



# Girl Scouts and GLOBE Observer Think Like a Citizen Science Journey Land Cover Script



*A video version of the [Land Cover presentation](#) [25:53] can be found at [youtu.be/iHoZhcbiN4w](https://youtu.be/iHoZhcbiN4w). Visit the [Girl Scout Guides](#) page ([observer.globe.gov/toolkit/guides/girl-scouts](https://observer.globe.gov/toolkit/guides/girl-scouts)) to download an MP4 file of the video. You can also use this script with the presentation slides available on the website as PDF and PPT files.*

## Introduction

Hello Girl Scouts and troop leaders! We at GLOBE are very excited that you have chosen to use the GLOBE Observer app to work on your Think Like a Citizen Scientist Journey. This video can be used as a plug and play (with pauses for activities, so pay attention and pause the video while you work). Alternatively, troop leaders, service unit or council volunteers, can use this video as an example of how you might run your own program. However you choose to use this video, enjoy your Journey as you learn to Think Like a Citizen Scientist.

## Slide 1

Welcome to the first step in being a critical part of a growing citizen science project. Today you will learn about what it means to Think Like a Citizen Scientist, learn about the Land Cover tool on the GLOBE Observer app and practice identifying different types of Land Cover.

## Slide 2

But first let me tell you about GLOBE and GLOBE Observer.

- **GLOBE** is an international science and education program that provides students and the public worldwide with the opportunity to participate in data collection and the scientific process and contribute meaningfully to our understanding of the Earth system and global environment.
- **GLOBE Observer** app is the data entry tool that allows citizen scientists to enter their data and share observations.
- **GLOBE Observer is part of GLOBE.**

## Slide 3

Okay, speaking of the Think Like a Citizen Scientist Journey, learning about what it means to observe is the first step in thinking like a citizen scientist. Let's get started by practicing our observation skills.

I'm going to show you a satellite image and I'm going to ask you to make observations about it. When we observe, we use our senses (hearing, smell, touch, sight, and taste). Since we can't really taste, smell, hear, or touch this satellite image, we are going to use sight.

#### **Slide 4**

Some possible questions to help you with your observations could be:

- What do you notice about the satellite image?
- What colors do you see?
- What recognizable features do you see?
- When was this image taken?
- What satellite collected the data?

You can write down any observations you made in your science journal or on a piece of scratch paper. Observations are anything that you notice with your senses, so today, you probably won't notice any tastes, touches, or smells, but I bet you will be able to see some cool observations.

*Do this activity with your Girl Scouts, but make it more personal by using satellite images of your region from a recent time period or a historic time in your area. [NASA Worldview](https://worldview.earthdata.nasa.gov) allows you to download your own satellite images (worldview.earthdata.nasa.gov.)*

#### **Slide 5**

Leaders, once your Girl Scouts have finished examining their satellite images and noting their observations, ask them to share their observations and discuss.

Pause the video and discuss.

*Things to point out:*

- *Brown land – not a lot or no living vegetation*
- *White – clouds or snow*
- *Cloud features – cloud streets*
- *Blue – water*
- *Green – vegetation*
- *Bright Green – Salt Lake*
- *Diagonal line in the image (different swaths from different orbits – images were taken 90 minutes apart from each other)*
- *Add place label layer to add observation context*

#### **Slide 6**

Welcome back! I bet you made some really great observations. But what does this have to do with Thinking Like a Citizen Scientist? Let me ask you, what do scientists do?

#### **Slide 7**

Pause the video and discuss what a scientist does.

I bet you had a great discussion on what it means to be a scientist. There are lots of different types of scientists out there, but one thing they all have in common in their research is that scientists rely on the scientific method to learn new things.

You are going to be citizen scientists, where you use the scientific method to help gather data for NASA scientists and other researchers including students or scouts like you.

### Slide 8

The first part of the scientific method is to observe. You all did a great job of observing the satellite image.

The next part of the scientific method is to create a question and make a hypothesis, which is a fancy word for an answer to your question based on your observations. Let's look at this image and make a question based on our observations.

### Slide 9

Pause the video and discuss. You can come up with your own question or you can use the one that I'll provide on the next slide.

*In-person option: Show the [satellite image from NASA Worldview](https://www.nasa.gov/3IJdgdE), a VIIRS image at night (go.nasa.gov/3IJdgdE)*

*Possible observations:*

- *light pixels*
- *dark pixels*
- *location of white pixels*
- *time of day*

### Slide 10

Our question could be, "What is located where there are clusters of white pixels?"

### Slide 11

The hypothesis is your answer to that question. The white pixels indicate that there are a lot of lights, so I think that there are more lights in cities. The clusters of white pixels are where there are cities.

