Handout 1c) filled in lab

Neatly printed in lab book before class

Use this as a guide for finishing your report in your lab book.

Name The Batman Title: Mass of Objects Using a Balance

Experiment # 21 Partner: Robin, the Boy Wonder

Purpose: To takeobtain the mass of an object by difference using two objects using different balances.

Method: I will use a centigram and a milligram balance and to get the mass of an object 1 and then object 1 & 2 together. I will then get the mass of object 2 by difference. I will also observe the difference between a centigram and milligram balance.

Procedure	Observations
1. Obtain 2 unknown metal	
2 Write down the unknown numbers	Unknown 1= 156- gray rectangular metal, kind of light feeling for its size. hard Unknown 2 = 112-yellow cylinder of metal; kind of heavy feeling for its size. soft
3. Go to a centigram balance	
4. Tare the balance by pressing the tare	
5. Using tongs put object 1 on the pan	
6. Read the mass	10.02 g
7. Without zeroing put object 2 on pan	
8. Read mass	27.30 g
9. Go to the milligram balance	
10 Tare the balance	
11 Using tongs put object 1 on pan	
12 Read mass	10.017g
13 Without zeroing, put object 2 on pan	
14 Read mass	27.301g

Blank when you came to class, but now filled in with date and observations. Notice the use of units and significant figures and the entries are directly across from the procedural point.

This section is now filled in with the data you get from doing the lab. Notice that significant figures and units are maintained.

Data Table	Object 1	Object 1 + 2
centigram balance	10.02 g	27.30 g
milligram balance	10.017 g	27.301 g

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Calculations

Mass of object 2 centigram 27.30g – 10.02g = 17.28 g
Mass of object 2 milligram 27.301 g – 10.017 g = 17.284 g

Results and discussion
I obtained the mass of object 1 and the mass of object 1 & 2 by using a centigram and a milligram balance. Object no. 1, # 156, is gray rectangular piece of metal, kind of light feeling for its size and hard.
It had a mass of 10.02 g using a centigram balance and 10.017 g using the milligram balance. Object 2, #112 is yellow cylinder of metal, kind of heavy feeling for its size and soft. It had a mass of 17.28 g using a centigram balance and 17.284g using a milligram balance. The analytical balance gave me more information than the centigram balance. It has more significant figures. I obtained the mass of the second object by difference. Since I am obtaining the mass of object 2 by difference, I can conclude that masses are additive. In order to prove that masses are additive, I should have taking the individual masses of objects 1 and 2 and compared them to the values obtained by difference. I could have repeated the lab several times to get more data for statistical information, but I did not. This would have given me the precision of the balances, assuming that they have been calibrated correctly.

The results, discussion, and conclusion are typed in a readable font like Palatino, Times, or Comic San. The spelling and grammar have been checked. Data from the lab is incorporated in a logical manner.

Questions
1. **Did the centigram and milligram balances give you data with the same number of significant figures? Explain.** No the balances did not give the same number of significant figures. The milligram balance gave more significant figures because it has a higher degree of precision.

2. **You are asked in an experiment to add 5.00 g of water and 10.000 g NaCl to a cup. Which of the balances would you use for the whole experiment?** I would the milligram balance to measure the mass of the NaCl and the water. From the question, it is more important that I know the mass of NaCl precisely than the mass of water. If I have more significant figures for the water, it does not matter.

3. **An experiment needs about 5 g of Mg. A crucible weighed 31.278g. You put a piece of Mg metal in the crucible and re-weighed the crucible, 35.987 g. What is the mass of Mg in the crucible? Should you add more Mg?**
By subtraction, the mass of the Mg is 4.709 g (35.987 g– 31.278g = 4.709g). No, I don't need to add more magnesium. I have approximately to 1 significant figure the amount of Mg I need.

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4. **Why should you always use the same balance when doing mass measurements?** When you use the same balance, you remove some error caused by the instrument. If your data is off, it is all off by the same degree of accuracy. Using a different balance each time factors in a new inherent error.

Complete sentences were used to answer the questions. The answers are typed and easy to read. The answers also make sense based on knowledge obtained from lecture, lab, and life.