Parents of math-talented students often call us with a list of questions about challenging their children in math. Below are the responses to some of those questions.

**What are some specific ideas for working with my school?** The goal is to find a good match between the student’s abilities and achievements in mathematics and the program provided by the school. Options for mathematically talented students include:

- Enrichment within the regular classroom (the teacher excuses the student from simple assignments and uses the time saved to provide more challenging assignments)
- Independent projects in math
- Ability grouping (putting several mathematically talented students together for a math class, either offered as a stand-alone class, or grouping the students within the regular classroom for instruction)
- Acceleration (moving up a class for mathematics, or skipping an entire grade)
- Working individually with a teacher in school (using the DT->PI process described below or moving through a set curriculum systematically)
- Participating in a distance-learning program

(Continued on page 5)

---

**C-MITES Spring and Summer Calendar**

- **January**
  - 27, 28: EXPLORE test
- **February**
  - 24: EXPLORE test
- **March**
  - EXPLORE scores mailed
  - Weekend Workshops
- **April**
  - Weekend Workshops
- **May**
  - Weekend Workshops
- **June**
  - Summer Program Session I
- **July**
  - Summer Program Session II
- **August**
  - Steppingstones Workshops

---

**C-MITES News** is published by the Carnegie Mellon Institute for Talented Elementary and Secondary Students. C-MITES sponsors a talent search for 3rd-6th graders as well as summer and weekend programs for K-9th graders throughout Pennsylvania.

- **Director:** Dr. Ann Lupkowski Shoplik
- **Program Coordinator:** Pamela J. Piskurich
- **Publications Coordinator:** Raymond T. Budd
- **C-MITES Assistant:** Barbara J. Dunn

A portion of the funding for C-MITES is provided by the Fisher Family Fund of The Pittsburgh Foundation, Mr. Mark Gelfand, The Grable Foundation, Dr. Bernard Meisner, C-MITES families, and several anonymous donors.
Thanks to the ESTS Test Centers!

We would like to thank all of the schools that participated in the Elementary Student Talent Search this year by sharing information about our testing program with their students. Students in grades 3-6 took the EXPLORE test in January and February of this year at 60 different test sites in 26 different Pennsylvania counties. We would especially like to thank the following schools for allowing us to use their facilities for testing:

Abington Junior High School (Abington)
Aguinas Academy (Greensburg)
Bangor Area Middle School (Bangor)
Berwick Middle School (Berwick)
Blessed Sacrament School (Erie)
Campus School of Carlow University (Pittsburgh)
Candlebrook Elem. School (King of Prussia)
Carnegie Mellon University (Pittsburgh)
Center Township Elementary School (Butler)
Centre County Christian Academy (Bellefonte)
C. F. Patton Middle School (Kennett Square)
Cumberland Valley High School (Mechanicsburg)
Delahuntly Middle School (Hermitage)
East Union Intermediate Center (Russellton)
Eden Christian Academy (Pittsburgh)
The Ellis School (Pittsburgh)
Fairfield Academy (Montourville)
French International School (Bala Cynwyd)
Glenside Elementary School (Glenside)
Glenwood Elementary School (Media)
Hampton High School (Allison Park)
Harrisburg Area Community College (Harrisburg)
Hillel Academy (Pittsburgh)
Holy Child Catholic School (Bridgeville)
Indian Valley Middle School (Harleysville)

Linden Academy (Pittsburgh)
Linntown Elementary School (Lewisburg)
Linton Middle School (Pittsburgh)
Marshall Middle School (Wexford)
McDowell High School (Erie)
Moon Area Middle School (Moon Township)
New Castle Christian Academy (New Castle)
New Covenant Christian School (Lebanon)
North American Martyrs School (Monroeville)
Penn View Christian Academy (Butler)
Penn-Mont Academy (Hollidaysburg)
Pocono Elementary Center (Tannersville)
Riverside Middle School (Eldwood City)
Ross Elementary School (Pittsburgh)
Sacred Heart Elementary School (Pittsburgh)
Saint Frances Cabrini School (Fairless Hills)
Saint Luke School (Erie)
Saint Philip School (Pittsburgh)
Saints Peter and Paul School (Beaver)
Scranton High School (Scranton)
South Allegheny Elementary School (Port Vue)
South Lebanon Elementary School (Lebanon)
South Side Elementary School (Connellsville)
Southern Middle School (Reading)
Torah Academy of Greater Philadelphia

