Clouds in a Jar

Don’t you just love looking at clouds in the sky? We sure do! Do you also wonder how they get there?

In this project, you'll learn how clouds are formed and how to make your very own cloud in a jar. Put your lab coats and safety glasses on and let's get started.

Materials:

- 1 clear, glass jar with a lid
- 1/3 cup of hot water
- 1 cup of ice cubes
- 1 can of aerosol hairspray

Learning objectives:

- Explain the water cycle
- Identify the different phases of water
- Explain how a cloud is formed

Time required: 15 minutes

Context:

Liquid water comes from the top of oceans, rivers, and lakes. Through a process called evaporation, liquid water changes into water vapor (the gaseous form of water) from the sun.

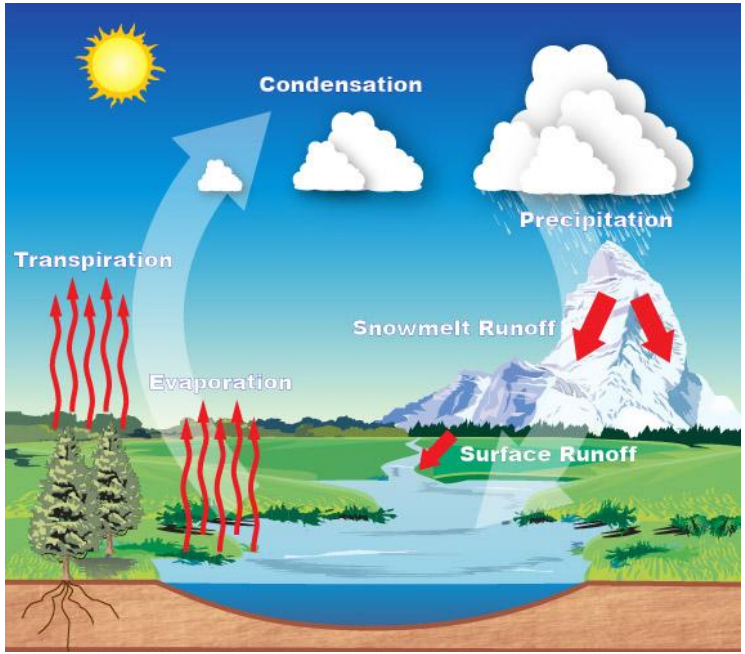
The water vapor rises into the atmosphere where it cools down and forms tiny water droplets in a process called condensation. These droplets then attach to particles (dust, pollen, smoke, etc.) in the air to form clouds.

When the cloud grows so big that it’s too heavy to stay in the air, the water droplets fall to the ground as rain because of gravity. Precipitation is any result of condensation of water vapor from the sky that falls due to gravity.

Once the rain has fallen, a lot of it goes into oceans, rivers, lakes, and streams. If the cloud is in a cold place, the water droplets may freeze to become a solid and fall as snow or hail.

Context:

Eventually, the water will find its way to an ocean where the process starts all over again. This entire process is commonly called the water cycle.



Activity:

1. Start by pouring the hot water into the jar. Swirl the water around to warm up the sides of the jar. Be careful not to drop the jar.

2. Turn the lid upside down and place it on the top of the jar. Place some ice cubes into the lid, and allow it to rest on top of the jar for 20 seconds.

3. Remove the lid, quickly spray a bit of hairspray into the jar, and replace the lids with the ice still on top. Watch as your cloud forms.

4. When you see a good amount of condensation form, remove the lid and watch the “cloud” escape into the
air.

5. See what other kids have made and share your work at #MadeToHack.

Reflection:

When you add the warm water to the jar, some of it turns to water vapor. The water vapor rises to the top of the jar where it comes into contact with cold air, thanks to the ice cubes on top. Water vapor condenses when it cools down. However, a cloud can only form if the water vapor has something to condense on to. In nature, water vapor may condense onto dust particles, air pollution, pollen, volcanic ash, etc. In the case of this activity, the water vapor condensed onto the hairspray.

What do you think about this activity?

What materials would you want to try this with next?

Happy Making!

-Team Hack