

Think Like a Citizen Scientist Pt. 2

Overview

Juniors take field notes about animal tracks and learn about collecting and analyzing data over time. Girls also choose their citizen science project to conduct in Think Like a Citizen Scientist PT. 3.

Notes for Volunteers:

Use The Talking Points (But Make Them Your Own): In each session, you'll find suggested talking points under the heading "SAY." Some volunteers, especially new ones, find it helpful to follow the script. Others use the talking points as a guide and deliver the information in their own words. Either way is just fine.

Be Prepared (It's What Girl Scouts Do!): Each meeting includes a "Prepare Ahead" section that includes a materials list and what kind of set-up is required. Read it in advance so you have enough time to gather supplies and enlist help, if needed.

Use Girl Scouts' Three Processes: Girl-led, learning by doing, cooperative learning — these three processes are the key to making sure girls have fun in Girl Scouts and keep coming back.

"Learning by doing" and "cooperative learning" are built into this Journey, thanks to the hands-on activities and tips. You'll also find specific "keep it girl-led" tips in the meeting plans. They'll help you create an experience where girls know they can make choices and have their voices heard.

Observe. Record Data. Analyze Data.: On this Journey, girls will do hands-on activities to learn about the scientific method. They'll learn how to observe closely, record their observations and analyze what they've learned. They'll then put what they've learned into practice by doing a citizen science project.

When they send in the data they collected, girls are doing something very important. Their data will help a real-life scientist to do real-life research. They will join thousands — even millions! — of other people who also did the project and sent in their data. That's how science works — gathering millions of pieces of information and then figuring out how it all fits together. And it all starts with observing, recording and analyzing data.

Leave Time For The Closing Ceremony: If girls are having fun doing an activity, you may be tempted to skip the Closing Ceremony so they can keep going — but the Closing Ceremony is absolutely key to their learning. Here's why:

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When girls leave a meeting, they'll remember how much fun it was to play an observation game or go outside and take pictures of clouds. However, they may not realize that they just learned how scientists make discoveries — unless you tell them.

When you do that, you turn a *hands-on* activity into a *minds-on* activity. During the Closing Ceremony, you can connect the dots for girls by:

- Pointing out how they acted as citizen scientists. For example: They noticed dozens of details, small and large, about nature as they did their project. (You might tell them that children are actually *better* at citizen science than many adults! That's because children see the world in a fresh way — they don't fall into the habit of seeing what they expect to see.) The girls may have scribbled notes, taken pictures and recorded sounds. They thought about what they discovered.
- Reminding girls that they are *already* scientists, because they're naturally curious about the world. (Think of how many times girls ask "why" -- why is the sky blue, why is it cold in winter and hot in summer, why aren't there giraffes in Iowa?) Encourage girls to try to find answers to their questions by observing the world around them and asking questions about what they notice.
- Letting them know that they have what it takes to continue exploring STEM.

These simple messages can boost girls' confidence and interest in STEM — and end the meeting on an upbeat note!

Tell Your Troop Story: As a Girl Scout leader, you're designing experiences that girls will remember their whole lives. Try to capture those memories with photos or videos. Girls love remembering all they did — and it's a great way for parents to see how Girl Scouting helps their girls.

And please share your photos and videos with GSUSA by emailing them to STEM@girlscouts.org (with photo releases if at all possible!).

Program Pairing: The Junior Camper, Animal Habitats, and Flowers badges go well with this Journey!

Prepare Ahead (Roughly 75 minutes total)

1. Review vocabulary (2 minutes)

This meeting includes the following vocabulary:

- **Citizen Science** – Citizen science connects regular people with scientists to help them conduct research. With the help of thousands of citizens around the world,

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scientists can do research more quickly, share information more readily, and greatly add to the store of human knowledge.

- **Observation** – watching and noticing something using all of your senses, especially sight, to get information and better understand a situation or environment.
- **Scientific Method** – the process, or series of steps, that scientists take when conducting scientific research.
- **Data** – information that scientists receive, collect, or observe in the field.
- **Analysis** – reviewing data or information to create conclusions that explain more about the subject of observation.

See the **Junior Think Like a Citizen Scientist Journey Glossary** for more vocabulary and examples.

2. Read through this guide and its Meeting Aids (15 minutes)

This will help you to get familiar with the flow of the meeting.

Read the following handouts (found in the **Meeting Aids** section):

- **Junior Think Like a Citizen Scientist Journey Materials List:** Each meeting has its own materials list, but you can use this handout if you like to do all your supply shopping at one time. It includes all materials needed for the entire Journey.
- **Junior Think Like a Citizen Scientist Journey Glossary:** This is a list of words that Juniors may not know and how to define them.
- **Think, Pair, Share:** These facilitation tips will help you to make sure that every girl's voice is heard during brainstorming activities.
- **Take Action Guide:** This handout explains the difference between Take Action and Community Service. It also includes tips to make a project sustainable and Take Action project ideas that you and your troop can use as inspiration.

3. Gather materials (30 minutes)

Gather materials using the Materials List for this meeting. If your meeting location doesn't have a flag, bring a small one that Juniors can take turns holding or hang in the room.

4. Room preparation (10 minutes)

Before girls arrive, prepare the room for Activity 3: Animal Tracking Field Notes.

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Tape the animal track cutouts in different places around the room for girls to find. To help girls to easily analyze why the animals may travel past certain areas, it might help to group similar tracks around key parts of the room.

Example: Place 3 bear tracks around a chair. Then, girls could reason out and conclude that there was something about the chair that made bears travel past during that Observation Session, like food.

You do not need to put all tracks out at once. As there are multiple observation sessions within the activity, you will be changing the location and number of tracks throughout. You can also choose for there to be 0 tracks out for an animal each Observation Session (meaning there are none of the animal in the area that round).

