

Endeavour Hydrothermal Vents: Canada's First Marine Protected Area

Activity I

Becoming a Researcher

Time

1 hour plus discussion time

Grades 4-8

Grades 4 and 5 use Glossary, Backgrounder, reference books, interesting facts page, illustration page on chemo and photosynthesis, and older students could also do web research in order to gain an understanding of the Endeavour hydrothermal vents and Marine Protected Areas.

Materials

Backgrounder

Glossary of terms

Interesting facts page

Photosynthesis vs. chemosynthesis page

Resources and key words.

Lesson Overview

Students are being introduced to hydrothermal vents and Marine Protected areas, and come to understand what these places are, how they are formed, who lives there, (and some of their unique characteristics), and how we try to protect them. Many new terms will need to be discussed and explained. This lesson is the first step in students' understanding of these unique areas.

Curriculum Connections –

Grade 4 – Science -Communication, Creative thinking, Critical thinking

- all life is interdependent on its environment
- energy comes in a variety of forms that can be transferred from one object to another.
- energy has various forms and is conserved
- features of biomes

Grade 5- Science - Communication, Creative and Critical thinking, Social Responsibility

- humans use earth materials and natural resources. .
- sustainable practices
- local types of earth materials
- the nature of sustainable practices around BC's living and non-living resources.

Grade 6 –Science - Critical thinking

- multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment.
- force of gravity

English Language Arts

- elements of non-fiction texts

Social Studies

- social responsibility - The pursuit of valuable natural resources has played a key role in changing the land, people, and communities of Canada.

Grade 7 – Science - Communication, Creative thinking, Critical thinking, Social responsibility.

- the theory of evolution by natural selection provides an explanation for the diversity and survival of living things.
- natural selection, survival needs and interactions between organisms

English Language Arts

- elements of non-fiction texts
- access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability.

Grade 8 – Science – Communication, creative and critical thinking.

- characteristics of life
- the theory of plate tectonics is the unifying theory that explains Earth's geological processes.
- plate tectonic movement
- layers in earth
- the relationship of micro-organisms with living things
- photosynthesis (vs. chemosynthesis)

English Language Arts

- Create and communicate – presentation techniques

Becoming a Researcher – the Activity

Teacher reads out backgrounder to class.

Discussion

How did these unique areas form, and why did Canada decide to protect some of them? Where do these areas exist and why?

Give students page on chemosynthesis vs. photosynthesis and discuss.

Then hand out the glossary of terms and interesting facts. * make sure to discuss tectonic plates, pick this term out of the glossary.

Students are given a list of research topics, (see below) and assigned to groups of 3 or 4, and are given a half hour to find 3-4 interesting facts about their topic. (Make sure that each group has a different topic)

Groups research items and gain basic knowledge of their chosen topic.

Groups present their results to the class, making sure to leave time for questions so that class becomes familiar with hydrothermal vents, marine protected areas, and deep sea research.

Class discussion of harsh environments and Endeavour Hydrothermal Vents, how life has adapted to survive there, how humans explore these areas, and why we need to protect them.

Research suggestions:

- a. Marine Biomes – the Abyss Zone of the Ocean
- b. Tectonic Plates – Juan de Fuca
- c. What is a hydrothermal vent– specifically Endeavour
- d. Marine Protected Areas
- e. Endemism and hydrothermal vent inhabitants
- f. Photosynthesis vs. Chemosynthesis
- g. Deep Sea Exploration.

Evaluation

Ask each group for their 3-4 interesting facts about their topic.

What did they find interesting about their facts?

What did they find interesting about the other groups presentations?

How many students knew about hydrothermal vents?

Did they know hydrothermal vents exist off Vancouver Island?

Extensions

Students pick their own area of interest in the deep sea to explore further.

Students draw some of the creatures they have discovered that live in the Endeavour HTV area.

Students can find out what other types of places are Marine Protected Areas or are under consideration to become MPAs.

Students write a story about discovering something new on the earth.

Resources and key words

Canada's Marine Protected Areas

Deep Sea Mining - <http://www.pbs.org/wgbh/nova/next/earth/deep-sea-mining/>

Tectonic Plates

The Marine Biome

The Deep sea and Ocean Exploration

Oceans Act – Endeavour Hydrothermal Vents Marine Protected Area Regulations - Designation, Prohibitions, and Coming into Force
<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2003-87/page-1.html#docCont>