Wyoming Mathematics

Grade 5

Adopted 2021

Standards for Mathematical Practice

1. **Make sense of problems and persevere in solving them.** MP.1
2. **Reason abstractly and quantitatively.** MP.2
3. **Construct viable arguments and critique the reasoning of others.** MP.3
4. **Model with mathematics.** MP.4
5. **Use appropriate tools strategically.** MP.5
6. **Attend to precision.** MP.6
7. **Look for and make use of structure.** MP.7
8. **Look for and express regularity in repeated reasoning.** MP.8

Operations And Algebraic Thinking

A. **Write, interpret, and/or evaluate numerical expressions.** 5.OA.A

1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. 5.OA.A.1

Ad. Create and evaluate numerical expressions that use two or more types of grouping symbols to complete the simplification of numerical expressions. 5.OA.A.1.AD

P. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. 5.OA.A.1.P

B. Evaluate two-step numerical expressions with no grouping symbols. 5.OA.A.1.B

BeB. May be able to evaluate two-step numerical expressions with no grouping symbols with partial success. 5.OA.A.1.BEB

2. Write simple expressions requiring parentheses that record calculations with numbers, and interpret numerical expressions without evaluating them. 5.OA.A.2

Ad. Using the order and properties of operations, determine whether expressions are equivalent and justify their thinking. 5.OA.A.2.AD

P. Write simple expressions requiring parentheses that record calculations with numbers, and interpret numerical expressions without evaluating them. 5.OA.A.2.P

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Ba. The Basic student is able to:
Write simple expressions requiring parentheses that record calculations with numbers. OR
Interpret numerical expressions without evaluating them. 5.OA.A.2.BA

BeB. The Below Basic student may be able to:
Write simple expressions requiring parentheses that record calculations with numbers with partial success. OR
Interpret numerical expressions without evaluating them with partial success. 5.OA.A.2.BEB

B. Analyze patterns and relationships. 5.OA.B

3. Generate two numerical patterns with each pattern having its own rule. Explain informally the relationship(s) between corresponding terms in the two patterns. 5.OA.B.3

A. Form ordered pairs consisting of corresponding terms from the two patterns. 5.OA.B.3.A

B. Graph the ordered pairs on a coordinate plane. 5.OA.B.3.B

Ad. In addition to Proficient, the Advanced student is able to identify and explain features between the corresponding terms of two numerical patterns not explicitly given in the rule. 5.OA.B.3.AD

P. The Proficient student is able to generate two numerical patterns with each pattern having its own rule. Explain informally the relationship(s) between corresponding terms in the two patterns. 5.OA.B.3.P

A. Form ordered pairs consisting of corresponding terms from the two patterns. 5.OA.B.3.P.A

B. Graph the ordered pairs on a coordinate plane. 5.OA.B.3.P.B

Ba. The Basic student is able to extend two numerical patterns with each pattern having its own rule. Form ordered pairs consisting of corresponding terms from the two patterns. 5.OA.B.3.B.BA

BeB. The Below Basic student may be able to extend two numerical patterns with each pattern having its own rule with partial success. Form ordered pairs consisting of corresponding terms from the two patterns with partial success. 5.OA.B.3.BEB

Number And Operations In Base Ten

C. Understand the place value system. 5.NBT.C

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 1/10 of what it represents in the place to its left. 5.NBT.C.1

Ad. The Advanced student is able to:
Recognize that given two different digits in a multi-digit number, one digit can represent a multiple of 100 times the digit two places to its right, and a multiple of 1/100 times the digit two places to its left. OR
Extend reasoning about place value to go two or more places to the left and right. 5.NBT.C.1.AD

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P. 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 1/10 what it represents in the place to its left. 5.NBT.C.1.P

Ba. 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 1/10 of what it represents in the place to its left when given a visual model or representation. 5.NBT.C.1.BA

BeB. May be able to 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 1/10 of what it represents in the place to its left with partial success, when given a visual model or representation. 5.NBT.C.1.BEB

2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain 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. 5.NBT.C.2

Ad. The Advanced student is able to:
Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10 and use whole number exponents to denote powers of 10. OR
Compare two powers of 10 expressed exponentially. OR
Apply understanding of exponents to real-world examples of scientific notation. 5.NBT.C.2.AD

P. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain 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. 5.NBT.C.2.P

Ba. Continue a pattern of a number multiplied and divided by a power of 10. 5.NBT.C.2.BA

BeB. May be able to continue a pattern of a number multiplied and divided by a power of 10 with partial success. 5.NBT.C.2.BEB

3. Read, write, and compare decimals to thousandths. 5.NBT.C.3

A. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. 5.NBT.C.3.A

B. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols. 5.NBT.C.3.B

Ad. The Advanced student is able to:
Relate decimals to real-world scenarios with scientific notation. OR
Create numbers in different forms, order them, and justify reasoning for order. OR
Apply what is known about comparing decimals to be able to analyze and justify errors in comparisons. 5.NBT.C.3.AD

A. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. 5.NBT.C.3.P.A

B. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols. 5.NBT.C.3.P.B

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A. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. OR 5.NBT.C.3.BA.A

B. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols. 5.NBT.C.3.BA.B

A. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form with partial success. OR 5.NBT.C.3.BEB.A

B. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols with partial success. 5.NBT.C.3.BEB.B

4. Use place value understanding to round decimals to any place to a given place. 5.NBT.C.4

Ad. The Advanced student is able to:
Explain how to use the digits in multi-digit decimal numbers to round numbers to any place. OR
Use an example of rounding decimals and explain how it is helpful in computation. OR
Justify the appropriate place value to which the student would round in a given situation. 5.NBT.C.4.AD

P. Use place value understanding to round decimals to any place to a given place. 5.NBT.C.4.P

Ba. Use place value understanding to round decimals to any place when provided a model such as a number line with benchmark numbers. 5.NBT.C.4.BA

BeB. May be able to use place value understanding to round decimals to any place with partial success, when provided a model such as a number line with benchmark numbers. 5.NBT.C.4.BEB

D. Perform operations with multi-digit whole numbers and with decimals to hundredths. 5.NBT.D

5. Multiply multi-digit whole numbers using place value strategies including the standard algorithm. 5.NBT.D.5

Ad. Justify how the various place value strategies for multiplication relate to the standard algorithm. 5.NBT.D.5.AD

P. Multiply multi-digit whole numbers using place value strategies including the standard algorithm. 5.NBT.D.5.P

Ba. Multiply multi-digit whole numbers using place value strategies. 5.NBT.D.5.BA

BeB. May be able to multiply multi-digit whole numbers using place value strategies with partial success. 5.NBT.D.5.BEB

6. Find whole-number quotients with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of multiplication, and/or the relationship between multiplication and division, including the standard algorithm. Use appropriate models to Illustrate and explain the calculation, such as equations, rectangular arrays, and/or area models. 5.NBT.D.6

Ad. The Advanced student is able to:
Create a real-world situation that can be modeled using a given division problem. OR
Find quotients and remainders with up to four-digit dividends and two-digit divisors using more than one model or strategy and defend the efficiency of the strategy used. OR
Justify how the various place value strategies for division relate to the standard algorithm. 5.NBT.D.6.AD

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P. Find whole-number quotients with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of multiplication, and/or the relationship between multiplication and division, including the standard algorithm. Use appropriate models to Illustrate and explain the calculation, such as equations, rectangular arrays, and/or area models. Assessment Boundary: The standard algorithm for division will not be assessed. 5.NBT.D.6.P

Ba. The Basic student is able to:
Find whole-number quotients with up to four-digit dividends and two-digit divisors when given a partially completed model. OR
Find quotients with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of multiplication, and/or the relationship between multiplication and division. Use appropriate models to Illustrate and explain the calculation, such as equations, rectangular arrays, and/or area models. 5.NBT.D.6.BA

BeB. The Below Basic student may be able to:
Find whole-number quotients with up to four-digit dividends and two-digit divisors with partial success when given a partially completed model. OR
Find quotients with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of multiplication, and/or the relationship between multiplication and division with partial success. Use appropriate models to Illustrate and explain the calculation, such as equations, rectangular arrays, and/or area models with partial success. 5.NBT.D.6.BEB