5. Check your SciStarter Dashboard (15 minutes)

In partnership with GSUSA, SciStarter has created a special dashboard for Volunteers to help you manage your troop's citizen science project.

Log in to your Girl Scouts SciStarter account at <https://scistarter.com/girlscouts/volunteer/landing>

1. **Explore Your Dashboard:** Once you sign up for SciStarter, you will see a Welcome Page. Scroll down to view the Welcome Videos from each project leader. Choose the remaining half of the introduction videos to show to girls this meeting. You can stream or download the videos for girls. **You must sign-up for SciStarter via the Girl Scouts landing page (<https://scistarter.com/girlscouts/volunteer/landing>) to start your Journey.**
2. **Girls Choose Their Project:** After girls watch the remaining videos this meeting, they will be choosing one project to complete in Think Like a Citizen Scientist PT. 3. This creates the Citizen Science Journey for your troop.
3. **Invite Girl Scouts to Join SciStarter:** After you choose a project with your girls this meeting, you'll have the opportunity to invite them to join SciStarter (with their parents help and permission). Confirm your email to receive your Citizen Science Session Link to share with the girls. Before the next meeting, sign in to your Girl Scouts SciStarter account to see which of your girls haven't yet signed up, and send an extra reminder to parents, if needed. **After the meeting, remind the parents/guardians to sign-up their girls for SciStarter through this session link before the next meeting so they can join you on the Journey.**

Get Help from Your Family and Friends Network

Your Friends and Family Network can include:

- Girls' parents, aunts, uncles, older siblings, etc.
- Other volunteers who have offered to help with the meeting

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Ask your Network to help:

- Bring art supplies or field notebooks for girls
- Help reposition the animal tracks during Activity 4: Graphing Animal Tracks as you help girls to graph the tracks after each Observation Session.

Award Connection

Juniors will earn two awards:

- Think Like a Citizen Scientist award
- Take Action award

Juniors will earn both awards following the completion of the Take Action project and Journey in **Think Like a Citizen Scientist PT. 6.**

(Note to Volunteers: You can buy these awards from your council shop or on the Girl Scouts' website.)

Meeting Length

90 minutes

- The times given for each activity will be different depending on how many Juniors are in your troop.
- There is no snack time scheduled in these meetings, but there are 15 minutes of “wiggle room” built in for snacks or activities that run long.
- Give Juniors 10- and 5-minute warnings before they need to wrap up the last activity so you'll have time for the Closing Ceremony.

Materials List

Activity 1: As Girls Arrive: Create Your Field Notebook

- **Option 1:** Blank paper, stapler
- **Option 2:** Field notebooks (one per girl). A field notebook can be any small notebook that girls can carry with them to jot down notes.
- Pens, pencils, or markers
- Decorating supplies construction paper, glue, animal stickers, etc.)

Activity 2: Opening Ceremony: Choosing Our Citizen Science Project

- Flag
- Device (computer, tablet or smartphone) with project videos from SciStarter, downloaded or with ability to stream
- Optional: Poster Board with the Girl Scout Promise and Law

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Activity 3: Animal Tracking Field Notes

- **Animal Tracks cutouts**, five sheets printed and cut out (making 15 tracks in total)
- **Animal Tracking Graph** (one for each girl)
- **Example: Animal Tracking Graph**
- **Animal Tracking Key** (one for each girl)
- Tape
- Field notebooks from Activity 1: As Girls Arrive: Create Your Field Notebook
- Pens, pencils or markers

Activity 4: Closing Ceremony: Brainstorming Our Take Action Project

- List of Juniors' Take Action ideas from Think Like a Citizen Scientist PT. 1
- Optional: **Take Action Guide**

Awards

Junior do not receive any awards in this meeting.

Detailed Activity Plan

Activity 1: As Girls Arrive: Create Your Field Notebook

Time Allotment

10 Minutes

Materials

- **Option 1:** Blank paper, stapler
- **Option 2:** Field notebooks (one per girl). A field notebook can be any small notebook that girls can carry with them to jot down notes.
- Pens, pencils, or markers
- Decorating supplies (construction paper, glue, animal stickers, etc.)

Steps

Welcome Juniors, and have them decorate their new field notebooks.

Option 1: Have girls create field notebooks

Have girls create their own field notebooks by folding blank paper in half and stapling to make a small notebook.

Option 2: Hand out field notebooks

Hand out field notebooks, one for each girl.

Have Juniors decorate their new field notebooks.

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SAY:

Scientists need somewhere to store their observations, so they keep a field notebook.

You'll take your notebook with you when you do your citizen science project so you can keep a record of what you see and do.

You can decorate your notebook while we wait for everyone to arrive.

Activity 2: Opening Ceremony: Choosing Our Citizen Science Project

Time Allotment

15 Minutes

Materials

- Flag
- Device (computer, tablet or smartphone) with project videos from SciStarter, downloaded or with ability to stream
- Optional: Poster Board with the Girl Scout Promise and Law

Steps

Recite the Pledge of Allegiance and the Promise and Law.

Conduct any troop business.

Review Think Like a Citizen Scientist PT. 1 with Juniors before they choose their citizen science project.

SAY:

What's a scientist? What does a scientist do?

Girls may say: Scientists do experiments, they study things, etc.

A scientist is someone who studies the world to understand how it works.

Last time, you were scientists and practiced observing your world.

*Does anyone remember what observation is? (Answer: **Watching and noticing something using all of your senses, especially sight, to get information and better understand a situation or environment.**)*

Observation is looking closely at something using all of your senses and thinking about what it means.

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What kind of senses could you use?

Girls may say: My eyes or looking, my nose or smelling, etc.

Observation is one of the first things scientists do.

