

Achievement Level Descriptors (ALDs)

Mathematics

Grades 3–5

# Achievement Level Descriptors (ALDs) Mathematics Grades 3–5

The achievement level descriptors describe what a typical student scoring at each achievement level can do. A student who scores at a level would be expected to also be able to demonstrate the skills described in previous levels. A student would not necessarily demonstrate all the skills listed at a particular achievement level on a particular test in order to score at that level.

## Achievement Level Definitions

**Needs Support** – Student may partially meet the standards but needs support to master the knowledge and skills of current grade−level content.

**Approaching Proficient** – Student partially meets the standards and may have gaps in knowledge and skills but is approaching mastery of some grade level content.

**Proficient** – Student meets the standards and demonstrates mastery of the knowledge and skills of most grade level content.

**Advanced** – Student meets the standards and demonstrates mastery of the knowledge and skills on a range of complex grade level content.

## Grade 3

### Operations and Algebraic Thinking

| AK Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 3.OA.1 | Interprets the products of whole numbers as a sum of equal addends (e.g., determines 3 + 3 + 3 + 3 to be equivalent to 3 x 4). | Interprets the product of whole numbers when given a visual representation (e.g., interprets an array of 3 groups of 4 marbles in each group as 3 x 4). | Interprets the product of whole numbers without a visual representation (e.g., interprets a description of 3 groups of 4 marbles in each group as 3 x 4).  Constructs an array that represents a real-world or mathematical multiplicative situation. | Generates a real-world context that can be modeled by a given multiplication expression. |
| 3.OA.2 | When given a visual representation, interprets the quotients of whole numbers (e.g., interprets a picture of 12 marbles divided equally into 3 groups as 12 ÷ 3). | Constructs a representation of a real-world or mathematical division situation (e.g., moves 12 marbles into groups of 3 to represent 12 ÷ 3). | Interprets the quotients of whole numbers without a visual representation (e.g., interprets a description of dividing 12 marbles into groups with 3 in each group as 12 ÷ 3). | Generates a real-world context that can be modeled by a given division expression. |
| 3.OA.3 | Determines a visual representation for a one-step multiplication or division word problem or situation involving equal groups, arrays, or measurement quantities.  Solves a one-step multiplication or division word problem involving equal groups, arrays, or measurement quantities involving well-known math facts (e.g., 1s, 2s, 5s, 10s). | Solves a one-step multiplication or division word problem involving equal groups, arrays, or measurement quantities with visual supports provided in the problem.  Represents a one-step multiplication or division word problem involving equal groups, arrays, or measurement quantities with an equation using a symbol to represent the unknown number.  Identifies real-world situations that are represented by one-step equations that involve multiplication or division. | Solves a one-step multiplication or division word problem involving equal groups, arrays, or measurement quantities.  Identifies arrays that represent real-world situations that involve multiplication or division.  Identifies missing information necessary to solve one-step word problems that involve multiplication or division. | Analyzes representations of and solutions to one-step multiplication or division word problems involving equal groups, arrays, or measurement quantities. |
| 3.OA.4 | Determines the unknown whole number in a multiplication or division equation when the unknown number is 1 (e.g., 8 = ? x 8 or 8 ÷ ? = 8). | Determines the unknown whole number in a multiplication or division equation when the given numbers and the unknown number are single-digit whole numbers (e.g., 8 = ? x 4 or 8 ÷ ? = 4). | Determines the unknown whole number in a multiplication or division equation when the equation includes a two-digit whole number (e.g., 48 = ? x 8 or 48 ÷ ? = 8). | Determines the quantity represented by a symbol for the unknown within an equation that involves multiplication or division. |
| 3.OA.5 | Identifies the multiplicative equation that is in the same fact family as a given equation that involves division.  Identifies an equivalent expression that uses the commutative property of multiplication for a given expression. | Identifies an equivalent expression that uses the associative property or distributive property of multiplication. | Simplifies multiplicative expressions by applying properties of operations.  Rewrites numerical and algebraic equations by applying properties of operations. | Solves algebraic equations that involve multiplication or division by applying properties of operations. |
| 3.OA.6 | Identifies a model that represents the problem. | Solves a division unknown-factor problem for well-known facts (e.g., 2s, 5s, 10s). | Solves a division unknown-factor problem for all dividends less than 100. | Solves a division unknown-factor problem for all dividends between 102 and 200 with a single-digit divisor. |
| 3.OA.7 | Identifies the product of two one-digit numbers for well-known math facts (e.g., 1s, 2s, 5s, 10s). | Identifies the one-digit quotient given the dividend and one-digit divisor (e.g., 6 ÷ 2 = 3). | Determines products of two numbers for products less than or equal to 100 (e.g., 3 x 6 = 18). | Determines quotients for divisors and dividends less than or equal to 100 (e.g., 36 ÷ 3 = 12). |
| 3.OA.8 | Solves one-step word problems involving addition or subtraction within 1,000. | Solves one-step word problems involving only multiplication or division within 100.  Solves two-step word problems involving only addition and/or subtraction within 1,000.  Creates one-step word problems involving multiplication or division within 100. (Note: If this cannot be done within the bounds of this assessment, the student could also select or identify.)  Creates one-step word problems involving addition and/or subtraction within 1,000. (Note: If this cannot be done within the bounds of this assessment, the student could also select or identify.) | Solves two-step word problems using any of the four operations: addition and subtraction within 1,000 and multiplication and division within 100.  Creates a two-step word problem using any of the four operations: addition and subtraction within 1,000 and/or multiplication and division within 100. (Note: If this cannot be done within the bounds of this assessment, the student could also select or identify.)  Generates an equation using a symbol to represent a real-world problem. | Solves an equation that represents a real-world situation to determine the quantity represented by a symbol.  Identifies an error in an incorrect solution method. |
| 3.OA.9 | Identifies rules in given patterns.  Identifies subsequent terms as even or odd numbers. | Completes patterns with consecutive terms.  Identifies arithmetic operations that result in odd or even numbers.  Determines one or more missing terms in a pattern that uses an addition or a multiplication rule. | Identifies patterns that use the same rules as each other. | Identifies terms as even or odd numbers where the terms are not consecutive to the given numbers.  Explains patterns in the multiplication table using properties of operations.  Identifies errors in the way that patterns were incorrectly extended. |

