

RESOURCE LIBRARY | ACTIVITY : 50 MINS

Hydrothermal Vent Chemistry and Life

Students explore interactives to learn about hydrothermal vent chemistry and the animals that have adapted to living in the harsh environment near vents.

GRADES

6, 7, 8

SUBJECTS

Biology, Earth Science, Geography, Physical Geography

CONTENTS

1 PDF, 1 Link

OVERVIEW

Students explore interactives to learn about hydrothermal vent chemistry and the animals that have adapted to living in the harsh environment near vents.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/hydrothermal-vent-chemistry-life/>

DIRECTIONS

1. Have students start a KWL chart about hydrothermal vents.

Distribute the KWL graphic organizer. Ask students to work independently to list what they already know and what they want to know about hydrothermal vents. Tell them they will fill in column 3 as they move through the activity.

2. Have students explore vent chemistry in a hydrothermal vents interactive.

Go to the Woods Hole Oceanographic Institution's Dive and Discover website. On the Vent Chemistry page, invite volunteers to click on numbers 1-7 and read aloud the information in

each. Encourage students to add to their KWL charts as they listen.

3. Have students explore vent life.

Divide students into small groups. Have the groups go through the Vent Life page on the interactive. Encourage them to click on each animal, have a member of the group read the text aloud, and then discuss what they learned about the specific [adaptations](#) these animals have made to their harsh environment as they add to their individual KWL charts.

4. Have students analyze photosynthesis and [chemosynthesis](#).

Next have groups click on the Chemosynthesis section of the site. Ask them to click through the Photosynthesis and Chemosynthesis interactives and write notes about what they learned in their KWL charts.

5. Have students complete the KWL chart and share what they learned.

Have students work independently to add any final notes about what they learned, including any new information about geology, biology, or chemistry related to hydrothermal vents. Invite volunteers to share the most interesting or surprising things they discovered.

Informal Assessment

Have small groups work together to complete the two hydrothermal vent quizzes on the Dive and Discover website. For any incorrect answers, have them find the appropriate section of the site and read or reread the information they missed.

Extending the Learning

Have students listen to one of the podcasts on the Dive and Discover website and summarize the information.

OBJECTIVES

Subjects & Disciplines

Biology

Earth Science

Geography

- [Physical Geography](#)

Learning Objectives

Students will:

- summarize information about hydrothermal vent chemistry and processes
- describe hydrothermal vent animal life and adaptations
- organize information about hydrothermal vent chemistry, biology, and geology

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Hands-on learning
- Reading
- Visual instruction

Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
 - Analyzing
 - Understanding
- Geographic Skills
 - [Acquiring Geographic Information](#)
 - [Analyzing Geographic Information](#)
 - [Organizing Geographic Information](#)

National Standards, Principles, and Practices

NATIONAL GEOGRAPHY STANDARDS

- **Standard 7:**

The physical processes that shape the patterns of Earth's surface

- **Standard 8:**

The characteristics and spatial distribution of ecosystems and biomes on Earth's surface

NATIONAL SCIENCE EDUCATION STANDARDS

- **(5-8) Standard C-5:**

Diversity and adaptations of organisms

- **(5-8) Standard D-1:**

Structure of the earth system

PREPARATION

What You'll Need

MATERIALS YOU PROVIDE

- Pencils
- Pens

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per small group, Projector, Speakers
- Plug-Ins: Flash

PHYSICAL SPACE

- Classroom

GROUPING

- Small-group instruction

BACKGROUND & VOCABULARY

Background Information

Hydrothermal vents are geysers located on the ocean floor in the deep sea. They are generally found at least 2,134 meters (7,000 feet) below the ocean surface in both the Atlantic and the Pacific Oceans. The discovery of hydrothermal vents changed our understanding of life on Earth. A vent ecosystem survives on energy from Earth, not from sunlight.

Prior Knowledge

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Recommended Prior Activities

- [Deep-Sea Geysers](#)

Vocabulary

Term	Part of Speech	Definition
adaptation	<i>noun</i>	a modification of an organism or its parts that makes it more fit for existence. An adaptation is passed from generation to generation.
chemosynthesis	<i>noun</i>	process by which some microbes turn carbon dioxide and water into carbohydrates using energy obtained from inorganic chemical reactions.

FUNDER



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