Crook County School District # 1 Curriculum Guide

Grade 1 Math

2011-2012

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Operations and Algebraic Thinking

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

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of **adding to**, **taking from**, **putting together**, **taking apart**, and **comparing**, with **unknowns** in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	• **This benchmark** builds on the work in Kindergarten by having students use a variety of mathematical representations (e.g., objects, drawings, and equations) during their work. The unknown symbols should include boxes or pictures, and not letters. • Teachers should be cognizant of the three types of problems . There are three types of addition and subtraction problems: Result Unknown, Change Unknown, and Start Unknown. • Use informal language (and, minus/subtract, the same as) to describe joining situations (putting together) and separating situations (breaking apart). • Use the addition symbol (+) to represent joining situations, the subtraction symbol (-) to represent separating situations, and the equal sign (=) to represent a relationship regarding quantity between one side of the equation and the other. • A helpful strategy is for students to recognize sets of objects in common patterned arrangements (0-6) to tell how many without counting.	Level 1 (recall)	**adding to**, **taking from**, **putting together**, **taking apart**, **comparing, unknowns** **sum** **difference** **addends** **subtract** **minus** **add** **equal to** **manipulatives**
1.OA.2 Solve word problems that call for addition of three whole numbers whose **sum** is **less than** or **equal to** 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	• **This benchmark** asks students to add (join) three numbers whose sum is less than or equal to 20, using a variety of mathematical representations. This objective does address multi-step word problems. Example: There are cookies on the plate. There are 4 oatmeal raisin cookies, 5 chocolate chip cookies, and 6 gingerbread cookies. How many cookies are there total?	Level 1 (Recall)	**sum** , **less than,** **equal to** **add** **manipulatives**

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Operations and Algebraic Thinking

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

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.OA.3 Apply properties of operations as strategies to add and subtract.**2** *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*	• This benchmark calls for students to apply properties of operations as strategies to **add** and **subtract**. Students do not need to use formal terms for these properties. Students should use mathematical tools, such as cubes and counters, and representations such as the number line and a 100 chart to model these ideas. Example: Student can build a tower of 8 green cubes and 3 yellow cubes and another tower of 3 yellow and 8 green cubes to show that order does not change the result in the operation of addition. Students can also use cubes of 3 different colors to prove that (2 + 6) + 4 is equivalent to 2 + (6 + 4) and then to prove 2 + 6 + 4 = 2 + 10.	Level 2 (Skill/Concept)	Compare Equal to Add Subtract Manipulative 100 chart
1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. Add and subtract within 20.*	• This benchmark asks for students to use subtraction in the context of unknown addend problems. Example: 12 – 5 = __ could be expressed as 5 + __ = 12. Students should use cubes and counters, and representations such as the number line and the100 chart, to model and solve problems involving the inverse relationship between addition and subtraction.	Level 2 (Skill/Concept)	Unknown addend Subtraction Addition Number line 100 chart
1.OA.5 Relate counting to **addition** and **subtraction** (e.g., by counting on 2 to add 2). Add and subtract within 20.	• This benchmark asks for students to make a connection between counting and adding and subtraction. • Students use various counting strategies, including **counting all, counting on, and counting back** with numbers up to 20. The counting all strategy requires students to count an entire set. The counting and counting back strategies occur when students are able to hold the —start number‖ in their head and count on from that number. • This standard calls for students to move beyond counting all and become comfortable at counting on and counting back.	Level 2 (Skill/Concept)	Counting on Counting all, Counting back, strategy

MATHEMATICS COMMON CORE STATE STANDARDS 1st Grade **Mathematics** **Understand and apply properties of operations and the relationship between addition and subtraction.**			
CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as **counting on**; **making ten** (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and **creating equivalent but easier or known sums** (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	• This benchmark mentions the word fluency when students are adding and subtracting numbers within 10. Fluency means accuracy (correct answer), efficiency (within 4-5 seconds), and flexibility (using strategies such as making 5 or making 10). • The standard also calls for students to use a variety of strategies when adding and subtracting numbers within 20. Students should have ample experiences modeling these operations before working on fluency. Teacher could differentiate using smaller numbers.	Level 2 (Skill/Concept)	Fluency Efficiency Strategy Counting on Making ten Doubles Doubles plus one,
1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.	• This benchmark calls for students to work with the concept of equality by identifying whether **equations** are **true** or **false.** Therefore, students need to understand that the equal sign does not mean ―answer comes next‖, but rather that the equal sign signifies a relationship between the left and right side of the equation. Example: The number sentence 4 + 5 = 9 can be read as, ―Four plus five is the same amount as nine.‖ • In addition, Students should be exposed to various representations of equations.	Level 2 (Skill/Concept)	Equation Equals

