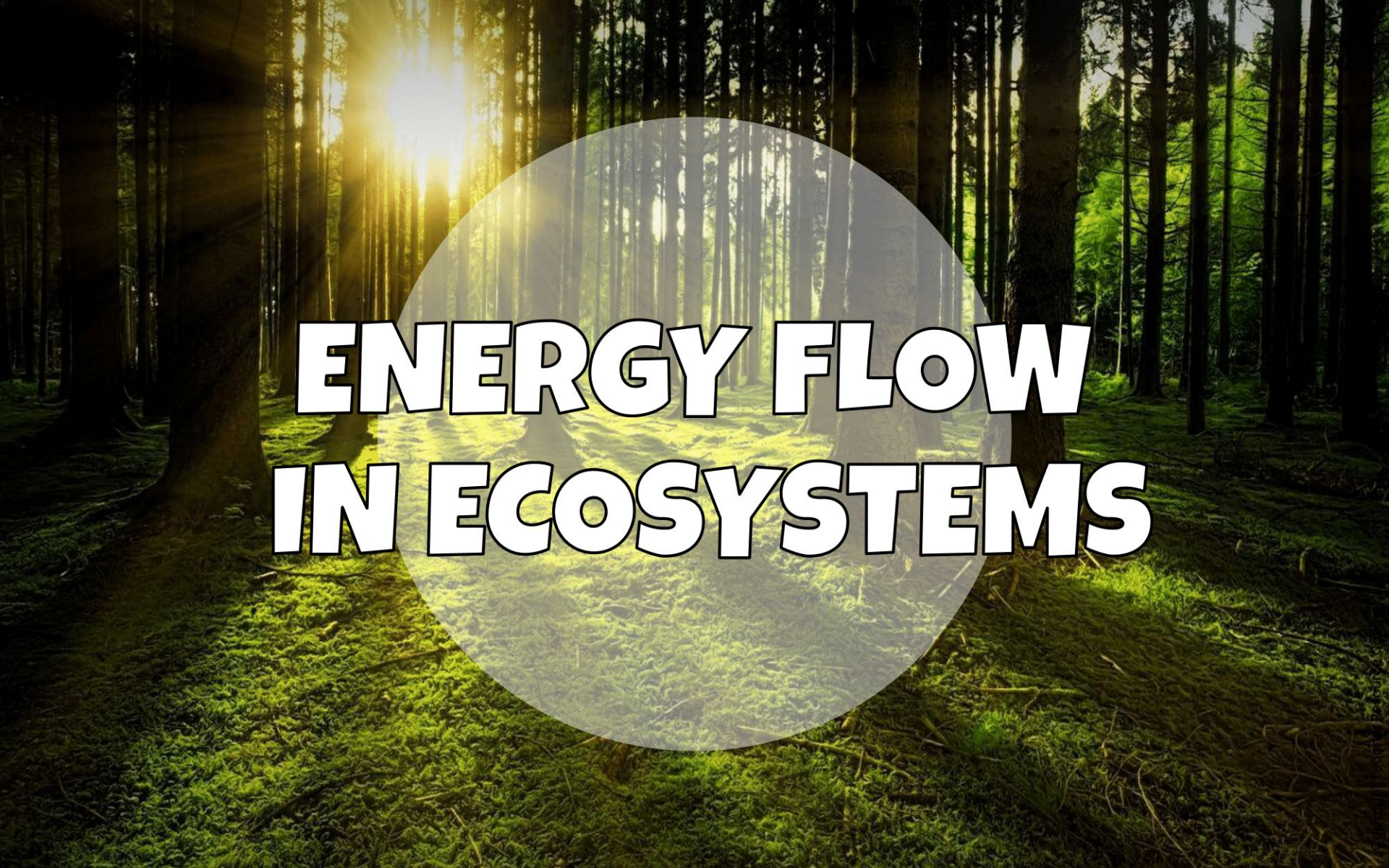
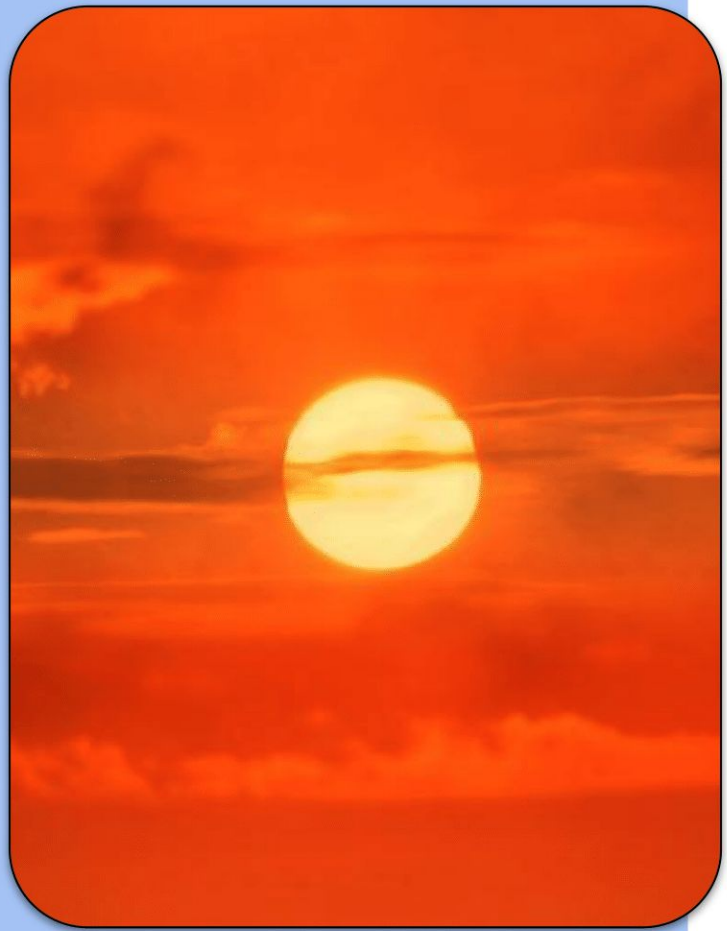
