SECTION EIGHT: Draft 5th Grade Standards

8A: Introduction

Critical Areas for Grade 5 Mathematics

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

1. Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)

2. Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

3. Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.

Grade 5 Overview

Operations and Algebraic Thinking

- Write and interpret numerical expressions.
- Analyze patterns and relationships.

Number and Operations in Base Ten

- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

Number and Operations—Fractions

- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Measurement and Data

- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Geometry

- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.

Mathematical Practices

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

Highlights of Major Work in Grades K-8

K-2:	Addition and subtraction – concepts, skills, and problem solving; place value
3-5:	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6:	Ratios and proportional relationships; early expressions and equations
7:	Ratios and proportional relationships; arithmetic of rational numbers
8:	Linear algebra and linear functions

Grade 5 Fluency Standard(s)

5.NBT.B.5	Multi-digit multiplication

8B: Draft Standards Statements – Grade 5

The standards listed in the tables below list both core standards statements and cluster prioritization for K-8 mathematics. Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. (Link to Focus by Grade Level documents)

Students should spend the large majority of their time on the major work of the grade ( ). Supporting work ( ) and, where appropriate, additional work ( ) can engage students in the major work of the grade.

5.OA - Operations & Algebraic Thinking

5.OA.A - Write and interpret numerical expressions.

Standard	Standards Statement (Jan 2021 Draft)
5.OA.A.1	Write and evaluate simple numerical expressions that include parentheses.
5.OA.A.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

5.OA.B - Analyze patterns and relationships.

Standard	Standards Statement (Jan 2021 Draft)
5.OA.B.3	Given rules for two numerical patterns, identify and analyze relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns and graph them on a coordinate plane.

5.NBT - Number & Operations in Base Ten

5.NBT.A - Understand the place value system.

Standard	Standards Statement (Jan 2021 Draft)
5.NBT.A.1	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. Use representations of place value within these forms to compare two decimals to thousandths using >, =, and < symbols.
5.NBT.A.2	Use whole number exponents to denote powers of 10 and explain the patterns that occur when multiplying and/or dividing whole numbers and decimals by powers of 10.
5.NBT.A.3	Read, write, and compare decimals to thousandths.
5.NBT.A.4	Use place value understanding to round decimals to any place.

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

Standard	Standards Statement (Jan 2021 Draft)
5.NBT.B.5	Demonstrate fluency with multiplication of multi-digit whole numbers using accurate, efficient, and flexible strategies and algorithms based on place value and properties of operations.
5.NBT.B.6	Use a variety of representations and strategies to reason about and find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.

Standard	Standards Statement (Jan 2021 Draft)
5.NBT.B.7	Use a variety of representations and strategies to add, subtract, multiply, and divide decimals to hundredths. Relate the strategy to a written method and explain the reasoning used.

5.NF - Number & Operations - Fractions

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

Standard	Standards Statement (Jan 2021 Draft)
5.NF.A.1	Add and subtract fractions with unlike denominators, including common fractions larger than one and mixed numbers.
5.NF.A.2	Solve problems in authentic contexts involving addition and subtraction of fractions with unlike denominators, including common fractions larger than one and mixed numbers.

5.NF.B - Apply and extend previous understandings of multiplication and division.

Standard	Standards Statement (Jan 2021 Draft)
5.NF.B.3	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve problems in authentic contexts involving division of whole numbers that result in answers that are common fractions or mixed numbers.
5.NF.B.4	Apply and extend previous understanding and strategies of multiplication to multiply a fraction or whole number by a fraction. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5.NF.B.5	Apply and extend previous understandings of multiplication and division to represent and calculate multiplication and division of fractions. Interpret multiplication as scaling (resizing) by comparing the size of products between two factors.
5.NF.B.6	Solve problems in authentic contexts involving multiplication of common fractions and mixed numbers.
5.NF.B.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions, including solving problems in authentic contexts.

5.MD - Measurement & Data

5.MD.A - Convert like measurement units within a given measurement system.

Standard	Standards Statement (Jan 2021 Draft)
5.MD.A.1	Convert between different-sized standard measurement units within a given measurement system. Use these conversions in solving multi-step problems in authentic contexts.

