

# How to Make a Cloud in a Bottle

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**Description:** Have you ever wondered what makes clouds form? Turns out you can make one yourself! In this experiment, you'll learn the three ingredients that clouds need to form, and then you'll make your own cloud in a bottle.

## Materials:

- Flexible plastic water bottle
- Small amount of water
- Matches
- Candle

**Before you start:** Make sure you get your parent's help with the matches and candle, or ask if it's ok to do it yourself!

## Instructions:

1. Pour about a half cup of water into the bottom of the bottle.
2. Light the match and carefully drop it into the bottle so that the water puts it out.  
OR: Light the candle with the match, blow it out, and stick the candle into the bottle, letting some smoke get in.
3. *Close the cap before the smoke can escape.*
4. Tightly squeeze and release the bottle several times. As you release, you'll see a cloud form. Each time you release the cloud will become more visible.
5. Open the cap of the bottle and squeeze. Watch your cloud escape into the air!

**More Experiments:** Try leaving one or more of the ingredients out. What happens if you don't add smoke or water to the bottle? Did a cloud still form? Why or why not? You can also try putting different temperatures of water in the bottom of the bottle. Which temperature works best and why do you think that is?

## How It Works



Clouds need three ingredients to form:

- 1) *Water vapor* - the gaseous form of water (aka moisture in the air)
- 2) A *Condensation Nucleus* - small particles of smoke or pollution in the air that water vapor can attach to (aka Cloud Seeds)
- 3) *Cold Air* - this can be caused by a sudden pressure decrease

When these three ingredients are combined, tiny, invisible particles of water vapor in the air attach onto condensation nuclei to form larger, visible particles that make up clouds. This process is called *condensation*. In our experiment, the warm water at the bottom of the bottle contributed *water vapor* to the air inside the bottle. The smoke from the match acted as a *condensation nucleus* for the water vapor. Finally, when we squeezed and released the bottle, this caused a sudden pressure decrease that cooled the air inside the bottle, allowing the water vapor to *condense* onto the smoke particles and form a visible cloud. To learn more, you can visit

<https://climatekids.nasa.gov/cloud-formation/>

**Activity Presenter - Emily Rice:** Hi everyone! My name is Emily Rice and I'm the creator of the Cloud in a Bottle video you may have watched. I'm a first-year student at OSU studying Climate Science. In the future, I plan to go to graduate school and research global warming.

**Additional Recourses:** I hope you had fun making a cloud! To learn more about clouds, weather, and the water cycle, check out these great websites:

[https://www.weather.gov/owlie/science\\_kt](https://www.weather.gov/owlie/science_kt)

<https://climatekids.nasa.gov/menu/weather-and-climate/>

My personal favorite: <https://cloudappreciationsociety.org/>