

Dept. of Education and
Early Development



ALASKA MATHEMATICS STANDARDS WITH LEARNING TARGETS GRADE 5

Adapted from the Kentucky Department of Education, Frankfort, Kentucky 40601.

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Operations and Algebraic Thinking
Cluster	Write and interpret numerical expressions.
Standard	5.OA.1.
	Use parentheses to construct numerical expressions, and evaluate numerical expressions with these symbols.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Use order of operations including parenthesis, brackets, or braces.	Evaluate expressions using the order of operations (including using parenthesis, brackets, or braces).		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Operations and Algebraic Thinking
Cluster	Write and interpret numerical expressions.
Standard	<p>5.OA.2.</p> <p>Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.</p> <p><i>For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognizing that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.</i></p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
<p>Write numerical expressions for given numbers with operation words.</p> <p>Write operation words to describe a given numerical expression.</p>	Interpret numerical expressions without evaluating them.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Operations and Algebraic Thinking
Cluster	Write and interpret numerical expressions.
Standard	<p>5.OA.3.</p> <p>Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</p> <p><i>For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i></p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
<p>Generate two numerical patterns using two given rules.</p> <p>Form ordered pairs consisting of corresponding terms for the two patterns.</p> <p>Graph generated ordered pairs on a coordinate plane.</p>	Analyze and explain the relationships between corresponding terms in the two numerical patterns.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Understand the place value system.
Standard	5.NBT.1.
	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Understand the place value system.
Standard	5.NBT.2.
	Explain and extend the patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain and extend the patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Represent powers of 10 using whole number exponents. Fluently translate between powers of ten written as ten raised to a whole number exponent, the expanded form, and standard notation ($10^3 = 10 \times 10 \times 10 = 1000$).	Explain the patterns in the number of zeros of the product when multiplying a number by powers of 10. Explain the relationship of the placement of the decimal point when a decimal is multiplied or divided by a power of 10.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Understand the place value system.
Standard	5.NBT.3.
	Read, write, and compare decimals to thousandths; a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form [e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 (1/10) + 9 (1/100) + 2 (1/1000)$].

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Read and write decimal to thousandths using base-ten numerals, number names, and expanded form.			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Understanding the place value system
Standard	5.NBT.3. Read, write, and compare decimals to thousandths; b. Compare two decimals to thousandths place based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Use $>$, $=$, and $<$ symbols to record the results of comparisons between decimals.	Compare two decimals to the thousandths based on the place value of each digit.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Understand the place value system.
Standard	5.NBT.4.
	Use place values understanding to round decimals to any place.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Use knowledge of base ten and place value to round decimals to any place.			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Perform operations with multi-digit whole numbers and with decimals to hundredths.
Standard	5.NBT.5.
	Fluently multiply multi-digit whole numbers using a standard algorithm.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Fluently multiply multi-digit whole numbers using the standard algorithm.			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Perform operations with multi-digit whole numbers and with decimals to hundredths.
Standard	<p>5.NBT.6.</p> <p>Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, number lines, real life situations, and/or area models.</p>

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.	<p>Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division to solve division problems.</p> <p>Illustrate and explain division calculations by using equations, rectangular arrays, and/or area models.</p>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations in Base Ten
Cluster	Perform operations with multi-digit whole numbers and with decimals to hundredths.
Standard	5.NBT.7.
	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between the operations. Relate the strategy to a written method and explain their reasoning in getting their answers.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Add, subtract, multiply, and divide decimals to hundredths 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 to solve decimal operation calculations.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Use equivalent fractions as a strategy to add and subtract fractions.
Standard	<p>5.NF.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <i>For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)</i></p>

