

# Grade 1 Mathematics Contents

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## ***What is Mathematics?***

*Michigan's Curriculum Framework includes six categories of math your child will learn:*

### **1. Patterns, Relationships, and Functions**

*Patterns* are things that repeat; *relationships*, and functions are things that are connected by some kind of reason.

#### **Why does my child need this skill?**

Patterns, relationships, and functions are important because they help us understand the underlying structure of things; they help us feel confident and capable of knowing what will come next, even when we can't see it yet. Patterns and relationships are found in music, art, and clothing, as well as in other aspects of math such as counting and geometry. Mathematical thinking begins when your child recognizes the similarities among objects or events. Later, s/he will learn to generalize and think abstractly. Finally, s/he will be able to understand, explain or describe, and make predictions.

### **2. Geometry and Measurement**

*Geometry* is the area of mathematics that involves shape, size, space, position, direction, and movement, and describes and classifies the physical world in which we live. *Spatial sense* gives children an awareness of themselves in relation to the people and objects around them. *Measurement* is finding the length, height, and weight of an object using units like inches, feet, and pounds. Time is measured using hours, minutes, and seconds.

#### **Why does my child need this skill?**

We live in a three-dimensional world. In order to interpret and make sense of that world, students need both analytical and spatial abilities. Geometry and measurement, which involve notions of shape, size, position, and dimension, are used extensively to describe and understand the world around us.

### **3. Data Analysis and Statistics**

*Statistics* help people organize and interpret information and see relationships, by using tables, graphs, and charts. Graphing is another way to show and see information mathematically. Tables and charts, including calendars, can be used to organize weekly activities. Students organize, interpret, and transform data into useful knowledge to make predictions and decisions.

#### **Why does my child need this skill?**

We live in a sea of information. In order to make sense of the data that inundate our lives, we must be able to process and transform data into useful knowledge. The ability to interpret data, and to make predictions and decisions based on it, is an essential basic skill for every person.

#### 4. Number Sense and Numeration

*Number sense* is much more than merely counting. It involves the ability to think and work with numbers easily and to understand their uses and relationships. Number sense is about understanding the different uses for numbers (for example, describing quantities and relationships, using informational tools, ordering, etc.). Number sense is the ability to count accurately and competently, to be able to continue counting—or count on—from a specific number as well as to count backwards. Number sense helps a child to see relationships between numbers and to be able to take a specific number apart and put it back together again. It is about counting, adding, and subtracting.

##### **Why does my child need this skill?**

Counting and becoming familiar with numbers will help your child understand all other aspects of mathematics. Students must learn to quantify and measure, concretely at first and increasingly more abstractly as they mature. They also must develop an understanding of numeration systems and of the structure of such systems. They must learn to estimate mathematical quantities and to represent and communicate mathematical ideas in the language of mathematics.

#### 5. Numerical and Algebraic Operations and Analytical Thinking

By learning *numerical operations* and their properties, students understand and use various types of operations (e.g., addition, subtraction, multiplication, division) to solve problems. *Algebraic and Analytical Thinking* teaches students to analyze problems to determine how to solve real-world problems and use algebraic notations to model or represent problems.

##### **Why does my child need this skill?**

Your child needs to understand algebraic and analytical thinking and communication in order to use math in school and on the job. In order to solve problems, your child will need to be able to represent real-world situations with algebraic symbolism, numerical operations, and algebraic thinking.

#### 6. Probability and Discrete Mathematics

*Probability* tells the likelihood of something occurring. It is often expressed as a fraction or a ratio like “1 chance in 10.” Using *Discrete Mathematics*, students apply mathematical principals to real-world situations such as scheduling, routing, sequencing, and networking.

##### **Why does my child need this skill?**

Modern uses of mathematics demand new skills from students. They must:

- learn to deal with uncertainty,
- make informed decisions based on evidence and expectations,
- exercise critical judgment about conclusions drawn from data, and
- apply mathematical models to real-world phenomena.

Understanding probability and discrete mathematics will allow your child to function fully in a variety of work and school settings in a highly technological world.

## Math in a Minute

Helping your child to understand and use math doesn't have to take a lot of extra time or money. Here are some easy ways to build math skills, at home, in the sun, or on the run.

### At home

- Make sure your child sees you using math as you go through your day. Talk out loud about what you are measuring or figuring. Say: "I need to double this recipe. Let's see, 1 cup plus 1 cup is two cups. If the recipe says 2 teaspoons of baking powder, how much will we need if we double it?" (Number Sense and Numeration; Measurement)
- Napkin Fractions—Make fractions fun. Fold paper towels or napkins into large and small fractions. Start with halves and move to eighths and sixteenths. Use magic markers to label the fractions. (Number Sense and Numeration)
- When putting away groceries or organizing play areas, stack boxes with your children to help them become familiar with how different shapes move and fit together. Sort blocks by those that roll, those that stack, and those that do both. As your children play with containers, they learn about shape and size and also practice their mathematical thinking. (Geometry; Analytical Thinking)

### In the sun

- Find shells or pebbles at the beach or park. Line up four or five that share an attribute or two (same shape, color, or size), and one that does not. Ask your child to find the one that doesn't belong. Can she describe why? (Sorting; Matching; Recognizing and Describing Attributes)
- Give your child plenty of containers in many shapes and sizes when you play in the sand or water. Let your child scoop, dump, pour, and fill the cups. Ask him/her to predict how many of each of the smaller cups it will take to fill a large container. Use words such as *more than* and *fewer than*. (Volume and Measurement)
- Draw a giant clock face in the beach sand or with sidewalk chalk on a driveway. Draw in the numbers or mark them using cardboard or sticks. Have your child "walk around the clock," while you count by fives to show that there are 60 minutes in each hour. If you call out a time (10:15), can your child draw it? (Measuring Time)

### On the run

- When you travel, across the country or across town, map your route from home to your destination. Ask your child to estimate (guess) how many miles you will travel. Compare your guess to the mileage chart included on most maps. (Measurement; Estimation)
- Keep a piece of string in your purse or car. When you have "down time," play Simon Says Shapes. Give the string to your child. Say, "Simon Says make a triangle." Use the string to make the shape. Can s/he name something in the real world that has that shape? (*Example:* yield sign) (Geometry)
- Let your child help you weigh fruits and vegetables at the grocery store. Ask him/her to guess the weight before you actually weigh them. Ask, "Do you think these apples will be more than a pound? Give him/her an apple in one hand and potatoes in the other, and compare how heavy they feel. Ask, will the potatoes weigh more or less than the apples? If they cost 60 cents a pound, about how much will this cost? (Measurement)

## Resources for More Math Ideas

### Workbooks to boost mathematics skills

- ***Summer Bridge Activities***. Various authors, Rainbow Bridge Publishing. Available for all elementary school transitions. Lots of colorful worksheets, but may be boring for students who are already working at grade level. Better for the child who has struggled during the school year or a child who has not yet mastered basic skills.
- ***Summer Smarts: Activities and Skills to Prepare Your Child for \_\_\_\_\_***. Various authors, Houghton Mifflin Co. Available for all elementary school transitions. Less repetition of skills and more focus on reading real books.

### Books for parents

- ***Family Math Series***. Various Authors. Berkeley, CA: EQUALS. Call (800) 897-5036 for brochure.
- Adler, David A. (1997). ***Calculator Riddles***. Holiday House.
- Blocksma, Mary (1989). ***Reading the Numbers: A Survival Guide to the Measurements, Numbers, and Sizes Encountered in Everyday Life***. New York, NY: Penguin Books.
- Burns, Marilyn (1982). ***Math for Smarty Pants***. Boston, MA: Little, Brown and Co.
- Gardner, Martin (1961). ***Mathematical Puzzles***. New York, NY: Thomas Y. Crowell.
- Kaye, Peggy (1987). ***Games for Math: Playful Ways to Help Your Child Learn Math***. New York, NY: Pantheon Books.
- Kenda, Margaret, and Williams, Phyllis S. (1995). ***Math Wizardry for Kids: Solve Puzzles, Play Games, Have Fun!*** NY: Barrons.
- Pallas, Norvin (1991) ***Calculator Puzzles, Tricks and Games***. Dover Publications.
- Parker, Tom (1983). ***Rules of Thumb***. Boston, MA: Houghton Mifflin Co.
- Paulos, John Allen (1988). ***Innumeracy: Mathematical Illiteracy and Its Consequences***. New York, NY: Hill & Wang.
- Riedel, Manfred G. (1979). ***Odds & Chances for Kids: A Look at Probability***. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Weaver, Jefferson Hane (2002) ***What Are the Odds: The Chances of Extraordinary Events in Everyday Life***. Prometheus Books.