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 addition and subtraction; Relate the strategy to a written method and explain the reasoning used. 5.NBT.D.7

Ad. The Advanced student is able to:
Explain patterns in the base-ten system when finding sums and differences with decimals and how it is consistent with the standard algorithm. OR
Investigate and draw conclusions about decimal placement when finding products and quotients with decimals. 5.NBT.D.7.AD

P. 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. 5.NBT.D.7.P

Ba. Add, subtract, multiply, and divide decimals to hundredths when given concrete models or drawings, and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 5.NBT.D.7.BA

BeB. May be able to add, subtract, multiply, and divide decimals to hundredths with partial success when given concrete models or drawings, and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 5.NBT.D.7.BEB

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Convert like measurement units within a given measurement system. 5.MD.G

1. Understand a coordinate system. 5.MD.G.1

Ad. The Advanced student is able to:
Convert different-sized standard measurement units, within a given measurement system, requiring multiple conversions. Solve real-world problems with multiple steps involving these conversions. OR
Create and solve multi-step real-world problems by converting different-sized standard measurement units within a given measurement system. OR
Convert different-sized standard measurement units within multiple measurement systems to solve real-world problems. 5.MD.G.1.AD

P. The Proficient student is able to solve multi-step real-world problems by converting among different-sized standard measurement units within a given measurement system. 5.MD.G.1.P

Ba. The Basic student is able to solve multi-step real-world problems by converting among different-sized standard measurement units, within a given measurement system, when given the conversion equivalence. 5.MD.G.1.BA

BeB. The Below Basic student may be able to solve multi-step real-world problems by converting among different-sized standard measurement units, within a given measurement system, with partial success, when given the conversion equivalence. 5.MD.G.1.BEB

H. Represent and interpret data. 5.MD.H

2. Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, 1/8). Use operations on fractions to solve problems involving information presented in line plots. 5.MD.H.2

Ad. The Advanced student is able to:
Predict ways in which operations with fractions, and fractions on a line plot, would change if the data set were changed. AND
Use three or more operations with fractions to solve problems involving information presented in line plots. 5.MD.H.2.AD

P. Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, 1/8). Use operations on fractions to solve problems involving information presented in line plots. 5.MD.H.2.P

Ba. The Basic student is able to:
Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, 1/8). OR
Use operations on fractions to solve problems involving information presented in line plots. 5.MD.H.2.BA

BeB. The Below Basic student may be able to:
Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, 1/8) with partial success. OR
Use operations on fractions to solve problems involving information presented in line plots with partial success. 5.MD.H.2.BEB

I. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. 5.MD.I

3. Recognize volume as an attribute of three-dimensional figures and understand concepts of volume measurement such as "unit cube" and a volume of n cubic units. 5.MD.I.3

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Ad. In addition to Proficient, the Advanced student is able to explain how to find missing dimension(s) when given volume and justify. 5.MD.I.3.AD

P. The Proficient student is able to recognize volume as an attribute of three-dimensional figures and understand concepts of volume measurement such as "unit cube" and a volume of n cubic units. 5.MD.I.3.P

Ba. The Basic student is able to identify the use of volume and the appropriate measurement for a given situation or model. 5.MD.I.3.BA

BeB. The Below Basic student may be able to identify the use of volume and the appropriate measurement for a given situation or model with partial success. 5.MD.I.3.BEB

4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units. 5.MD.I.4

Ad. The Advanced student is able to:
Use an efficient counting strategy (not counting one unit at a time) and determine appropriate measurement units. OR
Explain how you would find volume in a compound figure. 5.MD.I.4.AD

P. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units. 5.MD.I.4.P

Ba. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units when given a partially completed visual model. 5.MD.I.4.BA

BeB. May be able to measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units, with partial success, when given a partially completed visual model. 5.MD.I.4.BEB

5. Relate volume to the operations of multiplication and solve real-world and mathematical problems involving volume. 5.MD.I.5

A. Find the volume of a right rectangular prism with whole number dimensions by multiplying them. Show that this volume is the same as when counting unit cubes. 5.MD.I.5.A

B. Find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems given the formulas V = (l)(w)(h) and V = (B)(h) for rectangular prisms. 5.MD.I.5.B