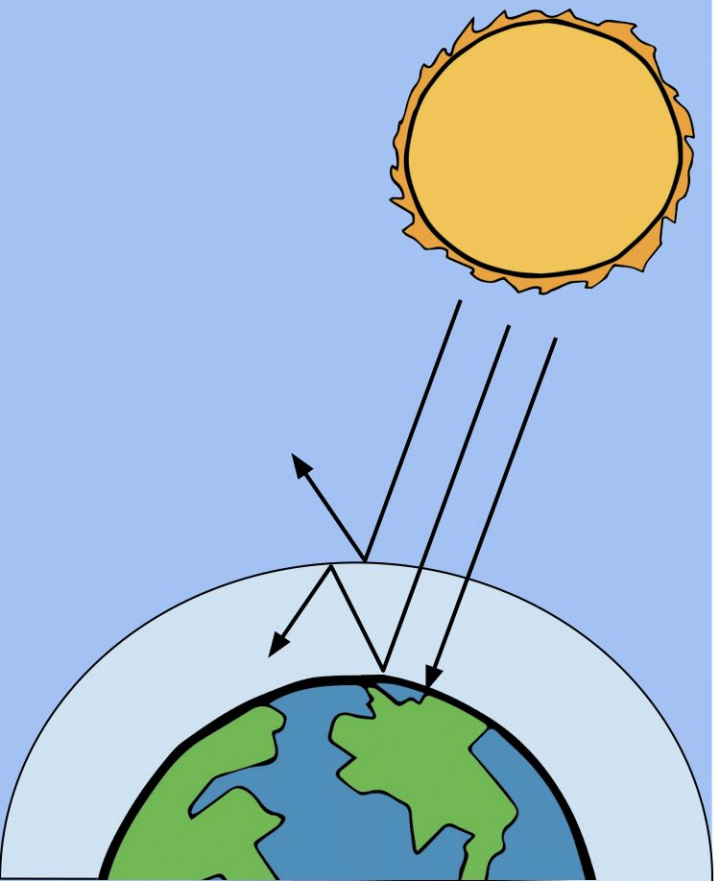

