Water Cycle

A. Fill in the Blanks

Complete each sentence with the correct term from the water cycle.

1. The sun's energy causes water to _____ from the surface of oceans and lakes.
2. Plants release water vapor into the atmosphere through a process called _____.
3. The process of water seeping into the ground to become groundwater is called _____.
4. When water vapor in the atmosphere cools down and turns into liquid water droplets, it _____ to form clouds.
5. When clouds become saturated, water falls back to Earth as _____.

B. Match the Following;

Match the term in Column A with its correct definition in Column B.

Column A	Column B
1. Evaporation	A. The release of water vapor from plants.
2. Condensation	B. Water flowing over the land's surface into rivers and lakes.
3. Precipitation	C. The process of a liquid turning into a gas.
4. Transpiration	D. Water soaking into the ground.
5. Infiltration	E. The process of a gas turning into a liquid.
6. Runoff	F. Water falling from clouds (e.g., rain, snow, hail).
7. Collection	G. The gathering of water in large bodies like oceans and lakes

C. Practice Problems

Answer the following questions in a sentence or two. Show your understanding of the key processes.

1. Explain the difference between evaporation and transpiration.
2. Describe how a cloud is formed.
3. List four different forms of precipitation.
4. What is the difference between surface runoff and infiltration?
5. What role do mountains often play in the water cycle, especially concerning precipitation?
6. Why the water cycle is called a "cycle"?
7. What is groundwater, and why is it an important resource?
8. How does an increase in air temperature affect the rate of evaporation?
9. What is sublimation? Give an example of where it might occur.
10. What happens during the collection (or accumulation) stage of the water cycle?

D. Warm-up Questions

Answer the following basic questions about the water cycle.

1. What is the main source of energy that drives the water cycle?
2. What is the process called when liquid water on the Earth's surface turns into a gas (water vapor)?
3. What do we call water in any form that falls from the clouds to the Earth?
4. What is the process of water vapor in the air cooling down and turning back into liquid water, forming clouds?
5. Where does most of the water on Earth collect?

E. Challenge Questions

Think critically to answer these more difficult questions.

1. How would large-scale deforestation (cutting down many trees) in a region likely affect the water cycle there? Explain two potential effects.
2. Explain how the water cycle acts as a natural water purification system.
3. If the Earth's average temperature were to rise significantly due to climate change, what are two major impacts this could have on the water cycle?
4. The water in the ocean is salty, but the rain that falls from clouds is fresh water. Explain why.
5. Can the water cycle exist without living organisms like plants? Explain your reasoning.

F. Word Problems & Application

Apply your knowledge of the water cycle to these real-world scenarios.

1. On a hot summer day, you take a cold can of soda out of the refrigerator. A few minutes later, you notice droplets of water on the outside of the can. Which process of the water cycle does this demonstrate?
2. A city paves over a large grassy park to build a new shopping mall and parking lot. How will this change affect the amount of surface runoff and infiltration in that area during a rainstorm?
3. A farmer is worried because there has been no rain for a month, and the local reservoir is drying up. Which two stages of the water cycle are deficient in this scenario?
4. After a heavy thunderstorm, a nearby river becomes very muddy and its water level rises quickly. Which process is primarily responsible for carrying the mud and extra water into the river?
5. A scientist studying a glacier on a high mountain notices that on cold, sunny, and windy days, the ice seems to vanish into the air without melting into water first. What is this process called?

G. True or False

1. Evaporation is the process where water turns from a gas into a liquid. _____
2. The water cycle has a clear starting point in the ocean and an ending point on land. _____
3. Runoff is the process of water soaking into the soil. _____
4. Condensation occurs when water vapor heats up and expands. _____
5. All precipitation that falls on land either becomes runoff or evaporates immediately. _____