

2022 GESTEM Workshop Descriptions

Track	Workshop ID	Presentation Title	Host Organization	Room	Short Description
Track 1 - Power It					
We depend on natural resources such as water, wind, solar energy and oil to survive and thrive on Earth					
1	6	Power Generation: Solar & Wind	Xcel Energy	NRTH 1405	Electricity is a huge part of everyone's day to day life. But where does it come from? How are our natural resources utilized to harness that power? Join Xcel Energy's GROW BRG to learn about the basics of power generation and participate in a hands on activity featuring solar and wind energy.
1	14	Steady Hand Game	Keysight Technologies	NRTH 3205	In this session, students explore the fundamentals of electricity. They build an electrical circuit that includes an energy source, resistance, a light and a switch. The completed assembly is also a steady hand game that students will have fun playing and demonstrating to family and friends
1	15	Fracturing with Jello	Society of Petroleum Engineers	NRTH 3207	Shale is the most common type of rock found to hold fragments of organic material required to produce oil and gas. Since this material is locked in layers of rock, simply drilling through the formation is not enough to retrieve and release the liquid hydrocarbons. Instead, the rocks must be broken (or fractured) using a highly pressurized water solution. Fracturing fluid is an essential component of the shale gas extraction process. Water makes up 98% to 99.2% of the fluids used for fracture treatments. The remaining 0.8% consists of friction-reducing additives, which allow the oil and natural gas to flow easily from the reservoir into the well. This activity aims to demonstrate how fracturing fluid, under pressure, is able to create a fissure in the rock layer. Students will be able to see the syrup come out at a high velocity to crack the gelatin. The gelatin, however, will not hold the syrup in like other rock materials will.
1	18	Racing Toward Renewable Energy	NREL	NRTH Atrium A	At this point, you probably know we need to move away from cars fueled by fossil fuels, but did you know research on alternative fuels is happening right here in Colorado? Join NREL to learn more about this research and build and race cars that use alternative fuel sources.
1	24	CubeSat Solar Power!	Redwire Space	Science 1010	Learn how to design a deployable solar array for a CubeSat! Learn about the history and design basics of on-orbit power collection. Experiment with different architectures to get the best mechanical, electrical, and deployable performance. Then you will get to build and deploy your own!
Track 2 - Tech It					
Your phone, tablet and computer all rely on electrical circuits and data networks to type emails, watch movies, open apps and play Candy Crush					
2	3	Tic Tac Toe as a Service	Bandwidth Inc.	NRTH 1207	SaaS via public APIs. Confused? Then join us as we break it down through the lens of Tic-Tac-Toe. Come with no knowledge and leave with a basic understanding of how pretty much the entire internet works! (Also, candy!)
2	7	Network in a box	Bit by Bit Analytics, LTD	NRTH 1408	Network in a box is a standalone, hands on interactive lab. Students will build a 5 site network environment comprised of analog / digital phones, routers and switches. Once completed, they will be able to make phone calls between stations and see how phone calls and data are sent across the network.
2	13	Working Wonders with Water	Carollo Engineers	NRTH 3202	Did you know that more than 800 million people around the world do not have access to safe drinking water? Come check out how you can make a difference by learning how to work wonders with water by building your very own water filter!
2	29	Code with Google	Google	Science 2001	Come join women in the industry for an exploration of what's possible with coding! Technology continues to transform the way we live and work, and women should be a part of that transformation.
Track 3 - Build It					
Man-made structures like buildings, bridges and airplanes provide shelter and allow us to travel with ease around the globe					
3	1	She Sieves Sweet Stuff in the Soils Lab	AECOM	NRTH 1003	Join AECOM female engineers for a workshop on soil gradation analysis using "soil sieves"! Soil sampling is integral to geotechnical engineering including foundation design and slope stability analysis. In this workshop, the young ladies will create their own soil sieves and use candy as representative soil sizes to complete soil gradation analysis.
3	2	Engineer Your Way Through the Clay	Eugene Lynne	NRTH 1005	Our workshop will provide you with perspective on how transportation corridors are planned. We will use a variety of craft materials to build a green landscape, then introduce destinations (school, shopping, home) and modes of transportation (bike, car, transit, aviation) to arrive at your destinations.
3	10	Brooklyn Bridge is Falling Down	Burns & McDonnell	NRTH 1605	The Brooklyn Bridge is reaching the maximum lifespan it was designed for and is starting to show signs of aging. Burns & McDonnell structural engineers have been hired to design a stronger, state-of-the-art bridge to support the heavy, rapidly growing traffic volume and need your help to come up with the best design.
3	11	Graham Cracker Construction	Hensel Phelps Construction Co.	NRTH 1606	We need to build a graham cracker house for our Teddy Graham family and they have very specific requirements! We need you to design the house and build it on time and within budget using a plethora of candy, frosting, crackers and other goodies as specified by the Graham family.
3	5	Why Ceramics	Coorstek	NRTH 3210	CoorsTek's workshop will introduce students to engineered ceramics. This workshop will teach you the basic processes to making ceramics: material preparation, forming, firing, and finishing! We're going to teach you about processing ceramics by having you make playdough and baking it. You might be surprised to hear you can learn a lot about making ceramics from playdough making.

