

Exploration, Making Scientific Observations

Main Lesson Objective: Students will plot out and study a particular section of the PLAYces location, taking notes, and sharing their findings with the larger group.

Number of students/adults	Goal of 1 adult to 15 kids max
Age of students	Middle school ages
Length of each session	~60 minutes
Focus	Environment
Background knowledge	Assuming providers have no background knowledge
Season	Can be used during any season
Resources	Minimal cost and easily accessible

Supplies: Minimal cost and easily accessible

- ✚ String
- ✚ Stakes – 4 per group of 2, plus 4 for teacher demonstration (to hold string in ground; can be as simple as wooden sticks or popsicle sticks)
- ✚ Paper (lined and/or plain)
- ✚ Pens/pencils
- ✚ Colored pencils, if possible
- ✚ Dice
- ✚ Graphic Organizer (attached)
- ✚ Rulers or tape measures, if possible

Learning Objectives:

Students will:

- Plot a specific area of the PLAYce
- Conduct scientific observations on their specific plot of land
- Document observations of the land
- Share findings with the group

Three Options for This Lesson

The first will be detailed throughout the lesson plan.

1. All students stand in center of space, facing out/back to back, teacher rolls a die and students walk the number of steps that are shown on the die. Have small groups (of ~3 students) plot an area together.
2. Have whole group plot one large area.
3. Have individual students plot their own individually selected area.

Prior to lesson, teacher should:

- Know how to map out/plot an area using string and stakes.
- Gather all needed materials and know their intended purpose.
- Print out copies of graphic organizer (attached) if using this option.
- Know what the specific space was before it was repurposed. (Teacher can look at the GTECH website [Projects page](#) to familiarize themselves with the particular project spaces. Before and after pictures are available.)

Lesson Overview:

1. **Warm-up** (5 minutes)
 - Welcome students to the Green PLAYce
 - Assess prior knowledge
 - Turn and talk to share with peer
2. **Introduction to New Material/Vocabulary** (5 minutes)
 - Making scientific observations
 - Plotting an area
3. **Pre-Activity** (15 minutes)
 - Discuss the importance of plotting and studying an area of land
 - I do – teacher demonstration – guide students through plotting a section of space
 - Distribute graphic organizers
4. **Activity** (30 minutes) (Guided and Independent practice)
 - Divide students into groups
 - Distribute materials
 - Plot the area, explore, make scientific observations
5. **Wrap-up** (10-15 minutes)
 - Share findings with group

Detailed Lesson Plan:

1. **Warm-up** (5 minutes)
 - Once in the Green PLAYce, allow students the opportunity to naturally find a place to sit (Ask them to find a place to sit). Don't give direction on where to sit (as long as it is within the boundaries of the PLAYce).
 - Once seated, welcome students to the Green PLAYce.
 - Assess prior knowledge
 - **Ask** students what kinds of scientific observations they've ever made. (If they need help, mention science classes, field trips, class labs, outdoor events, etc., but don't give them ideas about what scientific observation means.)
 - Once they have a couple of ideas, ask them to turn and talk to share ideas with a nearby peer.
 - Depending on time and size of group, take a few responses or all responses. See if there were any similarities between students.

2. **Introduction to New Material/Vocabulary** (5 minutes)
 - Discuss what it means to make scientific observations.
 - **Say**, "Today, we are going to be **making scientific observations** by plotting a section of this space and seeing what we find there. Observation uses the senses. So we'll be thinking about what we see, feel, hear, smell, or taste. Scientific observations may also involve using instruments to collect data and recording the data that you find/experience, but it may just be using your senses. It's that simple. So, you've been making scientific observations for years, you may just not have realized it."
 - **Say**, "**Plotting an area** means that we will section off a specific space. Today, we will be doing that by using **stakes** that go into the ground and **string** to connect the stakes and section off the area."

3. **Pre-Activity** (15 mins)
 - Discuss the importance of plotting and studying an area of land.
 - **Ask**, "Why do you think it could be important to study a piece of land?"
 - Take responses.
 - **Add**, "It could be important to study an area of land to see if you can plant or build something on the land. You can look into the land's history to find out what was there 100 years ago. Studying land can give us a lot of information. Even the soil under your feet is working and is an important part of the environment."
 - **Say**, "We are all going to be studying different areas within our space today, so we need to know how to observe it and collect data the same way."
 - **Teacher demonstration** – Guide students through plotting a section of space:
 - For demonstration, teacher should have something to be used for a stake, like popsicle sticks, a very long, continuous piece of string, and preferably a ruler or measuring tape.
 - 1. Put at least 4 stakes in the ground to make a square. Make sure that stakes are at least a foot apart for demonstration.

