Interactions Between Earth's Spheres

Outdoor Classroom Field Journal Activity Lesson Plans & Resources

Online Lesson Plans & Resources: https://www.alabamawildlife.org/oc-field-investigation-interactions-between-earths-spheres/

Students will explore the outdoor classroom to find examples of Earth's four spheres (geosphere, hydrosphere, atmosphere, and biosphere). Then will then answer questions about the interactions among these spheres.

The questions below can be used to help introduce the topic, engage the students, and build a foundation to discuss the topic:

Example Discussion Questions & Answers (online as a interactive PowerPoint or PDF)

Q: What parts of the Earth are visible from this view?
A: *You can see some of the continents (land), the oceans (water), and some clouds*

Q: What are some living and non-living things you see in these photos?
A: *Birds, the ocean, sand, clouds, stream, rocks, trees, moss, tree branches, ferns*

Q: How could you group or categorize the things you saw in the previous pictures?
A: *Things on earth can be classified as living and non-living. The living and non-living components of Earth can be classified into one of four spheres. They are called "spheres" because the earth is a sphere, and each is a part of the earth.*

Q: What are the four spheres of Earth?
A: *Geosphere (also called lithosphere), Hydrosphere, Atmosphere, and Biosphere*

Q: What is the geosphere (or lithosphere)?
A: *The geosphere contains the solid parts of the earth including rock, dust, soil, sand, metal, and other related materials. The layers of the geosphere include Earth's core (toward the center of the earth), the mantle, and the crust.*

Q: What is the hydrosphere?
A: *The hydrosphere includes the water found on earth. It includes oceans, lakes, rivers, groundwater, rain, and snow. Frozen parts of the hydrosphere are called the cryosphere and include glaciers, ice caps, and icebergs.*

Q: What is the atmosphere?
A: *The atmosphere is the envelope of gases surrounding the earth. It includes the air, wind, ozone, oxygen, nitrogen, and other gases.*

Q: What is the biosphere?
A: *The biosphere includes all living organisms on the earth including plants, animals, fungi, and other life like microscopic organisms.*

Q: Do interactions occur between the Earth's spheres?
A: *YES!! All of Earth's spheres and cycles are interconnected. They make up the Earth's system (a complex whole unit with smaller connected parts working together).*

Q: How does the biosphere interact with the other spheres?
A: *Animals interact with the geosphere by digging burrows while plants interact with the geosphere with their roots. Roots provide a way for the plant to anchor and absorb nutrients from the soil.*
Animals interact with the hydrosphere by drinking water or living in the water. Plants take up water through their roots and lose water through their leaves during a process called transpiration.
Animals interact with the atmosphere when they breathe, and plants interact with the atmosphere during the process of photosynthesis.

Q: How does the geosphere interact with the other spheres?
A: *Erosion and weathering are examples of how they hydrosphere and atmosphere interact with the geosphere.*

Q: How does the hydrosphere interact with the atmosphere?
A: *When water evaporates, the hydrosphere interacts with the atmosphere. Clouds contain water vapor and are located in the atmosphere.*

Q: How can multiple systems interact at one time?
A: *Some events include interactions among several spheres at one time or can cause interactions among various spheres. For example, Larger events like volcanic eruptions can cause interactions among all spheres. When a volcano (the **geosphere**) erupts, gases like carbon dioxide are released into the **atmosphere**. This can cause water vapor to attach to additional molecules, causing an increase in rain (**hydrosphere**). The increase in rain can promote additional plant growth (**biosphere**).*

*A volcano can also cause lava flows (**geosphere**) that melts surrounding ice (**hydrosphere**) and can cause mudflows (**geosphere**).*