

How to Help Your Child Succeed in School

*A Guide for
Parents and Families*

M A T H **K-12**

Math Pg. 291

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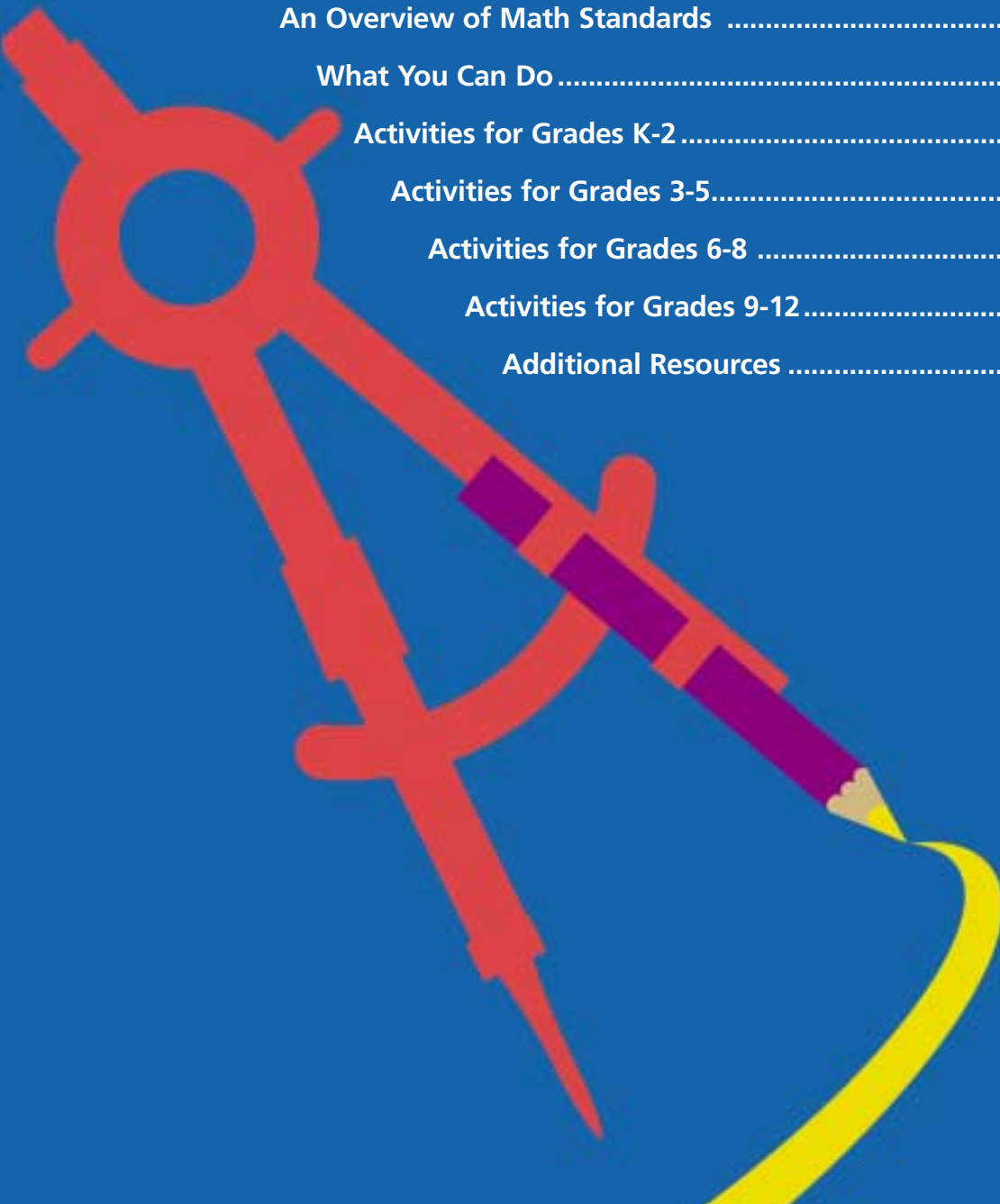
How to Help Your Child Succeed in School

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MATH K-12

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How to
use

this guide

There is nothing more important
to your child's future than making sure
he or she gets a quality education.

