

Nova's Water Cycle Expedition: Greater Depth Flashcards

Learning objective: To describe and explain the processes of the water cycle, identifying key states of matter and the role of the Sun in driving these changes.

Study these flashcards to master the stages of the water cycle. Use the 'Greater Depth' questions to test your ability to explain scientific phenomena in detail.

What is the primary energy source that drives the entire water cycle?

The Sun provides the solar energy required to heat water bodies, causing evaporation.

Define 'Evaporation' within the context of the water cycle.

Evaporation is the process where liquid water turns into water vapour (a gas) due to heating from the Sun.

Explain the process of 'Condensation'.

Condensation occurs when water vapour cools down as it rises in the atmosphere, turning back into tiny liquid water droplets to form clouds.

Define 'Precipitation' and list three common forms.

Precipitation occurs when water droplets in clouds become too heavy and fall to Earth. Examples include rain, snow, and hail.

What is 'Transpiration'?

Transpiration is the process by which plants release water vapour into the atmosphere through small pores in their leaves.

Explain the role of 'Collection' in the cycle.

Collection is the stage where water gathers in oceans, rivers, lakes, and streams after falling as precipitation, ready to be evaporated again.

Greater Depth: Explain why water vapour is invisible to the human eye, but clouds are visible.

Water vapour is a gas and is transparent. Clouds consist of millions of tiny liquid water droplets or ice crystals that reflect and scatter light, making them visible.

Greater Depth: Compare and contrast how temperature affects the rate of evaporation and condensation.

Higher temperatures increase the rate of evaporation by providing more energy. Lower temperatures are required for condensation to occur as the gas loses energy.

Greater Depth: Justify why the water cycle is considered a 'closed system' on Earth.

It is a closed system because the Earth does not gain or lose significant amounts of water; the same water is continuously recycled through the states of matter.

Greater Depth: What might happen to the water cycle if the average global temperature significantly decreased?

A decrease in temperature would slow the rate of evaporation, potentially leading to less cloud formation and reduced precipitation, disrupting global water distribution.

Greater Depth: If you were designing a model of the water cycle, why would it be essential to include a heat source?

Without a heat source, the energy required for the phase change from liquid to gas (evaporation) would be absent, and the cycle would cease to function.

Creative Task: Imagine a water droplet named 'Dewy'. Write a short paragraph describing 'Dewy's' journey from a puddle to a cloud.

Student responses should demonstrate an understanding of the transition from liquid to gas (evaporation) and the subsequent cooling and cloud formation (condensation).