ENERGY FLOW
IN ECOSYSTEMS

ENERGY FLOW



- The Sun converts hydrogen to helium through nuclear fusion.
- During nuclear fusion, hydrogen atoms collide violently to form helium.
  - Releases an incredible amount of energy
- This energy is released through the photosphere until it eventually reaches Earth.

ENERGY FLOW



- The ozone layer of the atmosphere absorbs some ultraviolet radiation (about 20%).
- About 30% gets absorbed by Earth's surface and clouds.
- The radiant energy that is not absorbed reaches Earth's lithosphere and hydrosphere where it gets converted to thermal (heat) energy (about 50%).

PHOTOSYNTHESIS

- Photosynthesis is the process where plants use sunlight to synthesize foods from carbon dioxide and water.
    - Converts radiant energy to chemical energy, which can be used and stored by plants
- Autotrophs can use photosynthesis to produce their own food.

Think about it!

Photosynthesis involves using light energy to convert water and carbon dioxide into sugar and oxygen. **Fill in the blanks in the word equation for photosynthesis.**

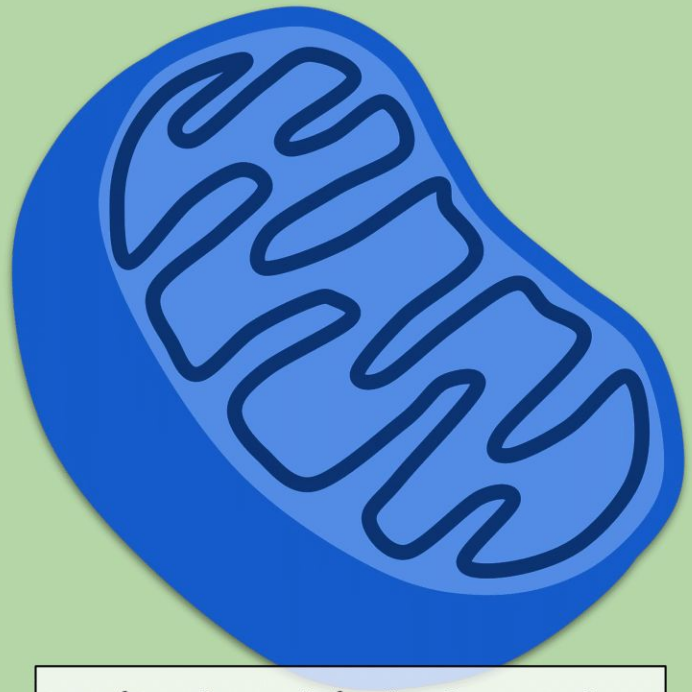
Photosynthesis

	+	Light Energy →		+

- The sugar produced through photosynthesis is called glucose.
- Glucose is used by plants for energy and to make substances like cellulose and starch.
- Glucose gets stored as chemical energy in various parts of the plant.

CELLULAR RESPIRATION

- Cellular respiration is the process by which organisms use oxygen to break down food molecules to get chemical energy for cell functions.
- During cellular respiration, sugar and oxygen are used to release energy along with water and carbon dioxide.
- Cellular respiration does not require light energy.



Mitochondria is the main organelle involved in cellular respiration

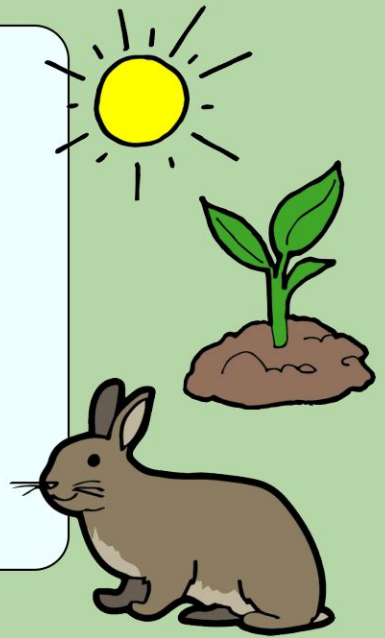
Think about it!