Robots: A Girl’s Best Friend

Early in the fall semester, C-MITES offered its first all-girl robotics course. Participants checked out the new trends in robots! They created their own robots, gave them names and personalities and decorated them. They learned by playing with the different types of equipment that make up robots, including motors, servos, LEDs, sensors and circuits. They designed prototypes of robots that could send messages to each other. They even designed an alien robot answering machine that acted out the messages they received from friends! At the end of the day, parents watched a demonstration of the robots the girls had created.

The class was designed for 6th – 8th grade girls with a genuine interest in robotics. The class resulted from a collaboration between the University of Pittsburgh Center for Learning in Out of School Environments (UPCLOSE) and the Robotics Institute at Carnegie Mellon University. The goal was to develop activities that engage middle school girls in technology exploration. We were delighted to offer this special opportunity to C-MITES students! Professor Illah Nourbakhsh was instrumental in designing the course. Debra Bernstein, Carl Disalvo, Emily Hamner, Tom Lauwers, Jeff Maki and Shelley Zhen Zeng worked together to prepare and teach the course. We at C-MITES would like to thank all of the people who made the course possible. A good time was had by all participants and instructors. Kudos😊
PAGE Conference in Pittsburgh

The annual PAGE Conference will be held this year in Pittsburgh on April 19-21, 2007 at the Marriott Pittsburgh City Center. PAGE (Pennsylvania Association for Gifted Education) is an organization of parents and school personnel who are interested in furthering the cause of gifted education in the state of Pennsylvania. This year’s conference will feature a Pre-Conference session of strands on Curriculum Development, Programs for Mathematically Gifted, and Writing GIEP’s. There will also be special workshops for students while adults are attending the conference.

For more information on the PAGE Conference, check their website at www.penngifted.org.

Scholarship Help for Low-Income Students

If you are a low-income student looking for scholarship aid to attend college, QuestBridge College Match might be able to help. QuestBridge offers an opportunity for outstanding low-income students to gain admission and full four-year scholarships to some of the nation’s top-ranked colleges, including: Amherst, Bowdoin, Columbia, Oberlin, Princeton, Rice, Stanford, Swarthmore, Trinity, Wellesley and Wheaton.

Students who qualify may download a free application from the QuestBridge website at www.questbridge.org. Applications are available online from August to October each year. In the 2005-2006 school year, 46 students received full four-year scholarships and 250 students received some scholarship help.

QuestBridge College Match is a venture of the Quest Scholars Program, a 501(c)(3) non-profit organization that has provided mentorship and leadership training to outstanding low-income students. For more information, visit the QuestBridge website at www.questbridge.org.

A Day with the Pittsburgh Voyager

The C-MITES staff was delighted to offer our students a new opportunity this fall—a voyage on Pittsburgh’s Three Rivers. On a cold and windy day in October, 35 C-MITES students boarded the “Discovery,” an old Navy vessel that is now a part of the Pittsburgh Voyager’s educational fleet.

Onboard Discovery, the students enjoyed a three-hour exploration into the world of freshwater ecology. They took samples of the river water and viewed those samples under microscopes in the lab below deck. They enjoyed identifying the various “creatures” they found living in the water droplets. They conducted experiments to answer the question, “How healthy are the rivers in Pittsburgh?” Although they couldn’t sail down the river due to the poor weather conditions, the students still had a great “hands-on” day learning what ecologists and marine biologists do. Thanks to the Voyager’s knowledgeable crew for providing a memorable day. We’re looking forward to offering the class again this spring!