5.MD.B - Represent and interpret data.

Standard	Standards Statement (Jan 2021 Draft)
5.MD.B.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

5.MD.C - Geometric measurement: understand concepts of volume.

Standard	Standards Statement (Jan 2021 Draft)
5.MD.C.3	Recognize that volume is a measurable attribute of solid figures.
5.MD.C.4	Measure the volume of a rectangular prism by counting unit cubes using standard and improvised units.
5.MD.C.5	Relate volume to the operations of multiplication and addition. Solve problems in authentic contexts involving volume using a variety of strategies.

5.G - Geometry

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

Standard	Standards Statement (Jan 2021 Draft)
5.G.A.1	Graph and name coordinate points in the first quadrant using the standard x, y notation. Understand the coordinate points values represent the distance traveled along the horizontal x-axis and vertical y-axis.
5.G.A.2	Represent authentic contexts and mathematical problems by graphing points in the first quadrant of the coordinate plane. Interpret the meaning of the coordinate values based on the context of a given situation.

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

Standard	Standards Statement (Jan 2021 Draft)
5.G.B.3	*Note: propose combining with 5.G.B.4*
5.G.B.4	Classify two-dimensional figures within a hierarchy based on their geometrical properties, and explain the relationship across and within different categories of these figures.

8C: Grade 5 Crosswalk with Clarifying Guidance

CLUSTER: 5.OA.A - Write and interpret numerical expressions.

STANDARD: 5.OA.A.1

Original CCSS Text (2010):

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Standards Statement (JAN 2021):

Write and evaluate simple numerical expressions that include parentheses.

Clarifying Guidance (JAN 2021):

Use of nested parentheses should be used in favor of brackets or braces in numerical expressions.

Example:

Express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7).

If this expression were tripled, then it could represented as 3 x (2 × (8 + 7)), where the number of open parentheses is the same as the number of closed parentheses.

STANDARD: 5.OA.A.2

Original CCSS Text (2010):

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

Standards Statement (JAN 2021):

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Clarifying Guidance (JAN 2021):

Expressions included should contain numbers, operations, and grouping symbols.

Example:

Recognize that 3 × (18,932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

CLUSTER: 5.OA.B - Analyze patterns and relationships.

STANDARD: 5.OA.B.3

Original CCSS Text (2010):

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. 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.

Standards Statement (JAN 2021):

Given rules for two numerical patterns, identify and analyze relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns and graph them on a coordinate plane.

Clarifying Guidance (JAN 2021):

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. Identify and explain why the terms in one sequence are twice the value of the terms in the corresponding sequence.

Boundary:

Generating numerical patterns is a fourth grade standard, therefore is also an expectation for 5th grade.

CLUSTER: 5.NBT.A - Understand the place value system.

STANDARD: 5.NBT.A.1

Original CCSS Text (2010):

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.

Standards Statement (JAN 2021):

Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. Use representations of place value within these forms to compare two decimals to thousandths using >, =, and < symbols.

Clarifying Guidance (JAN 2021):

Read and write decimals to thousandths using base-ten numerals, number names, and expanded form.

For example, 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

700 is 10 times as much as 70, and 70 is 1/10 of 700.

STANDARD: 5.NBT.A.2

Original CCSS Text (2010):

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.

Standards Statement (JAN 2021):

Use whole number exponents to denote powers of 10 and explain the patterns that occur when multiplying and/or dividing whole numbers and decimals by powers of 10.

Clarifying Guidance (JAN 2021):

Observe and explain the patterns in the number of zeros of a product when multiplying a whole number by a power of 10, and the placement of the decimal point when a decimal is multiplied or divided by a power of 10.

Boundary:

Work with exponents at this grade is limited to powers of 10.

STANDARD: 5.NBT.A.3

Original CCSS Text (2010):

Read, write, and compare decimals to thousandths.

5.NBT.A.3.A	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
5.NBT.A.3.B	Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Standards Statement (JAN 2021):

Read, write, and compare decimals to thousandths.

