MATHEMATICS

In second grade, your child will extend understanding of place value to the hundreds place. He will use this place value understanding to solve word problems, including those involving length and other units of measure.

Your child will continue to work on his addition and subtraction skills, quickly and accurately adding and subtracting numbers up through 20 and also working with numbers up through 100. He will also build a foundation for understanding fractions by working with shapes and geometry. Activities in these areas will include:

- Adding numbers together that total up to 20 or less or subtracting from numbers up through 20 quickly and accurately.

- Solving one- or two-step word problems by adding or subtracting numbers up through 100.

- Understanding what the different digits mean in a three-digit number.

- Adding and subtracting three digit numbers.

- Measuring lengths of objects in standard units such as inches and centimeters.

- Solving addition and subtraction word problems involving length.

- Solving problems involving money.

- Breaking up a rectangle into same-size squares.

- Dividing circles and rectangles into halves, thirds, or fourths.

- Solving addition, subtraction, and comparison word problems using information presented in a bar graph.

- Writing equations to represent addition of equal numbers.

Your child can use addition and subtraction within 100 to solve one and two step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).

- Understand how to compare numbers.
- Add and subtract fluently.
- Model number sentences with drawings, equations, or objects.

HELP AT HOME

▸ Use everyday life situations to create story problems for your child. For example, while buying groceries, have your child count how many potatoes and carrots that you have purchased. Then ask him to figure out how many onions you would need to have the same amount as the potatoes. Have him create a math sentence to solve. While at a restaurant, have your child decide how many chairs are at each table and then determine how many chairs are in the room. Practice these types of two-step real world problems often.

Your child can fluently add and subtract within 20 using mental strategies. By the end of Grade 2, your child will know from memory all sums of two one-digit numbers.

- Know mental strategies for adding and subtracting.

- Understand part-part-whole relationships.

- Understand addition and subtraction using place value.

HELP AT HOME

▸ Use flash cards to practice addition and subtraction fluency.

▸ Practice using addition and subtraction strategies that have been learned (e.g., doubles, doubles +1, counting on, counting back, making 10).

VOCABULARY

FLUENCY is remembering math facts quickly and accurately.

ADDITION AND SUBTRACTION STRATEGIES

COUNTING ON
Start with the largest number and count forward.

DOUBLES
A number is doubled (e.g., 3 + 3, 7 + 7).

COUNTING BACK
Start with the largest number and count backward.

DOUBLES PLUS 1
The doubled fact, 8 + 8, then add 1 (e.g., 8 + 9 = 17).

MAKING 10
Use two numbers to make ten (e.g., 6 + 4, 8 + 2).

Your child can determine whether a group of objects (up to 20) has an odd or even number of members (e.g., by pairing objects or counting them by 2's). Your child can write an equation to express in even numbers a sum of two equal addends.

- Skip-coun by two's.
- Add numbers to 20.
- Understand that an equation is a number sentence.
- Understand the part-part-whole relationship.

HELP AT HOME

▸ Using some type of counters (e.g., coins, cotton balls), place a pile on the table. Have your child "find a partner" for each counter (or object), pairing items up in groups of 2. Discuss with your child that if one counter does not have a partner, then the number is odd. If every counter has a partner, then the number is even.
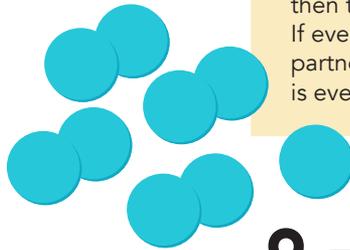
$9 =$ ODD

Your child can use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. Your child can write an equation to express the total as a sum of equal addends.

- Understand repeated addition.
- Use models to represent an addition sentence.
- Skip-count.

HELP AT HOME

▸ Using coins, arrange the coins in an array (e.g., 4 rows and 3 columns). Have your child use addition to determine the number of coins (3+3+3+3). Repeat with several different combinations.

Your child can understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.

- Understand place value of the ones, tens, and hundreds.

- Recognize the value of a digit.

- Use place value models to show a number.

- Understand that place value is foundational to all other math.