3	14	The Brownie Factory	Terumo Blood & Cell Technologies	Science 1117	Welcome to The Brownie Factory! It's all hands on deck as we have a large customer order to fill! Participants will learn how high rate manufacturing facilities have learned to efficiently manage assembly lines through a hands-on simulation. Every girl will leave with their own brownie mix and recipe.
Track 4 - Examine It					
Science is essential to medical advances that help animals and people live longer, healthier lives					
4	5	What Mr. Potato Head, Mind Control, and the Game Operation have in Common	Medtronic	NRTH 1403	Surgical navigation precisely tracks instruments and patient anatomy throughout neurosurgery. This area of bioengineering requires knowledge of imaging modalities, motion capture, electromagnetics, and medicine. Come see how YOU can combine these exciting technologies by participating in our interactive demonstrations.
4	9	The KNEEd to Get Back to Speed	Stryker	NRTH 1604	The KNEEd to Get Back to Speed will give participants an opportunity to learn about how engineering can be applied to the human body, specifically in the field of medical device design for Sports Medicine.
4	23	The central molecules of biology, revealed	Horizon Discovery PKI	Science 1008	DNA is the central molecule of life and encodes our genetic blueprint. Learn more about what DNA is and how researchers can manipulate DNA to study diseases using CRISPR-Cas9 technology. You'll also get to build your own DNA molecule keychain!
4	24	Diffusion, Filtration, and Osmosis saves lives!	Davita Dialysis	NRTH 1402	We are focused on Science. All three of us work in dialysis. Dialysis is done by Diffusion, Filtration, and Osmosis. There will be 3 live experiments happening in front of your eyes. Volunteers will be helping as well as prizes for participation in answering questions. Diffusion, Filtration, and Osmosis save lives and come learn to find out how! Taking science and math ties into our careers in dialysis and without classes we took, the live saving treatments provided would not be possible.
4	27	Blood- It's Not Just for Vampires!	Terumo Blood & Cell Technologies	Science 1113	Better Blood for Better Lives – Find out all about blood, how we process it and how it is used to help people and save lives. Participants will learn all about the composition of blood, how it is used to help people, and how Terumo's products help ensure a clean and safe blood supply. They will learn about pathogens and the immune system through a fun team activity. Applying blood separation concepts, each girl will make a work of art to take home that demonstrates centrifugal force.
Track 5 - Conserve It					
By using precise engineering we can practice environmental stewardship and preserve the planet that sustains our lives					
5	8	Environmentally Friendly Roads	Colorado Department of Transportation (CDOT)	NRTH 1602	Calling all environmental rock stars - do you love the environment, animals, and parks and trails? Do you wonder how roads are designed to protect these things? This workshop will work through protection of the environment while moving people to places they want to go everyday.
5	12	Pipes, Duct Tape, and Dirt – Building a Drinking Water System	HDR	NRTH 1607	Build your own drinking water system taking untreated water from a source through treatment and delivering it to customers. Learn about the parts of a drinking water system and understand why all the parts are important to delivering safe water to the community, all the time, every day!
5	16	Build a Landscape!	Merrick and Company	NRTH 3209	Build a landscape and plan the infrastructure of your own world! Why do we build out and organize our habitat the way we do? How can we design our surroundings differently? Become a master planner for a landscape of your own design.
5	25	The Perfect Pucker Power – Quality and Consistency of Lemonade	Emerson Electric Inc.	Science 1111	This workshop will demonstrate the importance of consistency in drink mixtures and explain some of the parameters that can be measured to ensure consistency including density, viscosity, and mass flow. Students will prepare lemonade and measure quality parameters while competing to make the "perfect lemonade" based on density.
Track 6 - Explore It					
We still discover new items every day by surveying Earth and Space					
6	4	AIAA RMS Good Vibrations	American Institute of Aeronautics and Astronautics (AIAA)	Science 3079	Structural Dynamics is an engineering discipline concerned with controlling sound and vibration of structures. When engineers design rockets, aircraft, spacecraft, buildings and even musical instruments they control vibration. In this workshop you will learn about natural frequency and the factors that influence frequency. With what you have learned you will design and build your own wind chime!
6	19	Paper Airplane Challenge	Northrop Grumman	NRTH Atrium B	Design, build, and test you own paper airplane! In this activity, students will learn about some of the basic principles of aerodynamics, like lift and drag, that Northrop Grumman engineers consider when designing military aircraft.
6	20	Rocket Propulsion 101	Ursa Major Technologies	NRTH Atrium D	Our workshop will give students the opportunity to learn the basics of rocket propulsion! In our workshop, students will get hands on experience with Newton's Laws to understand how rocket engines propel things to space.
6	21	Eggstraordinary Lander	Lockheed Martin	PE/Events 111G	The Eggstraordinary Lander is a fun, highly interactive workshop where students learn the basics of Mechanical Engineering Design, Assembly, and Test by building a space lander to protect fragile equipment.
6	22	Dream Big, Go Far. Your Mission: Mars	Lockheed Martin	PE/Events 220	Since the beginning of time, humans have always tried to understand the unknown. At Lockheed Martin, we engineer spacecraft that continue to explore further into space. We challenge YOU to develop a launching system that can safely land cargo in a target zone, just like when we land our spacecraft on Mars.