### Books for kids

The following resources offer extensive booklists sorted by grade or math concept:

**PBS Teacher's Source**—[http://www.pbs.org/teachersource/recommended/rec\\_books\\_math.shtml](http://www.pbs.org/teachersource/recommended/rec_books_math.shtml)

**Math Literature**—<http://home.nyc.rr.com/teachertools/mathliterature.html>

**Carol Otis Hurst's Booklists**—[www.carolhurst.com/products/booksets.html](http://www.carolhurst.com/products/booksets.html)

***Exploring Math with Books Kids Love***, by Kathryn Kaczmariski, Fulcrum, 1998. (*Parenting J* 372.7 Ka)



**Here are some titles to get you started:**

Anno, M., **Anno's Math Games** (Look for more titles by this author.)  
 Appelt, K., *The Bat Jamboree*  
 Atherlay, S., *Math in the Bath (and other fun places, too!)*  
 Bang, M., *Ten, Nine, Eight*  
 Beaton, C., *One Moose, Twenty Mice*  
 Birch, D., *The King's Chessboard*  
 Bradbury, J., *One Carton of Oops!*  
 Brittain, B., *Mystery of the Several Sevens*  
 Burns, M., *Spaghetti and Meatballs for All! A Mathematical Story*  
 Burningham, J., *Pigs Plus*  
 Christelow, E., *Five Little Monkeys Jumping on the Bed*  
 Daniels, T., *Math Man*  
 Duffey, B., *The Math Wiz*  
 Esbensen, B., *Echoes For The Eye: Poems to celebrate patterns in nature*  
 Giganti, P., *Each Orange Had 8 Slices*  
 Glass, J., *Fly on the Ceiling*  
 Grossman, B., *My Little Sister Ate One Hair*  
 Grover, M., *Amazing & Incredible Counting Stories*  
 Hawkins, C., *Take Away Monsters*  
 Hopkins, L., *Marvelous Math: A Book of Poems*  
 Hutchins, P., *The Doorbell Rang*  
 Jonas, A., *The Quilt*  
 Kaplan, M., *Henry and the Boy Who Thought Numbers Were Fleas*  
 Lasky, K., *The Librarian Who Measured the Earth*  
 Lionni, L., *Inch by Inch*  
 Lobel, A., *Frog and Toad Are Friends*  
 Long, L., *Domino Addition*  
 McMillan, B., *Eating Fractions*  
 Myller, R., *How Big Is A Foot?*  
 Pinczes, E., *One Hundred Hungry Ants*  
 Schwartz, D., *If You Made A Million*  
 Silverstein, S., *Giraffe and a half*  
 Viorst, J., *Alexandar Who Used To Be Rich Last Sunday*  
 Wargin, K-J., *A Michigan Counting Book*

**Math Series (containing many books connecting math and reading)**

**Mathnet (series):** Connell, D. (J Co)

Detectives use mathematical knowledge to decipher clues and solve mysteries.

**MathStart (series):** various authors

Nonfiction picturebooks at preschool and school-age reading levels.

**Math in Literature:** various authors, compiled by Carol Hurst.

Contains 3 sets for grades K-4.

## Magazines

**Dynamath.** Scholastic. Available from the school division. Filled with different activities involving all strands of math. Children in grade five particularly like this. \$5.00 for the subscription.

**Games Junior,** P.O. Box 10147, Des Moines, Iowa 50347. A challenging and fun magazine filled with all different kinds of games that give children hours of “brain workouts.” Ages 7 and up.

**Puzzlemania.** Highlights, P.O. Box 18201, Columbus, Ohio 43218-0201. Includes puzzles involving words, logical thinking, hidden pictures, and spatial reasoning. The cost is about \$7.50 per month.

**Zillions.** Consumer Reports, P.O. Box 54861, Boulder, Colorado 80322. Children’s version of Consumer Reports. Shows math in the real world and offers children the opportunity to see how gathering data and information can lead to good decision making.

## Web sites with information and free math activities

### The Math Forum

[www.mathforum.com](http://www.mathforum.com)

Resources for students, parents, and teachers. A related Website, MathWorld Interactive, (<http://mathforum.org/mathworld/>) gives students open-ended word problems online.

### Math Flashcards

[www.edu4kids.com/](http://www.edu4kids.com/)

Online flash cards with a variety of options and mathematical operations.

### U.S. Department of Education, Office of Educational Research and Improvement

[www.ed.gov/pubs/parents/](http://www.ed.gov/pubs/parents/)

### Education Place

[www.eduplace.com](http://www.eduplace.com)

A wealth of worksheets and online activities.

### Illustrations: National Council of Teachers of Mathematics (NCTM)

<http://illustrations.nctm.org/>

Lesson plans and math tools based on NCTM’s Principles and Standards for School Mathematics

### MathMastery.com

[www.mathmastery.com](http://www.mathmastery.com)

Online math courses, daily math activities, and resources you can purchase.

### PBS Teacher Source and PBS Kids

[www.pbs.org](http://www.pbs.org)

Resources for teachers, kids, and parents, connected to your child’s favorite PBS shows.

### Math Goodies

[www.mathgoodies.com](http://www.mathgoodies.com)

Offers worksheets, software, and puzzles you can download.

### FunBrain.com

[www.funbrain.com](http://www.funbrain.com)

At this site, your child can play math games that practice math skills right at the computer.

### Print and Learn for Kids

[www.brobstsystems.com/kids/](http://www.brobstsystems.com/kids/)

Offers downloadable and printable worksheets, sorted by grade level.



# What's My Rule?

## A Goal:

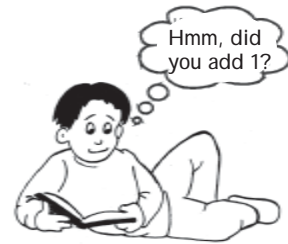
To help your child analyze and describe change using a table to record and identify the pattern

## B What You Will Need:

- "What's My Rule" chart
- Time with your child

## C Let's Go!

1. Draw or copy a simple chart like the one pictured here.
2. Begin by writing any number you choose on the left side of the chart.
3. Think of a rule that will change the number in some way (add 1, subtract 3, double it, etc.). Write the new number in the right column.
4. Repeat for two or more additional numbers. Can the child tell you the rule you are using? (S/he may need help at first.) Can s/he complete the pattern for the next 3 numbers in the table?



What's My Rule?

Add 1

1	2
2	3
5	6
7	—
10	—
21	—

5. Once your child succeeds at some simple rules, change places and let the child think of the rule and insert the numbers.

**Quick Tip for Math:** Help your child notice the changes that occur in the world around you.

- Talk about how a butterfly develops.
- Explain how the seasons change.
- Discuss together what happens as evening approaches.

Ask questions: "Do butterflies develop the same way every time?" "What things change?" "What will come next?"

# Which One Is Missing?

## A Goal:

To help your child build memory skills, practice counting, and recognize patterns

## B What You Will Need:

- Toys, blocks, or other items that come in a variety of colors or shapes

## C Let's Go!

1. Line up a row of matchbox cars or different shaped blocks. Line them up in random order, using no particular pattern.
2. Have your child count the objects.
3. Then have her/him close her/his eyes while you take away some of the objects.
4. After s/he reopens her/his eyes, count the remaining objects.
5. Can s/he tell how many are missing?
6. Now, exercise memory skills; ask her/him to tell you which objects are missing.
7. Now line up the objects in a pattern. *Example:* red, blue, green; red, blue green.
8. Repeat steps 2-6.
9. Was it easier to remember what was missing when the objects included a pattern?



## D Let's Go On!

10. The game can be varied to teach grouping skills by hiding all the green cars or blue blocks. Make it tougher for older children by hiding all the sports cars or 4-wheel-drives. Can your child tell which group is missing?

---

**Quick Tip for Math:** Help your child understand that wrong answers aren't always bad. They may help you discover what s/he doesn't understand.

When your child gets a wrong answer:

- Be patient. Look further; ask questions, and see what the wrong answer is saying about the child's understanding. Did the child understand the question?
- Ask your child to explain how the problem was solved. Does your child need help with the procedures, the number facts, or the concepts involved?
- Help your children become risk takers: show them wrong answers are OK; assure them that the right answers will come in time.

# What's the Next Move?

## **A** Goal:

To help your child recognize patterns and describe the patterns they see and feel.

## **B** What You Will Need:

- Time with your child

## **C** Let's Go!

1. Invite your child(ren) to join you in a pattern dance.
2. Ask each child to suggest two movements for your dance. *Example:* jump and wiggle.
3. Tell your child(ren) that when they hear the letter A, they should jump and when they hear the letter B they should wiggle.
4. Call out a pattern, such as ABAB or AABAAB, and together perform the corresponding movements.
5. Can you do it if you dance to music? Perhaps you can use one pattern for the verses, and another pattern for the chorus.
6. Choose two new movements or add a third movement to your set. *Example:* jump, wiggle, and twirl.
7. Call out a new pattern, such as ABCABC or AABBC.
8. Start dancing!