RESOURCES

PLACE VALUE

$$1,429$$

thousands   hundreds   tens   ones
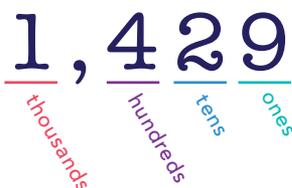
HELP AT HOME

▸ Write a three-digit number on an index card. Have your child write 100 under the hundreds place for each 100 of the number. Then write 10 under the tens place for each 10 needed and finally 1 under the ones place for each one needed (e.g., 324 = 100, 100, 100, 10, 10, 1, 1, 1, 1).

▸ Have your child write the given number in expanded form (e.g., 423 = 400 + 20 + 3), then write the same number in words (e.g., four hundred twenty-three).

PLACE VALUE CHART

Using a place value chart (see the example below), have your child place the number into the chart to see the place value breakdown.

Thousands	Hundreds	Tens	Ones
1	4	2	9

Your child can count within 1000. Your child can also skip-count by 5's, 10's, and 100's.

- Understand position words such as "before" and "after."

- Understand that skip-counting is a repeated, predictable pattern.

- Use the hundred chart to describe the position of a number in relation to another number.

HELP AT HOME

▸ Using a 1000 chart, have your child color the number said when counting by 5's in yellow. Then as he counts, have him touch the number and say it aloud. Next, color the numbers said when counting by 10's in a different color, touching and counting the numbers when counting.

INTERNET RESOURCES

Search the Internet for free, printable 1000 charts.

Your child can read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

- Understand the place value system.

- Know and understand the differences between standard form, expanded form, and a number written in words.

- Understand the relationship between base-ten and place value.

HELP AT HOME

▸ Write a three-digit number on an index card. Have your child practice writing the number in words and expanded form (e.g., 423= four hundred twenty-three or 400 + 20 + 3).

▸ Write a number in expanded form (e.g., 500 + 40 + 8) then have your child write the standard form of the number.

VOCABULARY

STANDARD FORM: 354

EXPANDED FORM: 300 + 50 + 4 or three hundred fifty-four

Your child can compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, < symbols to record the results of comparisons.

- Understand the symbols for comparison greater than (>), less than (<), and equal to (=).

- Understand that place value can be used to compare and order numbers.

- Identify if groups of objects are greater than, less than, or equal to another group of objects.

HELP AT HOME

▶ Write down two numbers between 0 – 1000 (such as 692 and 684). Have your child use a yellow crayon to highlight the number in the hundreds place. This will help him see the numbers clearly in order to compare. If the numbers in the hundreds place are the same, have him highlight the tens place in a different color then decide which number is the greatest. If the numbers in the hundreds and tens places are the same, highlight the numbers in the ones place and decide which number is greater. Continue this exercise using different combinations.

▶ Play "Greater or Less Than." Make three cards, one with the less than (<) sign, one with the greater than (>) sign, and one with an equal (=) sign. Then play a game in which you put down two numbers written on index cards. Ask your child to put the correct sign between the numbers and do this is as fast as possible.

Your child can fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

- Understand that adding is combining and subtracting is taking away.
- Understand place value.
- Know that two-digit numbers can be broken down into tens and ones.

HELP AT HOME

▸ Use flash cards in order to help your child practice math fact fluency.

▸ Help your child remember different strategies that he has learned (e.g., counting on, counting back, making a ten, doubles facts, doubles +1). By using these strategies, your child will become more fluent in learning math facts.

Your child can add up to four two-digit numbers using strategies based on place value and properties of operations.

- Know basic addition facts.
- Understand place value.
- Use the commutative and associative properties.
- Understand that numbers can be added in any order.
- Understand regrouping rules.

HELP AT HOME

▸ Write four two-digit numbers vertically on a piece of paper. Have your child add the numbers, starting with the ones place, then moving to the tens place. Have your child use math strategies that he has learned, such as making a 10, doubles, etc.

VOCABULARY

COMMUTATIVE PROPERTY states that numbers can be added or multiplied in any order. Therefore, changing the order of addends does not change the sum (e.g., 4+3 = 3+4).

ASSOCIATIVE PROPERTY states that changing the order in which numbers are added, does not affect the result of addition.

Your child can add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Your child can relate the strategy to a written method.

- Understand that each number has a value.

- Use basic addition facts.

- Understand the connection between addition and subtraction.

- Know how to draw and use concrete models.

