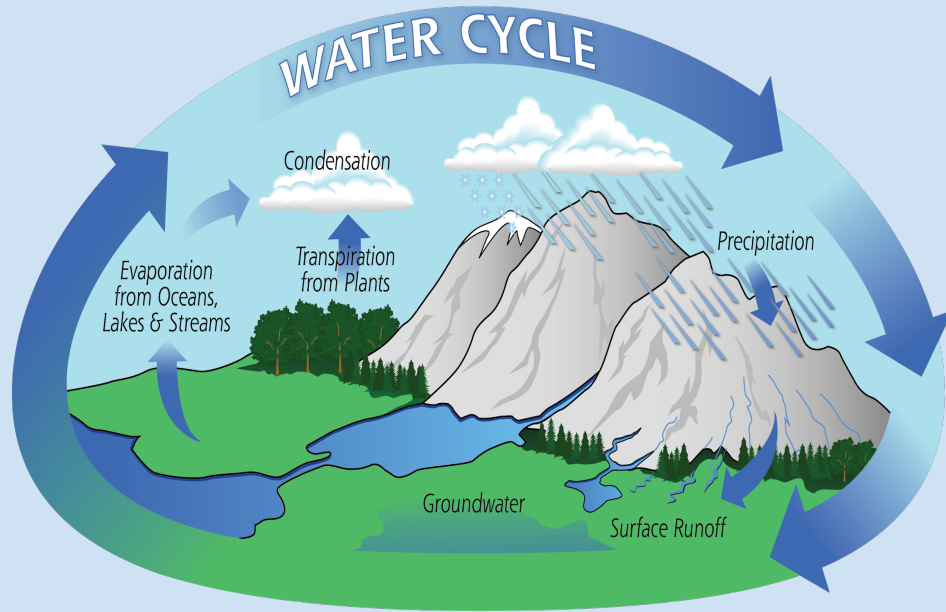


# Cycles of Matter



## Learning Target:

Create a model describing how matter (water and carbon) cycles through the biosphere.

# How does matter move through the biosphere?

- Matter is recycled within and between ecosystems.
- Elements pass from one organism to another and among parts of the biosphere through closed loops called **biogeochemical cycles**.

# How does matter move through the biosphere?

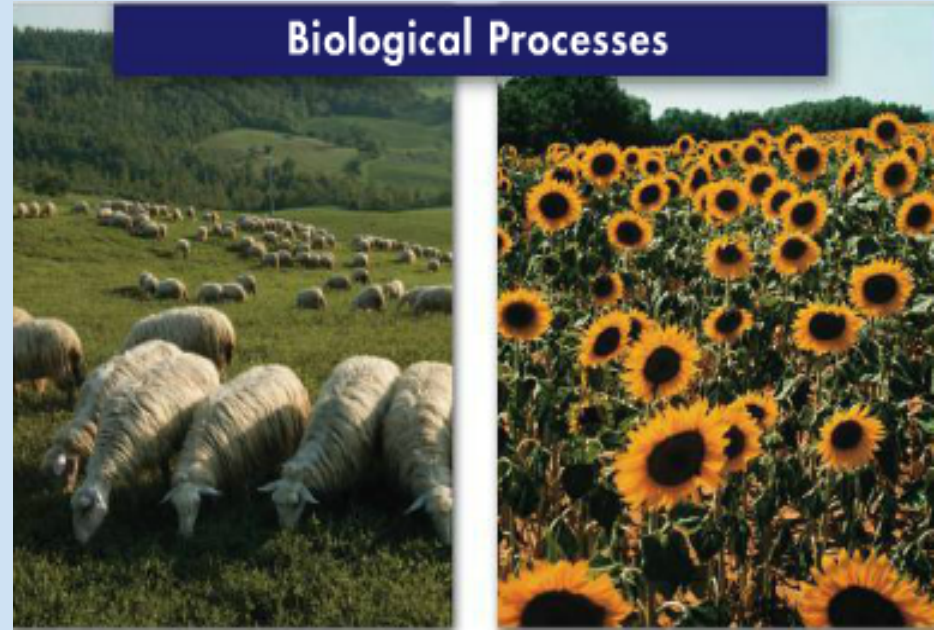
- Cycles of matter involve:
  - biological processes
  - geological processes
  - chemical processes
- As matter moves through these cycles, it is transformed.
  - matter is never created or destroyed-just changed!

