About Girls Get STEM: Unleash Your Inner Scientist

Girl Scouts of the USA has unleashed a new partnership with Discovery Education to spark girls' interest in STEM and help them unleash their G.I.R.L. (Go-getter, Innovator, Risk-taker, Leader)™ potential. Girls Get STEM: Unleash Your Inner Scientist provides educators and Girl Scouts troop leaders with standards-aligned curriculum that aims to address gender equity in STEM education across the country through a series of girl-led, girl-tested, and girl-approved resources for students in grades 2–5.

Quick Facts

- **Program Name:** Girls Get STEM: Unleash Your Inner Scientist

- **URL:** https://www.girlsleadstem.com/educator-resources

- **Audience:** Girl Scouts in grades 2-5

About the Girls Get STEM Activities

The Girls Get STEM activities below were created to bridge national science and engineering standards into the Think Like a Citizen Scientist Journey. This can support you as a troop leader in recruiting girls and establishing relationships with educators. In additional to our national standards, non-cognitive skills are factors that predict success in school beyond content knowledge and academic skills. In education, we refer to some of the most popular learning strategies in today's workforce as the "4Cs" for 21st Century Learning. They include critical thinking, communication, collaboration, and creativity. Each of the activities created in this partnership highlight and help develop these important skills.

The table below provides an overview of each Girls Get STEM activity, how to include this activity in your current Think Like a Citizen Scientist Journey, and identifies the 21st Century Learning Skill featured.

Data Collection Activity: Critical Thinking

Timing: Approximately 30 minutes, but tailor this activity to fit your troop's needs!

Focus Area: Critical thinking involves all of the skills we use to make our own decisions and form our own independent thoughts. It's important to begin developing critical thinking skills at an early age, and this activity does just that!

Activity Overview: Throughout the Think Like a Citizen Scientist Journey, the troop will learn about and practice data collection. To prepare for collecting data for a citizen science project, the girls will brainstorm what needs to be observed or the data that needs to be collected. They will also be introduced to different types of tools that scientists and engineers use to collect data and see which may apply to their project. The leader will then assign each data/observation item a number, and each girl will roll a dice to see which data they will be responsible for collecting.

Materials:

- One piece of chart paper or poster board

- Tape or glue

- **Data Collection Tools 1–6,** one copy of each

- **Prepare Ahead:** Before the meeting or activity, print and cut out the Data Collection Cards into separate cards**.**

- Dice, at least one

Where can this activity fit in?

- Citizen Science Project: This activity can be used to complement any citizen science project the girls take on throughout the Think Like Citizen Scientist Journey. In particular, it can be used prior to the troop conducting their project in Think Like a Citizen Scientist Pt. 3.

- Take Action Project: For those troops who have decided to complete a second citizen science project as part of their Take Action project, this activity can be integrated into Activity 3 of Think Like a Citizen Science Pt 5.

- Other times of data collection: The activity can be used to support any kind of activity that includes data collection!

Critical Thinking

Steps:

Brownies will learn about tools for collection data and determine what data they'll collect for **their citizen science project.**

Part 1: Ask Questions

Though your troop has likely already discussed what it means to make observations and collect data, begin with a review.

SAY:

- As part of the Think Like a Citizen Scientist Journey, you'll complete at least one citizen science project as a troop.

- No matter what project you choose, you'll be collecting data to send to a scientist for analysis.

- What does it mean to collect data?

Encourage girls to share their ideas with a partner, and then discuss as a troop. Arrive at an answer that when someone collects data, they record information that they measure or observe. This information is then used to help them better understand a problem!

Part 2: Seek Information

As a whole troop, brainstorm the type of data that the girls will need to collect for their citizen science project. For instance: Will they be measuring rainfall? Will they be recording the types of clouds that they see?

Try to break the observations into as many smaller parts as possible, and keep a list of these observations on the board or on a piece of chart paper. Leave a little space in between each observation as you record them.

Number each observation as #1–6. If you have fewer than six observations, assign important observations two numbers. If the observations total more than six, put similar observations in pairs.

SAY:

- Now you have a list of observations to collect for your citizen science project.

- Each of these is a data point that you need to collect!

- How can you collect each data point? What tool(s) could you use to collect each data point for the project?

