Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Candy Bar Density Lab

**Problem:** How does the density of a candy bar change when it is cut in half?

**Introduction:** Your group will have a Milky Way, Three Musketeers, Starburst, and Hershey’s candy in which to experiment the property of density on. Density is a measure of mass of an object or substance per unit of volume. It is how tightly packed the atoms are in the space the substance occupies. When we heat or cool a substance, we change the arrangement of the atoms by causing them to move closer or further apart. Likewise, if add or remove pressure, we have caused a change in closeness of the atoms. What would happen if you cut an object in half? Are we changing the internal arrangement of the atoms? THINK ABOUT THIS WHEN YOU DESIGN YOUR HYPOTHESIS REGARDING THE ABOVE PROBLEM. **You may eat your candy after the experiment is completed. Make sure you have all of your data first.**

**General Directions:** Develop experimental procedures in which you compare the density of a whole candy to half or a quarter of the same candy. Round all of your calculations and measurements to the nearest tenths. Use complete sentences for all steps except data table, formulas, and materials list. You must measure mass, volume, and density for all candy **DO NOT SIMPLY DIVIDE MEASUREMENTS ON YOUR PAPER.**

**Materials: Compile a materials list with your group that will help you solve the problem.**

**Procedure (remember always begins with a verb):**

1. **Measure the length, width, and height (in centimeters) of each candy using a ruler.**

**Data Table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Milky Way | Three Musketeers | Starburst | Hersheys |
| 1. Mass of paper | g | g | g | g |
| 2. Mass of paper + candy bar | g | g | g | g |
| 1. **Mass** of candy bar   (#2-#1) | g | g | g | g |
| 4. length of candy bar | cm | cm | cm | cm |
| 5. height of candy bar | cm | cm | cm | cm |
| 6. width of candy bar | cm | cm | cm | cm |
| 7. **volume** (V = L x W x H) | cm3 | cm3 | cm3 | cm3 |
| 8. density D = m/v (#3÷#7) | g/cm3 | g/cm3 | g/cm3 | g/cm3 |
| 9. Prediction (sink or float) |  |  |  |  |
| 10. \*Actual (sink or float) |  |  |  |  |

**Analysis and Conclusion Questions**

1. **According to the experiment you just conducted, what would happen to the volume, mass, and density of the candy when you cut it in half?**
2. **The density of aluminum is 2.7 g/mL. What would happen to the density of a piece of aluminum if it were cut in half?**
3. **The density of water is 1.0 g/mL. What would happen to the candy if placed in a tub of water? Why?**
4. **If you took a book and found that the mass was 1800 grams and had a length of 15 cm, a width of 5 cm, and a height of 20 cm, what would the density of the book be? (Show your work and formula).**
5. **If the book were placed in water would it sink or float? Why?**
6. **Which candy turned out to be most dense?**
7. **What do you believe caused one type of candy to be more dense than another type of candy?**

**Conclusions:**