Scientists take what they learn from their observations to create solutions to problems or questions they have about nature.

Does anyone remember what these steps are called? (Answer: The scientific method!)

Today, we're going to explore more of the steps scientists take when they want to learn more about nature through scientific research.

But first, let's look at more videos of citizen science projects you may want to do!

Watch the remaining project videos from SciStarter with Juniors. Note aloud the different things they will be observing for each project (i.e. clouds, ants, etc.). **(Note to Volunteers:** If you don't have ability to stream or don't have the videos downloaded, tell girls about some of the options for their citizen science project.)

Have Juniors discuss their favorite projects as a group and choose one citizen science project to complete in Think Like a Citizen Scientist PT. 3.

If girls are having trouble choosing, have them vote or try Fist-to-Five. Remind Juniors whose projects were not chosen that the troop may choose to complete another project for their Take Action and that they can always access the project on their own SciStarter Dashboard (with help from their parents).

Following the meeting, log on to your SciStarter Dashboard to finish creating your Citizen Science Journey and invite your girls to join the project (see Prepare Ahead for more information).

SAY:

Next time, we'll take all the skills we've been practicing and work like scientists!

Activity 3: Animal Tracking Field Notes

Time Allotment

40 Minutes

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Materials

- **Animal Tracks cutouts**, five sheets printed and cut out (making 15 tracks in total)
- **Animal Tracking Graph** (one for each girl)
- **Example: Animal Tracking Graph**
- **Animal Tracking Key** (one for each girl)
- Tape
- Field notebooks from Activity 1: As Girls Arrive: Create Your Field Notebook
- Pens, pencils or markers

Steps

Set-Up. (10 minutes before the meeting)

Prior to starting the meeting, tape the animal tracks in different places around the room. You may want to group similar tracks near one another to help Juniors with the analysis portion later in the activity.

Example: Place 3 bear tracks around a chair. Then, girls could reason out and conclude that there was something about the chair that made bears travel past during that Observation Session, like food.

You do not need to put all tracks out at once. As there are multiple observation sessions within the activity, you will be changing the location and number of tracks throughout. You can also choose for there to be 0 tracks out for an animal each Observation Session (meaning there are none of the animal in the area that round).

Observe Animal Tracks. (10 minutes)

Talk to Juniors about field notes.

SAY:

How do scientists remember what they observe?

Girls may say: They write it down, they take notes, etc.

Taking notes about what you see is an important part of being a scientist. It's another step in the scientific method.

The notes scientists write are called field notes. What do you think they'd want to make notes about?

Girls may say: What something looks like, how big it is, what it sounds like, how many things she sees, etc.

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Right. A scientist may want to write down what the weather is like. She may want to make sketches of tracks or record measurements of soil temperature. You'll be taking notes, but scientists also take photos or videos or record sounds as part of their field notes.

Now, you're going to have a chance to take field notes like a scientist!

Juniors take out their field notebooks and pencils, pens, or markers.

SAY:

Today, we're going to pretend we're helping a scientist to learn more about animal tracks. She's asked you, as citizen scientists, to tell her about the animal tracks in the room, so she can know more about the animals that cross our area.

First, take notes on the tracks you see. Then, we'll review what you observed.

For the next three minutes, look around and write notes about the tracks you see.

Remember, scientists pay super close attention to all of the details and are constantly thinking about what their observations might mean.

Juniors walk around the room and take notes.

As they make their field notes, remind them that they can sketch or trace the animal tracks, count the number of tracks and record that information, and note where the tracks are located.

Bring Juniors back to form a Friendship Circle.

SAY:

Looking at your field notes, what did you observe?

Have Juniors share their observations. You can note aloud any patterns in their observations, such as location and the number of tracks.

SAY:

If a scientist were taking field notes on the animal tracks, what are some other things she might want to write down?

Girls may say: What the tracks look like, what animal made them, where they are, how close different animals' tracks are to each other, etc.

What other information would be useful to write down?

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They write down the date and where they were when they made their notes. Let's add today's date and our location to your field notes right now.

Give girls time to write the date and location in their field notebook.

SAY:

All your notes are called data. Data simply means information. Data can be notes, drawings, photos, recordings or videos of what you see and hear. It can also be information about where you are — how hot or cold it is, what the weather is like, and so on.

Soon after scientists come back from the field, they review their notes to make sure their data is detailed and reflects what they observed.

Scientists also reflect on what they saw, and add new notes about what they think their data means.

Is there anything you would add to your notes about the animal tracks? Are there any other observations you think you should add?

Take a minute to add these details to your field notes.

Juniors add missing information to their notes.

Graph Your Data. (15 minutes)

Have Juniors identify the animal tracks.

SAY:

What animals do these tracks belong to?

Girls may say: Bird, cougar, bear, deer, cat, dog, rabbit, etc.

We saw bear, bird, and deer tracks!

To help us easily identify the tracks in future observation sessions, we have a Key to help us.

Can you identify what track belongs to what animal?

Hand out the **Animal Tracking Key**, one for each girl.

Girls identify what tracks belong to each animal.

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SAY:

Just like you, scientists look at past research, like your Animal Tracking Key, to understand what they observe.

Scientists also go back into the field to observe their subjects several times to check their notes and see how things change over time.

For example, you reviewed your notes and added in any observations you forgot to write down.

If we were to go back and look for animal tracks a week from now, what do you think would happen?

Girls may say: They would be gone, there would be others, etc.

The number of animal tracks would change over time as the animals move around and old tracks are covered.

If we wanted to track the changes in animal tracks over time, how could we do that?

Girls may say: We could write down what we see each time, etc.

One way to show changes over time would be to create a graph.

Not only can a graph capture what we see each time we go out for an Observation Session, but it can easily show if there were more or less animals between the different sessions, too.

