

**EQ #15-HOW MUCH
WATER IS THERE ON
EARTH? HOW MUCH DO
WE USE?**

EQ #15

What is Earth's water supply? Why is water important to life on earth?

- EQ #15-What is Earth's water supply? Why is water important to life on earth? How do we use water?

How Neat is Water?



- Why do you love water?
- Why is water important to life on earth?
- What are the major sources of water on earth?
- Brainstorm a list with a partner.

Why is water so neat (important)?

- Without it, **life on earth would NOT be possible.**
- We are the **only planet with flowing water in our solar system**
- Water **remains a liquid over most temperature ranges on earth...**that's pretty neat!
- Animals (including humans) and plants are mostly made of water. **Humans are about 75% water!**
- Water carves land forms, provides energy, makes soil (thru erosion), and much more!

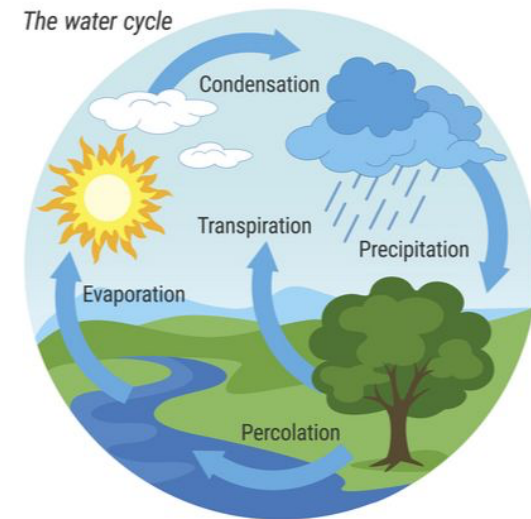
Is water a Renewable or Non-renewable Resource?

- **Renewable resources** – can be replenished on a human time scale (trees, solar, wind, geothermal)
- **Non-Renewable Resources** – cannot be replenished on a human time scale. (fossil fuels like oil, coal and natural gas).



Is Water a Renewable or Non-Renewable Resource?

- Water is technically renewable—it can be used over and over and is recycled in the water cycle.
- But it is NOT unlimited!
- More cannot be made on a human time scale.
- It can be depleted faster than it can cycle and replenish itself.



Where did our water come from?



- https://www.youtube.com/watch?v=_LpgBvEPozk

World's Water Supply

- If the tank represents **ALL of earth's water**,
 - ▣ **Remove the amount that is FRESH**, relative to the amount which is salt.
 - ▣ The remaining water in the tank represents the amount that is **SALT**.



World's Water Supply

- Only 2 cups (from the 5 gallons in tank) are fresh water!
- 97.2% of earth's water is salt water
- 2.8% is fresh water



How much fresh water is available for human use?

- Of the fresh we removed from the tank, much is still not accessible to humans.
- **Why is most fresh water NOT available to humans?**



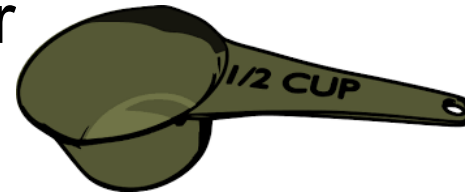
Frozen v. Unfrozen Fresh Water

- If most fresh water is frozen and unavailable for immediate human use, remove the amount that ISN'T frozen.
- How much of earth's water is **fresh AND unfrozen** water?



Unfrozen Fresh Water

- 2.8% of earth's water is fresh water
- 2% of earth's water is frozen (that's 71% of all fresh!)
- Only .8% is unfrozen!
- Just one half cup (from 5 gallons) represents the fresh AND unfrozen water on earth!



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- Of this unfrozen fresh water, much is still NOT available for humans. Why?

Unfrozen Fresh Water

- Most unfrozen water is cycling in the atmosphere and in plants, soil and animals alive on earth.
- That leaves very little is available for direct human use.
- **Separate the amount available to humans from the unfrozen that is NOT available.**



How much of this is

Unfrozen Water Available to Humans

- **Just TWO drops represent the unfrozen water that is available to humans!**
- Just .3% remains from the .8% of fresh, unfrozen.
- .5% is in the atmosphere and in plants and animals.

- Where does this .3% exist?

