Focus Topic: OA – Operations and Algebraic Thinking

TSW = The Student Will

Objective(s)	Common Core Alignment	Essential Questions	Understandings	Suggested Assessments
• TSW interpret a multiplication equation as a comparison, (For example: interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations	4.OA.1	How does knowing basic facts make problem solving easier?	There are different ways to calculate mentally. Most involve breaking numbers apart or replacing them with numbers that are easy to compute with.	Ongoing observation & questioning during class discussions
• TSW multiply or divide to solve word problems involving multiplicative comparison, *(For example: by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison)*	4.OA.2	Where does multiplication occur in real life?	Multiplication and division are inverse operations.	Performance tasks
• TSW solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted	4.OA.3	Why is memorizing basic facts better than finger counting?	Real situations can be represented by writing variable expressions, and those expressions can be evaluated by substituting values for the variable.	Self-Assessment
• TSW represent problems using equations with a letter standing for the unknown quantity	4.OA.3			Literature Connections
• TSW assess the reasonableness of answers using mental computation and estimation strategies including rounding	4.OA.3			Projects
• TSW find all factor pairs for a whole number in the range 1–100	4.OA.4			Multiple Choice
• TSW recognize that a whole number is a multiple of each of its factors	4.OA.4			Short Constructed Response
• TSW determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number	4.OA.4			Extended Constructed Response
• TSW determine whether a given whole number in the range 1–100 is prime or composite	4.OA.4			

• TSW generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. (*For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way)*	4.OA.5			

Focus Topic: NBT– Number & Operations in Base Ten

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Objective(s)	Common Core Alignment	Essential Questions	Understandings	Suggested Assessments
• TSW recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *(For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division)*	4.NBT.1	What property do numbers belong to?	Place value can be used to write numbers in different but equivalent forms.	Ongoing observation & questioning during class discussions
• TSW read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form	4.NBT.2	Why should we order numbers?	Use place value periods to help understand, read, and write larger numbers.	Performance tasks
• TSW compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons	4.NBT.2	When do we use rounding?	Place value can be used to write numbers in different but equivalent forms.	Self-Assessment
• TSW use place value understanding to round multi-digit whole numbers to any place	4.NBT.3	Why is it important to know the difference of digits in a number?	Word problems tell us what is known and what needs to be figured out.	Literature Connections
• TSW fluently add and subtract multi-digit whole numbers using the standard algorithm	4.NBT.4			Projects
• TSW multiply a whole number of up to four digits by a one-digit whole number using strategies based on place value and the properties of operations	4.NBT.5			Multiple Choice
• TSW multiply two two-digit numbers, using strategies based on place value and the properties of operations	4.NBT.5			Short Constructed Response

• TSW find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division	4.NBT.6			Extended Constructed Response
• TSW illustrate and explain the calculation by using equations, rectangular arrays, and/or area models	4.NBT.6			

Focus Topic: MD – Measurement and Data

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Objective(s)	Common Core Alignment	Essential Questions	Understandings	Suggested Assessments
• TSW know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec.	4.MD.1	How does what we measure influence how we measure?	Some real-world problems can be solved using known concepts, skills, and strategies.	Ongoing observation & questioning during class discussions
• TSW understand that within a single system of measurement, express measurements in a larger unit in terms of a smaller unit	4.MD.1	Why do we need standard units of measurement in real-life?	The metric system of measurement is based on the decimal system of numeration. Metric units can be converted to other metric units by multiplying or dividing by a power of 10.	Performance tasks
• TSW record measurement equivalents in a two-column table.(*For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...)*	4.MD.1	What things would be impossible without measurement?		Self-Assessment
• TSW use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit	4.MD.2	Is there such a thing as exact measurement?		Literature Connections

