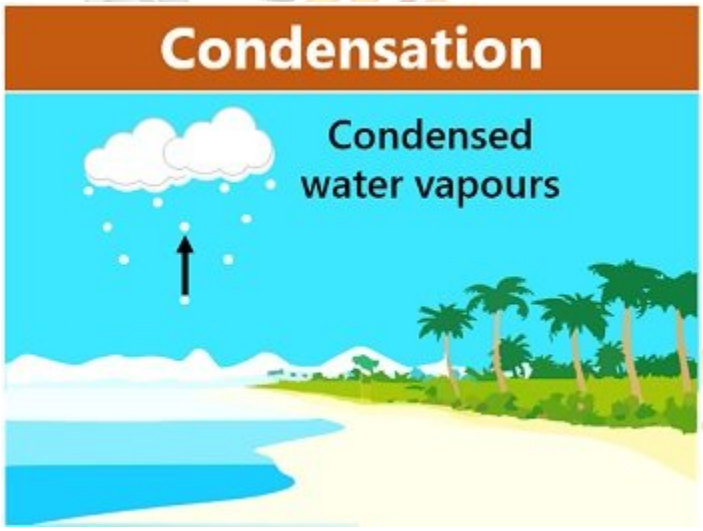
E3. Condensation

Condensation: The Cool of the Cycle

Have you ever seen droplets of water on the outside of a cold glass on a hot day? Or perhaps you noticed how your bathroom mirror gets foggy after a hot shower? These are examples of condensation, an important process in the water cycle.

What is Condensation?
Condensation is the process by which water vapor, an invisible gas, transforms into tiny water droplets when it cools down. When water vapor rises into the sky during evaporation, it forms clouds. As the clouds move higher and higher in the atmosphere, they encounter cooler temperatures. This cooling causes the water vapor to lose its energy and transform into tiny water droplets, becoming visible to the naked eye.



Forming Clouds
Clouds are made up of millions of tiny water droplets. When warm, moist air rises and meets cooler air at higher altitudes, the water vapor in the warm air condenses into these tiny droplets. These droplets stick together and form clouds. The type and appearance of the clouds depend on various factors, such as the amount of moisture in the air, the temperature, and the altitude.

Dew Drops and Fog
Condensation is not just limited to the sky; it also occurs on the ground. Have you ever noticed droplets of water on the grass or leaves in the early morning? This is called dew. Overnight, the temperature drops, causing the moisture in the air to condense on surfaces that have cooled down, like the grass and leaves.

Fog is another example of condensation close to the ground. It happens when warm, moist air moves over a cool surface, such as a lake or river. The air cools down rapidly, and the water vapor condenses into tiny droplets, creating a thick, low-lying cloud known as fog.

The Water Cycle Connection
Condensation is an essential part of the water cycle. After the water evaporates and forms clouds, it can condense back into water droplets. When the droplets become too heavy, they fall back to Earth as precipitation, such as rain or snow. This completes the cycle as the water returns to the surface, where it can evaporate again and continue the cycle.

Why is Condensation Important?

Condensation helps to regulate the Earth's temperature and weather patterns. It plays a crucial role in forming clouds, which have a significant impact on the Earth's climate. Clouds reflect sunlight back into space, which helps to cool the planet. They also trap heat close to the Earth's surface, acting as a blanket to keep the planet warm.

1. What is condensation in the water cycle?
    A) The process by which water vapor transforms into tiny water droplets.
    B) The process of water turning into ice.
    C) The process of water moving from the ocean to the sky.
    D) The process of water falling back to Earth as precipitation.

2. When does condensation occur in the water cycle?
    A) When water evaporates from the Earth's surface.
    B) When water turns into ice.
    C) When water vapor rises into the sky and forms clouds.
    D) When water falls back to Earth as rain or snow.

3. What causes water vapor to transform into tiny water droplets during condensation?
    A) Cooling down of water vapor.
    B) Warming up of water vapor.
    C) Evaporation of water droplets.
    D) Freezing of water droplets.

4. What are clouds made of?
    A) Millions of tiny water droplets.
    B) Millions of tiny ice crystals.
    C) Millions of tiny rocks.
    D) Millions of tiny air bubbles.

5. What causes dew to form on grass and leaves?
    A) Cooling down of the ground surface.
    B) Heating up of the ground surface.
    C) Evaporation of water droplets.
    D) Precipitation falling from the sky.

6. When does fog occur?
    A) When warm, moist air meets a cool surface.
    B) When warm, dry air meets a cool surface.
    C) When cool air meets a warm surface.
    D) When cool air meets a cool surface.

7. How does condensation affect Earth's temperature?
    A) It helps to cool the Earth by reflecting sunlight back into space.
    B) It helps to warm the Earth by trapping heat close to the surface.
    C) It has no impact on Earth's temperature.
    D) It only affects the temperature in the winter.

8. What completes the water cycle?
    A) Condensation, precipitation, and evaporation.
    B) Evaporation, freezing, and condensation.
    C) Melting, evaporation, and precipitation.
    D) Precipitation, melting, and freezing.

9. What happens to water droplets in clouds when they become too heavy?
    A) They evaporate back into water vapor.
    B) They fall back to Earth as precipitation.
    C) They freeze into ice crystals.
    D) They rise higher into the atmosphere.

10. Why is condensation an essential part of the water cycle?
    A) It helps to form clouds and regulate Earth's temperature.
    B) It causes water to evaporate from the Earth's surface.
    C) It causes water to freeze into ice.
    D) It only happens in the winter.

ANSWERS & EXPLANATIONS

1. A) The process by which water vapor transforms into tiny water droplets.
    - Condensation is the process of water vapor in the atmosphere cooling down and transforming into tiny water droplets, forming clouds.

2. C) When water vapor rises into the sky and forms clouds.
    - Condensation occurs when water vapor rises into the sky and encounters cooler temperatures, causing it to transform into tiny water droplets, which form clouds.

3. A) Cooling down of water vapor.
    - During condensation, water vapor cools down, losing its energy, and transforms into tiny water droplets as it condenses.

4. A) Millions of tiny water droplets.
    - Clouds are made up of millions of tiny water droplets that have condensed from water vapor in the atmosphere.

5. A) Cooling down of the ground surface.
    - Dew forms on grass and leaves when the ground surface cools down overnight, causing the moisture in the air to condense into water droplets.

6. A) When warm, moist air meets a cool surface.
    - Fog occurs when warm, moist air moves over a cool surface, causing the water vapor in the air to condense into tiny water droplets, creating a thick, low-lying cloud.

7. A) It helps to cool the Earth by reflecting sunlight back into space.
    - Clouds formed through condensation reflect sunlight back into space, helping to cool the Earth.

8. A) Condensation, precipitation, and evaporation.
    - The water cycle is completed through a series of processes: evaporation, condensation, and precipitation.

9. B) They fall back to Earth as precipitation.
    - When water droplets in clouds become too heavy, they fall back to Earth as precipitation, such as rain or snow.

10. A) It helps to form clouds and regulate Earth's temperature.
    - Condensation is an essential part of the water cycle as it forms clouds, which play a significant role in regulating Earth's temperature and weather patterns.