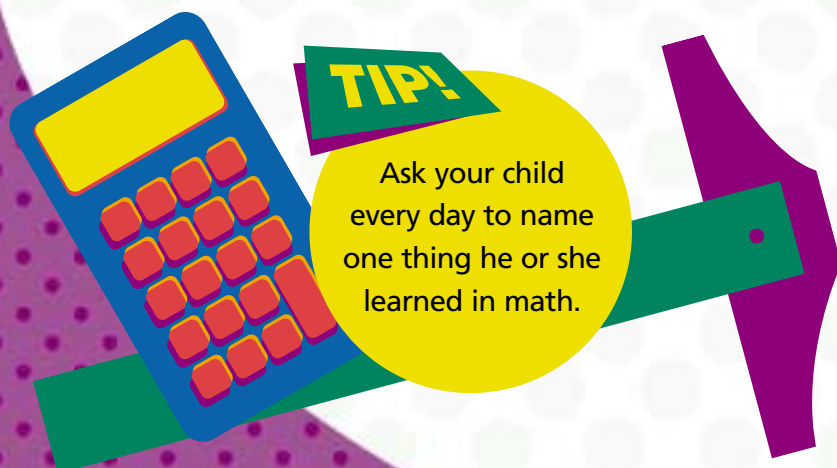
**Your child must learn certain knowledge
and skills to succeed, regardless of what
he or she chooses to do after high school.**

This is why Ohio's schools are changing — and why teachers have created **new, rigorous academic standards for students**. The standards define what your child should know and be able to do at every grade level in English language arts (reading and writing), math, science and social studies.

These new academic standards let educators know what they are expected to teach, just as they let students know what they are expected to learn. They also help teachers identify and measure what their students are actually learning.

It also is important for **you** to understand what your child needs to know and be able to do by the time he or she finishes each grade. A clear understanding of these expectations will help you monitor — and contribute to — your child's progress and success in school.

Battelle for Kids has prepared this guide to give parents and families a better understanding of the math skills their children are expected to learn in grades K through 12. While the guide doesn't spell out specific standards on a grade-by-grade basis, it does identify the six broad areas in which students are expected to show they have certain knowledge and are able to use certain skills. The guide also provides helpful tips and activities that parents and families can use to help their children become successful in math.



To review the complete set
of math standards, go to
www.BattelleforKids.com.

Skills that matter:

The importance of math

Many parents have a genuine fear of math. It's right up there with the fear of flying, confined spaces and creepy, crawly things.

Often, this fear is rooted in parents' own difficulties in math classes when they were students and in their misunderstanding of what math is all about and how it is used in day-to-day living. It is based on what they remember as a bunch of confusing concepts, formulas to be memorized and homework assignments that didn't often seem relevant to their everyday lives.

There is no reason why this "math phobia" should be passed on from generation to generation. Parents know a great deal about math — they use it in their own lives every day. By learning more about what students should know and be able to do in math, parents can help their own children develop the knowledge and skills that will make them more successful in the classroom and throughout their lives.

TIP!

Let your child see you doing math in your everyday life. Ask him or her to help.



TIP!

Don't pass on negative math attitudes to your child. Even if you struggled with math in school, be positive and encourage your child to develop an interest in math.

What is math, and why should every child learn it?

Math involves more than numbers and calculations. It is a **way of exploring** and using shapes, spaces and patterns. It is a **way of thinking** that helps people organize and analyze data through the use of tables, charts, graphs and equations. It is a **language** that uses special terms and symbols to help people communicate about science and the world around us.

Math is a **tool** that everyone uses in the course of daily life to solve both practical and abstract problems. It is part of a wide variety of real-life situations from sports and shopping to cooking and the financing of a new home.

In today's world, math also is a **requirement** for many jobs and careers. Without well-developed math skills, today's students can be shut out of certain life choices and career opportunities.

In other words, math is one of the most important skills your child will learn in school. By mastering math, he or she is more likely to succeed not only in school but also in the world beyond the classroom.

For many years — and for a large number of today's parents and grandparents — learning math only involved memorizing a lot of facts. It focused on flashcards, worksheets and time spent on drills designed to build math skills.

This is no longer the case in most of our schools. More likely than not, your child is being taught math with a hands-on approach that encourages students to learn by handling and experimenting with objects. Your child also is likely to be using calculators and computers to solve math problems.