Adapted with permission from Helping Your Child Learn Math (1992), by Patsy F. Kanter, edited by Cynthia Hearn Dorfman. U.S. Department of Education

## Quick Tip for Math

Some children just have to keep moving. For these children, adding movement and touch to a math activity makes the learning easier.

If you have an active learner, try to get the whole body involved when you work with numbers or other math concepts. Try naming numbers while you play hopscotch. Or write numbers on the sidewalk and make up addition or subtraction problems your child can solve in her/his head. When s/he knows the answer, s/he can jump onto the right number on the sidewalk.

# Math Maps For the Mind

## A Goal:

To help your child connect new math ideas with what they already know

## B What You Will Need:

- Paper and pencil
- [Word Map](#) sheets (attached)
- List of math words/ideas your child is learning



## C Let's Go!

1. Explain to your child that a Word Map is a "graphic organizer" to help your brain connect new math concepts to what they already know.
2. In the center circle, write the word or concept your child is learning.  
*Example: Circle*
3. In the top box, write a definition in the child's own words. *Example: It's a round shape.*
4. Help your child think of some examples, and write them in the left box.  
*Example: ball, clock, coins.*
5. Ask your child to describe what it is like, and write this in the bottom circle.  
*Example: It is curved and never ends.*
6. Have your child think of some non examples, and write these in the right box. *Example: book, paper, clip.*

The best words come from your child's own math lessons. But here are some math concepts you might use:

**Geometry Words:** circle, square, triangle, rectangle, right, left, top, bottom, next to, under, over, around.

**Subtraction Words:** less than, subtract, minus, difference, take away, have left.

**Addition Words:** add, all together, both, in all, increased by, more than, plus, put together, sum, total.

**Additional Concepts:** graph, estimate, measure, number, statistics, patterns, shapes, groups, match.

(Use with Word Map Activity to help your child connect new math concepts with what they already know.) *FOR I*



**FAMILY**  
*FUNdamentals*

FOR LITERACY & MATHEMATICS

Patterns, Relationships, & Functions —1

# Coin Sort

## A Goal:

To help your child observe differences, sort by attribute, and describe variations in patterns

## B What You Will Need:

- An assortment of coins
- Paper plates or blank sheets of paper



## C Let's Go!

1. Gather coins from all corners of your home. The more varieties the better (old, new, shiny, dull, from many countries).
2. Look over the coins you have. Ask your child what s/he notices about the coins. Ask, "How can you tell how old a coin is?" "How would you describe the color of this coin?" "What information is stamped on the coin?"
3. Now find different ways to sort the coins. Put each group on a separate paper plate, and label your groups. *Example:* All the silver-colored coins on one plate; the copper colored coins on another. Or, all coins older than the child on one plate; all coins newer than the child on another.
4. Now create a pattern with the coins. *Example:* large, large, small; large, large, small. Can your child describe the pattern? Can s/he continue it?

## D Let's Go On!

5. After your child catches on to this game, let her/him set the pattern and try to stump you. Make sure s/he describes the pattern after you've guessed.
6. Try creating a pattern that changes or varies. *Example:* nickel, nickel, nickel, penny; nickel, nickel, penny; nickel penny; nickel, nickel, penny. (*The number of nickels goes up or down by 1, while the penny stays the same.*)

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**Quick Tip for Math:** You can encourage your child to be a good problem solver by involving him or her in family decision-making using math.

*A problem solver* is someone who:

- questions, investigates, and explores solutions to problems;
- demonstrates the ability to stick with a problem to find a solution;
- understands that there may be different ways to arrive at an answer;
- considers many different answers to a problem;
- and applies math to everyday situations and uses it successfully.



**A** Goal:

To help your child \_\_\_\_\_

**B** What You Will Need:

- 
- 
- 

**C** Let's Go!

1.

**D** Let's Go On!

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Quick Tip for Math:

# Measure and Pour

## A Goal:

To help your child understand measurement

## B What You Will Need:

- Measuring cup
- 6 empty clear cups of the same size
- Paper
- Pencil
- Water



## C Let's Go!

1. Take six cups of equal size from your cupboard.
2. With a measuring cup, pour different amounts of water into each cup.
3. Fill the cups with water as follows:  $\frac{1}{4}$  cup,  $\frac{1}{2}$  cup,  $\frac{1}{3}$  cup,  $\frac{2}{3}$  cup,  $\frac{3}{4}$  cup and 1 cup.
4. Line the cups up in a row, from the one containing the least water to the one containing the most water.
5. Ask your child if all the water levels are the same.
6. Encourage your child to compare and estimate and to think about how measurements led to the different water levels in the cups.
7. Ask which glass is the fullest, which cup has the third largest amount, etc.
8. Place a measuring cup out on the table (for example, a 1-cup measuring cup). Ask your child to guess if any of the cups of water will fill the measuring cup.
9. Move the cups around and see if your child can still tell which have more or less water than the others.
10. Once your child can visually recognize the differences, pour the water from each cup into the measuring cup and have your child record the measurement. Do this for every cup.
11. Older children can add these amounts together on paper, and then pour them into a 4-cup measuring cup to see if their additions are correct.
12. What amounts can you add together to make 1 cup? See how many variations your child can come up with.

# Attribute Trains

## A Goal:

To help your child compare, sort, and classify shapes

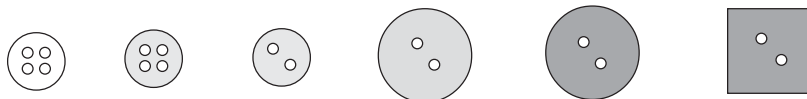
## B What You Will Need:

- Blocks, beads, buttons, or other small objects that vary in color, shape, size, or other attributes

## C Let's Go!

1. Tell your child that "attributes" are characteristics that describes an object: for example, its size, color, thickness, shape, or its type of corners or edges.
2. Practice sorting the objects you've collected into groups according to their attributes. Perhaps you'll group by color, or perhaps by whether it will stack, roll, or slide.
3. Next, build an "attribute train" with your child. This means that you will make a "train" of objects that have different attributes. A "one-difference" train consists of objects that differ by one attribute. A "two-difference" train consists of objects that differ by two attributes.

*Example:* Suppose I'm working with buttons, and I want to build a "one-difference" train. I might make a train like this:



Only one thing about the button changes with each new "car" on the train: color, shape, or number of holes.

4. Practice making new trains together: a two-difference train, or even a three-difference train. Have your child make a train and guess if it's a one- or two-difference train. Can your child describe why?

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**Quick Tip for Math:** **Weigh Me**—Teach estimating skills. Ask your children to guess the weight of several household objects—a wastebasket, a coat, a full glass of water.

Then show children how to use a scale to weigh the objects. Next, have them estimate their own weight, as well as that of other family members, and use the scale to check their guesses. Some brave parents get on the scale, too.

You can also try estimating the height of people and things in your home.

# Equal Parts

## **A** Goal:

To help your child understand how whole things can be divided into parts

## **B** What You Will Need:

- Dinner or dessert item

## **C** Let's Go!

1. Let your child help you divide dinner or dessert into equal parts for each member of your family.
2. Explain the problem: "How can everyone get a fair share?" Ask for their help as you work it out. You may be surprised how much they already understand.
3. Allow the child to help cut, measure, and compare to see if the pieces they cut are "equal shares."

## **D** Let's Go On!

4. Extend the idea. Ask your child to predict how many shares s/he thinks you can get from a whole pizza or cake. What size does s/he think the shares will be.
5. What would happen if more neighbors dropped by to share the meal or dessert?
6. Help the child to see that as more people take part in the meal, the size of the shares gets smaller.

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**Quick Tip for Math:** Give everyone, even little ones, summer jobs at home. These provide opportunities for learning every day, and teach valuable life skills that will help in school and beyond.

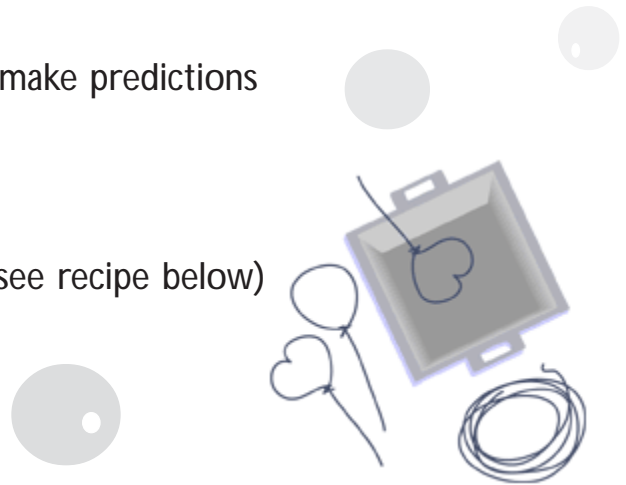
# Bubble Shapes

## A Goal:

To help your child identify shapes and make predictions

## B What You Will Need:

- Shallow baking pan
- Ingredients to make soap bubbles (see recipe below)
- 2 drinking straws per child
- One 3-foot length of string
- Wire coat hangers



## C Let's Go!

1. Combine 1/4 cup dishwashing liquid, 3/4 cup water and either one tablespoon of sugar OR one package unflavored gelatin OR one tablespoon glycerin. (These last ingredients slow down the drying time. Dry bubbles break.)
2. Thread three feet of string through two straws and tie the ends together.
3. Hold one straw in each hand to create a square.
4. Pour the bubble mixture into a large baking pan and slosh the straws and string through the bubble solution.
5. Take turns predicting what shape the bubbles will be.
6. Wave the frame into the air to release a giant bubble.

