

Notes for Families

The Leader's Role

Whether you are a parent, older brother or sister, grandparent, or friend, the first thing to remember is that you do not have to be a teacher or a mathematician to help someone learn and enjoy math. The *Math Power* activities are designed so that you can use them in various ways. Depending on your own personality and style of working, you can be:

- A leader* showing children how to do their best
- A partner* working together, sharing ideas and discoveries
- A coach* encouraging and demonstrating whenever necessary
- A friend* being supportive and accepting.
- A parent* aware and caring about needs and progress
- A manager* planning and coordinating activities
- A model* being interested and excited about learning math

Most of all, be yourself and a role model who enjoys getting involved and doing some work and learning. Be willing to explore and make mistakes. Your attitude and energy are much more important than what you know about mathematics. In the words of Jaime Escalante, “you’ve got to have *ganas* [desire].”

About Mathematics

It is important that children develop the mathematical skills and concepts they need for algebra and other high school courses. But unless they learn to enjoy mathematical thinking and see the usefulness of math, many children are unlikely to reach their potential.

Children often think of math as being only about numbers. They see it as abstract and difficult with no useful applications. The *Math Power* activities are designed to emphasize math that involves:

- Estimating*: finding an answer that is “close enough.” Most real problems have more than just one exact answer.

- *Finding information*: looking at a situation and figuring out what to do and what strategy to use is more important than “crunching numbers.”
- *Planning*: knowing what to do first and what steps to follow is the way real math problems are solved.
- *Visualizing*: being able to picture a situation or problem and represent it in a drawing or diagram.
- *Organizing*: putting information in order, using tables, graphs, and lists to see patterns and make sense of what is known and what is to be found.

About Learning Mathematics

All too often, the mathematics that children learn in school is mostly rules and memorization. There is no question that learning and understanding anything completely, including mathematics, involves hard work and effort. But hard work can also bring the enjoyment of discovery and the satisfaction of solving a problem.

The activities in *Math Power* are intended to show that learning mathematics can be enjoyable. Learning mathematics this way can involve:

- *Cooperation*: working together to solve a problem, not competing to see who can finish first
- *Enjoyment*: experiencing success in solving a problem or learning a new idea
- *Hands-on activity*: measuring, drawing, building things
- *Real-life applications*: using math to explore ideas and solve problems that occur in everyday life
- *Seeing patterns*: exploring the design, size, and shape of objects and ideas
- *Problem solving*: using common sense, trial and error, and reasoning to find answers to questions

The intent of the *Math Power* activities is to help children gain experiences that will motivate and encourage further interest in and study of mathematics; not to remediate or compensate for skills taught in school.

Suggestions

Preparation

Working with children and doing activities requires planning and preparation. Having everything ready ahead of time and being organized can make learning math an enjoyable experience.

- *Try the activity yourself first*. This will help you think of ways to improve or adapt the activity to your child. It will also help identify any trouble spots or need for extra planning.

- *Get supplies ahead of time.* Make sure that you have plenty of everything. Have extras on hand in case of mistakes or if you want to try something again.

Doing Activities

The *Math Power* activities are designed to let the student do things with a minimum of explanation and demonstration. Remember your role is to be a coach and partner. If there is a trouble spot, encourage the youngster to try things out before stepping in to help. When you do help, try to provide hints and ask questions that lead in the right direction, rather than just giving the answer.

- *Use objects and materials.* Most of these are suggested in the activities, but feel free to adapt and use more suitable or more available materials. Use the materials and do hands-on work, too.
- *Focus on relationships, why things work, and on ideas.* Let the youngster explain what he or she is doing. Encourage questioning and figuring out why things happen, try not to accept an answer without understanding how he or she got it.
- *Take your time.* It is best to spend enough time so that the youngster understands and enjoys an activity. Rushing to cover more material can be frustrating. Try not to push too far, too fast. It is better to stop while you are both enjoying yourselves, saving some anticipation for the next time. Some projects are designed to be completed over several days.
- *Avoid long, complicated, paper-and-pencil calculations.* Have a calculator handy. In most cases, the actual calculation is not as important as how and why to combine the numbers. If the student understands why things work, she can push the right buttons on the calculator.
- *Avoid speed contests and competition.* Children can sometimes be motivated by competition, but the activities are designed to emphasize reflective thought, problem solving, and cooperative interaction with others.

Asking Questions

Some of the best teachers provide very little direct information to children. Instead, they ask questions and help children to discover for themselves. Try to practice asking questions that require more than just a “yes” or “no” answer. When you ask a question, *wait for an answer*, do not answer it yourself right away. Here are the kinds of questions you should try to ask:

- *How did you figure that out?*
- *Why does it work that way?*
- *How do you know?*
- *Is there another way to do it?*
- *What do you like about doing this?*

Adapt and Personalize

Any book or written activity is a starting point and a source of ideas. Every situation is different and only you know the kinds of activities and experiences that are likely to work best with your children.

Some of this knowledge comes through experience. You will make mistakes the first few tries. Use these mistakes to learn how to adapt and change the activities so they will be better the next time.

Sometimes you will be surprised. An activity that seems to be a sure winner will fall flat. Other times, children will do great with an activity that you think might be boring to them. The only way to find out is to try.

Once you try an activity, you will think of a lot of different approaches, ideas, and materials that you could use the next time. That is what makes working with children and learning with them so enjoyable.