



# 2016 MSSM SUMMER CAMP

## Boys' Weeks

### Course Selections

### **CSI 3.0: Crashes, Lies, and the Look in Your Eyes**

*Instructor: Christopher Beckwith*

Students don their detective badges as they learn the physics of reconstructing a crash, explore how facial recognition programs work, and construct an electronic lie detector. The young investigators will also analyze different samples of evidence such as powders, hair, and ink to determine the guilty suspect.



### **Welcome to Mars, Your New Home**

*Instructor: Christopher Beckwith*

Participants will use Google Earth and other online resources to explore some of the topographical features of Mars, and by researching the existing conditions, they will determine the factors that must be considered to establish a sustainable human colony on the Red Planet.

Following their research, the young colonists will then become specialists, each designing an essential component of a Martian colony. Communication and cooperation will be essential in developing the layout of their colony as they build collaboratively on a specially designed Minecraft server with the Galacticraft/Mars plugin. The colonists will work side-by-side, physically and virtually, racing against time to construct the necessary elements for survival and comfort on a hostile world. Finally, the team will market their colony to prospective settlers with a public relations video.

### **Bonsai Away**

*Instructor: Bob Hancock*

In this course we will be studying the art, philosophy, and horticulture of Japanese rock gardens and Bonsai trees. For generations, cultured and intelligent peoples from all countries and backgrounds have marveled at this interaction of the living and the spirit. Students will get to make creations of their own to keep as 'plant pets'.





## Should I Eat This?

*Instructor: Bob Hancock*

Why can't I have my burger medium rare? How do we best store milk products? In Food Microbiology, we will discuss the importance of behind safe food habits. Everyone should be aware of the many ways that food can be dangerous. Many of these situations will be explored before, during, and after the process of cooking. Areas of exploration will include

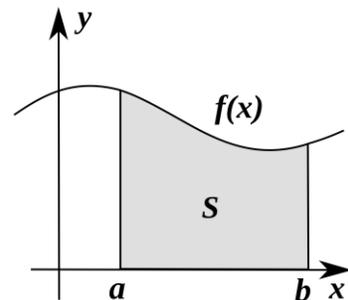
bacterial growth and the reactions of different types of bacteria given different types of food. Another topic that will be discussed is how to best store the different types of commonly found in different parts of the world. Foods available during the Revolutionary and Civil Wars will also be discussed, because, what is hard tack, anyway? We will cook; we will eat; we will work in the lab to see what the dangers are and how to avoid them.

## Calculus in a Week: Holy Smokes!

*Instructor: James Robertson*

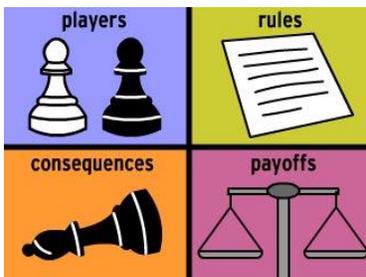
In this course, we will study a few cool functions (like  $x^2$  and sine waves) and learn about some of their cool properties. These will include how fast they go, what they do at infinity (even the infamous "Infinity plus one!"), what is going on above and below them, and ultimately arriving at "I know more math than my math teacher!"

Through this course you will be introduced to limits, derivatives, differentiation, integrals, and so much more! By the end of the week, we will tackle the question: How do we find the area between two curves?



## How to Win Games: The Path to Victory

*Instructor: James Robertson*



In this course, we will study game theory and learn about Nash Equilibriums and other equilibrium states. We will play a lot of games in order to collect data, record and analyze results in Excel, and test new theories. When you go home you can use the techniques you've learned to crush the competition in your favorite games!

## **Insects, and the Birds Who Eat Them**

*Instructor: Katie Perez*

Learn how to identify insects and birds out in the field! In this course, we will learn some anatomy which will allow us to identify these creatures in the great outdoors, as well as samples within the classroom. Maine, in the summer, has a plethora of insects to be found in a variety of habitats. Be ready to get outside and find some fascinating animals!