Now, if we wanted to create a graph for what we just saw, we first need to figure out how many tracks we saw and how many of each type.

Looking at your data, how many animal tracks were there?

Let girls answer.

SAY:

How many bear tracks were there? How many bird tracks were there? How many deer tracks were there?

Let girls answer.

SAY:

Let's see if you were correct!

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Organize Juniors into 3 groups.

Assign each group one type of animal track to collect: Bear, bird, and deer.

Girls collect the tracks and bring them back into the friendship circle.

Have each group share how many tracks they collected.

Hand out copies of the **Animal Tracking Graph**, one for each girl.

SAY:

Here is a graph for us to track what we see.

Look at the bottom line. Since this was our first time observing, we will be using the area above the "1" for tracks we see during Observation Session 1.

Look at the vertical line on the left. That is the number of tracks you observe each session.

This time, we saw [X] bear tracks. How would we put this on our graph?

Let girls answer.

SAY:

We would go across to the "1" because it is our first observation session, and then move up [X] spots and draw a bear track to show that we saw [X] bears during Observation Session 1.

Graph the number of bear tracks with the girls.

Have the girls repeat for the bird and deer tracks observed this session.

As the girls work on tracking the bird and deer tracks for Observation Session 1, reposition the tracks around the room for Observation Session 2, adding or subtracting some of each type. Remember, you can have 0 tracks for some animal each session!

After you have repositioned the tracks, review the girls' graphs for Observation Session 1 to make sure the graphs are correct and that girls understand how to graph the animal tracks.

SAY:

Now, fast forward one week! We are going to see how the animals have moved.

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This will be Observation Session 2.

Again, take notes on what you see, but when you come back, try to graph the number of each type of animal track you observed.

Girls go around the room, observing and taking notes on what and how many of each type of animal track they find

Circle the room to help girls locate all of the tracks and take accurate notes.

After 5 minutes, girls return to the Friendship Circle and complete their Animal Tracking Graph for Observation Session 2.

As the girls work on graphing the animal tracks for Observation Session 2, reposition the tracks around the room for Observation Session 3, adding or subtracting some of each type. Remember, you can have 0 tracks for some animal each session!

After you have repositioned the tracks, review the girls' graphs for Observation Session 2 to make sure the graphs are correct.

Repeat until girls have completed all four observation sessions and correctly graphed their animal tracks. (**Note to Volunteers:** If you are running short on time, 3 observation sessions are enough.)

Have girls connect their tracks for each animal on the graph with a line, so they will easily see the change in the number of each animal between Observation Sessions.

Analyze Your Animal Tracking Graph. (15 minutes)

Introduce Juniors to analysis before they review their graphs, looking for patterns and trends.

SAY:

Once scientists have data, what do they do with it?

Girls may say: They read the notes, they share them, etc.

Just like you, scientists observe their subjects several times to see how things change over time.

By graphing the animal tracks, you also created a new way to present your data over time to others.

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After scientists review their data, they think about what it might mean. This is called analysis. It is another step in the scientific method.

Looking at your graph, what do you think are some things scientists could learn? Are there any patterns?

Girls may say: They see where the animals went, they see how many tracks there are, etc.

Lead girls to analyze and create conclusions by asking some of these questions:

SAY:

The number of animal tracks changes over time as they move around. Sometimes, this means there aren't tracks from animals where there used to be tracks.

For example, during some Observation Sessions there were bears, and other Observation Sessions there weren't any bears.

Why do you think the number of bears would change?

Girls may say: They went somewhere else to look for food, it was time for them to hibernate, etc.

If scientists see a change like that, they might want to go back and to make more observations. That might help them answer why the number of animal tracks changed.

Activity 4: Closing Ceremony: Brainstorming Our Take Action Project

Time Allotment

10 Minutes

Materials

- List of Juniors' Take Action ideas from Think Like a Citizen Scientist PT. 1
- Optional: **Take Action Guide**

Steps

Have Juniors form a Friendship Circle to briefly reflect on the last activity.

SAY:

Today, you did what scientists do — you used the scientific method. You make observations. You recorded data. And you looked for patterns in your data.

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What was your favorite part?

Can you think of other ways, besides making a graph, to spot patterns?

Let girls answer.

SAY:

At our last meeting, we talked about how Girl Scouts do Take Action projects to help make the world a better place.

*What scientists do is a lot like a Take Action project. Can you say why? (Answer: **Scientists spot problems that they want to research. Then they make lots of observations and review their notes to analyze what they might mean. Scientists use these ideas to create solutions and cures to problems faced by humans, animals, and other parts of nature.**)*

What's a problem in your community that you've noticed?

Let's make a list of Take Action project ideas.

Write down Juniors' ideas.

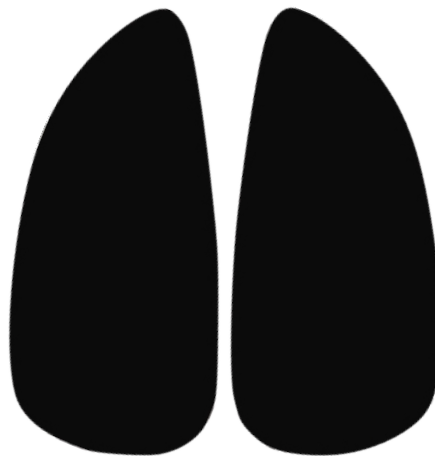
(Note to Volunteers: Check out the **Take Action Guide** handout in the Meeting Aids if Juniors need help with ideas. Bring the list of ideas Juniors come up with to the next meeting.)

End the meeting with a Friendship Squeeze.