### Number and Operations in Base Ten

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 3.NBT.1 | Identifies the result when two-digit numbers are rounded to the nearest 10.  Uses number lines to identify the result when numbers are rounded to the nearest 10 or 100. | Identifies the result when three-digit numbers are rounded to the nearest 100. | Identifies the numbers that round to a given result when rounded to the nearest 10 or 100.  Determines the result when a number is rounded to the nearest 10 or 100. | Identifies errors in the result when incorrectly rounding numbers to the nearest 10 or 100.  Rounds whole numbers to the nearest 10 or 100 in which the digit in question changes to 0 and the next digit to the left increases by 1 (rounding results in regrouping). |
| 3.NBT.2 | Adds numbers with the same number of digits within 100 without regrouping.  Subtracts numbers with the same number of digits within 100 without regrouping. | Adds numbers within 1,000 without regrouping.  Subtracts numbers with the same number of digits within 1,000 without regrouping. | Adds or subtracts numbers within 1,000, including cases that require regrouping. | Explains how to check the accuracy of a sum or difference of given numbers using the relationship between addition and subtraction. Identifies errors in the result when incorrectly adding or subtracting numbers within 1,000. |
| 3.NBT.3 | Multiplies 1 by multiples of 10 in the range 10 to 90. | Multiplies one-digit whole numbers by multiples of 10 in the range 10 to 90, where the result is a two-digit number. | Multiplies one-digit whole numbers by multiples of 10 in the range 10 to 90, where the result may be a three-digit number. | Identifies errors in the result when incorrectly multiplying one-digit whole numbers by multiples of 10 in the range 10 to 90.  Determines an unknown factor when multiplying a one-digit number by a multiple of 10 in the range 10 to 90. |

### Number and Operations—Fractions

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 3.NF.1 | Identifies wholes that are partitioned into equal-sized parts. | Identifies the fraction that is represented by a given figure.  Identifies a figure that represents a given fraction. | Represents a given fraction with an area model.   Determines the fraction represented by a given area model. | Identifies errors in the incorrect use of *a*/b to represent a parts of size 1/b.  Explains how to represent a fraction with a figure. |
| 3.NF.2 | Identifies the point on a number line that represents a unit fraction (e.g., 1/2, 1/3, 1/4). | Identifies the point on a number line that represents a proper fraction.  Identifies the unit fraction that is represented by a point on a number line.  Determines a non-unit fraction (a fraction with a numerator greater than 1 such as 2/8) that is represented by a point on a number line. | Represents and labels a fraction between 0 and 1 on a number line or ruler. | Explains how to represent a fraction with a point on a number line. |
| 3.NF.3 | Identifies two equivalent fractions that are represented on number lines. | Identifies two equivalent fractions between 0 and 1 without supports.  Identifies area models or number lines that represent whole numbers as fractions.  Compares two fractions using a visual fraction model. | Generates two simple equivalent fractions (e.g., 1/2, 2/4, 3/6).  Explains why two fractions are equivalent using a visual fraction model.  Identifies fractions that are equivalent to whole numbers.  Represents whole numbers as fractions using an area model or number line.  Compares two fractions with the same numerator or same denominator and records the results using comparison symbols. | Uses equivalent fractions to compare other fractions.  Identifies errors in incorrect comparisons of equivalent fractions.  Generates a fraction that is between two given fractions with the same numerator or same denominator. |

### Measurement and Data

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 3.MD.1 | Identifies the time to the nearest five minutes shown on an analog clock. | Identifies the analog clock that shows a given time.  Adds or subtracts time intervals to or from given times, provided that the hour in the result is the same as the given hour. | Writes the time to the nearest minute shown on an analog clock.   Solves word problems involving addition and subtraction of time intervals. | Identifies errors in incorrect calculations involving times and time intervals. |
| 3.MD.2 | Solves measurement problems involving well-known math facts and diagrams that include labels on all intervals. | Solves measurement problems involving well-known math facts with or without labeled diagrams.  Identifies masses or capacities of everyday objects.  Identifies expressions to represent one-step word problems involving masses or volumes. | Uses drawings, such as balances and the transitive property of inequality, to compare measurements.  Solves one-step word problems involving masses or volumes.  Generates one-step word problems using one operation.  Determines the measurement of liquid volumes or masses of objects given in pictures.   Estimates the measurement of everyday objects. | Identifies differences of measurements on a number line.  Solves measurement problems with symbols representing unknown values.  Compares the measurement of two different objects or capacities. |
| 3.MD.3 | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* |
| 3.MD.4 | Identifies the number of data points in a specific category on a scaled picture graph or scaled bar graph. | Solves one-step “how many more” and “how many less” problems involving well-known math facts and scaled bar graphs or picture graphs.  Identifies scaled picture graphs and scaled bar graphs that represent given data.  Given a scaled picture graph or scaled bar graph and a set of data, places labels on the graph. | Explains correct comparisons of data represented in scaled picture graphs and bar graphs.  Solves two-step “how many more” and “how many less” problems involving scaled picture graphs and scaled bar graphs.  Creates a scaled picture graph or scaled bar graph given a set of data. | Identifies errors in scaled bar graphs or scaled picture graphs given a set of data. |
| 3.MD.5 | Measures lengths of objects with rulers to the nearest one-half inch when the ruler is shown and the object is aligned with 0 on the ruler.   Identifies line plots or lists that represent given measurement data presented as diagrams of objects near a ruler, where the data is measured to the nearest whole number. | Measures lengths of objects with rulers to the nearest one-fourth inch when the ruler is shown and the object is aligned with 0 on the ruler.   Identifies line plots or lists that represent given measurement data presented as diagrams of objects near a ruler, where the data is measured to the nearest quarter of an inch. | Measures lengths of objects with rulers to the nearest one-fourth or one-half inch when the ruler is not already aligned with the object.  Identifies line plots that represent given measurement data presented as lists, where the data is measured to the nearest quarter of an inch.  Generates line plots for given sets of data. | Measures lengths of objects with rulers to the nearest one-fourth or one-half inch when the ruler is shown and the object is not aligned with 0 on the ruler.   Identifies line plots that represent measurement data that are obtained with a ruler.  Measures lengths using a ruler and makes a line plot to represent the data. |
| 3.MD.6 | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* |
| 3.MD.7 | Identifies a unit square and that its area is one square unit. | Identifies figures divided into unit squares. | Identifies a real-world measurement that is an area measurement and can be measured in square units. | Explains or analyzes how to find the area of a figure by placing unit squares on the figure without gaps or overlaps (e.g., explains why the same size square is needed to cover the shape to determine the area). |
| 3.MD.8 | Measures area by counting unit squares. | Measures the area of a rectangle by counting unit squares and justifies the result. | Measures area by tiling using unit squares.  Determines the area of a partially tiled rectangle. | Identifies the area of composite figures using smaller, non-square figures.  Justifies and estimates the area of rectangular and composite figures. |
| 3.MD.9 | Identifies figures with equivalent areas. | Identifies arrays to represent a given multiplication expression. Identifies expressions to represent the decomposition of a non-rectangular figure to calculate the total area. | Identifies equations that represent the areas of given figures represented by tiling.  Justifies the areas of given figures using area models.  Identifies figures with given areas.  Tiles a rectangle and generates a multiplication equation to represent the area.  Calculates the areas of non-rectangular figures by decomposing the figures into rectangles. | Identifies side lengths and perimeters given the areas and other dimensions of rectangles.  Describes how to find the area of composite figures.  Identifies possible dimensions given areas of rectangular figures.  Compares areas of figures.  Solves two- or three-step real-world problems involving the area of a rectangle given a diagram. |
| 3.MD.10 | Identifies the perimeter of polygons, where all side lengths are given. | Determines the perimeter of regular polygons with only one side length labeled. | Identifies figures with equivalent perimeters but different areas.  Identifies figures with equivalent areas but different perimeters.  Identifies a missing side length of a figure given the perimeter and other side lengths.  Calculates perimeters of polygons in real-world and mathematical problems. | Identifies errors in incorrect claims about areas and perimeters of figures.  Identifies counterexamples to claims regarding perimeters and areas of figures (e.g., given the claim that all rectangles with the same perimeter have the same area, provides two rectangles with the same perimeters but different areas). |

