Fanning the Flame Demonstration

Created by: IRRC Adapted from BLM Fire lesson- Fanning the Flame	**Time Required:** 30 minutes
Subject: Science	**Grade Level:** 2nd +

Overview	A demonstration of how different air pressure generated by the cooling and heating up of air causes fire to generate its own wind.
Goal(s) & Objective(s)	Students will learn about the attributes of fire and observe through a demonstration how fire generates its own wind.
Prerequisites & Materials	"Fire, Fire, What's it All About?" **Materials:** 1. Small candle (a free-standing votive candle 2. Heat-resistant quart jar (do Not use a smaller jar- experiment doesn't work correctly) 3. Food coloring (blue, green, or red) 4. Bowl of water (Bowl also needs to be heat-resistant)
Teaching Activities: ***Instructional Approaches/Strategies***	**Introduction:** 1. Read over Fire Fact Sheet. **Procedures** 1. Place the candle in the bowl and add enough water to cover about half the length of the candle. 2. Add a few drops of food coloring (do not use yellow, it's hard to see) 3. Light the candle and slowly place the jar over the candle. 4. Observe what happens when the flame goes out. (this may need to be done several times with different groups of students. It is best seen when you are close to the jar) **Closure** 1. Challenge students to explain what they observed.

What's happening:

The candle heats up the air in the jar, when the flame goes out, the air inside the jar cools. Cooler air takes up less space than the hot air; which means that the air pressure inside the jar becomes lower than the air pressure outside the jar. The water rises inside the jar until the air pressures are equal inside and out.

In a wildland fire, atmospheric gases—primarily nitrogen—are heated and become lighter than the surrounding air. As this warm air rises and the air in the burned areas becomes cooled, fresh air flows toward the fire—in the same way that the water flowed up into the jar. The air—like the water—moves

from an area of high pressure to an area of lower pressure; therefore it creates a wind that moves the fire.

For Best Results-

1. Try this demonstration before you do it for your students.

2. Make sure the water is cold, or put 1-2 cubes of ice in the bowl of water (take out the ice cubes before you place the jar over the candle.) This makes the water rise more drastic

3. When placing the jar over the candle, pause for 5 seconds with the flame just inside the jar. This heats up the air in the jar without putting out the flame and gives the result of the water rising more drastically.

4. If you have to do it more than once make sure you have 2 jars, so you can alternate jars. An already warm jar will affect the experiment.