BEAR

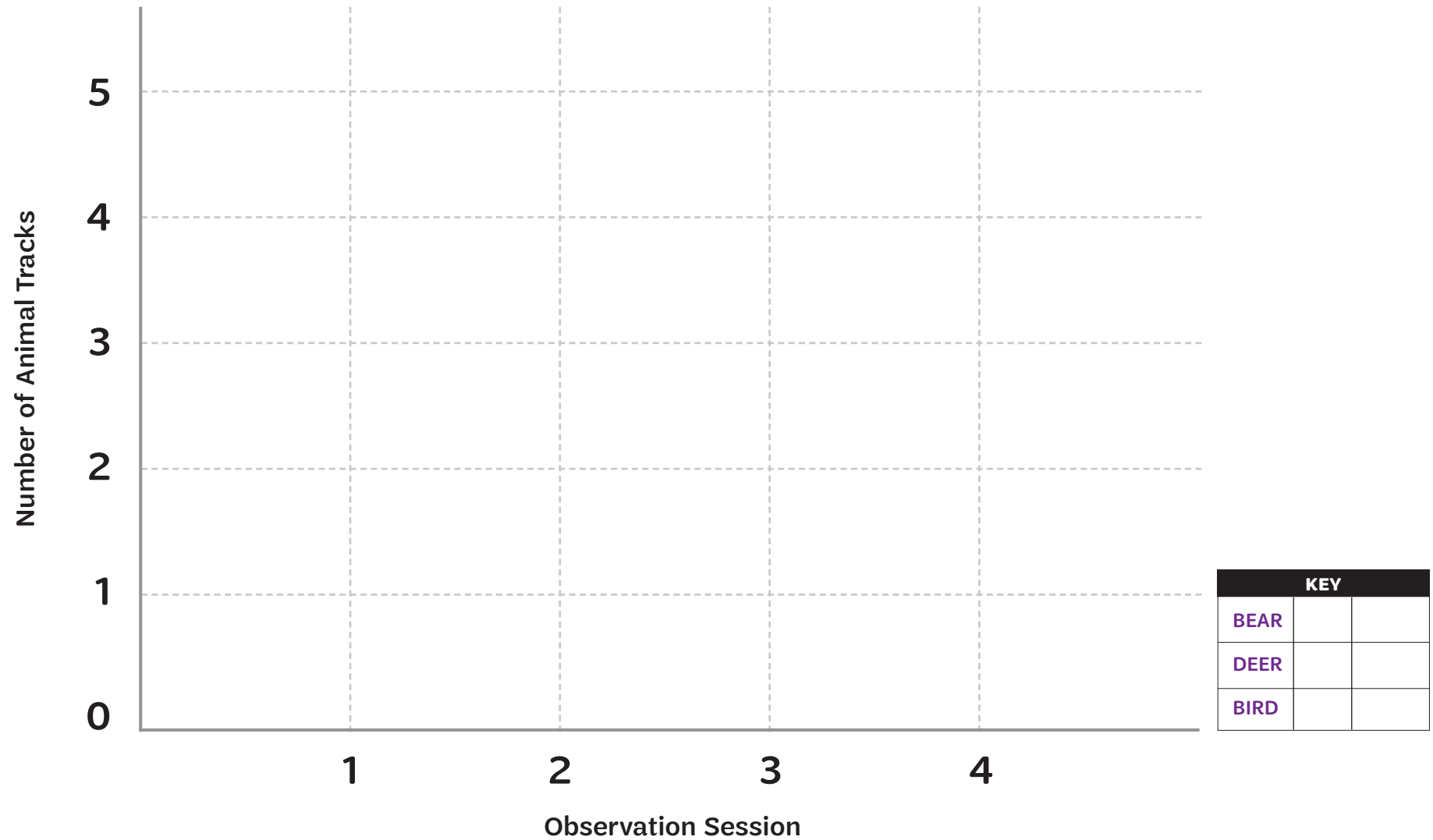


DEER



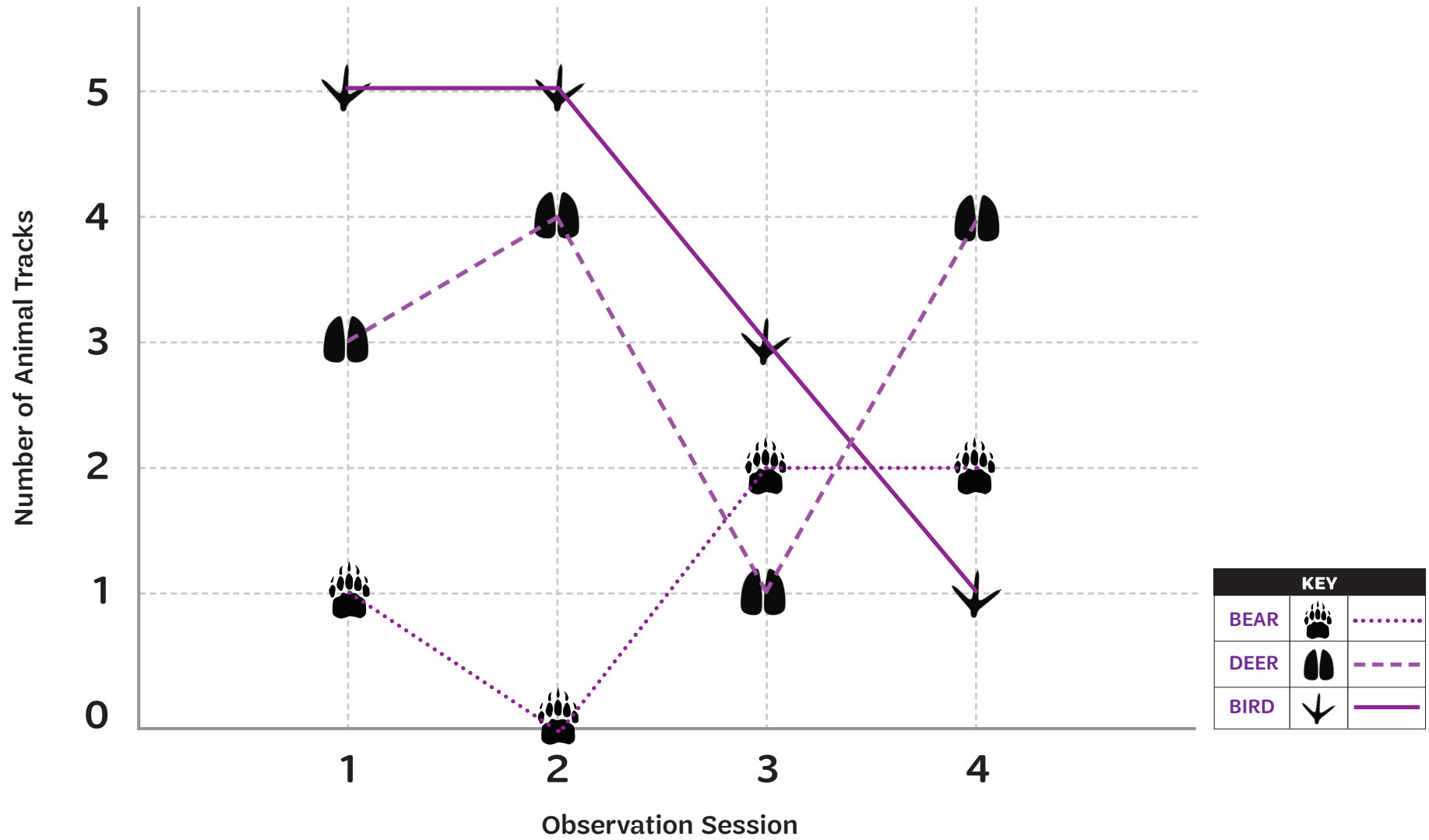
BIRD

Animal Tracking Graph



Name: _____

Example: Animal Tracking Graph



Think Like a Citizen Scientist Journey

Glossary for Juniors

Juniors may not know some of the words used on this Journey. Here are definitions you can share with them:

Citizen Science connects regular people with scientists to help them conduct research. With the help of thousands of citizens around the world, scientists can do research more quickly, share information more readily, and greatly add to the store of human knowledge.

The **scientific method** is the process, or series of steps, that scientists take when conducting scientific research.

Observation is watching and noticing something using all of your senses, especially sight, to get information and better understand a situation or environment.

Data is information that scientists receive, collect, or observe in the field.

Analysis is reviewing data or information to create conclusions that explain more about what you're observing.

Think Like a Citizen Scientist Journey

Materials List

Think Like a Citizen Scientist 1

Activity 1: As Girls Arrive: Sensing Nature

- 10-15 small items from nature for girls to observe (leaves, twigs, flowers, rocks, etc.) Option: If you can find enough objects of the same type, girls will have to observe and describe the items with even more detail in Activity 3: Observing with Detail and Precision.

Activity 2: Opening Ceremony: Becoming Citizen Scientists

- Flag
- Device (computer, tablet or smartphone) with SciStarter project videos downloaded or with ability to stream
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Observing with Detail and Precision

- 10-15 small items from nature for girls to observe (leaves, twigs, flowers, rocks, etc.) Option: If you can find enough objects of the same type, girls will have to observe and describe the items with even more detail
- Blank paper
