

# Uses of Permafrost

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Levels V-VI



Grades 9-12

## Overview:

A local Elder visits the classroom to share information on permafrost in the local area.

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**Teacher's Note:** This activity is repeated in the Level I-II lesson "Walking on Frozen Ground" and Level III-IV lesson "Tour of the Frozen Ground." If other teachers in the school are using the ACMP curriculum, they may wish to collaborate on this activity.

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## Objectives:

The student will:

- observe and draw local permafrost features; and
- compare and contrast the use of permafrost among Arctic cultures.

## GLEs Addressed:

*Science*

- [9] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [10-11] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, analyzing data, developing models, inferring, and communicating.

## Whole Picture:

Many northerners know of permafrost because of their interactions with frozen soil. Many people first discover permafrost exists, because they hit frozen ground while trying to dig a hole. Others notice permafrost in areas where they or others have cleared an area of insulating ground cover and the permafrost has thawed. People in some far-north places have dug, and still dig into permafrost to make "ice cellars" to store whale blubber and meat, and other game meat. Inupiat whalers replace the snow floors in their ice cellars each spring in a cleaning effort that is also spiritual in a way: "A whale will not give itself to you unless there is a clean place for it to rest," whalers in Barrow have said.

## Materials:

- Computer with Internet access
- OVERHEAD: "Permafrost Features"
- STUDENT WORKSHEET: "Uses of Permafrost"

## Activity Preparation:

Invite an Elder to visit with students to share local knowledge of permafrost. Within the Activity Procedure are suggestions for Elder involvement; make adjustments as needed to ensure the Elder's comfort. Make sure the Elder has adequate transportation to and from the classroom, and arrange for snacks and drinks for both the Elder and students.

## Activity Procedure:

1. Remind students they should be good listeners and be respectful during the activity.
2. Introduce the Elder and explain he or she will be sharing information on permafrost in the local area, such as how it has been used by people in the past, how it is used today, how it influences local subsistence activities, how it influences local infrastructure (buildings and roads), how one can tell if there is permafrost under the ground, and where it exists in the local area.
3. If weather permits, invite the Elder to take students on a short walk to investigate local permafrost features.
4. Upon returning to the classroom, show the OVERHEAD: "Permafrost Features." Explain surface features associated with permafrost include patterned ground (polygons) and pingos, mounds of earth-covered ice. These features are caused by a cycle of freezing and thawing of water, because water expands when it freezes.
5. Ask students if they saw any of those features on their walk. Have they seen them elsewhere in the local area? You may wish to use a map of the community to mark the locations of permafrost features.
6. Divide students into groups, and distribute the STUDENT WORKSHEET: "Tour of the Frozen Ground." Instruct students to complete the assignment in small groups; however, each student should complete his or her own worksheet.

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**Teacher's Note:** On the STUDENT WORKSHEET, students are asked to do research using the Internet. Use this as an opportunity to teach students Web retrieval strategies, such as the use of databases in addition to search engines, key word choice, Boolean searching (use of and/or/not operators in searches), and evaluating information for validity.

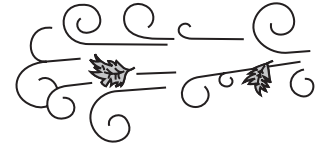
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## Answers:

Answers will vary.

Name: \_\_\_\_\_

Levels V-VI



# Uses of Permafrost Student Worksheet

**Directions:**

1. Draw a permafrost feature in the space below.

2. Write the name of the feature drawn above. \_\_\_\_\_

3. Write the name of the Elder who spoke with your class. \_\_\_\_\_

4. A) Describe a way permafrost was used in the past.

\_\_\_\_\_  
\_\_\_\_\_

B) Do people still use permafrost in that way today? Why or why not?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Ice cellars, tunnels dug into the permafrost for food storage, are used throughout the Arctic. Using the Internet, as approved by your teacher, locate two examples of an ice cellar in two different communities.

A) Community 1: \_\_\_\_\_

URL: \_\_\_\_\_

B) Community 2: \_\_\_\_\_

URL: \_\_\_\_\_

C) Describe any differences between the two ice cellars. Why do you think the differences exist?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

