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"Do not worry about your difficulties in

mathematics. I can assure you that mine are still

greater." -Albert Einstein

Everyone struggles with math, whether learning the multiplication tables or trying to figure out how to stretch the monthly income to pay bills. Some find mathematics easier

than others, just as some find spelling easier. Some use mathematics extensively in their work, just as some make more use of hammers. Everyone, though, uses mathematics daily, and limited math proficiency leads to limited success with the daily challenges of our society. As Sutton has said, "one of the most significant things parents can do is to help their children understand the normalcy and the value of struggle in mathematics" (1998, p.9).

WHAT ARE CHILDREN LEARNING IN MATHEMATICS?

Each school has its own mathematics program and expectations, but most are aligned with state curriculum frameworks or guidelines that are, in turn, strongly influenced by national standards. National standards were developed for math by the National Council of Teachers of Mathematics (NCTM, see http://www.enc.org/reform/journals/ENC2280/nf_280dtoc1.htm), and revisions are underway (http://www.nctm.org/standards2000). The NCTM standards reflect five general goals: (1) that all students learn to value math, (2) that students become confident in their own abilities to do math, (3) that they learn to solve mathematical problems, (4) that they learn to communicate mathematically, and (5) that they learn to reason mathematically. Students must learn basic math skills and concepts as in the past, but schools give increased attention to connections and applications of math to the workplace and the demands of daily life. "Today, children learn that mathematics is a tool that can help them understand the world around them" (Parent Handbook: Math and Your Child, http://www.eduplace.com/math/res/parentbk/index.html).

HOW CAN PARENTS HELP?

Research shows that the level of parent involvement in a child's education is strongly related to the degree of success in school (Henderson & Berla, 1994). "Families play a vital role in educating children. What families do is more important to student success than whether they are rich or poor, whether parents have finished high school or not, or whether children are in elementary, junior high, or high school" (Robinson, in Paulu, 1995). For general tips on ways to strengthen the bonds with children, see the National Parent Teacher Association (PTA) website (select "Get Involved" at http://www.pta.org/commonsense/2_parents/2_parents.html).

The importance of family involvement in education led the U.S. Congress to add the following goal to the National Education Goals (http://www.ed.gov/pubs/parents/Homework/pt11.html): "Every school will promote partnerships that will increase parental involvement and participation in promoting the social, emotional, and academic growth of children." To that end, the U.S. Department of Education has established the Partnership for Family Involvement in Education program (see http://pfie.ed.gov) and provides financial resources to communities for developing programs that serve families. For parents actively working with schools, the PTA has produced "National Standards for Parent/Family Involvement Programs"

(Online at http://pta.org/programs/invstand.htm).

SET THE EXAMPLE. One of the most important ways parents can help a child in math is by exhibiting attitudes and values supportive of learning. "All children have two wonderful resources for learning-imagination and curiosity. As a parent, you can awaken your children to the joy of learning by encouraging their imagination and curiosity" (Ravitch, in Kanter, 1994). Sutton (1998) offers the following suggestions:

*Accept the Struggle as a normal part of doing math, just as you accept the struggle to become better in sports. Help uncover difficulties, and offer suggestions for overcoming them.

*Encourage Mastery. Just as it is important to repeat fundamentals again and again in sports until performed automatically, it is important to see practice in mathematics as developing mastery, not a chore or form of punishment.

*Look Beyond the Grade. Math grades are often calculated on percentages of correct answers on tests and assignments accumulated during a grading period, so they may not reflect under-standing that has developed over the course of a grading period. Help focus on understanding and being able to identify specific difficulties.

*Discover the Textbook. "Reading" math can be difficult, and math textbooks are often used as collections of assignments and homework problems. Help your child learn how to "read" the math textbook, see the underlying structure, and learn from the examples provided.

HELP CHILDREN SEE THE MATH AROUND THEM. Help children recognize the use of math around them in daily life, and engage them in games and activities that foster familiarity with numbers and mathematical thinking. A guide, "Helping Your Child Learn Math," is available online at http://www.ed.gov/pubs/parents/Math/index.html. The guide suggests many activities that parents can do with children (grades K-8) at home, at the grocery store, or in transit. The activities generally make use of playing cards, coins, containers, or other simple materials around the house. Here are some other ideas that the guide offers:

*Wrong answers can help!

*Be patient; incorrect answers tell you that you need to look further, ask questions, and

figure out what you do not understand.

*Sometimes a wrong answer is the result of misunderstanding the question.

*Ask your child to explain how they solved a problem; responses may clarify whether help is needed with a procedure, the "facts" are wrong, or a crucial concept is not understood.

*You may learn something that the teacher would find helpful. A short note or telephone call will alert the teacher to possible ways of helping your child.

*Help your children become risk takers. Help them examine wrong answers, and assure them that right answers come with understanding.

*Problems can be solved in different ways. Though a problem may have only one correct solution, there are often many ways to get the right answer.

*Doing math in your head is important. Increased use of calculators and computers makes it increasingly important that people be able to determine whether an answer is reasonable.

More activities and games for strengthening specific skills and concepts are provided online in a "Guide to Helping Your Child Understand Mathematics," provided by Houghton Mifflin's Education Place (see http://www. eduplace.com/parents/index.html); select "Parent's Place," then "Parent's Resources." Suggestions are also provided for things to do in the grocery store, in a restaurant, while shopping, and on the refrigerator door.

PROVIDE A PLACE AND RESOURCES TO STUDY. Provide children with convenient, quiet, and comfortable work areas, along with whatever resources are needed to study math and complete assignments. Encourage the use of reference materials (such as dictionaries and encyclopedias), and provide a computer and calculator if possible. If a computer is not available in the home, plan regular visits to a public library or community learning center where access is available.

