Adapted to STEMAZing ECE Format by
Amanda McPherson

DaNel.Hogan@schools.pima.gov
Director of The STEMAZing Project

Cloud in a Jar

NOTE: Children should always be given ample time to experiment, notice, and wonder before they are provided an explanation.

Always engage children with our two favorite questions:

What do you notice?

What do you wonder?

Resist the urge to answer any questions children have while exploring. Instead, respond back with questions to children and let them make sense of the world. Sample questions you might use: What do you think? Do you notice any patterns? What could we change? Can we test something else? What can we try next? If children ask a testable question, which they could answer by doing an experiment, talk through with them how they might design a test to help answer their question. As much as possible and within reason, let them test their questions by trying the experiments they propose.

Learning Objectives

Children will…

- learn how a cloud is formed.
- type of clouds

Key Question

How does a cloud form?

Vocabulary (See **What the heck? Explanation of Science** at the end for definitions.)

Cloud	Water vapor	Condensation

Materials

Glass jar with lid	Ice
Aerosol Hairspray	1/3 cup of hot water

Adapted to STEMAZing ECE Format by
Amanda McPherson

DaNel.Hogan@schools.pima.gov
Director of The STEMAZing Project

Notice and Wonder Developmentally Appropriate Practice

1. Start by pouring the hot water into the jar.
2. Swirl it around a bit to warm up the sides of the jar.
    - What do you notice?
3. Turn the lid upside down and place it on the top of the jar.
4. Place several ice cubes onto the lid, and allow it to rest on the top of the jar for about 20 seconds.
5. Remove the lid, quickly spray a bit of hairspray into the jar, and then replace the lid with the ice still on top.
6. Watch the cloud form.
    - What do you notice?
7. When you see a good amount of condensation form, remove the lid and watch the "cloud" escape into the air.
    - What do you notice?
    - What do you wonder?

Children should notice…

- a cloud forming inside the jar.

Differentiating Developmentally Appropriate Practice

For younger children, make this a group activity

For older children, they can work with a partner and make their own cloud.

Extensions for Additional Learning

As always, ask the children throughout the experiment what they notice and what they wonder. If their wonder questions are testable, as much as possible and within reason, let them test their questions by trying new experiments.

See below for examples of what they might wonder and experiments they might do to test their wonderings.

- I wonder what would happen if we added cold water instead of hot water?
    - Let them try it!
- I wonder what different aerosol we could use instead of hairspray?
    - Let them try it!

#STEMAZingPictureBook Recommendation: *Clouds* by Anne Rockwell

Connections to the activity:

Types of Clouds

Cloud Viewer

Adapted to STEMAZing ECE Format by
Amanda McPherson

DaNel.Hogan@schools.pima.gov
Director of The STEMAZing Project

References

https://littlebinsforlittlehands.com/cloud-in-a-jar/

SAFETY CONCERNS

n/a

AZ Early Learning Standards

Science Standard - Strand 1: Inquiry & Application - Concept 1: Exploration, Observation & Hypotheses
The child observes, explore, and interacts with materials, others, and the environment.

Science Standard - Strand 1: Inquiry & Application - Concept 2: Investigation
The child researches their own predictions and the ideas of others through active exploration and experimentation.

Cloud in a Jar

What the heck? Explanation of the Science (Vocabulary in bold.)

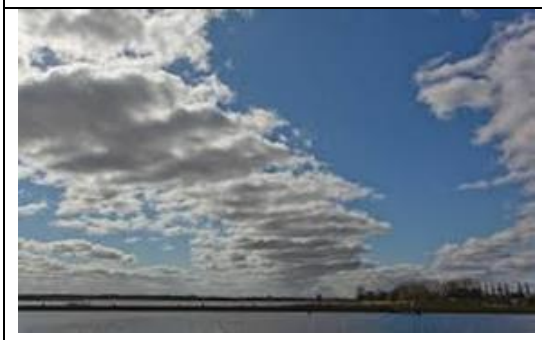
Three things are needed to make a cloud. The definition of a **cloud** is a visible mass of small water droplets or ice particles which are suspended in the sky.

First, you need warm moist air. Next, you need a cooling process. Lastly, you need a cloud condensation nucleus or something to start the cloud. An example of this could be a dust particle! **Condensation** occurs when water vapor (gaseous form) in the air changes into liquid water when it comes in contact with a cooler surface. **Water vapor** is a dispersion, in air, of molecules of water.

By pouring warm water into a jar and trapping it, you create the first step which is warm, moist air. This warm air rises and meets with the cool air at the top of the jar which is made by the ice cubes.

The aerosol hairspray provides the cloud condensation nuclei. As the water vapor inside the jar cools down, it begins to form around the hairspray nuclei into many droplets. When you remove the lid, the swirling cloud is released!

Types of Clouds

	Cirrus	White, feathery Highest in sky
	Stratus	White blankets of gray, high fogs, low
	Stratocumulus	Gray low in sky, lumpy
	Cumulus	Puffy, flat bottoms, low in sky
	Cumulonimbus	Thunderstorm clouds, look like tall cumulus clouds