|  |  |  |
| --- | --- | --- |
| **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. (Note: See Glossary, Table 1.)  **PA2.2.1.A.1:** Represent and solve problems involving addition and subtraction within 20.  Compare problems are more complex than those introduced in Kindergarten. In order to solve compare problem types, First Graders must think about a quantity that is not physically present and must conceptualize that amount. In addition, the language of “how many more” often becomes lost or not heard with the language of ‘who has more’. With rich experiences that encourage students to match problems with objects and drawings can help students master these challenges.  First Graders also extend the sophistication of the methods they used in Kindergarten (counting) to add and subtract within this larger range. Now, First Grade students use the methods of counting on, making ten, and doubles +/- 1 or +/- 2 to solve problems.  In order for students to read and use equations to represent their thinking, they need extensive experiences with addition and subtraction situations in order to connect the experiences with symbols (+, -, =) and equations (5 = 3 + 2). In Kindergarten, students demonstrated the understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations using objects, pictures and words. In First Grade, students extend this understanding of addition and subtraction situations to 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. |  | **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.  **PA2.2.1.A.1:** Represent and solve problems involving addition and subtraction within 20.  •When presented with a word problem involving addition of three whole numbers within 20:  •Represent the problem with an addition equation using a symbol  (such as a blank or empty box or question mark) to represent the  unknown value; and  •Use objects or drawings to model the problem and find the solution  (i.e., the missing number).  In order for students to read and use equations to represent their thinking, they need extensive experiences with addition and subtraction situations in order to connect the experiences with symbols (+, -, =) and equations (5 = 3 + 2). In Kindergarten, students demonstrated the understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations using objects, pictures and words. In First Grade, students extend this understanding of addition and subtraction situations to 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. |
|  |  |  |
| **1.OA.3:** Apply properties of operations as strategies to add and subtract. (Note: Students need not use formal terms for these properties.)  *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.)*  **PA2.1.1.B.3:** Use place value concepts and properties of operations to add and subtract within 100.  •Give the answer to *b* + *a* if the student already knows the answer to *a* + *b* (e.g., if the student already found 9 + 2 = 11 by using a counting-on strategy (“9…10…11”), then the student automatically gives the answer to 2 + 9 without having to use a counting or adding strategy).  •Strategically group addends (such as using commutative and associate properties to pair two addends that make 10) in order to make it easier to add three numbers (e.g., for 3 + 9 + 7, the student adds the 3 and 7 first to make 10).  •Elementary students often believe that there are hundreds of isolated addition and subtraction facts to be mastered. However, when students understand the commutative and associative properties, they are able to use relationships between and among numbers to solve problems. First Grade students apply properties of operations as strategies to add and subtract. Students do not use the formal terms “commutative” and “associative”. Rather, they use the understandings of the commutative and associative property to solve problems. |  | **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.*  **PA2.2.1A2:** Understand and apply properties of operations and the relationship between addition and subtraction.  When given two numbers to subtract:  •Explain why solving “*a* – *b* = \_\_\_” is the same is solving “*b* + \_\_\_ = *a”*  (or “\_\_\_ + *b* = *a*”); and  •Write an addition equation with a symbol for the unknown addend, and then find  the missing number using an appropriate strategy such as counting on or adding  on.  •First Graders often find subtraction facts more difficult to learn than addition facts. By understanding the relationship between addition and subtraction, First Graders are able to use various strategies described below to solve subtraction problems.  Think-Addition uses known addition facts to solve for the unknown part or quantity within a problem. When students use this strategy, they think, “What goes with this part to make the total?” The think-addition strategy is particularly helpful for subtraction facts with sums of 10 or less and can be used for sixty-four of the 100 subtraction facts. Therefore, in order for think-addition to be an effective strategy, students must have mastered addition facts first. |