### Slide 12

But, how do scientists know if their hypothesis is correct? They have to collect and analyze data. The more data they have the better their results will be because it helps filter out some of the outliers (the mistakes, errors, or oddball data). Kind of like if I was measuring favorite Girl Scout cookies. The more people I sell cookies to, the better my data.

### Slide 13

For example, here is a pie chart showing real data from my troop sales. This Girl Scout made a single sale to one family (who love Samoas and don't like Thin Mints). But are Samoas the most popular cookie sold by Girl Scouts nationwide? With this data my hypothesis should be yes! But is it? How could I get a better data set?

I could collect more data. The pie chart on the right is the data for my entire troop's sales. This is a much better data set because it has 1,559 packages of cookies sold – 1,554 more boxes than my single sale. With this much data, I could look at which ones I sold the most of and be able to make a better conclusion to my hypothesis than if I'd only sold 1 or 2 boxes. The more data that is collected, the better. So are Samoas the most popular according to this data? No. Thin mints are. Your troop can do this same exercise with your troop sales! If you added your data to this data, we'd have an even better data set!

*Optionally, you could have them conduct this research with your own troops' cookie sales*

#### **Slide 14**

In the nighttime satellite image, we were mostly right, but there are some outliers. For example, in North Dakota, there are bright spots where there are oil fields, but not cities.

For NASA scientists, we rely on a lot of data. And this is where you can come in. You can be citizen scientists.

#### **Slide 15**

These are data points taken by citizen scientists all over the world with GLOBE and GLOBE Observer and you can be part of the network of citizen scientists that are collecting and analyzing this data.

*Girl Scouts can interact and explore data in the [GLOBE Visualization System](https://vis.globe.gov) ([vis.globe.gov](https://vis.globe.gov)). Click around and add layers to explore the data.*

#### **Slide 16**

Let's learn about GLOBE Observer's Land Cover tool.

[Introducing GLOBE Observer Land Cover video](https://youtu.be/HkXLweBNKd4) [0:49] ([youtu.be/HkXLweBNKd4](https://youtu.be/HkXLweBNKd4))

#### **Slide 17**

Next, let's watch this video to learn about the importance of land cover data and how your citizen science observations contribute to continuing land cover research.

[Why Observe: Land Cover video](https://youtu.be/vHmwHBFHCQE) [7:40] ([youtu.be/vHmwHBFHCQE](https://youtu.be/vHmwHBFHCQE))

#### **Slide 18**

Now it's your turn. Let's try analyzing and classifying some land cover data collected by GLOBE Observers. Let's play the Land Cover Classification Challenge.

We are going to use the [Land Cover Type Quick Reference Guide](#) to identify and classify different types of land cover. You can keep watching the video and go through the Land Cover Classification Presentation or you can do this activity as a troop, logging the different types of Land Cover that you see.

#### **Slide 19**

- 1) Each slide will show you a photo from a GLOBE Observer Land Cover Observation.
- 2) Use the Land Cover Quick Reference Guide to identify the types of land cover in the photos.
- 3) Write down your answers on a piece of paper.
- 4) After all nine photos, continue watching the video to see how many you got right.

*The Land Cover Quick Reference Guide can be downloaded and printed in advance, then you can distribute them among your scouts. Alternatively, instead of watching the slides and answering the questions, you can send your Girl Scouts out on a hike, where they would identify land cover types along the way, if it is safe to do so.*

[Land Cover Quick Reference Guide](https://go.usa.gov/xtE4N) ([go.usa.gov/xtE4N](https://go.usa.gov/xtE4N))

**Slide 20 - 29**

*Let these slides play through. Then, pause the video and discuss.*

**Slide 30**

Thanks for playing! Let's find out how well you did.

**Slide 31**

This photo is of a barren landscape. Barren means that there isn't much vegetation. We can see bare rock, glaciers, and soil.

**Slide 32**

In this photo of a road in a forest we have two different types of land cover. Urban and Trees. The trees are deciduous broadleaf, because most of them are missing their leaves. Deciduous means that the leaves (or needles fall off the trees in the Fall). If you were in this forest, you could use this opportunity to use the GLOBE Observer Trees tool and measure the tree height of one of these trees. It is also an urban land cover because there is a road that cuts through the forest. The road is an urban land cover, while the forest is a tree land cover.

**Slide 33**

Look at all that grass! This is a grassland. And the grass is medium in length. If it was tall the grass would have to be over 6.5 feet high. That's taller than most people I know!

**Slide 34**

This is a picture of a forest with both trees and shrubs. The trees are primarily needle leaf evergreens and there are both short and tall shrubs.

