



THE UNIVERSITY of
MISSISSIPPI

CENTER FOR MATHEMATICS AND SCIENCE EDUCATION

MathCamp Special Report

Summer 2013 Volume VII

The Center for Mathematics and Science Education created the MathCamp program to expose students to methods of learning mathematics and science concepts that are participatory, hands-on, and challenging. At MathCamp, teachers no longer stand in front of the classroom and lecture - they ask questions and lead students to figure out the answers. The rooms buzz with active student participation and discussion. Talking is encouraged. Students frequently work in groups to complete tasks in which they have to solve problems and be critical thinkers.



Students in grades 5-8 arrive at camp often being encouraged by their parents because who can imagine that a week of doing math and science all day could be fun? The students who come to this camp are students who have not performed well in mathematics so far, but their teachers think that with the appropriate motivating environment, they could do better. Students usually leave camp with a completely different view of mathematics. As camp concludes, students are saddened that the week has passed so quickly. Many express an interest in returning the next year for Alumni MathCamp. Those who have completed Alumni MathCamp plead a case for having a camp for third year campers.

The instructional strategies used in the MathCamp classrooms are based on current research. All the tasks used are aligned with *Common Core State Standards for Mathematics* and the *National Council for Teachers of Mathematics (NCTM) Process Standards*. These standards outline expectations for students to be engaged in problem solving, communication, representation, reasoning and proof, and making connections to mathematics content as well as real world situations.

The goal of MathCamp is to allow students to have a positive experience in learning mathematics and science while at the same time deepening their understanding of concepts. The students learn that they possess the capabilities to solve mathematical problems. They leave with increased confidence and many times with a new attitude about something they may have disliked only one week earlier.



As a pre-service teacher, my experience as a MathCamp instructor has been highly valuable. MathCamp gave me the chance to practice teaching in a low-pressure environment where students get to learn for the joy of it rather than to pass a standardized test. The problem-solving nature of all the tasks the students engaged in provided an opportunity for me to experience facilitating true mathematical discourse, and the tasks themselves have served as a model for the type of tasks I want to develop for my own students. I also got to work alongside experienced in-service teachers who provided guidance when I was unsure about my next move, but also treated me as an equal and completely trusted me to make instructional decisions. Being a MathCamp instructor has improved both my teaching skills and my confidence in my teaching abilities.

~MathCamp Instructor; Pre-Service Teacher

For the past two summers, I have been privileged to be an instructor during math camps sponsored by the Center for Math and Science Education. Each time the opportunity is set before me, I am very excited. I certainly enjoy facilitating discussions, building on students' prior knowledge, and having them engage in very interesting hands-on tasks. Teaching the camps, help me "get back in the swing of things" as it prepares me for my own classroom. It is also refreshing to collaborate with other educators about how well tasks are going in their classrooms and/or strategies for improvement. For the 2013 summer, I taught upcoming 7th and 8th grade students which was an anomaly for me since I teach 5th grade math. At first, I was nervous because they were a different grade level. However, I appreciated the chance to teach these students because I was able to conquer the challenge and discovered it was not much different from teaching my 5th graders. Ultimately, the experience is amazing and I look forward to continuing to be an instructor as long as the opportunity presents itself.

~MathCamp Instructor; In-Service Teacher



My son has attended MathCamp for the last two years. We love that it has shown him that math can be fun and not uninteresting. I also believe it helped give him confidence in his math building skills. He enjoys everything from being on campus, to the friendships he has made. He loves all the leaders involved and the activities done during the day. Thank you for this wonderful program!

~ Parent of a MathCamper

MathCamp

In July, the CMSE welcomed 73 upcoming fifth through eighth grade students to Ole Miss for their first year of MathCamp. The theme "Mission to Mars" presented tasks in which students analyzed characteristics of polygons and polyhedra. Students also learned about current exploration of Mars by the newest NASA rover, "Curiosity." They used a calculator programmed miniature rover to investigate unit conversion, velocity, and linear regression during the central task of the week in which they collected data to compare their calculator rovers to Curiosity. Throughout the week, instructors encouraged students to make observations, communicate mathematically, and engage in mathematical debate, in order to improve both student understanding and confidence in mathematics.



Alumni MathCamp

In late June, the CMSE welcomed back 44 excited campers to participate in this year's Alumni MathCamp entitled, "A Mathematical Journey Around the World." Students completed mathematical tasks in order to "travel" to each location around the world. They loved getting their tickets punched in Spain, France, England, Egypt, and China before arriving back home in the U.S.A.

Campers explored Algebraic topics, including finding patterns in perfect squares, prime numbers, area, volume, and creating equations. Throughout the week, campers

developed skills, confidence, and interest in mathematics through group work, problem solving, and critical thinking.



Science Portion

Math is interwoven in many science concepts; therefore, it is important to make purposeful connections between the two. Campers paced out a mathematical scale model of our solar system across campus which utilized everyday objects to represent the sun and planets. According to camper surveys, understanding the vastness of our universal neighborhood was an inspiring experience. In addition to the Solar System walk, campers visited the CMSE portable planetarium for a close-up visit to space as well as a depth defying excursion into the Earth's structure.

Campers also classified code responses on miniature rovers and used these codes to carry out tasks during math activities. They explored simple machines while constructing their own Rube Goldberg contraption to perform tasks related to the Mission to Mars camp theme.

UM Fire Services, in conjunction with Oxford Firefighters, shared math theories that must be understood in order to effectively fight fires. Alumni campers took turns aiming the water hose at a target in order to feel the surge of pressure required to reach fires from a safe distance.



MathCamp is full of different expectations for everyone involved. Campers expect to have fun. Parents, teachers and administrators look forward to the presentations at the end of the camp that showcase what their camper has learned. Instructors expect to be able to inspire a student. Our staff expects all of this to happen and more! MathCamp is a large part of the CMSE and gives a good overview of the mission that has been set in place. MathCamp provides the opportunity to meet various expectations of those looking to the CMSE for results. Each summer prior camps are evaluated and goals are set to go above and beyond the previous year. It is with great pride that the CMSE rises to meet these expectations.

Year	Recommended	New Campers	Alumni Campers	Return Percentage
2007	87	40	-	-
2008	172	69	20	50%
2009	180	71	36	52.2%
2010	272	73	41	57.7%
2011	191	80	51	69.9%
		22 (traveling camp)		
2012	194	77	33	41.3%
2013	177	73	44	57.1%

2013 Impact
73 First Year Campers
44 Alumni Campers
53 Males
64 Females
30 Counties
53 Schools

MathCamp offers rewards to all those involved. The selection process for the campers is unique. Teachers are asked to nominate students based on the criteria that the student shows potential in Math, but for whatever reason is not living up to that potential. The campers are rewarded with a week of fun that they didn't expect, and leave with confidence they may not have had prior to attending. Instructors have the distinct pleasure of touching a child's life in a way they may not have had an opportunity to before. The teachers in the schools reap the rewards as their students return to the classroom excited about mathematics. The staff of the CMSE is rewarded by the overwhelming words of thanks as well as the hugs that are a reminder of what a difference a week has made.

For more information on this program, as well as all programs offered by the CMSE, visit our website www.olemiss.edu/cmse