

FACTivity

Time required: 30 to 40 minutes

Materials needed:

- One page of lined paper and pencil for each student.
- A copy of page 49 for each student. (Optional: An unlined piece of paper, scissors, and glue for each student.)

The question students will answer in this FACTivity is:

What does photographic evidence appear to tell us about glaciers over the last century?



the glacier photograph on the right. Students may draw a line connecting the matching glacier photographs. If students are using a copy of the photographic sheet, they may cut the photos out and paste the pairs side-by-side on a separate sheet of paper.

- Each student will select two pairs of matching photographs to observe.

3. Students will study each pair of photographs for 10 seconds. From this, students should form an overall impression of the photographs and write down their impression on a sheet of paper. In the next 4 minutes, students should compare and contrast the early photographs with the more recent photographs. To assist with the observation, students may divide each photo into quadrants (four equal areas) and study each section to see what new details become visible.

4. Based on these observations, students should list three things they might conclude from the two pairs of photographs.

The process students will use to answer the question is as follows:

1. Students may work on page 49 in the journal, or may work from a sheet that was copied from this page. These are photographs of five glaciers in Alaska. The photographs on the left were taken in the early 1900s. The photographs on the right were taken in 2000.

2. Students will examine these photographs and do two main tasks.

- First, students will carefully observe the photographs and match the glacier photograph on the left with

FACTivity

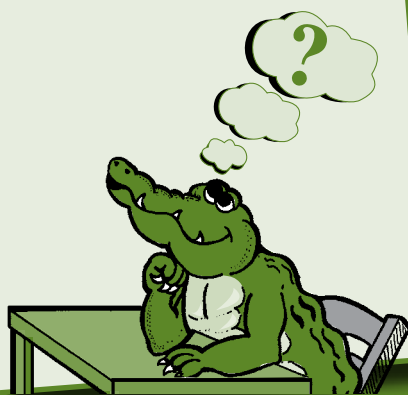
continued

5. Hold a class discussion about the students' observations. What was the students' overall impression? What did students conclude about glaciers based on the photographs?

6. Hold a class discussion about photographic evidence. Some questions to discuss are:

- Can photographic evidence be trusted? Why or why not?
- How do photographs provide information that words cannot?
- What might add to the photographic evidence presented by these photographs?

Now, answer the question posed at the beginning of this FACTivity.



This FACTivity was adapted from http://www.windows2universe.org/teacher_resources/glacier_then_now.pdf. The photographs were provided by the Glacier Photograph Collection. Boulder, Colorado USA: National Snow and Ice Data Center/World Data Center for Glaciology, <http://nsidc.org/>

National Science Education Standards addressed in this article:

Science as Inquiry: Abilities to do scientific inquiry, Understandings about scientific inquiry

Life Science: Reproduction and heredity, Regulation and behavior, Populations and ecosystems, Diversity and adaptation of organisms

Earth Science: Structure of the Earth system

Science in Personal and Social Perspectives: Natural hazards, Risks and benefits, Science and technology in society

Science and Technology: Understandings about science and technology

History and Nature of Science: Science as a human endeavor, Nature of science

If you are a Project WET-trained educator, you may use the activity "Old Water," page 171, as a supplemental activity.

Web Site Resources

http://www.fs.fed.us/r10/tongass/forest_facts/resources/geology/icefields.htm: Tongass National Forest, icefields and glaciers

<http://www.pbs.org/wgbh/nova/vinson/glacier.html>: The life cycle of a glacier. This slide show traces the journey of a snowflake onto a glacier and eventually reaching the sea.

<http://ga.water.usgs.gov/edu/earthglacier.html>: U.S. Geological Survey: glaciers and icecaps. Focuses on glaciers as a source of the world's freshwater.

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Holgate Glacier 1909. Photograph by Ulysses Sherman Grant



2000. Photo by Bruce F. Molina



McCarty Glacier 1909. Photograph by Ulysses Sherman Grant



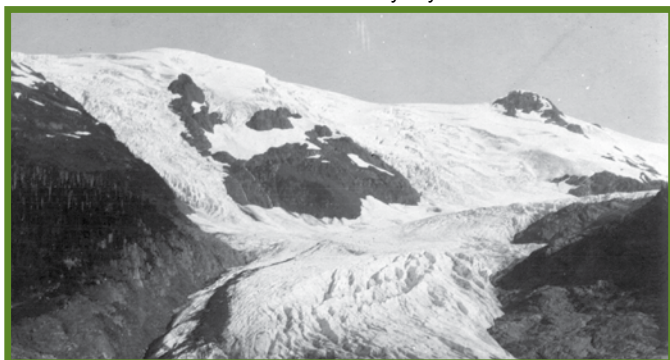
2004. Photograph by Bruce F. Molina



Pedersen Glacier 1909. Photo by Ulysses Sherman Grant



2004. Photograph courtesy of the U.S. Geological Survey



Toboggan Glacier 1909. Photo by Sidney Page



2004. Photo by Bruce F. Molina



Muir Glacier 1941. Photograph by William O. Field



2004. Photo by Bruce F. Molina