

LAB 3 – MASS & THE SINKING STRAW

Name:

Period:

BACKGROUND

Graphs of data sometimes show regularities and patterns. From these patterns we can predict events. For example, we can use the graph of the data on the sinking of straws to predict the quantity of BBs needed to sink a straw to different depths.

The straw sinks a little with no BBs in it, so the BBs and the straw may have some similar property or properties. Both the straw and the BBs have the property of mass, which under the pull of gravity gives them weight. *Mass* is the measure of the amount of "stuff" in objects such as a straw or a BB.

PROBLEM

What is the mass necessary to sink a straw to any chosen depth in water?

MATERIALS

- ◆ Graph of class data from Lab 2
- ◆ sinking straw
- ◆ BBs
- ◆ triple-beam balance
- ◆ graph paper
- ◆ ruler
- ◆ Petri dish

PROCEDURE

Note: This is a dry lab. You do not need water or beakers at any time

1. Use the **graph** from Lab 2, Graphing the Sinking Straw Data, to find the *average* quantity of BBs needed to sink the straw to the 4cm, 5cm, 6cm, and 7cm marks. Record the quantity of BBs for each in table 3-1.
2. Measure the mass of the Petri dish.
3. Put the straw into the Petri dish. Add to the Petri dish the quantity of BBs needed to sink the straw to 4cm. Measure the mass and record your results in table 3-1.
4. Find the total mass of the straw and BBs necessary to sink the straw to the 5cm mark. Record the total mass in the data table.
5. **Predict** the total mass of straw and BBs necessary to sink the straw to the 6cm mark. Record your prediction. Test your prediction. Record your results.
6. **Predict** the total mass for the 7cm mark. Record and test your prediction, then record your results.

Comment [AJK1]: Teach how to do this.

- Clean up your lab station, then copy your data onto the class data table. Printouts of the class data will be available outside my door and online by 6th period.

What's a good title for this data table?

DATA

Table 3-1:

Depth of Straw (cm)	Average number of BBs	Mass of BBs, Straw & Petri Dish (g)	Mass of Petri Dish (g)	Mass of Straw & BBs (g)	
				Predicted	Actual
4					
5					
6					
7					

SUMMARY

Summary and Challenge Questions must be typed on a separate piece of paper.

- Graph the **class data** on the total mass of the straw and BBs vs. the depth of the straw.
 - If there is a relationship between the variables, show it with a best-fit line. If not, write "no relationship" in the margin of your graph.
- Explain the relationship between the variables (try to use a ratio if you can). If you think there is no relationship, explain how the number of BB's does **not** affect the depth of sinking.
- Explain how you can use the information on this graph to find the mass of the straw.

CHALLENGE

- Suppose that the diameter of one straw is twice the diameter of another. If both straws are the **same mass** and contain the **same number of BBs**, would they both sink to the same depth in a container of water?
- Explain your answer to Challenge Question 1.