## D Let's Go On!

7. Twist wire coat hangers into more shapes. Dip these into the bubble mix.
8. Predict what shape the bubbles will be.
9. Wave the frames and release the bubbles. Were your guesses right?

**Quick Tip for Math:** One of the best ways adults can help children become successful in math is to ask questions and get your children *thinking*. It is not just the activities that children do that help them learn. The questions you and your children ask and the things you point out can get them thinking mathematically.

Talk to your children about why you are doing these activities. Answer their questions and ask them your own questions. Ask things like "Why do you suppose that happened?" "What makes you think so?" "What would have happened if we did it another way?"

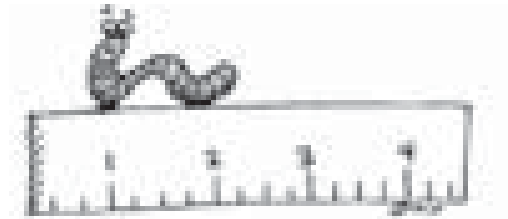
# Jump and Measure

## A Goal:

To help your child practice measuring and comparing

## B What You Will Need:

- Sidewalk chalk or popsicle sticks
- Chalk or masking tape



## C Let's Go!

1. Clear an area where you can have your child(ren) jump as far as they can.
2. Draw a starting line with chalk or masking tape.
3. Have your child(ren) line up with toes touching the starting line. Talk about how all measurements have a beginning point and an ending point.
4. Let your child(ren) jump from a standing position as far as they can. Mark where each child's heels landed with sidewalk chalk (use names or initials) or a stick.
5. When everyone has had a turn, find a way to measure each jumper's distance. What kinds of tools could you use? (Standard measures include rulers, yardsticks, measuring tape. Non-standard measures might include the number of footsteps, heel-to-toe, a broom handle, or a folded umbrella.)
6. Talk about the measurements you get. Whose jump is longest? Whose was the shortest? If you used someone's footstep to measure, try using a bigger or smaller person's footstep instead. What happened to the measurements? Ask, "Why do you think it's important for people to have standard units of measurement, like yards, meters, or miles?"

Note: (If you have only one child jumping, have her/him repeat the jumps several times, so you will have something to compare.)

### Quick Tip for Math:

Did you  
Know?

Positive attitudes about math are important for our country. The United States is the only advanced industrial nation where people are quick to admit that "I am not good in math." We need to change this attitude, because mathematicians are a key to our future.

When you talk to your children, encourage them to believe that they *can* learn math and that it can be fun. Find ways to use math in everyday life to solve problems.



# Measuring in Jumps and Bumps

## A Goal:

To help your child practice estimating, counting, and measuring using nonstandard units of measure

## B What You Will Need:

- Pencils
- Paper



## C Let's Go!

1. Brainstorm a list of measuring tasks: "How many hops from the basketball hoop to the sidewalk?" "How many baby steps from the deck to the swingset?" or "Which is longer, the garage door or the porch?"
2. Give each child a pencil and piece of paper.
3. Assign a measuring task to each child. (If you have only one child, play along!)
4. First ask, "How long do you think it will be?" and have children record their guesses on the paper.
5. Now, go ahead and measure. Record the answer next to the guess.
6. Repeat for all the measurements you brainstormed earlier.
7. Look at your charts and talk about what you learned. Were your guesses close? Why do some children have different "baby steps" measures from others?

## D Let's Go On!

8. Use cones or rocks to mark off distances you want measured. Ask, "Are there more baby steps or giant steps from cone to cone? Why do you think so?"

---

**Quick Tip for Math:** When you measure things at home, let your child hold the ruler or yardstick. Talk about the units of measurement you use.

You don't have to have special equipment to measure, though. Your child's hand, foot or even a toy can be used to measure distance. For example, how many footsteps are in between the slide and the swing set at the playground? Walk heel to toe to find out.

Now compare that distance to that between the car and the picnic table. If we use Dad's feet to measure, will our answer be larger or smaller? Why?

**A** Goal:

To help your child \_\_\_\_\_

**B** What You Will Need:

- 
- 
- 

**C** Let's Go!

1.

**D** Let's Go On!

-----  
Quick Tip for Math:

# Time Trackers

## A Goal:

To help your child collect information, analyze it, and present the findings in an organized way

## B What You Will Need:

- Clock or watch
- Blank paper
- Graph paper (Your teacher may have attached some, or you can draw your own.)

Day	Time w/ TV	Time w/ Reading
Monday		
Tuesday		
Wed.		
Thurs.		
Friday		
Sat.		
Sunday		

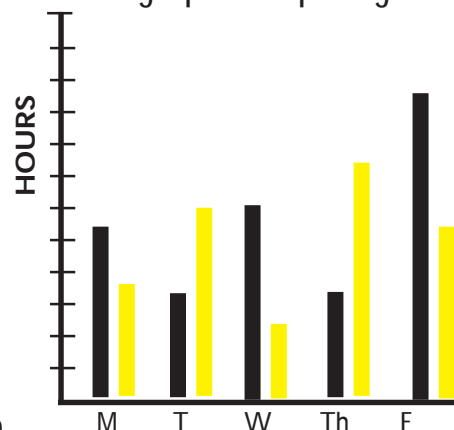
## C Let's Go!

1. Together with your child, keep track of the time s/he spends watching television as well as reading.
2. Make a table listing the 7 days of 1 week. Keep two columns, one for television and one for reading.
3. At the end of the week, see if together you can make a graph comparing the two different activity columns.

## Let's Go On!

## D

4. While watching television, make a chart showing how much time in every hour is used for commercials compared to how much time is used for the actual show. Do this for every half-hour of television you watch.
5. Then make a bar or pie chart showing the two amounts. Time the minutes carefully. Extend the chart to include other activities: the amount of time sleeping, eating, playing, or riding in the car.



**Quick Tip for Math:** Help your child understand that wrong answers aren't always bad. They may help you discover what s/he doesn't understand.

When your child gets a wrong answer:

- Be patient. Look further; ask questions, and see what the wrong answer is saying about the child's understanding. Did the child understand the question?
- Ask your child to explain how the problem was solved. Does your child need help with the procedures, the number facts, or the concepts involved?
- Help your children be a risk takers: show them wrong answers are OK; assure them that the right answers will come in time.

# Time Trackers I I

## A Goal:

To help your child collect information, analyze it and present the findings in an organized way

## B What You Will Need:

- Clock or watch
- Blank paper
- Graph paper (May be attached or make your own with a 1-inch grid.)

## C Let's Go!

1. Together with your child, keep track of how s/he spends time in one 24-hour period: time spent sleeping, eating, playing, reading, and going to school.
2. Measure a strip of paper that is 24 inches long. Let each inch represent one hour.
3. Color in the number of hours for each activity, using a different color for each activity.
4. When finished, make the strip into a circle and place it on a blank piece of paper. Trace around the circle. Then make lines from the center of the circle to the end of each color.
5. Your child has just made a circle (pie) chart of how s/he spends 24 hours. Compare this with how other people in your family spend their time.



## Quick Tip for Math:

One of the most important ways parents can help a child in math is by exhibiting attitudes and values supportive of learning. Here's a way to start:

- Accept that struggle is a normal part of doing math, just as it is when you become better in sports. Help spot difficulties, and offer suggestions for overcoming them.
- Encourage Mastery. When you learn to play a sport, it's important to repeat fundamentals again and again until you can do it automatically. It's just as important to see practice in mathematics as developing mastery, not a chore or form of punishment.

# Favorite Ice Cream

## A Goal:




To help your child collect and analyze information and present it in an organized way

## B What You Will Need:

- Paper
- Friends, family, or neighbors to survey

## C Let's Go!

1. Make a survey sheet similar to the one shown above.
2. Ask your child to name three flavors of ice cream. Then color each scoop to resemble those flavors.
3. Together, write the flavor names in the box below the scoop.
4. Ask 10 people which of these three flavors they would prefer.
5. Use tally marks to record each person's answer.
6. Count the tally marks in each column and write the matching numeral at the bottom of the column.

