

Habitable Worlds Part 2

Ecosystems

Water and nutrient cycles

Vocabulary

- Ecosystems
- Biotic factor
- Abiotic factor

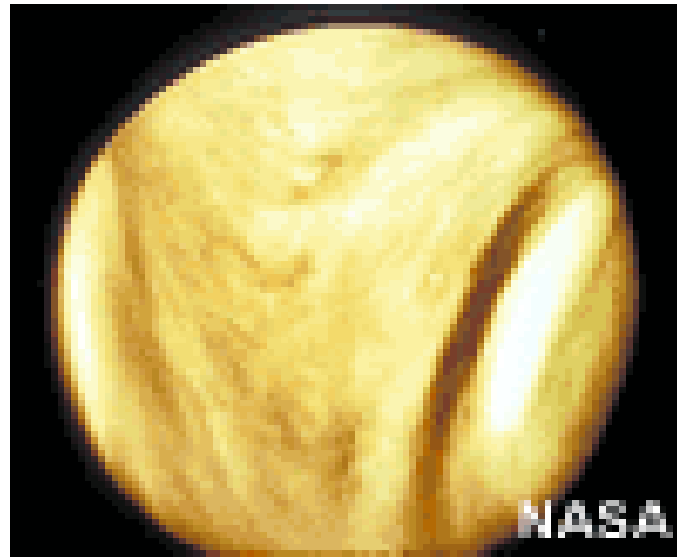
Why is Earth the only planet filled with life?

An underwater photograph showing sunlight rays filtering through the water surface, creating a serene and deep blue environment. The rays are visible as bright, vertical streaks of light against the darker blue water. The surface of the water is visible at the top, with ripples and reflections of light.

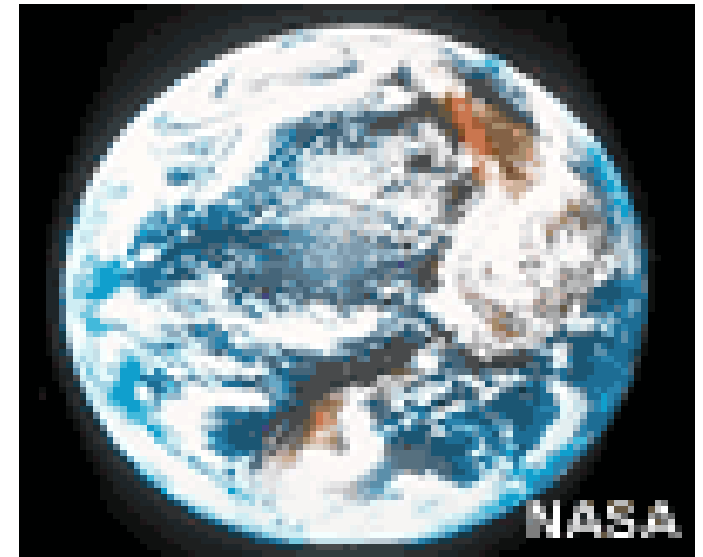
Liquid Water

Atmosphere → right amount of solar energy
(not too much and not too little)





Venus



Earth

Carbon Dioxide (CO₂)	96.5%	0.03%
Nitrogen (N₂)	3.5%	78%
Oxygen (O₂)	Trace	21%
Argon (Ar)	0.007%	0.9%
Methane (CH₄)	0	0.002%

What is our atmosphere made mostly of?

- Nitrogen and oxygen

What is the atmosphere of Venus made mostly of?

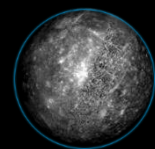
- Carbon dioxide

Set up an experiment to determine the **effect of CO₂ on global temperature**

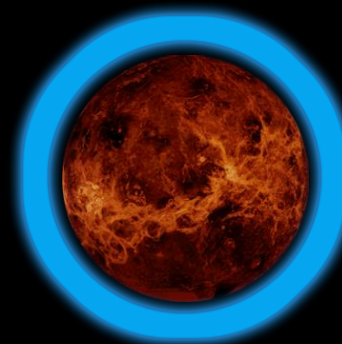
- Independent variable
- Dependent variable
- Control group
- Describe how you can test this theory
- Make a claim
- Gather evidence