### Geometry

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 3.G.1 | Identifies a square as a quadrilateral. | Identifies trapezoids and rectangles as quadrilaterals. | Identifies different types of quadrilaterals.  Sorts quadrilaterals into categories based on given attributes.   Identifies non-examples of shapes given a description.   Generates a quadrilateral based on a given description. | Identifies characteristics of different quadrilaterals.  Explains the relationships among different types of quadrilaterals.   Explains characteristics of figures that can be divided into different parts with certain conditions. |
| 3.G.2 | Identifies figures that are divided into any number of equal parts. | Identifies the unit fraction represented by each section of an area model. | Generates an area model to represent a given unit fraction. | Explains how to divide a figure into a certain number of equal parts.  Identifies errors in incorrect reasoning related to figures that are divided into equal parts.  Matches multiple area models representing unit fractions with the correct unit fraction. |

## Grade 4

### Operations and Algebraic Thinking

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 4.OA.1 | Identifies simple word problems solved using a given multiplication expression. | Identifies the relationship between the values in a multiplication equation.   Completes simple statements of multiplicative comparisons by providing a missing value that represents a factor or product in the comparison. | Generates one or more equations that represent a multiplicative comparison described in words. | Generates a word problem that would be solved with a given multiplication equation. |
| 4.OA.2 | Solves word problems using additive comparisons.  Identifies an equation that represents a given word problem involving a multiplicative comparison. | Uses multiplication to solve a word problem involving a multiplicative comparison. | Uses division to solve a word problem involving a multiplicative comparison.  Identifies when a model does or does not represent a multiplicative comparison in a given contextual situation. | Given a multiplicative comparison in context, determines more than one expression that represents the comparison. |
| 4.OA.3 | Uses two operations to solve two-step word problems in which any multiplication or division step is based on simple multiplication facts. | Uses any of the four operations to solve multi-step word problems where letters are used for the unknown quantity and in which any division steps do not result in remainders that must be interpreted.  Identifies expressions that represent how to solve a multi-step word problem. | Uses any of the four operations to solve multi-step word problems in which the remainder in a division step must be interpreted. Generates expressions that represent how to solve a multi-step word problem.  Generates an estimate to a multi-step word problem and then solves the problem, comparing the estimate to the actual solution.   Writes and solves word problems using letters for the unknown quantity. | Given a word problem and an equation representing how it is solved, explains the meaning of the different values in the equation, including any resulting remainder.  Solves a multi-step word problem, and then solves an additional word problem that requires using the answer from the first problem.  Writes and solves multi-step word problems using letters for the unknown quantity. |
| 4.OA.4 | Identifies factors of a number in the range 1–100 when options given are all less than or equal to the number.  Identifies multiples of a number in the range 1–100 when all options given are greater than or equal to the number. | Identifies one or more factors of a number in the range 1–100 when the options given include values less than, equal to, or greater than the number.  Identifies one or more multiples of a number in the range 1–100 when the options given include values less than, equal to, or greater than the number. | Identifies a list of numbers that are all prime numbers in the range 1–100.  Identifies a list of numbers that are all composite numbers in the range 1–100. | Categorizes numbers in the range 1–100 as factors, multiples, or neither factors nor multiples of a given number.  Categorizes individual numbers in the range 1–100 as prime or composite. |
| 4.OA.5 | Determines one or more missing terms in a pattern given an addition rule used to generate the pattern.  Determines the next figure in a pattern using figures or determines a pattern of figures that follows the same rule as a given pattern of figures. | Extends a pattern beyond the given terms when the pattern uses small values or follows an easy adding or subtracting rule or a rule of doubling. | Determines one or more missing terms in a pattern that uses a multiplication or division rule.  Determines values that complete a table of pairs of related values, including in contextual situations.  Generates a number or shape pattern given a rule.  Analyzes a pattern to determine the rule used and applies the rule to find a term well beyond the next few terms that would occur in the pattern.  Identifies features of a pattern that are not explicit in the rule, such as whether terms in the pattern are all odd numbers or even numbers or alternating between odd and even. | Explains the rule used for a number pattern and justifies with examples and calculations that the rule is correct. |
| 4.OA.6 | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* |