Cogito

www.cogito.org is an exciting new website developed by a team of experts at the Center for Talented Youth at Johns Hopkins University. Cogito, which means “I think” in Latin, is developed especially for young scientists and mathematicians. Students can read news and features on topics including global warming, bioethics, computer animation, and science fiction. Great resources are available, including book reviews, “Best of the Web” guides, and reviews on different educational opportunities, including summer programs, internships, and competitions. This website is for students ages 11 and up and includes an online community for exceptionally talented youth.

This wonderful new project was inspired and funded by the John Templeton Foundation. The Center for Talented Youth has partnered with C-MITES at Carnegie Mellon University and other organizations specializing in working with academically talented youth to develop this one-of-a-kind resource.

C-MITES students on the Pittsburgh Voyager
Teacher Feature:  
Erika Zajdel

The teacher featured in this issue of the C-MITES Newsletter began her involvement with the program in the summer of 2001. Mrs. Erika Zajdel began as a teaching assistant that year. Now, five years later, Ms. Zajdel has created, revamped, revised, and rewritten numerous courses to make them more enjoyable for all of the students who participate!

In Erika’s summer class, Roaming Ancient Rome, students learn about Roman soldiers, Roman children and famous Romans. They make laurel wreaths, shields and even togas! Students understand ancient Roman history by performing hands-on activities designed to make the past come alive.

Over the years, Erika has taught the following courses and workshops: Roaming Ancient Rome, Amazed by Aztecs, Intrigued by Incas, Ancient Chinese Secrets and Ice Cream Science. She also taught the American Math Idol class this past fall. All of her courses are hands-on and packed with activities that get her students interested in learning.

Teachers who have worked with Erika commented on her dedication, enthusiasm and passion for teaching and conveying those characteristics to her students. She is truly an outstanding C-MITES teacher and we are very thankful to have Erika as an instructor in our program.

Erika graduated from University of Pittsburgh and is a certified secondary math teacher. She continues to work in the C-MITES weekend and summer programs. Besides teaching for the C-MITES program, she enjoys teaching home school students and singing! She and her husband have three wonderful children, all of whom graduated from the C-MITES program. Ian, her son, even became a teaching assistant with C-MITES!

We are very proud to have Mrs. Zajdel as a teacher in our program. She is a wonderful person and teacher.

Weekend Workshops at Lower Merion High School

C-MITES offered weekend workshops in Ardmore, PA at Lower Merion High School in November. This was the first time we offered classes at that location, and we were thrilled with the response. 172 students dug for fossils, programmed robots, donned lab coats to study genetics, built a “raft” as they “survived” a math class, blasted off rockets, and bought and sold stocks in a trading game. Students and staff had a great day!

Thank you to Dr. Ellen Braffman and the Lower Merion School District for hosting this opportunity for our students. We would also like to offer a special thanks to Ramaa Nathan, our on-site coordinator. She worked tirelessly to establish this successful program, and we are very grateful for her efforts! We hope to be back again in the spring; we’ll keep you posted as the plans for future classes develop!
C-MITES Summer Program

One- and two-week summer programs will be offered throughout Pennsylvania for academically talented students in mathematics, science, and humanities. The tentative 2007 locations include: Abington/Philadelphia Area, Erie, Greensburg, Harleysville, Lebanon, Lewisburg, Pittsburgh, Pottstown, Sidman/Johnstown Area, South Fayette, West Chester, and Wexford. C-MITES courses offer students a hands-on approach to math, science, and humanities.


Commuter program weekdays from 9 a.m. – 12 noon
Some sites offer optional afternoon programs.
June 11 – July 20, 2007 (one- and two-week sessions)
Financial Aid Available
Grades: completed 3-9
Cost: $175 - $400
Application Deadline: April 14, 2007

Summer Program brochures and applications will be mailed in early February.