Mercury
333° F



Venus
+855° F



Earth
59° F

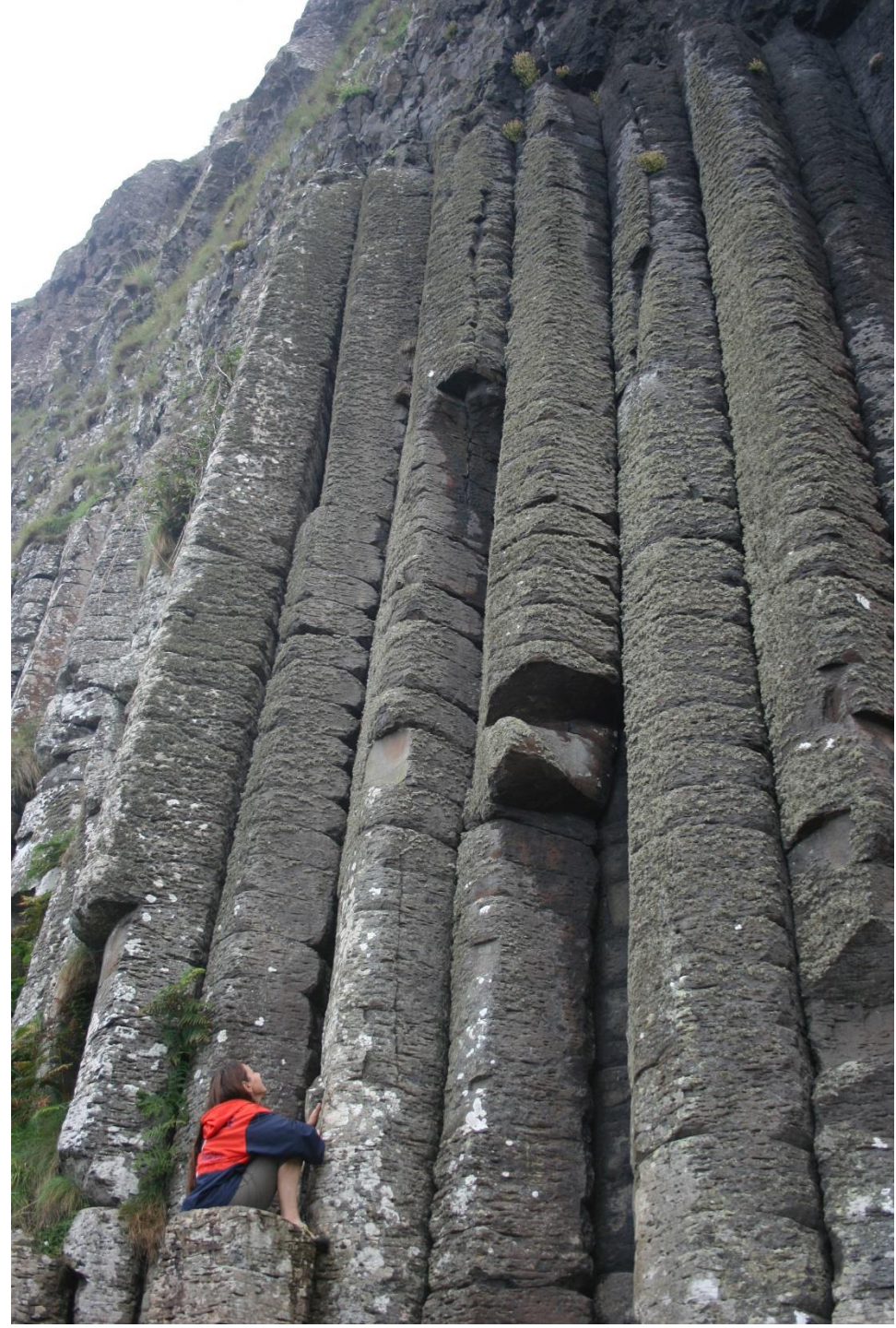


3rd reason why Earth is the only planet full of life = plate tectonics