While your child still will be learning arithmetic and developing measurement skills in the primary grades, don't be surprised to find that introductions to geometry, probability, algebra, statistics and estimation are also part of his or her early math work.



TIP!

Encourage your child to ask questions when he or she is trying to solve problems.

What can be done

to help make sure your child develops strong math skills?

One answer is to set academic standards in math and other subjects, and to make sure those standards are reflected in what teachers teach and in the textbooks and other teaching materials that are available to students. Such standards — clear and rigorous expectations for what all students need to know and be able to do — have been developed for Ohio’s schools. The purpose of this guide is to give parents and families a better understanding of how they can help their children meet these new standards.

Parents and families make a big difference. Children need to work on their math skills both in and out of school — and to understand how math relates to their daily lives. You can help make sure that happens.

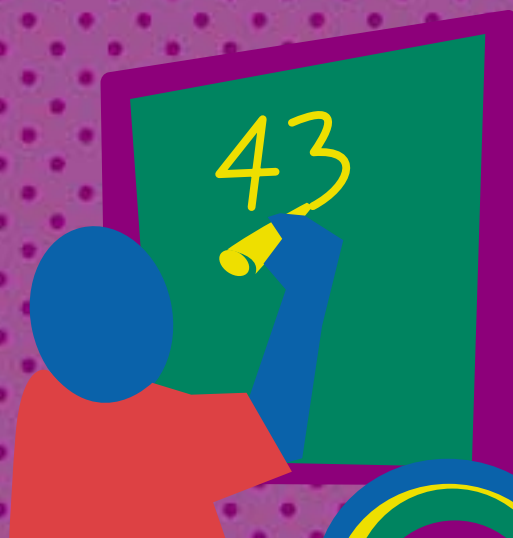
Parents and families can help their children develop math skills even before they enter school by giving them plenty of opportunities to count, recognize shapes and collect and organize information. Family members also can help children see how math is used in everyday life. Taking measurements for a do-it-yourself home project. Planning a grocery list that fits the family budget. Adjusting recipes for a smaller or larger number of servings. All of these common everyday activities involve math.

Math matters. That’s why all of us should help our children master this fundamental skill.

An Overview of Ohio's **math** standards

Ohio's new academic standards for math cover six broad areas in which students are expected to show they have certain knowledge and are able to use certain skills.

Following is a brief explanation of the **six** areas.



Numbers, Number Sense and Operations

1

Students begin with such simple things as sorting, classifying and matching. Then they develop an understanding of numbers so they can make sense of the ways numbers are used in their everyday world. Students learn to use number words and how to use them in the right order. They develop basic number skills from counting to paper-and-pencil calculations that require an understanding of number systems (the symbols that represent numbers) and operations (such as adding, subtracting, multiplying and dividing). Over time, students learn to make reasonable estimates using both mental and paper-and-pencil methods, as well as calculators and computers.

Measurement

2

Students begin to measure long before they enter school by comparing and ordering objects based on size, weight or color. In school, students estimate and measure things by selecting and using appropriate units, tools and technologies. They develop an expanded understanding of units of measure such as inches, feet, meters, pounds, grams, gallons and liters, as well as instruments for measuring such as rulers, scales and clocks. They learn to identify and measure such things as length, capacity, weight, area, volume and angles. Usually in the upper grades, students learn to use formulas for measuring areas, perimeters, volumes and surfaces.

Continued on page 6 >

An Overview of Ohio's
Math Standards
Continued

3

Geometry and Spatial Sense

Students learn to identify, classify and analyze characteristics, properties and relationships of one-, two- and three-dimensional geometric figures and objects. Before they are ready for formal geometry, students begin to handle and manipulate geometric shapes using blocks and puzzles. They develop the ability to see how objects look and fit together. Later, they learn to use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.



4

Patterns, Functions and Algebra

Students learn to use patterns, relationships and functions to model, represent and analyze problem situations that involve variable quantities. They analyze, model and solve problems using tables, graphs, symbols and equations.

5

Data Analysis and Probability

Students learn to gather, organize, analyze and interpret information, often using tables, charts and graphs of various kinds. They use data to ask questions, as well as to come up with answers and make decisions. Students develop and evaluate predictions, arguments and conclusions that are based on data. Through the use of statistics, they learn about probability — determining the likelihood of an event occurring.