# How does matter move through the biosphere?

- There are many ways in which the processes involved in biogeochemical cycles can be classified:
  - biological processes
  - geological processes
  - chemical and physical processes
  - human activity

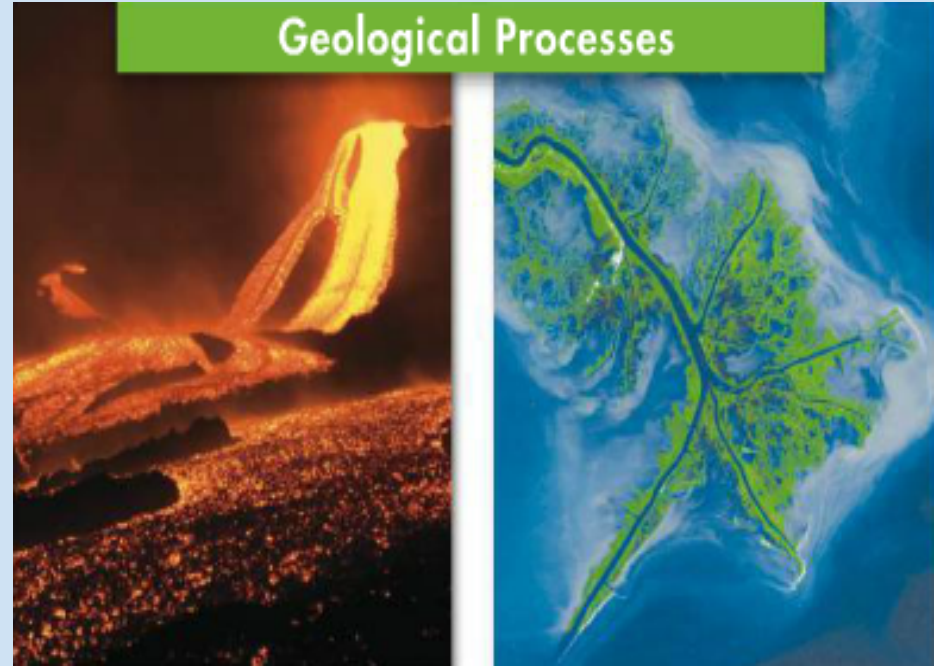
# How does matter move through the biosphere?

- Biological Processes
  - Consists of any and all activities performed by living organisms.
    - eating
    - breathing
    - eliminating waste products



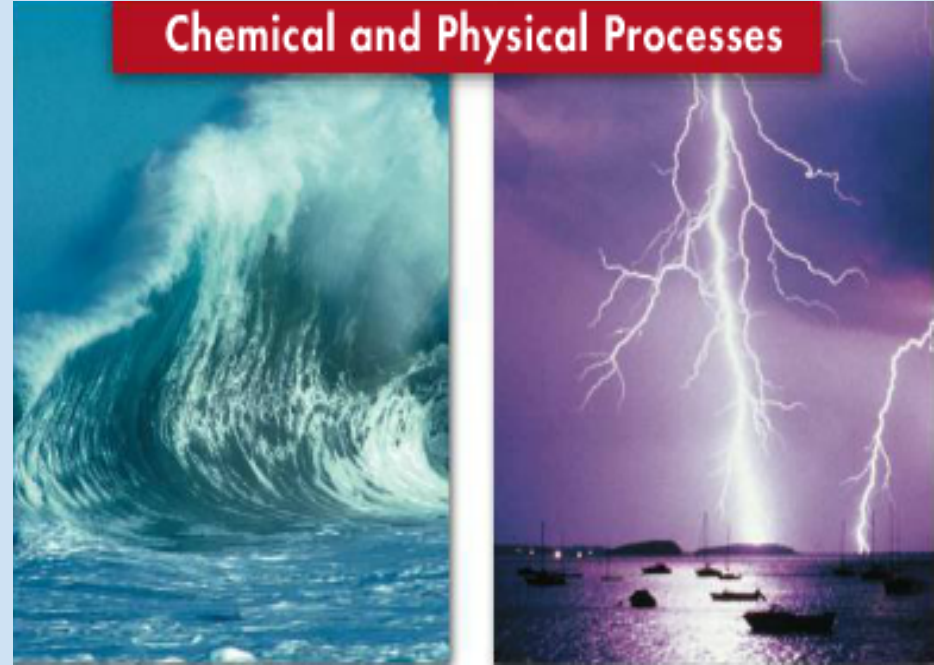
# How does matter move through the biosphere?