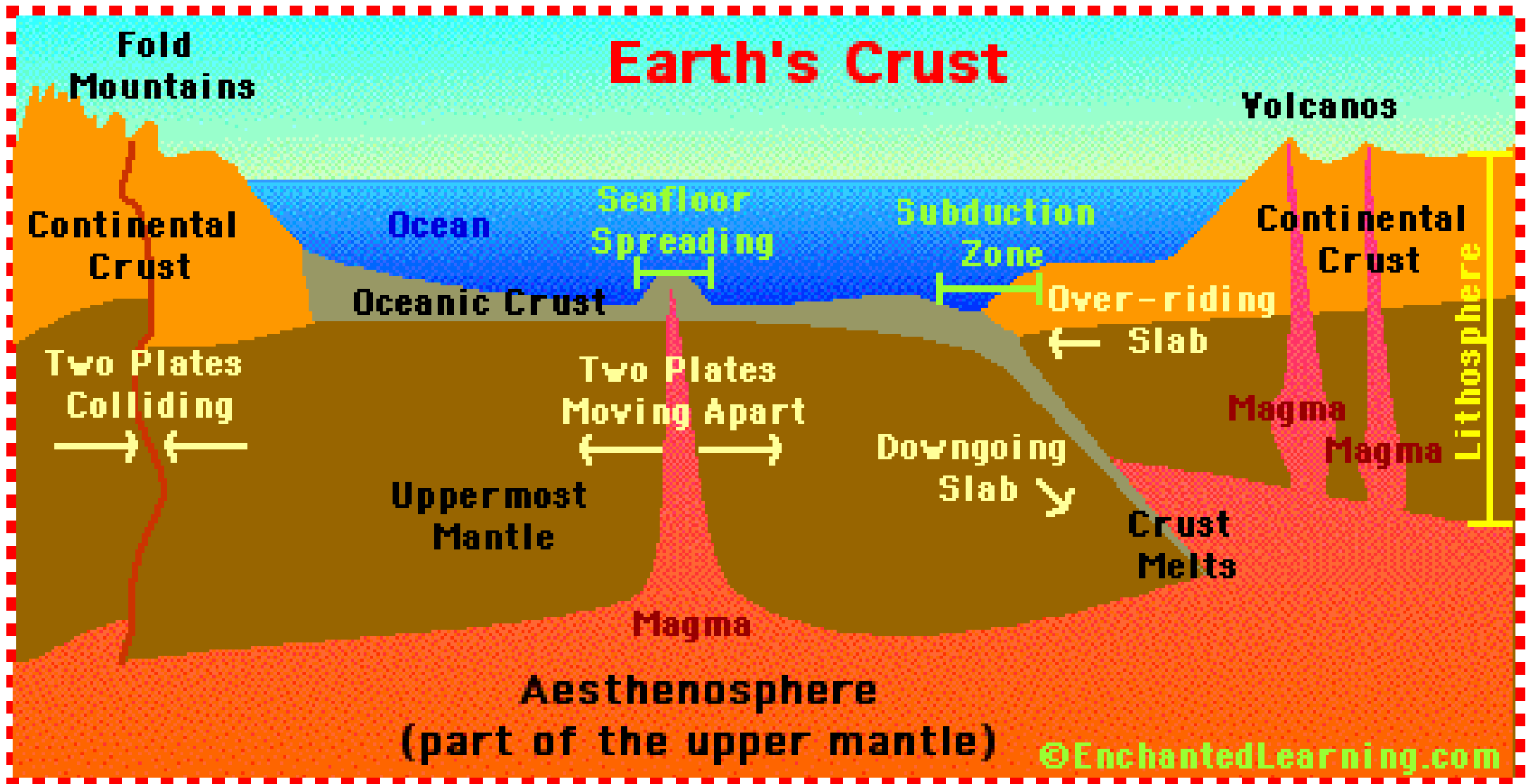


Lithosphere

- Rock layer of Earth
- Made of plates



What happens at plate boundaries?

