Hydrothermal Vents
Student Activity Guide

Specific Activities:
1. Investigate Vents
2. Investigate Organisms
3. Investigate Chemosynthesis
4. Chemosynthetic Food Web
5. Importance of vent communities: Human Uses
6. Engineering & Ethical Challenges
1. Investigate Vents

Questions:

a. Look up what a vent is and where it is found
b. Describe the different types of vent. How old and how large are they?
c. Look up how and where they were first discovered and how they are found today.

Possible Sources:

1. Current text you are using in class
2. Wikipedia - hydrothermal vents
5. www.amnh.org search "hydrothermal vents"
6. video - Bill Nye and Robert Ballard on youtube -
   http://www.youtube.com/watch?v=D69hGvCsWgA
2. Investigate organisms

Questions:

a. What is a chemosynthetic microbe, how does it get its food and where is it found?
b. Do all vents have the same microbes and the same dominant organisms?
c. What are some invertebrate and vertebrate organisms found in the vents and what is their relationship to these microbes?

Possible Sources:

1. http://www.darkenergybiosphere.org/ - go to research theme 3 read introduction
4. 4.noaa.gov/search?affiliate=noaa.gov&v%3Aproject=firstgov&query=tube+worms& x=0&y=0
3. Investigate Chemosynthesis

Questions:

a. How do these organisms break the chemical bonds in small molecules and use this energy to create carbohydrates, proteins and lipids - the biological molecules?

Possible Sources:

7. https://deepcarbon.net/
4. Chemosynthetic Food Web

Questions:

a. Who are the primary producers & compare to a photosynthetic web.
b. Who are the first level consumers & compare to a photosynthetic web.
c. Who are the second level consumers & compare to a photosynthetic web.
d. Who are the third level consumers & compare to a photosynthetic web.

Possible Sources:

   via link from http://www.darkenergybiosphere.org/resources/programs.html
4. marine microbes - via link in
   http://www.darkenergybiosphere.org/resources/programs.html
5. Importance of vent communities: Human Uses

Questions:

Possible Sources:
5. coastalmanagement.noaa.gov/otec/docs/environmentalfactsheet.pdf
6. Engineering & Ethical Challenges

Questions:

a. What engineering challenges does exploration in these deep ocean vent communities present?

b. What impact will human activities have on this ecosystem? Should we conserve or exploit?

Possible Sources:

Engineering Challenges:

Ethical Challenges:
4. coastalmanagement.noaa.gov/otec/docs/environmentalfactsheet.pdf

TOOLKIT CREDITS:
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WEBSITE:
http://www.coexploration.org/C-DEBI/toolkits_biology.html