Science: Making Clouds

Ages: 7 - 13

Hello everyone. This is Bill from the Okanagan Regional Library System. Welcome to the fun and inventive world of making STEAM projects in your own home. Each month, I will share a fun and interesting project that you can make using materials commonly found in your own home.

This month's project: Making Clouds in a Jar

Making Clouds

Clouds are made of water droplets or ice crystals that are so small and light they are able to stay up in the air. But how does the water and ice that makes up clouds get into the sky in the first place?

The water and ice that make up clouds travels into the sky within air as water vapor, the gas form of water. Water vapor gets into air mainly by evaporation – some of the liquid water from the oceans, lakes, and rivers turns into water vapor and travels into the air. When air rises in the atmosphere it gets cooler and is under less pressure. When air cools, some of the water vapor condenses. As air pressure drops, some water vapor condenses too. The vapor becomes small water droplets and a cloud is formed.

It's easier for water vapor to condense into water droplets when it has a particle to condense upon. These particles, such as dust and pollen, are called condensation nuclei. Eventually, enough water vapor condenses on pieces of dust, pollen, and other condensation nuclei to form a cloud.
(Center for Science Education)

Materials Needed:

- Jar with lid
- Hot Water
- Funnel
- Ice Cubes
- Blue Food Colouring
- Stopwatch or watch with second hand
- Sheet of dark paper

Time: Approximately 30 minutes

Steps:

1. Prop up the sheet of dark paper behind the jar.

2. Using the funnel pour about 3 cm of hot water into the jar. (The water needs to be very hot for this experiment to work. Make sure you have an adult with you when using hot water).

3. Put a few drops of the blue food colouring into the water and swirl to mix it up.

4. Turn the cap of the jar upside down and fill with ice cubes. Place the cap, upside down, on top of the jar.

5. Watch for clouds of water vapor form inside the jar.

6. Lift the lid off the top of the jar and watch the “cloud” escape. The paper makes it easier to see the clouds.

7. Use the stopwatch to time how long it takes for the clouds to form.

Read World Science: Making Clouds

Water vapor formed in the jar as the hot water evaporated. The warm water vapor is less dense than the air around it. It rises through the jar and funnel. When it meets the cooler air above the ice, the water vapor condenses to make a cloud.

Repeat the experiment with different temperatures of water. Do the clouds form faster or slower with cooler water?

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STEAM Concepts:

- Evaporation
- Condensation
- Density,
- Heat
- States of Matter