## **Ohh Behave! Investigating Animal Behavior**

*Instructor: Katie Perez*

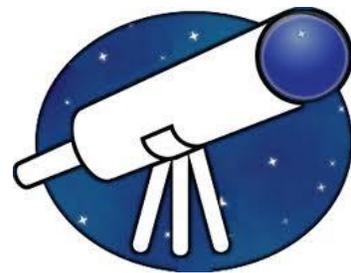


Why do animals behave the way they do? In this course we will observe animal behavior in videos and through firsthand observation of specimens. We will observe a direct correspondence of behavior to anatomy and habitat. We will also learn about Darwin's theories and how animal behavior can be an evolutionary adaptation. Students will learn about different anatomy features that correlate to certain behaviors. Students will theorize the reason for the various social behaviors of animals, such as aggression, migration, and mate selection. Students will complete an experiment on behavior using earthworms.

## **Astronomical Adventure Tours**

*Instructor: Larry Berz*

Campers, come and thrust yourself into the Universe of Deep Space Interstellar wonder including: White Dwarf Stars, Supernovae, Pulsars, Black Holes, Dark Stuff-Matter and Energy, and Quasars. "Goliath" and our telescope fleet await your gaze as this Tour enters its 19th popular season led by American Astronomy Educator, Lawrence Berz.



### **Lift-Off!**

*Instructor: Larry Berz*

High flying campers will never forget the step-by step assembly and study of rocket design and related preparation for personal deployment into the "New Frontier" A review of American and Russian technological achievement in space will provide perspective and power in driving a quest to the stars.

## LEGO Robotics

*Instructor: Mark Meyers*

You will learn about robotic motors and sensors and how to use them to create many types of robots. Using the Mindstorms programming language, your robot will autonomously drive through mazes, pick up and retrieve items, play golf, and race other robots. Work within your small team to design, build, and test a robot. The exact challenge is up to the students to pick but the instructor will ensure that it is, in fact, a challenge. There will be a focus on problem solving, teamwork, and innovation. #CollaborativeEngineering



## It's A Jungle Out There: Earth's Amazing Plants

*Instructor: Justin Lewin*



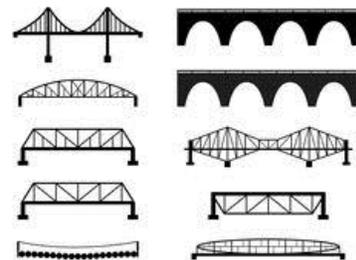
Where does our food come from? Directly or indirectly, it all comes from plants! In this course, students will be exposed to the world of plants – with activities and lessons that dabble in all aspects of botany. Students will learn about plant evolution, anatomy, and physiology through hands on activities both in the classroom and outside. Moving backwards through time, from the largest and most complex seed producing plants to the smallest of the

algae, students will explore the broad group of organisms that are essential to life on earth. Being in Aroostook County with access to both forests and agricultural fields, students will explore the plants that we depend on daily.

## Civil Engineering: The Great Bridge Challenge

*Instructor: Justin Lewin*

Most people use engineered structures every day without giving them much thought. Bridges, dams, and multistory buildings are among the greatest accomplishments of civil engineers. In this course students will learn about engineered structures and will have hands on experiences with the typical materials used in bridge construction. Students will be challenged to design and construct bridges using a limited amount of material. Bridges will be evaluated on the weight capacity and distance spanned. This course will help students appreciate the infrastructure they use on a regular basis and may inspire the next generation of civil engineers.

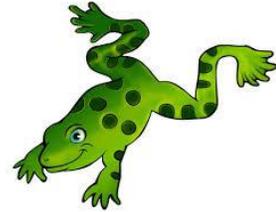


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## **A Hands-on Exploration of Living Things through Dissections**

*Instructor: Kayla Dow*

What do humans, fish, and frogs have in common? You might be surprised! Through a series of dissections, campers will explore the inner workings of a wide variety of critters from all over the animal kingdom to learn what lies below the surface.



## **Exploring the Science of the Great Outdoors**

*Instructor: Kayla Dow*

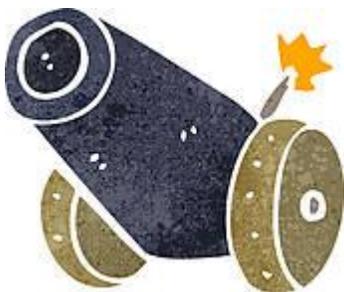
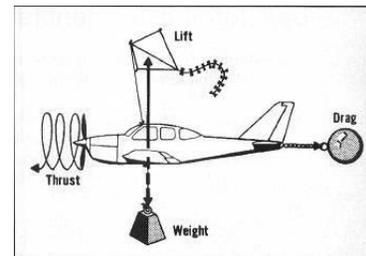


Do you love camping, hiking, and exploring? Do you know what it takes to keep our Nation's woodlands in pristine condition? In this course, you'll learn some of the skills it takes to be a forest ranger, environment engineer, or conservation scientist by exploring the science of the great outdoors!