Math-Talented Students
(Continued from page 1)

It’s relatively easy to make changes in a school program on an individual level. For example, a parent might ask for extra enrichment within the regular classroom. If the regular classroom teacher is willing to do the extra work, this is a simple option. It’s also fairly easy to move a student from one classroom to another to accelerate him or her in mathematics. On the other hand, it might take several years to set up a new program where mathematically talented students are identified and grouped together for specially-designed instruction. Parents need to be realistic in understanding how long these programmatic changes might take.

What is the Diagnostic Testing -> Prescriptive Instruction model?
The DT->PI model, first developed by Dr. Julian Stanley at Johns Hopkins University in the 1970’s, was designed to match the level and pace of mathematics instruction to the student’s mathematical abilities and achievements. In Step 1, the student takes an above-level aptitude test to measure ability in mathematics. In Step 2, the student takes a diagnostic pre-test (under standardized conditions) to measure specific achievements in mathematics. In Step 3, the test proctor re-administers items (in unlimited time) that the student missed, skipped, or did not have time to answer. This step is critical in discovering whether the student got an item wrong because of a simple mistake or because of not understanding the concept. The fourth step, Prescriptive Instruction, is the heart of the model. In this step, the mentor works with the student on topics he or she has not yet mastered. The mentor and student do not spend a lot of time reviewing material that the student has already learned; they focus on new concepts. The mentor and student might be in a one-on-one situation, or the mentor might work with a small group of students. In Step 5, the mentor administers a post-test to measure mastery of the material. Successful students then re-enter the process at Step 2, but with a test at the next level of mathematics.

The DT->PI model is a powerful model for mathematically talented students. It avoids some of the problems that might be encountered when a student simply skips a grade in math, because the DT->PI model identifies the “gaps” in a student’s background and allows time for the mentor to help the student fill those in. It also allows the student to study mathematics at the appropriate level and pace.

What happens if my child runs out of math? Ask any math professor if he or she has “run out of math,” and it’s likely that the answer is “no!” Elementary and high school students won’t run out of math, but their school might not offer the right level of math for them. Parents and school personnel might need to be creative in getting the student to the right math class. This can be accomplished in different ways: by having the student go to a different building for math, by having a tutor work individually with the student, by participating in a distance learning program, etc.

When making a plan for students to accelerate in mathematics, it is important to think about the long-term implications, and how the student will study mathematics in the future. However, the fact that there might not be a math class sometime in the distant future for an advanced student to take shouldn’t prevent a student from being advanced now.

What are the pitfalls to radical acceleration? A large body of research on acceleration demonstrates what an effective option it is for talented students. Much of that research has looked...
Math-Talented Students

(Continued from page 5)

specifically at mathematically talented students. Educators seem especially concerned about the effects of acceleration on social development. Bright students actually tend to prefer the company of older students, so the social situation might be better for the student if he or she accelerates.

Long-term planning is essential, so that the student is consistently challenged in mathematics every year. We wouldn’t want to see the situation where a student skipped ahead several grade levels in mathematics, only to be left with no appropriate math class to take in a later year.

The issue of credit is important: will the student receive credit for the work completed? One talented 6th grader took geometry at the high school, but wasn’t given high school credit for it “because he’s a 6th grader.” Later, as an 11th grader, he had already taken all of the high-level math classes the school could offer, but he didn’t have enough high school math credits to earn his high school diploma. The choice was either to take a less-challenging math class for high school credit or to take a college-level math class and not earn enough math credits to graduate from the high school. Please note, in this situation, the student had other options. He or she could have taken a distance learning course, attended a local college part time, or simply elected not to graduate from high school. Many excellent universities (including Carnegie Mellon) do not require students to have earned a high school diploma in order to be accepted into their freshman class.

How do we find a mentor for our child? If you are looking for a mentor who can help your child to have fun and explore math, then an adult who is good at math and enjoys working with children might be a good mentor. If the primary purpose is to complete a course in math for school district credit, it’s important to find a certified teacher who is also very good at math and enjoys working with children. Graduate students (math majors or math education majors), high school teachers, and retired engineers have all been good mentors.

