

Global Systems - Teacher Vocabulary

We can consider that materials are moved or recycled through the Earth through several interconnected natural systems by natural processes. For example, an atom of oxygen will move through the biosphere through the processes of photosynthesis and respiration but will also enter the hydrosphere through transpiration. Processes change materials from one physical or chemical state to another



The spheres are:

1. **Atmosphere:** This consists of gases, mostly nitrogen 78.09%, oxygen 20.95% and carbon dioxide 0.039%. Air contains a variable amount of water vapour (average 1%). This zone is one of small molecules of low density bound by weak intermolecular forces.
2. **Lithosphere:** This consists of rock. It is the cold, brittle and elastic outermost shell of our planet. It is made of minerals whose atoms are joined with ionic lattices e.g. alumina-silicates.
3. **Hydrosphere:** This is the mass of water lying over, on or under the surface of the Earth as oceans, seas, lakes and rivers. 97.5% is saline and 2.5% is fresh, of which 68.7% is ice. The hydrosphere is mostly small molecules with dissolved ions. The **cryosphere** is that part of the hydrosphere where water is frozen.
4. **Biosphere:** The biosphere is the very thin layer in which all living organisms exist. Life is based on long chain carbon based polymers.

Activity: To remember the components of four Earth spheres

Materials per student

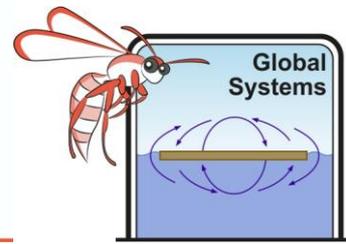
- Compass, ruler and pencil (or use base of beaker or Petri dish for circle sizes)
- This worksheet

Method

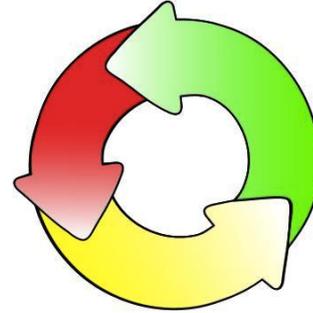
1. Draw four overlapping circles 10 cm in diameter on the reverse of this worksheet.
2. Label each circle after one of the spheres listed above.
3. Draw a smaller 5cm circle within the hydrosphere for the cryosphere.
4. Place the following words into the appropriate Earth System.
5. **Beware!** Some words can be found in more than one sphere!

Animal, basalt, carbon, carbon dioxide, clouds, continent, coral, decomposition, deposition, dew, erosion, evaporation, glacier, granite, groundwater, hydrogen, ice, ice cap, lake, mist, mountain, nitrogen, ocean, oxygen, penguin, photosynthesis, plant, rain, respiration, river, rocks, sand, sea, sea ice (pack ice), seagull, silicon, soil, water, water table, water vapour, weathering.

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animal	Biosphere
basalt	Lithosphere
carbon	All spheres
carbon dioxide	Atmosphere, biosphere & hydrosphere
clouds	Atmosphere
continent	Lithosphere
coral	Biosphere
decomposition	Biosphere
deposition	Lithosphere
dew	Hydrosphere
erosion	Lithosphere
evaporation	Hydrosphere
glacier	Hydrosphere (cryosphere)
granite	Lithosphere
groundwater	Hydrosphere
hydrogen	All spheres
ice	Hydrosphere (cryosphere)
ice cap	Hydrosphere (cryosphere)
lake	Hydrosphere
mist	Hydrosphere & atmosphere
mountain	Lithosphere
nitrogen	All spheres
ocean	Hydrosphere
oxygen	All spheres
penguin	Biosphere
photosynthesis	Biosphere
plant	Biosphere
rain	Atmosphere and Hydrosphere
respiration	Biosphere
river	Hydrosphere
rocks	Lithosphere
sand	Lithosphere
sea	Hydrosphere
sea ice (pack ice)	Hydrosphere (cryosphere)
seagull	Biosphere
silicon	All spheres
soil	Lithosphere & biosphere
water	Hydrosphere
water table	Hydrosphere & lithosphere
water vapour	Hydrosphere and atmosphere
weathering	Lithosphere



Which of the above describe **processes**? (Something which causes a physical or chemical change). **Decomposition, deposition, erosion, evaporation, photosynthesis, respiration & weathering.**