

## North America Virtual Field Trip #3

### North America: Explore Glacier National Park

The activities in this guide are designed to deepen student appreciation of North American wildlife and natural resources. Students will participate in a virtual field trip to Glacier National Park to learn about the animals and landmark features unique to this area; to explore the role of science in wildlife and natural resource stewardship; to consider how they can make a difference to ensure these natural resources are available for generations to enjoy. The pre- and post- field trip activities will provide opportunities for students to explore all of these topics.

#### Overview

Topic: Wildlife and Natural Resources of North America

Real World Science Topics:

- North American Wildlife
- Ecosystems of North America
- Natural Resource Management

Objective

- Students will be able to show how science is used in wildlife and natural resources stewardship.

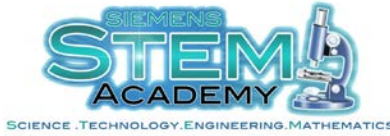
Materials Needed for Student Activities

- Internet access
- Interactive white board or overhead projector
- Student Handout #1: Wildlife of Glacier National Park
- Student Handout #2: Wildlife Management and Stewardship
- Student Handout #3: Build a Bear Proof Garbage Can

#### Teacher Preparation

Glacier National Park is in the center of a large region of protected lands collectively known as the Crown of the Continent. Spanning both the US and Canada, this region encompasses northwest Montana, southwest Alberta and southeast British Columbia and protects glaciers, mountains, prairies, and lakes in one of the most pristine and intact wild areas left in North America.

Glacier National Park preserves more than a million acres of diverse habitats and provides a unique opportunity for exploration, research, and preservation of these natural resources. Glacier National



Park's unique location results in many diverse habitats which are home to an incredible array of plants and animals, including nearly 70 species of mammals (66) and over 270 (277) species of birds.

Glacier National Park is named for its glacier-carved terrain. In 1850 there were 150 active glaciers, however today only 25 remain. The retreat of the glaciers in Glacier National Park is studied by scientists who want to understand the impact of glacial retreat on the park's ecosystems and wildlife.

Scientists are an important part of the effective management of Glacier National Park. For example, scientists are currently studying grizzly bears, bald eagles, harlequin ducks, fish populations, wild-fire impacts, invasive plants, and climate change within Glacier National Park. Scientists use critical thinking skills and science process skills to conduct a wide variety of scientific investigations including short-term problem-solving type investigations, fact-finding studies, wildlife monitoring projects, and descriptive types of investigations. The knowledge gained through scientific research on the park's wildlife and ecosystems is used to guide management decisions for protecting and preserving park resources.

## Standards Met

Crosscutting Concepts of the Framework

2. *Cause and effect: Mechanism and explanation.* Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

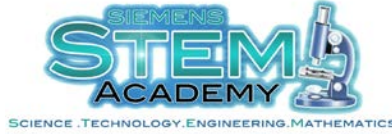
4. *Systems and system models.* Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.

7. *Stability and change.* For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

## Resources

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas  
(<http://nextgenscience.org/next-generation-science-standards>)

Glacier National Park Official Website:  
<http://www.nps.gov/glac/index.htm>



Map of Glacier National Park

<http://www.nps.gov/pwr/customcf/apps/maps/showmap.cfm?alphacode=glac&parkname=Glacier%20National%20Park>

Scientific Research in Glacier National Park

<http://www.nps.gov/glac/naturescience/index.htm>

Ecosystems of Glacier National Park

<http://www.nps.gov/glac/naturescience/naturalfeaturesandecosystems.htm>

Amphibians of Glacier National Park

<http://www.nps.gov/glac/naturescience/amphibians.htm>

Reptiles of Glacier National Park

<http://www.nps.gov/glac/naturescience/reptiles.htm>

Birds of Glacier National Park

<http://www.nps.gov/glac/naturescience/birds.htm>

Mammals of Glacier National Park

<http://www.nps.gov/glac/naturescience/mammals.htm>

Arthropods of Glacier National Park

<http://www.nps.gov/glac/naturescience/insects.htm>

Bear Safety in Glacier National Park

<http://www.nps.gov/glac/planyourvisit/bears.htm>

Greater Glacier Bear DNA Project 1997-2002, Remote Imagery of DNA-based Sampling (bears at rub trees)

<http://www.nrmsc.usgs.gov/research/KendallRemoteCamera.htm>

Grizzly and Wolf Discovery Center bear resistant food and garbage storage container testing

<http://www.grizzlydiscoveryctr.com/product-testing.php>

## **Pre-Field Trip Activity (40 minutes)**

Wildlife of Glacier National Park

Ask your students to imagine that they have been hired by the US National Park Service to help build public awareness concerning Glacier National Park's wildlife. As part of their research for the project



they will work with scientists to conduct a wildlife inventory of a rarely explored part of the park. As a class, brainstorm ideas for what information a scientists would want to gather to understand more about the wildlife of the area.

Using an interactive whiteboard or overhead projector show the class a map of Glacier National Park. Provide them with a brief overview of the park and its ecosystems using the background notes and web resources provided.