Critical Thinking

Use the **Data Collection Tools** sheets to introduce girls to some of the different tools that scientists and engineers use. Try to touch on the following points as you hold up each sheet, and ask girls to imagine a time when they might use each one.

SAY:

- Ruler, yardstick and measuring tape: Used for measuring distances and lengths. Which one might you use to measure the size of an insect? How about the width of a stream?

- Magnifying glass, microscope and binoculars: While magnifying glasses and microscopes help a small object look bigger, binoculars help you see objects at a distance. Which one might you use to observe a bug as it crawls on the sidewalk? How about a bird on the top of a tree?

- Thermometer: Thermometers measure temperature! When might you need to know how hot or cold something is?

- Graduated Cylinder: This measures the amount of liquid you have. When might it be helpful to have a graduated cylinder?

- Notebook and camera: A notebook can be used for recording sketches and descriptions, whereas a camera will help you remember something just as it appears. These types of observations help you remember what something looked like, smelled like, sounded like or felt like. Why is it important to write your own observations and take pictures?

Keep the **Data Collection Tools** sheets out for the girls to easily see. In small groups, ask girls to think about which of these tools could be used to collect the data that they need for their project.

Ask each group to share what they came up with for one of the data points. If the troop agrees with the data tool that each group identifies, ask a volunteer to tape or glue the **Data Collection Card** with a picture of the tool next to the data.
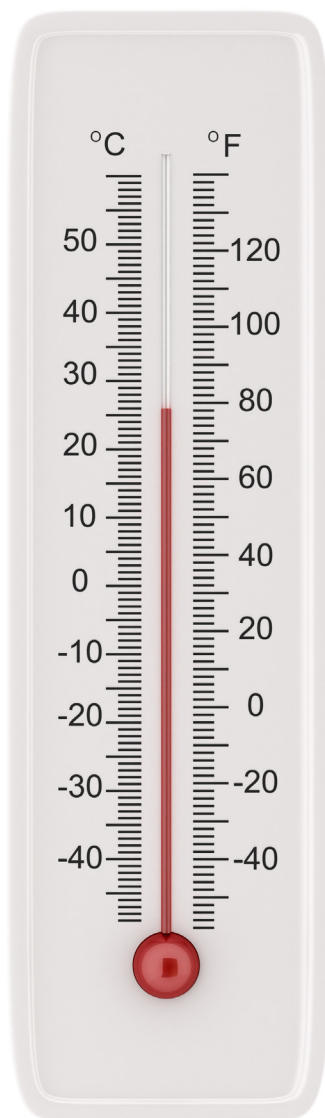
Part 3: Be Open-Minded

Distribute the dice, and ask each girl to roll them. The number they roll will show them which data point they will be collecting! It's important to be open-minded when collecting data, and this will ensure that data points are distributed randomly.

Note to Volunteers: As girls roll the dice, it may be a good idea to write the girls' initials next to the data point they are assigned so everyone remembers!

Once everyone has rolled the dice, take a look at the distribution of data collection. If any data points are missing data collectors, ask for volunteers to either double up or switch. Otherwise, your troop is ready to begin collecting data!

Thermometers measure temperature, which is how hot or how cold something is.

Graduated cylinders measure amounts of liquid.

A **balance** measures how much something weighs.

Microscopes, magnifying glasses and binoculars help make objects seem bigger or closer so they can be seen more easily.
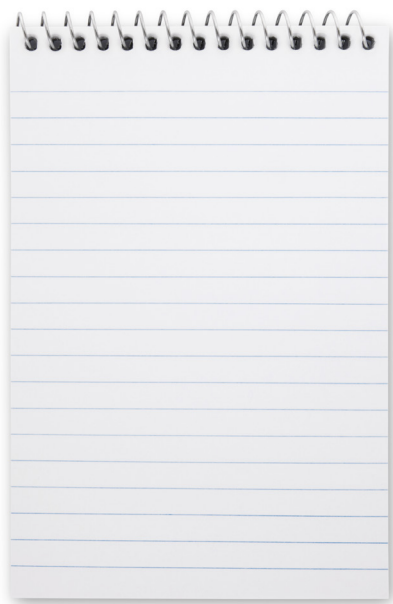
Rulers, **yard sticks**, and **measuring tapes** measure how long something is.

Sketches, **written descriptions** and **photographs** are observations that help you remember what something looked like, smelled like, sounded like, or felt like.

Critical Thinking

Measurement Cards