- **Say**, “I am putting my stakes a foot apart, but you should have at least 3 feet between each of your stakes. This will make sure that you have enough to study within your space, but not too much that you don’t get a chance to study everything.”
 - **2.** Wrap string around one of the stakes and tie a knot in it to secure it to the stake.
 - **3.** Stretch string to another stake and wrap around a couple of times, repeating the process around the other 2 stakes, finally finishing back at the original stake.
 - **Say**, “Plotting the land this way makes sure that you are only studying what is within your area. If your area is too big, it would take a lot longer to study it and you may not have much different information from other groups to share.”
 - **Provide** students with the graphic organizer (attached) and pens/pencils.
 - **Say**, “We are going to use this graphic organizer to collect data from what we find in our spaces.”
 - **Say**, “When you are in your space, take a few minutes to just observe what is there. Note anything obvious first, like a bench. Record it on your paper. Then, look deeper for things that most people might miss or something that the group wouldn’t know was there because it is unique to our space, like specific plants. Once you’ve done that, look at the soil. Try to see if you can find any insects or critters. They have an important function in the environment as well. Count how many different things you find and record it. Nothing you see is too little or insignificant to document! Everything that is in your space has a specific function and purpose. With your group, discuss what you think their purpose is and record it on your paper. Fill in all other boxes with your group or individually. Try to fill in as many of the rows as possible. Use the prompts in each column to help you remember what I just mentioned.”
 - Ask if anyone has any questions about the graphic organizer or what they’re supposed to do. Answer accordingly.
- 4. **Activity** (30 minutes) (Guided and Independent practice)

This is where the 3 options will determine how you proceed. Option 1 is detailed.

 - **Divide students into groups** of 2 or 3, depending on the size of your group. Allow them to work with who they want to work with if it is manageable.
 - **Distribute materials** for plotting the area (stakes, string, and rulers/measuring tape).
 - Have students stand in the center of the space, facing out/back to back.
 - Roll a die to determine the number of steps that students will walk from the center. Try to make sure that there are at least 3 steps. Preferably, they will have a space that is significantly different from their peers, but that’s not required.
 - **Say**, “This is the area that you will be plotting and studying.”
 - **Say**, “Once you have plotted your land, you will be making scientific observations.”
 - **Ask**, “What did we say scientific observations were?” Take responses. (**Answer:** Observation uses the senses. So we’ll be thinking about what we see, feel, hear, smell, or taste. Scientific observations may also involve using instruments to collect data and recording the data that you find/experience, but it may just be using your senses.)

Lesson Plan

- **Say**, “So with your group, first plot out your area and then study the area for a few minutes. Then complete your graphic organizer, as we have discussed. I look forward to seeing good teamwork! We will come back together at the end to share our findings, so be thinking about who you want to share the information that your group has discovered. Have fun!”
 - As students are plotting their area and making observations, circulate around the group. Give praise and redirection as needed.
 - When 15 minutes have passed, tell the groups that they have 5-10 minutes left to observe and complete their graphic organizer.
 - Tell students when there are 5 minutes left and ask them to decide who they want to present their group’s information. One person from a group can present or all group members can present.
5. **Wrap-up** (10-15 minutes)
- **Present ideas**
 - Depending on how large the space is, it would probably be best to have all groups stay in their specific areas, so that they can point out any key features that are meaningful to their space and their presentation.
 - Provide groups an opportunity to share their findings with the larger group.
 - If you have limited time, you can ask them to pick 2-3 of the most important observations to share.
 - Give praise after groups present and mention something specific that you liked about their observations or group work.

Additional Lesson Options

Instead of going through the entire aforementioned lesson plan, teacher can choose to do any of the following activities, instead of using the graphic organizer and working in groups. Teacher would take students through plotting the area and then let students work individually to complete any of the following. (This would cut down on time and materials needed, but still meets the objective of plotting the area and making observations.)

- Students can create a poem of their space.
- Students can draw their interpretation of their space.
- Students can create a skit about how some of the elements in their space work together.



Graphic Organizer for Data Collection (print front and back)

<i>What is observed?</i> <i>(What is obvious? What would most people miss? What is unique to your space? What's in the soil? Find the critters.)</i>	<i>How many do you see?</i>	<i>What is its purpose?</i> <i>(Make a guess if you're not sure. Think about its function within the environment.)</i>	<i>Why was this important for you to document?</i>	<i>Other Notes</i>



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