



Disappearing Glaciers

6th-8th

Preparing for your Distance Learning Program





Table of Contents

Welcome and Need to Know Information	Dear Teacher	3
	What is Distance Learning?.....	3
Park Background	Background Information on Glacier National Park.....	4
Program Information	Lesson Overview.....	5
	Essential Questions.....	5
	Vocabulary.....	5
	Next Generation Science Standards.....	5
	Lesson Objectives.....	5
Suggested Lesson Sequence	Pre-Program Lesson.....	6
	During the Program.....	6
	Post-Program Lesson.....	6
Pre-Program Lesson	“Examining Repeat Photography” ..(Qualitative Data).....	6
During the Program	Time.....	7
	Getting Ready.....	7
	Procedure.....	7
Post-Program Lesson	“Climate Change Near You”.....	7



Welcome and Need to Know Information

Dear Teacher,

This packet contains all the information you will need to prepare your students for a “Disappearing Glaciers” Distance Learning program with Glacier National Park.

The lesson plans and resources on pages 5-7 should answer most questions about program logistics, objectives, and schedules.

The rest of the lessons are meant to prepare students for the concepts and vocabulary highlighted during the program. Each activity can serve as a pre-visit introduction or a post-visit assessment/extension.

Be sure to confirm the date(s) and times for your Distance Learning program (received via email) are correct. There is no cost for this program.



The education ranger assigned to your group will email you before the program to arrange for a test call and answer any questions. You can also reach them at 406-888-7899.

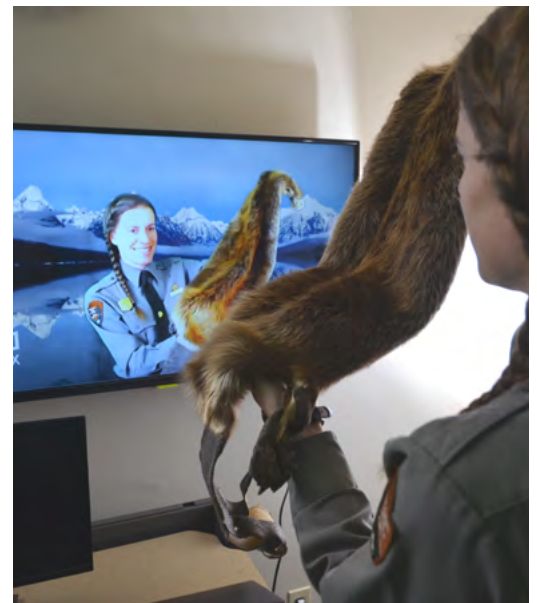
Finally, this project and many other critical projects would not be possible without your donations to the Glacier Conservancy.

Glacier National Park
Education Staff

What is Distance Learning?

Glacier National Park protects some of our nation’s greatest treasures, and hosts nearly 3 million visitors a year. While its pristine location in the mountains of Northwest Montana provides spectacular scenery, it also proves tricky to visit; often requiring a long drive or flight.

Glacier’s Distance Learning Program strives to bring the experience and learning opportunities of this special place to classrooms around the country, providing interactive, curriculum based education programs to students of any age!





Background on Glacier National Park

Established in 1910, Glacier National Park is located in northwest Montana and is often referred to as the jewel of the Crown of the Continent ecosystem. Known to Native Americans as the “Shining Mountains” and the “Backbone of the World”, Glacier National Park preserves more than a million acres of forests, alpine meadows, lakes, rugged peaks, and glacial-carved valleys in the Northern Rocky Mountains. Its diverse habitats are home to nearly 70 species of mammals including the grizzly bear, wolverine, gray wolf, and lynx. Over 270 species of birds visit or reside in the park, including such varied species as harlequin ducks, dippers, and golden eagles. The landscape is a hiker’s paradise that is traversed by more than 740 miles of maintained trails. Glacier’s location at the headwaters of the Pacific, Atlantic and Hudson Bay drainages, in addition to its climate influences, have given rise to an incredible variety of plants and animals.

The park is named for its prominent glacier-carved terrain and remnant glaciers descended from the ice ages of 10,000 years past. Bedrock and deposited materials exposed by receding glaciers tell a story of ancient seas, geologic faults, and uplifting. The result of these combined forces is some of the most spectacular scenery on the planet.

In 1932, Glacier National Park and Canada’s Waterton Lakes National Park, adjacent to Glacier’s northern border, were designated Waterton-Glacier International Peace Park. This designation celebrates the longstanding peace and friendship between the two nations. Both parks have since been designated International Biosphere Reserves and together were recognized in 1995 as a World Heritage Site.





Program Information

Lesson Overview

When European settlers first arrived in what would later become Glacier National Park, they found over 80 active glaciers. Today the count is 26. Climate change is affecting all aspects of life in the park, from melting glaciers to altering animal habitats.

