Resources from NCTM:

Songs/Technology:

<http://www.kidsknowmath.com/>

<http://kidsknowmath.blogspot.com/>

Problems:

Place eight quarters in a row. Replace every other coin with a dime. Replace every third coin with a nickel. Finally, replace every fourth coin with a penny. What is the value of the eight coins now? How much more or less money do you have than when you started? Were any coins not replaced? Why or why not?

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|  | **The Eyes Have It**Each honeybee has 5 eyes! Three honeybees are circling a flower. How many bee eyes are around the flower? Five honeybees are returning to the hive with nectar. How many bee eyes are returning to the hive? Now there is a total of 30 bee eyes in the flower garden. How many honeybees are in the garden? |

**Pay Me the Money**

Marvin works in the summer for his dad's lawn service, 5 days a week for 4 weeks. His dad offers to pay him $125 a week. Instead, Marvin offers to work for $0.01 the first day, $0.02 the second day, $0.04 the third day, $0.08 the fourth day, and so on. Should Marvin's dad accept his offer? Explain.

**Cooking With Fractions**

Chef Fracto has 9 cups of milk. He uses 1/2 of the milk plus 1/2 cup to make pancakes. He uses 1/2 of what is left plus 1/2 cup to make French toast. Next, he uses 1/2 of what is left plus 1/2 cup to make muffins. How much milk does he use for each of the three recipes? How much milk is left?

**Paychecks**

Eduardo has a choice of whether to get paid in pennies, nickels, dimes, or quarters. For each type of coin, he will receive the following amounts: 1,000 pennies, 200 nickels, 450 dimes, or 41 quarters. Which type of coin should he choose if he wants to get paid the greatest amount of money?

**Most Expensive Cat**

In February 1998, Cindy Jackson of London, England, bought a Bengal cat for U.S. $41,435. How long would you have to save your allowance in order to save that amount of money? Suppose every person in your class saved $15 a week. How long would it take the class to purchase the cat?

**Making Postage**

Mak found more than 50 3-cent and 5-cent stamps in a desk. His uncle needed 87¢ worth of postage to mail a package and asked Mak if he could use some of these stamps. How many different combinations of the stamps could Mak give his uncle to make exactly 87¢ of postage?