Mathematical Processes

Students learn to apply problem-solving and reasoning skills. They acquire an understanding of how questions or problems can be framed and what information is needed to solve them, as well as the ability to recognize what information is *not* important to solving the problem. Students develop the ability to assess the reasonableness of predictions, estimates and solutions. They learn how to communicate solutions using everyday language and appropriate mathematical language and symbols.

6

To review the complete set
of math standards, go to
www.BattelleforKids.com.

What you can do...

to help your child meet Ohio's academic standards for math

The most important ways you can help your child be successful in school are to provide support and encouragement, emphasize that learning can be fun and make sure he or she understands how important it is to do well in school. In addition, there are many simple and easy things you can do at home to help reinforce the math skills your child is learning in school. **Remember: You are your child's first and most important teacher.**

On the following pages you will see lists of suggested activities and games that you and your child can do without any special training or unusual materials. Some of them you already may be doing. Others may be new ideas. In every case, the activities will help your child grow as a learner and develop the knowledge and skills he or she needs to be successful.



TIP!

Reading calendars, schedules, timetables, weather charts and other common items with numbers builds math awareness and skills.

activities

TIP!

Display your child's math worksheets in your home.

- **Play number games** with your child. For example, count the number of steps when walking from one place to another, or count the number of items as you unload a bag of groceries. When riding in the car, have your child count how many trees you pass or how many traffic lights you come to.

- Grocery stores are filled with many different **geometric shapes**. On grocery shopping trips, ask your child to find items that have circle shapes, cone shapes, square shapes, rectangle shapes and other geometric shapes.

- Have your child help you **sort the laundry** into different groups. For example, put all pants in one pile, shirts in another pile and socks in a third pile. Or, have your child sort the clothes into different groups for each person in the family who wears them.

- Ask your child to **practice measuring things** around the house using a ruler, yardstick, tape measure, measuring cup or scale. If possible, have your child help you with measuring as part of real household projects such as cooking, planting in the garden or building or repairing things.



- Practice **counting money and making change**. For example, tell your child you have coins in your pocket that total 90 cents and ask, "What combinations of coins could be in my pocket?"

TIP!

Ask your librarian for titles of literature books in which math is part of the story.

- Gather a collection of small objects of various colors and sizes (such as buttons). Ask your child to **sort the objects** by color. Then pick two of the groups and ask your child to **count** the number of objects in each group. Have him or her **add** the numbers together, then **find the difference** between the two numbers. Repeat the process sorting the objects by size.


- **Setting the table** is a perfect opportunity to teach patterns. Set two place settings and ask your child to finish setting the rest of the table, following the pattern you began.

great games for *reinforcing* math skills

- Candyland
- Chinese Checkers
- Chutes & Ladders
- Connect Four
- Countdown
- Dominoes
- Husker Du
- I Spy Memory Game
- Lego
- Maisy Game
- My First SKIP-BO
- Perfection
- Card games such as War, Go Fish, Memory or Crazy Eights


