

Help Your Child Achieve in Math

■ **Visit your child's school.** Meet with your child's teacher to see if your child is actively involved in math. Find out how you can help your child to better understand math problems.

■ **Set high standards for your child in math.** Make sure your child is mathematically challenged and encourage his or her interest and pursuit of math. By the end of the 10th grade, your child should be expected to have studied algebra and geometry.

■ **Help children see that math is very much a part of everyday life.** From statistics in sports to the sale price of clothing, from the calories in food to the amount of gas needed to travel from one city to another, math is important to us every day. Help your child make these connections to math.

■ **Point out that many jobs require math.** From the scientist to the doctor, from the plant manager to the newspaper salesman, from the computer programmer to the hardware store owner, many jobs require a strong foundation in math. Help your child see that math leads to many exciting career opportunities.

■ **Stimulate your child's interest in technology.** Encourage your child to use calculators and computers to further learning.

■ **Play games that help children develop decision making and mental math skills.** There are many games sold commercially, such as board games, that involve patterns and probability. Play games from your own family traditions such as counting games and games that keep score. Try schoolyard games such as jump rope, hopscotch, and jacks. Games require children to use strategies to make decisions, solve problems, and develop an understanding about numbers and how to use them (number sense) and computational skills.

■ **Positive attitudes about math will reinforce encouragement.** Your feelings will have an impact on how your children think about math and themselves as mathematicians. Positive attitudes about math are important in encouraging your child to think mathematically.

How Will Math Look in Your Child's Classroom?

As a result of the recent effort in mathematics teaching to include understanding in the teaching of math, from basic through advanced levels, the picture of your child's math class may, indeed, look different from what you remember when you were in school. For instance:

■ **Children will be expected to know their math facts:** Children will be learning their math facts with an understanding of how facts relate to each other.

■ **Children will be doing more than arithmetic:** Children will be seeing that math is much more than arithmetic (knowing the facts and number operations); it involves estimation, geometry, probability, statistics, and more.

■ **Children will be striving to achieve high goals:** Children will be achieving high standards of understanding, complexity, and accuracy set for them by their parents, teachers, schools, and states.

■ **Children will be actively involved in the study of mathematics:** Children will be doing tasks that involve investigations. They will be talking and writing explanations for their thinking.

■ **Children will be working with one another:** Children will be collaborating to make discoveries, draw conclusions, and discuss math.

■ **Children will be evaluated in a variety of ways:** Teachers will use many different ways to determine if children know and understand math concepts. Some of these will include writing samples, projects, or written tests. Not all evaluation will be the same for every classroom or every child.

■ **Children will be using calculators to solve problems:** They will be using calculators not as crutches but as tools to solve more complex problems with bigger numbers than they could do otherwise. Children with good knowledge of math facts, number sense, and reasoning about math will be able to use the calculator most effectively.

■ **Children will be using computers:** They will be developing databases, spreadsheets and computer graphics, while solving problems.

Math in the Home

Your home is full of opportunities to explore math with your child and, at the same time, build his or her self-confidence and understanding of mathematical ideas. This is a chance for you and your child to "talk math" that is, to communicate about math while discovering relationships between numbers. Being able to describe mathematical patterns and relationships, such as those between "addition and subtraction" or "odd and even numbers," is important to later success in math.

The activities in this section are intended to be enjoyable and inviting and use items that can be found in your home. While doing the activities, keep in mind that an understanding of math and a sense that math is enjoyable will help children develop skills that they will need for success their entire lives.

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What kind of attitude do you have toward math? Do you believe that math skills are important job and life skills? Do you see math as useful in everyday life? Or do you dread doing things that involve math—figuring out how much new carpet you'll need, balancing the checkbook, reading the technical manual that came with the DVD player? How you answer these questions indicates how you may be influencing your child's attitudes toward math—and how he* approaches learning math.

Some Important Things Your Child Needs to Know

About Mathematics

You can help your child learn math by offering her insights into how to approach math. She will develop more confidence in her math ability if

she understands the following points:

1. Problems Can Be Solved in Different Ways.

Although most math problems have only one answer, there may be many ways to get to that answer. Learning math is more than finding the correct answer; it's also a process of solving problems and applying what you've learned to new problems.