## **The Science of Flight: Surfing on Air**

*Instructor: Daniel Dow*

Have you ever dreamed of flying? Everything that flies obeys the same simple aerodynamic principles. In this course campers will learn those basic principles that govern the science of flight by building simple flying machines that actually surf on air. Follow in the footsteps of Leonardo DaVinci, the Wright brothers, and many others in the quest to dominate the sky!



## **Ancient Siege Machines**

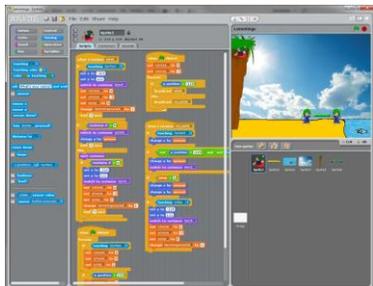
*Instructor: Daniel Dow*

How did the medieval knights and Roman soldiers fight wars without tanks, missiles, and bombs? The answer: they did have them. Learn how ancient civilizations used ropes, wood, and stones to build giant catapults that could launch two thousand pound rock over half a mile! Choose and build your own to see which design is best!

## **Game Programming**

*Instructor: Mark Meyers*

Create your own video games and share them with the world. Using Scratch, you will learn the basics of game design and computer programming. Create your own maze games, platform games, and arcade games and share them with all your friends!



## **ADVANCED Game Programming**

*Instructor: Mark Meyers*

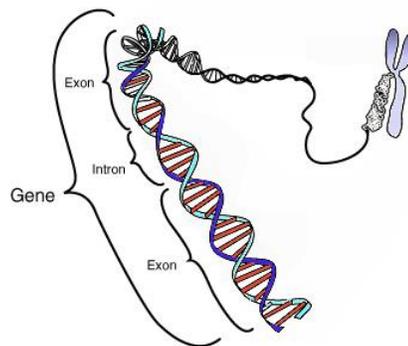
Create your own video games and share them with the world. In this more advanced course, students will get the opportunity to use Python and JavaScript to design games and learn more about computer programming.

## **The Gene Scene**

*Instructor: Joshua Fortmann*

Have you ever wondered how the person you are came to exist? Genes are small particles contained within your cells that hold the blueprints to creation you!

Over the course of this class, we will explore fascinating topics, such as how we inherit traits from family members; creating your own family tree; and how genetics is being used in modern day applications like medicine and forensics. While there will be a lot of learning in this class, there will also be tons of entertaining activities, such as designing your own monster; modeling the structure of DNA; and solving genetic puzzles and riddles.



## **Chemistry in Action!**

*Instructor: Joshua Fortmann*



Chemistry is one of the most interesting sciences! This class will give students hands-on experience in the world of chemistry experiments. We will explore concepts in chemistry through fun and engaging (and occasionally edible) experiments. Examples of activities may include, but are not limited to: Invisible Ink and Oxidation, The Rainbow in a Jar and Density, Instant Ice Cream and Thermodynamics, and The Fried Green Egg

and Acidity and pH. This class will allow students to understand and comprehend challenging concepts in chemistry, while in a fun and engaging environment.

***\*Be sure to submit the electronic version of this 2016 Course Selections Form through your child's CampMinder account.***

**2016 MSSM SUMMER CAMP**  
**Boys' Weeks**  
**Course Selections**

**Camper Name:** \_\_\_\_\_  
First Last

- Camper Week(s):**
- Boys' Week 1: June 26-July 2
  - Boys' Week 2: July 3-July 9
  - Boys' Week 3: July 10-July 16

**Directions:** *Please indicate the order of your top ten choices for courses. Mark a "1" for your first choice and a "10" for your tenth choice. Please do not mark any "ties."*

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	Welcome to Mars, Your New Home
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	Insects, and the Birds Who Eat Them
	Ohh Behave! Investigating Animal Behavior
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	Ancient Siege Machines
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	Chemistry in Action!

*Course offerings are based solely on instructor available.*

