

2018 STEM DAY DESCRIPTIONS

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Dirty Jobs - Recycling, Stormwater, and Wastewater

Presented by Tina Stevens, Nicole Fornof, & Laura Denlinger

Join us as we talk about "Dirty Jobs" that are a necessary part of your everyday life! We will talk about recycling, what we do and why we do it in Monroe County. You will also have the opportunity to participate in a hands-on demonstration about what stormwater is, why it is important to where we live, and what you might do everyday to keep the mighty Lake Ontario clean!

Mendon Centerpede: Building an iPad Game

Presented by Scott J. Kleper

Mendon Centerpede is a iPad remake of the classic Centipede video game. The only problem is that the centipede seems to crawl right off the screen and never come back!

In this workshop, we'll collaboratively write the logic that tells the centipede how to move and split apart. Participants will come up with potential solutions, which will be translated into Swift code and run on an iPad simulator. Participants will also receive a paper design toolkit that they can use to prototype what other screens of the app would look like.

Technology Saves Rhinos

Presented by Michelle Chiantera, Vice President, Global Partner Marketing

Do you want to save animals for a living?

During the session, we will discuss an initiative called Connected Conservation led by Dimension Data and Cisco, leading technology companies across the globe. Connected Conservation is aimed at reducing the number of rhinos being poached in South Africa. The two companies implemented some of the world's most sophisticated technology in a move to proactively intervene and stop potential poachers entering the reserve illegally before they could get to the rhino.

Technology is a powerful tool in today's day and age. It powers the internet, enables us to FaceTime with our friends and family and it even saves animals. You will learn about the possibilities technology has to offer now and in the future.

Mitosis - How You Grow!

Presented by Bala Bhagavath, M.D.

Mitosis is important for your growth as it makes more identical cells. In this workshop, you will learn that all living beings are made of cells. You will learn how these cells make more cells just like themselves in order for you to grow, become tall, and put on weight. The process of duplication of cells is called Mitosis and Dr. Bhagavath will use power point presentation and videos and a fun hands-on activity with modeling clay to help you understand this. You will learn that humans have 23 pairs of chromosomes in each cell of the body and mosquitoes have only 3 pairs of chromosomes in each of their cells. Because it will be complex for you to make 23 pairs of chromosomes using modeling clay, you will use the mosquitoes as a model as they have only three pairs of chromosomes in each cell of their body. The video will demonstrate that one chromosome in each pair comes from mom and one from dad which is an important concept. You will use different colored modeling clay to differentiate mom chromosome from dad chromosome.

As you go through the fun exercise of how the cell divided, you will be thrilled to see that irrespective of the order in which the chromosomes line up, there will be one chromosome from dad and one from mom in the two identical cells that are finally formed from the single cell.

Math Magic and Puzzles

Presented by Tony Harkin, Ph.D.

Learn how to do magic tricks with simple math that will make your friends think you can read their minds! There will also be lots of fun hands-on puzzles and brain teasers to play with and solve, including a computer puzzle where cannibals will eat you if you fail.

Inhale-Exhale: How Do Your Lungs Work?

Presented by Theresa Bingemann, M.D. and Anitha Shrikhande, M.D.

Have you ever wondered what your doctors are listening for when they examine your lungs? You will have a chance to listen to lungs, learn about air flow through the lungs, and the sounds made when airflow is disrupted. You will learn about the anatomy of the respiratory tract and what factors influence the flow of air through the lungs. We will learn how airway resistance affects flow.

Statistics In Real Life

Presented by Xueya Cai

This will be a fun workshop introducing statistics used in real life, height, weight, flipping coins, and raffle tickets.

FIRST Robotics Team 3181 Power Up Robot

Presented by Brian Holliday and Team Members

FIRST robotics Team 3181 will provide some background about the team and what we had to do for this years FIRST robotics competition. We show the students the same video we saw on January 6 this year with teams from around the world. Groups of students will brainstorm their ideas how to build a robot to accomplish the goals of the competition and present them to the other groups. The last step will be to compare their ideas to the robot that the high school students created followed by a brief demonstration.