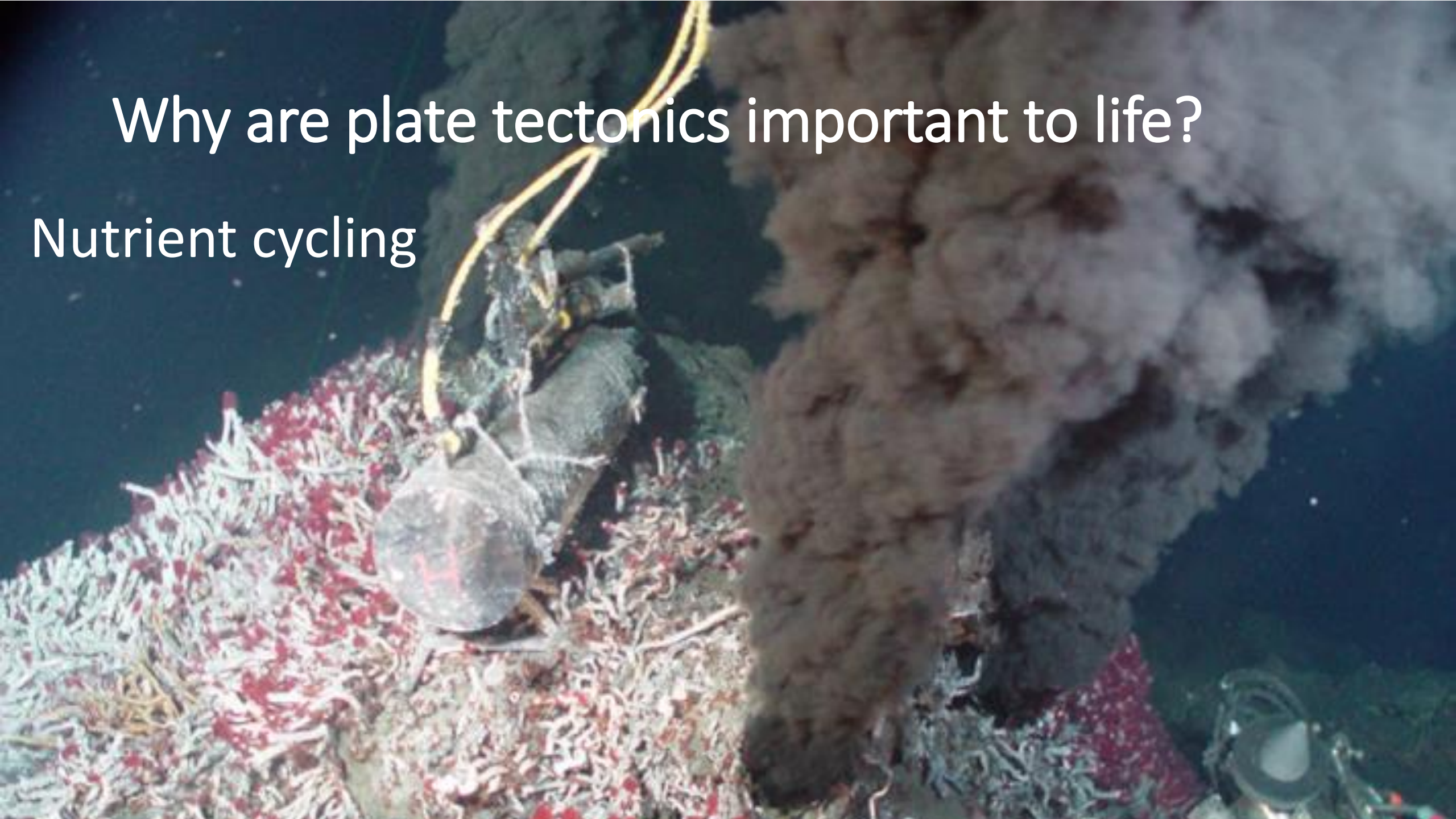


Why are plate tectonics important to life?

- <https://www.youtube.com/watch?v=6ByT4ponpUQ>

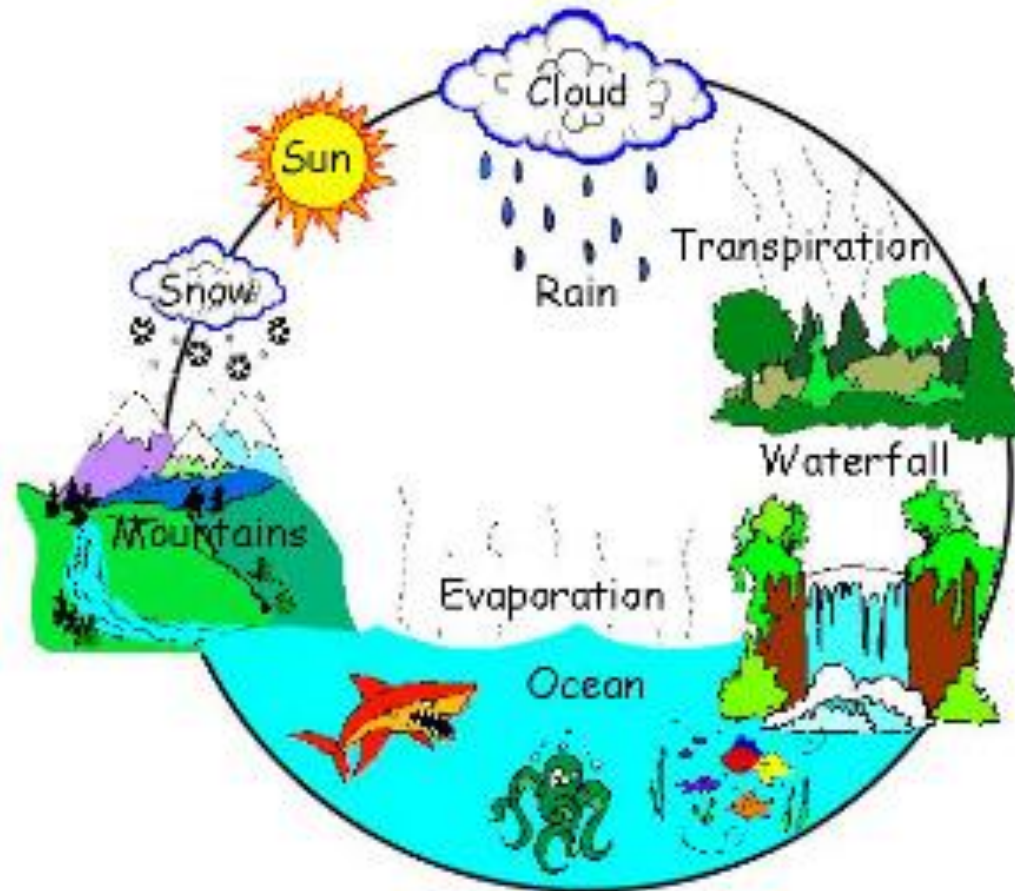
Why are plate tectonics important to life?