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Generate equivalent fractions to find the like denominator.	Solve addition and subtraction problems involving fractions (including mixed numbers) with like and unlike denominators using an equivalent fraction strategy.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Use equivalent fractions as a strategy to add and subtract fractions.
Standard	<p>5.NF.2.</p> <p>Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (e.g., by using visual fraction models or equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and check the reasonableness of answers.</p> <p><i>For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.</i></p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Generate equivalent fractions to find like denominators.	<p>Solve word problems involving addition and subtraction of fractions with unlike denominators referring to the same whole (e.g. by using visual fraction models or equations to represent the problem).</p> <p>Evaluate the reasonableness of an answer, using fractional number sense, by comparing it to a benchmark fraction.</p>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	<p>5.NF.3.</p> <p>Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers (e.g., by using visual fraction models or equations to represent the problem).</p> <p><i>For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$; If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?</i></p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$).	<p>Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers (e.g., using visual fraction models or equations to represent the problem).</p> <p>Interpret the remainder as a fractional part of the problem.</p>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	<p>5.NF.4.a</p> <p>Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction;</p> <p>a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$).</p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
<p>Multiply fractions by whole numbers.</p> <p>Multiply fractions by fractions.</p>	<p>Interpret the product of a fraction times a whole number as total number of parts of the whole (for example $\frac{3}{4} \times 3 = \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = 9/4$).</p> <p>Determine the sequence of operations that result in the total number of parts of the whole (for example $\frac{3}{4} \times 3 = (3 \times 3)/4 = 9/4$).</p> <p>Interpret the product of a fraction times a fraction as the total number of parts of the whole.</p>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Numbers and Operations- Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	5.NF.4.b
	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Find area of a rectangle with fractional side lengths using different strategies (e.g., tiling with unit squares of the appropriate unit fraction side lengths, multiplying side lengths).	Represent fraction products as rectangular areas. Justify multiplying fractional side lengths to find the area is the same as tiling a rectangle with unit squares of the appropriate unit fraction side lengths.	Model the area of rectangles with fractional side lengths with unit squares to show the area of rectangles.	

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	5.NF.5.a
	Interpret multiplication as scaling (resizing) by; a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know that scaling (resizing) involves multiplication.	Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. For example, a 2x3 rectangle would have an area twice the length of 3.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5						
Domain	Number and Operations—Fractions						
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.						
Standard	5.NF.5.b						
	Interpret multiplication as scaling (resizing) by: b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. (Division of a fraction by a fraction is not a requirement at this grade.)						
Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know that multiplying whole numbers and fractions result in products greater than or less than one depending upon the factors.	<p>Draw a conclusion multiplying a fraction greater than one will result in a product greater than the given number.</p> <p>Draw a conclusion that when you multiply a fraction by one (which can be written as various fractions, ex 2/2, 3/3, etc.) the resulting fraction is equivalent.</p> <p>Draw a conclusion that when you multiply a fraction by a fraction, the product will be smaller than the given number.</p>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	5.NF.6.
	Solve real world problems involving multiplication of fractions and mixed numbers (e.g., by using visual fraction models or equations to represent the problem).

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Represent word problems involving multiplication of fractions and mixed numbers (e.g., by using visual fraction models or equations to represent the problem).	Solve real world problems involving multiplication of fractions and mixed numbers.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Number and Operations—Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard	<p>5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p> <ol style="list-style-type: none"> Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions (e.g., by using visual fraction models and equations to represent the problem). <i>For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?</i>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know the relationship between multiplication and	Interpret division of a unit fraction by a whole number and justify your answer using the		

<p>division.</p>	<p>relationship between multiplication and division, and by creating story problems, using visual models, and relationship to multiplication, etc.</p> <p>Interpret division of a whole number by a unit fraction and justify your answer using the relationship between multiplication and division, and by representing the quotient with a visual fraction model.</p> <p>Solve real world problems involving division of unit fractions by whole numbers other than 0 and division of whole numbers by unit fractions using strategies such as visual fractions models and equations.</p>		
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Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Convert like measurements units within a given measurement and solve problems involving time.
Standard	<p>5.MD.1.</p> <p>Identify, estimate measure, and convert equivalent measures within systems English length (inches, feet, yards, miles) weight (ounces, pounds, tons) volume (fluid ounces, cups, pints, quarts, gallons) temperature (Fahrenheit) metric length (millimeters, centimeters, meters, kilometers) volume (milliliters, liters), temperature (Celsius), (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems using appropriate tools.</p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize units of measurement within the same system.	Convert units of measurement within the same system.		
Divide and multiply to change units.	Solve multi-step, real world problems that involve converting units.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Convert like measurements units within a given measurement and solve problems involving time.
Standard	5.MD.2.
	Solve real-world problems involving elapsed time between world time zones. (L).