During cellular respiration, sugar and oxygen are used to release energy along with water and carbon dioxide. **Fill in the blanks in the word equation for cellular respiration.**

Cellular Respiration

+	→	+	+

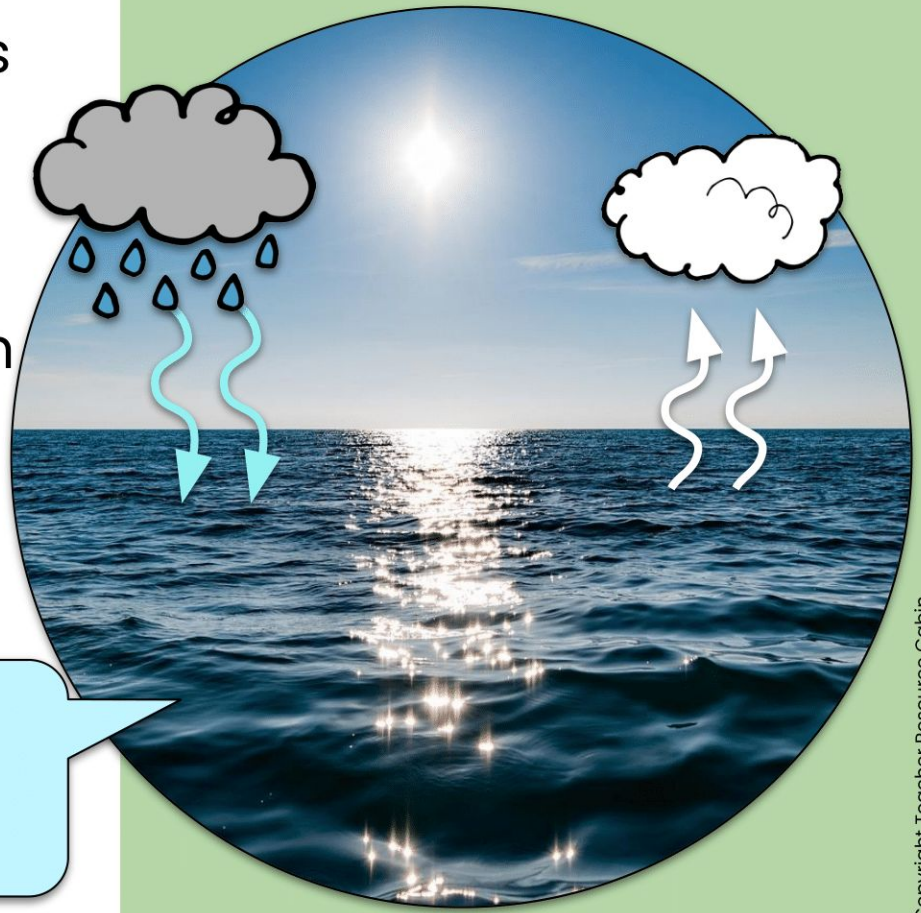
Explain the transfer of energy and the interrelationship of the Sun, plants, and animal species.