Distribute Student Handout #1: Wildlife of Glacier National Park to each student. Divide class into research teams and assign them one of the following wildlife categories to research:

Amphibians: <http://www.nps.gov/glac/naturescience/amphibians.htm>

Reptiles: <http://www.nps.gov/glac/naturescience/reptiles.htm>

Birds: <http://www.nps.gov/glac/naturescience/birds.htm>

Mammals: <http://www.nps.gov/glac/naturescience/mammals.htm>

Arthropods: <http://www.nps.gov/glac/naturescience/insects.htm>

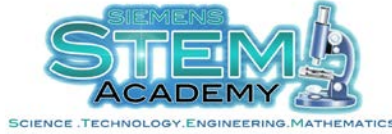
Using Student Handout #1, students will record what they learn about the organisms in their assigned wildlife category. Next, explain that as a research team, they must select one organism from their assigned category to feature in the park's public awareness campaign. Teams will then make a brief presentation to the class on the organism they selected and why they think it should be featured.

*Grade 3-5 Adaptation: Focus the class on the mammals of Glacier National Park. Provide each research team with a specific mammal and ask them to gather information on that mammal using print and web resources. Each team will prepare a brief presentation about their mammal and why they think it should be included in the public awareness campaign.*

## **Virtual Field Trip – Glacier National Park (30 Minutes)**

During the virtual field trip, students will join National Park Service Staff LIVE to explore Glacier National Park. Their goals is to learn about the animals and landmark features unique to this area; To consider how science helps guide management decisions for park wildlife; and to consider why stewardship is so critical to our National Parks and how they can make a difference to ensure these natural resources are available for generations to enjoy.

Before joining the virtual field trip, distribute Student Handout #2: Wildlife Management & Stewardship. Explain that students should use the table provided to write down examples of how



Glacier National Park staff manages the ecosystems, wildlife, and visitors to ensure a future for this unique and pristine natural resource.

Following the virtual field trip, ask students to share their examples of park management. Conclude by asking students to share their ideas on how they can do their part to be good stewards of the environment when visiting a national park.

*Grade 3-5 Adaptation: For younger students, taking detailed notes might not be appropriate. Instead, explain that their goal is to find one example of how visitors to the park have an impact (good or bad) on the wildlife or ecosystems of the park.*

### **Post-Field Trip Activity (30 minutes)**

In a national park, animals and people often come in contact with one another. Usually these encounters are positive; sometimes these encounters can be dangerous. Discuss with your students the importance of responsible wildlife interactions. Brainstorm a list of “do’s and don’ts” for wildlife watching. Explain that Glacier National Park is home to both black bears and grizzly bears. When bears become too comfortable with humans they can be a problem. One of the things that attract bears to campgrounds is food waste. Propose a design challenge to your students and ask them to create a proposal for a “bear-proof” garbage can. Distribute Student Handout #3: Bear-Proof Garbage Can. Ask students to brainstorm ideas and prepare a proposal for creating a bear proof can. Upon completion ask students to share their ideas with the class.

*Grade 3-5 Adaptation: Hold a class brainstorming session on how to build a “bear-proof” garbage can. Using an interactive whiteboard or overhead projector, complete Student Handout #3 as a class.*

**Extension:** Explore careers in our National Parks. Have students write a classified ad for a Glacier National Park Service Ranger. Use this link for information on a day in the life of a Glacier National Park Service Ranger:

<http://www.nps.gov/glac/forkids/loader.cfm?csModule=security/getfile&pageid=395502>



## Student Handout #1: Wildlife of Glacier National Park

You have been hired by the US National Park Service to help build public awareness about the park's wildlife. Use this handout and resources provided by your teacher to gather information about the different types of wildlife in the park and select one for the public awareness campaign.

### Wildlife Category (Circle One)

Amphibians    Reptiles    Birds    Mammals    Arthropods

### Possible Animals to feature in Glacier National Park Public Awareness Campaign

- 1.
- 2.
- 3.
- 4.

The animal I want to feature is: \_\_\_\_\_

Description of featured animal and why you want people to know about it:

## Student Handout #2: Wildlife Management & Stewardship

As you watch the virtual field trip use the table provided to write down examples of how Glacier National Park staff manages two very different wildlife species in the park - harlequin ducks and bears. Think about how managing visitors is connected with managing wildlife.

Harlequin Duck Management	List one question park scientists would like to know about harlequin ducks in order to help protect them and their habitat. What is one thing they did not know about the ducks that they've discovered with their research?
Visitor "Management" to protect Harlequin Ducks	How does new information about harlequin ducks relate to how the park manages visitors in areas with ducks?
Bear Management	Why is much of bear management, actually "people" management?
Visitor "Management" to protect Bears	How does the park help visitors understand how to hike and camp safely in bear country?

## Student Handout #3: Build a Bear-Proof Garbage Can

**Challenge:** Bears can be a problem in Glacier National Park campgrounds. They are attracted to food waste in garbage cans. You have been hired to create a “bear-proof” garbage can for use throughout the park.

**What factors need to be considered?** (Bear claws bear sense of smell, their strength and ability to turn over or break into heavy things, type of waste products, etc.)

**My solution:** (draw and label a picture of your bear-proof garbage can prototype in the box below)

**Materials needed:**

**How would you test your prototype?**

**Please note:** students could go to the Grizzly and Wolf Discovery Center bear resistant food and garbage storage container testing <http://www.grizzlydiscoveryctr.com/product-testing.php>

**How would you educate the public about their role in preventing bears from finding garbage?**