Ice Cream Survey		
		
Strawberry	Superman	Chocolate
	<del>    </del>	\
1	5	4

7. Talk about your results:

Which column has the least marks?

Which column has the most?

Are there more \_\_\_\_\_ or more \_\_\_\_\_?

Are there fewer \_\_\_\_\_ or fewer \_\_\_\_\_?

How many people did you ask? Do you have that many marks?

How many more \_\_\_\_\_ are there than \_\_\_\_\_?

How many less \_\_\_\_\_ are there than \_\_\_\_\_?

How many \_\_\_\_\_ altogether?

Are any columns the same?

## D Let's Go On!

8. You can build a graph out of almost any information you can collect. Look for things that interest your child, collect data and then talk about what you learn using the questions above. *Examples:* favorite vacations, different bugs or plants found in your yard, favorite sports, time spent eating each day.

# Jumping Jack Graphs

## A Goal:

To help your child understand time and estimate and chart data

## B What You Will Need:

- Stopwatch or watch with a second hand

## C Let's Go!

1. Invite your child(ren) to wave hands for 10 seconds so they will know how long 10 seconds is.
2. Now, predict how many jumping jacks they can do in 10 seconds. Write that number in a table like the one at the top.
3. Say, "Ready, set, go!" and begin timing for 10 seconds. Encourage child(ren) to count the number of jumping jacks as they jump.
4. Call "Stop!" when 10 seconds are up. Record how many were completed. Does that number match what you predicted?
5. Repeat several times, recording your predictions and your actual count each time. Ask, "Are you getting better at predicting?" "Did you do more or fewer jumping jacks this time? Which time did you do the most jumping jacks?"

Movement	guess	real
J.J./ 10 seconds	20	9
J.J./ 20 seconds	18	15
J.J./ 30 seconds	30	27
hop 1 foot (10)	15	19
hop 2 feet (10)	21	20
twirl (10 sec.)	12	8

## D Let's Go On!

6. Make your graph more complicated by adding one of the following variables:
  - Ask more people to participate, and include columns for them.
  - Change the amount of time you exercise. How many can you do in 15 seconds? 30 seconds? 60 seconds?
  - Repeat the activity with other movements, such as hopping on one foot, jumping on two feet, or skipping along the driveway.

**Quick Tip for Math:** Talk about the charts or graphs you see in your world: sports statistics, price charts, newspaper illustrations, weather forecasts.

Ask your child questions like these to get them thinking:

Are there more \_\_\_\_\_ or more \_\_\_\_\_?

Are there fewer \_\_\_\_\_ or fewer \_\_\_\_\_?

How many more \_\_\_\_\_ are there than \_\_\_\_\_?

How many less \_\_\_\_\_ are there than \_\_\_\_\_?

Are any \_\_\_\_\_ the same?



# Cracker Graphs

## A Goal:

To help your child learn to graph and compare data

## B What You Will Need:

- Snack-sized crackers in four different shapes: squares, rectangles, triangles, and circles
- [Cracker table](#) (attached)

## C Let's Go!

1. Give each child a bag containing some of each cracker shape.
2. Place crackers on the Cracker Graph.
3. Discuss how tables are used to show information.
4. Figure out which cracker shape you have the most and least of.
5. Finish some of the following problems, using  $>$  (greater than),  $<$  (less than) or  $=$  (equal to).
  - CIRCLES \_\_\_\_\_ SQUARES
  - TRIANGLES \_\_\_\_\_ RECTANGLES
  - SQUARES \_\_\_\_\_ TRIANGLES
  - RECTANGLES \_\_\_\_\_ CIRCLES
  - TRIANGLES \_\_\_\_\_ CIRCLES
  - SQUARES \_\_\_\_\_ RECTANGLE
  - SQUARES + CIRCLES \_\_\_\_\_ TRIANGLES
  - RECTANGLES + TRIANGLES \_\_\_\_\_ CIRCLES
  - RECTANGLES + CIRCLES \_\_\_\_\_ SQUARES + TRIANGLES
  - CIRCLES - SQUARES \_\_\_\_\_ TRIANGLES - RECTANGLES
  - RECTANGLES - CIRCLES \_\_\_\_\_ TRIANGLES - SQUARES

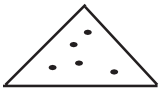
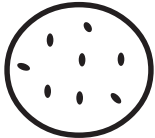


### Quick Tip for Math: Play "\_\_\_\_\_ Unplugged" (fill in your child's name).

At least once this summer, take a family pledge to not watch TV for a week. Then have each child record his or her unplugged activities—books read, games played, and other activity during the usual TV time.

At the end of the week, have a celebration, ask children which alternative they liked best, and discuss future cutbacks on viewing.

# Cracker Graph—worksheet

Use this graph with Cracker Graph activity

			
	<b>My Guess</b>	<b>My Count</b>	<b>How Close?</b>
<b>Number of ALL crackers</b>			
<b>Number of circles</b>			
<b>Number of squares</b>			
<b>Number of triangles</b>			
<b>Number of rectangles</b>			

**Quick Tip for Math:** You can graph almost anything you and your child can observe and record. If you want to learn more visit the following Web site and learn about the many ways that graphs are used. You can even create your own graphs--in many shapes and formats!

**Create A Graph** (National Center for Education Statistics)

<http://nces.ed.gov/nceskids/graphing/index.asp>

# License Plate Math

## A Goal:

To help your child use data to infer and predict

## B What You Will Need:

- Paper and pencil
- Access to lots of passing cars
- 2 or more players

3	8	7
5	4	0
6	9	1

## C Let's Go!

1. Each player should make a grid of squares, 3 across and 3 down for a total of 9 squares.
2. Each player should fill squares with digits 0-9 in any order they like. (There will be one leftover digit.) The game works better if every player orders their numbers differently.
3. As cars pass you, or you pass them, call out the number of the last digit of the license plate, and each person marks off that digit on her/his card. Three in a row wins (across, up-and-down, or diagonally).
4. After you've played awhile, ask the players to think about strategy.
  - Do some numbers seem to come up more often?
  - If so, where should you put that number on your card?
  - Why does the game work better if the cards are different?

## D Let's Go On!

5. Play again, but this time remember the last digit of a license plate. Count how many license plates you see until you spot the same last digit again. (Then the round ends.)
6. Do this a few times, recording how many plates you see until you find a match of the original number.
7. Now change the rules. Start recording all last digits. Keep playing until you get a repeat of any last digit. Ask:
  - How many plates did it take to get a repeat?
  - Which version has shorter rounds?
  - Why do you think this is so?

**A** Goal:

To help your child \_\_\_\_\_

**B** What You Will Need:

- 
- 
- 

**C** Let's Go!

1.

**D** Let's Go On!

---

Quick Tip for Math:

# Guess if You Can

## A Goal

To help your child develop an understanding of the characteristics and meanings of numbers.

## B What You Will Need:

- Questions about numbers

## C Let's Go

1. Let your child think of a number between a range of numbers you choose  
*Example: "Think of a number between 1 and 25."*
2. 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 divide this number up into 3 equal parts?

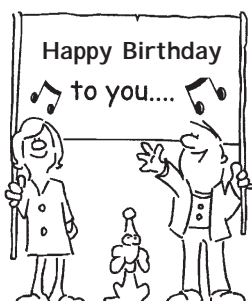
And so on ...

3. After you have guessed your child's number, you choose a number and let your child guess, asking similar questions.

## D Let's Go On

This activity works on many different levels of math. The questions can serve as learning tools for explaining concepts. For example, you can take the opportunity to explain even and odd numbers, place value, and other concepts.

**Quick Tip for Math:** Did you know that music uses and teaches math skills to children?



- Teach your children to listen to the patterns found within songs.
- Count the beat as you listen to the radio or CDs.
- March along to some patriotic music and get their bodies and brains working together! Some children learn faster and remember more when they move their bodies while they practice mathematics or reading skills.

# Money Match

## **A** Goal:

To help your child count change (Lots of repetition will make it even more effective.)

## **B** What You Will Need:

- A die to roll
- 10 of each coin (penny, nickel, dime)
- 6 quarters

## **C** Let's Go!

1. For young players (5- and 6-year-olds), use only 2 different coins (pennies and nickels or nickels and dimes). Older children can use all the 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 die and gets the number of pennies shown on the die.
4. Players take turns rolling the die to collect additional coins.
5. As each player accumulates 5 pennies or more, the 5 pennies are traded for a nickel.
6. The first player to reach the set amount wins.
7. Add the quarter to the game when the children are ready.



Adapted with permission from Helping Your Child Learn Math (1992), by Patsy F. Kanter, edited by Cynthia Hearn Dorfman. U.S. Department of Education

**Quick Tip for Math:** Encourage comparison of prices and quantities marked on containers to determine the best buys. Allow the child to purchase an item and figure out the change to be received.



