

# Tour of the Cryosphere

Levels V-VI



Grades 9-12

## Overview:

Students watch *A Tour of the Cryosphere: the Earth's Frozen Assets*, a NASA DVD, create a Venn diagram, and play a trivia game to test their knowledge.

## Objectives:

The student will:

- compare and contrast sea ice, glaciers, and permafrost;
- create a Venn diagram; and
- participate in a trivia game about the cryosphere.

## Whole Picture:

“Cryosphere” describes the parts of Earth that are cold enough for water to become a solid, at least for a little while. “Kryos” is Greek for “ice.” The frozen world consists of places that are always frozen, like Antarctica, and places that are only sometimes frozen, like the high desert in southern Colorado in midwinter, covered with snow. Other places far from the equator have permafrost, ground that has been frozen for more than two full years, even during the summers. Most of the world’s ice is in Antarctica, but almost one-quarter of the land and sea north of the equator is covered with snow and ice in January. Ice sheets on Antarctica and Greenland have within them 77 percent of the potential freshwater in the world. Glaciers in Alaska hold a surprising amount of water too, and most are shrinking fast; Columbia Glacier in Prince William Sound has shrunk in height by an average of about 21 feet per year along the whole length of the glacier.

## Materials:

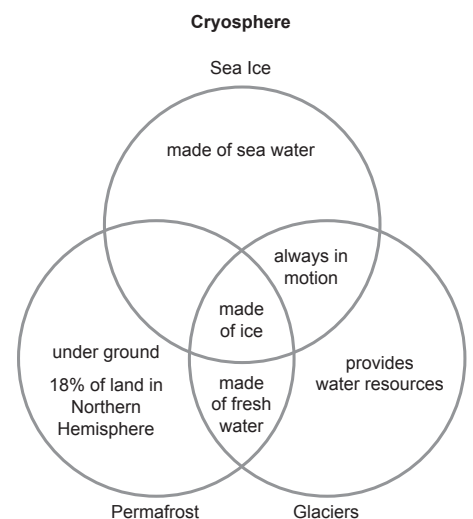
- National Aeronautics and Space Administration (NASA). *A Tour of the Cryosphere: the Earth's Frozen Assets*.
- ELECTRONIC FILE: “Cryosphere Trivia Game”\*
- STUDENT WORKSHEET: “Tour of the Cryosphere”

## Activity Preparation:

Download the ELECTRONIC FILE: “Cryosphere Trivia Game” PowerPoint from the ACMP Web site.

## Activity Procedure:

1. Display *A Tour of the Cryosphere: the Earth's Frozen Assets*. Distribute the STUDENT WORKSHEET: “Tour of the Cryosphere” and instruct students to take brief notes during the video using the format on first page of the worksheet.
2. When the video is complete, provide students time to finish their notes as instructed on the worksheet.
3. Divide students into small groups and instruct them to use their combined notes to create a Venn diagram in Part II of their worksheets. If needed, explain how a Venn diagram works.
4. Draw the triple blank Venn diagram from the worksheet on the board. Ask groups to share their notes and place the combined facts in the Venn diagram. When completed, the Venn diagram should look similar to the diagram to the right.



5. Divide the class into two groups. Open the ELECTRONIC FILE: “Cryosphere Trivia Game” and follow the instructions as outlined on the second slide.

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**Extension Idea:** Visit the “Alaska Science Forum” at <http://www.gi.alaska.edu/ScienceForum>. Ask students to locate and read articles on glaciers. Assign each student or small groups of students a different article to read. Instruct students to take notes using the methods outlined above, and report back to the class.

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## Answers:

Answers will vary.

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

# Tour of the Cryosphere: Part I

## Student Worksheet

Levels V-VI



**Directions:** During the DVD, write brief notes in the “note taking area” on the right. Immediately after the video, pull out main ideas, key points, and statistics from your note taking area and write them in the “cue column” on the left. In the bottom section, write any questions you have.

Cue Column	Note Taking Area
Note Taking Area	



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

# Tour of the Cryosphere: Part II

## Student Worksheet

Levels V-VI



**Directions:** Using your notes from the “cue column” in Part I of this worksheet, complete the Venn diagram below.