	Example: An operation on the left side of the equal sign and the answer on the right side (5 + 8 = 13) an operation on the right side of the equal sign and the answer on the left side (13 = 5 + 8) numbers on both sides of the equal sign (6 = 6) operations on both sides of the equal sign (5 + 2 = 4 + 3). • Students need many opportunities to model equations using cubes, counters, drawings, etc.		

MATHEMATICS COMMON CORE STATE STANDARDS 1st Grade **Mathematics**			
CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = _ – 3, 6 + 6 = _.*	This benchmark extends the work that students do in 1.OA.4 by relating addition and subtraction as related operations for situations with an unknown.	Level 2 (Skill/Concept)	Addition Subtraction Missing digit

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Number and Operations in Base 10

Extend the counting sequence.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	• This standard calls for students to rote count forward to 120 by Counting On from any number less than 120. • Students should have ample experiences with the hundreds chart to see patterns between numbers, such as all of the numbers in a column on the hundreds chart have the same digit in the ones place, and all of the numbers in a row have the same digit in the tens place. • This standard also calls for students to read, write and represent a number of objects with a written numeral in number form (standard form). These representations can include cubes, place value (base 10) blocks, pictorial representations or other concrete materials. • As students are developing accurate counting strategies they are also building an understanding of how the numbers in the counting sequence are related—each number is one more (or one less) than the number before (or after).	Level 1 (recall)	Counting on Number Digit

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Number and Operations in Base 10

Understand place value.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.NBT.2 Understand that the two digits of a two-digit number represent amounts of **tens** and **ones**. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones — called a ―ten.‖ b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. **c.** The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	**1.NBT.2a** asks students to unitize a group of ten ones as a whole unit: a ten. This is the foundation of the place value system. So, rather than seeing a group of ten cubes as ten individual cubes, the student is now asked to see those ten cubes as a bundle- one bundle of ten . **1.NBT.2b** asks students to extend their work from Kindergarten when they composed and decomposed numbers from 11 to 19 into ten ones and some further ones. In Kindergarten, everything was thought of as individual units: ―ones‖. In First Grade, students are asked to unitize those ten individual ones as a whole unit: ―one ten‖. Students in first grade explore the idea that the teen numbers (11 to 19) can be expressed as one ten and some leftover ones. Ample experiences with ten frames will help develop this concept. Example: For the number 12, do you have enough to make a ten? Would you have any leftover? If so, how many leftovers would you have? **1.NBT.2c** builds on the work of **1.NBT.2b.** Students should explore the idea that decade numbers (e.g. 10, 20, 30, 40) are groups of tens with no left over ones. Students can represent this with cubes or place value (base 10) rods. (Most first grade students view the ten stick (numeration rod) as ONE. It is recommended to make a ten with unfix cubes or other materials that students can group. Provide students with opportunities to count books, cubes, pennies, etc. Counting 30 or more objects supports grouping to keep track of the number of objects.)	Level 2 (Skill/Concept)	Place value Tens Ones

MATHEMATICS COMMON CORE STATE STANDARDS 1st Grade **Mathematics** **Number and Operations in Base 10** **Understand place value**			
CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	This standard builds on the work of **1.NBT.1** and **1.NBT.2** by having students compare two numbers by examining the amount of tens and ones in each number. Students are introduced to the symbols greater than (>), less than (<) and equal to (=). Students should have ample experiences communicating their comparisons using words, models and in context before using only symbols in this standard.	Level 2 (Skill/concept)	Greater than, Less than, Equal to

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Number and Operations in Base Ten

Use place value understanding and properties of operations to add and subtract.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	This standard calls for students to use concrete models, drawings and place value strategies to add and subtract within 100. Students should not be exposed to the standard algorithm of carrying or borrowing in first grade	Level 2 (Skill/concept)	Number Words, Add, Subtract, 2-digit, Ten Ten-frame, Hundred chart
1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	**1.NBT.5** builds on students' work with tens and ones by mentally adding ten more and ten less than any number less than 100. Ample experiences with ten frames and the hundreds chart help students use the patterns found in the tens place to solve such problems. Example: There are 74 birds in the park. 10 birds fly away. How many are left?	Level 2 (Skill/Concept)	

