

2026 madiSTEM Student Workshop Descriptions

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.

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.

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.

DESIGN LAB: UNLEASH YOUR INNER ARCHITECT!

In this interactive and hands-on workshop, you will become architects and urban planners exploring your ideas to make a neighborhood in Harrisonburg the best place it can be! You will think about the pros and cons and then you will get the chance to dream big and create the world you want to see.

DNA DETECTIVES: HOW SCIENTISTS “EDIT” LIFE

Have you ever wondered how scientists help plants fight diseases, grow stronger, or survive drought? In this fun, hands-on workshop, you'll become a plant scientist and learn how a powerful tool called CRISPR can “edit” DNA—like using tiny scissors to fix instructions inside plants. You'll build DNA models, cut and replace “genes,” and discover how genome editing can help create healthier crops and protect our planet. Come explore and see how you can lead the future of plant biotechnology!

GAME MAKERS: BUILD YOUR OWN APP WITH MIT APP INVENTOR!

Have you ever wanted to create your own game? In this hands-on workshop, you'll learn how to use MIT App Inventor to design and build your very own game app! No coding experience? No problem! We'll guide you step-by-step as you bring your ideas to life. By the end of the session, you'll not only have a game to share with friends but also the confidence to keep creating apps. Let's code, play, and have fun!

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.

MYSTERIOUS SYMPTOMS

Medicine is full of mysteries, and it takes a skilled detective to solve them and help patients feel better! Join the JMU Physician Assistant students for an exciting hands-on workshop where you'll use medical tools like stethoscopes and reflex hammers to investigate symptoms and uncover the secrets behind common illnesses.

MYSTERY TUBES: CAN YOU CRACK THE CODE?

In this session, you will engage with the Nature of Science and the engineering design process to determine what's inside a "Mystery Tube". Using observation and engineering design, you'll have an opportunity to test your hypotheses and collaborate with your peers to create solutions.

ORANGE YOU A CUTIE

Do you like Cutie oranges? Have you ever wondered or noticed if the bigger ones weigh more? In this hands-on measuring workshop, we will use the oranges to collect data measurements, look at the data for patterns, and see if there are any relationships and what this might mean. Then, of course, we get to eat them!

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. Demonstrate how home networking WiFi and associated internet service can be easily hacked into by strangers if the home network wireless router is not configured correctly.

POWER UP! EXPLORING WIND AND SOLAR ENERGY

Join us for exciting hands-on activities where you'll explore the fascinating world of renewable energy! You'll discover how wind and solar energy can power everyday devices. Choose your experiment: 1. Use a wind turbine to see how wind generates electricity and investigate factors that affect energy output. 2. Experiment with a solar panel setup to explore how electricity is created from sunlight. Measure the energy your setup generates and find out if it's enough to power a small light. Join us to learn about renewable energy science and how you can contribute to a sustainable future!

READY, SET, HISS! INVESTIGATE HOW THE ENVIRONMENT AFFECTS MADAGASCAR HISSING COCKROACH BEHAVIOR

Have you ever thought about what environment a cockroach finds comfortable? How would you ask it where it would like to hangout? In this workshop we will answer those two questions experimentally using student designed test boxes and live Madagascar hissing cockroaches.

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.

SEEING THE INVISIBLE

Can you see a cell? What about DNA? In this workshop, you will have hands-on experience extracting DNA, using a microscope, and observing and describing different types of cells. If you are interested in biology or just curious to learn more about DNA and cells, join us for this experience!

SKITTLE STATISTICS

In this workshop, we will use Skittles to explore chance, make predictions, test our guesses, and explore probability in a fun and visual way—using candy as our data! Together, we will see how “random” things don’t always turn out the way we expect!

THE SECRET LIFE OF THE BODY: YOUR HIDDEN SUPERPOWERS

What are your superpowers? Why do they sometimes make you feel happy, tired, or moody? In this fun, easy-to-understand, and bilingual (Spanish-English) workshop, you’ll learn about the endocrine system, your body’s special message-sending team that helps everything work together. You’ll discover how it helps control growing, energy, feelings, sleep, and the changes that happen during puberty. Learning how your body works can help you take better care of yourself, feel more confident, and understand that these changes are a normal part of growing up.

THE WHAT'S-INSIDE STATION

Have you ever wondered what is inside a phone or toaster? So many engineered devices in our daily lives remain a mystery to too many of us! Learn to use hand tools to open up these mystery boxes and take them apart! What are all of those little things inside? Let's figure it out together. Will it be difficult? Maybe, but I am confident you are up for the challenge.

WHAT COLOR IS THAT?

Did you know that color can be measured? If you know how light makes color and how our eyes see it, you can understand how a color can be given a numerical value so that you can tell everyone exactly what color you want. We will talk about color mixing and play a game.

WHAT DOESN'T KILL YOU MAKES YOU STRONGER: VENOMOUS CONE SNAILS AND THE PROMISE OF LIFE-SAVING MEDICINES

Have you ever heard of fish-hunting snails? Snails are slow moving so how in the world could they ever catch a fast-moving prey? We will learn about a fascinating group of predatory marine animals with beautifully decorated shells and a powerful secret weapon. Cone snails have adapted an ingenious method for capturing fish using a harpoon-like extension that contains poisonous venom. Studying the venom has led to possibilities for new life-saving medicines but we need to study the evolution of the cone snail family.

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.