

**Project FOCUS  
Best Lessons  
FIRST GRADE**

**Title of Lesson:** Cloud in a Bottle

**Theme:** Earth/Space Science

**Unit Number:** 1      **Unit Title:** Weather and the Seasons

**Performance Standard(s) Covered (enter codes):**

S1E2

**Enduring Standards (objectives of activity):**

**Habits of Mind**

- Asks questions
- Uses numbers to quantify
- Works in a group
- Uses tools to measure and view
- Looks at how parts of things are needed
- Describes and compares using physical attributes
- Observes using senses
- Draws and describes observations

**Content (key terms and topics covered):**

This lesson is done in order to teach the condensation portion of the water cycle. Through this experiment they are able to observe water molecules transforming into the gas stage in order to form the cloud. They learned that when water is in the gaseous stage the molecules are farther apart and travel faster than they are when they are in the liquid, or solid phases. When squeezing the bottle, the water molecules are forced to compress. When the bottle is let go, it expands again making the bottle cold, which causes the cloudy appearance on the sides of the bottle. The main idea to get from this experiment is that clouds are formed by condensation, which is the process of water molecules transforming from water vapor to liquid.

**Learning Activity (Description in Steps)**

**Abstract (limit 100 characters):** I created a cloud in a bottle so they could observe changes in water molecules on a small scale.

**Details: Step One:** Add enough hot water to cover the bottom of the 2 liter bottle, screw the top back on it, and shake it so that water touches all sides of the bottle.

**Step Two:** Light two matches and put them into the bottle. (this adds dust particles)

**Step Three:** Immediately replace the cap and shake the bottle 2-3 times.

**Step Four:** With two hands, squeeze the bottle as tightly as you can. Release it evenly and quickly. (causes temperature and pressure changes)

**Materials Needed (Type and Quantity):**

1 clear plastic two liter bottle

Enough warm water to cover the bottom of the bottle  
2-3 Matches

**Notes and Tips (suggested changes, alternative methods, cautions):**

Be careful when lighting matches around the children. When I performed this experiment in the classroom, I made them all sit on their hands. Overall, I think that the experiment went well, the kids liked to squeeze the bottle themselves and observe the water inside the bottle changing states. At the end of the lecture I asked them several questions such as: What different stages did we just observe water in? When do we see condensation in the real world? and Why did we need the matches in order to make the cloud? When I performed this experiment for the project focus class I decided to use a smaller water bottle instead of using a 2 liter bottle. This did not work as well. I don't think that there was enough air pressure inside of the bottle, so I think that it is better to stick with the 2 liter sized bottle. It is also important that the water used is warm- hot in order to get good results.

**Sources/References:**

- 1) <http://www.wikihow.com/Make-a-Cloud-in-a-Bottle>
- 2) <http://en.wikipedia.org/wiki/Condensation>
- 3)