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| **Crazy Eights**How many eights would you write down if you wrote all of the whole numbers from 1 to 100? How could you find this answer without having to write all the numbers and count them? If you counted a different digit, would you have the same amount? Explain your thinking.From [Math by the Month](http://www.nctm.org/resources/%E2%80%9D/eresources/article_summary.asp?URI=TCM2000-04-504a&from=B%E2%80%9D), April 2000  |
|    | **Gauss the Mathematician**Carl Gauss quickly solved this problem when he was 10 years old: "Find the sum of the first 100 counting numbers." Try it. How long does it take you to solve the problem? Look up information about Carl Gauss and see if you can find out how he solved the problem.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2005-01-264a&from=B), December 2004/January 2005 *TCM*. |
|    | **What's in a name?**Discover how much your first name is worth if every consonant has a value of $5 and vowels are $10. Compare the value of your name with those of your friends. Graph the class results to see which names have the greatest and least value. Find the range of numbers (the difference between the greatest and least value). What do you notice on the graph about the names with the greatest and least value?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-08-32a) , August 2008  |
|    | **How Many Peas in your Pod?**Pea plants usually produce 5 or 6 peas in each pod. Suppose a pea plant had 5 pods and a total of 26 peas. How many of its pods would have only 5 peas? How many of its pods would have 6 peas? How many peas could a pea plant have if it had 6 pods?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-04-424a&from=B), April 2007 *TCM*. |
|    | **Building a Pen**A zookeeper was promised that she could have some special animals called mathemalsas soon as she builds a pen for them. She has 20 feet of fence to use for the pen. What type of pen can she build? How many different types of pens can she build?From [Math by the Month](http://catalog.nctm.org/eresources/article_summary.asp?URI=TCM2001-01-280a&from=B), January 2001 |
|    | **The Longest Presidency**The longest presidency in U.S. history was Franklin D. Roosevelt’s (from March 4, 1933, until April 12, 1945). He served three full terms and died early in his fourth term. How many days did he hold office? Record your thinking.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-11-224a) , November 2008  |
|    | **Do You Have the Time?**The hour and minute hands of the clock overlap at exactly 12:00, and also at other times during a 24-hour period. How many times during the day does this happen? How many times during the day do the two hands of the clock form a right angle?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2003-04-462a&from=B), April 2003 *TCM*.  |
|    | **Year of the Dog**The Chinese calendar gives each year a different animal name. There are 12 animals in the cycle. The year 2006 was the Year of the Dog. What is the next year that will be the Year of the Dog? What was the last Year of the Dog before 2006?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-01-264a&from=B), January 2007 *TCM*. |
|    | **Puzzle Time** Benjamin Banneker was an African American mathematician who wrote a series of almanacs that were published from 1791–1797. Farmers relied on the almanacs for weather forecasts and planting times. To relax, Banneker loved to collect and solve mathematics puzzles. Try solving this puzzle: A frog fell in a well that was 20 feet deep. Each day he climbed 3 feet up the well’s sides. At night he slid back down 1 foot. How many days did it take him to climb out of the well? Share your solution method with a friend. From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2005-01-264a&from=B), January 2005*TCM*. |
|    | **Curious Cats**Five curious cats went exploring in a freshly painted room. Four got paint on their front paws and one got paint on its back paws. How many paws didn't have any paint on them?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2002-11-172a&from=B), November 2002 *TCM*. |
|    | **Farthest Women's Long Jump**The record for the farthest women's long jump is about 7 1/2 meters, set by Calina Chistyakova in Russia. Measure that distance with a partner. How far can you jump? How many jumps does it take you to go 7 1/2 meters?From [Math by the Month](http://www.nctm.org/resources/%E2%80%9D/eresources/article_summary.asp?URI=TCM2003-05-530a&from=B%E2%80%9D), May 2003  |
|    | **Use a Model**Imagine that you have one penny, one nickel, and one dime. What amounts of money can you make using one, two, or all three coins? If you add another coin (penny, nickel, or dime), how will your answer change?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM1999-03-410a&from=B), March 1999  |
|    | **Now for Dessert!**Imagine that you are a hungry ant trying to get yourself and 99 friends to a picnic. Think about all the different ways 100 ants could march in rows and columns. Organize this information in a table and look for a pattern. From [Math by the Month](http://www.nctm.org/eresources/toc.asp?journal_id=4&Issue_id=688), December 2003 *TCM*. |
|    | **History Repeats**The Summer Olympic Games have occurred every four years since 1896, except 1940 and 1944. How many Summer Olympic Games have been held? How many Summer Olympic Games have occurred since you were born? From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2004-05-464a&from=B), May 2004 *TCM*. |
|    | **Gobble, Gobble**A small flock of wild turkeys can eat 50 pounds of cracked corn in a week. If they ate the same amount every day, how many pounds would they eat each day? How many pounds would they eat in one month?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-02-320a&from=B), February 2007 *TCM*. |
|    | **How Many Animals?**If a new neighbor moves in with pet dogs and birds, how many animals can there be if there are 10 legs altogether? Is there more than one answer?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2002-11-172a&from=B), November 2002 *TCM*. |
