The Math and Science Center's Summer 2006 program opened its doors on June 18, 2006. Funded by the U.S. Department of Education and administered by the University of Tennessee, the Math and Science Center (MSC) recruits high school schools from low-income families where neither parent holds a bachelor's degree. Additionally, students must desire to increase their knowledge of and skills in the fields of math and science. Students from the eight southeastern states (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) arrived on the university campus to attend the challenging academic program. Some flew while others made the journey in their parents' cars. For many, this was their first trip outside of their home state.

Starting off the program with the Campus Tour, students experienced true college life. Walking all over campus in the hot East Tennessee weather is nothing new to veteran UT students, but many MSRC students had to adjust. Students lived in Humes Hall and ate in the same food establishments as UT college students. Adjusting to roommates, resident assistants, schedules, and the freedom of living away from home were some of the many social challenges that the students faced while in the program.

MSC provided classes covering a wide spectrum of science and math fields. Animal Science was taught by University of Tennessee PhD candidate Magdalena Rambeau. In this class, students had the opportunity to examine and work with live farm animals in the Animal Science Department. University Professor Dr. Al Hazari sparked enthusiasm and excitement in his Advanced Chemistry class through live demonstrations and applied learning in UT's Chemistry Departmental laboratories. In the Engineering 101 and Odyssey of the Mind classes, graduate students Betsy White and Carley Harris educated students on the basics of engineering, design, and critical thinking. Instructor Chase Vandervelde worked alongside students in his anatomy and physiology class to perform feline dissections, while instructor Tom Webber taught the exciting world of astronomy. Students also explored the world of business and marketing with PhD student Jeff Bonney.

UT graduate student Natalie Langley introduced the investigation of bones and decay in her Forensic Anthropology class. Technology-minded students received hands-on instruction in web design. Other science classes included biology, chemistry, and physics. In mathematics, instructors Carley Harris and Betsy White provided classes ranging from trigonometry to calculus. Students were encouraged to take math
Positive Self-Concept

Know Your Strengths and Weaknesses...

When you look in a mirror, what do you see? What sorts of words would you use to describe yourself? Are they positive, negative, or a combination of both? The view that we have of ourselves is called our self-concept. This view may be negative or positive and is learned through interacting with other people and the environment around us. Self-concept includes not only how we view our physical body, but also how we view our ability to accept and respect ourselves and others, solve problems, and make a difference in the world around us.

Working toward achieving a good self-concept begins by learning to accept yourself as you are today. Become aware of your strengths and weaknesses and make an effort to capitalize on your assets. Concentrating on the ways your talents can help you experience success also fosters a better view of yourself. As your self-concept improves, you will have the resources to begin working on overcoming your greatest weaknesses.

The other essential ingredient in being able to move toward a positive self-concept is believing in yourself. If you do not believe in yourself, others sense this and will act accordingly. This clearly helps keep a bad self-concept firmly in place. On the other hand, if you do believe in yourself and project a good self-concept, others will look at you as someone who is self-confident and deserves respect. So, in attaining a good self-concept, you reach the point of being able to look beyond yourself and assist others.

Thus, the payoff of having a positive self-image is great, both for you and the people around you!

-Dr. Ernest W. Brewer
Project Director

2006 Math and Science Center Mentors

The University of Tennessee’s Math and Science Center connects students with scientific and mathematical professionals through the summer mentoring component.

During the summer 2006 program, fifteen mentors conducted a variety of projects with students. Shilang Deng, UT graduate student, helped three students to research finance issues in the rising cost of gas prices.

PhD candidate Jeff Bonney mentored three students as they designed a company using scientific research. Six students investigated forensic anthropology alongside PhD student Natalie Langley. Geography graduate student Jonathan Law assisted four students in urban geography. Graduate student John Harrell worked with four students in the field of exercise science. The University of Tennessee’s Engineering Department provided two mentors, Carley Harris and Betsy White, who explored various engineering-based projects with six different students. University of Tennessee Chemistry professors Dr. Larose and Dr. Xue offered hands-on research opportunities for four MSC students. High school science

Cont'd. on next pg.
Some Do’s and Don’ts...  
Test-Taking Tips from the Professor

Tests are in the same category as Monday mornings and root canals, but like other unpleasant events, they can be managed. If you’re well-prepared, you can turn a potentially unpleasant event into a good experience.

Tests are a part of academic life, so resolve to get the best of them. Begin to prepare for tests on the very first day of class by careful note-taking and studying. Schedule test preparation time well in advance and avoid last minute cramming!

