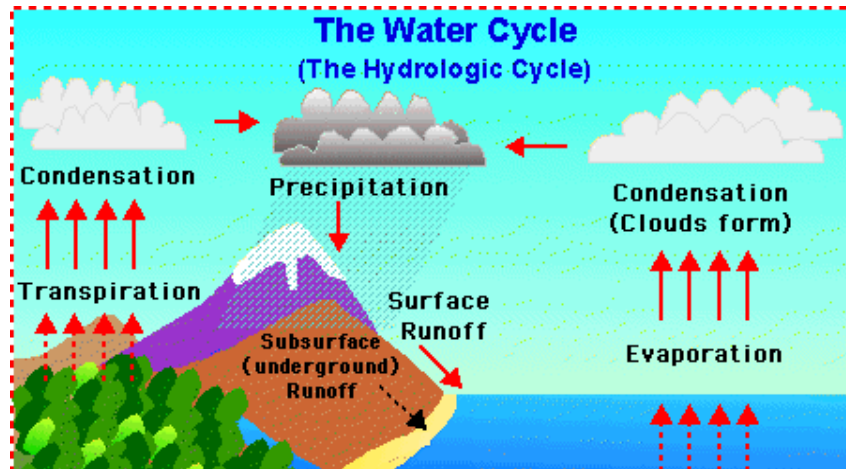


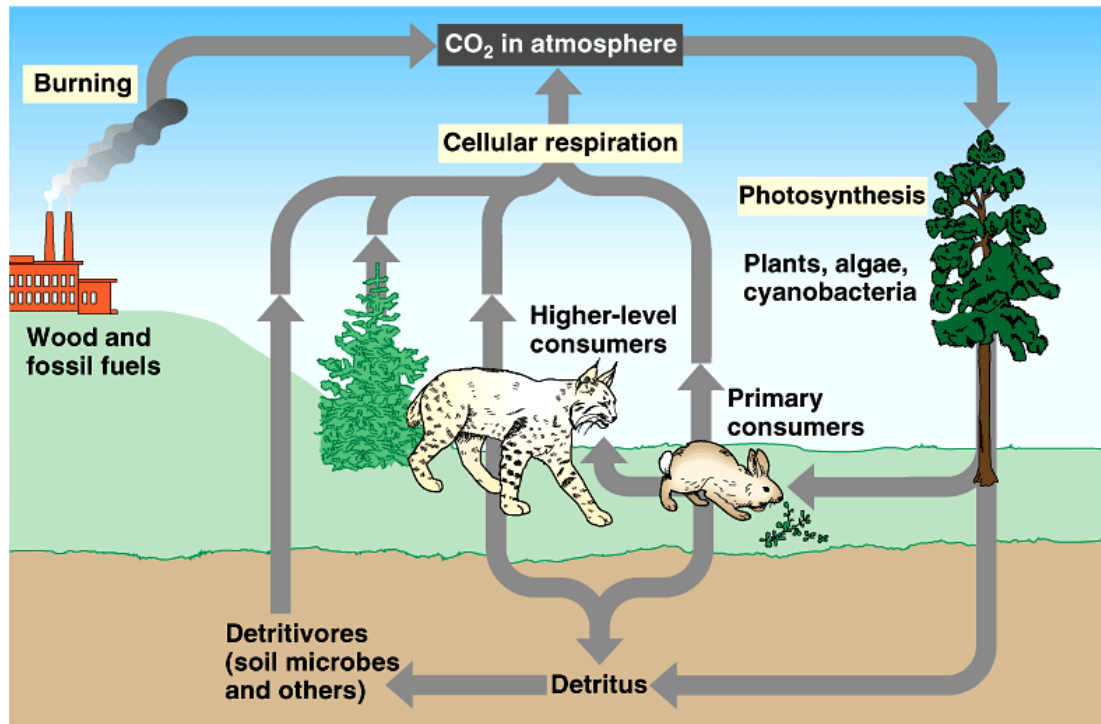
A) Cycles in the Earth System

- 1) _____ - A place where matter and energy are _____
- 2) _____ **Cycle**- Movement of water into and out of the _____, _____, _____, and _____
- a) _____ - Water changing from a liquid to a gas and flying up into the atmosphere
- b) _____ - Water changing from a gas to a liquid and becoming visible (cloud formation)
- c) _____ - Any form of water that falls to Earth from clouds
- d) _____ - Water vapor released by plants
- e) _____ - Water soaking into the ground
- f) _____ - Water soaking into plant roots
- g) _____ - water moving across impermeable land
- h) _____ - water breathed out of creatures
- i) _____ - water coming out of creatures as solid or liquid waste