|    | **Oldest Living Woman**The oldest living woman is Kamato Hongo of Japan. She is 115 years old. How many months has she lived? How many days (not considering leap years)? How many hours? How many minutes?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2003-05-530a&from=B), May 2003 *TCM*. |
|    | **Gingerbread Cooking**Many people bake special pastries at this time of year. If you need 7 1/2 dozen cookies for a holiday celebration, how many cookies do you need? A gingerbread cookie recipe makes only 60 cookies. Would that yield enough cookies for your celebration? The recipe for 60 cookies calls for 2 3/4 cups of flour. If you need to increase the recipe in order for it to yield 7 1/2 dozen cookies, how much more flour will you need? The recipe for 60 cookies calls for 1/4 teaspoon of nutmeg. How much more would you need for the larger recipe? If 16 cookies fit on 1 baking sheet, how many sheets of cookies will you need in order to use all the batter from the recipe for 60 cookies? For the recipe for 7 1/2 dozen cookies?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-01-264a&from=B), January 2007 *TCM*. |
|    | **Round and Round**Cycling is a great way to stay fit while getting yourself to places you need to be. By the 1880s, the front wheel of a bicycle had a diameter of 64 inches. What was this wheel's radius? What was its circumference? A bicycle wheel today has an averaged diameter of 26 inches. What is this wheel's radius? What is its circumference? Organize this information into a table or chart. Using the information you record on the chart, compare the wheel sizes, diameters, radii, and circumferences.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Getting Strong Now** In strength training, you use weights and do exercises for different parts of the body. Repeating the same exercise is called "doing reps (reps is an abbreviation for repetitions). If you do 4 different exercises and 12 reps of each, how many reps are you doing in all? At this rate, if you do 3 sessions of strength training each week, how many reps are you doing each week?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Fat in our Diet**The U.S. Department of Agriculture has developed a food pyramid to help guide us in making healthy food choices. Keep track of the total grams of fat in your diet for one week. Find your mean fat gram intake per day. Continue to collect data for one month. Then find your mean fat gram intake per week. Compare your personal results with the U.S.D.A. recommendations (Food Pyramid source: www.usda.gov/wps/portal/usdahome).From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Do You Get a Kick Out of Sports?**Conduct a survey to discover the most popular sport among your classmates. Collect data from your classmates and then organize your data into a bar graph to represent your survey results. What patterns do you notice in the graph? Discuss your results with your classmates.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Fast Tracks**After studying the length of a dinosaur's stridethe distance between its footprints—scientists have determined from tracks made by medium-sized dinosaurs that the fastest speed they could travel was about 27 miles per hour. At this speed, how long would it take a medium-sized dinosaur to travel 60 miles? How long would it take this dinosaur to travel 167 miles? How long would it take this dinosaur to travel from your home to your school? From your school to the nearest park or grocery store?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Calories from Fat**The labels on canned and packaged food contain important information about the nutritional content of a single serving. These labels indicate the total calories and fat calories in one serving. Using information from a variety of food labels, calculate the percentage of fat in each food item. Record the data as percentages. Sort the foods according to fat content: little fat (<10%); some fat (10–25%); much fat (25–90%); mostly fat (>90%). Experts recommend a diet of less than 30 percent fat. What do you notice about the data you gathered?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **On Top of Triceratops**Triceratops had three horns on its head. How many horns would you see in a family of 3 Triceratops dinosaurs? In a family of 5 Triceratops dinosaurs? How many wheels does a tricycle have? How many sides does a triangle have? Make a list of other words that start with *tri-,*. What do you think the prefi x *tri-* means?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Bigger than What**A typical Brachiosaurus measured about 85 feet (26 m) long. Find a way to measure a distance of 85 feet in your school or on your school playground. What other object can you identify that is about the same length? If you and your classmates were each 5 feet tall and if you lie head to toe, how many students would it take to extend the same distance?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Not So Speedy**Scientists have used the distance between each fossil footprint to estimate how fast dinosaurs moved. They estimate that dinosaurs such as Tyrannosaurus rex could run about 25 miles per hour. About how far could T. rex run in 3 hours? About how far could T. rex run in 30 minutes?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Dinosaurs Today**Did you know that many scientists believe that birds are distant relatives of a type of dinosaur? The bird skeleton has characteristics similar to the skeletons of some dinosaurs. What types of birds live in your area? Make a data collection sheet and record your class's sightings of various birds in one week. Use your data to make a graph. Study the information you collect. What conclusions can you make about the birds found in your area?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **It's Been So Long** A typical Diplodocus could measure up to 28 meters long. How many centimeters would that be? If you laid the dinosaurs end to end, how many would you need to cover a distance of approximately 1 kilometer? Talk with your classmates about the different strategies you used to get your answers.