

Number Corner Grade 4 Correlations to Common Core State Standards

Common Core State Standards for Mathematics, Grade 4

In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

(1) Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

(2) Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., $\frac{15}{6} = \frac{5}{2}$), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

(3) Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Grade 4 Overview

Operations & Algebraic Thinking

- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

Number & Operations in Base Ten

- Generalize place value understanding for multidigit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number & Operations—Fractions

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

Measurement & Data

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Geometry

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

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 27 & 28.

Number Corner Grade 4 Correlations to Common Core State Standards

OPERATIONS AND ALGEBRAIC THINKING 4.OA			
Standard	Number Corner	Bridges Supplement	Assessments
Use the four operations with whole numbers to solve problems.			
1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.			
2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.			
3a. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.	October Problem Solving November Problem Solving November Number Line December Problem Solving January Problem Solving February Problem Solving March Problem Solving May Calendar Collector May Problem Solving		Formal Number Corner Teacher's Guide, Vol. 2, pp 289–292 (Checkup 3)
3b. Represent these multistep word problems posed with whole numbers using equations with a letter standing for the unknown quantity.			
3c. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	November Number Line December Problem Solving December Number Line January Number Line May Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 2, pp 211–214 (Checkup 2)
Gain familiarity with factors and multiples.			
4a. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors.	March Number Line		Formal Number Corner Teacher's Guide, Vol. 2, pp 365–369 (Checkup 4)
4b. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.	September Number Line October Number Line November Number Line January Number Line February Number Line		Formal Number Corner Teacher's Guide, Vol. 2, pp 365–369 (Checkup 4)
Gain familiarity with factors and multiples.			

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

OPERATIONS AND ALGEBRAIC THINKING 4.OA			
Standard	Number Corner	Bridges Supplement	Assessments
4c. Determine whether a given whole number in the range 1–100 is prime or composite.	March Number Line		Formal Number Corner Teacher's Guide, pp 365–369 (Checkup 4)
Generate and analyze patterns.			
5a. Generate a number or shape pattern that follows a given rule.	September Calendar Grid September Number Line October Calendar Grid October Number Line November Number Line January Calendar Grid February Calendar Grid February Number Line		
5b. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	September Calendar Grid September Number Line October Calendar Grid October Number Line November Number Line January Calendar Grid February Calendar Grid February Number Line		

NUMBER AND OPERATIONS IN BASE TEN 4.NBT			
Standard	Number Corner	Bridges Supplement	Assessments
Generalize place value understanding for multi-digit whole numbers.			
1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.	September Calendar Grid September Problem Solving October Calendar Grid		
Generalize place value understanding for multi-digit whole numbers.			
2a. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form.	September Calendar Grid September Problem Solving November Number Line December Number Line January Number Line March Number Line		Formal Number Corner Teacher's Guide, Vol. 1, pp 97–101 (Checkup 1) Number Corner, Vol. 2, pp 365–369 (Checkup 4)

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS IN BASE TEN 4.NBT			
Standard	Number Corner	Bridges Supplement	Assessments
Generalize place value understanding for multi-digit whole numbers.			
2b. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.	September Number Line November Number Line December Number Line January Number Line		Formal Number Corner Teacher's Guide, Vol. 1, pp 59–63 (Baseline Assessment) Number Corner Teacher's Guide, Vol. 2, pp 365–369 (Checkup 4)
3. Use place value understanding to round multi-digit whole numbers to any place.	November Number Line December Number Line January Number Line		Formal Number Corner Teacher's Guide, Vol. 2, pp 211–214 (Checkup 2)
Use place value understanding and properties of operations to perform multi-digit arithmetic.			
4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	October Problem Solving January Number Line May Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 1, pp 59–63, 97–101 (Baseline, Checkup 1) Number Corner, Vol. 2, pp 211–214, 365–369 (Checkups 2, 4)
5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	November Problem Solving Dec. Computational Fluency April Problem Solving		Formal Number Corner Teacher's Guide, Vol. 2, pp 211–214, 365–369 (Checkups 2, 4)
6. Find whole-number quotients and remainders with up to four-digit dividends and one-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.	November Problem Solving January Problem Solving Jan. Computational Fluency February Problem Solving Feb. Computational Fluency March Problem Solving March Computational Fluency April Problem Solving April Computational Fluency		Formal Number Corner Teacher's Guide, Vol. 1, pp 59–63 (Baseline) Number Corner Teacher's Guide, Vol. 2, p 211–214, 289–292, 365–369 (Checkups 2–4)

