

Rong Fan

April 6, 2014, 2014

Lesson Plan #2

Title of Lesson: Fly Hot Air Balloons

Unit Title: Weather

Performance Standard(s) Covered:

S6CS1: Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S6E3: Students will recognize the significant role of water in Earth processes.

Target Grade Level: 6th grade

Materials Needed: List all materials needed and number (one per student, one for class, etc.)

Empty plastic water bottle

Balloon

Hot plate

Pot (or heat resistant bowl)

Ice

Water

Safety Concerns: Are you using anything sharp? Hot? Eating anything?

1. Heat: the hot plate can be very hot and should notice forehead to students. Also, gloves should be prepared.

2. Water and ice during the experiment cannot be eaten. Should notice forehead to students.

Essential Question:

1. What is hot air balloon?
2. How hot air balloon can fly?
3. How to test hot air can lift a balloon to the sky?

Objective: What is the goal of your lesson? What will your students accomplish during the lesson?

Students will learn about hot air balloons and understand air pressure properties.

Key Words and Terms:

High Pressure: normally caused by a phenomenon called subsidence, meaning that as the air in the high cools it becomes denser and moves toward the ground.

Low Pressure: it is an area where the atmospheric pressure is lower than that of the area surrounding it.

Air Temperature: air temperature is a measure of how hot or cold the air is. It is the most commonly measured weather parameter.

Density: it is the mass per unit volume of Earth's atmosphere.

Learning Activity

Abstract (limit 100 characters):

By introducing the example of hot air balloons, students relate different properties of air, such as temperature and density, in order to understand high pressure and low-pressure systems.

Procedure:

1. Review lesson about air pressure and the water cycle and density.
2. Review Safety Procedures and Precautions before experiment
3. Organize groups and distribute materials to each group
4. Before class cover an open empty water bottle with a regular sized balloon.
5. Set up a hot plate with a pot about 1/4 filled with water and also set up a bowl filled with ice water.

6. Turn on the hot plate to warm up the water. (Just hotter than comfortable to touch.)
7. Put sentences on the board with blanks in them that when answered say "warm air rises and expands" and "cold air sinks and condenses". Have the students try to fill in the blanks from the discussion and volunteers will write their answers in the blanks.
8. Once the students sit down begin the demonstration asking students to write down what they think will happen.
9. Place the water bottle in the hot water and watch the balloon inflate. Then move the bottle to the ice water and watch as the balloon deflates.
10. Ask students to write down their observations then discuss with their partners what they think just happened.
11. Come back together as a class and discuss.
12. Then draw a high-pressure system and a low pressure system on the board and ask them what kind of air relates to each. High pressure is cold air because it sinks and condenses towards the earth. Low pressure is hot air because it rises and expands towards the atmosphere.

Notes and Tips:

- Keep a closer eye on the students as they put their experiment together
- Find some video clips online to have better demonstrations about today's concept.
- Make sure to have enough students in each group to conduct this experiment.

References: If you got this lesson from another lesson online (which is ok!!) please link it here

<http://geography.about.com/od/climate/a/highlowpressure.htm>

<http://www.fondriest.com/news/airtemperature.htm>

http://en.wikipedia.org/wiki/Density_of_air

<http://www.focus.uga.edu/sixthgrade/documents/6-ESHotairballoons.pdf>