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Good Things Come in Small Packages** One of the smallest dinosaurs ever found was Microraptor. It measured 40 cm as an adult. How many Microraptors would it take to equal the length of one Diplodocus? Make a list of objects around your home or your classroom that are about the same length as Microraptor.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Speedy Dinos**Gallimimus and Ornithomimus were Oviraptors that could run up to 43 mph. What is the speed limit on the street near your school? What is the difference between that speed limit and how fast these dinosaurs could run? Could Gallimimus and Ornithomimus run fast enough to keep up with the cars on your local highway?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **That's One Big Egg!** Hypselosaurus eggs contained close to 6 pints of fluid. What object in your classroom or school has about the same volume? How many quarts would that be? How many cups? Could one Hypselosaurus egg hold more or less than a gallon?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Touchdown!** The regulation National Football League playing field is 120 yards long. A large Tyrannosaurus rex measured about 42 feet long. Approximately how many T. rex dinosaurs could fit in a line from one end of a regulation-sized football field to the other? How tall are you? How many of you would fit along the length of the playing field if you were lying head to toe? Express your answers as fractions and as decimals.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **One Heavy Head**A typical Tyrannosaurus rex had a skull that weighed about 600 pounds. If T. rex's body weight was roughly 7 tons, what percentage of the dinosaur's body weight was its skull? The average human skull weighs about 2 pounds. What percentage of your body weight is your skull? How many times greater is the weight of T. rex's skull compared with your skull? What other objects can you find that weigh the same as your skull?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Coin Combinations**When stores are very busy, lines of customers at the cash registers get very long. One way cashiers can work quickly is by using the minimum number of coins possible when giving change to a customer. If you had to give a customer 53 cents in change, how many different coin combinations can you find to give this amount of change? What is the minimum number of coins you can use? The maximum number? If you purchased an item that costs $2.99 plus 6% tax and paid with a $20.00 bill, what would be the minimum number of coins the cashier could give you as change?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-03-376a&from=B), March 2007 *TCM*. |
|    | **Carrots, Anyone?**The directions on a packet of carrot seeds state to plant the seeds 1 inch apart. How many seeds would you need for a row that is 1 foot long? For a row that is 5 feet long? When the seedlings are 1 inch high, you should thin the plants so that they are 3 inches apart. How many carrot plants would you then have in a 1-foot-long row? In a 5-foot-long row?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-04-424a&from=B), April 2007 *TCM*. |
|    | **Parts of a Flower**The head of a large sunflower can be 36 centimeters or more in diameter. The head of a teddy bear sunflower is about 10 centimeters in diameter. How many teddy bear sunflower heads would be needed to have the same area as a large sunflower head with a diameter of 40 centimeters? What is the ratio of the diameters? What is the ratio of the areas?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-04-424a&from=B), April 2007 *TCM*. |
|    | **Toot Sweet**Hummingbirds consume approximately 1.6 to 1.7 times their body weight in nectar each day. Many people attract hummingbirds to their home gardens by filling feeders with a homemade sugar solution similar to nectar. The solution is made by boiling together 4 cups of water and 1 cup of sugar. If you wanted to use 12 cups of water, how many cups of sugar would you need to make the solution? If you had 6 cups of sugar, how much water would you need to make the solution? The average weight of a common hummingbird found in southeastern Arizona is 7 to 8 grams (0.25 to 0.28 ounces). How much homemade nectar would you need to keep a flock of 12 of these hummingbirds in your yard and well fed for 2 weeks? For 3 weeks?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-02-320a&from=B), February 2007 *TCM*. |
|    | **Yuan or Dollars**Some people celebrate Chinese New Year by attending festive acrobatic performances. Adult tickets to a performance cost 500 yuan (the Chinese monetary unit), and student tickets cost 400 yuan. The yuan's value to the dollar changes, but assume that 90 yuan equal $1. If your family attends a Chinese acrobatic performance, what would be the total cost for your family in yuan? In dollars?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-01-264a&from=B), January 2007 *TCM*. |
|    | **An Apple a Day**An old saying claims that eating an apple a day will keep the doctor away. If you ate one apple a day, how many apples would you eat in one week? In two weeks? If you ate two apples a day, how many apples would you eat in one week? In two weeks? Use a bar graph to display the number of apples your classmates eat every day for one week. Each morning find the total number of apples your classmates ate the day before and represent that amount with a new bar on the graph.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Chasing a Goal**In many schools across the country, students run laps for exercise on the school track during recess or P.E. You have set a personal goal to run 100 miles in one year. If your school track is one-fifth mile, how many laps would you have to run to reach this goal for the year? On average, how many laps would you need to run each week to reach your goal of running 100 miles in a year?