

Further Resources

Ohio Resource Center (ORC)–Mathematics

[<http://ohiorc.org/>]

Online activities aligned with Ohio Mathematics Standards

Ohio's Mathematics Academic Content Standards

[http://www.ode.state.oh.us/Academic_Content_Standards/acsmath.asp]

Ohio Mathematics and Science Coalition (OMSC)

<http://www.oai.org/omsc/>

Principles and Standards for School Mathematics

[<http://standards.nctm.org/>]

The online version of standards from the National Council of Teachers of Mathematics, including the full text and online activities.

Illuminations [<http://illuminations.nctm.org/index2.html>]

Ready-to-use interactive lesson plans and investigations.

Helping Your Child Learn Math

[<http://www.kidsource.com/kidsource/content/Learnmath5.html>]

Guidelines for parents and real world math activities to do with children.

Figure This! Math Challenges for Families

[<http://www.figurethis.org/index40.htm>]

Interesting math challenges that middle-school students can do at home with their families.

Math at Hand Great Source Education Group (800) 289-4490

This student handbook provides detailed and illustrated mathematical explanations of topics for grades 4 - 6.

Family Math and Family Math for Young Children

EQUALS Publications (800) 897-5036

Filled with fun, instructive, and non-threatening math activities for families or small class groups to enjoy together.

This outreach to parents is sponsored by grants from organizations interested in promoting excellence in mathematics among Ohio students.

- Ohio Council of Teachers of Mathematics
<http://www.ohioctm.org/>
- National Council of Teachers of Mathematics
<http://www.nctm.org/>
- SMART Consortium <http://www.oai.org/SMART/>

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*Being a Parent Counts:
A guide to helping your child learn
mathematics at home*

WHY MATH MATTERS

It matters because of the world we live in—a world of numbers and shapes, where mathematical thinking is used in dealing with the most everyday situations. Children question how big? how much? how far? and need to understand numbers if they are to understand the answers. Much of the world's information is written not only in words but also in graphs, statistics, and percentages.

Besides the practical uses of math—paying the bills, reading graphs in the newspaper, coping with percentages on car loans—are other skills that children learn as they study math. These are mathematical ways of thinking, skills they can use all their lives. In studying math, children learn to:

Problem solve—to stick with a problem, to investigate it carefully, to attack it from several angles, and to check their answer to see if it makes sense.

Reason logically—to see how things fit together, to look for patterns, and to set out evidence carefully.

Communicate—to explain their thinking clearly, to listen to others' ideas, and to present their findings in numbers, words, and even mathematical symbols.

This booklet contains activities that invite you and your child to explore math in new, interesting ways. Each activity is aligned with the Ohio Math Standards. Choose any one and experience Standards-based math along with your child!

Newsworthy Numbers



Materials: Newspaper or magazine

Look in the newspaper or magazines with your child and find numbers—very large ones for older children, smaller ones for younger children.

Have your child read the number to you.

Use the ads in a newspaper to practice addition. Have your child choose five things from the ads and add the prices to see how much they would cost. Start with a given amount of money, possibly \$10.00, and subtract total from amount given.

Find number words in the newspaper. Have your child read the word and write the number that represents that word.

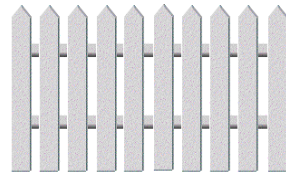
Example: Two million—2,000,000



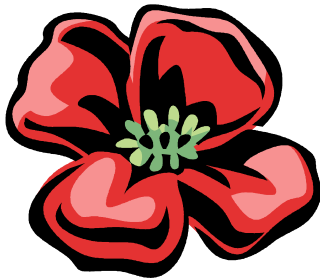
A World of Symmetry

Symmetry is all around us – in plants and animals, arts and crafts, signs and buildings, streets and automobiles. Children quickly learn to identify reflections or mirror symmetry, but there are other kinds of geometric symmetry based on sliding and turning.

Walking down the street, look for porch railings, picket fences, paving bricks, or sidewalk squares. Notice how each piece could slide onto the next one and the overall pattern would look the same.



In the garden, look for flowers with 3, 4 and 5 petals. Notice that, as you turn the flower around its stem, each petal moves to where its neighbor used to be. (With 4 petals, a 90° turn causes the flower to appear pretty much like it did before.) If you see a butterfly among the flowers, what do you notice about its two wings?



In a parking lot, notice the variety of hubcaps on automobiles. Usually a hubcap is divided into sections that can be rotated onto each other. There may be a few as 3 or as many as a dozen sections in one hubcap. See how many different numbers of sections you can find.



Math Anytime

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 3s? (At this stage, your child could be thinking of 21, 27, 33, or 39.)

After you have guessed your child's number. Let your child guess a number from you by asking similar questions.

Numbers, Numbers Everywhere

Look around you! How many ways do you see numbers written?

Look for all types of numbers-words, Roman numerals, fractions, decimals, percentages. Where did you see these numbers?

How many times do you use numbers throughout the day? Make a list of the numbers you use in one day. Don't forget to start your list with a number.

Going to the Moon

A Game for 3 or More Players

Typically this game is played using word properties (such as two words beginning with the same letter of the alphabet). This time, however, the players should think about mathematical properties.

The leader thinks of a mathematical property (for example, two numbers that differ by 5) and says, "I'm going to the moon, and I'm taking 17 and 12. Who wants to come along?" The other players try to determine the property by giving other examples.