Introduction to Chemical Reactions

Presented by Peyton Kunselman

In this workshop, basic chemical reactions will be demonstrated. The main demonstration that I'm focusing on is the classic "Elephant's Toothpaste" reaction. Kids will be able to participate in a smaller

scale reaction that will allow them to actively participate.

There will be a discussion afterwards about what I do and what there is to do in chemistry. Kids can feel free to ask as many questions as they like.

Play with Polymers - Making Instant Snow and more...

Presented by Renuka Manchanayakage, Ph.D.

Do you miss snow in June? Owing to some interesting properties of large molecules called polymers, you can make instant snow anytime. Do you know that you use polymers almost everyday? In this workshop, you will make a polymer and learn more about it. You will also explore properties of different polymers by making instant snow, writing a secret message to a friend by using invisible ink and making your own UV light detecting bracelet.

Veterinary Medicine 101

Presented by Katie Zink, DVM

I will talk to the students about what becoming a veterinarian involves (Schooling, testing, etc). I will also talk about the other careers that make up a "veterinary team". I will show several pictures which walk the students through a physical examination on a dog, show some interesting radiographs, and bring in some instruments. I will have a bandaging station, math calculation station, fine motor skill station, and a station that will have a lot of models of teeth, joints, etc, and some other interesting things for the students to look at.

Optics Suitcase

Presented by Dustin Froula & Danae Polsin

Optics is the future of our world--as conventional electronics meet their limitations many industries are looking to photonics as a way to continue growth and move our technologies into the next century. This presentation is aimed at engaging the students in optics (or photonics) through fun activities that will provide students an opportunity to explore light and see the connection between materials and photonics.

Crime Scene Investigation at the Medical Center

Presented by Megan Rashid & Madhvi Bansal

CSI: Crime Scene Investigation at the Medical Center

There has been a crime at the University of Rochester Medical Center. Can you use your powers of deductive reasoning and your knowledge of forensic science, genetics and microbiology to identify the

criminal, prove your case, and determine the treatment for a lab worker who was exposed to an unknown substance?

From DNA to Dude: The Basics of Genetics

Presented by Frank Salamone, M.D.

Instructions are needed to build everything from IKEA chairs to human beings. In the case of living things, instructions are written in sentences of DNA letters. These sentences are known as genes. Our genes determine many of our traits, including our eye color and hair color. Genetics is the study of how these genes are passed from individual to individual.

In this workshop, we will talk about how a monk figured out the basics of how genes work by experimenting in his garden with pea plants. We will then survey the class and determine the frequency of various human traits. Finally, we will do an experiment where we construct a “frankendog” from genes that we concoct with our imagination.

Light and Lasers

Presented by Igor Pastirk, Ph.D. & Sanela Iampa-Pastirk, Ph.D.

Light is enabler of life as we know it and has been subject of studies since ancient times. Optics is the science that studies how light interacts with objects around us. The 20th century, the one in which your parents and grandparents were born, was dominated by the great scientific phenomenon called electricity. Yours, the 21st century is dominated by the phenomenon of **light**. Light has a dual personality: sometimes it behaves as particles called photons, sometimes it behaves as waves. We will learn where light comes from, what color it is and how does it travel through our world. We will use optics to bend it, bounce it and make it change colors. When you train the light to behave well, it can travel far and not lose focus. Only well behaved and excited light earns the title of LASER.

Lasers are everywhere around us; they can be very gentle and help an eye doctor repair your vision, or they can cut metal for car engines. They can carry the information through optical fibers and make the internet possible or carry on a tune on a CD player (ask Mom and Dad).

The workshop will have brief 10-15 minute presentation describing light and how we study it. We will show how a basic laser is (currently) the most used photonics device. Due to safety concerns – students will not handle the laser pointer. The remainder of the workshop will include hands-on demonstration of light properties using LEDs demonstrating the laser (pointer) and letting students explore light color and optics.