MATTER
CYCLING

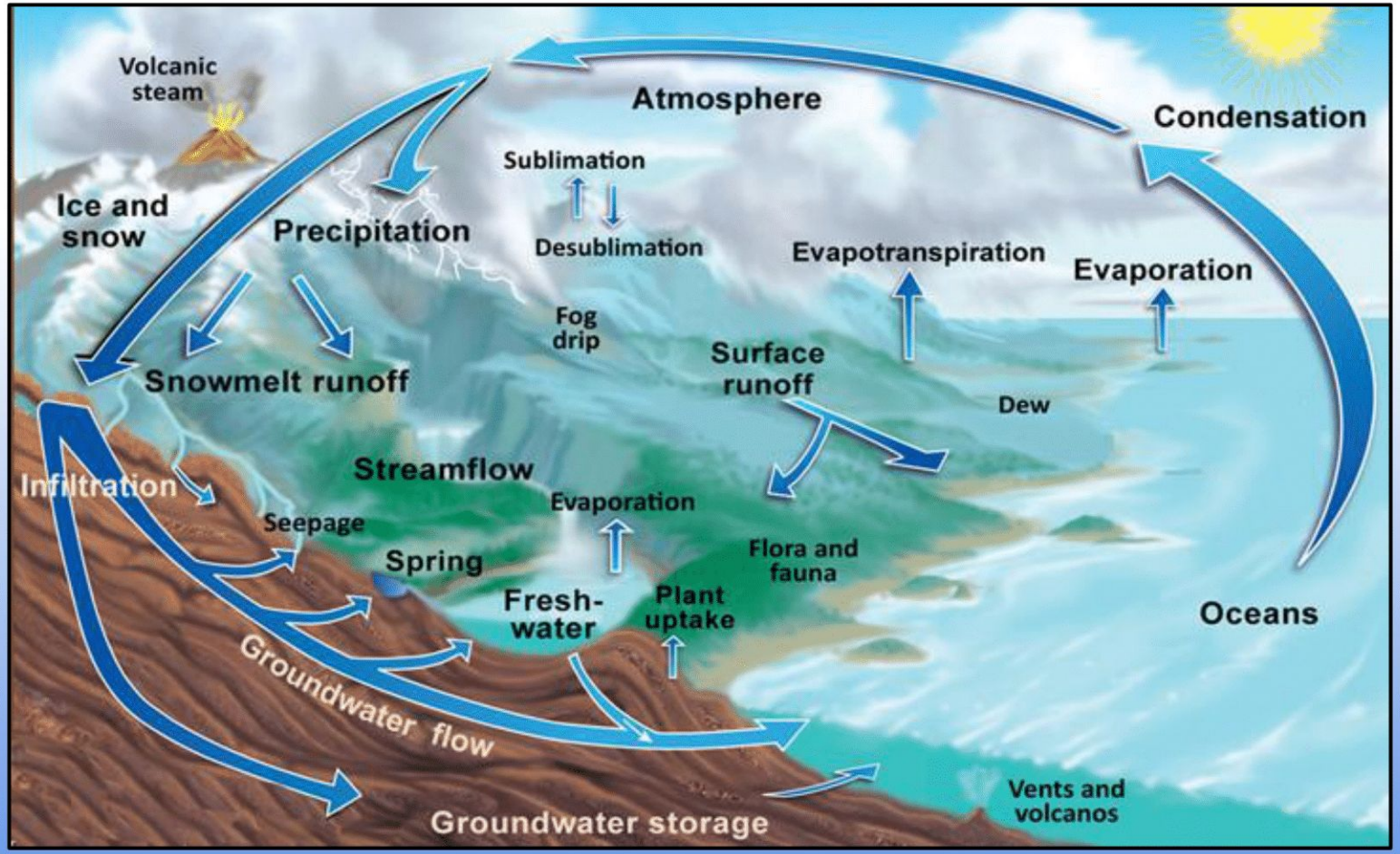
THE WATER CYCLE

- The water cycle is the process where water circulates between Earth's oceans, atmosphere, and land.
- Water converts between each of the three states.
- The water cycle is fuelled by the energy from the Sun.



Why is the water cycle important for ecosystem sustainability?

THE WATER CYCLE



THE CARBON CYCLE

- The carbon cycle is another example of matter cycling.

- Carbon dioxide enters living tissue and gets returned to the atmosphere through:
  - Photosynthesis
  - Respiration
  - Combustion (fires)

THE CARBON CYCLE

- Most of Earth's carbon is stored in fossil fuels.
- Fossil fuels are created from the compression of dead organisms over millions of years.

If fossil fuels are replaced naturally, why are they not considered a renewable resource?

THE NITROGEN CYCLE

- The nitrogen cycle is how nitrogen moves through living and non-living things.
- Most nitrogen is in Earth's atmosphere.
- Bacteria take this nitrogen and produce nitrogen compounds that get added to soil.