**Slide 35**

This photo was taken from the Pacific Coast. That is open water, since the Pacific Ocean is filled with saltwater, this is a marine open water land cover.

**Slide 36**

This is a photo from a river. This would be a freshwater open water land cover type because the river is filled with freshwater, not saltwater. Also, there are trees in the background, this is a wetland and specifically a river wetland.

**Slide 37**

This is a really dry landscape, but there are a few shrubs scattered among the barren dirt. These shrubs would be classified as short, since they are under 6.5 feet tall.

**Slide 38**

This photo shows a city, or an urban area. We can see that there are apartments (residential), businesses (commercial) and roads. This photo shows all the subcategories in the urban land cover type.

**Slide 39**

This looks like an outfield of a baseball field. The grass has been mowed and cared for. It wouldn't look like this if people didn't plant, water and mow this field. Because humans grow the vegetation to look like this, it is considered cultivated. Farms, pastures, or parks are cultivated land cover types. Since the field is covered in grass, it is specifically a cultivated grass land cover type.

**Slide 40**

Congratulations! How many did you get right? You can pause the video and discuss or you can continue on ...

**Slide 41**

... and learn about how to use the Land Cover tool in the GLOBE Observer app.

[GLOBE Observer Land Cover: Getting Started video \[2:44\]](https://youtu.be/PSCEpPIfGMs) ([youtu.be/PSCEpPIfGMs](https://youtu.be/PSCEpPIfGMs))  
Alternatively, you can share the [Land Cover Introductory Tutorial video \[1:26\]](https://youtu.be/Z5tdE12HjpA), ([youtu.be/Z5tdE12HjpA](https://youtu.be/Z5tdE12HjpA)) and narrate as the video plays.

**Slide 42**

If you want to get started as a GLOBE Observer, ask your troop leader to register your troop through SciStarter, then send you the link to set up your accounts.

[URL to set up SciStarter account](https://scistarter.com/girlscouts/volunteer/landing) ([scistarter.com/girlscouts/volunteer/landing](https://scistarter.com/girlscouts/volunteer/landing))

**Slide 43**

Once you have a troop SciStarter account, you will choose which citizen science opportunity interests you. There are a lot of different citizen science projects (including others with NASA) and others with GLOBE Observer: Trees, Land Cover, Clouds, and Mosquito Habitat Mapper.

**Slide 44**

Then you need to download the app. Register as a GLOBE observer. Then collect your data.

[Download the app](https://observer.globe.gov/get-the-app) ([observer.globe.gov/get-the-app](https://observer.globe.gov/get-the-app))

**Slide 45**

So now you've learned to Think Like a Citizen Scientist by observing, collecting and analyzing data. The next step is to collect and analyze your own data by using the app. Then, consider how you might use your data to take action.

What kind of "take action" projects could you think of doing?

- Adopt a place and take observations on a schedule. While you are there, take care of it. Pick up litter, do some gardening.
- Create a program to teach other Girl Scouts about a place that is important to you.
- Start a hiking group and take observations as part of your walk.
- Document changes with scheduled observations. If you know of a place that is undergoing changes (a new building being built, a development, a place where regrowth is happening after a landslide or forest fire – of course only after it is safe to do so) monitor that change with scheduled observations. Or take seasonal observations and compare the changes that take place.

What I love about Girl Scouts is that you all leave the world a better place. I for one am really excited that you are leading the future for us.

**Slide 46**

We would also love for you to share your Take Action projects inspired by GLOBE Observer. Please share on social media or email us at GLOBE Observer.

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Follow up email for your troop:

Thanks for joining the NASA GLOBE Observer and Girl Scouts Think Like a Citizen Scientist Journey!

I mentioned a few links in the presentation that you may want to revisit, and I've included a "How-To Guide" to help your troop leaders or parents get you started.

- [Earth Observatory for Kids](http://earthobservatory.nasa.gov/eokids) (earthobservatory.nasa.gov/eokids) – articles and activities for kids 9 – 14 years old. Explore how NASA uses satellites to learn more about Earth.
- [GLOBE Observer app link](http://observer.globe.gov/get-the-app) (observer.globe.gov/get-the-app) or download from the App Store or Google Play.
- [GLOBE Visualization System](http://vis.globe.gov) (vis.globe.gov) to see other citizen science data from GLOBE Observers around the world. You can look for tree height pictures or check out data from the other GLOBE tools.
- [NASA Worldview](http://worldview.earthdata.nasa.gov) (worldview.earthdata.nasa.gov) to explore current and past satellite data (yes, you can view data as early as today in near real time).
- [Land Cover Quick Reference Guide](http://go.usa.gov/xtE4N) (go.usa.gov/xtE4N)