The Water Cycle

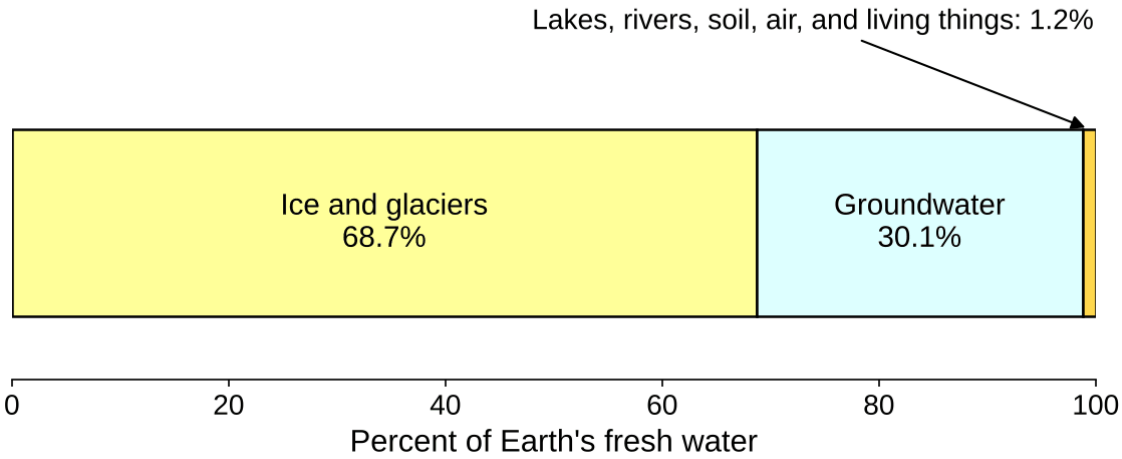
Essential Question

How does water move between living things and the rest of Earth?

Where Earth's Water Is

- About 97.5% of Earth's water is salt water
- Only 2.5% is fresh water
- Most fresh water is frozen or underground
- Land life depends on a tiny share

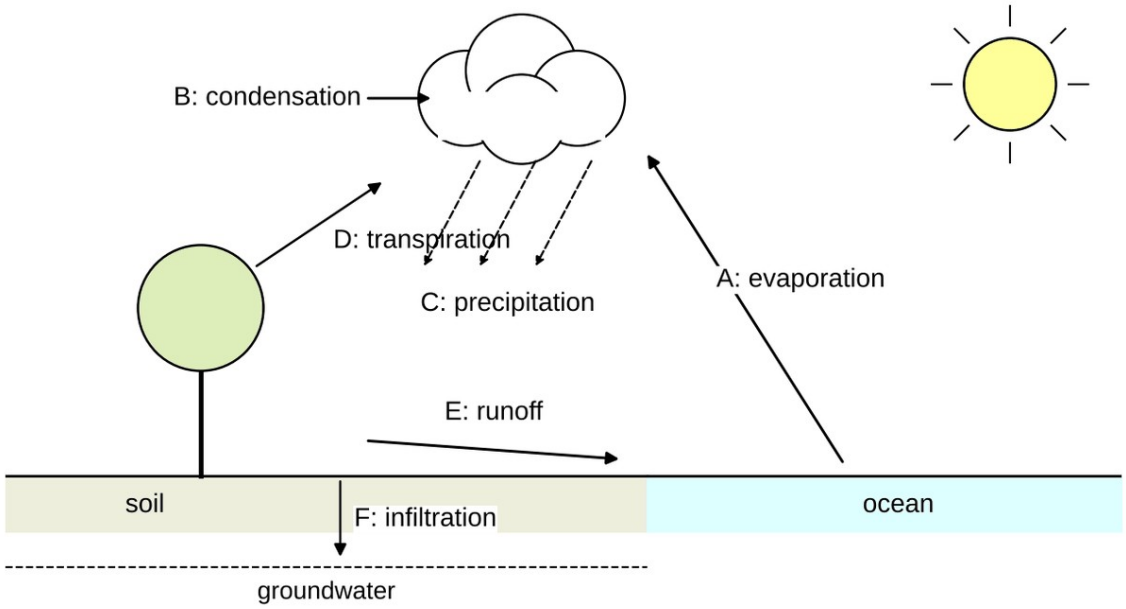
Earth's water: 97.5% salt water, 2.5% fresh water. Where is the fresh water?