| **1.OA.5:** Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).  **PA:** There isn’t a PA CC Standard that directly relates to this.  •Use counting-on as a strategy for adding on a smaller number to a larger number, and use counting back as a strategy for subtracting a smaller number from a larger number.  •When solving addition and subtraction problems to 20, First Graders often use counting strategies, such as counting all, counting on, and counting back, before fully developing the essential strategy of using 10 as a benchmark number. Once students have developed counting strategies to solve addition and subtraction problems, it is very important to move students toward strategies that focus on composing and decomposing number using ten as a benchmark number, as discussed in 1.OA.6, particularly since counting becomes a hindrance when working with larger numbers. By the end of First Grade, students are expected to use the strategy of 10 to solve problems.  **Counting All**: Students count all objects to determine the total amount.  **Counting On** & Counting Back: Students hold a “start number” in their head and count on/back from that number. |  | **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).  **PA2.2.1.A.1:** Represent and solve problems involving  addition and subtraction within 20.  **PA2.1.1.B.3:** Use place value concepts and properties of operations to add and subtract within 100.  •Use mental strategies to quickly add two numbers whose sum is within 10, especially those numbers that add up to 10.  •Use mental strategies to quickly subtract two numbers in which the starting number is 10 or less.  •Add within 20 using a variety of strategies (e.g., counting on, making ten, decomposing a number and recomposing numbers to make 10, adding doubles, adding doubles plus 1) and most importantly, picking and using strategies that efficiently lead to the sum.  For example, when adding 3 + 9, the student might:  •Think of 3 + 9 as 2 + (1 + 9) or 2 + 10.  •Start with 9 and count on 3 (“9, 10, 11, 12”).  •Already knows that 9+3=12 and uses commutative prop to know that 3+9 is also 12.  •Subtract within 20 using a variety of strategies (e.g., counting back, decomposing, turning the subtraction problem into a missing addend problem), and most importantly, picking and using strategies that efficiently lead to the sum.  For example, when subtracting 15 – 7, the students might:  •Think of 15 – 7 as 15 – 5 – 2 or 10 – 2. •Think of 15 – 7 as 17 – 7 – 2.  •Already know that 7 + 8 = 15, and relate this to 15 – 7 = 8 (fact family).  NOTE: The ability to quickly add or subtract should NOT result from flash cards and memorization as the primary learning strategies. |
|  |  |  |
| **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.*  **PA:**There isn’t a PA CC standard that directly states this however, this true understanding of equality as “the same as” rather than a prompt to “do the math” is essential! This isn’t done with a lesson but rather with continued modeling.  •Say whether an equation is true or false based on the values on both sides of the equal sign being equal.  For example, the student is able to identify the following as true equations:  • 6 = 6  • 6 = 5 + 1  • 1 + 5 = 4 + 2 (NOTE: A student who thinks this equation is false is probably thinking that the number after the equal sign should be 6 instead of 4.)  • Students need lots of practice and experiences with seeing the = sign in multiple circumstances and positions. They most often see it followed by the “answer” to a problem (6 + 1 = 7 or 5 – 2 = 3). This leads them to the misconception that the = sign is a “command” to “do the math”. Instead, they should often see things such as:  1 + 2 = 5 – 2 5 = 3 + 2 10 = 2 nickels  25 = 2 dimes and 1 nickel  Note: Google “Children’s Understanding of Equality” for a VERY interesting article on this – or email Sallie and she’ll send it to you. |  | **1.OA.8**: Determine the unknown whole number in an addition or subtraction equation relating to 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 =* ?*.*  **PA2.2.1.A.1:** Represent and solve problems involving addition and subtraction within 20.  **PA2.1.1.B.3:** Use place value concepts and properties of operations to add and subtract within 100.  •Determine the unknown number in an addition equation, in the form *a* + *b* = *c*, in which two of the values are given and the missing value is what needs to be found.  •Determine the unknown number in a subtraction equation, in the form *a* – *b* = *c*, in which two of the values are given and the missing value is what needs to be found. |

|  |  |  |
| --- | --- | --- |
| **1.NBT.4**: Add within 100, including adding a 2-digit number and a 1-digit number, and adding a 2-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 2-digit numbers, one adds 10s and 10s, ones and ones; and sometimes it is necessary to compose a 10.  **PA2.1.1.B.3:** Use place value concepts and properties of operations to add and subtract within 100.  •Represent addition by using drawings, especially drawings that depict base-10 manipulatives.  •Use numbers/symbols and/or a written explanation to explain the reasoning behind the strategy that is used.  For example, when adding 34 + 18, the student might first model the adding with base-10 manipulatives, and then write addition expressions that match what was modeled.  First Grade students use concrete materials, models, drawings and place value strategies to add within 100. They do so by being flexible with numbers as they use the base-ten system to solve problems. The standard algorithm of carrying or  borrowing is not an expectation nor a focus in First Grade. **Students are not expected to fluently add and subtract whole numbers using standard algorithms until the end of Fourth Grade.** |  | **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).  **PA2.1.1.B.2:** Use place value concepts to represent amounts of tens and ones and to compare two digit numbers.  •Represent two-digit numbers with manipulatives or drawings that consist of tens (such as ten-strips) and ones, and more importantly, the student automatically knows that the tens digit indicates how many ten-strips (or other units of ten) are needed and the ones digit indicate the remaining units that are needed.  •Verbalize the number of tens and ones that represent two-digit numbers (e.g., for 34, the student says, “Thirty-four is composed of three tens and four ones.”).  •First Grade students are introduced to the idea that a bundle of ten ones is called “a ten”. This is known as **unitizing**. When First Grade students unitize a group of ten ones as a whole unit (“a ten”), they are able to count groups as though they were individual objects. For example, 4 trains of ten cubes each have a value of 10 and  would be counted as 40 rather than as 4. This is a monumental shift in thinking, and can often be challenging for young children to consider a group of something as “one” when all previous experiences have been counting single objects. This is the foundation of the place value system and requires time and rich experiences with concrete manipulatives to develop.  •A student’s ability to conserve number is an important aspect of this standard. It is not obvious to young children that 42 cubes is the same amount as 4 tens and 2 left-overs. It is also not obvious that 42 could also be composed of 2 groups of 10 and 22 leftovers. Therefore, first graders require ample time grouping proportional objects (e.g., cubes, beans, beads, ten-frames) to make groups of ten, rather than using pre-grouped materials (e.g., base ten blocks, pre-made bean sticks) that have to be “traded” or are non-proportional (e.g., money). Example: 42 cubes can be grouped many different ways and still remain a total of 42 cubes. |
|  |  |  |
| **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 <.  **PA2.1.1.B.2:** Use place value concepts to represent amounts of tens and ones and to compare two digit numbers.  •Say which of two two-digit numbers is greater (or less) than the other by first looking at their tens digit:  •If the tens digits are different, the student says which is greater (or less)  without having to look at the ones digit.  •If the tens digits are the same, the student compares the ones digits to  make the decision.  •Write an equation or an inequality (with the < or > sign) to report the  results of the comparison. |  | **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.  **PA2.1.1.B.1:** Extend the counting sequence to read and write numerals to represent objects.  •Say the number names to 120 in sequence beginning from any number, especially the numbers after 99.  •Write the numerals to match the name of number (up to 120) that is said aloud.  •Read and say the numerals to 120.  •Write the numeral to match the number of objects in a given set.  First Grade students rote count forward to 120 by counting on from any number less than 120. First graders develop accurate counting strategies that build on the 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). In addition, first grade students read and write numerals to represent a given amount.  As first graders learn to understand that the position of each digit in a number impacts the quantity of the number, they become more aware of the order of the digits when they write numbers. For example, a student may write “17” and mean “71”. Through teacher demonstration, opportunities to “find mistakes”, and questioning by the teacher (“I am reading this and it says seventeen. Did you mean seventeen or seventy-one? How can you change the number so that it reads seventy-one?”), students become precise as they write numbers to 120. |

|  |  |  |
| --- | --- | --- |
| **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.  **PA2.1.1.B.3:** Use place value concepts and properties of operations to add and subtract within 100.  •Tell you what number is 10 more or 10 less, through a quick mental calculation (i.e., by adding or subtracting one from the tens digit).  First Graders build on their work with tens and ones by mentally adding ten more and ten less than any number less than 100. First graders are not expected to compute differences of two-digit numbers other than multiples of ten. Ample experiences with ten frames and the hundreds chart help students use the patterns found in the tens place to solve such problems mentally. |  | **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.  **PA2.1.1.B.3:** Use place value concepts and properties of operations to add and subtract within 100.  •Represent the subtraction by using concrete models (e.g., ten-strips) with a taking away strategy (e.g., if the problem is 90 – 30, the student starts with 9 ten-strips and them takes away 3 of them and reports that 60 (or 6 ten-strips) remain);  •Represent the subtraction with pictures that depict ten-strips (e.g., if the problem is 90 – 30, the student draws 9 ten-strips and then crosses off 3 of them); and  •Use numbers/symbols and/or a written explanation to explain the reasoning behind the strategy that is used.  For example, when subtracting 80 – 30, the student might first model the adding with base-10 manipulatives, and draw a picture of it, and explain in words that he started with 8 ten-strips and took away 3 ten-strips to be left with 5 ten-strips which is 50.  • First Grade students use concrete models, drawings and place value strategies to subtract multiples of 10 from decade  numbers (e.g., 30, 40, 50). |
|  |  |  |