If a player says, "I want to go to the moon, and I'll bring 16 and 13," the leader says, "You can't go." If another player says, "I want to go to the moon and I'll bring 10 and 15," the leader says, "Come on along." When all players have guessed the property and can "go to the moon," another person becomes the leader and chooses another property.

Some properties that could be used for this game might be:

- Pairs of numbers that differ by a certain amount (as in the example above)
- Pairs of numbers that add up to a certain amount (10 and 5, 8 and 7, 3 and 12)
- Numbers that are multiples of a number (3, 6, 9, . . .)
- Names of polygons or other shapes (triangle, square, rectangle)
- Prime numbers (2, 3, 5, 7, . . .)
- Coins that add to a certain amount (2 quarters and a dime, 5 dimes and 2 nickels)



Yummy Math

Materials: 20-50 cereal O's or small round candy

There are a number of activities that your child can do using cereal or candy. The following activities will focus on numbers and shapes.

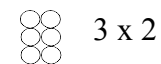
1. **Make a Shape.** Using the cereal or candy ask your child to make various shapes, i.e. Triangle, rectangle, circle, pentagon (5 sides), hexagon (six sides), octagon (eight sides). Your child can then find the distance around the shape, the **perimeter**, by counting the cereal or candy around the outside. Your child can then fill in the shape to find the **area**.



2. **Make an array.** Choose a number and ask your child to make a rectangle using that number of cereal or candy. This helps children understand multiplication and families of numbers.

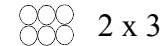
Example: Choose the number 6

Three rows of two



$$3 \times 2$$

Two rows of three



$$2 \times 3$$

One row of six



$$1 \times 6$$

Six rows of one



$$6 \times 1$$

This is Math Class???

What is happening in today's math classrooms:

Sense-making of basic facts

Children are expected to learn basic facts by developing different strategies that make sense to them instead of just memorizing.

Cooperative learning

Children are working cooperatively in small groups where each child is given many opportunities to contribute and explain his or her thinking instead of working alone.

Children can "see" the math

Children are using different manipulatives (objects that they can move around) in order to help them understand and visualize a problem.

Less "teacher talk" and more "student talk"

Children are discussing math with each other and the whole class. It is not just the teacher talking and telling. The teacher is asking questions, listening and recording student responses, and guiding discussions.

Writing in math class?

Children are expected to explain by writing or drawing pictures about their thinking and problem solving strategies in math class.

Use of technology

Children are using calculators and computers while solving real-world problems.

Assessment is not just a test

Children are evaluated in many different ways besides just the Friday written test or quiz. Teachers use observations and interviews with students, student writing samples, demonstrations and projects to determine progress in math.

Homework takes on a new look too!

Your child's math homework is not the traditional work sheet of computations but may be a problem to solve where they apply computations or gather data by interviewing family members or a game to be played with the family.

Money Matters



Materials: A collection of various coins: pennies, nickels, dimes, quarters

Give your child some coins and then ask questions like the following:

I have three coins in my pocket. They are worth 15 cents. What do I have? (three nickels)

I have three coins in my pocket. They are worth 25 cents. What do I have? (two dimes and a nickel)

I have six coins in my pocket. They are worth 30 cents. What could they be? (one quarter and 5 pennies or six nickels.) Problems like this are challenging for children.

I have coins in my pocket, which have a value of 11 cents. How many coins could I have? (two-one dime and one penny; three-two nickels and a penny; seven-a nickel and six pennies; eleven-eleven pennies)

How You Can Help Your Child Learn Math

Have a positive attitude about mathematics

- It's ok not to have all of the answers. Even if you don't feel confident about mathematics, don't brag about it or excuse it. Investigate along with your child
- Encourage his or her interest in the study of math
- Expect your child to succeed

Help your child see that math is a part of everyday life

- Consider: sports statistics, measurement in cooking, sales and taxes
- Estimating the total check-out amount at the grocery store, calories in food
- Budgeting income, check writing and banking, gas mileage, furniture placement
- All of these are examples of problem-solving and decision making every day

Point out that many jobs require mathematics

Not just high-tech or jobs in science; think about

- Business
- Store owners, managers, clerks
- Service jobs that require collecting data about people
- Teaching
- Health care
- Home management and child-care

Give your child the opportunity to “teach” you

- Encourage your child to explain his or her thinking by telling you how they are solving problems
- Explaining to another will help them recognize what they understand and where they are still fuzzy in their thinking
- Reversing roles will boost their confidence
- Engage your child in discussions about different ways to solve problems

Play games that help children develop problem-solving strategies and mental math skills

- Card and board games involve discovering patterns, counting, keeping score, predicting and making decisions

Visit your child's school

- Talk to his or her math teacher about what your child is doing in class
- The teacher will welcome your interest

Why Parental Help is Important

You affect how your child feels about math!

Family involvement is more important to student success in school than race, class, ethnicity, marital status and work. (Epstein, 1996)

Parents' impact on how their children feel about:

- Usefulness of math in everyday life
- How well they can learn math

Parents help build a learning community

- Parents become interested in how their children are learning math
- Children share what they are doing in school with their families

Parents' desire to prepare their children to succeed in today's world

- One of the most powerful forces to strengthen student achievement
- Research has shown that when families are involved in their children's education, children have improved self-esteem, attendance and behavior
- Children earn higher grades, do better on standardized tests, complete more homework, graduate from high school at higher rates and are more likely to enroll in higher education