ANSWER KEY.

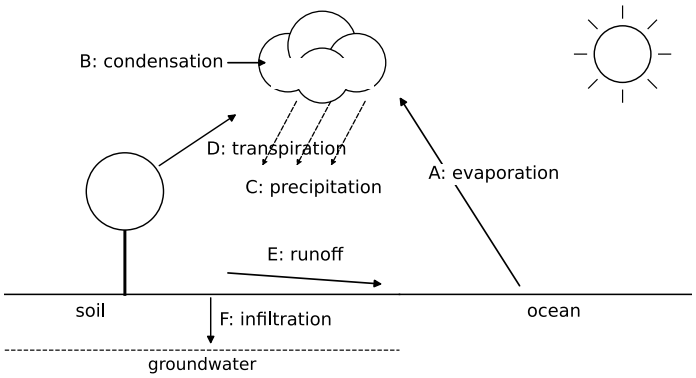
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The Water Cycle

Biology | ANSWER KEY

Answer in complete sentences. Show your work for calculations.

1. The model shows the water cycle. Name the process shown by arrows A, B, D, and F.



Arrow	Process
A	**Evaporation**
B	**Condensation**
D	**Transpiration**
F	**Infiltration**

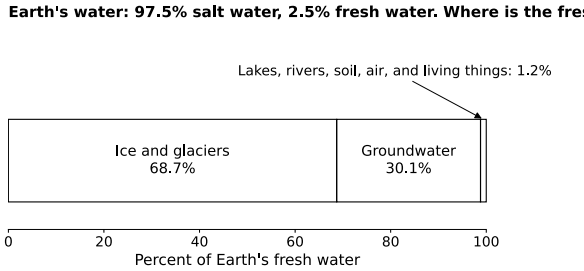
The Sun powers A and D; gravity powers C, E, and F.

2. Evaporation and condensation are opposite processes. Which one absorbs energy, which one releases energy, and what is the source of the energy for evaporation?

Evaporation absorbs energy; condensation releases energy (which warms the air). **The Sun** provides the energy for evaporation.

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3. Use the graph of Earth's fresh water.



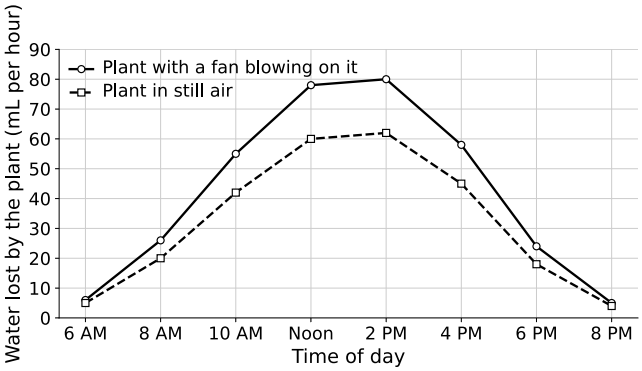
(a) What percent of Earth's fresh water is in ice and glaciers?

(b) Earth has about 1.39×10^9 km^3 of water, and 2.5% of it is fresh. How much is groundwater?

(a) **68.7%**

(b) Fresh = $0.025 \times 1.39 \times 10^9$ km^3 = 3.5×10^7 km^3; groundwater = $0.301 \times 3.5 \times 10^7$ km^3 = **1.0×10^7 km^3**

4. A student tests whether moving air changes how fast a plant loses water.



(a) How much more water per hour does the plant with the fan lose at noon?

(b) Write a claim about moving air and transpiration. Support it with data.

(a) 78 mL/h − 60 mL/h = **18 mL/h more**

(b) **Moving air speeds up transpiration.** At every time, the fan plant lost more water, for example 78 mL/h compared with 60 mL/h at noon. Moving air carries vapor away from the leaves.

5. A town plans to pave a large field to make a parking lot. Predict how this will change runoff, flooding, and groundwater. Use the data as evidence, and suggest one way to reduce the effect.

	Forest	**City (mostly paved)**
Runoff	10% of rain	55% of rain
Deep infiltration	25% of rain	5% of rain

Runoff rises from about 10% to 55% of the rain (5.5 times as much), so streams flood more often and carry more pollution. **Deep infiltration drops from 25% to 5%**, so less groundwater is refilled.

Ways to reduce it (any one): **porous pavement, rain gardens, green roofs, or keeping trees and grass around the lot.**

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