**Weight vs. Volume Assignment**

For this assignment you will be answering questions based upon written information and then conducting an experiment in the kitchen with sugar and flour. As we learn how to make recipes in class, you will need to learn how to correctly measure the ingredients listed in the recipe. How to *accurately* measure ingredients in a baking recipe is absolutely *essential* if you want the product to turn out correctly. That is what you will be learning about in this assignment.

Instructions:

First you will be conducting your own inquiry experiment with sugar and flour regarding the difference between weight and volume. Follow the instructions for measuring by volume and then weighing the sugar and flour in the chart provided. When you have finished the experiment portion of the assignment answer the questions based upon the article “WEIGHING IN: THE IMPORTANCE OF MEASURING INGREDIENTS IN BAKING”.

# **Part 1: Volume vs. Weight Experiment**

## **Procedure:**

1. Get out the following equipment:
   1. 125 ml dry (metal) measuring cup
   2. 250 ml liquid (glass) measuring cup
   3. Metal spatula
   4. Small mixing bowl
   5. Kitchen scale
   6. Sugar and flour canisters
2. Place the scale on the counter and turn it on – ensure the unit is set to g.
3. Put your bowl on the scale and reset the weight to zero.
4. Using the dry measuring cup scoop out the sugar and shake to level it off so it is even with the top of the measuring cup.
5. Pour the measured sugar into the bowl and record the weight in grams in the chart below.
6. Pour the sugar back into the canister and place the bowl back onto the scale – be sure the weight is 0 – of not then re-zero the scale.
7. Using the scoop in the sugar, scoop the sugar into the dry measuring cup until it is overfull and level it with the metal spatula. Pour it into the bowl, weigh and record the grams in the chart. Replace the sugar.
8. Using the glass measuring cup measure 125 ml of sugar. Shake the cup to ensure it looks level. Pour into the bowl, weigh and record then replace the sugar.
9. For the flour, use the scoop to fluff up the flour in the canister then repeat steps 4-8 recording your observations in the chart.
10. Wash, dry, and put away the equipment when you are finished then answer the questions.

*Table 1: Volume vs. Weight of Sugar and Flour*

|  |  |
| --- | --- |
| 1. **Sugar** | **Weight (g)** |
| 1. 125 ml dry measuring cup scooped & shaken |  |
| 1. 125 ml dry measuring cup spooned & leveled |  |
| 1. 125 ml liquid measuring cup |  |
|  |  |
| 1. **Flour** |  |
| 1. 125 ml dry measuring cup scooped & shaken |  |
| 1. 125 ml dry measuring cup spooned & leveled |  |
| 1. 125 ml liquid measuring cup |  |

### **Analysis:**

1. Were the weights of the three different measurements the same for the sugar? If one was greater than another, why do you think the weights would be different if the volume was the same?
2. Were the weights of the three different measurements the same for the flour? If one was greater than another, why do you think the weights would be different if the volume was the same?
3. Which type of measurement for sugar and flour do you think would be the most accurate and consistent? Explain your reason based upon what you observed.

### **Part 2: Article Questions**

1. Why is accurately measuring ingredients important when baking? What can happen if you add too much or too little of an ingredient?
2. Compare and contrast liquid and dry measuring cups.
3. What problems could you encounter if you tried to use only one type of measuring cups for both liquid and dry ingredients?
4. When measuring dry ingredients by volume, does it make a difference how you put them into the measuring cup? Why or why not?
5. Why does using a scale help avoid discrepancies in the amount dry ingredients used in a recipe?
6. Describe how to use a digital scale for weighing your ingredients.
7. Why should you *not* use the milliliter unit on your scale for ingredients?