

Both virtual and in-person field trip opportunities are available. Please note that these will be scheduled on a first-come, first-served basis. The Discovery Connections team will follow up as timely as possible to confirm status and logistics.

**IN-PERSON:** In-person experiences will take at the Discovery Building teaching labs located on the research floors, staffed with scientists committed to bringing cutting-edge science experiences to students of all ages. Max capacity 50 students.

**VIRTUAL:** Virtual experiences will take place online using preferred approved platforms. Each workshop is designed to accommodate classrooms participating on individual devices or collectively as a classroom preferably no more than 50 students per session .

## **Spring 2023 (In-Person: February-May)**

Choose two topics from below offerings when completing application.

### **Sustainability of Energy**

The U.S. uses 99,578,000,000,000 BTU of energy each year, but less than 10% of that energy comes from renewable sources. In this lab experience, students will explore energy usage and production by conducting a mock energy audit to model home and school energy use, and by optimizing a windmill energy production system. Students will be introduced to the research goals of the WI Energy Institute on UW-Madison campus and their efforts to transition towards new, clean energy systems and solutions.

### **Robotics, Automation, and Plant Research**

Learn about techniques used by the UW-Madison Botany Labs (Spalding Lab & Gilroy Lab) that combine robotics, supercomputers, and engineering for their research on plants, crop systems, and growing plants in space. Activities will focus on interdisciplinary (a mix of botany, computer science, engineering, math, etc.) applications to study plants. Small group activities that combine ideas of robotics, automation, and plant research will be part of the experience.

### **Hibernation: 13-Lined Ground Squirrel Metabolism**

When animals hibernate, it doesn't mean that they're just sleeping for the winter! There are many changes that happen to an animal's physiology and metabolism when hibernation begins, and students will spend this field trip exploring those changes. Examine hands-on models of a ground squirrel to determine what changes when the animals hibernate, explore the delicate energy balances required to keep an animal alive when food becomes scarce, and learn about how bacteria in the animal's gut may play a role in surviving the winter.

### **Sustainable Energy Through Motion**

In a world with a changing climate, sustainable energy production is vital to our future success. Triboelectric nanogenerators offer portable and localized electricity production without the need for batteries. Students in this hands-on lab will learn the theory behind this technology, discuss its applications, and build their own nanogenerators.



## Spring 2023 (In-Person: continued)

### **Stem Cells: Directed Differentiation and Cryopreservation**

Pluripotent stem cells have the remarkable ability to become any type of cell found in the human body. Through hands-on lab activities, students will conduct an experiment to learn how scientists turn pluripotent stem cells into specialized cells and store them in low temperatures using cryopreservation. Note: Students must be wearing closed-toe shoes and long pants to fully participate in the activities.

### **Manipulating Materials to Engineer their Properties (8th grade only)**

In engineering, it's important to choose a material that has the right properties for the job you want it to do. The properties a materials has depends upon what atoms the material contains and how the material is made or manufactured. In this hands-on field trip, students will heat treat different materials to change their properties. Then the students will measure those changes to understand how scientists and engineers can alter a material to fit their needs!

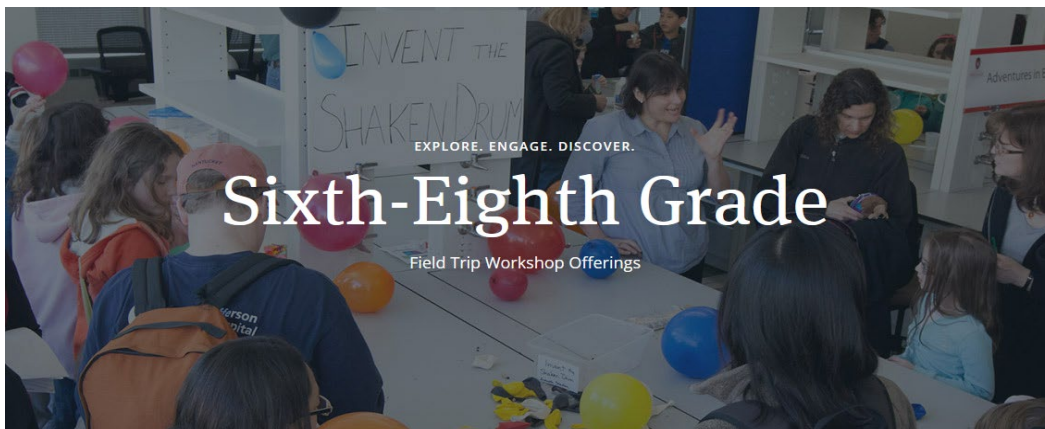
## Spring 2023 (Virtual: February-May)

### **Meet the Lab Collection**

Did you know that scientists work together in teams to discover answers to unique questions? Meet diverse scientists and explore science with them in a set of online learning experiences the scientists helped to create. The project is a Discovery Building partnership with PBS Wisconsin Education as part of the Timothy William Trout Education Fund, a gift of Monroe and Sandra Trout. These learning opportunities show how diverse groups of people work together across disciplines to pursue answers to questions about our world. The students complete the activities based on your teaching schedule prior to the event and the field trip will be an online conversation with scientists to learn more about them and their work.

**Selecting this option when applying will prompt you to indicate your preference of the following lab/topics:**

- 1. Meet the Lab: Data Decoders: Superpowered by Computers** - The Solis-Lemus lab develops math models to answer biological questions. The lab deals with modern big data in living systems and uses math to better understand life.
- 2. Meet the Lab: Virus Investigators: Superpowered by Electron Microscopes** - The Virology Research Team at the Morgridge Institute uses multiple approaches to accelerate understanding of virus replication including super amazing technologies that can see itsy bitsy viruses in great detail.
- 3. Meet the Lab: Nervous System Engineers Superpowered by Stem Cells** - The Stem Cell Bioprocessing and Regenerative Biomaterials Lab bioengineers neural tissue to study the nervous system. Brains, spines, nerves, oh my!
- 4. Meet the Lab: Cancer Detectives Superpowered by Laser Microscopes** - The Optical Microscopy in Medicine Lab uses high-powered laser microscopes to research cancer cell growth!
- 5. Meet the Lab: Antibiotic Hunters Superpowered by Students** - The Tiny Earth Network discovers new antibiotics through the soil; and students do the hunting!



## Spring 2023 (Virtual: Continued)

### **A Day in the Life of a Stem Cell Scientist**

Have you ever wondered what a science lab actually looks like and who works in a science lab? In this experience you'll get to take a behind-the-scenes tour of a stem cell research lab at UW-Madison - with a scientist as the tour guide! After the tour of the lab, you'll get to chat with scientists about what it's like to be a scientist. It's a perfect opportunity to hear more about how they knew they wanted to be a scientist, what their science career pathway was like and what a day in the life of scientist looks like.

### **My Story in Science So Far: From Voices Underrepresented in Science**

Join Graduate Research Scholars (GRS) for an engaging and interactive discussion with scientists and researchers who are underrepresented in science, engineering, technology and math careers. Engage with UW-Madison students and learn about their journey in STEM. How might your journey be similar or different from theirs?

### **Material Science Explorations**

**Choose from one of two options. Classroom kit materials included when applicable.**

1. **Renewable Energy with Everyday Materials** - Did you know it's possible to make a device using common household materials that harnesses static electricity to light up an LED? In this experience, you will learn what a triboelectric nanogenerator is and then get to build one! After participating in the activity, you'll get to chat with scientists who study materials and how they can improve our lives.
2. **Creating Art with Polarized Light** - Create your very own work of art that's only visible when viewed between two polarizing filters!