

# Lesson Plan: Photo Hike

## Activity Overview and Objectives

The purpose of this activity is for students to observe the connections between elements of an ecosystem and to reflect and understand how those elements are impacted by a changing climate.

In this National Park activity, students are given the opportunity to observe, take photos, and note particular components of a protected ecosystem. These observations are then used to establish a sense of place and draw conclusions about how this landscape may change in varying climate and weather patterns.

For classes that may not have access to these protected landscapes, the activity can be adjusted to take place in and around a school.

Students will reflect and discuss the implications of climate change on objects and organisms that they choose to focus on. The group will also think about how the landscape could change if it is continually impacted by climate change, and what they can do to mitigate these impacts.

Students will understand:

- that each ecosystem is made up of a variety of elements, living and nonliving
- that each part of an ecosystem can have different meaning to different people
- how to observe elements of a local ecosystem
- how to reflect on the potential impact of changing climate

## Next Generation Science Standards (4th Grade)

### 5-ESS3-1

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

## Related Disciplinary Core Idea

### Human Impacts on Earth Systems

Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts.

## Cross-Cutting Concepts

### Systems and Systems Models

- A system can be described in terms of its components and their interactions.

### Science Addresses Questions about the Natural and Material World

- Science findings are limited to questions that can be answered with empirical evidence.

## Video Description (Indiana Dunes National Lakeshore)

The six-minute video of this activity shows 4th grade students walking through their local National Park with digital cameras. The high school students are leading the 4th graders along a path and pointing out important and interesting components of this specific ecosystem (Indiana Dunes National Lakeshore). Once the students complete the hike, they return to the visitor center to discuss one photo that intrigued them most along with the implications climate change could have on the object in the photo.

## Park Option

If you have access to a Park Unit or other park setting that has a safe hiking trail or walking path with a variety of ecological diversity, you can run this activity as shown. If you don't have enough cameras, students draw their observations rather than take photos. Preparatory work can be completed in the classroom prior to the field trip, or can be done in the field.

## School Option

This activity guide shows you an alternative format that you can do with your students at your school site.

## Materials

- Digital cameras / cell phones with cameras
- Projector (if possible), for sharing follow up
- Clipboard and paper for each student
- Pens or pencils
- Activity video (provided here)

## Set Up

- Have the activity video ready to play for students
- Have all digital devices you plan on using in one bin, labeled with numbers and charged up for the activity (or have spare batteries)
- Written activity outline displayed (goals and timeline breakdown)

- Place paper on each clipboard

## Step 1: Ecosystem Components

### Key Definitions:

Term	Definition
Biodiversity	The variety of life in the world or in a particular habitat or ecosystem
Ecosystem	a system, or a group of interconnected elements, formed by the interaction of a community of organisms within their environment
Habitat	the natural environment of an organism

**Ask Students:** How much and what kinds of biodiversity do you think are around our school? These answers will differ based on whether you are in an urban or rural setting.

**Discuss:** Guide students in a discussion about how the area around the school compares to other local ecosystems that they have seen. What are some components that they can think of off the top of their head. Challenge them to think about both living and nonliving things. Remind students that a living organism can be something other than an animal they can see! Tell them to think smaller and look at the plants and smaller insects that are part of the ecosystem as well.

### Examples of Living and Nonliving Organisms:

Living	Nonliving
Animals	Sunlight
Plants	Wind
Humans	Rocks

**Ask students:** Are there other examples you can think of for living and nonliving organisms?

## Step 2: Local Ecosystems

**Ask Students:** What is something in nature that you have noticed that you find beautiful, interesting, scary, confusing, etc.? (this can be a living or nonliving organism).

*Note: This question is meant to establish an emotional connection between the students and something they can find in a local ecosystem.*

**Discuss:** Have students break up into small groups. Instruct them to share with the other students in their group what object they chose and why.

**Ask Students:** If the organism or object you picked wasn't here anymore, how would the world be different without it?

## Step 3: Adapting to a Changing Climate

**Ask Students:** What does climate change mean? You may want to begin by differentiating between weather and climate as a refresher.