- Use basic addition and subtraction strategies.
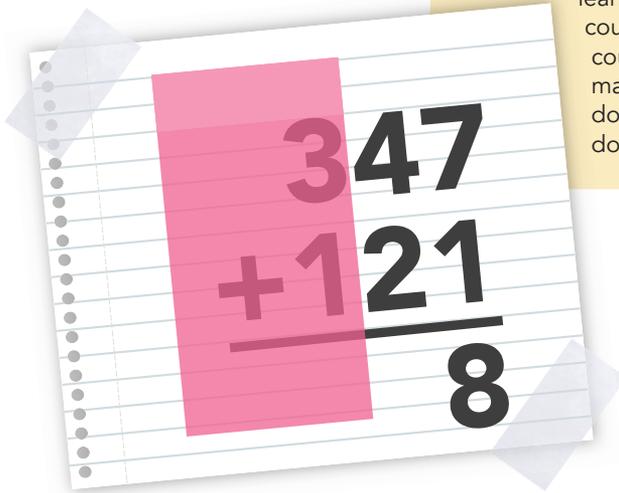
Your child can mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

- Understand basic addition and subtraction facts.

- Understand place value concepts.

- Understand that adding and subtracting ten from a number, the tens place changes and the ones place stays the same.

- Understand that adding and subtracting one hundred from a number, the ones and tens place stays the same and only the hundreds place changes.

HELP AT HOME

▸ Begin by using a 100 chart or a 1000 chart. Place a counter or coin on a number. Have your child count up or count back 100.

▸ Show your child that when adding or subtracting 100 from a given number, only the hundreds place will change. The ones and tens place will remain the same.

▸ Give your child any three-digit number. Have him mentally add or subtract 100 from that number.

Your child can measure the length of an object by selecting and using appropriate tools (e.g., rulers, yardsticks, meter sticks, measuring tapes). Your child can also measure the length of an object twice, using different units of measurement; and describe how the two measurements relate to the size of the unit chosen.

- Choose the appropriate unit and tool for measurement.

- Understand that items that are to be measured must have the same starting point.

- Understand that items can be measured using different units.

HELP AT HOME

▸ Choose several items at home for your child to measure. Discuss how certain tools do a better job of measuring than others. For example, have your child use a ruler to measure the dining room table, then use a yardstick or measuring tape. Both tools do the job, but one is more effective.

Your child can estimate lengths using units of inches, feet, centimeters, and meters.

- Understand how to measure in whole numbers.

- Know how to compare the length of two objects.

- Understand that "estimate" means an "educated guess" or "about."

Your child can use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units (e.g., by using drawings, such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem).

- Add and subtract one- and two-digit numbers.

- Compare numbers based on the ones and tens place.

- Understand measurement.

- Use drawings to model word problems.

Your child can represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, … and represent whole number sums and differences within 100 on a number line diagram.

- Know how to model addition and subtraction on a number line.

- Understand that sums and differences can be represented as lengths on a number line.
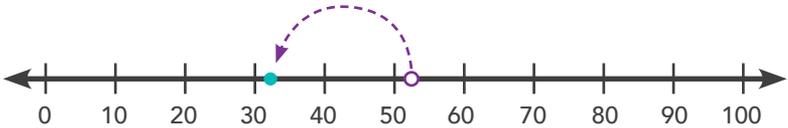
$$52 - 19 = 33$$

Your child can tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

- Understand that the "short hand" represents the hour and the "long hand" represents the minutes.

- Understand the difference between an analog clock and a digital clock.

- Know that a.m. is before noon and p.m. is afternoon.

HELP AT HOME

▸ Create your own paper plate clock. Using two paper plates, punch a hole in the middle and place two pipe cleaners in the hole for the hour and minute hands. Have your child number the face of the clock on the top plate. Then, cut in between the numbers about 1 inch on the top plate. On the second plate underneath, begin at 1 and count by fives writing the number underneath the top plate. Use this clock to help your child tell time.

▸ Using his paper plate clock, have your child practice looking at a digital clock and transferring the time to the paper plate clock.

▸ Call out a time to your child (in five minute increments). Have him create the time using his paper plate clock.

Your child can solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

- Understand adding and subtracting two-digit numbers.

- Identify the value of coins (e.g., dollar coin, half dollar, quarter, dime, nickel, penny).

- Understand that money amounts can be counted in different ways.

HELP AT HOME

▸ Allow your child to count the amount of change you have in your pocket each evening.