- Geological Processes
  - volcanic eruptions
  - formation and breakdown of rocks.
  - major movement of matter below the Earth's surface.



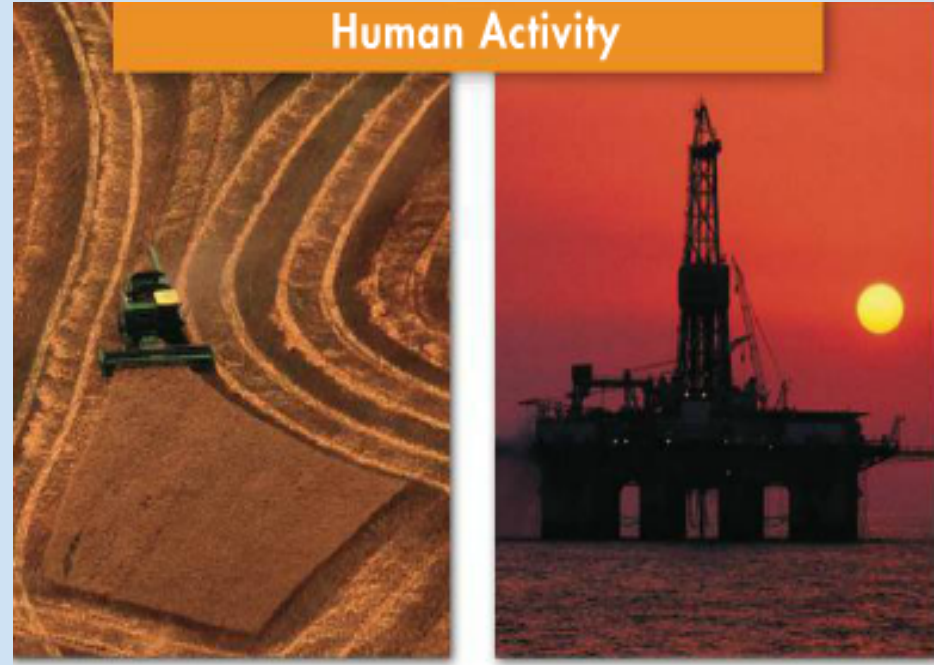
# How does matter move through the biosphere?

- Chemical & Physical Processes
  - formation of clouds and precipitation
  - flow of running water
  - action of lightning



# How does matter move through the biosphere?

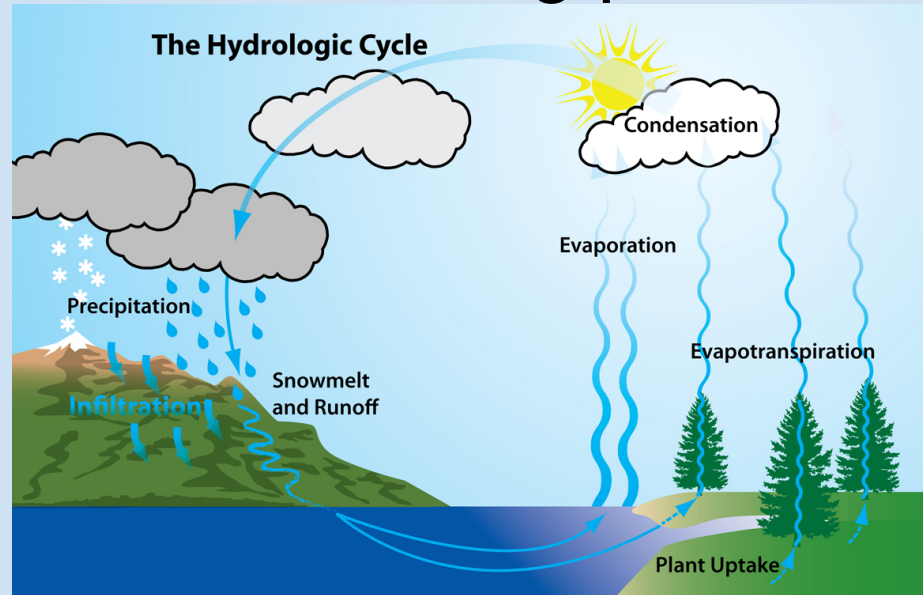
- Human Activity
  - mining and burning of fossil fuels
  - clearing of land for building and farming
  - burning of forests
  - manufacture and use of fertilizers