# Numbers in the News

## A Goal:

To help your child see that mathematical data is everywhere and can be used for many purposes

## B What You Will Need:

- Newspapers
- Crayons or colored pencils

## C Let's Go!

1. Have your child find and circle with different colored markers the following things in the newspaper:
  - a graph
  - a number less than 10
  - something that comes in 2s, 3s, 4s
  - a number more than 50
  - the days of the week
  - a number more than 100
  - a number that is more than 100 but less than 999
  - a symbol or word for inches, feet, or yards
  - a schedule of some kind
  - a triangle
  - a weather symbol
  - a percent sign
  - sports statistics



**Quick Tip for Math:** Want to have fun and build skills for learning all at once? Encourage your child to play card games, either with you or with friends. Card games like Concentration and Go Fish build memory, recognition, and recall skills.

Bingo, dominoes, toy telephones, card games, board games, calendars, and clocks with large numbers all can help familiarize your child with the world of numbers.

# Napkin Fractions

## A Goal:

To help your child connect mathematical concepts to real objects and make learning fractions fun!

## B What You Will Need:

- Paper napkins or square paper towels
- Pencils, crayons, or markers

## C Let's Go!

1. Start by folding the napkin into two halves. Unfold and label each side:  $\frac{1}{2}$  = one half.
2. Then fold again to make four quarters. Again, unfold and label each fourth.
3. Be sure to talk about what you are doing as you fold. *Example:* "If we fold these halves in half again, we get four squares when we unfold it. Let's label these  $\frac{1}{4}$  = one fourth."
4. Move on to eighths and sixteenths.
5. Talk together about the relationships you see. *Example:* How many fourths do you see in each half? Which is bigger: one half or one sixteenth?

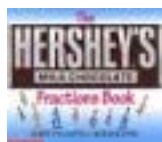
## D Let's Go On!

6. Use a Hershey® bar to have more fun with fractions. Remove the outside wrapper and rub softly over the foil wrap so you can see the sections of the bar.
7. Talk about how each small section is part of the whole bar. Can your child find how many sections are in  $\frac{1}{2}$  of the bar?  $\frac{1}{4}$  of the bar? How much of the bar is one section ( $\frac{1}{12}$ ). How many in  $\frac{1}{12}$  or in  $\frac{1}{2}$ ? How many  $\frac{1}{8}$  in  $\frac{1}{4}$ ? If you share the chocolate bar when you're done, this activity will appeal to almost every child!

## Quick Tip for Math:

Did you Know?

You can brush up your math skills just by reading a good book? Your library is full of literature that will help build math skills. Check the book list that came with this packet, or ask your local library staff for ideas. You can start with some more chocolate fun:



- ***The Hershey's Milk Chocolate Bar Fractions Book***, by Jerry Pallotta, Robert C. Bolster, Rob Bolster. Cartwheel Books, 1999.
- ***More M&M's Brand Chocolate Candies Math***, by Barbara Barbieri McGrath, Roger Glass. Charlesbridge Publishing, 1998.

# Playing Card Place Value

## A Goal:

To help your child learn place value

## B What You Will Need:

- Deck of cards
- Paper and pencil
- 2 or more players

## C Let's Go!

1. The object is to create the number with the most value (the highest number.)
2. Start by having each player draw 3 boxes on a sheet of paper.



3. Next, show your child a deck of cards (with the face cards removed). If s/he is very young, explain the meaning of the numbers and symbols on the cards. Tell her/him that s/he will be drawing cards from the deck to find the numerals they will use to fill in their boxes.
4. The value of the cards will be as follows:  
Ace=1   2=2   3=3   4=4   5=5   6=6   7=7   8=8   9=9   10=0
5. Begin by drawing one card. Ask each player to write the number represented on the card in one of their three boxes, reminding them that the goal is to create the highest number. *Example:* A 5 of hearts is drawn. Player one puts a 5 in box #1. Player two puts a 5 in box #3.



6. Continue until all boxes are filled. Which player has the higher number?
7. As the players gain experience with the game, they will learn to put smaller numbers in the "ones" and "tens" place; higher numbers need to go in the "hundreds" and "tens" value.

**Variations:**

- Add more place value, using 4, 5, 6, or more boxes.
- Add a discard box where each player can throw away one number of their choice during the game.

# Odd or Even?

## A Goal:

To help your child recognize odd and even numbers

## B What You Will Need:

- Paper
- Pencils
- Crayons in two colors

## C Let's Go!

1. Draw a simple pattern of boxes.
2. In some of the boxes, write even numbers. In the rest, write odd numbers.
3. Tell your child to find all the boxes with odd numbers. Color them one color.
4. Next, tell your child to find all the boxes with even numbers. Color them another color.

## D Let's Go On!

5. You can also do this using a one-month calendar. Have children color the boxes containing odd numbered dates one color. Then color the boxes containing even-numbered dates another color.
6. After finishing a row or two, ask your child if s/he can see a pattern?

Family Calendar Jan. 2000

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

*Back to School!* (on Tuesday 4th)  
*Skating Party!* (on Friday 14th)

**Quick Tip for Math:** It's easy to turn any snack-time into math time!

- Have children spread a graham cracker with peanut butter and make "dominoes" with different number of raisins pressed into each end of the graham cracker. Or use frosting and press chocolate chips into the icing.
- Have children guess how many raisins they think are in an individual box of raisins before opening. Open the box and guess again. Finally, count the raisins to see how close their estimate was to the actual number.

**A** Goal:

To help your child \_\_\_\_\_

**B** What You Will Need:

- 
- 
- 

**C**

Let's Go!

1.

**D** Let's Go On!

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Quick Tip for Math:

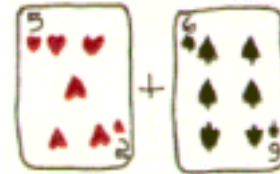
# Better Than Flash Cards-II

## A Goal:

To help your child develop speed and confidence in her/his ability to add and subtract quickly.

## B What You Will Need:

- Time with your child
- Deck of cards



## C Let's Go!

1. Play the card game War, except lay down two cards each and either add them or multiply them and whoever has the largest sum or product wins the cards.
2. Play a speed challenge with two or more children. Lay two cards down and the first one to give the correct answer to the product or sum wins those cards.
3. Give children a suit of cards from Ace (which will stand for the number one) to ten. *Example:* All the diamonds with the face cards removed. Mix them up and have the child add them. S/he can tell immediately if s/he made a mistake, because the answer will always be 55. Alternatively, start with 55 and have the child subtract the cards and if he is right, he will always get zero when the last card is played.

## D Let's Go On!

4. Put your catalogs and junk mail to work. Give the child a catalog and let him do a dream order. Have him write up the order on the sheet, total it, and figure tax. Alternatively, give him a certain budget to adhere to and tell him what he needs to purchase. Then let him figure out what to order and calculate it.
5. Have the child figure out the actual cost for an item when it's shown as a certain percentage discount. It's OK to use a calculator.

---

**Quick Tip for Math:** Don't worry about packing every summer day with activity or lessons. Leave enough free time for children to daydream and explore. Free time allows a child to develop new interests and create their own play.

# Concentration

## A Goal:

To help your child develop speed and confidence when working with number combinations

## B What You Will Need:

- 30 blank index cards or 3x5 slips of sturdy paper
- Pencil, crayon, or marker

## C Let's Go!

1. Write the number combinations you want to practice on one side of 15 cards. Example:  $9 \times 4 = \underline{\quad}$  or  $10 - 2 = \underline{\quad}$ .
2. Write the answers to each of those 15 combinations on one side of each of the remaining 15 cards.
3. Shuffle the cards and arrange them in a rectangle on a table or floor, blank sides up.
4. Take turns with your child turning over two cards, one at a time. Try to match the arithmetic problem on one card with the solution on another.
5. If the two cards you choose do not match, turn them over again so their blank sides show. Then the other player gets a turn.
6. If the two cards you choose match, pick them up and take another turn.

	10 + 2				
		12			

**Quick Tip for Math:** Teaching math skills can be as easy as playing games. That's because games teach children to focus on details and sharpen their memory. Here are a few to try that might be on your shelves already:

- Yatzee<sup>®</sup>
- S'math<sup>®</sup>
- Card games: Go Fish, Rummy, Solitaire
- Monopoly<sup>®</sup> (let your child be the banker)
- Dominos<sup>®</sup>
- Don't forget computer games for those techno-wizards!



# Math Bingo

## A Goal:

To help your child practice number facts and arithmetic while having fun

## B What You Will Need:

- A Math Bingo game sheet
- A set of clues prepared by an adult
- One marker (a coin or chip will work)
- Paper and pencils for each player

## C Let's Go!

1. Prepare grids with 4 rows and 4 columns. Choose numbers to fill each square. Make enough for each child who will play, but make each one different.
2. Prepare a set of clues, using skills your child needs to practice. (Addition, subtraction, fractions, multiplication, division.)
3. Read your first clue. *Example:* The answer to  $7+3-8$ . (2)
4. Have each child calculate the answer using mental math or paper and pencil. Put the marker or chip on the correct answer.
4. When each child has marked a number, read the correct answer. If they got it right, remove the marker and place an x over the number. If they got it wrong, remove the marker and try again.
5. Continue reading clues and marking answers until one child gets 4 in a row, across, up and down or diagonally.

