2024 madiSTEM Student Workshop Descriptions

A BIRD'S EYE VIEW OF THE WORLD
Satellite and aerial images are not just cool to view; they can be used for all sorts of important purposes. In this workshop, you will learn the basics of working with satellite and aerial imagery, and then use computer image processing to find a solution to an environmental problem.

ALL THAT GLITTERS
Have you ever wondered what makes your makeup shine? Chances are that shimmer is created by a mineral. Come find out which minerals make your lip gloss shine, discover where they come from, and then make your own.

BEATING THE ODDS: FIGURING OUT PROBABILITY
In this workshop we will play and analyze games and try to figure out how probability works as it relates to rolling dice and calculating how we should make decisions.

BEING A BIRD SLEUTH
Learn to be a citizen scientist in your own backyard by gaining the skills to be an expert birdwatcher. We will go outside to observe birds on the JMU campus using binoculars. The data you collect will be used to inform local agencies about our bird populations. In case of inclement weather, there will be a bird scavenger hunt indoors.

COLORFUL CRYSTALS
We will explore the world-class crystals and fluorescent minerals in the JMU Mineral Museum and look at some of our miniature collection under microscopes. Students will then choose their own crystals and create tiny but beautiful mineral displays in small boxes to take home with them.

CREATE YOUR OWN APPS WITH APP INVENTOR!
Have you ever thought about being the creator behind the apps on your phone or tablet? It could actually be you! Let's explore the process of making apps for both Android and iPhone using a tool called App Inventor. In this workshop, you'll be designing your own painting app, allowing you to express your creativity by drawing with your preferred colors and sharing your artwork with friends.

CUTTING WITH CODE
We make things out of wood, stone, plastic, and fabric. But first we make them out of numbers and code---on a computer. In this workshop, you'll create your own custom sticker by drawing a design, coding it up in a programming language, and sending it to a programmable cutting tool.

HERO TRAINING 101: LEARNING CPR WITH MANIKINS
Prepare yourself to be a young life saver! Learn the super skill of CPR in a fun, interactive way using high-tech Manikins. This will prepare you for future formal training. Learn, practice, and embark on your journey to becoming a life saver hero in your community!

LET'S MAKE A DEAL
In the famous Monty Hall problem, a contestant chooses from three doors, one of which has a prize. After the contestant makes their initial choice, the host opens one of the other losing doors and then gives the contestant the option of switching to the other closed door. Should they switch? We will play the game for candy prizes, discuss the history, and determine the best strategy to maximize the odds of winning.

MAKING SOAP
At one point in history, soap was heavily taxed and was a luxury item only available to the rich. Now we all use soap everyday as handwashing is one of the most important ways to prevent the spread of disease. In this workshop, we will make soap that you will be able to take with you.

MIMICKING BRAIN DISEASE
Proteins are essential for your body to function. Diseases such as Parkinsons and Alzheimers result in misfolded and aggregated proteins in the brain. This workshop will use common household items to illustrate how environmental conditions can misfold and aggregate proteins.

MINI CAMS FOR MINI MAMMALS: USING TECH TO STUDY FRAGILE SPECIES
Students will learn how to use a device that attracts, weighs and takes video of small mammals, and then help process and analyze real research data from live devices that have been monitoring the native species in our area. We will see how this data helps biologists answer questions like: Why do some mammals shrink their brain/body mass during winter? Why do some have venom glands? How does a mammal that's not a bat use echolocation? Students will work with the devices to collect sample data with the help of small toy animals, and taxidermic animals will also be available.

OPERATION STATISTICS
Which surgery tool is better? Does it matter who the surgeon is? Is one tool better for one type of operation but not the other? Come play the game Operation! We will use statistics to examine whether a store-bought tweezer is better than the one provided with the game while learning about collecting and analyzing data.

PI IS NOT JUST SOMETHING WE EAT!
We all love PIE, but what is PI? We will measure various properties and characteristics of circular objects to discover PI. You will learn measuring techniques and how to record and visualize the data you collect on a computer.

PLAYING WITH YOUR FOOD
Have you ever wondered what makes gummy worms gummy? Or why there is guar gum in your jam? Join us and explore the chemistry involved in your daily life! We will learn more about the chemicals that you interact with regularly and harness the power of chemical reactions to make delicious desserts.

POSITIVE WIFI
Prevent Others Stealing your Internet in Five (POSITIVE) on your WiFi. Home networking WiFi and the associated internet service can be easily hacked into by strangers if the home network wireless router is not configured correctly. You will learn how to protect your home network from strangers.

SCIENCE SLEUTHS: AN ESCAPE ROOM CHALLENGE
We must solve a science mystery by finding the best available information on a topic. We will use source evaluation methods called "lateral and vertical reading" to solve the mystery with the help of JMU librarians. You will learn about the SIFT & PICK method of reading, then apply it to ESCAPE the room by unlocking a treasure box. You will learn about the importance of fact-checking while working together in small teams to solve the puzzle.

SKITTLE STATISTICS
Learn valuable statistical analysis tricks with a fun and tasty twist!

THE GREAT MADISTEM BAKING SHOW!
Calling all bakers! Did you know that professional bakers have their own mathematical language? Come investigate the world of baker's math! Roll up your sleeves, put your baker's math skills to the test, and measure out your dry ingredients to create your own custom baking mix you can take home!

WHO DONE IT? - USING DNA EVIDENCE TO SOLVE A CRIME
We will use a scientific technique called *gel electrophoresis* to solve the mystery of a missing cell phone. We will also discuss possible careers in DNA science related fields.

YOUR HEARTBEAT...IT'S ELECTRIC!
Come be a physiologist for the day and study the fascinating subject of you, specifically your heart! We will look at the anatomy (structure) of the heart and how it pumps blood. This will include talking about the electrical system that makes your heart beat...you will also get to see what this looks like on an electrocardiogram (EKG), a tool doctors use in the hospital to determine a patient's heart health.