



# **WISEST, Future Energy Systems and Cybermentor STEM Challenge**

We've developed a STEM challenge that lays out the structure of how we think units should approach the challenge and we break it down by the category of activities, the type of activities (mandatory vs. pick-and-choose), while also providing additional resources that help units go beyond the challenge!

# Introduction

## Objectives

- The goal of this challenge is to introduce girls to the wonderful world of STEM! By completing this challenge your unit will explore Chemistry, Physics, Biology, and Engineering as well as get to meet a STEM mentor who will talk about their experiences in STEM. Sparks, Brownies, and Guides will get to understand the diversity of STEM and the possible careers it presents. Pathfinders and Rangers will get to do that and learn about networking and mentorship opportunities that are available to them if they choose to pursue STEM in post-secondary and beyond!
- Your unit should spend 3-4 meetings on this challenge. You can design your challenge in a way that is best for your unit, which includes picking specific activities that will help you complete your Design Space, Science Lab, Our Shared Planet, and Nature Discoveries theme badges.

## Outcomes

- Learn about career opportunities in STEM
- Meet a STEM mentor
- Learn about the different branches of STEM
- Develop and practice skills such as hypothesizing, observing, collaborating, critical thinking, decision-making, problem-solving, and innovation.

## Requirements

Activities	Sparks	Brownies	Guides	Pathfinders	Rangers
Required	2	2	2	2	2
Engineering	1	2	3	3	3
Biological	2	2	3	3	3
Physical	1	2	2	3	3
<b>Total</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>11</b>	<b>11</b>

## Planning/Tracking

Required Activities	<input type="checkbox"/> Women in STEM <input type="checkbox"/> Meet a STEM Mentor
Engineering Activities	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
Biological Sciences Activities	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
Physical Sciences Activities	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____

## Activities

### Legend

WISEST developed activity

Future Energy Systems developed activity

Cybermentor developed activity

### Required Activities

- Women in STEM (Science Lab)
- Meet a STEM Mentor (Science Lab)
  - Examples of a STEM mentor could be an undergraduate STEM student, a STEM professor or research scientist, an engineer, someone in a STEM industry
  - Younger girls should aim to understand why your mentor chose their career, how they got there, and what they do in their day-to-day
  - Older girls should aim to understand the same things + any barriers they faced in their STEM journey and how they overcame them

## Choose from the following activities based on your branch:

### Engineering Activities

- Pinocchio Nose Challenge (Design Space)
- Build an Egg Zipline (Design Space)
- Balloon Powered Car (Design Space)
- Cooking with the Sun (Design Space)
- Electrical Circuits (Design Space)
- How Fast Can You Go? (Design Space)

### Biological Sciences Activities

- Become a Community Scientist (Our Shared Planet)
- Be a Catalyst (Science Lab)
- Become an Earth Doctor (Our Shared Planet)
- Build Your Own Terrarium (Nature Discoveries)
- Can Plants Grow Without Soil? (Nature Discoveries)
- Energy From the Sun (Our Shared Planet)
- Journey of a Seed (Our Shared Planet)
- Biodiversity Virtual Escape Room (Our Shared Planet)
- Escape the ER (Science Lab)

### Physical Sciences Activities

- Build an Alka Seltzer Rocket (Science Lab)
- Be A Chemical Reaction (Science Lab)
- The Phone Book Myth (Science Lab)
- Adventures with Electricity (Science Lab)
- Hot and Cold of It (Science Lab)
- Escape from the STEAM Lab Virtual Escape Room (Science Lab)

## Bonus Activities (do not count towards STEM Challenge Activity Count)

Although these activities do not count towards the STEM Challenge Activity Count, these are great activities to use between activities or as a buffer for the beginning of the day and the end of the day/meeting.

- Renewable Energy Word Search
- “How Well Do You Know Your Energy” Quiz
- Future Energy Systems Word Search

**Note:** All activities listed above can be found in the following folders:

- WISEST Activities  
[drive.google.com/drive/folders/1EUgvh7ZBVYC5aGt2EN5BfEkhVMfM6o8X?usp=sharing](https://drive.google.com/drive/folders/1EUgvh7ZBVYC5aGt2EN5BfEkhVMfM6o8X?usp=sharing)
- Future Energy Systems Activities  
[drive.google.com/drive/folders/1vQNnMFUldqYHT7wqMDpa2i7NjUzLHXYh?usp=sharing](https://drive.google.com/drive/folders/1vQNnMFUldqYHT7wqMDpa2i7NjUzLHXYh?usp=sharing)
- Cybermentor Activities  
[drive.google.com/drive/folders/10PoMvsOCugs9h9HXEKm6WpZsUXHvxD81?usp=sharing](https://drive.google.com/drive/folders/10PoMvsOCugs9h9HXEKm6WpZsUXHvxD81?usp=sharing)

## Extra Resources

- Guest Mentor (Subject to availability)
  - WISEST, Future Energy Systems and Cybermentor can connect Girl Guide groups with mentors in STEM professions. To get connected with a mentor, you can email WISEST ([wisest.outreach@ualberta.ca](mailto:wisest.outreach@ualberta.ca)), Future Energy Systems ([vsmiller@ualberta.ca](mailto:vsmiller@ualberta.ca)) or Cybermentor ([cybermentor@ucalgary.ca](mailto:cybermentor@ucalgary.ca)) and indicate the age group of your branch, what STEM field your group is most interested in learning about, and we'll try our best to connect with our network of mentors to find someone in the STEM field of interest to your group. The mentors can share what they studied in post-secondary, their journey to their career, technical aspects of their work, and their experiences as women or gender diverse individuals in STEM.
- Future Energy Systems
  - Energy Video Resource Playlists for Girl Guides  
[docs.google.com/document/d/1TcH3YM8g1axka\\_S2PDgNA\\_5AvOfQifAVUCWcmoruHo0/edit?usp=sharing](https://docs.google.com/document/d/1TcH3YM8g1axka_S2PDgNA_5AvOfQifAVUCWcmoruHo0/edit?usp=sharing)
  - In “Energy Video Resource Playlists for Girl Guides”, Future Energy Systems has created a series of video playlists that include a variety of types of video content available for use. Each playlist focuses on a different topic: Women in STEAM, Engineering, Environment, Science and Community. Video types include: Energy At Home (at home experiments, crafts, activities), Storytimes (read stories related to energy and the environment, include worksheets with extra activities), Ask An Energy Expert (questions answered by researchers), Explore A Lab (tours of labs at the University of Alberta), Bite Size Research (mini easy to understand research talks) and more. Guiders are encouraged to share resources with the girls when topics are of interest or use the additional content for meeting, badges, etc. Consider subscribing to Future Energy Systems YouTube as playlists will be frequently updated with new content online.

## Credits

This STEM Challenge was developed by WISEST (Women in Scholarship, Engineering, Science and Technology) Future Energy Systems and Cybermentor to provide meaningful STEM (Science, Technology, Engineering and Mathematics) activities to the Girl Guides of Alberta. This collaboration was made possible through the support of the Natural Sciences and Engineering Research Council of Canada (NSERC) Promoscience Grant.

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