### Number and Operations in Base Ten

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 4.NBT.1 | Identifies in a multi-digit whole number a digit in one place represents ten times what it represents in the place to its right for numbers up to 10,000. | Identifies in a multi-digit whole number a digit in one place represents ten times what it represents in the place to its right for numbers greater than 10,000 but less than 100,000. | Identifies in a multi-digit whole number a digit in one place represents ten times what it represents in the place to its right for numbers greater than 100,000 but less than 1,000,000. | Explains why a digit in one place represents ten times what it represents in the place to its right.  Generates a number where the digit in one place is ten times the digit in the place to its right in another number.  Compares the same digit in two different numbers based on the place the digit is in for numbers greater up to 1,000,000. |
| 4.NBT.2 | Identifies a given number in one form in another form (e.g., given a number in expanded form, identifies the number in number names) up to 10,000. Compares two multi-digit numbers greater than 1,000 and less than 10,000 using a model such as base-ten blocks. | Identifies a given number in one form in another form (e.g., given a number in expanded form, identifies the number in base-ten numerals) up to 100,000.  Compares values represented in two different ways, such as in expanded form and word form.  Compares two multi-digit numbers greater than 10,000 and less than 100,000 using comparison symbols. | Translates between using base-ten numerals, number names, and expanded forms of numbers.  Determines a number that is greater than, equal to, or less than a given number up to 1,000,000.   Compares two multi-digit numbers greater than 100,000 and less than 1,000,000 using comparison symbols. | Identifies a given number in expanded notation in another form (e.g., given a number in expanded notation, identifies the number in number names and base-ten numerals) up to 100,000.  Uses understanding of place value to determine a whole number value that falls between a given range of values.  Justifies comparisons of numbers by explaining how place value would be used to make the comparisons.  Compares more than two multi-digit numbers up to 1,000,000 using comparison symbols. |
| 4.NBT.3 | Rounds whole numbers in which the digit in question stays the same or increases by 1 to a digit of 9 or less (no regrouping). | Rounds whole numbers in which the digit in question changes to 0 and the next digit to the left increases by 1 (rounding results in regrouping). | Identifies the numbers that round to a given result when rounded to any place value up to 1,000,000.  Determines the result when a number is rounded to the nearest place value up to 1,000,000.  Rounds the same whole number to two different places. | Determines how the results of an estimated calculation for a word problem in context compares to the results of the actual calculation.  Determines different values that will round to the same number when they are rounded to a given place. |
| 4.NBT.4 | Adds two multi-digit numbers within 1,000,000 without regrouping. Subtracts to solve problems within 1,000,000 without regrouping. | Adds two multi-digit numbers within 1,000,000 with one regrouping step.  Subtracts to solve problems within 1,000,000 with one regrouping step. | Adds and subtracts two multi-digit whole numbers within 1,000,000 with more than one regrouping step.  Verifies the accuracy of a sum or difference of given numbers using the relationship between addition and subtraction. | Adds and subtracts more than two multi-digit whole numbers within 1,000,000 with and without regrouping.  Solves problems that require addition and then subtraction within 1,000,000 to determine a final result.  Determines a missing addend or minuend given an algorithm or expression.  Justifies the reasonableness of the answer to an addition and/or subtraction problem within 1,000,000. |
| 4.NBT.5 | Solves non-contextual multiplication problems of two whole numbers in which only one factor is a multi-digit number with three or fewer digits.  Relates rectangular arrays to simple multiplication expressions. | Solves contextual problems that require multiplication in which at least one factor is a multi-digit number with three or fewer digits.  Identifies an area model for a multiplication problem to show decomposed factors and partial products. | Solves non-contextual multiplication problems of a whole number of one digit and a whole number of up to four digits OR two two-digit numbers.   Decomposes a multiplication expression into an expression that distributes the factors to represent partial products.  Completes area models for multiplication to show decomposed factors and partial products. | Solves contextual problems that require multiplication of two two-digit numbers.  Explains the relationship between factors in a multiplication expression and a model or equivalent expression that represents the same product. |
| 4.NBT.6 | Solves division problems with two-digit dividends and one-digit divisors that result in a quotient without a remainder.  Given a division expression or equation, determines a related multiplication expression or equation. | Solves division problems with four-digit dividends and one-digit divisors that result in a quotient without a remainder.  Identifies an area model to represent a division problem. | Solves division problems with four-digit dividends and one-digit divisors that result in a quotient with a remainder.   Explains how to use multiplication (and addition for remainders) to determine whether a quotient is correct.  Completes an area model for division.  Uses division to determine a missing factor in a multiplication equation. | Solves contextual division problems with four-digit dividends and one-digit divisors in which a remainder must be interpreted to determine the correct final answer.  Explains the meaning of the whole number and the remainder in a quotient.  Explains how a remainder affects a final answer to a contextual word problem solved with division. |

### Number and Operations – Fractions

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 4.NF.1 | Identifies fractions equivalent to 1/2 with or without visual models. | Determines a numerator or denominator missing in a fraction that is equivalent to another fraction.  Identifies fractions equivalent to fractions with the denominators 3, 4, 6, and 8 with or without visual models. | Explains whether two visual fraction models represent the same portion of a defined whole.  Explains that equivalent fractions are generated by multiplying the numerator and denominator by the same value.  Generates equivalent fractions by multiplying the numerator and denominator by the same value.  Determines equivalent fractions with fraction models that represent (*n* x *a*)/(*n* x *b*) for a given fraction where *n* is a whole number (e.g., identifies a fraction model that represents (2 x 4)/(2 x 6)). | Explains whether two described fraction models represent the same portion of a defined whole. |
| 4.NF.2 | Compares two fractions between 0 and 1 with the same denominators using the symbols >, =, or <. | Orders a set of three or more fractions with the same numerators or same denominators less than or equal to 1 from least to greatest or greatest to least.  Completes a fraction that is greater than, less than, or equal to another fraction with a different numerator and different denominator. | Compares two fractions greater than 1 using the symbols >, =, or <.  Determines one or more fractions that are greater than or less than a given fraction.  Determines one or more fractions that fall in the range between two given fractions with different numerators and different denominators.  Orders two or more fractions with different numerators and different denominators using comparison symbols.   Uses a visual fraction model to explain the comparison of two fractions with different numerators and different denominators. | Compares mixed numbers and fractions greater than 1 using the symbols >, =, or <.  Orders fractions and mixed numbers, including placing the values correctly on a number line.  Identifies errors in comparing two fractions with different numerators and different denominators and explains the correct comparison using a visual fraction model. |
| 4.NF.3 | Identifies an area model that represents a unit fraction.  Represents real-world or mathematical problems involving addition or subtraction of fractions or mixed numbers using an equation. | Determines the missing addend in an equation with a sum that is a fraction less than 1.  Determines the sum or difference of fractions or mixed numbers with like denominators in mathematical problems when regrouping is not required.  Solves a real-world or mathematical problem involving addition or subtraction of fractions or mixed numbers when regrouping is not required. | Identifies one expression that represents the addition or subtraction of fractions represented with area models.  Generates an equation to record a decomposition of a fraction into a sum of fractions with like denominators.  Determines the sum or difference of fractions or mixed numbers with like denominators in mathematical problems when regrouping is required.  Solves a real-world or mathematical problem involving addition or subtraction of fractions or mixed numbers when regrouping is required. | Identifies two or more expressions that represent the addition or subtraction of fractions modeled on a number line.  Explains whether a given decomposition of a fraction into a sum of fractions with like denominators is accurate for the given fraction.  Solves a two-step real-world or mathematical problem involving addition or subtraction of fractions or mixed numbers with or without regrouping. |
| 4.NF.4 | Identifies a model that represents a solution to a problem in which a whole number is multiplied by a fraction. | Identifies one or more expressions that represent the same product as a given expression in which a whole number is multiplied by a fraction.  Identifies the solution to a non-contextual problem in which a whole number is multiplied by a fraction. | Determines the product of a fraction and whole number in contextual and non-contextual problems.  Generates and solves an expression to represent a real-world problem in which a whole number is multiplied by a fraction.   Identifies an expression that represents how to solve a word problem that requires multiplying a fraction by a whole number.  Identifies a model that represents an equation in which a whole number is multiplied by a fraction. | Solves contextual word problems that require comparing the product of a whole number and a fraction to a given whole number.  Identifies errors in solving a real-world or mathematical word problem in which a whole number is multiplied by a fraction. |
| 4.NF.5 | Represents fractions with denominators of 10 using an area model. | Identifies equivalent fraction models when one fraction is partitioned into 10 equal parts and one is partitioned into 100 equal parts. | Determines the sum of two fractions with respective denominators of 10 and 100.  Expresses a fraction with denominator of 10 as an equivalent fraction with denominator of 100. | Models the sum of fractions with respective denominators of 10 and 100 with equivalent sums or visual models in which the fractions are represented with a common denominator. |
| 4.NF.6 | Identifies a decimal number that is equivalent to a given proper fraction with a denominator of 10. | Identifies a decimal number that is equivalent to a given proper fraction with a denominator of 100. | Generates a fraction that is equivalent to a given decimal number less than 1.  Generates a decimal equivalent for a given proper fraction. | Generates a fraction that is equivalent to a given decimal number greater than 1.  Generates a decimal equivalent for a given improper fraction. |
| 4.NF.7 | Compares two decimal numbers with the same number of decimal places. | Compares two decimal numbers less than 1 when one number has digits through the tenths place and the other has digits to the hundredths place.  Represents and compares two decimal numbers using visual models. | Identifies two or more correct comparisons of decimal numbers.  Compares two decimal numbers including numbers greater than 1 when one number has digits through the tenths place and the other has digits to the hundredths place. Compares two decimal numbers and justifies the comparison using a visual model.  Explains why a comparison of decimal numbers is correct or incorrect with valid reasoning and/or models. | Orders three or more decimal numbers greater than 1.  Compares decimal values represented in two different ways (e.g., compares the value represented by an area model partitioned into tenths to a decimal number with digits to the hundredths place).  Identifies errors in comparing two decimal numbers to the hundredths and determines the correct comparison. |