MATHEMATICS COMMON CORE STATE STANDARDS 1st Grade **Mathematics** **Measurement and Data**			
CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	• This standard calls for students to use concrete models, drawings and place value strategies to subtract multiples of 10 from decade numbers (e.g., 30, 40, 50). Example: There are 60 students in the gym. 30 students leave. How many students are still in the gym?	Level 2 (Skill/Concept)	Number Words, Subtract Manipulatives Place value
	.		

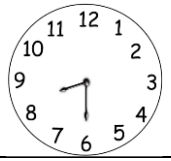
MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Measurement and Data

Measure lengths indirectly and by iterating length units.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.MD.1 Order three objects by length; compare the **lengths** of two objects indirectly by using a third object	• This standard calls for students to indirectly measure objects by comparing the length of two objects by using a third object as a measuring tool. This concept is referred to as transitivity. Example: Which is longer: the height of the bookshelf or the height of a desk?	Level 2 (Skill/concept)	Length Compare Shorter Longer
1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*	• This standard asks students to use multiple copies of one object to measure a larger object. This concept is referred to as iteration. Through numerous experiences and careful questioning by the teacher, students will recognize the importance of making sure that there are not any gaps or overlaps in order to get an accurate measurement. This concept is a foundational building block for the concept of area in 3rd Grade. Example: How long is the paper in terms of paper clips?	Level 2 (Skill/Concept)	

MATHEMATICS COMMON CORE STATE STANDARDS 1st Grade **Mathematics** **Measurement and Data** **Tell and Write Time**			
CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.MD.3 Tell and write **time** in **hours** and **half-hours** using analog and digital clocks.	• This standard calls for students to read both analog and digital clocks and then orally tell and write the time. Times should be limited to the hour and the half-hour. Students need experiences exploring the idea that when the time is at the half-hour the hour hand is between numbers and not on a number. Further, the hour is the number before where the hour hand is. Example: In the clock below, the time is 8:30. The hour hand is between the 8 and 9, but the hour is 8 since it is not yet on the 9. 	Level 2 (Skill/Concept)	Time Analog Digital Hour Half-hour Half-past o'clock

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics
Measurement and Data
Represent and interpret data.

<table>
<tr><th>CC STANDARD</th><th>Declarative Knowledge
Procedural knowledge</th><th>Level of Rigor</th><th>Academic Vocabulary</th></tr>
<tr>
<td>1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</td>
<td>
This standard calls for students to work with categorical data by organizing, representing and interpreting data. Students should have experiences posing a question with 3 possible responses and then work with the data that they collect.
Example below:
Students pose a question and the 3 possible responses.
Which is your favorite flavor of ice cream? Chocolate, vanilla or strawberry?
Students collect their data by using tallies or another way of keeping track.
Students organize their data by totaling each category in a chart or table.
Picture and bar graphs are introduced in Second Grade.
<table>
<tr><td colspan="2">What is your favorite flavor of ice cream?</td></tr>
<tr><td>Chocolate</td><td>12</td></tr>
<tr><td>Vanilla</td><td>5</td></tr>
<tr><td>Strawberry</td><td>6</td></tr>
</table>
Students interpret the data by comparing categories.
Examples of comparisons:
What does the data tell us? Does it answer our question?
More people like chocolate than the other two flavors.
Only 5 people liked vanilla.
Six people liked Strawberry.
7 more people liked Chocolate than Vanilla.
The number of people that liked Vanilla was 1 less than the number of people who liked Strawberry.
The number of people who liked either Vanilla or Strawberry was 1 less than the number of people who liked chocolate.
23 people answered this question.
</td>
<td>Level 2
(Skill/Concept)</td>
<td>Chart
table
More than
Less than
Difference
Tally marks
Data</td>
</tr>
</table>

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Geometry

Reason with shapes and their attributes.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.G.1 Distinguish between defining attributes (e.g., triangles are **closed** and **three-sided**) versus non-defining attributes (e.g., color, orientation, overall size) ; build and draw shapes to possess defining attributes.	• This standard calls for students to determine which attributes of shapes are defining compared to those that are non-defining. Defining attributes are attributes that must always be present (#angles, # sides, length of sides, etc.). Non-defining attributes are attributes that do not always have to be present to define a particular shape (color, position, location, etc.). The shapes can include triangles, squares, rectangles, and trapezoids.	Level 2 (Skill/Concept)	Attribute Shape Plane Classify Square Triangle Rectangle Trapezoid Angle Side