2. Wrong Answers Sometimes Can Be Useful.

Accuracy is always important in math. However, sometimes you can use a wrong answer to help your child figure out why she made a mistake.

Analyzing wrong answers can help your child to understand the concepts underlying the problem and to learn to apply reasoning skills to arrive at the correct answer.

Ask your child to explain how she solved a math problem. Her explanation might help you discover if she needs help with number skills, such as addition, subtraction, multiplication and division, or with the concepts involved in solving the problem.

3. Take Risks!

Help your child to be a risk taker. Help him see the value of trying to solve a problem, even if it's difficult. Give your child time to explore different approaches to solving a difficult problem. As he works, encourage him to talk about what he is thinking. This will help him to

strengthen math skills and to become an independent thinker and problem solver.

4. Being Able to Do Mathematics in Your Head Is Important.

Mathematics isn't restricted to pencil and paper activities. Doing math "in your head" (mental math) is a valuable skill that comes in handy as we make quick calculations of costs in stores, restaurants or gas stations. Let your child know that by using mental math, her math skills will become stronger.

5. It's Sometimes OK to Use a Calculator to Solve Mathematics Problems.

It's OK to use calculators to solve math problems—sometimes. They are widely used today, and knowing how to use them correctly is important. The idea is for your child not to fall back on the excuse, "I don't need to know math—I've got a calculator." Let your child know that to use calculators correctly and most efficiently, she will need a strong grounding in math operations—otherwise, how will she know whether the answer she sees displayed is reasonable!

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Math for the Fun of It

During summer vacations, on rainy days, while waiting at the doctor's office, or on a stroll through the neighborhood learning never ends. Your children can explore some fascinating mathematical possibilities in the world around them every day. For instance, math can be found outdoors in nature: look for symmetry in leaves; count the number, sizes, and kinds of trees on your street; and look at the various shapes and patterns of blooming flowers. Children will be learning math and enjoying it too! The activities in this section can be done anytime and anywhere.



Guess If You Can

Grades K-5

What to do

1. Let your child think of a number between a stated range of numbers while you try to guess the number by asking questions. Here is a sample conversation.

Child: I am thinking of a number between 1 and 100.

Parent: Is it more



than 50?

Child: No.

Parent: Is it an even number?

Child: No.

Parent: Is it more than 20 but less than 40?


Child: Yes.

Parent: Can you reach it by starting at zero and counting by 3's?

Child: Yes.

(At this stage, your child could be thinking of 21, 27, 33, or 39.)

2. Figure out the answers to your own questions.
3. After you have guessed your child's number, let your child guess a number from you by asking similar questions.

Parent Pointer	
	It is important to help children develop an understanding of the characteristics and meanings of numbers.

What Are the Coins?

Grades 2-5

What you'll need

Some coins


What to do

Ask your child the following questions:



1. I have three coins in my pocket. They are worth 7 cents. What do I have? (a nickel and 2 pennies)
2. I have three coins in my pocket. They are worth 16 cents. What do I have? (a dime, a nickel, a penny)
3. I have three coins in my pocket. They are worth 11 cents. What do I have? (2 nickels and 1 penny)
4. I have three coins in my pockets. They are worth 30 cents. What do I have? (3 dimes)
5. I have six coins in my pocket. They are worth 30 cents. What could I have? (1 quarter and 5 pennies or 6 nickels). This problem has more than one answer. It is challenging for children to experience problems like this.
6. I have coins in my pocket, which have a value of 11 cents. How many coins could I have?

You get the idea! Give your child a few coins to figure out the answers.

Parent Pointer	
	Use this activity to help your child develop an understanding of patterns and variables (the unknown) to solve a problem. This is critical to understanding algebra.

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What Are My Chances?

