Common Core Math Standards for Fifth Grade
Number and Operations in Base Ten[2]

The standards explain what children should be able to understand and do by the end of each grade. The box on the left lists the standards teachers are using, and the box on the right is what you can do at home to support what children are learning in the classroom.

Number and Operations in Base Ten — 5.NBT

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 1/10 of what it represents in the place to its left.
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.
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., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
   b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
4. Use place value understanding to round decimals to any place.

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

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

What does this mean and what can I do at home to help my child develop these skills?

- Using a store receipt, have your child underline digits that are the same and explain the relationship between the digits. Use vocabulary such as “10 times as much” or “1/10 as much.” For example, the digit 2 in 127 is 10 times as much as the digit 2 in 42.
- Ask your child questions about prices at the grocery store if you purchase 10, 100 or 1000 of an item. Help your child understand that the decimal point will move one, two or three places to the right each time the price is multiplied by 10, 100 or 1000. For example, one can of beans cost $0.59. How much will it cost if we purchase 10 cans? ($5.90)
- When shopping at the grocery store or for clothes, have your child round the prices to the nearest whole dollar.
- Use the internet, newspaper, or television to find rainfall or snow totals for your area. Then encourage your child to estimate the rainfall to the nearest half-inch.
- Use dominoes to practice multiplication. Have your child take two dominoes, read each domino as a 2-digit number and multiply to find the product.
- Together with your child, find a package of food with a sticker price and count the number of individual food items inside the package.
- Have your child choose items from a sale flyer and add the prices to get as close as possible to a total of $5, $10, etc.
- Give your child several quarters, dimes or nickels. Have your child write the value of each coin as a decimal and multiply the decimal amount by the number of coins to find the total value.

Common Core Math Standards for Fifth Grade: Numbers and Operations-Fractions

he standards explain what children should be able to understand and do by the end of each grade. The box on the left lists the standards teachers are using, and the box on the right is what you can do at home to support what children are learning in the classroom.

Number and Operations—Fractions **5.NF**

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, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*
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. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

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 ($a/b = a \div b$). 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 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?*
4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
   a. Interpret the product $(a/b) \times q$ 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 (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. (In general, (a/b) x (c/d) = ac/bd.)*
   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 $a/b = (n \times a)/(n \times b)$ to the effect of multiplying 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.
7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1]
   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) x 4 = 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 ÷ (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 x (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 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

What does this mean and what can I do at home to help my child develop these skills?

- Let your child see you doing real-life math that involves fractions. This will help your child see that everyone uses math.
- Ask your child questions such as, "Would you rather have 2/4 or 2/3 hour of homework? Have your child explain the choice.
- Discuss professions in which fractions with different denominators are added or subtracted (e.g., carpenter, seamstress, chef, etc.).
- Practice adding halves, fourths, eights, and sixteenths on a standard inch ruler. Your child could add 1/8 to 5/8 and show that the result is ¾.
- Have your child roll 3 dice. Ask your child to create a fraction with two of the dice and then multiply it by the third die, which represents a whole number.
- Use everyday objects to allow your child to explore the concept of fractions. For example, use measuring cups so your child can see how many times you have to refill a ¼ cup to equal a ½ cup or how many ¼'s are in two cups. Have your child describe two fractions that are equal using a measuring cup (fill a ¼ measuring cup twice is the same as filling one ½ measuring cup.)
- Look for a shelf of reduced items in the store. If, for example, the items are reduced to ¼ of the original price, help your child see that the sale price can be calculated by multiplying the original price by ¼.
- Encourage your child to stick with it whenever a problem seems difficult. This will help your child develop perseverance.
- Look at food labels to find items with fractional serving sizes, such as "1 serving = ¼ cup." Discuss how many of these servings would be needed if you wanted 2, 3, or 4 of the unit of measurement used.

Common Core Math Standards for Fifth Grade
Operations and Algebraic Thinking

The standards explain what children should be able to understand and do by the end of each grade. The box on the left lists the standards teachers are using, and the box on the right is what you can do at home to support what children are learning in the classroom.

Operations and Algebraic Thinking 5.OA

Write and interpret numerical expressions.

1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
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 x (8 + 7). Recognize that 3 x (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.*

What does this mean and what can I do at home to help my child develop these skills?

- Using grocery store ads, write a list of items with the dollar amount and quantity of each item needed. Ask your child to write an expression showing how much money will be spent for the items on the list. Use parentheses to show when more than one of an item is being purchased. Your child might write an expression such as, $3.39 + (2 x $4.89) + (10 x $0.59). Help your child evaluate the expression to find the total amount of money that will be spent.
- Using an old deck of cards, write a parenthesis on each Jack, an addition sign on each Queen, a subtraction sign on each King, a multiplication sign on each Ace, and a division sign on each Joker. Shuffle the deck and deal 7 cards to each player. Arrange the cards face up on the table to make expressions. Give a point to the player who creates the expression with the greatest value.
- Look at recipes for cookies, casseroles, etc. Have your child write equations to increase or decrease the amount of food the recipe makes (e.g., double or half the recipe).
- Cut the totals off cash register receipts. Give your child one or more receipts, and ask him/her to "be the cash register" and find the missing totals.
- Find a recipe for your child's favorite dish and have your child write expressions to show how much is needed to make various amounts of the recipe. For example, if a cookie recipe uses 2 ½ cups flour, 1 ¼ cups sugar and ½ cup of brown sugar, your child would write 3 x (2 ½ + 1 ¼ + ½) to show the total number of cups of these ingredients needed to triple the recipe. Discuss the meanings of "doubling", "tripling", and "halving", etc.

Common Core Math Standards for Fifth Grade
Measurement and Data

The standards explain what children should be able to understand and do by the end of each grade. The box on the left lists the standards teachers are using, and the box on the right is what you can do at home to support what children are learning in the classroom.

Measurement and Data — **5.MD**

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.

Represent and interpret data.

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. *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.
   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.
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
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.
   b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ 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.
   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.

What does this mean and what can I do at home to help my child develop these skills?

- Have your child find measurements around the house and determine measurement equivalents. For example, ½ yard is 18 inches.
- Help your child with conversions of measurements from larger units to smaller by having him/her measure water using different sizes of measuring cups.
- Have your child measure, to the nearest ¼ foot, the diameter of 10 circular objects found around your house. Then help your child create a line plot of the data.
- Have your child use sugar cubes or 1-inch blocks to fill boxes of different sizes. Record the approximate volume of each box.
- Talk with your child about volume. Discuss why you need to know the volume of things.
- Have your child create a sculpture using sugar cubes. Count the cubes to determine the volume of the sculpture in cubic units.
- Have your child use a ruler, tape measure, or yardstick to measure the dimensions of a variety of household items to the nearest inch or foot. Estimate the volume of a box that would be large enough to hold each item.
- Use store flyers to find large appliances. Point out that these items arrive at stores in boxes or crates. Have your child use the approximate dimensions (to the nearest foot) to estimate the volumes of the boxes or crates in which the items were shipped.
- Have your child use 1-inch blocks to build rectangular prisms of various sizes. Multiply the dimensions of the prisms to find the volume in cubic inches. Then deconstruct the prisms, count the cubes and compare to the calculated volume.