- 3) _____ **Cycle**- Movement of carbon into and out of the geosphere, hydrosphere, atmosphere, and _____
- a) _____ - Process of eating. Food (carbohydrates, fats, and proteins) is full of needed carbon atoms
- b) _____ - Process whereby creatures get rid of solid and liquid waste (contains carbon)
- c) _____ - Process where plants take carbon dioxide out of the air to make glucose, a carbohydrate ($C_6H_{12}O_6$).
- d) _____ - Process where glucose is broken down to release energy and carbon dioxide and water is released back into the atmosphere.
- e) _____ - The breakdown of dead matter (contains carbon) into simpler substances like carbon dioxide and water which is then released back into atmosphere. It is bacteria doing cell respiration.
- f) _____ - the removal of fossil fuels (carbon filled) from the Earth
- g) _____ - Burning (especially carbon-filled fossil fuels) which results in the release of carbon dioxide and water back into the atmosphere.
- h) _____ - The spontaneous movement of CO_2 in the air into lakes and oceans. (from an area of high concentration to an area of low concentration)
- g) _____ - The creation of shells (full of carbon) from the dissolved CO_2 in sea water

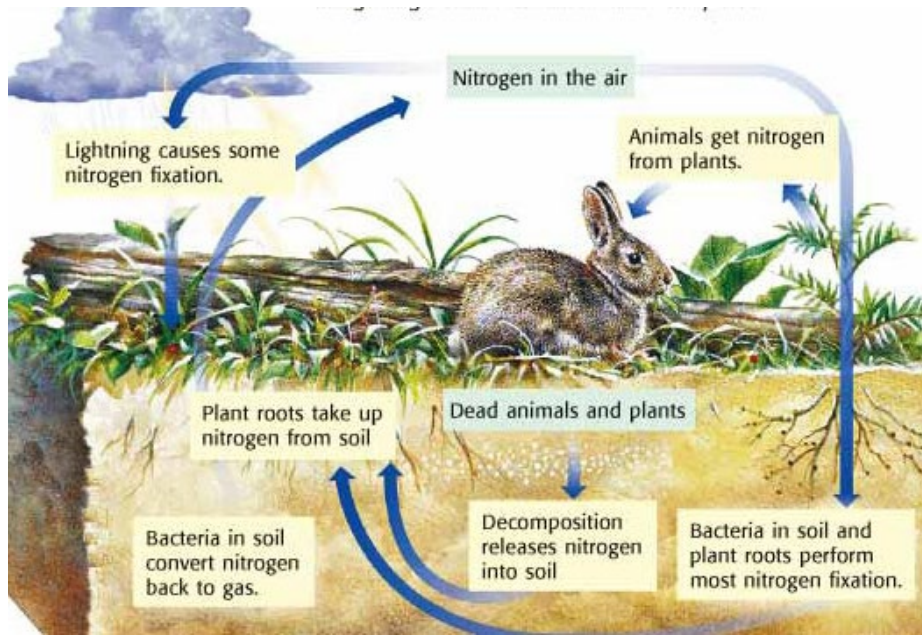
i) _____ - The creation of carbon filled rock (limestone) from the shells of dead marine organisms