- Pens or pencils
- Towel, blanket, or similar item to cover the small items all at once
- Blank paper
- Notecards or blank paper cut into four pieces
- Pens or pencils
- Optional: Take Juniors outside for this activity. It will give girls the chance to explore making observations outdoors, which will be an important part of their citizen science activity in Think Like a Citizen Scientist 3.

Activity 4: Closing Ceremony: Take Action Like Citizen Scientists

- Take Action Guide

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Activity 1: As Girls Arrive: Create Your Field Notebook

- Option 1: Blank paper, stapler
- Option 2: Field notebooks (one per girl). A field notebook can be any small notebook that girls can carry with them to jot down notes.
- Pens, pencils, or markers
- Decorating supplies (construction paper, glue, animal stickers, etc.)

Activity 2: Opening Ceremony: Choosing Our Citizen Science Project

- Flag
- Device (computer, tablet or smartphone) with SciStarter project videos downloaded or with ability to stream
- Optional: Poster Board with the Girl Scout Promise and Law

Think Like a Citizen Scientist Journey

Materials List

Think Like a Citizen Scientist 2 (continued)

Activity 3: Animal Tracking Field Notes

- **Animal Tracks Cutouts**, five sheets printed and cut out (making 15 tracks in total)
- **Animal Tracking Graph** (one for each girl)
- **Example: Animal Tracking Graph**
- **Animal Tracking Key** (one for each girl)
- Tape
- Field notebooks from Activity 1: As Girls Arrive: Create Your Field Notebook
- Pens, pencils or markers

Activity 4: Closing Ceremony: Brainstorming Our Take Action Project

- List of Juniors' Take Action ideas from Think Like a Citizen Scientist 1
- **Take Action Guide**

Think Like a Citizen Scientist 3

Activity 1: As Girls Arrive: Prepare Your Field Notebook

- Juniors' field notebooks from Think Like a Citizen Scientist 2
- Pens or pencils

Activity 2: Opening Ceremony: Time to be Citizen Scientists!