Clarifying Guidance (JAN 2021):

Read, write, and compare decimals to thousandths using base-ten numerals, number names, and expanded form.

Use >, =, and < symbols to record comparisons of two decimals.

For example:

347.392 =

= 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

=three hundred forty-seven and three hundred ninety-two thousandths

Note:

Students should be provided opportunities to simultaneously compare decimals and fractions, including equivalent fractions and decimals, on both single and double number lines.

STANDARD: 5.NBT.A.4

Original CCSS Text (2010):

Use place value understanding to round decimals to any place.

Standards Statement (JAN 2021):

Use place value understanding to round decimals to any place.

Clarifying Guidance (JAN 2021):

Boundary:

Work with decimals at this grade is limited to decimals up to the thousandths.

CLUSTER: 5.NBT.B - Perform operations with multi-digit whole numbers and with decimals to hundredths.

STANDARD: 5.NBT.B.5

Original CCSS Text (2010):

Fluently multiply multi-digit whole numbers using the standard algorithm.

Standards Statement (JAN 2021):

Demonstrate fluency with multiplication of multi-digit whole numbers using accurate, efficient, and flexible strategies and algorithms based on place value and properties of operations.

Clarifying Guidance (JAN 2021):

Note:

The National Council of Teachers of Mathematics provides the following definition of procedural fluency:

"Procedural fluency is the ability to apply procedures accurately, efficiently, and flexibly; to transfer procedures to different problems and contexts; to build or modify procedures from other procedures; and to recognize when one strategy or procedure is more appropriate to apply than another.

STANDARD: 5.NBT.B.6

Original CCSS Text (2010):

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, and/or area models.

Standards Statement (JAN 2021):

Use a variety of representations and strategies to reason about and find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.

Clarifying Guidance (JAN 2021):

Note:

Illustrate and explain calculations using rectangular arrays, area models, and/or equations, along with strategies based on place value, properties of operations, and/or the relationship between multiplication and division.

STANDARD: 5.NBT.B.7

Original CCSS Text (2010):

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.

Standards Statement (JAN 2021):

Use a variety of representations and strategies to add, subtract, multiply, and divide decimals to hundredths. Relate the strategy to a written method and explain the reasoning used.

Clarifying Guidance (JAN 2021):

Note:

As part of this standard, students must be able to use concrete models, visual drawings and strategies based on place value, properties of operations, and the relationship between addition and subtraction.

Boundary:

Fluency with operations with decimals is part of the 6th grade standards.

CLUSTER: 5.NF.A - Use equivalent fractions as a strategy to add and subtract fractions.

STANDARD: 5.NF.A.1

Original CCSS Text (2010):

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. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

Standards Statement (JAN 2021):

Add and subtract fractions with unlike denominators, including common fractions larger than one and mixed numbers.

Clarifying Guidance (JAN 2021):

A common fraction is a fraction in which numerator and denominator are both integers, as opposed to fractions. Fractions such as 4/3, or 14/5 should be thought of as common fractions greater than one, which could also be written using mixed numbers as 1-1/3 and 2-4/5 respectively.

Use of the term "improper fraction" should be avoided.

Note: Include replacing given fractions with equivalent fractions to produce an equivalent sum or difference.

Example:

2/3 + 5/4 = 8/12 + 15/12 = 23/12 or 1 11/12.

Boundary:

Work with fractions at grade 5 should focus on fractions with denominators 2-10, 12, 16, 25, 100 and 1000.

STANDARD: 5.NF.A.2

Original CCSS Text (2010):

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. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.

Standards Statement (JAN 2021):

Solve problems in authentic contexts involving addition and subtraction of fractions with unlike denominators, including common fractions larger than one and mixed numbers.

Clarifying Guidance (JAN 2021):

Example: Use visual fraction models or equations to represent the problem.

Boundary:

Work with fractions at grade 5 should focus on fractions with denominators 2-10, 12, 16, 25, 100 and 1000.

Connections to MP 2 and MP6:

Use benchmark fractions and number sense of fractions to estimate and assess the reasonableness of answers.

CLUSTER: 5.NF.B - Apply and extend previous understandings of multiplication and division.

