



Women *in* STEM

CONFERENCE

Saturday, March 26, 2022

8:45 am – 1:15 pm

Virtual - Zoom link will be sent after registration

Registration closes March 4, 2022

The Northboro Junior Woman's Club will be holding its fourteenth "Women in Science, Technology, Engineering and Math (STEM) Conference" to give middle school girls the opportunity to explore careers in science, technology, engineering and math. After an opening presentation, the girls will be able to attend four interactive career workshops. Presenters will represent fields such as Architecture, Nursing, Patent Law, Biotechnology, Engineering, Environmental Science, Finance, Forensics, Biology, Chemistry and Medicine. The presenters will explain what they do in their occupation and what sparked their interest in the field, share different tips on courses of study needed for their profession, and provide hands-on exploration/activities.

Brief Q&A sessions will take place between workshops.

This program has historically been very popular and always fills to capacity.

Please sign up early to ensure your spot!

After viewing the detailed description of the workshops on the following page,

Please go to this link to register and choose your workshops:

[2022 NJWC Virtual Women in STEM Conference](#)

NO information collected via this registration will be shared.

If you have any questions please contact us via email at: STEM@northborojuniors.org

or call Kathy at 513-703-6773.

Some workshops will have supplies that we will provide. Pick up of these supplies will take place on March 19, 2022. Details about supply pick up will be emailed.

WORKSHOPS

Dream It, Design It, Build It -Architect – If you were to explore a day in the life of an architect, it could look radically different from one day to the next. Learn more about the broad array of tasks, projects types, positions, and personalities in this challenging profession. Session will include discussion on technology, education path, salary ranges, and a mock design project.

Dance and Play with Physics -Physics - Physics is everywhere and Physics is what we apply everyday for activities like eating, walking, playing and dancing. Everyday Physics will be explained through this talk and simple demonstrations.

Radomes: How design, materials, and engineering come together to build structures that protect radar antennas and airplane signals! -Engineering - In this workshop we will explore the concepts of materials and design to see how they come together when radomes are engineered. Learn about Saint Gobain's process of making these structures and the people who help make these products from concept design right down to the manufacturing floor.

Science in the Kitchen - STEM Teacher and Chemistry PhD Candidate - We'll explore the concept of natural selection and demonstrate ways to use pH testing and chromatography to analyze everyday items using common kitchen materials.

Working in Drug Discovery, The Hunt to Find New Medicines - Research Scientist Chemistry/Biology - Explore the world of biomedical research through the eyes of a scientist. We will extract DNA from strawberries and talk about what it is like to work in the lab to help find new medicines!

Wearable Lights! - Electrical Engineering - Add a little shine to your day by using lights to make something you can wear! Using an LED (small light-emitting diode) and a battery, you can put lights in your hair and on your clothes!

Designing a Building's Anatomy -Mechanical Engineering - Look up, look down, look all around! Learn about the engineered equivalent to the brain, heart, lungs, and nerves of a typical building and how to identify objects you see everyday, hidden in plain sight. Explore a 3D model to see how an engineer designs these systems and learn why they are important to you

Surface Tension (Tie-Dye Milk) - Chemical and Materials Engineering - Matter exists in the form of solids, liquids, and gasses. Surface tension is a property of liquids that describes the attraction of liquid particles at the surface. Surface tension is a property of liquid; this workshop delves into the property of surface tension, which is common in material all around us.

Dam Engineer - Geotechnical Engineer - Let's learn more about dams and explore the inner workings of an embankment dam.

Polymers and Slime - Engineering/Chemist - What are polymers? Let's make some!

Have you considered nursing as a career in STEM? - Nursing - In this workshop you will hear from current practical nursing students about their decision to go into nursing and get a glimpse of the profession of nursing! We will talk about the different paths into nursing, what a nurse does, and how math and science are a part of nursing.

Air Traffic Control - Software Engineer - How does an airplane go from A to B? Come learn how air traffic controllers help pilots navigate and land planes everyday!

Food Energy - Electrical Engineer - In this module, students use food to light an LED clock (or LED light) as they learn how a battery works in a simple circuit and how chemical energy changes to electrical energy. As they learn more about electrical energy, they better understand the concepts of voltage, current and resistance.

