Lesson 10 – Helium Balloon Lab & Simulation Activity

Subject: Science

Learner Outcomes

1. The students will manipulate variables of a lab setting properly observing lab safety guidelines.
2. The students will engage in a discussion about buoyancy and false lift as it pertains to ballooning.
3. They will also experience a balloon ascension and landing through a web-based hot air balloon simulation.

Lesson time: approximately 45–50 minutes depending on number of balloons and items being used as ballast being weighed for each different room temperature

Materials: Helium filled balloons with varying amounts of helium, twine, paper clips, misc. items found in the classroom, Internet access. **Hot air balloon simulation** at http://phrontis.com/hotair/

WV Third Grade CSO's*:* SC.3.1.1, SC.3.2.1, SC.3.2.2, SC.3.2.3, SC.3.2.4, SC.3.2.5, SC.3.2.6, SC.3.2.7, SC.3.2.8, SC.3.3.1, SC.3.3.2, SC.3.3.3, SC.3.4.5, SC.3.6.2, SC.3.6.4, TEC 3.1.2, 3.3.1.

Procedures:

1. Divide students up into groups of 2 or 3.
2. Have on hand several sizes of balloons and filled with varying amounts of helium.
3. Tie strings onto all of the balloons.
4. The students will attach different items to the strings to get the balloon to hover right in front of themselves without going up or down and not touching anything such as a desk or table.
5. Using a chart, similar to the example below, have students record a description of the balloon, the type of items used for ballast, and the number of items it took to get the balloon to hover as directed.
6. The students should then weigh the items to see how different size balloons can hold more "ballast."
7. The students should compare their weight measurements with their classmates.
8. The students should then do the same experiment in either a warmer or colder room to see how temperature can affect a balloon when trying to lift weight.
9. The students will then compare weights again to determine in what type of temperatures it would be best to fly a hot air balloon in.
10. Students may work individually or in pairs to try this web simulation of a hot-air balloon flight. The information is outlined below, but to access play go to http://phrontis.com/hotair/

Balloon description	Number & Description of Ballast items	Weight of ballast items

Assessment: Small group hovering of balloon, adjusting ballast to account for temperature change to gain the right level of buoyancy.