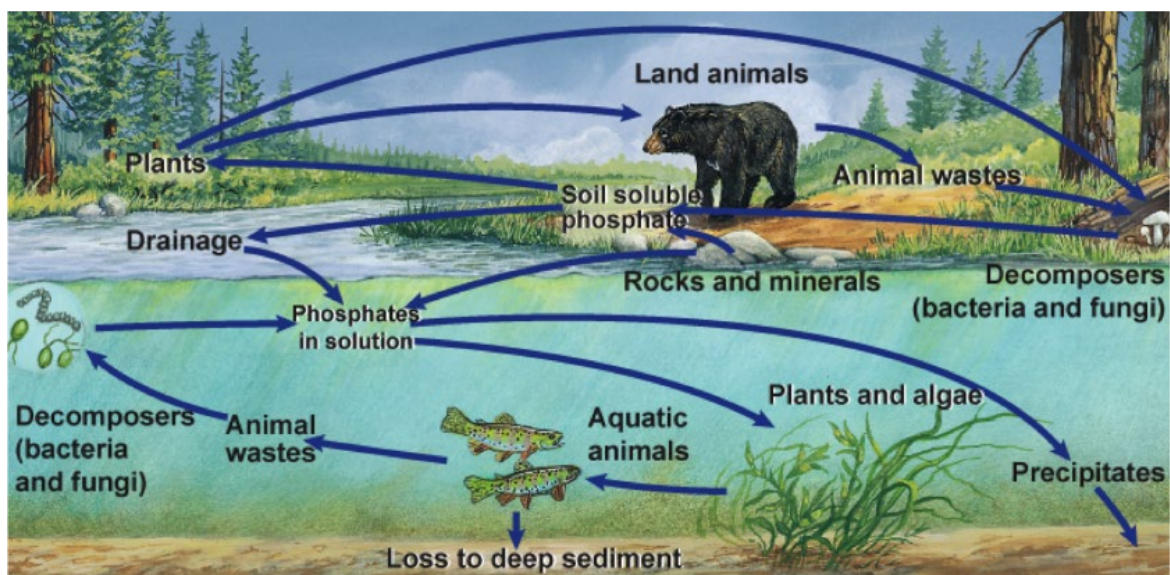
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4) _____ Cycle- Movement of nitrogen into and out of the geosphere, hydrosphere, _____, and biosphere

- a) _____ - Process of eating, and the only way creatures can get their nitrogen. Nitrogen in food is needed to make _____, _____, _____, _____, etc. Nitrogen in the air _____ be breathed in and used by animals because it is in the wrong form.
- b) _____ - the elimination of liquid and solid waste. Both are high in _____.
- c) _____ - bacteria break down dead organisms releasing nitrogen into soil or air
- d) _____ - denitrifying bacteria in the soil turn nitrogen into triple bonded N₂ (_____) and release it into the air
- a) _____ / AKA _____ - turning nitrogen into a _____ form (NO₂, NO₃) so plants can assimilate it through their roots. Happens in the soil. Lightning and bacteria can perform this process.
- b) _____ (Absorption)- nitrogen soaking into the roots of a plant



- 5) _____ Cycle -The movement of phosphorus between the environment and living things. (Needed in _____, RNA, _____, _____, and teeth)
- _____ and _____ release the phosphorus rich compounds trapped in _____ back into soil or water
 - Plants get phosphorus from soil, (_____) and animals get phosphorus by _____
 - _____ bacteria release the phosphorus rich compounds found in animal waste and dead matter back into _____ or _____
 - Phosphorus in water may be _____ and used by aquatic plants
 - Phosphorus enters aquatic animals through _____ and exits by death/ _____ or _____.
 - _____ (de-TRI-dus) which is _____, _____ material and _____, may settle to the bottom and form _____ rock once again.



6) Many Cycles with many connections

a) Each cycle is _____ in many ways, for example, nitrogen phosphorus, and carbon are carried by _____ in parts of the water cycle.

7) What happens if _____ of these substances are found in one place?

a) Too much _____ and _____ causes _____
_____ AKA (_____)

a. In spring nitrogen/phosphorus rich fresh water (caused by all the _____ farmers use) creates a _____ layer above the saltwater

b. Oxygen is now unable to _____ with the salt water

c. The nitrogen and phosphates cause excessive algae growth (**eutrophication**)

d. Algae _____ and sink to the bottom where they _____

e. Decomposers use up all the _____ (doing cell respiration)

f. All creatures _____, or _____ away if they can

b) Too much _____ caused the disaster at Lake Nyos

a. A pocket of _____ was beneath the lake

b. It leaked _____ (CO₂) into the water, changing it into carbonic acid.

c. This made it an _____ lake because it was saturated with carbon dioxide.

d. On August 21, 1986, possibly as the result of a landslide, Lake Nyos suddenly emitted a large cloud of CO₂, which _____ 1,700 people and 3,500 livestock in nearby towns and villages.

c) Too much carbon in the air is causing _____

a. excessive carbon is released into the air due to _____ of fossil fuels

b. the extra carbon is a _____ gas which traps heat like a blanket

c. over time the overheating atmosphere causes the _____ to get warmer