Nutrient cycling



Know your cycles

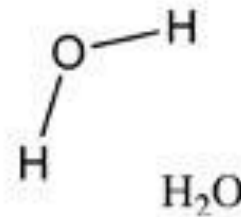
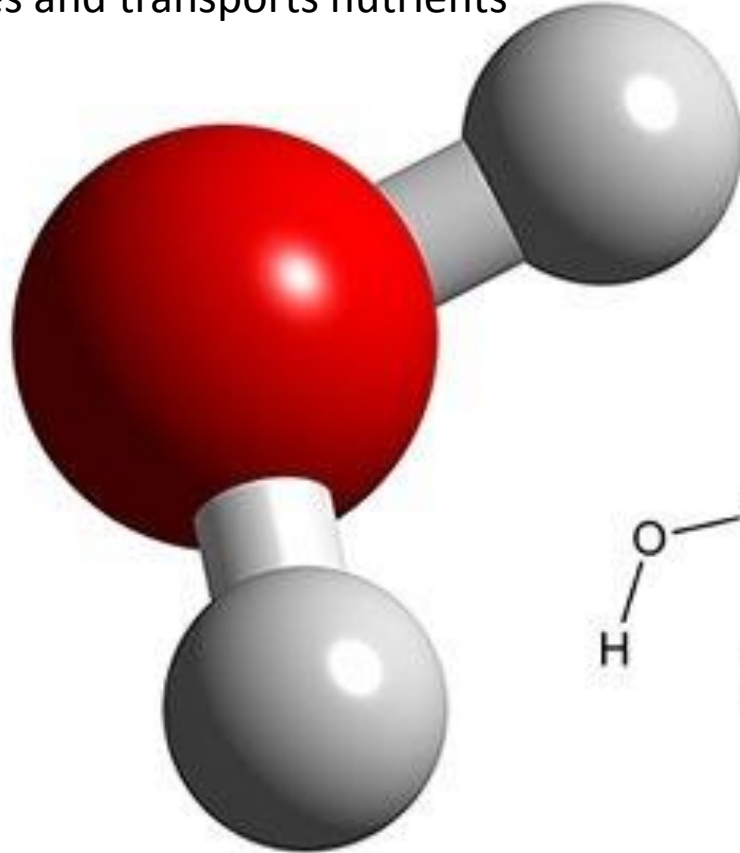
Water cycle activity in your notes