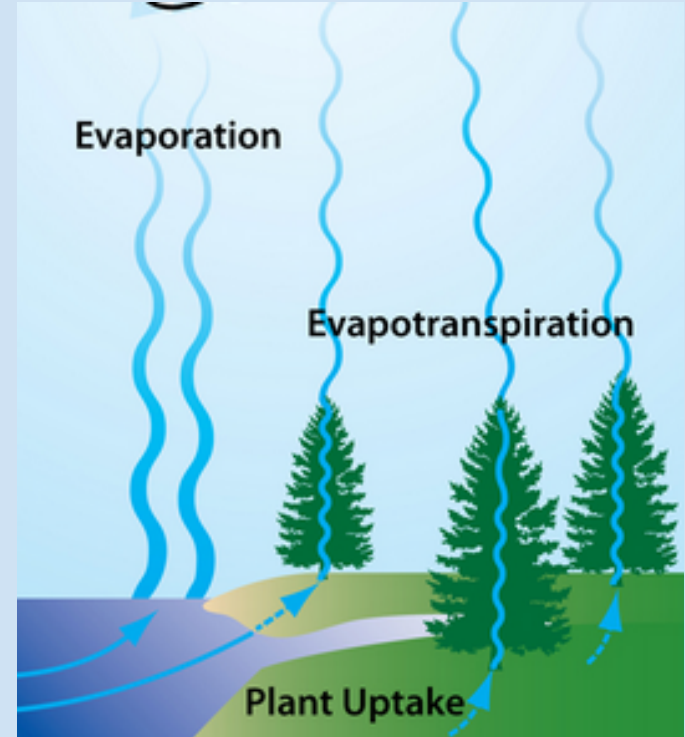
# How does water cycle through the biosphere?

- Every time you see rain or snow, or watch a river flow, you are witnessing part of the water cycle.



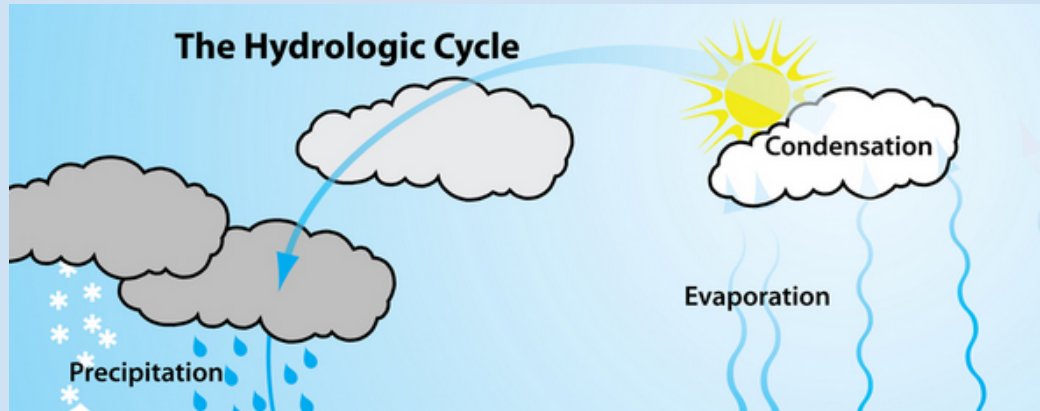
# How does water enter the atmosphere?

- Water molecules usually enter the atmosphere as water vapor when they evaporate from the ocean or other bodies of water.
- Water can also enter by evaporating from leaves through transpiration.



# How is water transported?

- By winds over great distances.
  - if the air carrying the water cools, water vapor condenses into tiny droplets that form clouds.
  - When the droplets become large enough, they fall to the Earth as precipitation.



# What happens to water when it hits the Earth's Surface?

- Some precipitation flows along the surface (runoff), until it enters a river or stream that carries it to an ocean or lake.
- Precipitation can also be absorbed by the soil (groundwater).
  - Groundwater can enter plants through their roots, or flow into other bodies of water.
  - Some groundwater can penetrate so deeply that it becomes part of underground reservoirs.

# How does water cycle through the biosphere?

## Your Task:

1. Water cycle practice worksheet.
2. Diagram of the water cycle
  - On the left side of your notebook draw (and color) a diagram that represents ALL stages of the water cycle.