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify benchmark fractions (1/2, 1/4, 1/8). Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).	Solve problems involving information presented in line plots which use fractions of a unit (1/2, 1/4, 1/8) by adding, subtracting, multiplying, and dividing fractions.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Represent and interpret data.
Standard	5.MD.3.
	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
<p>Recognize that volume is the measurement of the space inside a solid three-dimensional figure.</p> <p>Recognize a unit cube has 1 cubic unit of volume and is used to measure volume of three-dimensional shapes.</p> <p>Recognize any solid figure packed without gaps or overlaps and filled with (n) "unit cubes" indicates the total cubic units or volume.</p>			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Represent and interpret data.
Standard	5.MD.4.
	Explain the classification of data from real-world problems shown in graphical representations including the use of terms mean and median with a given set of data. (L).

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Measure volume by counting unit cubes, cubic cm, cubic in., cubic ft., and improvised units.			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard	5.MD.5.a
	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Identify a right rectangular prism. Multiply the three dimensions in any order to calculate volume (commutative and associative properties).	Develop volume formula for a rectangle prism by comparing volume when filled with cubes to volume by multiplying the height by the area of the base, or when multiplying the edge lengths ($L \times W \times H$).	Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes.	

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard	5.MD.5.b
	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. b. A solid figure that can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Know that “ B ” is the area of the base.	Apply the following formulas to right rectangular prisms having whole number edge lengths in the context of real world mathematical problems: <i>volume = length x width x height</i> <i>volume = area of base x height</i>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard	5.MD.5.c
	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize volume as additive.	Solve real world problems by decomposing a solid figure into two non-overlapping right rectangular prisms and adding their volumes.		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard	5.MD.6.
	Estimate and measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Measurement and Data
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard	<p>5.MD.7.a-c</p> <p>Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <ol style="list-style-type: none"> a. Estimate and find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Demonstrate the associative property of multiplication by using the product of three whole numbers to find volumes (<i>length x width x height</i>); b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Geometry
Cluster	Graph points on the coordinate plane to solve real-world and mathematical problems.
Standard	<p>5.G.1.</p> <p>Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p>

Standards of Mathematical Practice

Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.
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Learning Targets

Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Define the coordinate system. Identify the x - and y -axis. Locate the origin on the coordinate system. Identify coordinates of a point on a coordinate system.			

Recognize and describe the connection between the ordered pair and the x - and y -axis (from the origin).			
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Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Geometry
Cluster	Graph points on the coordinate plane to solve real-world and mathematical problems.
Standard	5.G.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Graph points in the first quadrant.	<p>Represent real world and mathematical problems by graphing points in the first quadrant.</p> <p>Interpret coordinate values of points in real world context and mathematical problems.</p>		

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Geometry
Cluster	Classify two-dimensional (plane) figures into categories based on their properties.
Standard	5.G.3.
	Understand that attributes belonging to a category of two-dimensional (plane) figures also belong to all subcategories of that category. <i>For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</i>

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize that some two-dimensional shapes can be classified into more than one category based on their attributes. Recognize if a two-dimensional shape is classified into a category, that it belongs to all subcategories of that category.			

Alaska Mathematics Standards Grade 5

Grade Level/Course	5
Domain	Geometry
Cluster	Classify two-dimensional (plane) figures into categories based on their properties.
Standard	5.G.4.
	Classify two-dimensional (plane) figures in a hierarchy based on attributes and properties.

Standards of Mathematical Practice							
Make sense of problems and persevere to solve them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Learning Targets			
Knowledge	Reasoning	Skill	Products
Facts and concepts we want students to know.	Use what they know to reason or solve problems.	Use knowledge and reasoning to act skillfully.	Use knowledge, reasoning, and skills to create a concrete product.
Recognize the hierarchy of two-dimensional shapes based on their attributes.	Analyze properties of two-dimensional figures in order to place into a hierarchy. Classify two-dimensional figures into categories and/or sub-categories based on their attributes.		