Fresh water available for use

- MOST fresh water available for human use is groundwater (70%)
- Groundwater is stored under earth's surface in soil & aquifers = the water table.
- Surface water water in lakes, rivers and streams; comprises just one drop from our demonstration!
- http://pmm.nasa.gov/education/sites/default/files/videos/Earths_Water_Cycle_HQ.mp4

Earth's Water Supply

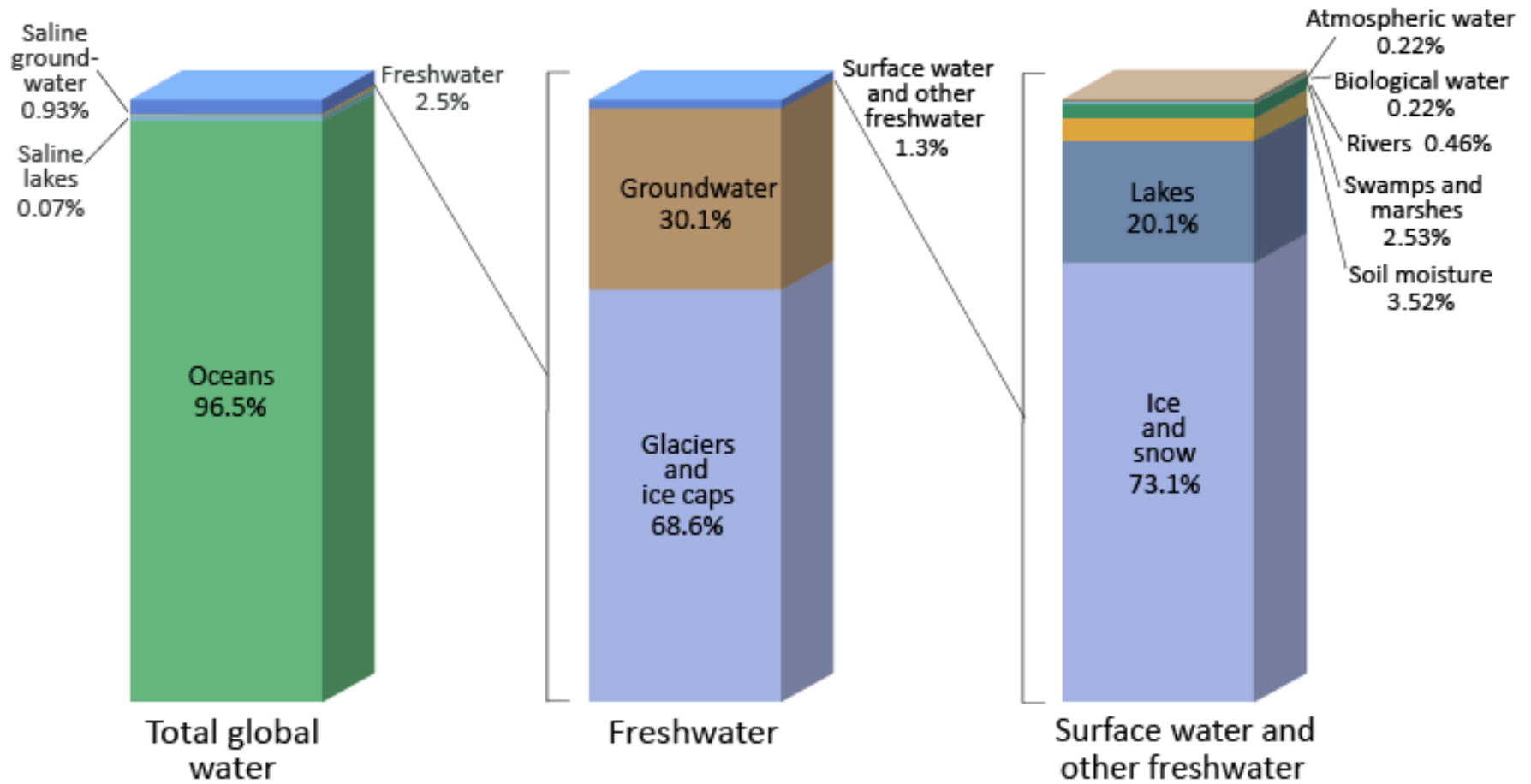
- Oceans **97.2%** Salt water
- All Fresh Water **2.8%**
- Ice caps/glaciers **2.0%** Fresh water (frozen)
- Air, soil, animals **0.5%** Fresh water
(unavailable)
- Useable fresh H₂O **0.3%** Fresh water
(available)

.3% Useable Fresh Water



- **Groundwater** (under surface of earth) 70%
- **Lakes** 20%
- **US Great Lakes** 9%
- **Rivers/Streams** 1%

Distribution of Earth's Water



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, *Water in Crisis: A Guide to the World's Fresh Water Resources*.