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **A Day of Exercise**Participating in sports is a great way to get the exercise your body needs. One day you did four different activities. You rode your bike after playing basketball but before running. The last thing you did was go swimming. Using drawings or pictures, put your activities in the order you did them from first to last. In what other order could you have done these activities? **Challenge**: Rearrange the drawings or pictures to explore other orders. How many different orders can you find?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Let's Get Moving!** Health experts recommend 60 minutes of physical activity each day for children and adults. If you follow this guideline, how many hours of exercise should you be getting in one week? In one month? In six months? In one year? For one week, keep track of the amount of exercise you do each day and then compare this amount with the amount recommended.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Calories Count!** The energy units we get from food are called calories. If you ride your bike for 30 minutes, you burn up, or use, about 200 calories. A slice of cheese pizza has about 230 calories. If you eat 4 slices of cheese pizza, about how long (in hours and minutes) will you need to ride your bike to burn up all the calories from these 4 slices? Can you ride your bike for that long without stopping? An average-size serving of baked chicken has about 85 calories. About how long would you need to ride your bike in order to burn up the energy(calories) from one serving of baked chicken?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2007-08-32a&from=B), August 2007*TCM*. |
|    | **Beep, Beep!** A typical car measures about 15 feet long, and a typical bus measures about 40 feet long. Determine your height (think of it as your length) in relation to the length of a car and to the length of a bus. For example, if you are 5 feet tall, your height is about 1/3 the length of a car. Stegosaurus measured 25 feet long, Velociraptor measured about 6 feet long, and Diplodocus measured about 90 feet long. Determine the ratio of the length of each of these dinosaurs to the length of a car. Then compare the length of each of these dinosaurs with the length of a bus. Use your data to make a graph. Give examples of objects in or at your school whose lengths are comparable to the lengths of these dinosaurs.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-10-160a&from=B), October 2006*TCM*. |
|    | **Where can dreams take you?**John Gage, 74, a New Jersey sailor, dreamed for 30 years of circumnavigating the globe in his sailboat. After extensive preparation, he set off on December 18, 2003. He planned to sail from Sandy Hook, New Jersey, to the British Virgin Islands, the Panama Canal, the Galapagos Islands, the Marquesas Islands, the Society Islands, Fiji, New Zealand, Australia, South Africa, the Caribbean, and back to Sandy Hook. On a world map or globe, calculate how many miles he planned to sail. If one mile is approximately 1.15 nautical miles, how far did he sail in nautical miles? His boat’s average cruising speed was 6 knots per hour. A knot equals 1 nautical mile per hour. How many hours of sailing time would it take to sail his course? Be sure to show how you know. (Gage completed his voyage in May 2007.)From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **Where do books come from?**Books are published all over the world. The publishing information is usually printed within a book’s first few pages. Sometimes more than one city is listed. (For this activity, use the first city listed.) Look at a sample of the books in your classroom library and list all the places where they were published. Use your list to create a graph showing where the books were published. In 2004, the School Library Journal stated that the average cost of books for children and young adults was $19.31. Using this average cost, how much money did the publishers in each city on your graph generate in book sales for your classroom? Order the cities on your graph from the city generating the most money in book sales to the city generating the least. How much money in book sales was generated altogether for your classroom?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **How Many Ways?**How many addition number sentences can you write that equal a certain number? For example, if your number is 3, you can write four number sentences: 0 + 3 = 3, 3 + 0 = 3, 1 + 2 = 3, and 2 + 1 =3. Make a chart to record and count your sentences. Try this activity with other numbers. What do you discover?From [Math by the Month](http://www.nctm.org/resources/%E2%80%9D/eresources/article_summary.asp?URI=TCM2001-01-280a&from=B%E2%80%9D), January 2001  |
|    | **Monarch Butterflies**Monarch butterflies are remarkable insects. Each year, they migrate about 3100 miles from Canada and the northern United States to Zitacuaro in Michocan, Mexico. Their flight speed averages about 12 mph, although they can fly as fast as 30 mph with a good tail wind. In one day, they fly about 80 miles. Calculate how many days it takes for a Monarch butterfly to make its journey. An elite marathon runner averages 12 mph. If such an athlete runs 6 hours per day, how many days would it take the runner to cover the same distance as the butterfly? If you drove the same distance in a car, averaging 50 mph for 7 hours per day, how many days would it take you to make the journey?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **How do you measure up?**Each person measures and records his or her arm span. Calculate the average length of an arm span in your class. Using the average arm span as a unit, how many units wide is the room? Measure the perimeter of the room, the distance from the classroom to the cafeteria, and the basketball court’s perimeter.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-08-32a) , August 2008  |
|    | **Your space**Draw a scale map of your bedroom: Gather centimeter grid paper, measurements of your bedroom, and a list of objects in your bedroom with their measurements. Include items that make your room unique to you, such as furniture, an area rug, posters, a closet, and doors. Create a key for your scale drawing. Share and post your drawing.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-08-32a) , August 2008  |