Draw a picture of a water molecule and state why it is so important to life



Dissolves and transports nutrients



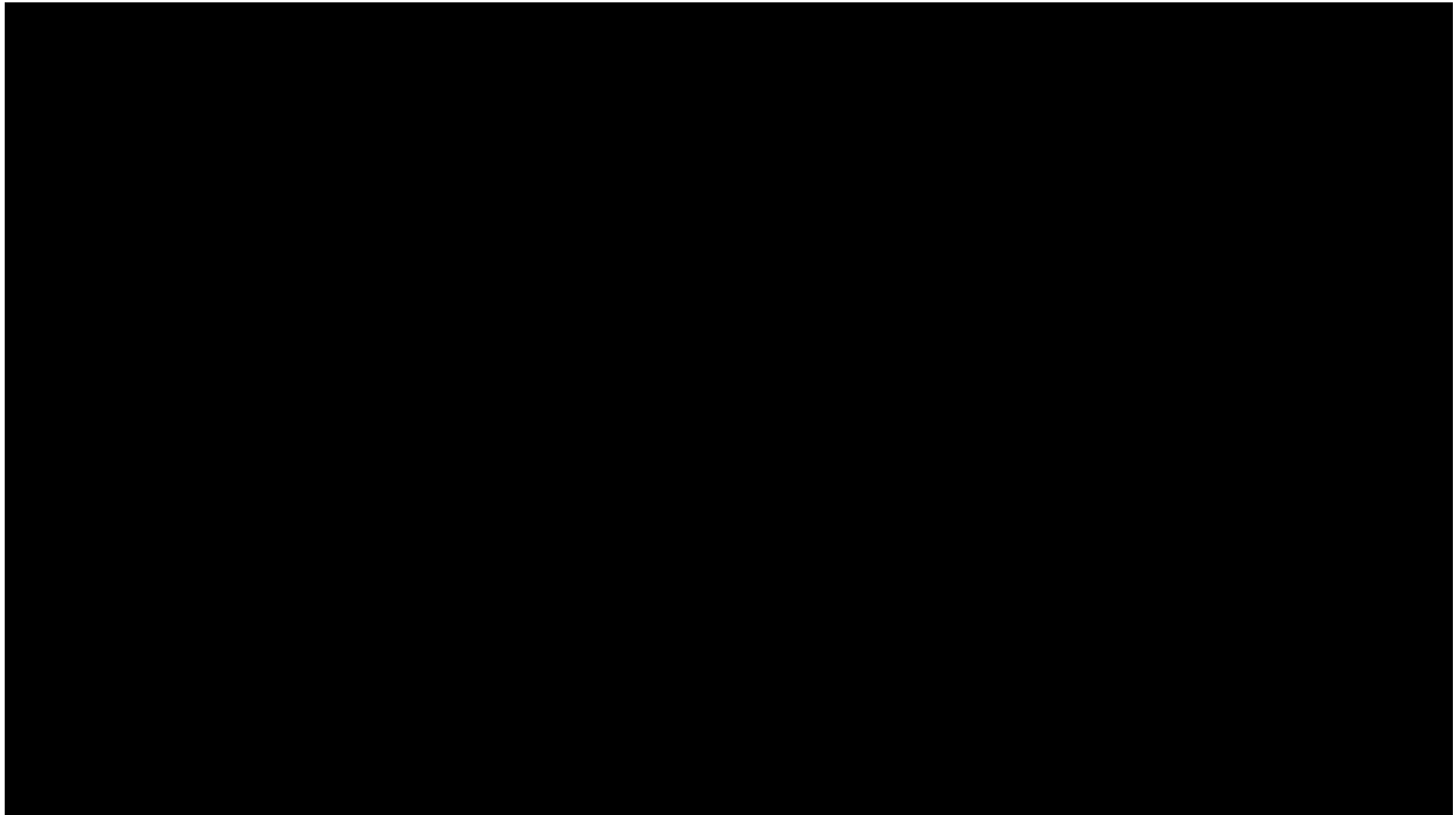
Things that put water into the atmosphere

- Evaporation = sun → liquid water → water vapor (gas)
- Sublimation = Sun → ice → water vapor (gas)
- Transpiration = sun → leaves → water leaves trees as a gas
- Respiration = living things breath out CO₂ and H₂O

Processes that bring water down to the surface of the earth

- Condensation = water vapor (gas) → liquid water in clouds
- Precipitation = water falls from the sky (rain, snow, sleet...)
- Runoff = water flows on land into lakes, rivers and streams
- Percolation = water flows through the soil into the groundwater