activities

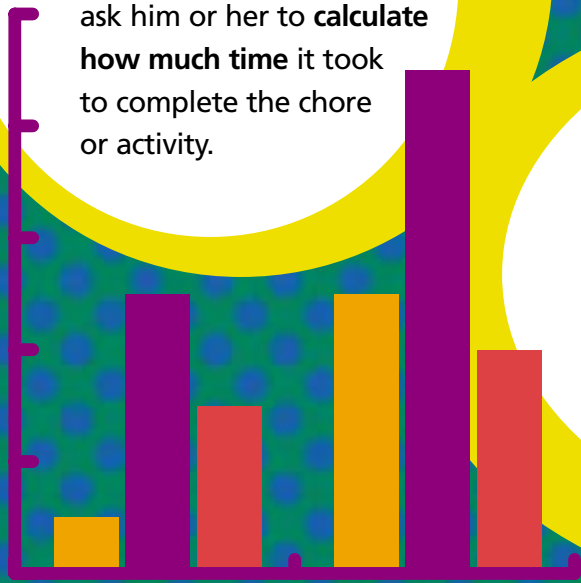
activities

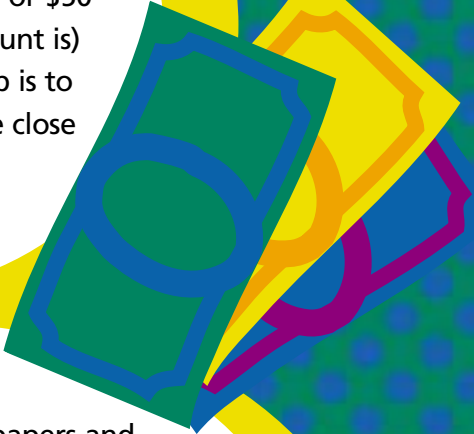
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- Use trips to the grocery store to help your child **practice estimation and measurement skills**. Show your child the scale in the produce department and explain the markings that indicate pounds and ounces. Ask your child to guess the weight of the produce you are buying and then to weigh it for you.

TIP!

Ask your child to “teach” his or her math lessons to you.

- 
- Another way to **practice estimation when shopping** with your child is to say, “We have only \$10, or \$20, or \$50 (or whatever the amount is) to spend, and your job is to estimate when we are close to that limit as we do our shopping.”

- 
- Have your child write down the time he or she begins and finishes a chore or activity. Then ask him or her to **calculate how much time** it took to complete the chore or activity.

- 
- Search through newspapers and magazines to **find charts, tables and graphs** that contain numerical information. Find specific information and ask your child to locate it. For example, in a chart that shows average movie prices for each of the last ten years, ask your child to determine how much prices have increased during that time.

- Help your child learn about fractions by **cooking and using measuring cups and spoons**. Also have him or her read food and drink nutrition labels to find another common use of percentages.

- If you are doing a craft or a building project, **involve your child** by asking him or her to help measure, to assist in figuring out the cost of the project or to help you figure out how much of a particular item is needed (paint, wood, fabric, etc.).

- On pizza night, ask your child to figure out how to **divide the pizza** so that each member of the family has an equal amount. If there are leftover slices, help your child as he or she figures out how to divide the pizza into halves, thirds, quarters, etc., so everyone gets the same amount.

TIP!

Talk to your child's teacher if you are concerned that he or she is struggling with math assignments.

great games for reinforcing math skills

- Blink
- Clue
- Hi-Q
- Make 7
- Mancala
- Mastermind
- Monopoly
- Rush Hour
- Simon
- SKIP-BO

activities

For parents
and families
of children in
GRADES
6-8

activities

- When traveling in the car on family trips, have your child **calculate how long it will take to arrive** at your destination. For example, if you are driving 225 miles, how long will it take to get there if you average 50 miles per hour? 55 miles per hour? 60 miles per hour?

- When shopping for groceries with your child, ask him or her to help you with **comparison shopping**. For example, ask your child whether 3 oranges for 79 cents or a dozen oranges for \$3.19 is a better buy based on the cost per orange.

- If your child is into sports, encourage him or her to **keep track of a favorite player or team**, or to predict changes in the statistics of players or teams based on their performance in recent games. For baseball, ask him or her to calculate hitters' batting averages or pitchers' earned run averages (average number of earned runs given up per nine-inning game). For football and basketball, ask your child to keep track of average yards gained or average points scored per game — and encourage him or her to chart the changes over time. And if your child plays on a team, urge him or her to keep track of his or her own performance levels.

TIP!

Ask your child to explain the process he or she used to answer math homework problems.

- Using newspapers, magazines and the Internet, **find tables of salaries of possible careers** for your child and have him or her compare the data and draw conclusions.



For parents
and families
of children in
GRADES
6-8

- Ask your child to keep **track of his or her allowance over time** — to keep a record of how the money has been spent and/or how much has been saved for future uses.

TIP!

Most children love to play video games or use computer software. Look for games that reinforce math skills such as geometry, problem solving and statistics.

- Have your child pretend he or she has \$5,000 to invest in the stock market. Help him or her pick several companies to invest the imaginary money in. Then have your child **follow the stocks** in the newspapers each day for a month and use basic math skills to calculate losses and gains and to determine the final value of the total \$5,000 investment.