STANDARD: 5.NF.B.3

Original CCSS Text (2010):

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, e.g., by using visual fraction models or equations to represent the problem. 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?

Standards Statement (JAN 2021):

Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve problems in authentic contexts involving division of whole numbers that result in answers that are common fractions or mixed numbers.

Clarifying Guidance (JAN 2021):

Note:

As part of this standard, students should have opportunities to use visual models or equations to represent and solve problems.

Example:

If 3 cookies are shared equally among 4 people each person receives ¾ of a cookie.

Sample Tasks:

- 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?

STANDARD: 5.NF.B.4

Original CCSS Text (2010):

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

5.NF.B.4.A	Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = (ac)/(bd).
5.NF.B.4.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 Statement (JAN 2021):

Apply and extend previous understanding and strategies of multiplication to multiply a fraction or whole number by a fraction. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Clarifying Guidance (JAN 2021):

Interpret the product of the fraction a/b and a whole number (q) as

- partitioning the whole number into b parts and counting a parts
- Repeating the fraction a/b q number of times.

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

Note:

Understand that ⅔ x 4 can be seen as partitioning 4 into 3 equal parts as well as counting 2 of the 3 (4/3 x 2) parts or as iterating ⅔ four times [(2 x 4)/3]. In general, a/b x q = q/b x a = (a x q)/b.

Example:

Use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15.

STANDARD: 5.NF.B.5

Original CCSS Text (2010):

Interpret multiplication as scaling (resizing), by:

5.NF.B.5.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.
5.NF.B.5.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 × a)/(n × b) to the effect of multiplying a/b by 1.

Standards Statement (JAN 2021):

Apply and extend previous understandings of multiplication and division to represent and calculate multiplication and division of fractions. Interpret multiplication as scaling (resizing) by comparing the size of products between two factors.

Clarifying Guidance (JAN 2021):

Note:

As part of this standard, students must be able to

- 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.
- Explain that multiplying a given number by a fraction greater than 1 results in a product greater than the given number.
- Explain that multiplying a given number by a fraction equivalent to 1 (such as 4/4) results in the same product as multiplying by 1.
- Explain that multiplying a given number by a fraction less than 1 results in a product smaller than the given number.

STANDARD: 5.NF.B.6

Original CCSS Text (2010):

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 Statement (JAN 2021):

Solve problems in authentic contexts involving multiplication of common fractions and mixed numbers.

Clarifying Guidance (JAN 2021):

Note:

Students should be given opportunities to use both visual fraction models and equations to represent and solve problems.Students should be given opportunities to use both visual fraction models and equations to represent and solve problems.

STANDARD: 5.NF.B.7

Original CCSS Text (2010):

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.1

5.NF.B.7.A	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) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.
5.NF.B.7.B	Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.
5.NF.B.7.C	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. 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?

Standards Statement (JAN 2021):

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions, including solving problems in authentic contexts.

Clarifying Guidance (JAN 2021):

Note: Students should be given opportunities to use both visual fraction models and equations to represent and solve problems.

Examples:

- Create a story context for (1/3) ÷ 4 and use a visual fraction model to show the quotient.
- Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.
- Create a story context for 4 ÷ (1/5) and use a visual fraction model to show the quotient.
- Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.
- How much chocolate will each person get if 3 people share ½ lb of chocolate equally?
- How many ⅓-cup servings are in 2 cups of raisins?

Boundary:

Division of a fraction by a fraction is not a requirement at this grade. However, students who are able to multiply fractions can develop strategies to divide a fraction by a fraction by reasoning about the relationship between multiplication and division.

CLUSTER: 5.MD.A - Convert like measurement units within a given measurement system.

STANDARD: 5.MD.A.1

Original CCSS Text (2010):

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Standards Statement (JAN 2021):

Convert between different-sized standard measurement units within a given measurement system. Use these conversions in solving multi-step problems in authentic contexts.

Clarifying Guidance (JAN 2021):

Note:

Students should be provided opportunities to convert within both metric and customary systems.

Example:

For example, convert 5 cm to 0.05 m.

Boundary:

Students do not need to convert between systems.