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Conducting Our Citizen Science Project

- Device (app or website on tablet, computer, or smartphone) or other materials needed for you to share Juniors' data and show them the 'Thank You' video SciStarter
- Materials needed for your chosen citizen science project (Check your SciStarter Dashboard or project's instructions.)
- Field notebooks or blank paper for girls
- Pens or pencils

Activity 4: Closing Ceremony: Time to Decide on Take Action

- List of Juniors' Take Action ideas from past meetings
- Index cards or paper
- Tape
- Pens, pencils, or markers

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Activity 2: Opening Ceremony: Working Together to Take Action

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Think Like a Citizen Scientist Journey

Materials List

Think Like a Citizen Scientist 4 (continued)

Activity 3: Designing Our Take Action Project

- Large pieces of paper or poster boards
- Markers
- Post-It notes
- Pens and pencils

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Activity 2: Opening Ceremony: Why is Our Project Important?

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Creating Our Take Action Project

- Any materials Juniors need for their Take Action project

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Activity 1: As Girls Arrive: Get Ready to Celebrate!

- Girl Scout Promise and Law poster(s)
- Any items Juniors want to display (such as photos or videos from their Take Action project)
- Photos and videos from the Journey meetings
- Music system
- Decorations
- Snacks

Activity 2: Opening Ceremony: Welcome!

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Awards Ceremony and Celebration

- Think Like a Citizen Scientist award
- Take Action award

(Note to Volunteers: You can buy these awards from your council shop or on the Girl Scouts' website.)

Activity 4: Girl Survey

- If girls are taking the survey online: Laptop/tablet
- If girls are filling out the survey on paper: Copies of Girl Survey (pdf available in Meeting Aids) and pen or pencil

Think Like a Citizen Scientist Journey

Take Action Guide

What's the difference between a community service project and a Take Action project?

Community Service makes the world better by addressing a problem “right now.” For example, collecting cans of food for a food pantry feeds people “right now.” Gathering toys for a homeless family shelter makes kids happy “right now.” Providing clothing and toiletries to people after a fire or flood helps them “right now.” These acts of kindness are important ways to help people — right now.

Take Action encourages girls to develop a project that is sustainable. That means that the problem continues to be addressed, even after the project is over. Sustainability simply means coming up with a solution that lasts.

For example, girls might want to do something about trash in a local park. If they go to the park and pick up trash, they've solved the problem for today — but there will be more trash to pick up tomorrow.

Instead, girls could explore why there's so much trash. Here's what they might discover:

1. There aren't enough trash cans in the park.
2. The trash cans are hard to find.
3. People have to walk out of their way to throw away trash because of where the cans are placed.
4. People don't realize the importance of putting trash in the trash cans.

Here's how girls might address these issues:

- **Issues 1 – 3:** Make a presentation to the city council to report on their findings and suggest adding more trash cans or moving them to more visible or convenient positions.
- **Issue 4:** Create a public awareness campaign that encourages people to use the trash cans instead of littering.
- **Variation:** Older girls may want to design interactive garbage cans that make tossing your trash fun. Do an online search for “the fun theory” or “the world's deepest bin” to see this in action.

What are the steps of a Take Action project?

Girls team up to:

- Identify a problem
- Come up with a sustainable solution
- Develop a team plan
- Put the plan into action
- Reflect on what they learned

Keep It Girl-Led: Girls should actively participate in each step in order for this to be girl-led. Younger girls will need more guidance, but they can and should decide as a team what problem they want to address.

How do girls make their project sustainable?

Here are three ways to create sustainable change:

1. Make your solution permanent.
2. Educate and inspire others to be part of the change.
3. Change a rule, regulation or law.

How can I help girls come up with Take Action Ideas?

Next are some specific examples you can use to help girls understand what sustainable Take Action projects look like.

Keep It Girl-Led: These examples are intended to give a sense of what a Take Action project could look like. **Please do not choose a project from this list for girls to do!** Instead, guide them to brainstorm ideas, get feedback, and come up with a plan. Girls will learn key leadership skills, such as decision-making, compromise, conflict resolution, and teamwork, when their Take Action project is girl-led.

Citizen Science Take Action Ideas

Issue: More kids and families should know about how they can have fun (and help scientists) by doing citizen science projects.

- **Solution: Educate and inspire others.** Do a presentation at your school's parents' night about why citizen science is important. Showcase a few citizen science projects that are particularly fun and easy for families to do together.

Issue: More people need to know how they can do citizen science projects to help scientists learn about the world.

- **Solution: Educate and inspire others.** Organize a Citizen Science Day at your school or in your town. Set up Citizen Science Stations with handouts explaining different projects (and materials, if needed). Invite everyone to choose a project, collect data and upload it.

Issue: Perhaps you've done a citizen science project that's really sparked your interest. You've discovered that a river near your town is polluted. You've learned that bees are dying off and that our food supply is threatened. You've realized that monarch butterflies are in danger because the milkweed plant, their main source of food, is disappearing.

- **Solution 1: Educate and inspire others.** You create a video, presentation, skit, event, poster campaign, movie, etc. to tell people about the problem — and give them several ways they can take action to address it.
- **Solution 2: Change a rule, regulation or law.** You do some research and find out that changing a local law or regulation could address the problem. You make a presentation to your city council, start a petition drive, or advocate at the state level for a change in laws or regulations to address the problem.

Issue: More people need to know how exciting and fun STEM can be.

- **Solution 1: Educate and inspire others.** Create a list of great books, movies and documentaries that focus on STEM. Make copies for teachers to hand out or make posters for the school library.
- **Solution 2: Educate and inspire others.** Create a short play based on one of the books and perform it for your class or school.

Other Ideas for Take Action

Issue: We could conserve water if more people collected rain water and used it to water plants.

- **Solution 1: Make it permanent.** Make rain collection devices for family or friends that can be installed in their yards. Give them a list of different ways to use rain water and how they're helping the Earth.
- **Solution 2: Educate and inspire others.** Create a handout, video tutorial, or show-and-tell presentation about how to make a rain collection device, how to use rain water and how that helps the Earth.