The Water Cycle

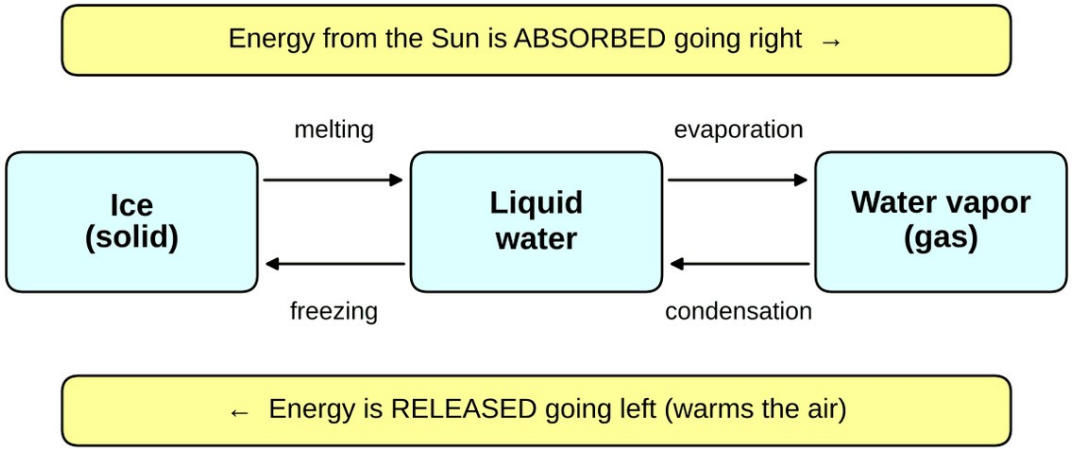
Processes That Move Water

- Evaporation: liquid water becomes vapor
- Condensation: vapor cools into cloud droplets
- Precipitation: rain, snow, sleet, or hail
- Runoff and infiltration: water flows over or soaks into the ground



