Activity: Cloud in a Jar

Learning Objective: Understand cloud formation

Materials: Glass Jar, hot water, and ice

Directions:
- To make a cloud in a jar, first pour about ½ C of hot water (from the coffee urn) and swirl it around in the jar so that the sides of the jar warm up. Fill the lid of the jar with ice (it should be turned upside down to hold the ice) and carefully place it on the opening of the jar. Wait about 30 seconds and then quickly move the lid ajar and spray 1-2 seconds of hairspray into the jar. Quickly place the lid back on and take a dark piece of paper and hold it against the back of the jar. You should see the vapor swirling and condensing into a “cloud” and the dark paper helps you see it better than looking through the clear glass.

Fun Facts:
- Clouds can form as air warms up near the ground and rises. Heated by sunshine, the ground heats the air just above it. That warmed air starts to rise because, when warm, it is lighter and less dense than the air around it. As it rises, its pressure and temperature drop causing water vapor to condense. Eventually, enough moisture will condense out of the air to form a cloud.
- Clouds are given different names based on their shape and their height in the sky. Some clouds are near the ground. Others are almost as high as jet planes fly. Some are puffy like cotton. Others are grey and uniform.
- The characteristics of clouds are dictated by the elements available, including the amount of water vapor, the temperatures at that height, the wind, and the interplay of other air masses.

Discussion Questions:
- Q1: Have you ever been in a car driving through fog? What is fog?
- Q2: Why are clouds white?
- Q3: What is the water cycle?

Answer Key:
- A1: As the warm, moist air flows over much colder soil or snow, dense fog often forms. Warm, moist air is cooled from below as it flows over a colder surface. If the air is near saturation, moisture will condense out of the cooled air and form fog. With light winds, the fog near the ground can become thick and reduce visibility to zero.
- A2: Light from the sun is made up of all the colors. Light travels as a wave and the water droplets scatter the waves of all the colors, our eye sees this scattered light at white in color.
- A3: The water cycle describes how water evaporates from the surface of the earth, rises into the atmosphere, cools and condenses into rain or snow in clouds, and falls again to the surface as precipitation. The water falling on land collects in rivers and lakes, soil, and porous layers of rock, and much of it flows back into the oceans, where it will once more evaporate and the cycle begins again.