In this program, students will learn about the characteristics of a glacier, the climate and weather of Glacier National Park, and how park scientists are working to understand how climate change will shape the future of our park.

The 5-10 minutes of the program are set aside to answer any questions students may have about climate change or Glacier National Park.

Essential Questions

How are the landscapes and ecosystems of Glacier National Park changing due to climate change?

How is the park responding to climate change?

What responsibility do humans have to respond to climate change?

Are all effects of climate change “bad”?

Vocabulary

glacier, climate, weather, climate change, ecosystem, watershed, phenology

Next Generation Science Standards

MS-ESS3-5 Earth and Human Activity: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

MS-ESS3-1 Earth and Human Activity: Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.

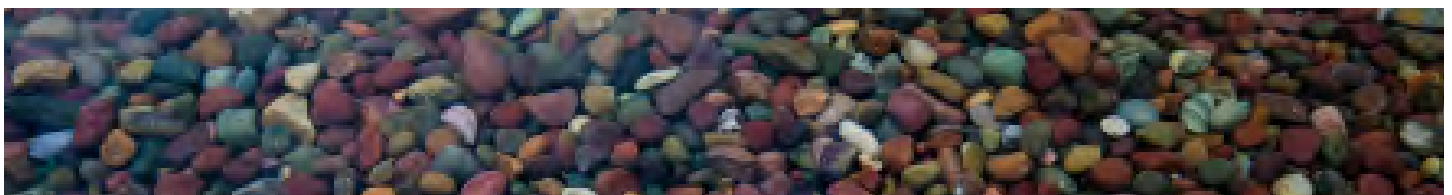
Lesson Objectives

At the end of this program, students will be able to:

-Explain what national parks are and what they protect.

-Describe how glaciers shape landscapes.

-Summarize what research has or is being done to study the impacts of





Suggested Lesson Sequence

- Pre-Program Lesson** Take a look at repeat photographs of glaciers to evaluate glacier and landscape change.
- During the Program** Students will participate in group discussions and answer questions with the ranger
- Post-Program Lesson** Research climate change in your area.



Pre-Program Lesson

Examining Repeat Photography (Qualitative Data)

Time 30 minutes

Materials lesson adapted from: [Evaluating Glacier and Landscape Change \(by USGS\)](#)

- Procedure**
1. Ask students what they know about climate change.
 2. Play [this video from National Geographic](#) about how we measure climate change in Glacier and what else is impacted besides glaciers
 3. As a class, in small groups, or as individuals, compare repeat photos of glaciers in Glacier National Park
 - Look at pictures on the computer and [use slide bar](#), or [print photos](#) and compare next to each other
 - Questions to ask: Did the glacier change a little or a lot? What similarities do you find between the photos? How can you tell the photos were taken from the same location? What conclusions can you draw from the photos?
 4. Have a discussion. Can scientists measure anything from the photographs? (*no, the photos are qualitative data*)
 - What is the value of the photos?
 - Can you think of other examples of photographs used as documentation? (*Dental x-rays, photographs of museum collections, school pictures, family photos*)
 5. As a class or individuals, compile a list of questions you still have about climate change and its impacts in Glacier National Park to ask the ranger during the distance learning program.



During the Distance Learning Program

Disappearing Glaciers

Time 45-60 minutes

Getting Ready Student Volunteers: Students will interact with the ranger during the program, but the ranger will rely on you to call on students directly.

Establish video conference connection: Prior to the program, you and the ranger will decide who is hosting the program. If you are the host, please email the connection link at least 15 minutes ahead of time. If the ranger is hosting, we will email a connection link at least 15 minutes prior to the program. Make sure your connection is up and running before beginning the session with the education ranger.

Procedure

Orient your students:

Before connecting, show students the set-up and go over any standards of behavior that students should follow during the session. Remind them that the ranger may not be able to see everyone in the classroom, so they should look to you as an intermediary when they want to make a comment or ask a question.

Connect with Glacier:

At the designated time, use video conferencing software to connect with the education staff. The program may last 45-60 minutes, depending on student input and questions.

Let the communication begin!

Please be available to the education staff during the entire length of the program. At the end of the program be ready to help facilitate questions.

After the program:

Take some time after the program for students to discuss and provide feedback about their experience. Let them know that if they have further questions for the education staff, they can contact us at:

glac_education@nps.gov

Post-Program Lesson

Climate Change Near You

Time 60 minutes

Materials Computer.

Procedure As a class, small groups, or individuals, research how climate change is affecting the area you live. Start by asking students if they have observed or heard about any changes in phenology. Then do a web search. Websites like noaa.gov and the epa.gov are great places to start. You can also explore [this map](#) and find an event near you.