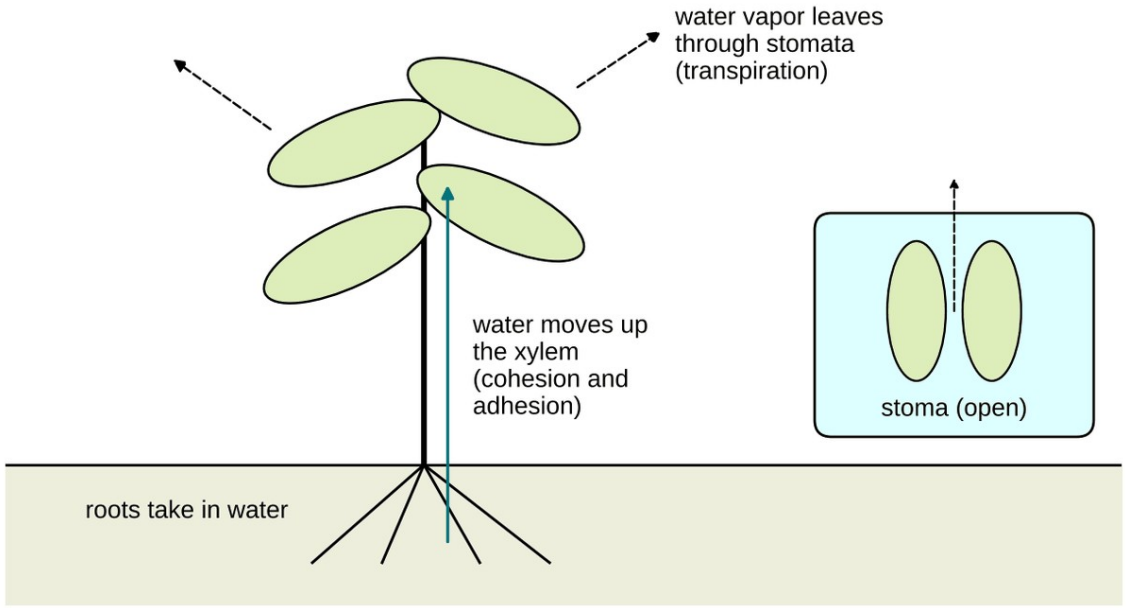
The Sun and Gravity Drive the Cycle

- The Sun's energy evaporates water
- Evaporation absorbs energy
- Condensation releases energy
- Gravity pulls precipitation and runoff down



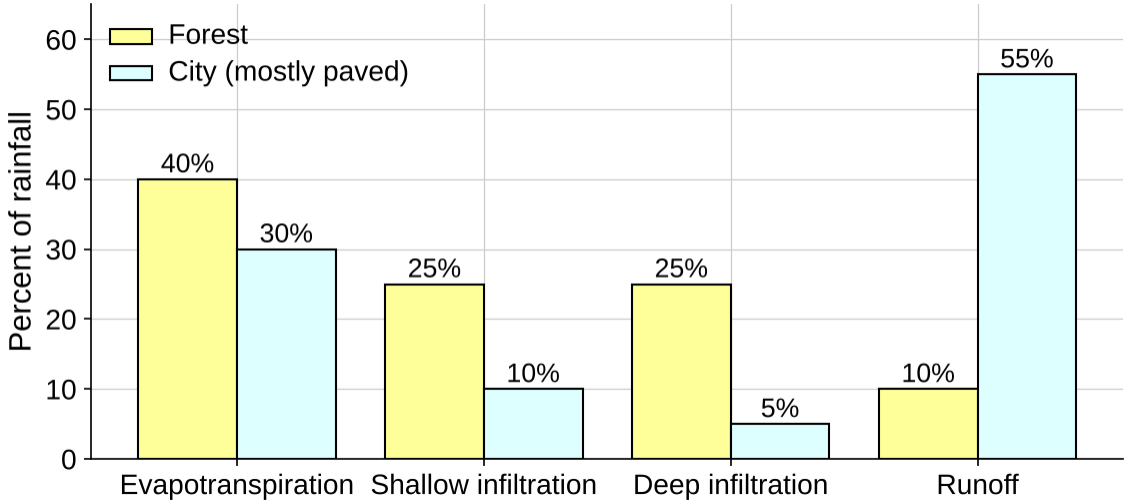
Living Things in the Water Cycle

- Roots take in water from the soil
- Cohesion and adhesion help water rise in the xylem
- Transpiration: water vapor exits through stomata
- Animals take in and release water too