### Measurement and Data

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 4.MD.1 | Identifies that a conversion from a measurement using larger units to smaller units increases the number (e.g., 5km = 5000m).    Identifies a conversion from a measurement using smaller units to larger units decreases the number (e.g., 500m = 0.5km). | Converts units of measurement, using multiplication. | Solves one-step problems in measurement conversion, using the four operations with distance, time, liquid volume, mass, and money.  Records or generates a table to record conversions from a larger unit in terms of a smaller unit. | Solves multi-step measurement conversion problems, using the four operations.  Compares and orders measurements expressed in different units from least to greatest or greatest to least.  Given a measurement of a real-world object in units, determines the unit of measurement that was used to make the measurement by reasoning about the size of the units.  Records a measurement in a smaller unit in terms of a larger unit. |
| 4.MD.2 | Solves addition or subtraction word problems within the same measurement unit. | Solves problems by converting measurements given in terms of two units of different magnitude to a measurement using one of the units (e.g., converts a length expressed in feet and inches to a length expressed in inches).  Solves single-step problems related to distance, time, money, volume, or mass. | Solves multi-step problems requiring conversions of measurements expressed in different units to measurements using the same unit.  Solves two-step problems related to distance, time, money, volume, or mass.  Uses number lines to represent measurements. | Locates measurements expressed in one unit on a number line scaled in a different unit.  Solves word problems that require expressing a measurement in a smaller unit in terms of a larger unit.  Solves multi-step problems related to distance, time, money, volume, or mass. |
| 4.MD.3 | Determines perimeters of rectangles when all side lengths are labeled.    Uses tiles to calculate area. | Determines perimeters of rectangles when the length and width are stated or shown in a diagram.  Determines areas of rectangles when the length and width are stated or shown in a diagram. | Identifies expressions that represent perimeters or areas of rectangles.  Identifies two or more rectangles that have a given perimeter or a given area.  Identifies two or more sets of dimensions that define a rectangle with a given perimeter or area.  Solves real-world area and perimeter problems using area and perimeter formulas.  Determines the width or length of a rectangle given the area and the length or width of the rectangle.  Determines the width or length of a rectangle given the perimeter and the length or width of the rectangle. | Solves multi-step problems involving perimeters and/or areas of rectangles.  Identifies errors in solving area and perimeter word problems. |
| 4.MD.4 | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* |
| 4.MD.5 | Identifies a line plot that correctly displays a data set when all tick marks on the number line are marked with values.  Determines the number of data points for a given value on a line plot. | Identifies a line plot that correctly displays a data set when whole numbers and some but not all fractional intervals are labeled on the number line.  Solves problems involving addition and subtraction of whole number values represented on such line plots. | Identifies a line plot that correctly displays a data set when whole numbers only are labeled on the number line and tick marks representing fraction intervals are not.  Generates a line plot to correctly display a data set using unit fractions and whole numbers.  Solves problems involving addition and subtraction of unit fractions represented on such line plots. | Identifies and explains how to correct errors in a line plot based on the data set the line plot should represent. |
| 4.MD.6 | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* | *Locally Assessed* |
| 4.MD.7 | Identifies when a figure does or does not represent an angle. | Identifies the verbal definition of “angle.”  Estimates angle measures using benchmarks such as right angles and the total number of degrees in a full circle. Compares angle sizes visually. | Determines an angle measure based on the fraction of a circle the angle turns through (e.g., given an angle turns through 1/4 of a circle, determines that the angle measures 90 degrees).  Determines the fraction of a circle an angle turns through (e.g., given an angle measuring 90 degrees is turned through a circle, determines that the angle turns through 90/360 of the circle). | Identifies true statements about angles, angle measures, and the number of degrees in a full circle. |
| 4.MD.8 | Reads angle measures on a protractor when the angle being measured begins on the left horizontal portion of the protractor and turns clockwise through the labeled degrees. | Reads angle measures on a protractor when the angle being measured begins on the right horizontal portion of the protractor and turns counterclockwise through the labeled degrees.  Identifies angles with given measures or that fall in a given range of measures. | Measures angles with a protractor.  Generates an angle in a given whole number degrees. | Given multiple rays that form angles on a protractor, determines which rays form an angle of a stated measure.  Determines angle measures when the angle is shown on a protractor with neither ray located on the horizontal 0-degree line. |
| 4.MD.9 | Represents composite angles given a diagram without degree measures (e.g., given angle ABD defined as made up of angle ABC, and CBD represents that angle ABD is the sum of angles ABC and CBD, and that the measure of angle ABC is the difference of angles ABD and angle CBD). | Represents composite angles given a diagram with degree measures (e.g., given angle ABD defined as made up of angle ABC, and CBD represents that angle ABD is the sum of angles ABC and CBD, and that the measure of angle ABC is the difference of angles ABD and angle CBD).   Determines the measure of an angle formed by two adjacent angles that have their measures given. | Determines the measure of an angle when a larger angle and one adjacent angle are given.  Solves addition and subtraction problems by finding unknown angle measurements. | Explains and justifies the steps to determine the measure of an angle that is part of a larger angle formed by two or more adjacent angles.  Identifies errors in solving a real-world or mathematical word problem involving finding unknown angle measurements. |

