

Divide fluently up to a four-digit number by a two-digit number and solve applied problems involving multiplication and division of whole numbers.

See content expectations for multiplication and division in earlier grades.

- Understand the meaning of division of whole numbers, with and without remainders; relate division to fractions and to repeated subtraction.
- Write mathematical statements involving division for given situations.
- Relate division of whole numbers with remainders to the form $a = bq + r$, e.g., $34 \div 5 = 6 \text{ r } 4$, so $5 \cdot 6 + 4 = 34$; note remainder (4) is less than divisor (5).
- Multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.
- Find the prime factorization of numbers from 2 through 50, express in exponential notation, e.g., $24 = 2^3 \times 3^1$, and understand that every whole number greater than 1 is either prime or can be expressed as a product of primes.

Solve contextual problems involving sums and differences of fractions with unlike denominators.

- Understand a fraction as a statement of division, e.g., $2 \div 3 = 2/3$ using simple fractions and pictures to represent.
- Given two fractions, e.g., $1/2$ and $1/4$, express them as fractions with a common denominator, but not necessarily a least common denominator, e.g., $1/2 = 4/8$ and $3/4 = 6/8$; use denominators less than 12 or factors of 100.
- Find the product of two unit fractions with small denominators using an area model.
- Divide a fraction by a whole number and a whole number by a fraction, using simple unit fractions.
- Add and subtract fractions with unlike denominators through 12 and/or 100, using the common denominator that is the product of the denominators of the 2 fractions, e.g., for $3/8 + 7/10$, use 80 as the common denominator.
- Use mathematical statements to represent an applied situation involving addition and subtraction of fractions.
- Solve contextual problems that involve finding sums and differences of fractions with unlike denominators using knowledge of equivalent fractions.
- Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness.
- Solve for the unknown in equations such as $1/4 + x = 7/12$.

Express fractions and decimals as percentages, and vice versa.

- Understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right, e.g., 1 is 10 tenths, one tenth is 10 hundredths.
- Understand percentages as parts out of 100, use % notation, and express a part of a whole as a percentage.
- Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1,000 and identify patterns.
- Divide numbers by 10s, 100s, 1,000s using mental strategies.
- Multiply one- and two-digit whole numbers by decimals up to two decimal places.

Convert measurements of length, weight, area, volume, and time within a given system using easily manipulable numbers.

- Recognize the equivalence of 1 liter, 1000 ml and 1000 cm^3 and include conversions among liters, milliliters, and cubic centimeters.
- Know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations (cm³, m³, in³, ft³, yd³).

- Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter.
- Convert measurements of length, weight, area, volume, and time within a given system using easily manipulable numbers.

Use area formulas for triangles and parallelograms and understand volume.

Areas of rectangles have been studied in 2nd, 3rd and 4th grades.

- Represent relationships between areas of rectangles, triangles, and parallelograms using models.
- Understand and know how to use the area formula of a triangle: $A = \frac{1}{2}bh$ (where b is length of the base and h is the height), and represent using models and manipulatives.
- Understand and know how to use the area formula for a parallelogram: $A = bh$, and represent using models and manipulatives.
- Build solids with unit cubes and state their volumes.
- Use filling (unit cubes or liquid) and counting or measuring to find the volume of a cube and rectangular prism.
- Solve applied problems about the volumes of rectangular prisms using multiplication and division and using the appropriate units.

Measure angles and understand angle relationships in geometric figures.

- Associate an angle with a certain amount of turning; know that angles are measured in degrees; understand that 90° , 180° , 270° , and 360° are associated, respectively, with $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ and full turns.
- Measure angles with a protractor, and classify them as acute, right, obtuse, or straight.
- Identify & name angles on a straight line & vertical angles. Know that angles on a straight line add up to 180° and angles surrounding a point add up to 360° ; justify informally by “surrounding” a point with angles. Find unknown angles in problems involving angles on a straight line, angles surrounding a point and vertical angles.
- Understand why the sum of the interior angles of a triangle is 180° and the sum of the interior angles of a quadrilateral is 360° , and use these properties to solve problems.
- Find unknown angles using the properties of triangles, including right, isosceles, and equilateral triangles; parallelograms, including rectangles and rhombuses; and trapezoids.

Find the mean of a set of data.

- Given a set of data, find and interpret the mean (using the concept of fair share) and mode. Solve multi-step problems involving means.

Also in 5th grade:

- Express ratios in several ways given applied situations, e.g., 3 cups to 5 people, 3:5, $\frac{3}{5}$; recognize and find equivalent ratios. Ratios are a power standard for 6th grade.
- Create and interpret line graphs. Used in science and social studies curricula.