Grades K-5

What you'll need

Two coins, paper, and pencil to keep score

What to do

Play these games with your child:

1. Flip one coin. Every time it comes up heads, your child gets 1 point. Every time it comes up tails, you get 1 point. Flip it 50 times. Tally by 5's to make it easier to keep track of scores. The person with the most points wins. If one person has 10 points more than the other person does, score an extra 10 points. Does this happen very often? Why not?
2. Flip two coins. If the coins come up two tails or two heads, your child scores 1 point. If it comes up heads and tails, you get 1 point. After 50 flips, see who has more points. Do you think the game is fair? What if one person received 2 points for every double heads and the other person received 1 point for everything else. Is this fair?
3. Flip one coin. Then flip the other. If the second coin matches the first coin, your child scores 1 point. If the second coin doesn't match the first coin, you receive 1 point. Try this 50 times. Is the result the same as in the previous game?



Parent Pointer



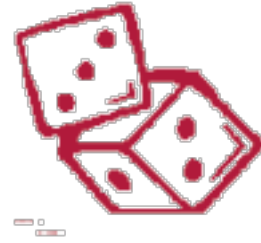
Understanding probability is essential in many areas of mathematics. Playing games that involve chance is one way to explore the laws of probability.

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Grades K-2

What you'll need

One number cube to roll; 10 of each coin (penny, nickel, dime, and quarter)



What to do

1. For young players (5 and 6 year olds) use only two different coins (pennies and nickels or nickels and dimes only). Older children can use all types of coins.
2. Explain that the object of the game is to be the first player to earn a set amount (10 or 20 cents is a good amount).
3. The first player rolls the number cube and gets the number of pennies shown on the cube. Keep all like coins in batches or stacks of 5 or 10.
4. As each player accumulates 5 pennies or more, the 5 pennies are traded for a nickel. Players take turns rolling the cube to collect additional coins.
5. The first player to reach the set amount wins.
6. Add the quarter to the game when the children are ready. As each player accumulates 5 nickels, they are traded for quarters.



Parent Pointer



Counting money and batching in groups of 2's, 5's, or 10's teaches children matching skills and helps in the beginning stages of addition and multiplication. Children also learn how to identify coins and understand their values.

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More or Less

Grades K-2

What you'll need

One coin, number cards (from book cover), scratch paper, pen, and pencil

What to do

Two players will play a card game where each will draw a card. The players will compare cards to see who wins that round. Before you begin, flip the coin and call "heads" or "tails" to see if the winner of each round will be the person with a greater value card (heads) or a smaller value card (tails).



1. To begin the game, divide the cards evenly between the two players.
2. Place the cards face down. Each player turns over one card at a time and compares: Is mine more or less? How many more? How many less? The player with the greater or smaller value card (depending on whether heads or tails was tossed) takes both cards.
3. The winner of the game is the player with more cards when all the cards are gone from the stack.
4. Now try the same activity with each player pulling two cards and adding them. Which sum is more? How much more? How much less?

Parent Pointer



Playing with numeral cards helps children learn to compare quantities of numbers. Children can also learn addition and subtraction.

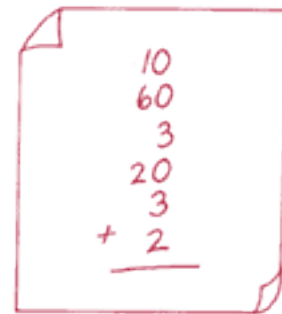
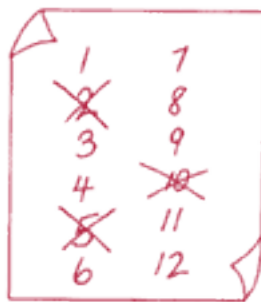
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Problem Solvers

Grades 1-3

What you'll need


Enough sets of cards so that each player has a set of cards numbered 1 through 6.



What to do

1. **Super sums.** Each player writes numbers 1-12 on a piece of paper. The object of the game is to be the first one to cross off all the numbers on this list. Use only the cards 1-6. Each player picks two cards and adds up the numbers on them. The players can choose to mark off the numbers on the list by using the total value or crossing off two or three numbers that make that value. For example, if a player picks a 5 and a 6, the player can choose to cross out 11, or 5 and 6, or 7 and 4, or 8 and 3, or 9 and 2, or 10 and 1, or 1, 2, and 8. If a player cannot cross off a number, the player loses the turn. The first player to cross off all the numbers wins.
2. **Make the sum of 100.** Use only cards 1-6. Each player takes turns drawing a card and each player must take 6 cards from the deck. With each draw, a player decides whether to use the number on the card in the 10s place

or the 1s place so that the numbers total as close to 100 as possible without going over. For example, suppose a player draws the following cards in this order: 1, 6, 3, 2, 3, 2, and chooses to use the numerals in the following way:

Parent Pointer	
	This card game helps children develop various ways to use numbers in different combinations and to see the many possibilities of arriving at the same sum by adding different sets of numbers.