• TSW represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale	4.MD.2	Why do we need standard units of measure?		Projects
• TSW apply the area and perimeter formulas for rectangles in real world and mathematical problems. (*For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor)*	4.MD.3			Multiple Choice
• TSW make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).	4.MD.4			Short Constructed Response
• TSW solve problems involving addition and subtraction of fractions by using information presented in line plots. (*For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection)*	4.MD.4			Extended Constructed Response
• TSW recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement	4.MD.5			
• TSW recognize that an angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles	4.MD.5			
• TSW recognize that an angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees	4.MD.5			
• TSW measure angles in whole-number degrees using a protractor. Sketch angles of specified measure	4.MD.6			
• TSW recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts	4.MD.7			

• TSW solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, *(For example: by using an equation with a symbol for the unknown angle measure)*	4.MD.7			

Focus Topic: G –Geometry

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Objective(s)	Common Core Alignment	Essential Questions	Understandings	Suggested Assessments
• TSW draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures	4.G.1	What is the best shape? Why?	Polygons can be described by specific properties and named based on the number of sides and corners, or vertices.	Ongoing observation & questioning during class discussions
• TSW classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size	4.G.2	How would the world look without (insert any shape)?	Triangles can be described and named based on the relative lengths of their sides and the sizes of their angles.	Performance tasks
• TSW recognize right triangles as a category, and identify right triangles	4.G.2	How would the world look if there were only (insert shape)?	Quadrilaterals can be classified by their angles and pairs of sides.	Self-Assessment
• TSW recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts	4.G.3			
• TSW identify line-symmetric figures and draw lines of symmetry	4.G.3			

Focus Topic: NF –Numbers & Operations - Fractions

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Objective(s)	Common Core Alignment	Essential Questions	Understandings	Suggested Assessments
• TSW explain why a fraction *a*/*b* is equivalent to a fraction (*n* × *a*)/(*n* × *b*) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size	4.NF.1	How can I use fractions in real-life?	The denominator of a fraction gives the number of equal parts in all, and the numerator tells how many equal parts are described.	Ongoing observation & questioning during class discussions
• TSW use the above principle to recognize and generate equivalent fractions	4.NF.1	What is the relationship between fractions and division?	A set or group can be considered a whole, and fractional parts are parts of the set.	Performance tasks
• TSW compare two fractions with different numerators and different denominators, *(For example: by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½)*	4.NF.2	How do we show a part of something?	Benchmark fractions are familiar fractions that are easy to visualize, such as halves, thirds, and fourths.	Self-Assessment
• TSW recognize that comparisons are valid only when the two fractions refer to the same whole	4.NF.2			Short Constructed Response
• TSW record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model	4.NF.2			Extended Constructed Response
• TSW understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*	4.NF.3			
• TSW understand addition and subtraction of fractions as joining and separating parts referring to the same whole	4.NF.3			
• TSW decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. (*Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8)*	4.NF.3			

• TSW add and subtract mixed numbers with like denominators, *(For example: by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction)*	4.NF.3			
• TSW solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, *(For example: by using visual fraction models and equations to represent the problem)*	4.NF.3			
• TSW apply and extend previous understandings of multiplication to multiply a fraction by a whole number	4.NF.4			
• TSW understand a fraction *a*/*b* as a multiple of 1/*b*. (*For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4)*	4.NF.4			
• TSW understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. (*For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*	4.NF.4			
• TSW solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. (*For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?)*	4.NF.4			
• TSW express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *(For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100)*	4.NF.5			

• TSW use decimal notation for fractions with denominators 10 or 100. (*For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram)*	4.NF.6			
• TSW compare two decimals to hundredths by reasoning about their size	4.NF.7			
• TSW recognize that comparisons are valid only when the two decimals refer to the same whole	4.NF.7			
• TSW record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model	4.NF.7			

Focus Topic: **Mathematical Practices**

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Objective(s)
• TSW make sense of problems and persevere in solving them.
• TSW reason abstractly and quantitatively.
• TSW construct viable arguments and critique the reasoning of others.
• TSW model with mathematics.
• TSW use appropriate tools strategically.
• TSW attend to precision.
• TSW look for and make use of structure
• TSW look for and express regularity in repeated reasoning.