

# Cloud Formation

## "A Cloud in a Bottle"

by Beth Bidwell and Melissa Lombardoni

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### **Purpose:**

This activity is designed to be used as either a teacher demonstration or a laboratory as part of a weather unit. This lab reinforces the concepts of condensation, dew point, humidity, pressure, and the process of cloud formation. This lab is appropriate for middle school and high school students

### **Materials:**

1. Clear 2-liter soda bottle with cap.
2. Matches.
3. A few drops of water.

### **Directions:**

1. Rinse bottle and leave a few drops of water in the bottle.
2. Swirl the water around to moisten all sides of the bottle.
3. Drop a lit match into the bottle.
4. Place the cap tightly on the bottle.
5. Squeeze the bottle gently and then release.
6. Repeat steps 1 through 4 if necessary.

### **Explanation:**

The water in the bottle is necessary to create a miniature atmosphere with a high humidity. The smoke provides the nuclei on which the water vapor can condense. As the bottle is released, the volume of the air inside the bottle suddenly increases, and the temperature decreases. As the humidity is very high, the air contains the maximum capacity of water vapor. The slightest drop in temperature, therefore, is enough to cause the water vapor to condense and produce a mist or fog.

### **Questions:**

1. What function does the water in the bottle serve?
2. What do we need the smoke in the bottle for?
3. What is suddenly increased by squeezing the bottle?
4. How does releasing the bottle change the temperature?
5. Why is it usually more cloudy and foggy over industrial areas as compared to rural areas?
6. Would the cloud be more easily formed if the bottle were warm or cold? Why?



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### Web links:

- [Cloud Types.](#)
- [Clouds and explanations.](#)
- [More clouds, systematic classification](#)
- [Cloud type schematic](#)
- [Making weather observations in K-12.](#)
- [More weather resources geared toward K-12 education.](#)

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