

# Read About Earth's Spheres

## DEFINITION OF EARTH'S SPHERES

The spheres are the four subsystems that make up the planet Earth. They are called *spheres* because they are round, just like the Earth. The four spheres are the geosphere (all the rock on Earth), hydrosphere (all the water on Earth), atmosphere (all the gases surrounding Earth), and biosphere (all the living things on Earth).

***To better understand how the 4 spheres of the Earth work....***

## LET'S BREAK IT DOWN!

### Earth's land makes up the geosphere.

Geo means "earth." The Earth's geosphere (sometimes called the lithosphere) is the portion of the earth that includes rocks and minerals. It starts at the ground and extends all the way down to Earth's core.

We rely on the geosphere to provide natural resources and a place to grow food. Volcanos, mountain ranges, and deserts are all part of the geosphere. Put simply, without the geosphere, there would be no Earth!



## Earth's water makes up the hydrosphere.

*Hydro* means "water." The hydrosphere includes the oceans, rivers, lakes, groundwater, and water frozen in glaciers. 97% of water on Earth is found in the oceans. Water is one of the most important substances needed for life and makes up about 90% of living things. Without water, life would not be possible.

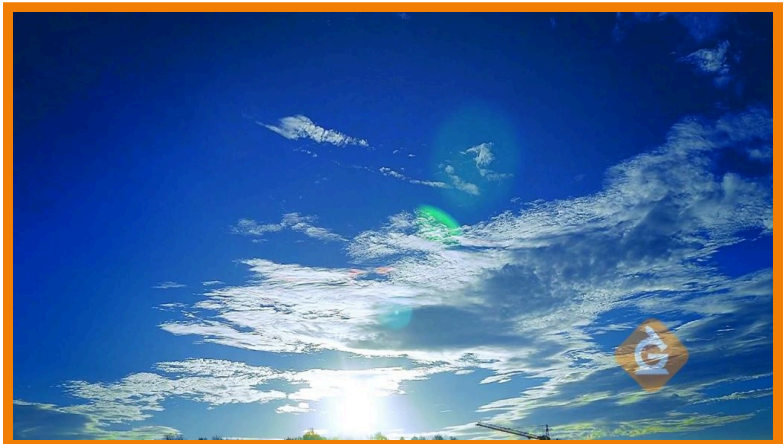


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## Earth's air makes up the atmosphere.

*Atmos* means "air." The atmosphere includes all the gases surrounding the Earth. We often call the atmosphere "air." All planets have an atmosphere, but Earth is the only planet with the correct combination of gases to support life.

The atmosphere consists of five layers and is responsible for Earth's weather. Even though it seems like air is made of nothing, it consists of particles too small to be seen. All these particles have weight that push down on Earth. The weight of air above us is called *air pressure*.



## Earth's living things make up the biosphere.

*Bio* means "life." The biosphere is made up of all the living things on Earth and it includes fish, birds, plants, and even people.

The living portion of the Earth interacts with all the other spheres. Living things need water (hydrosphere), chemicals from the atmosphere, and nutrients gained by eating things in the biosphere.



## EXAMPLES OF EARTH'S 4 SPHERES



Even though the island of Kauai in Hawaii gets more rain than almost any area on Earth, one side looks like a desert. The shape of the land (geosphere) affects where it rains (hydrosphere).



Every time you recycle, you are impacting all four spheres. Efforts such as recycling are important to keep all four of our spheres healthy.



Erosion creates mushroom rocks when wind carries sand close to the ground. This is another example of how the atmosphere affects the geosphere. Sand carried by wind carves the bottom of the rock more than the top.

## VOCABULARY ON EARTH'S SPHERES

### Geosphere

All the rock, soil and sediments that makeup Earth's land. It comes from the word "Geo" which means "Earth."

### Earth's Spheres

Everything on Earth can be placed into one of four major subsystems: land, water, living things, and air. These four subsystems are called "spheres." Specifically, they are the "geosphere" (land), "hydrosphere" (water), "biosphere" (living things), and "atmosphere" (air).

### Hydrosphere

All the oceans, rivers, lakes and water on Earth. It comes from the word "Hydro" which means "water."

### Atmosphere

All the gases surrounding the earth. It comes from the word "Atmos" which means "air."

### Biosphere

All the living things on Earth. It comes from the word "Bio" which means "life."

### Recycling

To reuse something that would have otherwise been thrown out or to turn it into

something usable again instead of sending it to a landfill.

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## **DISCUSSION QUESTIONS ON EARTH'S SPHERES**

### **In the investigation with aquariums, which of Earth's spheres are represented?**

The team uses sand to represent land, which is part of the geosphere. They use water to represent the hydrosphere and the air in the tank represents Earth's atmosphere.

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### **What happened to the temperature of the atmosphere when hot water was added?**

When hot water was added to the aquarium tank the temperature of the atmosphere above the land went up.

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### **Does water temperature have an effect on air temperature?**

Yes, water temperature does affect atmospheric temperature. When hot water was added to the aquarium tank, the temperature above the land went up. When cold water was added, the air temperature went down.

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### **Which two of Earth's spheres are represented in the example of erosion?**

Dr. Jeff uses a sand blaster (moving air containing sand particles) to erode rock. The air from the sand blaster represents wind in the atmosphere and it breaks down rock (that's geosphere).

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### **How did the example with dry ice show that land affects water and air?**

The team uses dry ice (frozen carbon dioxide) to create fog. The sand mountain (geosphere) blocked the fog from moving to the other side of the aquarium. This shows that the shape of the land affects the weather.

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### **Which of Earth's spheres are humans part of? Why?**

Humans are part of the biosphere because we are living things. The biosphere includes ALL living things.

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