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS—FRACTIONS 4.NF			
Standard	Number Corner	Bridges Supplement	Assessments
Extend understanding of fraction equivalence and ordering. (Note: Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 & 100.)			
1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Oct Calendar Collector Dec Calendar Collector March Calendar Grid April Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 2, pp 289–292 (Checkup 3)
2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.	March Calendar Grid March Calendar Collector April Calendar Collector May Number Line		Formal Number Corner Teacher's Guide, Vol. 2, pp 365–369 (Checkup 4)
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.			
3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.			
a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	Sept. Calendar Collector Oct. Calendar Collector Nov. Calendar Collector Dec. Calendar Collector April Calendar Collector		
b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.			
c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	March Problem Solving April Calendar Collector		

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS—FRACTIONS 4.NF			
Standard	Number Corner	Bridges Supplement	Assessments
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.			
d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Sept. Calendar Collector Oct. Calendar Collector Nov. Calendar Collector Dec. Calendar Collector		
4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.			
a. Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. For example, use a visual fraction model to represent $\frac{5}{4}$ as the product $5 \times (\frac{1}{4})$, recording the conclusion by the equation $\frac{5}{4} = 5 \times (\frac{1}{4})$.			
b. Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (\frac{2}{5})$ as $6 \times (\frac{1}{5})$, recognizing this product as $\frac{6}{5}$. (In general, $n \times (\frac{a}{b}) = (\frac{n \times a}{b})$.)			
c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person will eat $\frac{3}{8}$ of a pound of roast beef, and there are 5 people, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?			
Understand decimal notation for fractions, and compare decimal fractions.			
5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.	March Number Line April Number Line May Number Line		Formal Number Corner Teacher's Guide, Vol. 2, 211–214 (Checkup 2)
6. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	Dec. Calendar Collector April Number Line		Formal Number Corner Teacher's Guide, pp 365–369 (Checkup 4)

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

NUMBER AND OPERATIONS—FRACTIONS 4.NF			
Standard	Number Corner	Bridges Supplement	Assessments
Understand decimal notation for fractions, and compare decimal fractions.			
7a. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole.	Dec. Calendar Collector March Number Line April Number Line		Formal Number Corner Teacher's Guide, pp 365–369 (Checkup 4)
7b. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.			

MEASUREMENT AND DATA 4.MD			
Standard	Number Corner	Bridges Supplement	Assessments
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.			
1a. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.			
i. metric length (km, m, cm)	Sept. Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 1, pp 97–101 (Checkup 1)
ii. standard length (yd, ft, in)	Nov. Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 2, pp 211–214 (Checkup 2)
iii. metric mass (kg, g)			
iv. standard weight (lb, oz)			
v. metric capacity (l, ml)		Set D3 Measurement: Capacity in Metric Units, Activities 1 & 2 and Ind. Worksheet 1	
vi. standard capacity (gal, qt, pt, c)	October Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 2, pp 211–214 (Checkup 2)
vii. time (hr, min, sec)			
1b. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...			
i. metric length (km, m, cm)	Sept. Calendar Collector Number Corner St. Book, p 4		
ii. standard length (yd, ft, in)	Nov. Calendar Collector		
iii. metric mass (kg, g)			

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

MEASUREMENT AND DATA 4.MD			
Standard	Number Corner	Bridges Supplement	Assessments
iv. standard weight (lb, oz)			
v. metric capacity (l, ml)			
vi. standard capacity (gal, qt, pt, c)	October Calendar Collector Number Corner St. Book, p 20		
vii. time (hr, min, sec)			
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.			
a. distances	September Calendar Collector November Calendar Collector March Problem Solving May Calendar Grid May Calendar Collector May Problem Solving		
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.			
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.			
b. intervals of time	January Calendar Grid January Problem Solving		Formal Number Corner Teacher's Guide, Vol. 1, pp 59–63 (Baseline) Number Corner Teacher's Guide, Vol. 2, pp 211–214 (Checkup 2)
c. liquid volumes	October Calendar Collector March Calendar Collector Number Corner St. Book, p 21		
d. masses of objects			
e. money	December Calendar Collector		Formal Number Corner Teacher's Guide, Vol. 1, pp 59–63 (Baseline)
3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	January Problem Solving April Calendar Grid April Problem Solving		Formal Number Corner Teacher's Guide, Vol. 2, pp 211–214, 289–292 (Checkups 2, 3)

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

MEASUREMENT AND DATA 4.MD			
Standard	Number Corner	Bridges Supplement	Assessments
Represent and interpret data.			
4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.			
Geometric measurement: understand concepts of angle and measure angles.			
5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:			
a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles.			
b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.			
6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.			
7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.			

Number Corner Grade 4 Correlations to Common Core State Standards (cont.)

GEOMETRY 4.G			
Standard	Number Corner	Bridges Supplement	Assessments
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.			
1a. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines.	April Calendar Grid		
1b. Identify these in two-dimensional figures.	April Calendar Grid		
2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	April Calendar Grid		
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	April Calendar Grid		