|    | **How Much *IS* a Million?**Draw a square with 8-inch sides on a piece of paper. Inside the square, draw rows of stars, hearts, or your favorite symbol. Fill the square. Count how many symbols you have drawn. Determine how many pages of symbols you would need to make one million symbols!From [Math by the Month](http://www.nctm.org/resources/%E2%80%9D/eresources/article_summary.asp?URI=TCM2003-10-96a&from=B%E2%80%9D), October 2003  |
|    | **Presidential Faces**Presidential faces appear on American coins and paper currency. Investigate and then make a list of the presidential images that appear on the different pieces of American currency from the penny to the fifty-dollar bill. Which coin and bill combinations could you use to make $158.93? How many different presidential faces did you use? Can you use all the presidents to create that amount? Now find the fewest number of coins and bills to make $158.93. Work with a friend to find other combinations.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-11-224a) , November 2008  |
|    | **In an Election**In an election for class president, 20 students use two colors of beans to represent their votes. A red bean represents a vote for candidate 1, and a blue bean is a vote for candidate 2. One possible outcome of the election is 20 red and 0 blue. Another possible outcome is 19 red and 1 blue. What other outcomes are possible? Work with a partner to draw and complete a table. If you find any patterns that could help you find all possible combinations, write about them. How many possible combinations of votes exist? How do you know whether you have found them all? When you finish, compare your table with another pair’s.http://www.nctm.org/eresources/repository/calendar/tcm_1108_1.pngFrom [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-11-224a) , November 2008  |
|    | **Hold That Thought**Hold that thought. The shapes that float above cartoon characters when they speak are called thought bubbles. On a small piece of paper, write a number inside of a thought bubble and then fold your paper in half. Have your classmates try to guess the number. Other students may ask you if the number is even or odd, greater than or less than a specific number, or they may guess a specific number. You may answer their questions with only a yes or no reply. When someone guesses your number, show it to the class. The person who correctly guessed your number writes the next number in a thought bubble.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-12-288a) , December 2008  |
|    | **An Annual Salary**An annual salary of $25,000 is what George Washington made after he was voted into office in 1789. As of 2008, George W. Bush, our 43rd president, had an annual salary of $400,000 + $50,000 for expenses. For how many years has the United States been governed by a president? What is the difference between the annual salaries of the two Georges? Using your data, what do you notice happening? What is the percentage of increase of the presidential salary? If this trend continues, predict the annual salary for future presidents in 50 years, 100 years, and 200 years. Explain your thinking.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-11-224a) , November 2008  |
|    | **The White House**The White House building site and the architect who designed the home for all the presidents were chosen by George Washington, but he was the only one who did not live in the White House. It was first occupied by President John Adams in 1800. How many years have U.S. presidents lived in the White House? Show how you know. Share your thinking with a classmate. From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-11-224a) , November 2008  |
|    | **Compare Coins**Ask an adult for a penny, nickel, dime, quarter, and half dollar that you can closely compare. Identify the presidents on the coins. What is the same about the coins? What is different? Place the coins in order from smallest to largest in size. Make a rubbing of them in this order by placing a thin sheet of paper over them and rubbing the paper with the edge of a crayon. Now order the coins by their value and create a new rubbing.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-11-224a) , November 2008  |
|    | **You are the square!**Use paper pattern block shapes to represent your family members. You are the square. If you are a girl, add one blue rhombus to the square. If you are a boy, add one tan rhombus to the square. Represent each adult with a yellow hexagon. Represent each of your siblings with a trapezoid and each pet with a triangle. Use all of the shapes to create a polygon, making sure that your blocks are connected along matching sides. Glue the polygon to a sheet of paper. Use the back of your paper to write additional family details. Share your creation with a classmate.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-08-32a) , August 2008  |
|    | **How far is your state capital from a nearby one?**Ask your teacher for a U.S. map that shows all state capitals, state borders, and a scale in inches to represent miles or in centimeters to represent kilometers. With a partner and a piece of string, measure distances between cities on your map. (Place the end of the string on a capital city; your partner rolls out the string and cuts it at the point it reaches another capital. Use the map scale to find the distance in miles or kilometers between the two.) What are the longest and shortest distances you measured between capitals?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **Color me stately**Ask your teacher for a black-and-white copy of an enlarged portion of a map that includes your state (or province). Study the map and then make a prediction about the fewest number of colors that can be used to color your map if no borders share the same color. (You may use a color twice only if it does not share a border with an area that is the same color.) Test your prediction by coloring your map using the fewest number of colors. When you finish, share your map. Why is it important for mapmakers to use different colors for areas that share borders?