What can parents do to help keep children interested in math? Sometimes the regular classroom mathematics isn’t challenging enough. Parents might have to look outside of school to provide more challenges. Math clubs and competitions (such as www.moems.org) give students the opportunity to interact with other children who enjoy and are good at mathematics. Special programs such as those offered by universities (Johns Hopkins, Duke, Northwestern, Carnegie Mellon, The University of Iowa, etc.) bring exceptionally talented students to teachers who offer exciting, stimulating mathematics. Distance learning programs such as the one offered by EPGY at Stanford are another way to challenge students outside of school.

Parents can also challenge their children in math at home. Many “classic” games have a strong mathematical component. These include Battle- ship, checkers, chess, Connect-Four, dominos, MasterMind, Othello, and Pente. These are great games for teaching logical thinking and practicing reasoning skills.

What about the gaps? Mathematics is a logical subject, and one topic builds upon another. To avoid problems with gaps in students’ backgrounds, try the DT->PI model.

How much is too much? At what point is teaching above and beyond their age too much? Trust your instincts as a parent, and trust your child to let you know when he/she has had enough! The extra math should be an enjoyable challenge, not a burden. If your child complains excessively about the challenging work, describes physical ailments, often doesn’t complete homework, complains of feeling overwhelmed, now “hates” math, etc., then it is time to ease up!

If your child has a special talent in mathematics, don’t worry if he’s advancing in that subject area but is average or slightly above average in others. Don’t expect children to be well-rounded. You might have a child who is a specialist, who is very strong in mathematics but not as strong in other areas.

Resource

Reprinted with the permission of the Davidson Institute for Talent Development, which does not imply or constitute any endorsement of this publication. The Davidson Institute for Talent Development is a 501(c)3 nonprofit operating foundation founded in 1999 to support profoundly intelligent young people. For more information on the Davidson Institute, please visit www.Davidson-Institute.org, or call (775) 852-DITD.
The Pittsburgh Plan:  
Helping Preschoolers Achieve Their Full Intellectual Potential  
*by Richard T. McCoy, Ph.D. and Martha E. McCoy*

The *Pittsburgh Plan* is an innovative, non-profit program aimed at helping young children excel at reading and math. Early success in these critical areas fosters a love of learning and a sense of confidence, and lays the groundwork for continued academic excellence as the child moves through the school system.

Because the Plan emphasizes listening to the child, we thought it appropriate to ask the very first Plan participant, Marty McCoy, now age 19, to talk about the Plan.

"Sixteen years ago, I sat on my father’s lap, red crayon grasped firmly in my hand, and began my first session as the Pittsburgh Plan’s inaugural participant.

Over the next seven years, I averaged about two happy, low-pressure sessions per week. I remember these sessions vividly, partly because it was fun to spend time with my father, and partly because it was exhilarating to learn to read and to master math.

Now, years later, preschool children all over the country are sharing these experiences by participating in the first broad-based pilot program of the Pittsburgh Plan. Participants are learning to read and do math at least two years above age level; gifted participants are achieving at even higher levels. And they are doing all this the same way that I did, by sitting down with their parents twice a week for ten or fifteen minutes.

Upon learning that “O” is a letter, number AND shape, Eli (Fremont, CA) promptly hid all of his plastic “O’s” in a secret cache.

So, what is the Pittsburgh Plan? How does it achieve these results?

**Method.** The Plan is really a method – a method of exposing young children to math and reading, and a method of working with children to help them learn inductively. For example, under the Plan parents almost never teach by lecturing; instead, they ask directed questions -- and they always listen carefully to the child.

**Curriculum.** The Pittsburgh Plan is also a curriculum – a set of materials, complete with detailed instructions. Although the materials are simple and unpolished (by design, so as to be accessible to the child), they are carefully structured to take advantage of the child’s innate language learning ability, described below.

