Fire Fighting - Invisible Reactions:

Materials:

- cork "boat" with candle
- fireplace matches
- lemon juice
- baking powder
- glass jar
- water

Preamble:
Did you know that when a fire is burning a chemical reaction is taking place? To stop a fire we have to stop the chemical reaction. We can do this with fire extinguishers, buckets of sand, water, foam, wet blankets . . . .

Instructions:

- fill the jar 1/3 full with water
- float the cork boat
- light the candle with the fireplace match
- add several spoons of baking powder to the water and stir gently with a long spoon
- before the baking powder and water stop fizzing add a ¼ cup of lemon juice. watch what happens
- the fizzing should carry on for a few minutes. If it doesn't, add more baking powder and lemon juice
- the flame of the candle should dim and then die completely

What's happening?:
When you light the candle you start a reaction between the candle wick (fuel) and the oxgen in the air. The heat of the candle burning keeps the reaction between the fuel and the oxygen going.

The reaction between the lemon juice and the baking powder produces CO_2. CO_2 is heavier than the air in the jar so the air is pushed up andout of the jar. Without the oxygen in the air the burning reaction stops and the flame is extinguished.