| **1.MD.1**: Order three objects by length; compare the lengths of two objects indirectly by using a third object.  **PA 2.4.1.A.1:** Order lengths and measure them both indirectly and by repeating length units.  •Directly compare object A to object C, and directly compare object B to object C, and make a statement comparing the length of object A and B.  •Place three objects in order from longest to shortest.  •First Grade students typically measure and order objects by the length of each of the objects. Sometimes, the lengths are not known, but the relationships between the three objects are known. This concept is known as the transitivity principle for indirect measurement. |  | **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.*  **PA 2.4.1.A.1:** Order lengths and measure them both  indirectly and by repeating length units.  •Choose an object (such as a paper clip) to serve as a length unit. [NOTE: the length unit should be shorter than the object the student is trying to measure.]  •Line up multiple copies of that object with no gaps or overlaps to span the length of an object.  •Count the number of units it takes to span the object whose length the student is measuring.  •Expresses the length of the object in terms of the length unit (e.g., reports that the length of a pen is 5 paper clips long).  First Grade students use multiple copies of one object to measure the length larger object. Through numerous experiences and careful questioning by the teacher, students will recognize the importance of careful measuring so 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. |

|  |  |  |
| --- | --- | --- |
| **1.MD.3**: Tell and write time in hours and half-hours using analog and digital clocks.  **PA2.4.1.A.2:** Tell and write time to the nearest half hour using both analog and digital clocks.  For young children, reading a clock can be a difficult skill to learn. In particular, they must understand the differences between the two hands on the clock and the functions of these hands. By carefully watching and talking about a clock with only the hour hand, First Graders notice when the hour hand is directly pointing at a number, or when it is slightly ahead/behind a number. In addition, using language, such as “about 5 o’clock” and “a little bit past 6 o’clock”, and “almost 8 o’clock” helps children begin to read an hour clock with some accuracy. Through rich experiences, First Grade students read both analog (numbers and hands) and digital clocks, orally tell the time, and write the time to the hour and half-hour.  All of these clocks indicate the hour of “two”, although they look slightly different. |  | **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.  **PA2.4.1.A.4:** Represent and interpret data using tables/charts  •Take raw data (the data can be given or be collected by the student) and represent the data in an organized way into up to three categories (e.g., list each raw datum in a table under its appropriate category, or represent each datum as a tally mark under its appropriate category).  •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, and phrase the questions in the context of the problem. For example, if the data collected was about each student’s favorite fruit among the choices of apple, orange or banana, the student would ask questions like:  •How many students liked apples the best?  •How many students liked oranges the best?  •How many students liked bananas the best?  •How many students answered the question?  •Which fruit did more students like? |
|  |  |  |
| **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.  **PA2.3.1.A.1:** Compose and distinguish between two-and-three dimensional shapes based on their attributes.  •When given an attribute of a shape, say whether that attribute is a defining attribute or a non-defining attribute.  •When given a defining attribute (or a set of defining attributes), build and/or draw a shape that possesses the attribute(s).  First Grade students use their knowledge of defining and non-defining attributes of shapes to identify, name, build and draw shapes (including triangles, squares, rectangles, and trapezoids). They understand that defining attributes are always-present features that classify a particular object (e.g., number of sides, angles, etc.). They also understand that non-defining attributes are features that may be present, but do not identify what the shape is called (e.g., color, size, orientation, etc.). |  | **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. (Note: Students do not need to learn formal names such as “right rectangular prism.”)  **PA2.3.1.A.1:** Compose and distinguish between two-and-three dimensional shapes based on their attributes.  •Compose Pattern Blocks or other cut-out shapes to create a new shape, and then use that new shape as part of another new shape.  •Compose three-dimensional shapes to create a new shape, and the use that new shape as part of another new shape (e.g., the student places a pyramid on top of a cube to form a “house”). |

|  |  |  |
| --- | --- | --- |
| **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.  **PA2.3.1.A.2:** Use the understanding of fractions to partition shapes into halves and quarters.  •Fold a circle or rectangle in half and cut along the fold to form two equal halves, and:  • Refer to each piece as “half of” the circle or rectangle;  •Refer to both pieces as “halves”; and  •Refer to the whole circle/rectangle as being composed of “two of the  halves.  •Fold each of the halves of the circle/rectangle and cut along the fold to form four equal quarters, and:  •Refer to each piece as “quarter of” the circle or rectangle;  • Refer to all four pieces as “fourths” or “quarters”; and  •Refer to the whole circle/rectangle as being composed of “four of the  quarters” or “four of the fourths.”  •Explain that there are more quarters than halves that make up the whole, and explain that you need more quarters/fourths than halves to make up a whole because the quarters/fourths are smaller pieces than the halves. |  | The information related to “unpacking” the CCSM was taken from the following 2 sources:  and  <http://www.yuureka.com/resources-1/common-core>  http://www.ncpublicschools.org/acre/standards/common-core-tools/#unmath |