### Geometry

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 4.G.1 | Identifies figures that represent points, lines, line segments, rays, and angles. | Identifies acute, right, and obtuse angles in figures.  Identifies parallel and/or perpendicular sides in polygons, and identifies polygons that have parallel and/or perpendicular sides.  Determines the number of pairs of parallel sides and/or the number of pairs of perpendicular sides in a figure.  Determines the number of acute, right, and/or obtuse angles in figures. | Identifies multiple traits of a figure with regard to parallel sides, perpendicular sides, and types of angles formed by vertices.  Generates points, lines, line segments, rays, different types of angles, and different types of lines.  Selects parts of a two-dimensional figure that represent parallel or perpendicular lines or different types of angles. | Compares and contrasts traits of two groups of figures based on common characteristics of the figures in each group.  Determines the type of angle (acute, right, obtuse) formed by adjacent angles given the measure of each angle that composes the larger angle. |
| 4.G.2 | Identifies right triangles displayed with the right angle vertex oriented on the horizontal base of the triangle.  Distinguishes between triangles and quadrilaterals. | Identifies right triangles displayed in various orientations.  Identifies figures that do or do not have acute, right, and/or obtuse angles. | Categorizes figures based on traits related to angle sizes and/or the presence of parallel sides or perpendicular sides.  Classifies each triangle in a given set as a right triangle or not a right triangle.   Describes the features that define a right triangle. | Describes the features of a triangle that is not a right triangle.  Describes a common feature or features among a given set of figures. |
| 4.G.3 | Identifies when a line drawn on a simple figure is a line of symmetry.  Identifies which figures in a given set have exactly one line of symmetry.  Determines the number of lines of symmetry for a given simple figure. | Identifies which figures in a given set have exactly *n* lines of symmetry, where *n* is a specified number greater than 1. | Given a description of a figure, determines whether the figure has a line of symmetry.  Categorizes figures based on the number of lines of symmetry they have.   Generates one or more lines of symmetry for a given figure.   Identifies when a line drawn on a complex figure is a line of symmetry. | Given a figure and its side lengths and angle measures, explains why the figure does or does not have one or more lines of symmetry. |

## Grade 5

### Operations and Algebraic Thinking

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 5.OA.1 | Evaluates a numerical expression that includes grouping symbols and that requires two steps to be evaluated.  Identifies a numerical expression to represent a given value that includes grouping symbols and that requires two steps to be evaluated (e.g., given 10 identifies (2 + 3) x 2). | Evaluates a numerical expression that includes grouping symbols and that requires two to three steps to be evaluated, where all computations involve easy-to-compute numbers (e.g., using multiples of 0, 1, 2, 5, and 10).   Constructs a numerical expression to represent a given value that includes grouping symbols and that requires two steps to be evaluated (e.g., given 10 constructs (2 + 3) x 2). | Evaluates a numerical expression that includes grouping symbols and that requires multiple steps to be evaluated (e.g., evaluates the expression (2 + 5) x (5 + 2) x (13 + 4) or the expression 2 x (5 + 13) + 11).  Constructs or identifies a numerical expression to represent a given value that includes grouping symbols and that requires three steps to be evaluated (e.g., given 20 constructs (2 x 5) + (2 x 5)).  Identifies numerical expressions that represent real-world situations.  Identifies an error in an incorrectly evaluated expression.   Identifies equivalent expressions that include grouping symbols. | Determines the value of an expression that includes nested grouping symbols. Explains and corrects an error in an incorrectly evaluated expression. Constructs or identifies a numerical expression to represent a given value that includes grouping symbols and that requires four or more steps to be evaluated (e.g., given 20 constructs (2 x 2) + (2 x 5) (2 x 3)). |
| 5.OA.2 | Translates from a numerical expression to its written word form or translates from a written word statement to a numerical expression, limited to a single operation without grouping symbols (e.g., translating the expression “8 + 4” to “the sum of 8 and 4”). | Translates from a numerical expression requiring grouping symbols to its written word form or translates from a written word statement to a numerical expression requiring grouping symbols. | Translates between a numerical expression requiring grouping symbols and its written word form (words to symbols and symbols to words). | Translates from a numerical expression with grouping symbols and more than one equivalent written word form. |
| 5.OA.3 | Extends two numerical patterns to the next term.  Identifies the coordinate plane. | Identifies or generates a rule for a given pattern.   Generates two numerical patterns from two different starting numbers using the same rule.  Identifies ordered pairs on a coordinate plane. | Generates two numerical patterns from two rules.  Names corresponding pairs of terms as ordered pairs.  Explains relationships between the corresponding terms of two patterns.   Graphs ordered pairs generated from two patterns in the first quadrant of a coordinate grid. | Generates two complex numerical patterns from two rules.  Identifies corresponding terms in two complex numerical patterns.  Explains and analyzes the relationship between corresponding terms in two complex numerical patterns.  Explains and analyzes data displayed on a coordinate plane graphed in the first quadrant of a coordinate grid using ordered pairs generated from two patterns. |