Here are some strategies education experts suggest to increase your test-taking effectiveness:

**Before the Test**
- Try to predict test questions as you take notes.
- Review all notes taken in class and those developed when reading texts.
- Recite aloud any facts that you need to learn.
- Avoid rereading text books before a test.
- Consider studying with a partner or in a small group.
- Get a good night’s sleep.

- Concentrate on important information that you have highlighted or summarized.

**During the Test**
- Be sure you understand all the directions.
- Pace yourself. Don’t spend a lot of time on a few questions. Answer questions you know first then go back to those you are less sure of—but be sure to answer all questions.
- Write legibly and/or be sure your answers are recorded in the right place.
- Stay calm and avoid changing answers. Your first choice is most often correct.
- Finally, don’t second guess your performance. The actual results may be very different from your expectations.

By using these tips you’ll be well on your way to success in testing. If you feel you need outside help to improve your test taking, ask your teacher or advisor for an appropriate referral.

- Dr. Ernest W. Brewer  
  Professor and PI/ Director
Student Loans: Step by Step How-To Guide

Step 1
- Review your career plans and decide which type of school is best for you.
- Narrow your school choices to three. Request admissions information and school catalogs.
- Obtain registration materials and test dates for the ACT and/or SAT.
- Meet with school admissions' representatives who visit your high school.
- Ask employees, teachers and guidance counselors for letters of recommendation to include with your college applications.
- Attend college fairs and financial aid nights.
- Compose admissions essays.

Step 2
- Pick up a Free Application for Federal Student Aid (FAFSA) at your high school counselor's office, your local or college library, or college financial aid office. **Do Not Submit Before Jan. 1st!**
- Submit your FAFSA to the processor as soon as possible after January 1st. You can complete the form online at [www.fafsa.ed.gov](http://www.fafsa.ed.gov) (keep a copy of the form).
- **Parents:** File your tax forms as early as possible. You may need them to finalize the FAFSA. Be prepared to send a copy of your tax forms to the school, if requested.
- Take ACT and/or SAT exams, if not yet completed.
- Mark your calendar with registration, admissions and financial assistance deadlines and fees.

Step 3
- Begin completing your admissions applications. Double check the deadline for submission.
- Research taking Advanced Placement (AP) or College Level Examination Program (CLEP) exams.
- Visit your top school choices. Meet with faculty, staff and students.
- Research and apply for other funding and scholarships.
- Finalize your admissions applications (often can be done online). Be sure to keep copies of your applications.

Step 4
- Look for your Student Aid Report (SAR) in the mail. This form contains your financial aid information.
- Find out what outstanding items are needed by the financial aid office. If requested, submit tax forms.
- If you haven't received your SAR four weeks after submitting the FAFSA, immediately contact the Federal Student Aid Information Center at 800-4-FEDAI.

Step 5
- Watch the mail for school acceptance and financial aid award letters. Compare the packages based on the various costs.
- Make your final school decision and mail any deposits required.
- Check with the school that you have chosen to attend about returning financial aid award letters.
- Accept financial aid.
- Inform the schools where you will not be attending of your decision.
- Watch for other important school deadlines.
- Finalize any important school deadlines.
- Prepare a realistic student budget.

Step 6
- Plan for college orientation, transportation and housing.
- Follow up with the financial aid office at your school to be certain that all your paperwork is complete.
- Finalize plans for school.

THE POWER OF EDUCATION

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Average Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th grade</td>
<td>$18,935</td>
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<tr>
<td>Some High School</td>
<td>$22,463</td>
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<tr>
<td>High School Grad</td>
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<tr>
<td>Some College</td>
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<tr>
<td>Associate's</td>
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<td>Bachelor's</td>
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<td>Master's</td>
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<td>Doctorate</td>
<td>$89,638</td>
</tr>
<tr>
<td>Professional</td>
<td>$113,242</td>
</tr>
</tbody>
</table>

*Average income based on educational attainment. Individuals 25 years old and older, by total money earnings in 2002. Source: U.S. Census Bureau.*
SAT Prep Quiz! Are You Ready?

1. Since the SAT includes easy, medium and difficult questions, which type do you usually spend the least amount of time?
   - A) easy questions
   - B) medium questions
   - C) hard questions

2. On which type of SAT question do you usually spend the most amount of time?
   - A) easy questions
   - B) medium questions
   - C) hard questions

3. When in doubt on an SAT question, go with your first hunch?
   - True
   - False

4. Most SAT questions have trick answers.
   - True
   - False

5. On the SAT essay, quality is more important than quantity?
   - True
   - False

National TRIO ThinkQuest Winners

Mindy Ren and Helen Ren placed first for a new program at the National ThinkQuest competition, and they received the gold award for technical quality. The National ThinkQuest competition held each year is sponsored by the U.S. Department of Education through the University of Washington TRIO Training department.

