

Earth's Spheres

Take a look around you. Look outside. Where does our planet begin and end? Why is it important to know about how Earth's systems work?

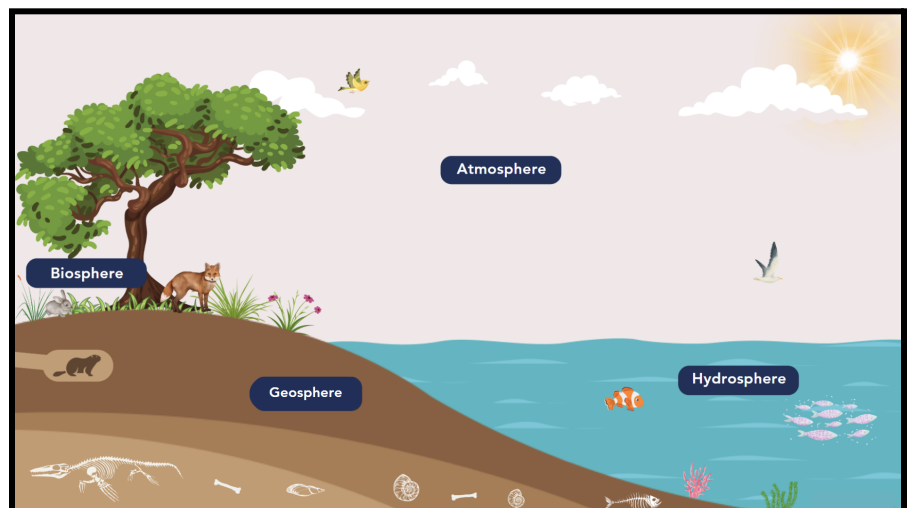
Earth as a System

The Earth is a system among other systems, like the Solar System and Milky Way Galaxy. A system is a group of interrelated and interdependent parts that interact to create a complex whole. Consider these systems:

- **The human body** - organs that interact to maintain *homeostasis*, or balance. Its subsystems include the respiratory, skeletal, muscular, endocrine, nervous system, and more.
- **A supply chain** - people, businesses, products, transportation, and regulation are all interrelated parts that help us get what we need.
- **A school** - students, teachers, buses, classrooms, library, gym, cafeteria, counselors, principal, and parents all interact to support learning.

What happens in systems when something goes wrong? Imagine that every member of the cafeteria staff is out sick one day. How would that affect other members of the school community? Imagine all the things that could happen in a supply chain that could affect members of that system: A hurricane in Florida might shut down a factory that makes medicines, which causes a shortage in a nearby state. That shortage directly affects a person who needs treatment. In this way, Earth is a system whose subsystems, or **spheres**, interact in ways that affect one another.

Earth is a **closed system**, which means that there is an exchange of energy, but matter does not leave the system. Matter and energy both circulate through the system to give the planet the ability to support life.



Earth's Spheres		
Sphere/ System	Elements & Functions	Careers
Atmosphere	- Contains four layers (troposphere, stratosphere, mesosphere, and thermosphere) - Our air (mostly nitrogen and oxygen) - Extends to over 348 miles above the earth's surface	Meteorologist Climatologist Journalist Attorney Respiratory therapist Helicopter pilot Astronaut
Geosphere	- Solid portion of the Earth - Continental and oceanic crust - Earth's interior layers - Surface constantly changes - Provides our mineral resources	Geologist Oceanographer Geophysicist Petroleum engineer Quarry manager Civil engineer Seismologist
Biosphere	- All living organisms - Structured into a food chain with producers and consumers - Energy and mass are transferred through the levels of the food chain	Zoologist Forester Photographer Farmer Firefighter Ecologist Teacher
Hydrosphere	- All the water on the planet - Water vapor - Ice (in the cryosphere) - Water trapped in soil	Hydrologist Marine biologist Ship captain Naval architect Professor

Think about it:

All spheres are represented in this photo. Take a moment to stop and identify them.

Then, we can start to think about how the spheres interact.