### Number and Operations in Base Ten

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 5.NBT.1 | Identifies the place value of digits in a multi-digit number. | Compares the place value of digits in a multi-digit number (e.g., identifies that the ‘5’ in 1,534 is 10 times the ‘5’ in 52). | Identifies when a digit in a multi-digit number is 1/10 of a digit in another multi-digit number (e.g., identifies that the ‘5’ in 52 is 1/10 the ‘5’ in 1,534). | Explains why a digit in one place represents 1/10 times what it represents in the place to its left. |
| 5.NBT.2 | Recognizes when number patterns change by a factor of 10 (limited to whole numbers). | Explains patterns in the number of zeros and the placement of the decimal when multiplying a number by powers of 10. | Represents a power of 10 using whole-number exponents (e.g., 10,000 is represented as 1x104). | Explains patterns in the number of zeros and the placement of the decimal when dividing a number by powers of 10. |
| 5.NBT.3 | Reads and writes decimals to the tenths using standard form, number name, or expanded form (e.g., recognizes that thirty and 8 tenths represents 30.8).  Compares numbers up to the tenths place based on the meanings of the digits in each place, including using symbols <, >, and = in comparisons. | Reads and writes decimals to the hundredths using standard form, number name, or expanded form (e.g., recognizes that 30 + 4 + 0.8 + 0.02 represents 34.82).  Compares numbers up to the hundredths place based on the meanings of the digits in each place, including using symbols <, >, and = in comparisons. | Reads and writes decimals to the thousandths using standard form, number name, or expanded form (e.g., recognizes that 30 + 4 + 0.8 + 0.02 + 0.005 represents 34.825).  Compares numbers up to the thousandths place based on the meanings of the digits in each place, including using symbols <, >, and = in comparisons. | Reads and writes decimals to the thousandths using expanded notation and standard form, number name, or expanded form (e.g., recognizes that 30 x 1 + 4 x 1 + 8 x 1/10 +2 x 1/100 + 5 x 1/000 represents 31.825).  Illustrates and explains comparisons between two numbers where at least one number is a decimal to the thousandths. |
| 5.NBT.4 | Rounds multi-digit numbers with decimals to the nearest whole number. | Rounds multi-digit numbers with decimals to the nearest tenth. | Rounds multi-digit numbers with decimals to the nearest hundredth or thousandth. | Illustrates and explains the rounding of decimal numbers to the nearest whole number, tenth, hundredth, or thousandth. |
| 5.NBT.5 | Multiplies whole numbers up to 3 digits by 1 digit. | Multiplies whole numbers up to 3 digits by 2 digits, including in the context of solving a one-step problem. | Multiplies whole numbers with up to 4 digits by 2 digits, including in the context of solving a one-step problem.   Determines missing values in the process of using the standard algorithm for multi-digit multiplication. | Solves multi-step problems that require multi-digit multiplication. |
| 5.NBT.6 | Solves mathematical problems that require finding quotients of whole numbers, involving up to three-digit dividends and a single-digit divisor.   Identifies a model that can be used to represent the quotient between a multi-digit whole number and a single-digit divisor. | Solves mathematical and simple real-world problems that require finding quotients of whole numbers, involving up to three-digit dividends and two-digit divisors.   Uses models to represent the quotient between a multi-digit whole number and a multi-digit divisor. | Solves mathematical and real-world problems that require finding quotients of whole numbers, involving up to four-digit dividends and two-digit divisors.   Explains how models, such as arrays and area models, can be used to represent the division of multi-digit whole numbers. | Illustrates and explains multi-digit division using strategies based on place value, the properties of operations, or the relationship between multiplication and division. |
| 5.NBT.7 | Adds and subtracts decimals to hundredths. | Multiplies decimals to hundredths. | Divides decimals to hundredths.  Relates visual models to the operations of addition, subtraction, multiplication, or division of decimal numbers.   Explains a strategy used to add, subtract, multiply, or divide decimals to hundredths. | Solves multi-step problems that involve adding and subtracting decimals to hundredths.   Interprets and uses visual models of addition, subtraction, multiplication, or division of decimal numbers.   Identifies and explains errors in adding, subtracting, multiplying, or dividing decimals to hundredths. |

### Number and Operations – Fractions

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 5.NF.1 | Adds and subtracts fractions with like denominators.   Adds and subtracts mixed numbers with like denominators. | Adds and subtracts fractions (including mixed numbers) with unlike denominators in which one denominator is a multiple of the other. | Adds and subtracts fractions (including mixed numbers) with unlike denominators in which the denominators are not multiples of each other. | Adds and subtracts fractions (including mixed numbers) with unlike denominators by determining the lowest common multiple of the denominators. |
| 5.NF.2 | Compares a fraction to a benchmark fraction (e.g., determines whether a fraction is closer to 0, 1/2, or 1). | Represents a word problem in the form of an expression or equation involving addition or subtraction of mixed numbers or fractions. | Solves word problems that require adding and subtracting mixed numbers or fractions with unlike denominators.    Estimates a solution to a word problem involving addition and subtraction of fractions by using benchmark fractions.  Identifies an incorrect answer to a word problem involving addition or subtraction of fractions by comparing the answer to a benchmark fraction. | Solves word problems that require representing addition and subtraction of mixed numbers in more than one way. |
| 5.NF.3 | Recognizes that *a* ÷ *b* can be represented as the fraction *a*/*b*. | Determines fractions that represent division problems, including simple problems in a real-world context. | Uses fractions to represent division of whole numbers in word problems that may result in mixed number quotients. | Uses fractions to represent division of whole numbers in multi-step word problems that may result in mixed number quotients. |
| 5.NF.4 | Determines the area of a rectangle when a figure is provided and the figure is partitioned into unit squares. | Determines the area of a rectangle when a figure is provided and one side length is a whole number and the other side length is a fraction or mixed number. | Multiplies fractions and mixed numbers to solve problems including problems that involve finding areas of rectangles.   Identifies a model that represents a product in the form (a/b) x q as a part of a partition of q into *b* equal parts and (a/b) x (c/d) = ac/bd. | Illustrates and explains products that include mixed numbers or fractions based on properties of operations or visual models.   Given a product in the form (a/b) × q, writes a real-world scenario that can be represented by the product. |
| 5.NF.5 | Recognizes that doubling one factor in a multiplication expression will double the product.  Determines whether the value of a fraction is greater than or less than 1. | Determines whether a given product of a fraction and a whole number is greater than or less than the whole number factor. | Recognizes that multiplying a factor by a fractional scale factor less than 1 results in a product that is less than the whole number factor (e.g., in the expression 3 x 2/5, if 2/5 is multiplied by 3, the resulting product will be less than 3).  Recognizes that multiplying a factor by a fractional scale factor greater than 1 results in a product that is greater than the whole number factor (e.g., in the expression 3 x 5/2, if 5/2 is multiplied by 3, the resulting product will be greater than 3).  Classifies products of fractions and whole numbers as greater than, less than, or equal to the whole number factor. | Explains why multiplying a given number by a fraction greater than 1 results in a product greater than the given number. |
| 5.NF.6 | Recognizes multiplication of fractions as the correct strategy to solve a real-world problem. | Multiplies fractions to solve real-world problems. | Multiplies fractions and mixed numbers to solve real-world problems. | Multiplies fractions and mixed numbers to solve multi-step real-world problems. |
| 5.NF.7 | Recognizes division of a fraction and a whole number as the correct strategy to solve a real-world problem. | Identifies a division expression that can be used to represent a real-world problem, involving division of unit fractions by non-zero whole numbers or division of whole numbers by unit fractions.   Identifies a visual fraction model that represents division of fractions. | Solves problems involving division of unit fractions by non-zero whole numbers or division of whole numbers by unit fractions.  Given a visual fraction model that represents division of fractions, identifies the expression that is represented by the model. | Solves multi-step problems that require division of whole numbers by fractions.   Creates a visual fraction model that represents division of fractions. |