THE NITROGEN CYCLE

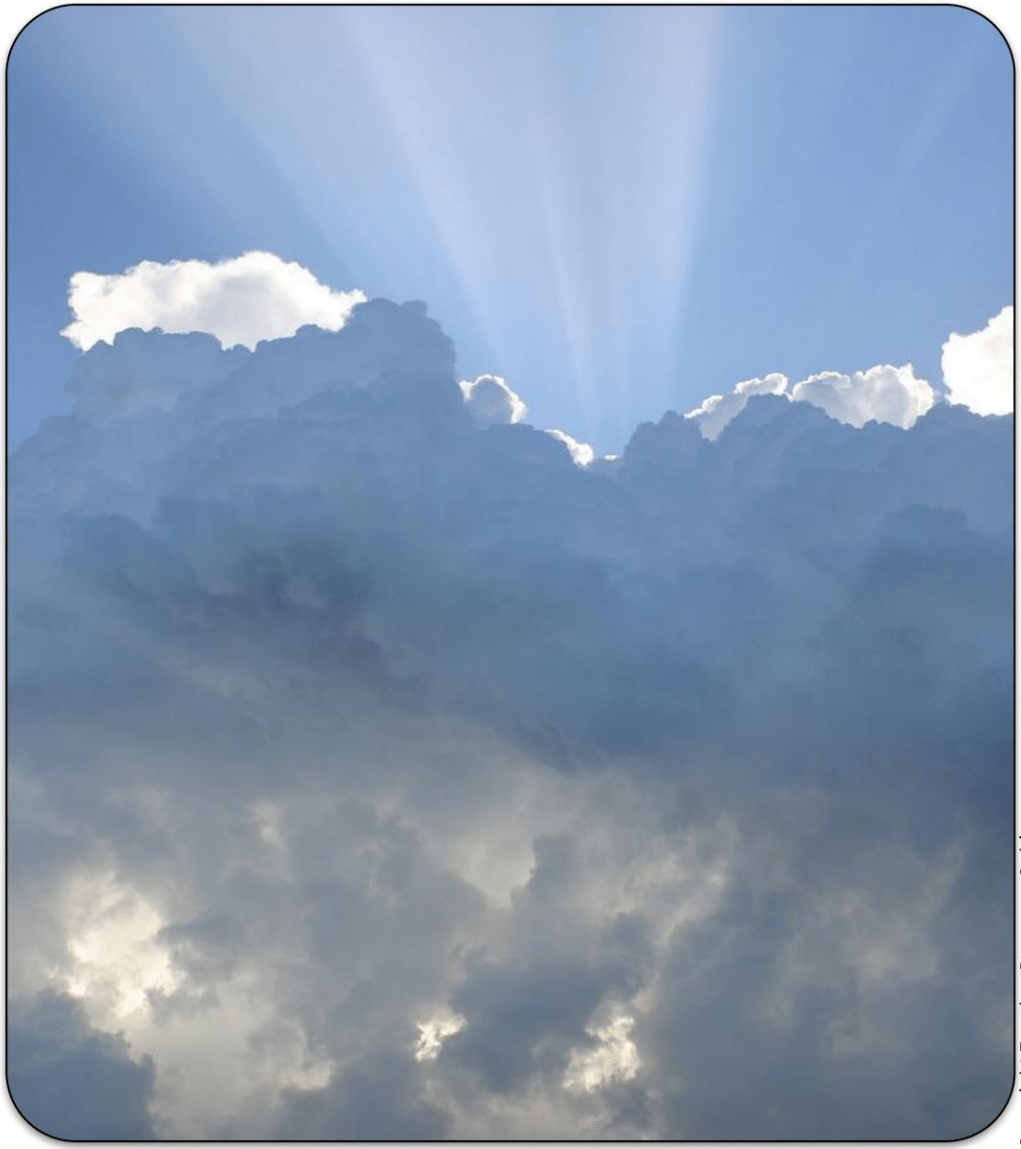
- Humans add nitrogen to soil because it is important for plant growth and chlorophyll production.
- The nitrogen gets absorbed into plants and moves through each stage of the food chain.
- Decomposing bacteria release the nitrogen back into the atmosphere.

? ? ?

How does nitrogen get moved from the atmosphere to the Earth's soil?

? ? ?

How does nitrogen get moved from the Earth's soil back into the atmosphere?



Think about it!

Describe each process of matter cycling.

The Water Cycle	
The Carbon Cycle	
The Nitrogen Cycle	

? ? ?

How does matter get cycled in ecosystems?