**Science – Grade 6**

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| **Name: “What’s In a BB ? ” – 60 minute activity** | | **Date: to be done Sept 2011**  **Submitted on 7/20/11** |
| **Content Area: Science** | **Grade Level(s): 6** | **Topic(s): Density**  **Measurement ( Intro. Unit )** |

**Standards (SOL)**

SOL 6.1 The student will plan and conduct investigations in which :

b – a classification system is developed based on multiple attributes

c – precise and approximate measures are recorded

i – data are organized and communicated through graphical representations ( graphs, charts and diagrams )

k – an understanding of the nature of science is developed and reinforced.

SOL 6.5 The student will investigate and understand the unique properties of water and its roles in the natural and human-made environment. Key concepts include :

b – the properties of water in all three states.

**Objectives**

The students will determine of what substance BB’s are composed.

The students will determine the density of BB’s.

The students will compare densities of various metals.

The students will be active, productive members of a collaborative group.

**Materials & Resources**

Each lab station should be equipped with :

* Triple Beam Balance
* Calculators
* BB’s sufficient to fill a 150 mL graduated cylinder
* Graduated cylinders ( various sizes – 500 mL, 250 mL, 100 mL, 50 mL )
* Abbreviated table / list of densities for common metals

**Safety Considerations**

Review relevant safety rules from Safety Contract on Day # 1, including use triple beam balance, proper behavior and clean / neat organization of station. Remind students to be extra vigilant with such small objects and NOT lose them on floor.

**Engage – Time Estimate \_\_\_5 min.\_\_\_\_**

*Display a number of metals, with labels, at teacher lab station. Ask students prompt questions from Daily Start Up format ( Bell Ringer ) and make reference to physical properties list ( previous notes ).*

**Explore – Time Estimate \_\_20 min.\_\_\_\_**

“Design and conduct your own investigation to determine what BB’s are composed of. Record your prediction, your procedure, and the data you collect.”

After 7 – 8 minutes, distribute WS ( Data Sheet ) to each group. If after 15 minutes a group is still struggling, offer assistance to the group leader by asking questions. If still struggling after another 5 minutes, demonstrate and explain how to use the Water Displacement Method to determine volume.

**Explain -- Time Estimate \_\_10 min.\_\_\_\_**

Ask each group to report back to the class the procedure and their results.

**Extend -- Time Estimate \_\_15 min.\_\_\_**

Rotate to a new group ( “leaders” and “data hounds” stay, “supply guys” move clockwise, and “graphic designers” moves counter-clockwise ). Share prepared flipchart on Promethean Board for key concepts :

* Vocabulary : Physical Property, Water Displacement, Density
* How to use a Triple Beam Balance to determine mass
* How to use the Water Displacement Method to determine volume
* Calculation for Density = Mass / Volume ( to the nearest whole # )

**Evaluate -- Time Estimate \_\_10 min. \_\_**

Distribute WS ( Connecting Learning ). Have “Data Hounds” and “Graphic Designers” identify the 3 types of variables in this experiment ( Manipulated, Responding & Controlled ).

**Plans for Diversity**

Four “Honors Science 6” classes will perform work in pre-arranged groups of 4 with strong & weak math students paired. Two “Academic Science 6” classes will also be in groups of 4 but will have guided key questions as prompts throughout the “Explore” phase written out on 3” x 5” cards and distributed by teachers aide to the leader of each group. The Academic classes will NOT switch partners during the “Extend” phase as there are many special needs students who would have difficulty re-gaining focus. Rounding and use of calculators can be used to aide in math computation.

**Connections**

Loudoun County Public Schools lays out a detailed curriculum that closely aligns with the VA State SOL’s. One of the first key concepts is measurement, so the first few weeks of the year I use an introductory skill unit spanning measurement, how to use equipment, lab principles and “How to think like a scientist”. This lesson will fall near the end of September and aide students on their SOL benchmark assessments later in November.

A Real-World application of this lab could be to relate it to how indirect methods of measurement may be necessary to determine vital physical properties ( flipchart of examples ) . Math connections to algebraic thinking, use of formulas and ratios is reinforced.

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