

The Earth System

Earth System

- Earth = a system
- system = a group of parts working together
- four major subsystems (parts) working together as a complex system: biosphere, geosphere, hydrosphere, atmosphere
- all parts (spheres) are interconnected (no part acts alone without influencing another)
- everything on Earth can be placed into one of these spheres

Hydrosphere = all Earth's water in the ground, on the surface, & in the air

- hydro = water (Greek)
- hydrologists = study water
- Liquid (river, ocean)
- Solid (sea ice, glaciers)
- Gas/Vapor (clouds, fog)
- all life depends on water

Geosphere = all the rocks, minerals, and ground

- geo = ground
- includes solid rock (mountains) & liquid rock below the Earth's surface (magma)
- geologists = scientists that study the Earth

Atmosphere = the air around the Earth made up of different gases (extends outward about 6,000 miles)

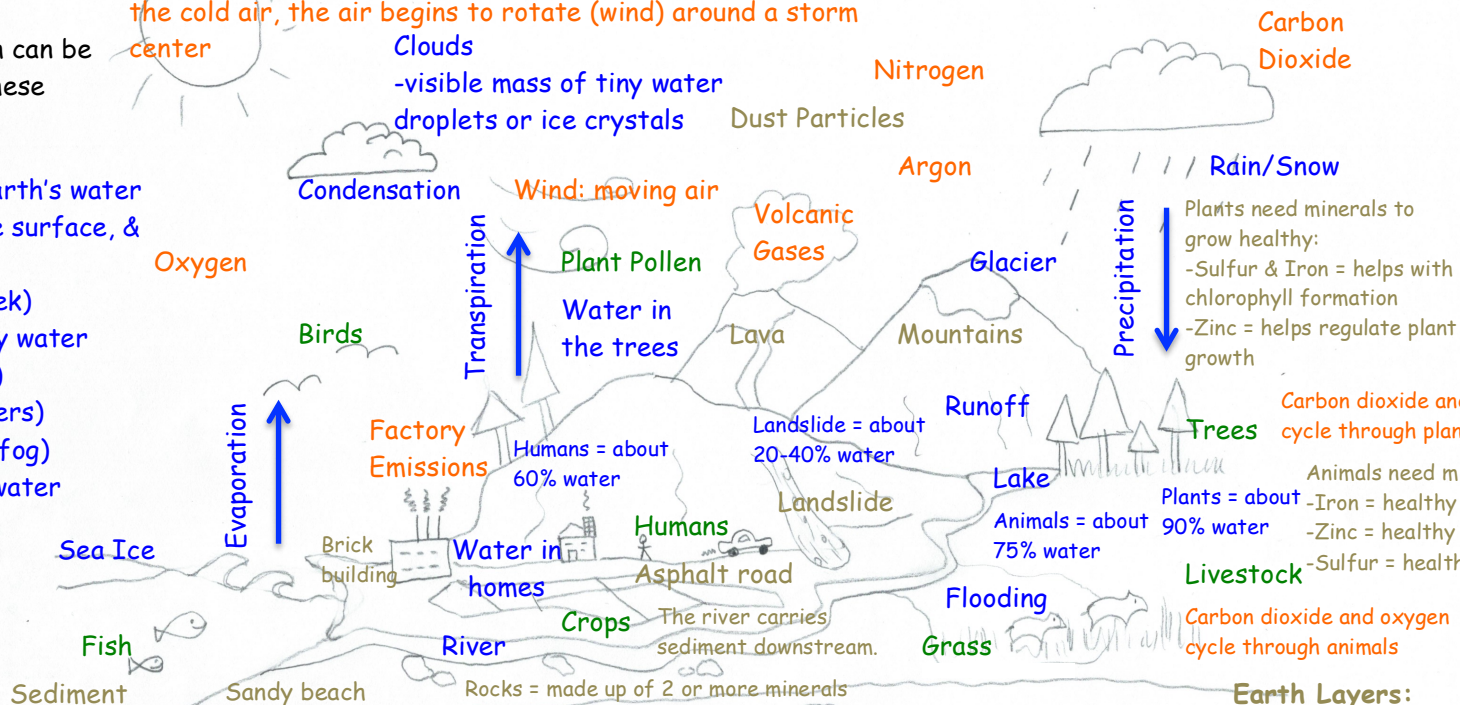
- atmo = air (Greek)
- aerologists = scientists that study the atmosphere
- all weather that takes place is in the atmosphere
- keeps out most harmful ultraviolet radiation while letting in the sun's warming rays (solar heat)
- burns up asteroids
- holds in heat (greenhouse effect)
- when the sun goes down at night, the temperature of the atmosphere decreases
- when hot & cold air collide, the hot air is forced to rise over the cold air, the air begins to rotate (wind) around a storm center

What is air?

- invisible, tasteless, scent free
- made up of gases
- 78% nitrogen
- 21% oxygen
- 1 % argon
- 0.4% carbon dioxide
- small amounts of other gases
- contains water vapor (about 1%)

Biosphere = all life on Earth
 -bio = life
 -biologists = scientists that study life on Earth
 -includes bacteria, plants, animals, fungi, protists
 -can be in the sky, on land, or deep in the ocean

Minerals = building blocks for rocks
 About 4000 minerals on Earth
 Common Minerals:
 Aluminum - buildings, cars
 Copper -wires, plumbing
 Gold - jewelry, electronics
 Lead - batteries, tanks
 Silver - coins, jewelry
 Uranium - used in nuclear power plants



Carbon Dioxide

Nitrogen

Dust Particles

Argon

Rain/Snow

Condensation

Wind: moving air

Volcanic Gases

Glacier

Precipitation

Plants need minerals to grow healthy:
 -Sulfur & Iron = helps with chlorophyll formation
 -Zinc = helps regulate plant growth

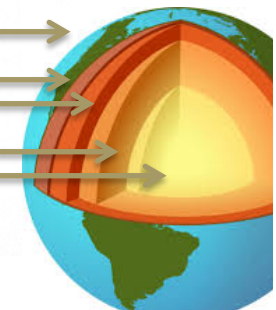
Carbon dioxide and oxygen cycle through plants

Animals need minerals to grow healthy:
 -Iron = healthy red blood cells
 -Zinc = healthy reproduction
 -Sulfur = healthy skin, nails, & hair

Carbon dioxide and oxygen cycle through animals

Earth Layers:

- Crust
- Upper Mantle
- Mantle
- Outer Core
- Inner Core



Soil is about 45% minerals
 Soil is about 25% water
 Soil is about 25% air
 Soil is about 5% organic matter (decomposing plants & animals)

Aquifer
 -an underground layer of rock that holds groundwater

Bacteria: can be found everywhere (air, soil, & water)