

Directions Complete one copy per group. Hand in.

Objective Demonstrate Chapter 1 measurement skills.



Materials 10 pennies metric ruler triple beam balance (you may need to share)
50 mL graduated cylinder water

Procedure

Step 1: Use your ruler to measure the height in mm of the following (don't estimate, actually measure).

2 pennies (stacked)

4 pennies (stacked)

6 pennies (stacked)

8 pennies (stacked)

10 pennies (stacked)

Record your results in Data Table 1.



Do you see a pattern? _____ *Predict the height of 20 pennies.* _____

Convert the height of 10 pennies to centimeters. _____ cm

Convert the height of 10 pennies to meters. _____ m

Step 2: Use the balance to find the mass of the following (don't estimate, actually measure).

2 pennies

4 pennies Record your results in Data Table 1.

6 pennies

8 pennies

10 pennies



Convert the mass of 10 pennies to kilograms. _____ kg

Step 3: Use the graduated cylinder to measure the volume of 10 pennies. _____ mL

To find volume, you will be using the water displacement method.

Be sure to read the meniscus.



Step 4: *Calculate the density of 10 pennies. Show work and label.*

Estimate the density of 1 penny. _____ g/mL

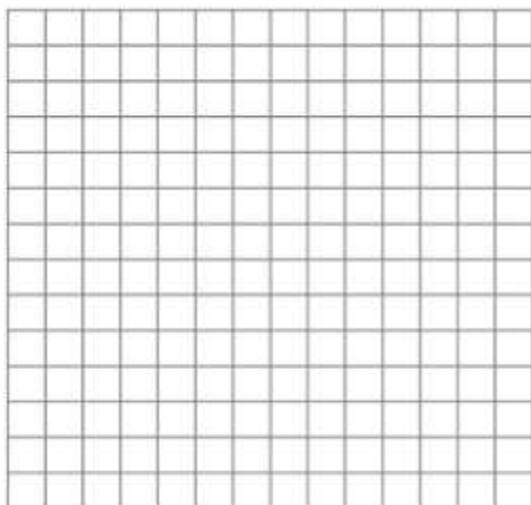
Step 5: Construct two graphs using the data you recorded in Table 1. On graph 1, show the relationship between number of coins and the height of the coins. Graph 2, should show the relationship between number of coins and the mass. Draw a smooth line connecting the points on each graph.

Step 6: Dry pennies and return all equipment.

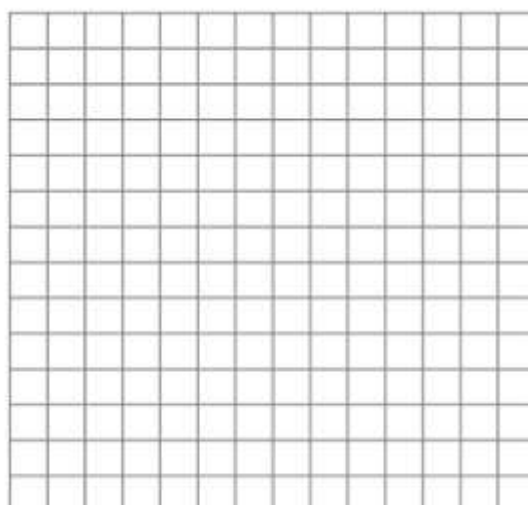
Data Table 1

Number of Pennies	Height (mm)	Mass (grams)
2		
4		
6		
8		
10		

Graph 1 *Title:* _____



Graph 2 *Title:* _____



Questions and Conclusions

1. Using your data collected in the lab, estimate the height and mass of a roll of pennies. (A roll is 50 pennies.)
2. Describe the appearance of the line in each graph.
3. Does your data show a difference in the mass of different coins? Explain.
4. Does your data show a difference in height of different coins? Explain.
5. What is the meniscus? Why is important to read the meniscus?
6. How might the data from this investigation have real importance for a bank teller?