During the MSC summer 2005 program, Mindy and Helen worked closely with mentor Christopher Reardon to create their website “The Beauty of the Golden Ratio.” This website details the mathematical and scientific concept of the golden ratio (also known as Pi) and the Fibonacci numbers.

This geometric equation can be found throughout history in architecture, nature, art, and even in people.

Using Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS) as the primary web design techniques, Mindy and Helen designed their website to be both informational and visually pleasing. Both students comment on the website that they have always been interested in building a website. With “The Beauty of the Golden Ratio,” they have accomplished that dream.

Not only have these two MSC students reached their goal of creating a website—they have also reached far beyond to win in two major categories in the National ThinkQuest competition. No other program from Tennessee made it to the semifinals. This is the first time that MSC students have entered the contest, but hopefully not the last. With the assistance of strong mentors like Mr. Reardon, MSC will hopefully continue this mentor project in future summer programs.

For their hard work, Mindy and Helen were honored at the annual Southeastern Association of Educational Opportunities for Program Personnel (SAEOPP) in February of 2006. Each student received Microsoft Office 2003, Microsoft OneNote, and Macromedia Dreamweaver 8, as well as $250 scholarships.

To visit the website, go to: http://library.thinkquest.org/05aug/01274/.
2006 Poster Symposium

Fifty-eight students presented a combined total of eighteen poster projects at the 2006 Math and Science Poster Symposium. In the Environmental & Geographical Science category, poster topics included “Effects of Flying on Travelers” and “Urban Sprawl.” Medical science research project topics consisted of “Geriatrics Assessment Program,” “Sterile Processing,” and “Clinical Utility of Evoked Potentials.” The two chemistry projects were titled “Finding Iron in Pig’s Blood” and “It’s All a Matter of Concentration.” The Web Design group’s project “How to Develop a Website” created a site based upon the Astronomy Group’s project “Hot Stuff.” The forensic anthropology group presented “Sex Determination in Adults Using the Clavicle and Femur.” The three engineering projects were entitled “Unmanned Aerial Vehicles,” “The Biological Effects of Nuclear Radiation,” and “The Dome Zone.” The two business and finance groups demonstrated “Gas Prices” and “Media Magnet: Using Scientific Research to Start a Company.” Students in the exercise physiology group researched “Aerobic and Anaerobic Contribution of Caloric Expenditure During Various Running Velocities.” Finally, the Knoxville Zoo research exhibited “Grassland Animals” and “Endangered Animals.”

In addition to the posters, students presented their research orally to their peers and a panel of judges, and they also completed a research paper. At the Awards Banquet, awards were given for the best poster, best oral presentation, best paper, and best overall project. The forensic anthropology group’s project entitled “Sex Determination in Adults Using the Clavicle and Femur” won first place in the poster, oral, and all-around categories. The engineering project “The Biological Effects of Nuclear Radiation on Human Skin” took first place in the written submission category.

Tuition Help is Available

Upper-income students are the least likely to file a Free Application for Federal Student Aid, but a significant percentage of low and middle-income students also fail to file.

The breakdown among undergraduates who were listed as dependents in academic year 1999-2000:

<table>
<thead>
<tr>
<th>Income</th>
<th>Did’t file a FAFSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $20,000</td>
<td>20.5%</td>
</tr>
<tr>
<td>$20,000-$39,999</td>
<td>31.6%</td>
</tr>
<tr>
<td>$40,000-$49,999</td>
<td>43.7%</td>
</tr>
<tr>
<td>$60,000-$79,999</td>
<td>46.2%</td>
</tr>
<tr>
<td>$80,000+</td>
<td>56.9%</td>
</tr>
</tbody>
</table>

Source: American Council on Education

Getting Organized

Here are some of the documents you’ll need to fill out a FAFSA for the 2006-07 academic year:
- 2006 W-2 forms
- Records documenting other sources of income, such as Social Security, welfare or veterans benefits
- Current bank statements
- Mortgage information
- Statements showing your stocks, bonds, mutual funds and other investments
- Records related to any unusual family circumstances, such as unemployment or family medical expenses not covered by insurance

Source: FinAid.org
Need College Financial Aid?

Apply Immediately!

Unless your child is 7-foot-3 and has an amazing jump shot, people will not show up on your doorstep offering to pay for his college education. If you want financial assistance, you have to ask for it. And the first step in that process is filling out the Free Application for Federal Student Aid, also known as the FAFSA.

