

MSSM Summer Explorations 2010

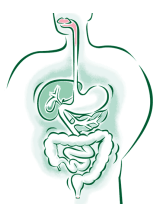
Course Descriptions

(Only courses meeting minimum enrollment numbers will be offered)



A-“Mazing” Labyrinths- Embark on this fascinating journey through the twists and turns of the history, mathematical relationship, artistic value, and pure fun of mazes and labyrinths. We will gain knowledge of the ancient Greek Myth of Theseus and the Minotaur. We’ll explore the ancient Egyptian Labyrinth. We will conquer challenging mazes, discover maze solving strategies, create our own mazes, and finish the week by building a life sized maze to challenge the rest of the camp.

Astronomical Adventure Tour – Come into cosmic contact with the fundamental wonders and awesome scale of space! You will encounter white dwarfs, supernova, pulsar, black holes, and quasars. Engineered as a hands-on, head-swelling, leg-pumping experience of discovery and activity, this astronomical tour, now in its tenth year at camp, ranks as an unforgettable experience for curious campers. Volunteers welcome!



Biological Breakdowns -Do you know what happens to an apple after you eat it? You’ve eaten...now what? What is the first step that your body takes to start the digestive process? How does your body absorb all the nutrients that it needs from what you ingest every day? What exactly do you need to eat everyday to keep healthy and happy? On this journey through your digestive system, we will be looking at how your body breaks down the foods that you eat, and what nutrients your body needs in order to keep you healthy and strong.

Energy of the Future - In this course, we will not only learn about renewable energy sources, but students will get to build their own cardboard homes powered by actual energy captured from the wind, sun, and water! We will discuss the importance of these renewable energy sources in the future of our planet, and then move on to learning how simple electronic circuits work. Students will use these lessons to design their own “Green” home, building both the energy sources for the house and elements that will make it energy efficient.



Game On! - We discuss the mathematical principles at work in the board games we all know, starting with Tic Tac Toe and then moving on to Connect Four and eventually getting to Chess and Go. Go is a game that takes no time to learn and a lifetime to master. In addition, all of the students in the class will get an opportunity to make their own Go boards that they can take home with them, so they can teach their friends how to play.

Forensic Chemistry – It is CSI: Maine. There has been a crime committed in woods of northern Maine and you will set out to solve this crime and find out who did it. And to solve this crime we will use forensic chemistry. Someone left an unknown solid at the crime scene and we will learn how to identify it. Fingerprints were found on a glass at the scene and we will learn how to extract them. With our new knowledge of forensic chemistry we will solve this crime in the woods of Maine.



Kemistry in the Kitchen – It is the Food Network meets the Science Channel. It is chemistry in the kitchen! How is rock candy made? How do we make ice cream? What is a Calorie and why should I care? These are all questions that we might ask when we are in the kitchen and the answer to them involves chemistry. We will learn the chemistry behind these questions and run various experiments to try to answer some of them and along the way we even make some food.

Lift-OFF! – You can do it! Engineer, construct, launch, and recover your own rocket from its flaming flight into the troposphere and back. Campers will investigate rocket theory, propulsion, and calculation, and will review the marvelous milestones of the moon-bound few who left their bootprints on our nearest neighbor in space. Highly recommended for those seeking a life-changing experience!



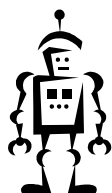
Math History's Mysteries - Let's travel through time and around the world to learn the origins of some of the discoveries in mathematics. Through fun hands on activities we will explore Ancient Egyptian, Babylonian, Mayan, Middle Eastern, and Chinese cultures, as well as examine the artist M.C. Escher's contributions to mathematics. These activities will include building Mayan temples, calculating using Egyptian hieroglyphs, creating our own polyhedra, and building a huge three dimensional tessellation!

Mathematical Music - You may not know it but there is a deep connection between math and music. We start by discussing the mathematical relationships between frequency and pitch and how those relationships constitute harmonies. We illustrate this by having everyone make a simple, one stringed instrument that demonstrates how dividing the string into different lengths creates different pitches. A portion of the class will focus on how the great composers, especially Bach, Mozart, and Beethoven used the mathematical principles we have discussed knowingly or unknowingly to write the greatest music ever made.



Physics of Projectiles – This course will explore the forces acting on projectiles, starting with an introduction to Newton's Laws of Motion. We will discuss terms such as velocity and acceleration that are used to describe projectiles, and how up-down motion relates to sideways motion. Throughout the week, we will spend lots of time playing with tennis ball sling-shots, taking measurements and analyzing the path of the ball. Finally, the course will conclude with a competition day, where teams will use their careful measurements to shoot the ball through hoops!

Ready, Set, Grow! - Have you ever stopped to wonder exactly what is going on inside the trees in your backyard? Or the flowers in your garden? Why do leaves change color when Autumn comes around, and what kind of role do plants really play in our ecosystem? Do plants need soil to live? Let us explore the balance that plants provide for the entire globe. In this class we will not only learn about how oxygen is made, but we will watch it happen. Ready, set, grow!



Robo-Vision! - Robots don't have eyes and ears like we do, so they need special tools to "see" the world that we live in. These tools might include infrared and ultrasonic sensors to measure range, scales to measure weight, or even touch sensors to sense obstacles. This class is all about sensors, and how we can teach robots to use them for specific tasks.

Video Games Made Easy - What makes a game fun? Is it the bright flashing colors? Are harder video games more fun? What about the theme behind a game? To answer these questions, think about this: would checkers be more fun if each piece weighed 20 pounds and had Tony Hawk wearing Christmas lights? Don't bet on it. This course is all about exploring the reason we keep playing and making video games! And what better way than to make and play our own?