5	12	0	7
11	<del>2</del>	16	21
10	6	13	9
3	17	4	1

**Quick Tip for Math:** The workplace is rapidly changing. No longer do people need only the computational skills they once needed in the 1940s. Now workers need to be able to estimate, to communicate mathematically, and to reason within a mathematical context.

Did you  
Know?

Because our world is so technologically oriented, employees need to have quick reasoning and problem-solving skills and the capability to solve problems together. The work force will need to be confident in math.

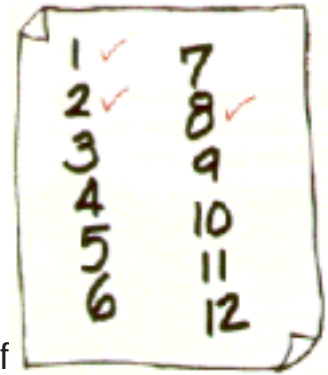
# Super Sums

## A Goal:

To help your child develop different ways to see and work with numbers by using them in different combinations to achieve a goal.

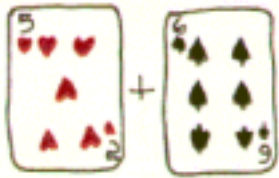
## B What You Will Need:

- Deck of cards
- Paper
- Pencil



## C Let's Go!

1. Have each player write the 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 the list.
2. Open a deck of cards. Use only the cards 1(Ace)-6 in every suit (hearts, clubs, spades, diamonds).
3. 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 the 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.



## D Let's Go On!

**Make 100.** Using only Ace–6, have each player draw 8 cards. Each player must get as close to 100 as possible without going over. Players can decide whether to use a card in the tens place or the ones place. For example, if a player draws two 1s (aces), a 2, a 5, two 3s, a 4, and a 6, he can choose to use the numerals in the following way: 30, 40, 10, 5, 6, 1, 3, 2. This adds up to 97.

Adapted with permission from Helping Your Child Learn Math (1992), by Patsy F. Kanter, edited by Cynthia Hearn Dorfman. U.S. Department of Education

**Quick Tip for Math:** Help your child understand that wrong answers aren't always bad. They may help you discover what s/he doesn't understand.

When your child gets a wrong answer:

- Be patient. Look further, ask questions, and see what the wrong answer is saying about the child's understanding. Did the child understand the question?
- Ask your child to explain how the problem was solved. Does your child need help with the procedures, the number facts, or the concepts involved?
- Help your children be a risk takers: show them wrong answers are OK; assure them that the right answers will come in time.

# Shop-o-rama

## A Goal:

To help your child practice numerical operations and learn to be careful spenders

## B What You Will Need:

- A variety of catalogs, magazines, and store circulars
- Scissors
- Construction paper
- Colored markers
- Glue



## C Let's Go!

1. Label one piece of construction paper **Needs** and another one **Wants**.
2. Invite your child to sort through catalogs, cutting out pictures, descriptions, and prices of school clothes and supplies that appeal to them. If there isn't a price on an item, help your child guess the amount the item might sell for.
3. Ask your child to divide your pictures and descriptions in two piles—Wants and Needs, and then glue them onto the appropriate sheets.
4. Now have your child make a "shopping" list. Set a budget of \$250.00 for clothes and supplies. Your child should first look at the Wants and Needs lists to help decide what to buy, keeping track of what s/he's spending. Remind your child that the goal is to get the most for her/his money.

## D Let's Go On!

5. After discussing what your REAL budget might be, do this activity again. Now you're ready to go on a real shopping trip.
6. Encourage your child to find coupons for the items s/he wants to buy. Ask, "How much will you save if you use this coupon?" "How much will you save all together if you use all of them?" Consider letting her/him keep the money saved with the coupons s/he finds.

## 2-Bean Salad

### A Goal:

To help your child learn logical thinking and get ready to learn algebra

### B What You Will Need:

- Dry Beans in 3 colors (lima, red, and black work well)  
OR markers of various colors
- A glass or clear plastic bowl in which to put the beans



### C Let's Go!

1. Work together to find out what's in each salad described below. Each one has two kinds of beans. Some salads may have more than one answer. Use real beans to solve the problems at first. Can your child think of any other ways to find the answers? Check that answer by using beans.
  - a. This salad has 8 beans. Half of the beans are black. How many are not black?
  - b. This salad has 10 beans. 4 of the beans are lima beans. How many are red beans?
  - c. This salad has 10 beans. It has the same number of each kind of bean. What could be in the salad?
  - d. This salad has 4 black beans. The number of red beans is double the number of black beans. How many beans are in the salad?
  - e. There are 5 lima beans and 2 more red beans than lima beans. How many red beans are there?
  - f. There are 5 beans in all. There is 1 more lima bean than red beans. How many of each kind?
  - g. There are 6 lima beans. There are 3 more red beans than lima beans. How many beans in the salad?
  - h. There are 6 beans in all. There are half as many lima beans as red beans. Describe this salad.
  - i. There are 4 beans in all. There are three times as many black beans as red beans. How many of each color?
  - j. There are 5 lima beans and 2 less red beans than lima beans. How many red beans are there?
2. Don't worry if some of these problems are too hard for your child. Just do the problems that you can, or make up some simpler problems of your own.



**A** Goal:

To help your child \_\_\_\_\_

**B** What You Will Need:

- 
- 
- 

**C** Let's Go!

1.

**D** Let's Go On!

---

Quick Tip for Math:

# Coin Toss

## A Goal:

To help your child understand probability

## B What You Will Need:

- Two or more coins
- A T-chart (see below)



## C Let's Go!

1. Ask your child, "What is the probability of getting "heads" on both coins?"
2. Lay out several pairs of coins to find all the possible combinations. Then draw a chart like the one below to record the possibilities.  
(There should be 4.)
3. Since any of these 4 possibilities are equally likely to happen, mathematicians would say that the probability of getting two heads is 1 chance in 4 or  $1/4$ .
4. Now, draw a new T-chart and toss the coins for awhile. Record the tosses for each coin. Did you get two "heads" about  $1/4$  of the time?

Coin 1	Coin 2
T	H
T	T
H	T
H	H

## D Let's Go On!

5. Ask other questions about probability. What are the chances that three coins will all turn up "tails"?
6. Lay out all the possibilities and then chart your answers (There should be 8.) Do you see a pattern between the number of coins and the number of possibilities?

**Quick Tip for Math:** Instead of saying "Let's do some math." say, "Would you like to hear a story?" or "Can I show you a trick?"

Parents who collect a good stock of math stories and tricks will always have an eager audience, especially when kids are trapped in a car or otherwise "bored."

Try *Games for Math: Playful Ways to Help Your Child Learn Math*. Or look for more books in the 793.7 and 510 sections of the juvenile section of your local library.

# Put It Away

## A Goal:

To help children develop classifying and reasoning skills and the ability to examine data or information

## B What You Will Need:

- Paper
- Pencil
- Ruler
- Computer



## C Let's Go!

1. After getting home from grocery shopping, find one characteristic that is the same for some of the products. For example, some are boxes and some are cans.
2. Put together all the items that have the same characteristic.
3. Find another way to group these items.
4. Continue sorting, finding as many different ways to group the items as you can.
5. Play "Guess My Rule." In this game, you sort the items and ask your child to guess your rule for sorting them. Then, reverse roles and let your child sort the items so that you can guess her/his rule.
6. Using paper, pencil, ruler, or computer spreadsheet, make a table of how many items are in each category.

Adapted with permission from Helping Your Child Learn Math (1992), by Patsy F. Kanter, edited by Cynthia Hearn Dorfman. U.S. Department of Education

**Quick Tip for Math:** Learning to do math often requires children to learn a whole new language. Whenever you can, try to connect the language of math with the concepts. For example, when you share an apple or sandwich, split it into two parts of the same size. Explain to your child that each of you is eating one-half.

You can talk to children about other mathematical concepts: greater than, less than, or equal to; likely and unlikely events; adding together, subtracting; grouping and sorting; about, approximately, in between, around.



# Is It Certain?

## A Goal:

To help your child understand the difference between chance and certainty

## B What You Will Need:

- Paper divided into 3 columns
- Pencils or markers
- Time with your child

Certain	Impossible	Chance

## C Let's Go!

1. Talk with your child about everyday experiences of chance and certainty.
2. Make a list of some things that will never happen (a dog will never have kittens). Label this list: Things that are Impossible.
3. Now make a list of things that will definitely happen. (The sun will rise tomorrow.) Label this list: Things that are Certain.
4. Now make a list of events that may or may not happen. (Tomorrow it might rain.) Label this list: Chance Events.
5. Compare your lists: Which is longer? Which was hardest to create. Which list was the most fun to create?