It costs nothing to fill out the FAFSA, not even a stamp, if you do it online. Yet, every year, thousands of families forsake the FAFSA, depriving themselves of thousands of dollars in grants and low-cost loans.

A recent study by the American Council on Education found that half of undergraduates enrolled in colleges and universities in academic year 1999-2000 failed to fill out a FAFSA.

Even more troubling, 850,000 of those students were probably eligible for a federal Pell Grant, the study said. Pell grants provide up to $4,050 a year for low-income students, and the money doesn’t have to be paid back. President Bush has proposed raising the maximum Pell grant to $4,550 by 2010.

Financial aid experts offer lots of reasons for FAFSA avoidance. Many middle- and upper-middle income families don’t file because they believe they’re ineligible for financial aid. Others are intimidated by the form, which asks detailed questions about family finances. And like preparing your taxes, filling out the FAFSA takes time.

Still, if your child will start college this fall, it’s worth the effort. Even if you don’t qualify for a Pell grant, you may be eligible for assistance from your state or your child’s college. At a minimum, you’re eligible for a federal student loan with a below-market interest rate, said Martha Holler, spokeswoman for student loan provider Sallie Mae. But to get a loan, you have to fill out the FAFSA.

How to make the FAFSA process run smoothly:

1. **File early.** The Department of Education will begin accepting FAFSA applications for the 2007-2008 academic year on Jan. 1. The deadline for federal assistance is June 30, 2007, but many states and individual schools impose earlier deadlines. Some want the information by mid-February. Plus, getting your application in early could improve your chances of receiving aid, said Chris Chapman, chief executive officer of loan provider ALL Student Loan. “States have a limited amount of money to give out, and many give it on first-come, first-served basis,” he said. When you fill out the FAFSA, you’ll be asked to list up to six colleges or universities. Your information will be sent to those schools. Once you’ve selected the schools that will receive your application, check their deadlines and find out if they require additional information, Holler said. You’ll need to provide information about your 2006 income, which is easier to do after you’ve completed your tax returns. Even if you haven’t filed your taxes yet, you can file FAFSA.

   Estimate your income, using last year’s returns and your year-end pay stub, and revise the form later.

2. **Take your time.** You’ll need to pull together a lot of documents, such as your investment statements and W-2’s. Divorced parents and blended families may need to devote even more time to the process to make sure they follow the guidelines correctly, said Ben Baron, vice president for Kaplan Test Prep and Admissions.

3. **File online.** You can file a FAFSA over the Internet by going to www.fafsa.ed.gov. Filing online speeds processing. You’ll be notified immediately of errors, such as skipping a line. If you make an error on a paper application, the Department of Education will mail it back, which could cost you to miss the deadline.


Source: The Daily Times, Gannett News Service
Managing Your Time

We all have the same amount of time. So, why do some people seem able to accomplish so much? They usually follow a system of time management.

Do you know where your time goes? In order to manage time, you need to know what you usually do. One way to accomplish this is to keep a time log. Briefly jotting down what you are doing every 15-30 minutes for a week will give you important information. Once you have this, ask yourself:

- Did I get everything done?
- Was I rushed for time?
- Did I meet deadlines?
- What habits interfered with reaching my goals?
- Did I accomplish more at a certain time of day?
- At what time of the day did I accomplish the least?

Now, you're ready to use the information from your time log. Make a list of the activities you have to do. Mark those that are scheduled at definite times and those that can be arranged according to your own time. Then, prioritize the list:

1. the most crucial activities
2. activities that can wait until after those in group 1
3. the least crucial activities

Prepare a schedule using the prioritized list. Use your list and schedule every day. When you develop the schedule, remember to plan for your peak times and low energy times.

Some important tips for stretching your time include: using waiting time effectively, being sure of instructions, avoiding perfectionism, doing the difficult tasks first and avoiding overcommitment.

Effective time management frees you to do your best and to succeed. Remember, the schedule isn't your master because you control it. It's well worth the time to plan your time.

- Dr. Ernest W. Brewer
  Professor and PI/Director

MSC Program Description

Since its inception in 1990, the University of Tennessee's Math and Science Center (MSC) has served over 700 high school students interested in the fields of math and science. Students from across the Southeastern United States participate in the MSC summer program each year.

Participants experience true college life by living in University of Tennessee dormitories and eating in the on-campus dining facilities. Through rigorous academic classes and research activities, students experience hands-on learning at its best.

During the academic year, local students participate in monthly Saturday session activities that focus on college admissions, financial aid, career and educational counseling, and science and mathematics. Through the summer and academic components, the Math and Science Center strives to increase the number of students entering into math and science college majors and career fields.