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Geometry

Reason with shapes and their attributes.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.G.2 Compose **two-dimensional shapes** (**rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles)** or **three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders)** to create a composite shape, and compose new shapes from the composite shape.**1** **1** Students do not need to learn formal names such as ―right rectangular prism.‖	• This standard calls for students to compose (build) a two-dimensional or three-dimensional shape from two shapes. • This standard includes shape puzzles in which students use objects (e.g., pattern blocks) to fill a larger region. • Students do not need to use the formal names such as ―right rectangular prism.‖	Level 3 (Strategic Thinking)	two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders

MATHEMATICS COMMON CORE STATE STANDARDS
1st Grade

Mathematics

Geometry

Reason with shapes and their attributes.

CC STANDARD	Declarative Knowledge Procedural knowledge	Level of Rigor	Academic Vocabulary
1.G.3 Partition circles and rectangles into two and four **equal shares**, describe the shares using the words ***halves, fourths,* and *quarters,*** and use the phrases ***half of, fourth of***, and ***quarter of*.** Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	• This standard is the first time students begin partitioning regions into equal shares using a context such as cookies, pies, pizza, etc... This is a foundational building block of fractions, which will be extended in future grades. • Students should have ample experiences using the words, *halves, fourths,* and *quarters*, and the phrases *half of, fourth of,* and *quarter of*. • Students should also work with the idea of the whole, which is composed of two halves, or four fourths or four quarters. Example: How can you and a friend share equally (partition) this piece of paper so that you both have the same amount of paper to paint a picture?	Level 2 (Skill/Concept)	halves, fourths, quarters fraction

Common Core Student Math Vocabulary

2012-2013 Version

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Zero One Hundred Greater More Less fewer equal same amount join add separate subtract and same amount as equal less more number words left over length weight heavy long more of less of longer taller shorter color words descriptive words	adding to taking from putting together taking apart comparing unknowns addition equal shares *halves* *fourths* *quarters* *half of* *fourth of* *quarter of*	Standard units of measurement Inch centimeter number of angles number of equal faces triangles quadrilaterals pentagons hexagons cubes columns trapezoid	products groups of quotients partitioned equally multiplication division equal groups arrays equations unknown operation multiply divide factor product quotient strategies properties mental computation addend sum place value partition(ed) equal parts fraction equal distance (intervals), equivalent equivalence reasonable denominator	factor pairs factor multiple prime composite convert/conversion relative size liquid volume mass length distance kilometer (km) meter (m) centimeter (cm) kilogram (kg) gram (g), liter (L), milliliter (mL) inch (in), foot (ft), yard (yd), mile (mi), ounce (oz), pound (lb), cup (c), pint (pt), quart (qt), gallon (gal) line plot graph ray angle circle fraction intersect	parentheses brackets braces numerical expressions numerical patterns rules ordered pairs coordinate plane **right rectangular prism** **unit** **unit cube** **cubic units (cubic cm, cubic in. cubic ft)** coordinate system coordinate plane first quadrant points lines axis/axes, x-axis, y-axis horizontal vertical intersection of lines, origin ordered pairs coordinates x-coordinate y-coordinate	one-variable equations inequalities dependent and independent variables statistical variability histogram box plot

Update on: November 12, 2011

squares circles triangles rectangles hexagons cubes cones cylinders spheres analyze compare create compose			numerator comparison compare justify greater than >
less than < estimate time time intervals minute hour elapsed time measure liquid volume mass standard units metric gram (g) kilogram (kg) liter (L) scale scaled picture graph scaled bar graph line plot data attribute area square unit plane figure gap overlap square cm square m square in., square ft, nonstandard units tiling side length decomposing perimeter	one-degree angle protractor vertex/vertices right angle acute obtuse perpendicular parallel right triangle isosceles triangle equilateral triangle scalene triangle line of symmetry symmetric figures	attribute category subcategory hierarchy	

			plane figure linear area polygon quadrilateral open figure closed figure three sided 2-dimensional 3-dimensional rhombi			