Ad. The Advanced student is able to:
Solve real-world problems by finding volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts. OR
Find the base or height when given volume and some of the dimensions. OR
Find multiple possible dimensions of a right rectangular prism with a given volume. 5.MD.I.5.AD

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P. Relate volume to the operations of multiplication and solve real-world and mathematical problems involving volume. 5.MD.I.5.P

A. Find the volume of a right rectangular prism with whole number dimensions by multiplying them. Show that this volume is the same as when counting unit cubes. 5.MD.I.5.P.A

B. Find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems given the formulas V = (l)(w)(h) and V = (B)(h) for rectangular prisms. 5.MD.I.5.P.B

Ba. The Basic student is able to:
Find the volume of a right rectangular prism with whole number dimensions by multiplying them. Show that this volume is the same as when counting unit cubes. OR
Find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems given the formulas V = (l)(w)(h) and V = (B)(h) for rectangular prisms. 5.MD.I.5.BA

A. Find the volume of a right rectangular prism with whole number dimensions by multiplying them with partial success. OR 5.MD.I.5.BEB.A

B. Find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems given the formulas V = (l)(w)(h) and V = (B)(h) for rectangular prisms with partial success. 5.MD.I.5.BEB.B

Geometry

J. Graph points on the coordinate plane to solve real-world and mathematical problems. 5.G.J

1. Understand a coordinate system. 5.G.J.1

A. The x- and y- axes are perpendicular number lines that intersect at 0 (the origin). 5.G.J.1.A

B. Any point on the coordinate plane can be represented by its coordinates. 5.G.J.1.B

C. The first number in an ordered pair is the x-coordinate and represents the horizontal distance from the origin. 5.G.J.1.C

D. The second number in an ordered pair is the y-coordinate and represents the vertical distance from the origin. 5.G.J.1.D

Ad. Show understanding of the coordinate system in real-world situations (first quadrant only). 5.G.J.1.AD

P. Understand a coordinate system. 5.G.J.1.P

A. The x- and y- axes are perpendicular number lines that intersect at 0 (the origin). 5.G.J.1.P.A

B. Any point on the coordinate plane can be represented by its coordinates. 5.G.J.1.P.B

C. The first number in an ordered pair is the x-coordinate and represents the horizontal distance from the origin. 5.G.J.1.P.C

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D. The second number in an ordered pair is the y-coordinate and represents the vertical distance from the origin. 5.G.J.1.P.D

Ba. The Basic student is able to identify the components of a coordinate system. 5.G.J.1.BA

A. The x- and y- axes are perpendicular number lines that intersect at 0 (the origin). 5.G.J.1.BA.A

B. Any point on the coordinate plane can be represented by its coordinates. 5.G.J.1.BA.B

C. The first number in an ordered pair is the x-coordinate and represents the horizontal distance from the origin. 5.G.J.1.BA.C

D. The second number in an ordered pair is the y-coordinate and represents the vertical distance from the origin. 5.G.J.1.BA.D

BeB. May be able to identify the components of a coordinate system with partial success. 5.G.J.1.BEB

A. The x- and y- axes are perpendicular number lines that intersect at 0 (the origin). 5.G.J.1.BEB.A

B. Any point on the coordinate plane can be represented by its coordinates. 5.G.J.1.BEB.B

C. The first number in an ordered pair is the x-coordinate and represents the horizontal distance from the origin. 5.G.J.1.BEB.C

D. The second number in an ordered pair is the y-coordinate and represents the vertical distance from the origin. 5.G.J.1.BEB.D

2. Plot and interpret points in the first quadrant of the coordinate plane to represent real-world and mathematical situations. 5.G.J.2

Ad. Describe the x- and y-coordinate's position when mathematical operations are performed on the coordinates in any of the four quadrants. 5.G.J.2.AD

P. Plot and interpret points in the first quadrant of the coordinate plane to represent real-world and mathematical situations. 5.G.J.2.P

Ba. Locate a point in the first quadrant using an ordered pair. 5.G.J.2.BA

BeB. May be able to locate a point in the first quadrant using an ordered pair with partial success. 5.G.J.2.BEB