List 2 abiotic factors that move water through the cycle



Water on Earth: **The Hydrosphere**



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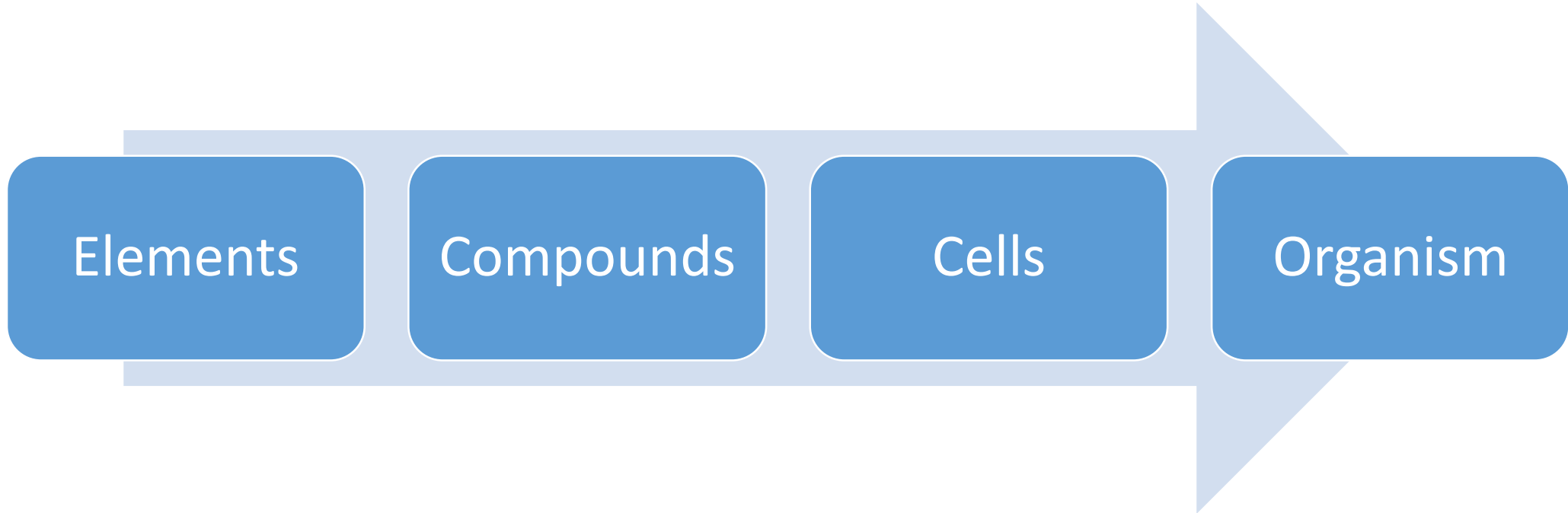
Photo Source: NASA Images

Draw a picture of the water cycle using all of the words from today's lesson

- Evaporation
- Transpiration
- Sublimation
- Condensation
- Precipitation
- Respiration
 - Runoff
- Percolation

Levels of Organization

Smallest → biggest



Levels of Organization in Ecosystems



Population

- = all the members of 1 species in 1 area
- Example
- moose in the Adirondacks



Community

- many populations interacting
- Example:
- Herbivore communities in a grassland



Ecosystem

- biotic and abiotic factors interacting in a given area.
- Examples:
- forest, pond



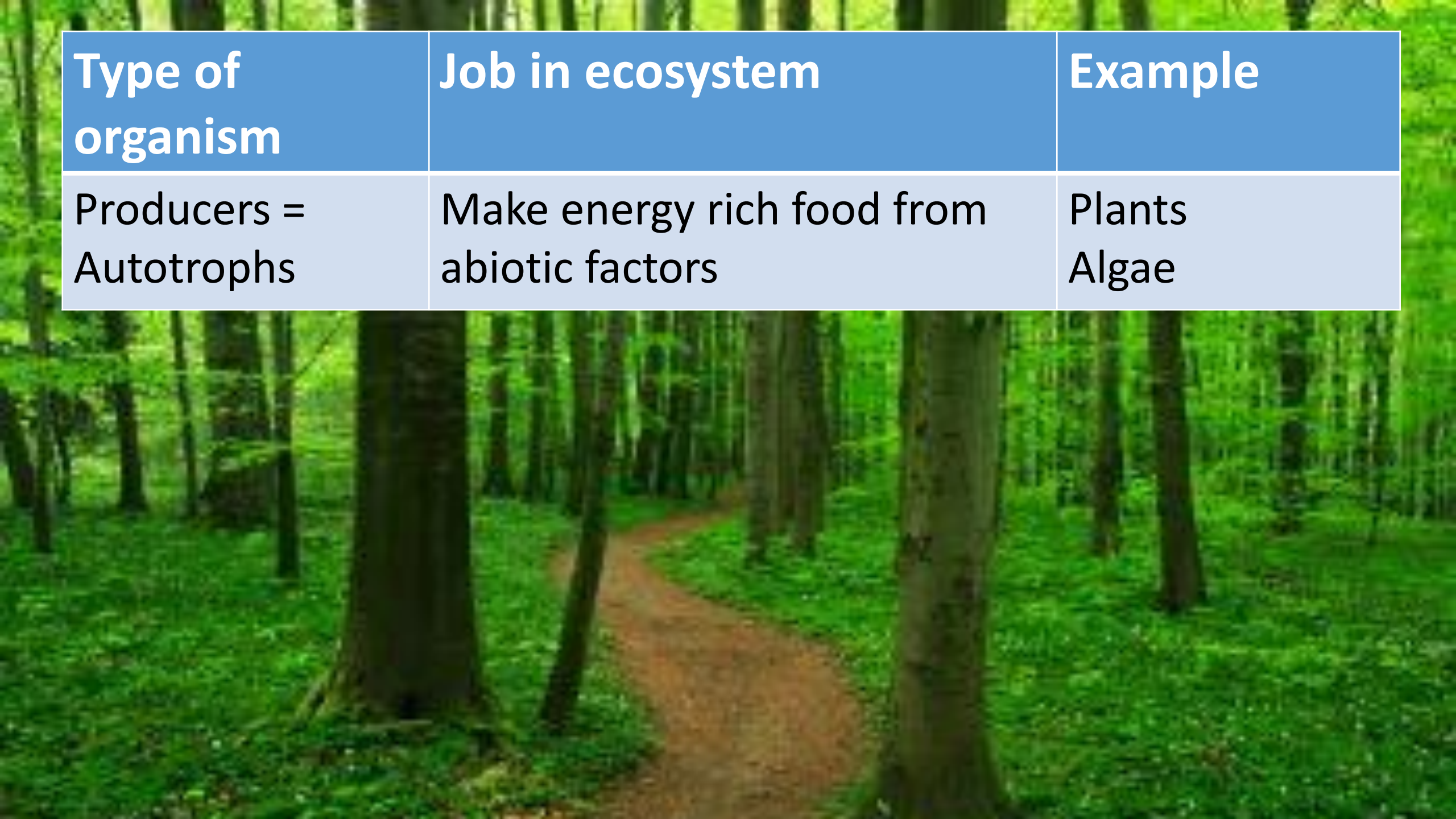
Biosphere = portion of Earth that supports life