# What is the importance of the main nutrient cycles?

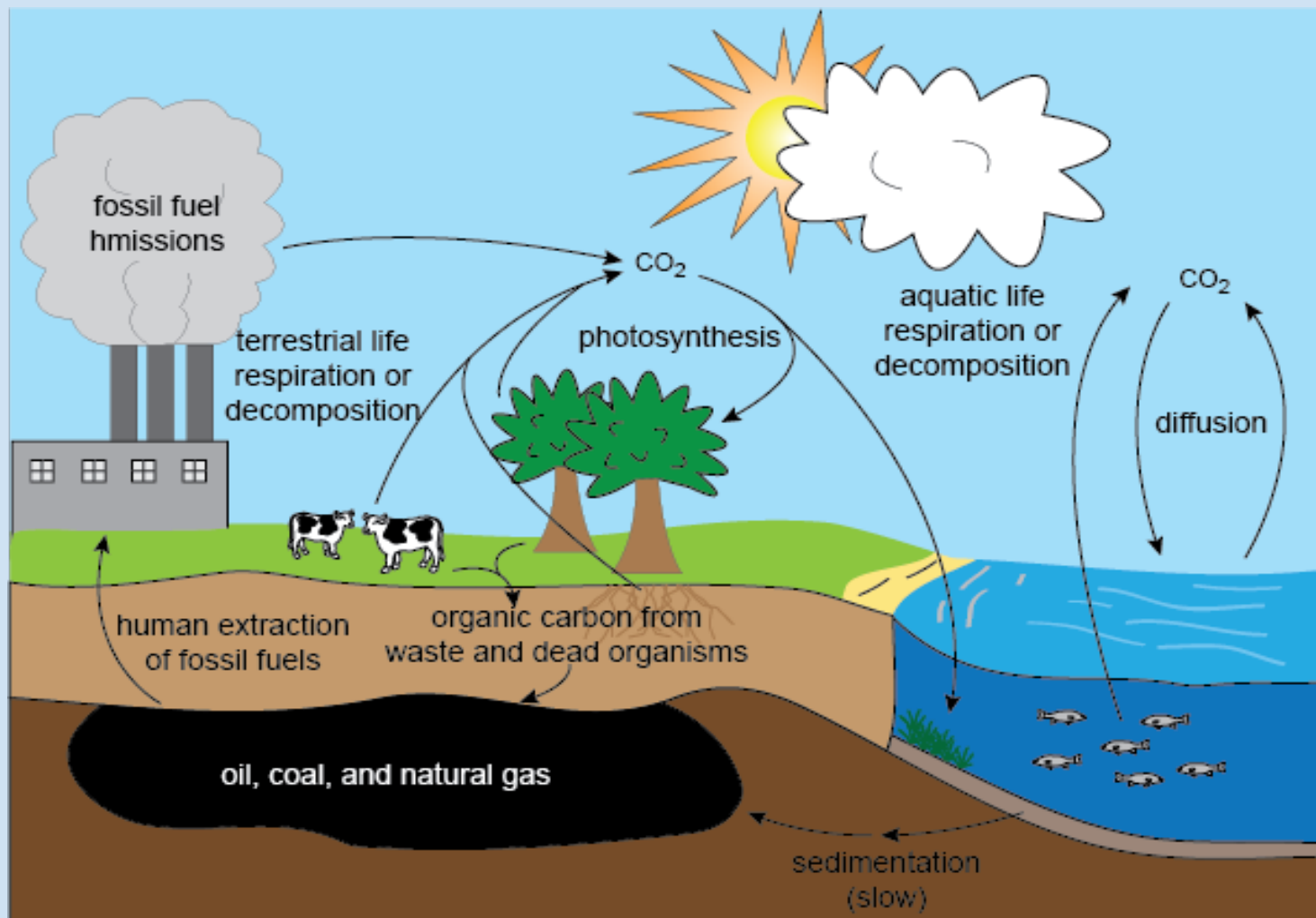
The chemical substances that an organism needs to sustain life are called **nutrients**.

- Every organism needs nutrients to build tissues and carry out life functions.
- Like water, nutrients pass through organisms and the environment through biogeochemical cycles.

# How does carbon cycle through the environment?

Carbon is a major component of all organic compounds.

- Carbon is found in several large reservoirs in the biosphere.
  - atmosphere = carbon dioxide gas
  - oceans = dissolved carbon dioxide
  - land = organisms, rocks, soil
  - underground = coal, petroleum, calcium carbonate





# How does water cycle through the biosphere?

## Your Task:

1. Diagram of the carbon cycle
  - On the left side of your notebook draw (and color) a diagram that represents ALL stages of the carbon cycle.