CLUSTER: 5.MD.B – Represent and interpret data.

STANDARD: 5.MD.B.2

Original CCSS Text (2010):

Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to 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 Statement (JAN 2021):

Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

Clarifying Guidance (JAN 2021):

Note: Students should be provided opportunities to read and interpret information presented in line plots.

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.

CLUSTER: 5.MD.C - Geometric measurement: understand concepts of volume.

STANDARD: 5.MD.C.3

Original CCSS Text (2010):

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

5.MD.C.3.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.
5.MD.C.3.B	A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

Standards Statement (JAN 2021):

Recognize that volume is a measurable attribute of solid figures.

Clarifying Guidance (JAN 2021):

Note:

- 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.
- A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

STANDARD: 5.MD.C.4

Original CCSS Text (2010):

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

Standards Statement (JAN 2021):

Measure the volume of a rectangular prism by counting unit cubes using standard and improvised units.

Clarifying Guidance (JAN 2021):

Note:

Students should have opportunities to use metric, customary and improvised units.

STANDARD: 5.MD.C.5

Original CCSS Text (2010):

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

5.MD.C.5.A	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. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
5.MD.C.5.B	Apply the formulas V = l × w × h and V = b × 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.
5.MD.C.5.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 Statement (JAN 2021):

Relate volume to the operations of multiplication and addition. Solve problems in authentic contexts involving volume using a variety of strategies.

Clarifying Guidance (JAN 2021):

Note:

Students should be provided opportunities to use a variety of strategies including counting cubes, addition and multiplication, and applying the formula.

Examples:

- Find the volume of a rectangular prism with whole-number side lengths by packing it with unit cubes.
  Show that the volume is the same as would be found by multiplying the edge lengths or by multiplying the height by the area of the base.
- Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping rectangular prisms by adding the volumes of the non-overlapping parts.
- Given the volume and 2 side lengths, determine the missing side length.

Boundary:

Work with volume at fifth grade is limited to whole number edge lengths.

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

STANDARD: 5.G.A.1

Original CCSS Text (2010):

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).

Standards Statement (JAN 2021):

Graph and name coordinate points in the first quadrant using the standard x, y notation. Understand the coordinate points values represent the distance traveled along the horizontal x-axis and vertical y-axis.

Clarifying Guidance (JAN 2021):

Note:

This is students first formalized introduction to the conventions of coordinate graphing:

- The first number indicates the distance from the origin on the x-axis.
- The second number indicates the distance from the origin on the y-axis.
- The names of the two axes and coordinates (or ordered pairs) correspond (x-axis and x-coordinate, y-axis and y-coordinate).

In addition to whole numbers, ordered pairs should include the decimal and fractional values of halves and fourths.

Boundary:

Graphing beyond the first quadrant is not a requirement at this grade.

STANDARD: 5.G.A.2

Original CCSS Text (2010):

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 Statement (JAN 2021):

Represent authentic contexts and mathematical problems by graphing points in the first quadrant of the coordinate plane. Interpret the meaning of the coordinate values based on the context of a given situation.

Clarifying Guidance (JAN 2021):

Example:

The coordinate (1,1.5) or (1,1½) means that in the first year, a person grew 1.5 or 1 ½ inches.

CLUSTER: 5.G.B. - Classify two-dimensional figures into categories based on their properties.

STANDARD: 5.G.B.3

Original CCSS Text (2010):

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

Standards Statement (JAN 2021):

Note: propose combining with 5.G.B.4

Clarifying Guidance (JAN 2021):

STANDARD: 5.G.B.4

Original CCSS Text (2010):

Classify two-dimensional figures in a hierarchy based on properties.

Standards Statement (JAN 2021):

Classify two-dimensional figures within a hierarchy based on their geometrical properties, and explain the relationship across and within different categories of these figures.

Clarifying Guidance (JAN 2021):

For example:

Explain that since all rectangles have four right angles, and squares are rectangles, then all squares have four right angles. Explain that parallelograms and trapezoids are both quadrilaterals, and both have at least one set of parallel sides, but that they differ in that trapezoids have exactly one set and parallelograms have exactly two sets.

Note:

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.