Smallest → biggest



Types of organisms in an ecosystem



Type of organism	Job in ecosystem	Example
Producers = Autotrophs	Make energy rich food from abiotic factors	Plants Algae

Type of organism	Job in ecosystem	Example
Consumer = Heterotrophs	Cannot make their own food need to eat other organisms	Animals, fungi, decomposers





Heterotroph

Autotroph



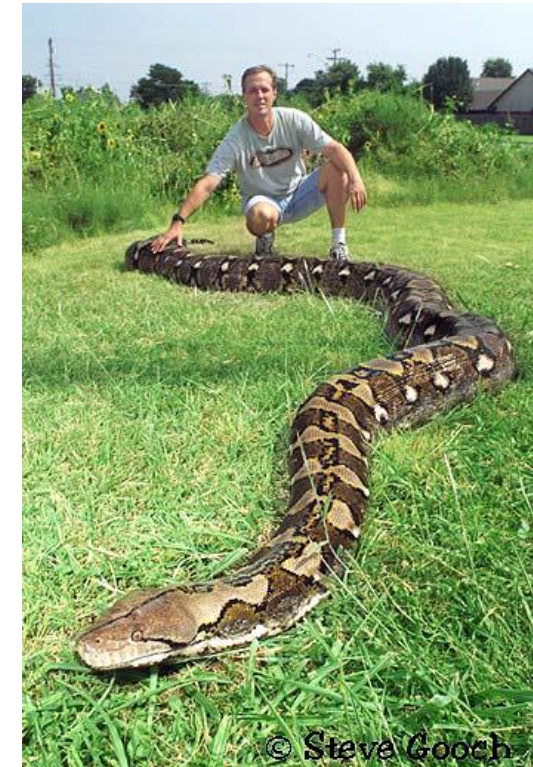
Type of organism	Job in ecosystem	Example
Herbivore	Type of consumer that eats only plants	Deer Rabbits



Type of organism	Job in ecosystem	Example
Omnivore	Type of consumer that eats plants and animals	Bear Raccoon



Type of organism	Job in ecosystem	Example
Carnivore	Type of consumer that eat animals only	Lion, tiger, annacondas



Type of organism	Job in ecosystem	Example
Decomposers	Organisms that break down dead organisms Job = <u>Recycle Nutrients</u>	Bacteria and fungi



Type of organism	Job in ecosystem	Example
Predators	Animals that hunt and kill prey	Lion



Type of organism	Job in ecosystem	Example
Prey	Animal that gets hunted	Mouse



Study for Unit 1 Exam Friday