▸ Create real-world problems for your child. While at the grocery store, have your child count out the money needed to pay for your items and then have him determine the amount of change you should receive.

▸ When you are with your child in the store have him help you figure out the math involved in paying. Talk about change received, total money spent, or how much money you saved by using a coupon. You can also play "store" at home using real or game money.

Your child can generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Your child can show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

- Know how to organize data.

- Understand that a table and a line plot is one way to organize data.
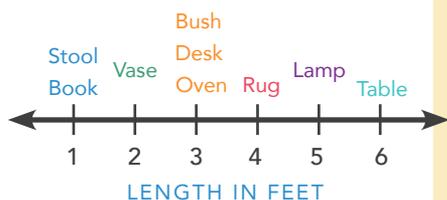
Stool / Book   Vase   Bush / Desk / Oven   Rug   Lamp   Table

1   2   3   4   5   6

LENGTH IN FEET

Your child can draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Your child can also solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

- Understand that graphs provide information and represent real data.

- Understand how to add and subtract.

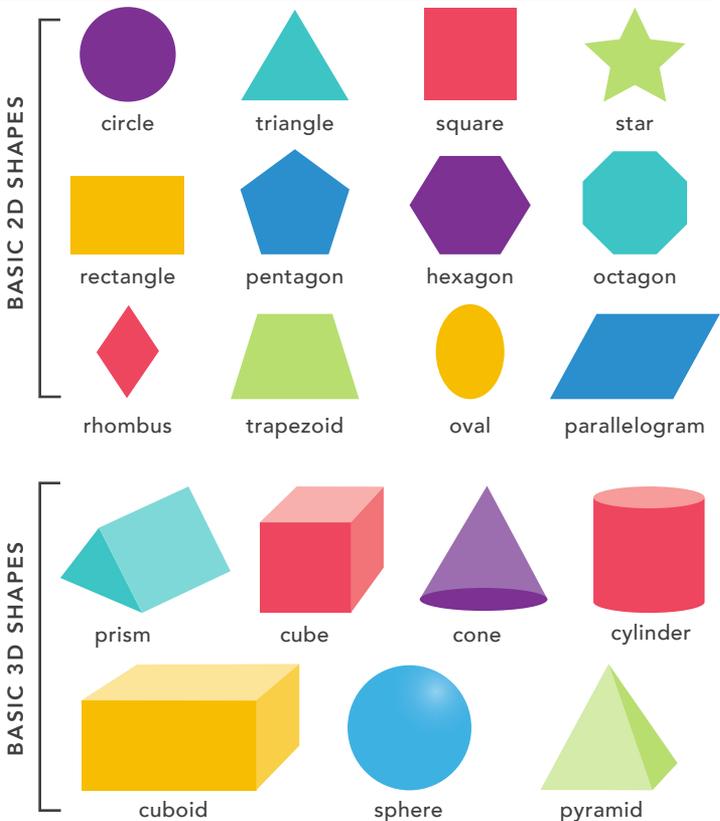- Understand how to interpret graphs.

Your child can recognize and draw shapes having specified attributes, such as a given number of angles or given number of equal faces.

- Know the basic shapes.
- Know three-dimensional shapes.
- Understand that a polygon is a flat two-dimensional shape.
- A shape can be identified by the number of sides, vertices, or angles.
- A three-dimensional shape is solid and has length, width, and height.

RESOURCES

BASIC 2D SHAPES

circle   triangle   square   star

rectangle   pentagon   hexagon   octagon

rhombus   trapezoid   oval   parallelogram

BASIC 3D SHAPES

prism   cube   cone   cylinder

cuboid   sphere   pyramid

Your child can partition circles and rectangles into two, three, or four equal shares, describe the shares using the words, halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Your child can also recognize that equal shares of identical wholes need not have the same shape.

- Understand that whole shapes can be divided into a fractional part.

- Understand equal parts.

HELP AT HOME

▸ Cut several rectangles out of construction paper. Have your child cut each one into equal parts. Label each piece (e.g., if cutting a rectangle in thirds, label each piece as 1/3). Repeat this activity with circles and squares.

▸ Use food to show fractional parts. Use things like cookies, pizzas, sandwiches, etc. Cut them into different fractions. Discuss with your child the number of parts that make up the whole.