AI Smart Picker - Computer Science - Machine Learning, is the new generation of AI systems that have the ability to make predictions. Participants will learn how machine learning works in computer science by creating game projects with machine learning models to recognize images. This will create an opportunity for them to be part of the rapidly evolving field of AI through hands-on and fun activities.

Yummy Tower! -Structural Engineer/Civil Engineer - Structural design is the methodical investigation of the stability, strength and rigidity of structures. The basic objective in structural analysis and design is to produce safe and strong structures that are resistant to all applied loads without failure during its intended life. In this module you will learn the key parameters of safe, strong and tall structures. The challenge is to build the most effective and cost efficient building!

How Scientists Play a Role in Criminal Investigations - Forensic Science - What exactly is Forensic Science? In this workshop, you'll explore the different forensic "disciplines" as well as the variety of evidence types examined at a crime scene and in the laboratory. Through hands-on testing activities, you'll learn the basics of chromatography, friction ridge (fingerprint) analysis, trace evidence collection, and more. The results you obtain may assist in solving a crime!

Suturing Like Surgeons -Surgery/Medicine - Have you ever wondered what exactly surgeons do in the operating room? Here, you can learn how to tie knots and close wounds and cuts of all different sizes, just like surgeons do!

Intellectual Property - Patent Law- Scientific discoveries generate many inventive technologies that need to be protected. Come explore alternative careers in science related to intellectual property and patent law.

Balloons are not just for birthday parties! - Biomedical Engineering - Did you know that medical device engineers design balloons to go inside the body? Many minimally invasive medical devices (meaning the surgery can happen through a small hole, rather than a big incision), are designed to include a deflated balloon to get to the right spot in the body and inflated to open a vessel or help to deliver an implant. This workshop we will build a basic balloon catheter together and talk through designing minimally invasive medical devices.

I Scream, You Scream, We all Scream for Ice Cream!! -Engineering - What is the science behind making ice cream in a bag?

Atomic Photography in Drug Discovery - Structural Biology/Computational Chemistry- Visualizing and understanding molecules in 3D is a critical aspect in drug discovery. This workshop will introduce the technique called X-ray crystallography, a method which can take 3D atomic snapshots of molecules in action. The visual demonstration will include the molecular structures of DNA and proteins. As a group, we will discuss how scientists can use this information to help design therapeutics for diseases.

How do scientists discover new medicines? - Research Scientist - We will walk you through the basic science of identifying new medicines and perform a fun science experiment that we would run in our labs today!

What's that Machine Learning? - Software and Principal Machine Learning Engineer - How are we training machines to learn us!

The Flexibility of a STEM Education. Journey from Engineering to Finance - Finance - An interactive conversation with participants sharing images of phases from my journey. Including international places traveled to for work. Throughout the discussion asking questions and educating them about the process or products I

worked on (Fiber, LCD glass, Securities, Big Data/Data Science). Aim is to leave the participant feeling excited by the opportunities available to them and that STEM careers are dynamic.

Paper Towel Chromatography: Separating the sludge - Biology - In the world of biotech, discovering a drug is just the beginning! To bring a product to market you also need a robust manufacturing process. Scientists must grow thousands of liters of cells and then employ biochemistry principles to pull out one molecule of interest from all the surrounding junk. We'll talk about the world of bio-pharmaceutical drug manufacturing ('bioprocess') and then do an activity where we employ a common technique called chromatography to do our very own separation experiment!

Going with the Flow!- Environmental Science - Make a splash by exploring and measuring the pH of everyday household items. Afterwards, you may not think of these items the same way! Learn why pH is a crucial environmental indicator and the significant problem of ocean acidification.

STEM for Real Life - Science and Technology- Join me as I take you on a fun tour of life in the lab, where Science and Technology meet! You will see and learn how different scientists and engineers work together to make groundbreaking discoveries; from cures for diseases, to the things you use every day!

Copper Tape Circuits - Electrical/Computer Engineering- Learn what it is like to be an electrical/computer engineer and build a copper tape circuit.

Winning at Search-Computer Science/Technology- Walk through the basics of search engine optimization and discover ways to get your content visible by taking advantage of what we know about Google's algorithms.

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