
	Indicates Mastery in 2nd Semester				

Standards for Mathematical Practice:

<u>Standards</u>		<u>Description</u>
K.MP.1. Make sense of problems and persevere in solving them.		In Kindergarten, students begin to build the understanding that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Younger students may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, "Does this make sense?" or they may try another strategy.
K.MP.2. Reason abstractly and quantitatively.		Younger students begin to recognize that a number represents a specific quantity. Then, they connect the quantity to written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities.
K.MP.3. Construct viable arguments and critique the reasoning of others.		Younger students construct arguments using concrete referents, such as objects, pictures, drawings, and actions. They also begin to develop their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" and "Why is that true?" They explain their thinking to others and respond to others' thinking.
K.MP.4. Model with mathematics.		In early grades, students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart or list, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed.
K.MP.5. Use appropriate tools strategically.		Younger students begin to consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, kindergarteners may decide that it might be advantageous to use linking cubes to represent two quantities and then compare the two representations side-by-side.
K.MP.6. Attend to precision.		As kindergarteners begin to develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning.
K.MP.7. Look for and make use of structure.		Younger students begin to discern a pattern or structure. For instance, students 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. They also recognize that $3 + 2 = 5$ and $2 + 3 = 5$.
K.MP.8. Look for and express regularity in repeated reasoning.		In the early grades, students notice repetitive actions in counting and computation, etc. For example, they may notice that the next number in a counting sequence is one more. When counting by tens, the next number in the sequence is "ten more" (or one more group of ten). In addition, students continually check their work by asking themselves, "Does this make sense?"