

**Lesson Plan by:** Leanne Rakestraw

**Lesson:** How Are Clouds and Fog Formed?

**Length:** 30-40 minutes

**Age/Grade:** 5<sup>th</sup> grade

**Academic Standard:**

5.3.5 Observe and explain that clouds and fog are made of tiny droplets of water

**Performance Objective:**

Given the materials, in groups students will create fog in a bottle.

**Assessment:**

This will mostly be formative assessment. The teacher will walk around and observe what each group is doing. The teacher will also engage the students by asking questions and making sure the students are doing the experiment correctly.

**Advanced Preparation by Teacher:** ice cubes, clear narrow-mouthed bottles (enough for each group to have two), an extra glass bottle, hot and cold water, and matches

**Procedure:**

**Introduction/Motivation:**

1. Engage the students by asking:
  - a. What is a cloud and how is it formed?
  - b. What is fog and how is it formed?

**Step-by-Step Plan:**

1. Split the class into groups
2. The teacher will walk around and fill one bottle from each group with hot water
  - a. Pour out most of the water and leave about 2cm in the bottom of the bottle
3. The teacher will pour the same amount of cold water into the remaining bottle
4. Put an ice cube on top of each bottle
5. Have students observe the two bottles and ask:
  - a. What do you see happening in each bottle?
  - b. Why did the cloud or fog form in the bottle?
  - c. Why do you think clouds or fog formed in the bottle with hot water and not in the one with cold water?

**Closure:**

1. The teacher will:
  - a. Set up a different bottle with hot water in it
  - b. Light a match, extinguish it, and blow some of the smoke from the match into the bottle
  - c. Place an ice cube on the bottle
2. Ask:
  - a. What differences do you observe with and without the smoke?
  - b. What was the purpose of the smoke?

- i. Answer: to provide particles on which water vapor might condense
- c. How do clouds and fog form in nature?

**Adaptations/Enrichments:**

Adaptations: Instead of doing groups, just have two bottles and have students help and have the other students observe (closer to the text book lesson)

Enrichment: Have the students write/draw what they observed in a science notebook.

**Self-Reflection:** Done after the lesson. What went well and what can be improved.

Adapted from:

Carin, Arthur A. "How are Clouds and Fog Formed?" Activities for Teaching Science as Inquiry. Pearson. Upper Saddle River, New Jersey. 2005:249-250.