### Measurement and Data

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 5.MD.1 | Solves one-step problems with whole numbers that require simple measurement conversions using English length measurements (yards, feet, and inches).  Identifies which units belong to which measurement system, as described in the text of the standard.  Identifies appropriate tools for measurement. | Solves problems with whole numbers and decimals that require simple measurement conversions within a given measurement system involving only one conversion factor.   Solves one-step problems with whole numbers that require simple measurement conversions using length, weight, and mass measurements.  Estimates a real-world measure in a given measurement system (limited to the systems described in the standard, except temperature). | Solves real-world problems with whole numbers, decimals, and fractions that require measurement conversions within a given measurement system involving multiple conversion factors (e.g., converting inches to miles by first converting to feet and/or yards).  Estimates a real-world measure in a temperature measurement system.  Appropriately uses measurement tools. | Solves multi-step problems with whole numbers that require simple measurement conversions using length, weight, mass measurements, and temperature.  Solves real-world problems with whole numbers, decimals, and fractions that require measurement conversions between multiple measurement systems.   Solves real-world problems with whole numbers, decimals, and fractions that require measurement conversions between Celsius and Fahrenheit. |
| 5.MD.3 | Identifies a line plot among several data displays. | Constructs a line plot that represents a data set of measurements in fractions or mixed numbers.  Solves simple problems that require reading data presented in a line plot.   Identifies the type of data that can be displayed on a line plot (must be countable data). | Solves problems that require interpreting data presented in a line plot that uses fractions of a unit (1/2, 1/4, 1/8) (e.g., a line plot that includes volume measurements to the nearest 1/8 cup).  Makes calculations using multiple values in the data set, including computing the difference between the greatest and least value. | Makes comparisons between data displayed in two line plots. |
| 5.MD.5 | Distinguishes between a real-world volume measurement and a one-dimensional (length) or two-dimensional (area) measurement. | Identifies a cube with sides of a length of 1 unit as a unit cube.  Recognizes that the number of unit cubes that pack a solid figure without gaps or overlaps is the same as the volume of the figure. | Recognizes when an attribute of a real-world object would be measured in cubic units (as compared to an attribute best measured in square units) (e.g., the space inside a container might best be measured using cubic inches, but the base of the container would be measured in square inches). | Explains and justifies the volume in cubic units of a rectangular prism (e.g., explains why the volume of a figure is 6 unit cubes). |
| 5.MD.6 | Calculates the volume of a solid figure composed of a single layer of unit cubes by counting unit cubes. | Calculates the volume of simple solid figures composed of unit cubes, including rectangular prisms by counting unit cubes. | Calculates and compares the volumes of solid figures composed of unit cubes by counting unit cubes.  Estimates the number of unit cubes that would fit inside a three-dimensional object. | Estimates the volume of complex solid figures by packing it with unit cubes. |
| 5.MD.7 | Calculates a quantity using a formula, given all the needed measurements for the formula (e.g., calculates the area of a rectangle given the length and width measurements). | Calculates the volume of a rectangular prism with given whole-number side lengths.   Solves simple problems that require finding the volume of a rectangular prism with given whole-number side lengths.   Identifies rectangular prisms with equal volumes.   Uses estimation to identify rectangular prisms with approximately equal volumes. | Calculates the volume of solid figures composed of two non-overlapping rectangular prisms with whole-number side lengths.   Calculates the volume of a rectangular prism given the area of the base and the height.   Solves real-world and mathematical problems requiring adding or comparing volumes of rectangular prisms.   Recognizes equivalent expressions that represent the volume of a rectangular prism (e.g., the volume could be expressed as (3 × 5) × 7, 3 × (5 × 7), 15 × 7, or 3 × 35). | Calculates the volume of solid figures composed of two non-overlapping rectangular prisms in which some dimensions must be derived.  Solves real-world and mathematical problems requiring subtracting volumes of rectangular prisms. |

### Geometry

| Alaska Standard | **Needs Support**  **A student at this level:** | **Approaching Proficient**  **A student at this level:** | **Proficient**  **A student at this level:** | **Advanced**  **A student at this level:** |
| --- | --- | --- | --- | --- |
| 5.G.1 | Locates a point on the coordinate grid given its coordinates and identifies the coordinates of a point on the coordinate grid. Graphs are limited to the first quadrant. | Locates multiple points on a coordinate grid given their coordinates or a description of their location relative to the origin. Graphs are limited to the first quadrant.  Interprets coordinates of a point in the context of the situation. | Locates a point on a coordinate grid given a description of its location relative to another point or the axes (e.g., if point A is located at (8, 3), what are the coordinates of the point that is 5 units to the left of point A?). Graphs are limited to the first quadrant). | Identifies and explains errors in the placement of points on a coordinate plane given an ordered pair (e.g., explains the error if the point (2, 3) is placed at (3, 2)).  Explains the difference between a point placed on the *x*-axis and a point placed on the *y*-axis (e.g., explain that the coordinate (0, 5) lies on the *y*-axis because it has an *x*-value of 0). |
| 5.G.2 | Graphs a point on a coordinate grid given its coordinates. | Uses a coordinate grid to identify a path from one location to another in a real-world setting, and identifies the coordinates of points that complete shapes with horizontal and vertical sides on the coordinate plane. | Given a real-world setting, locates a point on a coordinate grid given a description of its location relative to another point or the axes. Real-world settings can include the relationship between distance and time or North-South-East-West distances on a map. | Identifies the coordinates of points that complete complex shapes on the coordinate plane.   Describes attributes of shapes or angles that can be formed by graphing and connecting points in the coordinate plane. Extension could include activities where students complete coordinate grid mystery pictures. |
| 5.G.3 | Names most two-dimensional (plane) figures using correct mathematical terminology. | Names two-dimensional (plane) figures using correct mathematical terminology (e.g., triangle, square, rectangle, rhombus, parallelogram, trapezoid).  Determines whether a shape has a given property or is a member of a given category. | Identifies shared attributes between two different categories of plane figures (e.g., identifies that squares and rectangles each have four right angles and that all types of triangles have three sides). | Compares and contrasts the attributes of two-dimensional figures. |
| 5.G.4 | Classifies plane figures based on number of sides (e.g., identifying hexagons, quadrilaterals, and triangles). | Classifies plane figures based on angles and sides (e.g., identifying right, obtuse, and acute triangles). | Uses hierarchy relationships to identify properties of quadrilaterals and identifies whether a quadrilateral in one category always, sometimes, or never belongs in another category. | Compares and contrasts given shapes and their properties. |