

Number Corner Grade 5 Correlations to Common Core State Standards

Common Core State Standards for Mathematics, Grade 5

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 & Algebraic Thinking

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

Number & Operations in Base Ten

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

Number & 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 & 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.

Taken from the Common Core State Standards for Mathematics 2010, pages 33 & 34.

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

OPERATIONS AND ALGEBRAIC THINKING 5.OA			
Standard	Number Corner	Bridges Supplement	Assessments
Write and interpret numerical expressions.			
1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	September Computational Fluency		
2. 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 $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.			
Analyze patterns and relationships.			
3. 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.			

NUMBER AND OPERATIONS IN BASE TEN 5.NBT			
Standard	Number Corner	Bridges Supplement	Assessments
Understand the place value system.			
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.	November Calendar Grid February Calendar Grid March Computational Fluency		Formal Number Corner Teacher’s Guide, Vol. 1, pp 57–60, 110–114 (Baseline Assessment, Checkup 1) Number Corner Teacher’s Guide, Vol. 2, pp 232–236, 320–324, 400–404 (Checkups 2–4)

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS IN BASE TEN 5.NBT			
Standard	Number Corner	Bridges Supplement	Assessments
Understand the place value system.			
2a. 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.	November Computational Fluency December Computational Fluency		
2b. Use whole-number exponents to denote powers of 10.			
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., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (\frac{1}{10}) + 9 \times (\frac{1}{100}) + 2 \times (\frac{1}{1000})$.	November Calendar Grid February Calendar Grid Mar. Computational Fluency		Formal Number Corner, Vol. 1 & 2, pp 57–60, 232–236, 320–324, 400–404 (Baseline, Checkups 2, 3, 4)
b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.	November Calendar Grid February Calendar Grid		
4. Use place value understanding to round decimals to any place.			Number Corner Teacher's Guide, Vol. 1, pp 110–114 (Checkup 1) Number Corner Teacher's Guide, Vol. 2, pp 232–236, 320–321 (Checkups 2, 3)
Perform operations with multi-digit whole numbers and with decimals to hundredths.			
5. Fluently multiply multi-digit whole numbers using the standard algorithm.	Nov. Computational Fluency Dec. Computational Fluency Jan. Computational Fluency		Formal Number Corner, Vol. 1, pp 57–60 (Baseline) Number Corner, Vol. 2, pp 232–236, 320–324 (Checkups 2, 3)
6. 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.	October Calendar Collector December Computational Fluency February Computational Fluency May Computational Fluency		Formal Number Corner, Vol. 1, pp 57–60, 110–114 (Baseline, Checkup 1) Number Corner Teacher's Guide, Vol. 2, pp 232–236, 320–324 (Checkups 2, 3)

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS IN BASE TEN 5.NBT			
Standard	Number Corner	Bridges Supplement	Assessments
Perform operations with multi-digit whole numbers and with decimals to hundredths.			
7a. Add and subtract 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.	March Computational Fluency		Number Corner Vol. 2, pp 320–324 (Checkup 3)
7b. 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.	March Computational Fluency		

NUMBER AND OPERATIONS—FRACTIONS 5.NF			
Standard	Number Corner	Bridges Supplement	Assessments
Use equivalent fractions as a strategy to add and subtract fractions.			
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. For example, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.)	November Calendar Grid November Calendar Collector March Computational Fluency April Computational Fluency		Formal Number Corner Vol. 1, pp 57–68 (Baseline) Number Corner, Vol. 2, pp 320–324, 400–404 (Checkups 3 & 4)
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.	November Calendar Grid November Calendar Collector March Computational Fluency April Computational Fluency Number Corner Student Book, page 58		Formal Number Corner Teacher’s Guide, pages 57–60, 320–324, 400–404 (Baseline Assessment, Checkups 3 & 4)

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS—FRACTIONS 5.NF			
Standard	Number Corner	Bridges Supplement	Assessments
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.			
3. Interpret a fraction as division of the numerator by the denominator ($\frac{a}{b} = a \div b$). 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. For example, interpret $\frac{3}{4}$ as the result of dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$.	March Computational Fluency		
4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.			
a. Interpret the product $(\frac{a}{b}) \times q$ 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 $(\frac{2}{5}) \times 4 = \frac{8}{5}$, and create a story context for this equation. Do the same with $(\frac{2}{5}) \times (\frac{4}{5}) = \frac{8}{25}$. (In general, $(\frac{a}{b}) \times (\frac{c}{d}) = \frac{ac}{bd}$.)	March Computational Fluency April Problem Solving		
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.			
5. 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.			
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 $\frac{a}{b} = \frac{(na)}{(nxb)}$ to the effect of multiplying $\frac{a}{b}$ by 1.			
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.	April Problem Solving		

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS—FRACTIONS 5.NF			
Standard	Number Corner	Bridges Supplement	Assessments
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.			
7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Note: Division of a fraction by a fraction is not a requirement at this grade.)			
a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(\frac{1}{3}) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(\frac{1}{3}) \div 4 = \frac{1}{12}$ because $(\frac{1}{12}) \times 4 = \frac{1}{3}$.			
b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (\frac{1}{5})$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (\frac{1}{5}) = 20$ because $20 \times (\frac{1}{5}) = 4$.			
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 $\frac{1}{2}$ lb of chocolate equally? How many $\frac{1}{3}$ -cup servings are in 2 cups of raisins?			

MEASUREMENT AND DATA 5.MD			
Standard	Number Corner	Bridges Supplement	Assessments
Convert like measurement units within a given measurement system.			
1. 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.	November Calendar Collector March Calendar Grid March Calendar Collector April Problem Solving		Formal Number Corner Teacher's Guide, Vol. 2, pp 232–236, (Checkup 2)

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

MEASUREMENT AND DATA 5.MD			
Standard	Number Corner	Bridges Supplement	Assessments
Represent and interpret data.			
2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). 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.			
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.			
3. 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.	January Calendar Grid April Calendar Grid		
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.	January Calendar Grid April Calendar Grid		
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	January Calendar Grid April Calendar Grid		Number Corner Teacher’s Guide, Vol. 2, pp 232–236, (Checkup 2)
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.			
5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.			
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.	January Calendar Grid April Calendar Grid		

Number Corner Grade 5 Correlations to Common Core State Standards (cont.)

MEASUREMENT AND DATA 5.MD			
Standard	Number Corner	Bridges Supplement	Assessments
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.			
5. 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.	January Calendar Grid		

GEOMETRY 5.G			
Standard	Number Corner	Bridges Supplement	Assessments
Graph points on the coordinate plane to solve real-world and mathematical problems.			
1. 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).	March Calendar Grid		Formal Number Corner, Vol. 2, pp 320–324 (Checkup 3)
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.	October Computational Fluency March Calendar Grid		
Classify two-dimensional figures into categories based on their properties.			
3. 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.	September Calendar Grid October Calendar Grid		
4. Classify two-dimensional figures in a hierarchy based on properties.			