Issue: Parents often run their engines outside the school as they wait to pick up or drop off their children, which pollutes the air.

- **Solution: Change a rule, regulation or law.** Make a presentation to the school board or administrators about why this is a problem and suggest a new rule that makes the pick-up/drop-off area a "no idling" zone.

Issue: There's no sidewalk along a street near the elementary school, which makes it dangerous for children to walk home.

- **Solution: Make it permanent.** Make a presentation to the city council about the problem and suggest that they build a sidewalk. (Note: Even if the council doesn't vote to create a sidewalk, the girls have earned their Take Action award because they came up with a sustainable solution and took action through their presentation.)
- **Extra Inspiration:** Do an online search for "Girl Scout Brownies Convince City Hall to Build Sidewalk."

Issue: There have been several accidents at a busy intersection that doesn't have a stoplight.

- **Solution: Make it permanent.** Research the number of accidents and make a presentation to the city council, asking that they have a stoplight installed.

Issue: The local park doesn't have a swing for children with disabilities.

- **Solution: Make it permanent.** Make a presentation to the city council explaining the problem and offering to use troop money from the cookie sale to help pay for the swing.
- **Extra Inspiration:** Do an online search for "How One Brownie Troop Became Social Entrepreneurs.")

Issue: We should recognize women who have helped their communities and made the world a better place in all kinds of ways.

- **Solution: Educate and inspire others.** Research the “hidden figures” in your community (unsung women who’ve done great things). Create a display about their accomplishments for a library or community center.

Issue: It’s hard for new students to meet people and make friends at school.

- **Solution: Make it permanent.** Design and build “buddy benches.” Partner with the school to have the benches installed on the playground so kids who want to make new friends can find each other.

Issue: The local shelter is having a hard time getting rescue animals adopted.

- **Solution: Educate and inspire others.** Use your photography skills to create pet portraits for the shelter’s web site. Use your writing skills to craft heart-warming bios for each portrait.

Need more ideas?

Check out [Girls Changing the World](#) on the GSUSA web site. Girls post their Take Action and Bronze/Silver/Gold Award projects on this site. You can search by project topic or grade level. (And after the troop has done their project, please post it so they can inspire other girls!)

33 Ways to Take Action!

Make your solution permanent.

1. Make and install something outside (benches, bird houses, dog run, ropes course, sensory trail for children with disabilities, Little Library, etc.)
2. Plant something (butterfly garden, tree, wind chime garden, etc.)
3. Make something inside (Maker Space, reading room, etc.)
4. Create a collection (children's books children's hospital or family shelter, oral histories for town museum, etc.)
5. Advocate for building a permanent community improvement (sidewalk, bridge, park, streetlights, stoplight, etc.)

Educate and inspire others to be part of the change.

6. Do a show-and-tell
7. Create a poster campaign
8. Perform a skit
9. Make a "how to" handout
10. Draw a comic
11. Give a speech
12. Write and perform a song
13. Make an animated movie
14. Make a live-action movie
15. Make a presentation
16. Create a workshop (perhaps in partnership with a local business or organization) to teach a skill such as coding, camping, canoeing, robotics, sewing, car care, healthy eating, gardening, home repair, budgeting, etc.
17. Create a workshop to teach others about healthy living (exercise, nutrition, mental health, etc.)
18. Create a social media campaign
19. Make video tutorials to teach a skill
20. Organize an email campaign
21. Organize a petition
22. Organize an event (concert, play, poetry slam, art exhibit, sporting event, field day) to raise awareness about an issue
23. Make a "playbook" to help others follow your lead (how to mentor robotics teams, organize a workshop or event, advocate to city council, create an online petition, change a law, etc.)
24. Make an app that helps people take action on an issue
25. Create a web site
26. Write an op-ed or letter to the editor of a newspaper or magazine
27. Start a blog

Change a rule, regulation or law.

28. Make a presentation to your school principal
29. Make a presentation to your school board
30. Make a presentation to your city council
31. Speak up at your representative's town hall meeting
32. Create an online petition
33. Advocate for a law with your state government

Brainstorming Tips: Think, Pair, Share

How to Run a Think, Pair, Share Activity:

Tell girls that they're going to brainstorm answers to your question using "Think, Pair, Share."

Lead girls through the basic steps by telling them they will:

1. Break into small groups.

2. Listen to the question or prompt.

3. Think about their answers.

- Girls may want to write their answers down.
- Twenty seconds should be enough time, since girls will need to sit quietly.

4. Pair with other girls.

- Girls talk with one to three other girls (depending on group size), making sure everyone has a chance to share their answers. If there's time, it's OK for girls to ask questions about each other's answers.
- For pairs, 20 seconds should be enough time. If your troop enjoys discussion, consider extending this to 1 to 2 minutes.

5. Share with the group.

- Girls share their answers with the larger group.
- This can be completed in 20 – 30 seconds, but will run longer based on group size and how the group sharing is done.

There are two ways to set up group sharing:

- **Strongly Recommended:** One girl shares the best/most interesting/summary answer for the group. This approach is great if you're running short on time. It also helps develop conflict resolution and compromise skills.
- **Optional:** Each girl shares her partner's answer. This helps girls develop active listening skills, but will run longer because all girls are sharing.

The Girl Scout Promise

On my honor, I will try:

To serve God and my country,

To help people at all times,

And to live by the Girl Scout Law.

The Girl Scout Law

I will do my best to be

honest and fair,

friendly and helpful,

considerate and caring,

courageous and strong, and

responsible for what I say and do,

and to

respect myself and others,

respect authority,

use resources wisely,

make the world a better place, and

be a sister to every Girl Scout.