**Approach.** Basically, the Pittsburgh Plan trusts your child to learn, rather than trusting you to teach. Why? Because – and there is really no way to say this gently – your child is almost certainly much better at learning than you are at teaching! In particular, your child has an amazing innate ability to learn to speak a language.

The Plan takes advantage of this innate ability by treating math and reading as languages, and then helping children learn these skills in the same deep, inductive way that they learn to speak a native language. As a result, participants learn to read and do mathematics the same way that they speak, effortlessly and well.

**One Last Point -- Girl Power!** By the time I hit elementary school, I loved math and was pretty darn good at it. Likewise with my younger sisters, who went on to excel in calculus in eighth and sixth grades. And by all reports the same is true today for young girls across the country who are working with the Plan. So if you have a young daughter and are worried about the gender gap in mathematics, you probably have an extra reason to try the Pittsburgh Plan.”

While mastering the usual Plan material, Sophie (Seattle, WA) is also learning to read Chinese through Plan materials created by her parents.

*To learn more about the Pittsburgh Plan, go to www.pittsburghplan.com or call (724) 940-2658*
* The C-MITES Sweatshirt is royal blue with red and white lettering. The cost is $27.

Developing Math Talent:
A Guide for Educating Gifted and Advanced Learners in Math
By Dr. Susan Assouline & Dr. Ann Lupkowski-Shoplik
(Cost is $30.95)

Name: ____________________________________
Address: __________________________________
City: ________________ State: _____ Zip: ______
Telephone: ________________________________

Sweatshirts Quantity:
_____ youth size S   _____ adult size S
_____ youth size M   _____ adult size M
_____ youth size L

Number of sweatshirts X $27 =$ __________
Number of books X $30.95 =$ __________
TOTAL ENCLOSED =$ __________
(Shipping & handling included in prices)

* Proceeds from these sales go to the C-MITES scholarship fund. Make check payable to Carnegie Mellon University

Send to:
C-MITES
5136 Margaret Morrison St., MMP30
Carnegie Mellon University
Pittsburgh, PA 15213

C-MITES Families: Please give this to your employer and/or other businesses:

Corporate Sponsors for C-MITES

C-MITES is a not-for-profit, charitable organization with 501(c)(3) status, dedicated to encouraging the intellectual curiosity and academic development of Pennsylvania’s gifted students. For more information about C-MITES, please visit our website at www.cmu.edu/cmites.

We are requesting corporate sponsors to help us nurture the future leaders that C-MITES educates. Your support of C-MITES not only shapes today’s students and tomorrow’s workforce, but also promotes the visibility of your business among parents and teachers throughout Pennsylvania.

For your sponsorship, your company name or logo will be displayed as follows:*

- $5,000 Company logo, name, and slogan or motto on the C-MITES website, with a link to your company’s website, for the period of one year. Our website records approximately 8,500 hits per month.
- $1,000 Company logo, name, and slogan or motto on the C-MITES t-shirt, which is printed each June and worn by approximately 800 C-MITES students each year (deadline: February 1st).
- $250 Ad (business card size) in C-MITES News, our semiannual newsletter, which is read by approximately 10,000 Pennsylvania families (deadlines: June 1st and October 15th).
- $100 Company logo, name and slogan or motto displayed on back cover of C-MITES Information and Resources guide, which is sent to approximately 3,000 families in December of each year (deadline: October 1st).
- $50 Company name listed in C-MITES News (deadlines: June 1st and October 15th).
- $25 Company name listed in the C-MITES Information and Resources guide (deadline: October 1st).

* C-MITES reserves the right to limit advertisements.

Sponsorship checks can be made out to Carnegie Mellon University and sent to the address below. Contributions above the $50 level should be accompanied by digital artwork. We hope we can count on your support. Please contact us if you have questions. Thank you.

Ann Lupkowski Shoplik, Ph.D.
C-MITES Director
5136 Margaret Morrison St., MMP30
Carnegie Mellon University
Pittsburgh, PA 15213
(412) 268-1629
annshoplik@cmu.edu