## D Let's Go On!

6. Look for opportunities to talk about these concepts when going through your day. Ask your child, "Is there a chance that \_\_\_\_\_ might happen this week? Why or why not?"
7. Help your child get used to using the language of probability: impossible/certain; more likely/unlikely or less likely; equally likely/not equally likely; possible/probable; fair/not fair.

---

**Quick Tip for Math:** Reasoning is used to think through a question and come up with a useful answer. It is a major part of problem solving.

Ask your children to figure out why something is the way it is and then check out their ideas. Let them think for themselves, rather than try to figure out what answer you want to hear.

# Is It Likely?

## A Goal:

To help your child compare events and describe them as “more likely” or “less likely”

## B What You Will Need:

- Weekly weather report
- Time with your child



## C Let's Go!

1. Look a weekly weather report for your area. You can find these in local newspapers, on the weather channel, or on the Internet.
2. Talk with your child about the upcoming forecasts. Based on the information in the forecast, have your child answer whether the following weather events are *more likely* or *less likely*. Are any of these *impossible*?

It will rain tomorrow. \_\_\_\_\_

The sun will shine on Tuesday. \_\_\_\_\_

It will be windy. \_\_\_\_\_

It will snow. \_\_\_\_\_

We will have a tornado \_\_\_\_\_

You will need to wear shorts. \_\_\_\_\_

You will need an umbrella. \_\_\_\_\_

The sun will rise before 7 a.m. \_\_\_\_\_

3. Talk about your child's answers. Why did s/he give the answers s/he did?

---

**Quick Tip for Math:** Reasoning is used to think through a question and come up with a useful answer. It is a major part of problem solving.

To promote reasoning, ask your children questions and give them time to think about the answer. By simply asking questions and listening to answers, you are helping your children learn to reason.

# What's the Chance?

## A Goal:

To help your child explore the concepts of chance and certainty and develop the language of probability

## B What You Will Need:

- Time with your child
- Paper and pencils



## C Let's Go!

1. For a week, children listen for, discuss, and record events according to the likelihood they will occur.

Event	More/Less Likely	Why?
I will lose a tooth.		
My friend will visit.		
Mom will bake cookies.		
We will have a hurricane.		

2. Explore ways to show the probability of an event occurring:

What Is the Probability?				
	No Way	Poor	Good	For Sure
Of it snowing tomorrow?				
Of it raining today?				
Of Grandma visiting this week?				

3. Ask your child why s/he gave the predictions they did.
4. Discuss possible events throughout the year and have fun exploring the concept of probability!

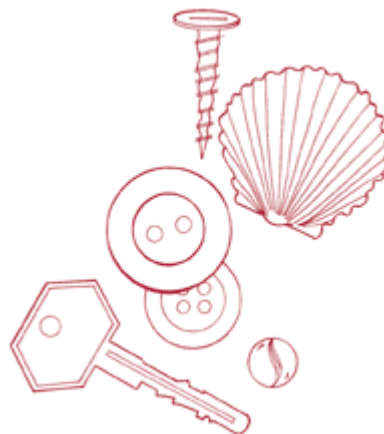
# Treasure Hunt

## A Goal:

To give your child hands-on experience with numbers, counting, sorting, and other mathematical concepts.

## B What You Will Need:

- Buttons
- Screws
- Washers
- Bottle caps
- Old keys
- Sea shells
- Rocks
- OR anything else you can count



## C Let's Go!

1. Find a container to hold the treasures. Have your child predict what size and shape will be needed to hold all the items.
2. Sort and classify the treasures. For example, do you have all the same sized screws or keys? How are they alike? How are they different?
3. Use these treasures to tell addition, subtraction, multiplication, and division stories. For example, if we share 17 buttons among three friends, how many will we each get? Will there be some left over? Or, if we have 3 shirts that need 6 buttons each, do we have enough buttons.
4. Organize the treasures by one characteristic and lay them end-to-end. Compare and contrast the different amounts of that type of treasure. For example, there are 3 short screws, 7 long screws, and 11 medium screws. There are 4 more medium screws than long ones. This may also provide an opportunity to talk about fractions:  $\frac{7}{21}$  or  $\frac{1}{3}$  of the screws are long.

## D Let's Go On!

5. Ask your child if s/he to think about objects that might belong to two groups at one time. *Example:* buttons with 4 holes; objects that are round. Can s/he think of a way to display that?

# Let's Go to the Movies

## A Goal:

To help your child practice making combinations

## B What You Will Need:

- Newspaper with movie schedules OR video rental selections
- Paper and Pencils



## C Let's Go!

1. Draw a simple grid with 3 columns. Label the left column "Movies." Label the middle column "Snack Choices." Label the right column "Combinations."
2. Now, name 3 movies from which your child can choose to plan a night on the town.
3. Next, name 3 snack items and tell your child s/he can choose one to enjoy while s/he watches the show.
4. Using your chart, figure out how many different combinations you could make for your movie night?

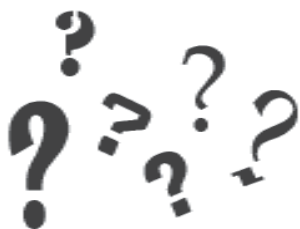
Movies	Snacks	Combinations

## D Let's Go On!

5. Ready for a challenge? Add a fourth column to your grid. Add the 2 or 3 show times you might select. Now how many combinations can you make?
6. If you add another column, like sitting in the front row or the back row of the theater, how many combinations could you make?
7. Do you see a pattern?
8. You can do this with any number of everyday combinations: 3 kinds of bagels with 2 choices of creamed cheese; two kinds of cones, 3 flavors of ice cream.

**Quick Tip for Math:** When talking with your children, ask them to justify their thinking. This will help them clarify their reasoning.

Ask questions like: Why? How do you know? What makes you think that?



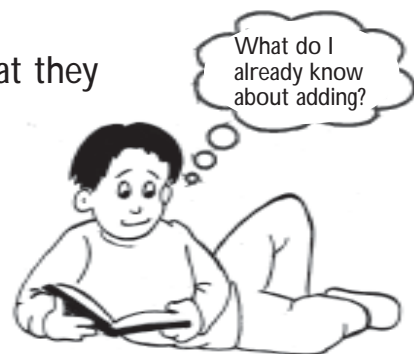
# Math Maps for the Mind

## A Goal:

To help your child connect new math ideas with what they already know

## B What You Will Need:

- Paper and pencil
- [Word Map](#) sheets (attached)
- List of math words/ideas your child is learning



## C Let's Go!

1. Explain to your child that a Word Map is a “graphic organizer” to help your brain connect new math concepts to what they already know.
2. In the center circle, write the word or concept your child is learning.  
*Example: Circle*
3. In the top box, write a definition in the child's own words. *Example: It's a round shape.*
4. In the left box, write some examples. *Example: ball, clock, coins.*
5. In the bottom box, describe what it is like. *Example: It is curved.*
6. In the right box, write some non examples: *book, paper clip.*

The best words come from your child's own math lessons. But here are some math concepts you might use:

**Multiplication Words:** times, product, double, twice, factors

**Subtraction Words:** decreased by, remain, less than, subtract, minus, difference, take away, have left.

**Addition Words:** add, all together, both, in all, increased by, more than, plus, put together, sum, total.

**Division Words:** divide, separate, quotient, half of, dividend, divisor, half as many.

**Additional Concepts:** graph, estimate, measurement, number, probability, statistics, patterns, shapes.

# Word Map

(Use with Word Map Activity to help your child connect new math concepts with what they already know.)

PILOT



WHAT IS IT?	<div>CONCEPT</div>	WHAT ARE SOME NON EXAMPLES?	<div></div> <div></div> <div></div> <div></div> <div></div>	WHAT IS IT LIKE?	<div></div> <div></div> <div></div> <div></div> <div></div>
WHAT ARE SOME?	<div>CONCEPT</div>	WHAT ARE SOME NON EXAMPLES?	<div></div> <div></div> <div></div> <div></div> <div></div>	WHAT IS IT LIKE?	<div></div> <div></div> <div></div> <div></div> <div></div>



**A** Goal:

To help your child \_\_\_\_\_

**B** What You Will Need:

- 
- 
- 

**C** Let's Go!

1.

**D** Let's Go On!

---

Quick Tip for Math:

## Additional Learning Tools

## Number Chart, 1-100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

FOR *LITERACY & MATHEMATICS*

[illegible]

# 10 x 10 Geodot Paper

Copy this dot paper and encourage your child to draw shapes that connect the dots. Can s/he make a shape village? A shape creature? Have fun!

