Earth Science: Sphere interactions

**Objective**: Understanding connections between spheres of the Earth as a Global system

**Earth**

Apollo 17 astronauts captured a snapshot of the Earth ______________ on their way to the moon in 1972. Essentially everything that was a part of the system ______ is still a part of the system ______ --- that is why it is considered a ___________ _________________.

All of the ________ (solid, liquid and gas) and all of the _______________ that move energy and materials from one part of the planet to another make up the Earth system.

Looking at the image what are the major parts of our planet that can interact as a system?

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Earth’s Four Spheres

- Four major parts of Earth work ______________ as a complex ________________: rocks, water, air and life.
- On a _______________ scale, each part can be thought of as a sphere that when ________________ form our planet.
- The four parts are called the ________________, ________________, ________________, and ________________.
**Detailing the Four spheres**

- **Lithosphere** or ______________________: Earth’s core, mantle, and crust including continents, _________________, rocks, sand, dust, metal, _____________ and asphalt.

- **Hydrosphere**: Earth’s oceans, _________________, rivers, _________________, glaciers, polar ice caps, rain and snow.

- **Atmosphere**: Earth’s oxygen, _________________, water vapor, ozone, ad wind.

- **Biosphere**: Earth’s _________________ organisms such as plants. ____________, animals, insects and _________________.

➢ Describe each of the Earths four spheres.

➢ List several examples of features in each sphere.
Do you think clouds should be classified as part of the atmosphere or hydrosphere? Why or why not?

Sphere interactions

- The surface of the ________________, where the rocky part of our planet is in contact with water, air, and/or life is generally where the spheres ______________ and affect each other.

- The processes that ______________ matter and energy from one sphere to another, we can call sphere _________________.

- Look at the picture, identify the spheres and at least two sphere interactions.
Examples of sphere interactions

- Humans (__________) built a dam out of rock materials (__________).
- Water in the lake(__________________) seeps into the cliff walls behind the dam, becoming groundwater(__________________), or evaporating into the air(__________________).
- Humans (__________________) harness energy by the water (__________) by having it spin turbines (__________) to produce electricity.

How are Earth’s spheres interacting?

- What sphere interactions can you infer from this photograph?

When you identify sphere interactions, think of one feature of the image at a time, decide which sphere it is a part of, then consider how it interacts with other spheres.

- With a partner describe the interactions in this scene, tracing the movement of materials or energy through all four of Earth’s spheres.
In each image, look for evidence of materials and energy moving among the spheres.

- List the major features in the image and tell which sphere each one represents.
- Describe sphere interactions you can infer from the scene.
- Whenever possible, follow the results of an interaction through all four spheres.

- **Image 1 – Glacier**
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- **Image 2 – Mesa**
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- The ____________ you’ve been describing are the processes of Earth ____________ science. The current “balance” among these complex ____________ makes it possible for life to flourish here. Because the spheres are all part of the same ____________ system, changes in any sphere ultimately affect the other spheres as well.
What effect do you have on the Earth system? As a part of the biosphere, think of some ways that you change the atmosphere, hydrosphere or geosphere.

List some Earth sphere interactions that result from your own daily activities.