**Weather vs. Climate:** Weather is short-term, and can change very frequently depending on the conditions of each day (rain, snow, thunder, etc.). Whereas climate is a long-term condition of an area, and when the climate changes, the daily weather will likely change as well.

**Discuss:** Sometimes climate change, which evidence shows is accelerated by humans, can have negative impacts on ecosystems. Lead students through a discussion about how local practices in their area might impact the environment (agriculture, factories, piping water cross-country). Feel free to use an example that relates most to where your students are based.

## Step 4: Observations

**Discuss:** Observations are a key component to seeing the physical manifestations that climate change can have. You can use your senses to discover what an area around you is like, and watch how it changes over time. Today we will be using one of our senses in particular to observe the world around us - sight.

**Ask Students:** What are some things you noticed on your way into school/class/the park/etc. today?

## Step 5: Intro to Photo Hike/Walk

Watch Photo Hike video to introduce a few ideas to the students about what they are going to be doing, looking for, and observing.

**Define:**

<b>Key Term:</b>	<b>Definition:</b>
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Phenology	The time of year that certain events happen in the biological world (when things flower, when leaves turn colors, when birds migrate, etc.)
Phenological Mismatch	When two events that typically happen at the same time, are no longer aligned (example in video of karner blue butterfly)

At this time, you will tell the students that you are going to do your own version of the photo hike. You can plan the route of this hike depending on where you are doing this activity. The route could be around the school, to a local park or natural area, or a National Park or similar.

**Explain:** Like in the video, each of you will be recording your observations today about particular items on our trip/hike/walk that interest you. You will be taking photos along our path today and recording what you notice about them or why you chose that particular item. Try and take photos of things that you would want to see stick around through a changing climate, or something you would like to share with future 4th graders. As you take photos, think about how these things could be impacted if there were changes in temperature (hotter/colder) and weather patterns (snow, rain, lack of precipitation, etc.) to create a hypothesis about one of these situations.

**Note:** Remind students to use the “if... then... because...” format for their hypotheses. Perhaps give them a local example along the lines of: “**If** the temperature rises and the precipitation decreases, **then** the local bee population will be impacted **because** the flowers where the bees get pollen will no longer be able to survive in this environment”.

Keep in mind, we’ll be coming back together to share *one* photo from your journey, why it stuck out to you, and your hypothesis about how it might be affected by climate change.

Tell students to take notes about a few of their favorite or organisms if cameras are unavailable.

### Step 6: Photo Hike/Walk

Bring students along the path you had planned for this activity and remind them of the objectives as they walk. Perhaps ask them leading questions about how their organism would be impacted by a few of the scenarios listed above.

After you think students have enough photos and/or observations to share, bring them back together in a space where you can project or show photos/drawings with the group.

### Step 7: Debrief and Reflection of Observations and Photos

Once you return from the hike, have students take a few minutes to choose their one photo from the hike/walk and write down their observations about it, why it interested them, and how they

think it could be impacted by climate change. You could talk to the group how we all managed to find something special to us just in the immediate area, so there are opportunities to connect to nature all around the world.

**Student Sharing:** In whatever format you see fit, have students come up and share:

- Photo they chose
- Why they took a photo of that object
- What about it interested them/what makes it special to them
- How they think it could be impacted by climate change in the future

## Step 8: Taking Action

**Ask Students:** What action can you take to lessen your impact on your local ecosystems?

**Pledge:** Have students talk about and then write down on cards what they are committing to do. They will likely need some guidance to identify ways they can make a positive impact. Remind students that taking such actions is a way to Elevate--to be a leader who serves and have a positive impact on the world. Post students' pledges somewhere in the classroom. Be sure the check back with students at points in the future to check on their progress and reflect on the impact their action may be having.

### Examples of Actions Students Can Take

- Stay on designated trails while hiking
- Share your passion for the object with others
- Teach others about what you learned in this lesson today (what phenological mismatch means)
- Get involved in your local community in conservation efforts