The computer has become a common and essential tool in learning many school subjects, particularly mathematics and science. You and your children can use the computer to:

*Produce reports and assignments using wordprocessing programs, spreadsheets, and other software.

*Find information from reference materials on CD-ROMS. Many are typically available from school and public libraries.

*Use commercial software packages that teach math skills in interesting and enjoyable ways.

*Access the abundant math and homework resources and assistance freely available on the Internet.

For help in selecting mathematics software, seek recommendations from one or more of the many websites that provide software reviews. The Educational Software Review page at the SuperKids website (see http://www.superkids.com) provides monthly features, annual software awards, an index of all software reviewed, and pertinent articles. For instance, "Mathville VIP" by Courseware Solutions Inc. is a highly rated program that allows middle school and high school students to practice everyday math skills in real-life activities. For younger children, "Reader Rabbit's Math 6-9" by The Learning Company is highly rated for teaching basic skills through arcade-like activities. Software reviews are also provided by the North Carolina Department of Public Instruction (see http://www.evalutech.sreb. org/archives/). A rating system is not provided, but software programs are thoroughly described, and strengths, weaknesses, and uses are identified.

If you have access to the Internet, there are many helpful websites that provide guidance, resources, or information not readily available in most homes. Both the access to Internet resources and the practice in finding useful resources are valuable. For help in using the Internet, refer either to "The Parent's Guide to the Information Superhighway" (http://www.pta.org/programs/guide.htm) or "Parent's Guide to the Internet" (http://www.ed.gov/pubs/parents/internet/). Following are some representative online resources for math:

*Dave's Math Tables http://www.sisweb.com/math/tables.htm#top Site provides math tables and includes a search area to find a specific formula.

*The Math Forum http://forum.swarthmore.edu/ An extensive collection of resources for students, parents, and teachers. Students will be particularly interested in the "Student Center" and "Ask Dr. Math," where questions can be submitted. A related website, MathWorld Interactive, (http://forum.swarthmore.edu/mathworld/) enables students to work on open-ended word problems online and exchange information with other

students worldwide.

*DO MATH and you can do anything! http://www.domath.org/ Here you will find age-specific mathematical activities that children can do with their families or on their own.

*The CRC Concise Encyclopedia of Mathematics http://www.astro.virginia.edu/~eww6n/math/math.html Provides access to an enlarged version of a comprehensive reference book by the same title, including more than 120 additional printed pages of material.

*S.O.S. MATHematics http://www.math.utep.edu/sosmath/ Provides resource materials to help students do homework, prepare for tests, or get ready for class. Learning units are presented as worksheets and require active participation.

*Math Flashcards http://www.edu4kids.com/ This site provides online flash cards with a variety of options and mathematical operations.

*Math League Help Topics http://www.mathleague.com/help/help.htm This is a help resource for grades 4-8 that provides guidance for key topics in basic math.

HELP WITH HOMEWORK. Teachers assign homework for a variety of reasons: to help students review what has been learned; to help them prepare for the next class session; to extend student exploration of topics more fully than class time permits; or to help students gain skill in self-directed learning and using resources such as libraries and reference materials. Parents can help children get the most out of homework by:

*Encouraging them to take notes about homework assignments when they are given.

*Limiting after-school activities to allow time for homework and family activities.

*Planning a homework schedule with each child that allows some free time when assignments are completed.

*Monitoring television viewing and other potential distractions.

*Doing some problems or questions together with a child when he or she asks for help.

*Staying nearby-reading, writing, studying or catching up on paperwork.

*Checking completed assignments, and reviewing homework that has been marked and returned.

For more details about these and other homework tips, see "Helping Your Child With Homework" (Paulu, 1995) and "How Important is Homework?" (Available online at http://www.accesseric.org:81/resources/parent/homewrk.html). As Weaver (1998) has said, "the entire family needs to cooperate to help students develop good study habits." Before studying, it is also important for "a child [to] be rested and relaxed after a school day before concentrating on homework. Help the child avoid rushing to finish homework before a deadline such as dinner or bedtime. Try to schedule study time so it doesn't conflict with a favorite activity or necessary function."

There are many homework guidelines and resources available online for both parents and students. For parents having questions about homework or wanting more guidelines, see the following websites:

*Dear Parents: Math (http://www.dearparents.com/Category/mCategory.shtml)

*National PTA's Education Resource Libraries (http://www.pta.org/programs/edulibr.htm#home) (Look for "Math matters: Kids are counting on you and Helping your student get the most out of homework.")

*Apple Learning Interchange: Featured Curriculum Resources (http://henson.austin.apple.com/edres/parents/pfet/hwrkmenu.shtml)

*Parentsoup Online Guide (http://www.parentsoup.com/onlineguide/) In addition to the math Internet resources described previously, the following website offer resources for doing homework:

*Homework Central: Math Search Engines (http://www.homeworkcentral.com/sectionshc.htp?sectionid=1980)

*Star Tribune Online Homework Help (http://www.startribune.com/stonline/html/special/homework/)

*Schoolwork. Ugh! (http://www.schoolwork.org/)

*Kids Connect (http://www.ala.org/ICONN/kidsconn.html)

*The New "Homework" (http://fromnowon.org/feb97/teach.html)

*B.J. Pinchbeck's Homework Helper: Math (http://tristate.pgh.net/~pinch13/framemath.htm)

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MORE RESOURCES

Contact the Eisenhower National Clearinghouse for Mathematics and Science Education (1-800-621-5785) and ask for a copy of ENC Focus, vol. 5, issue 3 that focuses on family involvement in education. Also, search the ERIC database for more resources on mathematics and homework at http://www.accesseric.org:81/searchdb/searchdb.html.

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