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Card Smarts

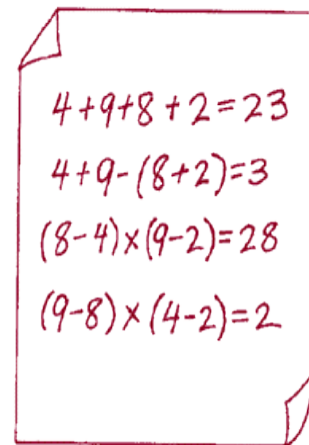
Grades 3-5

What you'll need

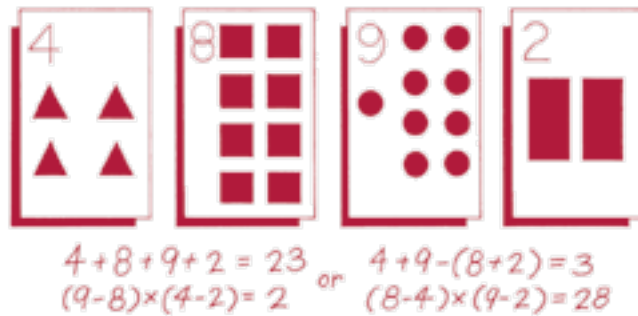
Number cards, pencil, and paper

What to do

- 1. How many numbers can we make?** Give each player a piece of paper and a pencil. Using the cards from 1 to 9, deal four cards out with the numbers showing. Using all four cards and a choice of any combination of addition, subtraction, multiplication, and division, have each player see how many different numbers a person can get in 5 minutes. Players get one point for each answer. For example, suppose the cards drawn are 4, 8, 9, and 2. What numbers can be made?


$$4 + 9 + 8 + 2 = 23$$
$$4 + 9 - (8 + 2) = 3$$
$$(8 - 4) \times (9 - 2) = 28$$
$$(9 - 8) \times (4 - 2) = 2$$

2. Make the most of it. This game is played with cards from 1 to 9. Each player alternates drawing one card at a time, trying to create the largest 5-



digit number possible. As the cards are drawn, each player puts the cards down in their "place" (ten thousands, thousands, hundreds, tens, ones) with the numbers showing. Once placed, a card cannot be moved. The first player with the largest 5-digit number wins. For example, if a 2 was drawn first, the player might place it in the ones' place, but if the number had been an 8, it might have been put in the ten thousands' place.

Parent Pointer	
	This card game helps children develop strategies for using numbers in different combinations using addition, subtraction, multiplication, and division.

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Let's Play Store

Grades K-5

What you'll need

Empty containers (cartons or boxes), old magazines, books, newspapers, calculator, pencil or crayon, and paper

What to do

1. Help your child collect empty containers so that you can play as if you were shopping at the grocery store. Gather the items and put them on a table.
2. Help your child think of a price for each item. Mark the prices on the containers. You can even mark some items on sale.
3. Pretend to be the customer while your child is the cashier.
4. Teach your child the difference between the math symbols ($+$, $-$, \div , \times , and $=$) and how they are used when using the calculator. Help your child add the prices of each item on the calculator and total the amount using the ($=$) symbol. Have your child write the total on a piece of paper, which will be your receipt.
5. While you and your child play store, you can ask questions like how much would it cost to buy three cartons of eggs? How much does 1 box of soap cost, if they are 2 for \$5.00? How much is my bill, if I don't buy the cereal? How much more will it cost if I buy this magazine? Have your child estimate the amounts of the items you are buying. Check to see if the estimation is correct on the calculator.



Parent Pointer



Learning to use the calculator will help your child understand and apply estimation and reasoning skills, as well as learn addition, subtraction, division, and multiplication.