LAB: MASSING TECHNIQUES (HOW TO PROPERLY USE A BEAM BALANCE)

Students: Please read the following information given below, and then come to class on your lab day with the following already prepared in your notebooks:

1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, 7) Diagram, 8) Procedures/Observations, and 9) Data Table.

NOTES: Questions on the last page need to be printed out and will be done after completion of the experiment. A formal conclusion in paragraph format must also be included in the final lab report. (After data table)

Your final individual lab report (WRITTEN OR TYPED) will be due one week after performing the lab in class. (Your next lab class)

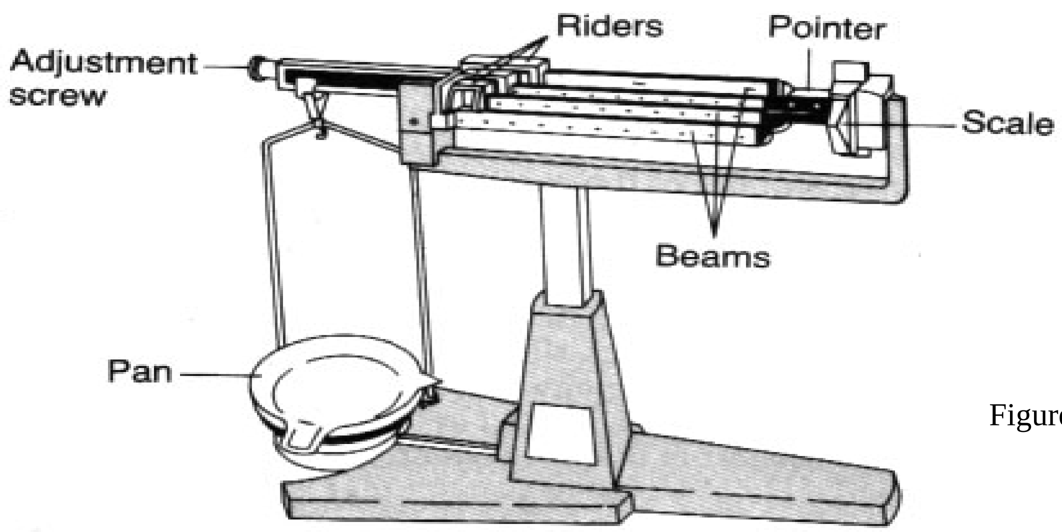

Figure A

When the balance is required for determining mass, you will use a balance like the one shown in Figure A above. The balance has a readability of 0.001 g. This means that your mass readings should all be recorded to the nearest 0.001 g.

Before using the balance, always check to see if the pointer is resting at zero. If the pointer is not at zero, check the riders on the beams. If all the riders are at zero, turn the zero adjust knob until the pointer comes to rest at the zero marking. The zero adjust knob is usually located at the far left end of the balance beam as shown in Figure above. NOTE: The balance will not adjust to zero if the movable pan has been removed. Make sure that the pan number (on the bottom of the pan) and the balance number (located on the back of the balance) match. Never place chemicals or hot objects directly on the balance pan. Always use weighing paper or a massing container. Chemicals can permanently damage the surface of the balance pan and affect the accuracy of measurements.

Once the balance has been zeroed, you will check the balance for accuracy (how close the experimental data is to the true value). Obtain a mass kit and place the 20-gram mass onto the balance pan. Move the riders so that the balance reads 20 grams. Is the balance zeroed out?

In many experiments, you will be asked to determine the mass of a specified amount of a chemical solid. Use the following procedure to obtain approximately 13 grams of sodium chloride. Make sure the pointer on the balance is set at zero. Obtain a massing cup and place it on the balance pan. Determine the mass of the massing cup by adjusting the riders on the various scales. Record the mass of the massing cup to the nearest 0.001 g. Add 13 to the mass of the massing cup and record. Then move the scale riders to the new number.