- Ask your child to **calculate how much money would be saved** from various sale discounts offered in advertisements, coupons and other special offers. For example, if the regular price of a coat is \$45 and you have a coupon for 40 percent off, ask your child to calculate the sale price of the coat.

great games for reinforcing math skills

- Abalone
- Backgammon
- Backspin
- Battleship
- Chess
- Jenga Extreme
- Othello
- Polygon Game
- Risk
- Six Cubes
- Stock Market Tycoon
- Yahtzee

activities

activities

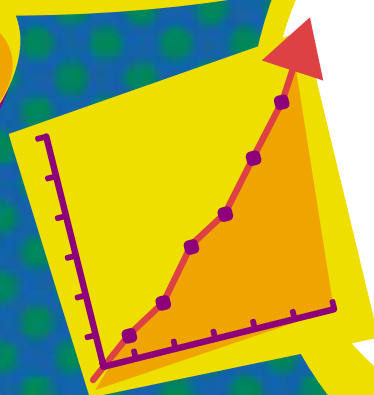
- If you are planning to **open a checking or savings account** for your son or daughter, ask him or her to balance the account on a monthly basis. Help your child understand and **compute interest rates** over time. Then ask him or her to research different investment options such as certificates of deposit (CDs) or money market funds and to compare the interest rates of these options to what he or she is earning from the savings account.

- If your son or daughter is thinking about **buying a car**, ask him or her to calculate the costs of this purchase — and to estimate operating costs and car insurance costs over time. Have your child calculate the amount of sales taxes that will have to be paid and then compare the cost of either leasing or purchasing the vehicle. Or, ask him or her to get information about the car's estimated miles per gallon (mpg) and to estimate total fuel costs on an annual basis.

- If your family is planning a vacation in Canada or Mexico, or in any other country, ask your son or daughter to help by **identifying currency exchange rates** and estimating how much pocket money will be needed. Ask your child to calculate travel times, estimate arrival times and convert temperatures and distances to more familiar units.

TIP!
Involve your child in family decision-making when math skills are involved.

- If your son or daughter is planning on going to college, have him or her **create a cost comparison chart** of the cost of tuition, room and board for various colleges, including opportunities for scholarships and other forms of financial aid. Then, look at the chart together and discuss the different options as a family.



- Some companies such as Buffalo Games, Educa and Heye specialize in making **puzzles for teenagers**. Use the Internet to find where you can obtain puzzles that challenge older children to use their problem-solving skills.



- Children are being introduced to **credit cards** at younger and younger ages. Have your child figure out the cost of a purchase he or she wants to make if it is paid for in cash or if it is financed over a period of time on a credit card. Use different interest rates to illustrate the need to comparison shop even with credit cards.

- Before your child receives his or her **first paycheck**, have him or her calculate the amount of deductions that will be made for city, state and federal taxes and for Social Security.



great games for reinforcing math skills

- 100 Play Thinks
- Acquire
- Axis & Allies
- Bunco
- Game of Knowledge
- Global Survival
- Gobblet
- Card games such as Euchre, Rummy and Pinochle

TIP!

Encourage your child to take advanced math courses. Tell teachers and guidance counselors you want your child to take challenging math courses each year in high school.



additional resources

for Parents and Families

Use the following resources to find more fun and interesting ways to reinforce what your child is learning in school.

www.aaamath.com

www.aplusmath.com

www.brainpop.com

www.coolmath.com

www.dositey.com

www.exploremath.com

www.gamequarium.com

www.kidsbank.com

www.math.com

www.mathgoodies.com

www.Ohioacademicstandards.com



thank you

Battelle for Kids thanks the many Ohio teachers who contributed to the development of this Guide for Parents and Families. Your input on the general content and the suggested activities and tips was invaluable in making this publication a useful tool for parents who want to help reinforce what their children are learning in school. **Thank you for your input — and for all you do every day in your classrooms to help prepare Ohio's children for successful futures.**



Supported by an initial grant from Battelle and established by the Ohio Business Roundtable in 2001, Battelle for Kids is a unique partnership initiative created to champion improved student achievement in Ohio by supporting, accelerating and sustaining standards-based education. Battelle for Kids works to strengthen support from the business community and the general public for an education system focused squarely on student achievement.

For additional information, visit our Web site at www.BattelleforKids.com.

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