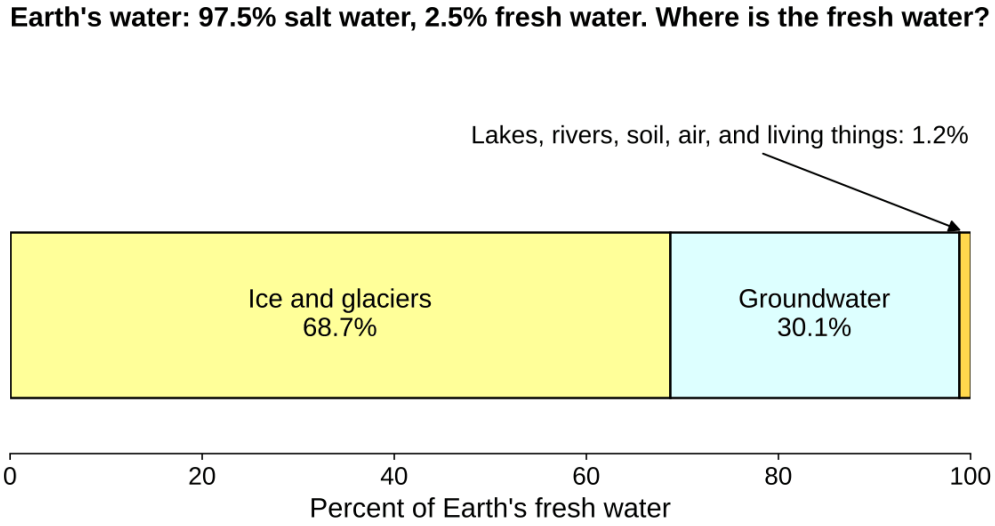
People Change the Water Cycle

- Pavement and roofs block infiltration
- More runoff: more flooding and pollution
- Less infiltration: less groundwater
- Cutting forests reduces transpiration



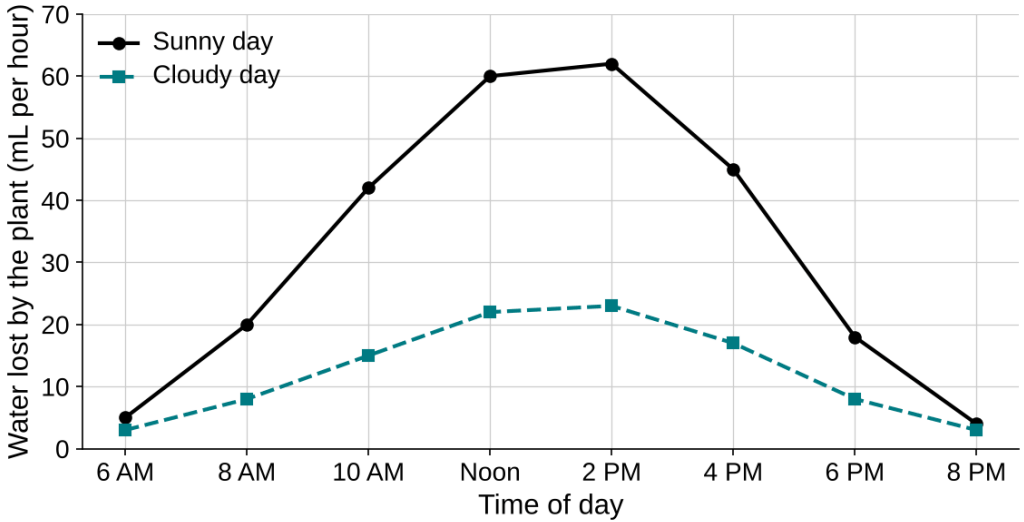
Example: How Much Fresh Water Is Ice?

Earth has about 1.39×10^9 km^3 of water. Use the percentages in the lesson to find how much of it is fresh water, and how much of that fresh water is ice.



Example: Transpiration on Sunny and Cloudy Days

A student measures how much water a potted plant loses each hour on a sunny day and on a cloudy day. When does the plant lose water fastest? Why does it lose less on the cloudy day?



Example: Rain on a Forest and a City

Use the forest and city graph. A region gets 1,000 mm of rain in a year. How much becomes runoff in the forest and in the city? How much soaks deep into the ground in each?

	Forest	**City**
Runoff	10% of rain	55% of rain
Deep infiltration	25% of rain	5% of rain

The Water Cycle

Big Ideas

- Oceans hold most water; little is fresh and liquid
- Evaporation, condensation, precipitation, runoff, infiltration
- The Sun and gravity drive the cycle
- Plants move water by transpiration
- Paving increases runoff and cuts groundwater