Obtain a beaker containing sodium chloride. Using a scoopula, slowly scoop the sodium chloride from the beaker onto the massing cup. Continue until the pointer once again comes to rest at zero. In most cases, you will only have to be close to the specified mass. Do not waste time trying to obtain exactly 13.00 g. Instead, read the exact mass when the pointer rests close to zero and you have around 13 g of sodium chloride in the balance pan. Example: The mass might be 13.180 g. Record your exact mass of sodium chloride and the massing cup to the nearest 0.001 g. (HINT: Remember to subtract the mass of the massing cup to find the mass of sodium chloride).

Some experiments may ask you to determine the mass of a group of objects. Make sure the pointer on the balance is set at zero. Obtain 5 pennies and place them on the balance pan. Determine the mass of the pennies by adjusting the riders on the various scales. Record the mass of the 5 pennies to the nearest 0.001 g. Calculate the average mass of the pennies. Record the measurement to the nearest 0.001 g. Determine what the mass of 10 pennies should be based on your findings. Record your prediction. Then obtain 10 pennies and place them on the balance pan. Determine the mass of the 10 pennies by adjusting the riders on the various scales. Record the mass of the 10 pennies to the nearest 0.001 g. If there is a difference in the 2 values, calculate the difference. Show your calculations.

Make sure the pointer on the balance is set at zero. Obtain 5 nickels and place them on the balance pan. Determine the mass of the nickels by adjusting the riders on the various scales. Record the mass of the 5 nickels to the nearest 0.001 g. Calculate the average mass of the nickels. Record the measurement to the nearest 0.001 g. Determine what the mass of 10 nickels should be based on your findings. Record your prediction. Then obtain 10 nickels and place them on the balance pan. Determine the mass of the nickels by adjusting the riders on the various scales. Record the mass of the 10 nickels to the nearest 0.001 g. If there is a difference in the 2 values, calculate the difference. Show your calculations.

MAKE SURE TO HAVE PROCEDURES THAT DETAIL HOW TO COLLECT THE DATA ON THE FOLLOWING PAGE:

DON’T FORGET- THE LAST PAGE WITH THE QUESTIONS MUST BE PRINTED OUT, ANSWERED, AND SUBMITTED WITH YOUR LAB REPORT WHEN YOU COME IN FOR NEXT WEEK’S LAB.

DATA TO COLLECT:

Did the balance zero out when the riders were moved to 20 grams? ____________________

If not, what was the reading on the balance? ____________________________________

Mass of the massing cup: ____

Mass of NaCl and massing cup: ____

Mass of NaCl: ____

Mass of the 5 pennies: ____

Mass of 1 penny: ________________________

Predicted mass of 10 pennies: _______________________________________

Actual mass of 10 pennies: ____

Difference in Predicted and Actual masses of pennies: ___________________________

Mass of the 5 nickels: ____

Mass of 1 nickel: ________________________

Predicted mass of 10 nickels: _______________________________________

Actual mass of 10 nickels: ____

Difference in Predicted and Actual masses of nickels: ___________________________

Lab Station ______ Name________________________________
Period______ Lab Partner(s)______________________________

Lab: Massing Techniques: How to Properly Use a Beam Balance

1. When the 20 gram mass was added to the balance, did the balance zero out?

2. What is the mass of your sample of sodium chloride?

3. How many decimal places should any massed item contain when using a four-beam balance? Why?

4. How should you hold your balance? Why?

5. Why should your balance read zero before you place an object on the pan?

6. If your balance is not reading zero, what can be done to zero the balance?

7. When using a measuring instrument, how does one determine the number of decimal places to have in the measurement?

8. Was your predicted value for the mass of 10 pennies equal to the actual measured amount? If not, how close are the values?

9. Was your predicted value for the mass of the 10 nickels equal to the actual measured amount? If not, how close are the values?

10. Name three possible reasons why the two amounts (predicted and actual) could differ for the pennies and nickels.