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **Where would you go?**List four places you would like to visit. Locate each place on a map. Which is farthest from where you live? Which is closest? Put your list in order from closest to farthest. Compare your list to those of your classmates. Are some places more popular than others? Make a graph showing the four most popular places your classmates would like to visit.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **Where do you stand?***Ordinal* numbers describe position: first, second, third, and so forth. The next time you stand in a line of people, count how many people are in front of you. How many are behind you? What is your position in the line?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2008-09-96a) , September 2008  |
|    | **It's Shadow Time**People used to tell time by observing the sun and shadows. Place a dowel in the ground away from buildings. Measure the length of the shadow two times during the day, once in the morning and once at noon. Record what you notice about the direction of the shadow and the length of the shadow. Predict how the shadow might change by the end of the day. Then measure it one more time. Were you correct?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2005-09-80a&from=B), September 2005  |
|    | **It Takes All Ages**Visit each grade level in your building to determine the number of students at that level. What percent of the total school population is at each grade level? Show your work in a graph.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2005-08-24a&from=B), August 2005  |
|    | **Trees and Cars**Trees need carbon dioxide to live, just as humans need oxygen. Scientists estimate that about 1,000 trees are able to use approximately 20,000 kg of carbon dioxide. Each liter of gas used by a car releases 2.36 kg of carbon dioxide into the atmosphere. How many liters of gas would release the amount of carbon dioxide needed by 1,000 trees for photosynthesis? How many trees would be needed to absorb the carbon dioxide from a single car in a month? in a year?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-04-408a&from=B), April 2006  |
|    | **Take A Hike**One of the biggest pollutants of our air is the exhaust from cars. A great way to reduce air pollution is to walk or ride a bike instead. A person can walk about 3 miles per hour. How far would you get in 4 hours? At this rate, how long would it take you to walk 10 miles? How long would it take you to get to school if you walked at this pace? Talk to others in your class and see who would have the longest and shortest walks to school.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-04-408a&from=B), April 2006  |
|    | **What Is for Lunch?**What are the lunch choices in the school cafeteria for this week? Take a poll of your class and ask about the favorite lunch menu item. How could you represent your data on a graph or a chart? Make a display and share it with your class.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2005-08-24a&from=B), August 2005  |
|    | **Gateway to the West**The Gateway Arch in St. Louis, Missouri, was built between 1963 and 1966. It became the tallest man made memorial structure of its kind, achieving many engineering feats. As workers built it section by section, they had to make very precise measurements. This was necessary so that the last piece would fit at the top. Visit your school library and research information about the Arch. Within what margin of error did the engineers have to work? What geometric shapes were used in the design and building of the Arch? What kinds of measuring devices were available for the engineers to use in 1963–66? What does the Arch symbolize and why was it built in St. Louis? Make a poster and present your findings to the class.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2005-03-376a&from=B), March 2005  |
|    | **Cafeteria Waste**For one week, have your classmates throw their cafeteria food waste into a container that you can weigh each day. Determine the average weight of food waste for the week. Each day, observe the type of food that is thrown away. Collect data with the names of food on the day's menu. Create a graph to display your results. Using the data, predict the amount of food waste generated by all the classes at your school for one year.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-04-408a&from=B), April 2006  |
|    | **Check Your Pulse**Use your fingers (not your thumb) to gently find your pulse on your wrist. Place some clay over that spot. Stick a straw in the clay so that the straw sticks straight up. You should be able to see the straw move lightly with your pulse. Have a friend help you count how many times the straw moves in 1 minute. Compare your number with an adult's. Does your heart beat faster or slower than the adult's? By how much?From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-02-304a&from=B), February 2006  |
|    | **Go For It**When a bee is looking for nectar to make honey, it can travel about 1 mile in 4 minutes. How far can you travel in 4 minutes? Time yourself while running or walking in your school gym or on your school's track. Use this data to determine how long it would take you to travel 1 mile. Ask an adult to help determine the distance you traveled.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2006-09-96a&from=B), September 2006  |
|    | **Where In the World?**Think of a place in North America that you would like to visit. What if you had to walk to get there? How long would it take? Research to find out the number of miles to your chosen location. Use a stopwatch to find out low long it would take you to walk a mile. Use that amount of time to make an estimate.From [Math by the Month](http://www.nctm.org/eresources/article_summary.asp?URI=TCM2003-11-160a&from=B), November 2003 *TCM*. |