K. Classify two-dimensional figures into categories based on their properties. 5.G.K

3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. 5.G.K.3

Ad. Formulate logical arguments to show that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. 5.G.K.3.AD

P. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. 5.G.K.3.P

Ba. Classify two-dimensional figures into basic subcategories. 5.G.K.3.BA

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BeB. May be able to classify two-dimensional figures into basic subcategories with partial success. 5.G.K.3.BEB

4. Classify polygons in a hierarchy based on properties. 5.G.K.4

Ad. In addition to Proficient, the Advanced student is able to construct polygons according to given attributes. 5.G.K.4.AD

P. The Proficient student is able to classify polygons in a hierarchy based on properties. 5.G.K.4.P

Ba. The Basic student is able to:
Classify two-dimensional figures into two basic subcategories. OR
Identify specific properties of the subcategories. 5.G.K.4.BA

BeB. The Below Basic student may be able to:
Classify two-dimensional figures into two basic subcategories with partial success. OR
Identify specific properties of the subcategories with partial success. 5.G.K.4.BEB

Number And Operations - Fractions

E. Use equivalent fractions as a strategy to add and subtract fractions. 5.NF.E

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. 5.NF.E.1

Ad. Add or subtract three or more fractions with unlike denominators (including mixed numbers) that require regrouping by replacing the given fractions with equivalent fractions and justify the denominators chosen. 5.NF.E.1.AD

P. 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. 5.NF.E.1.P

Ba. Add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators when given a visual model. 5.NF.E.1.BA

BeB. May be able to add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators, with partial success, when given a visual model. 5.NF.E.1.BEB

2. 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 assess the reasonableness of answers. 5.NF.E.2

Ad. Solve real-world problems involving addition or subtraction with at least 3 or more 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. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. 5.NF.E.2.AD

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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 assess the reasonableness of answers. 5.NF.E.2.P

Ba. Solve one-step mathematical problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, when given visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. 5.NF.E.2.BA

BeB. May be able to solve one-step mathematical problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators with partial success, when given visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. 5.NF.E.2.BEB

F. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. 5.NF.F

3. Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers by using visual fraction models or equations to represent the problem. 5.NF.F.3

Ad. Create a real-world situation and visual model to demonstrate understanding between division of whole numbers and fractions. 5.NF.F.3.AD

P. Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers by using visual fraction models or equations to represent the problem. 5.NF.F.3.P

Ba. Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b) when given a visual model. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers when given visual fraction models or equations to represent the problem. 5.NF.F.3.BA

BeB. May be able to interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b) with partial success, when given a visual model. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, with partial success, when given visual fraction models or equations to represent the problem. 5.NF.F.3.BEB

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4. Extend the concept of multiplication to multiply a fraction or whole number by a fraction. 5.NF.F.4

    A. Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths. 5.NF.F.4.A

    B. Interpret multiplication of a fraction by a whole number and a whole number by a fraction and compute the product. 5.NF.F.4.B

    C. Interpret multiplication in which both factors are fractions less than one and compute the product. 5.NF.F.4.C

A. Draw a visual representation to show understanding of how to multiply a fraction by a fraction OR find a missing fractional side length when given an area and one side length of a rectangle. 5.NF.F.4.AD.A

B. Estimate the result of multiplying a whole number by a fraction less than one, by a fraction equal to one, or by a fraction greater than one and justify the estimation with a visual model or description. Predict the sizes of the factors based on the product without performing the indicated multiplication. 5.NF.F.4.AD.B

P. Extend the concept of multiplication to multiply a fraction or whole number by a fraction. 5.NF.F.4.P

    A. Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths. 5.NF.F.4.P.A

    B. Interpret multiplication of a fraction by a whole number and a whole number by a fraction and compute the product. 5.NF.F.4.P.B

    C. Interpret multiplication in which both factors are fractions less than one and compute the product. 5.NF.F.4.P.C

A. Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths when given a visual model. 5.NF.F.4.BA.A

B. Interpret multiplication of a fraction by a whole number and a whole number by a fraction and compute the product when given a visual model. 5.NF.F.4.BA.B

C. Interpret multiplication in which both factors are fractions less than one and compute the product when given a visual model. 5.NF.F.4.BA.C

A. Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths, with partial success, when given a visual model. 5.NF.F.4.BEB.A

B. Interpret multiplication of a fraction by a whole number and a whole number by a fraction and compute the product, with partial success, when given a visual model. 5.NF.F.4.BEB.B

C. Interpret multiplication in which both factors are fractions less than one and compute the product, with partial success, when given a visual model. 5.NF.F.4.BEB.C

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5. Justify the reasonableness of a product when multiplying with fractions. 5.NF.F.5

   A. Estimate the size of the product based on the size of the two factors. 5.NF.F.5.A

   B. Explain why multiplying a given number by a number greater than 1 (improper fractions, mixed numbers, whole numbers) results in a product larger than the given number. 5.NF.F.5.B

   C. Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. 5.NF.F.5.C

   D. Explain why multiplying the numerator and denominator by the same number has the same effect as multiplying the fraction by 1. 5.NF.F.5.D

Ad. Estimate the size of a factor based on the product and the other factor without performing the indicated multiplication and justify the reasonableness of a product when multiplying with fractions by creating a visual model or explanation. 5.NF.F.5.AD

P. Justify the reasonableness of a product when multiplying with fractions. 5.NF.F.5.P

   A. Estimate the size of the product based on the size of the two factors. 5.NF.F.5.P.A

   B. Explain why multiplying a given number by a number greater than 1 (improper fractions, mixed numbers, whole numbers) results in a product larger than the given number. 5.NF.F.5.P.B

   C. Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. 5.NF.F.5.P.C

   D. Explain why multiplying the numerator and denominator by the same number has the same effect as multiplying the fraction by 1. 5.NF.F.5.P.D

B. The Basic student is able to estimate the size of the product based on the size of the two factors. 5.NF.F.5.BA.B

BeB. Estimate the size of the product based on the size of the two factors with partial success. 5.NF.F.5.BEB

6. Solve real-world problems involving multiplication of fractions and mixed numbers by using visual fraction models or equations to represent the problem. 5.NF.F.6

Ad. The Advanced student is able to:
Solve multi-step real-world problems involving multiplication of fractions including mixed numbers with multiple strategies or representations. OR
Create and solve real-world problems involving multiplication of fractions and mixed numbers by creating visual fraction models or equations to represent the problem. 5.NF.F.6.AD

P. Solve real-world problems involving multiplication of fractions and mixed numbers by using visual fraction models or equations to represent the problem. 5.NF.F.6.P

Ba. Solve real-world problems involving multiplication of fractions and whole numbers when given visual fraction models or equations to represent the problem. 5.NF.F.6.BA

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BeB. May be able to solve real-world problems involving multiplication of fractions and whole numbers, with partial success, when given visual fraction models or equations to represent the problem. 5.NF.F.6.BEB

7. Extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations. 5.NF.F.7

   A. Interpret division of a unit fraction by a non-zero whole number and compute the quotient. 5.NF.F.7.A

   B. Interpret division of a whole number by a unit fraction and compute the quotient. 5.NF.F.7.B

   C. Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions by using visual fraction models and equations to represent the problem. 5.NF.F.7.C

Ad. The Advanced student is able to:
Create and solve a real-world problem and justify how the model/equation relates to the problem. OR
Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers using multiple representations. 5.NF.F.7.AD

P. The Proficient student is able to extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations. 5.NF.F.7.P

   A. Interpret division of a unit fraction by a non-zero whole number and compute the quotient. 5.NF.F.7.P.A

   B. Interpret division of a whole number by a unit fraction and compute the quotient. 5.NF.F.7.P.B

   C. Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions by using visual fraction models and equations to represent the problem. 5.NF.F.7.P.C

A. Interpret division of a unit fraction by a non-zero whole number and compute the quotient when given a visual model. 5.NF.F.7.BA.A

B. Interpret division of a whole number by a unit fraction and compute the quotient when given a visual model. 5.NF.F.7.BA.B

A. Interpret division of a unit fraction by a non-zero whole number and compute the quotient with partial success when given a visual model. 5.NF.F.7.BEB.A

B. Interpret division of a whole number by a unit fraction and compute the quotient with partial success when given a visual model. 5.NF.F.7.BEB.B