

**LAB**  
**2** Laboratory  
Activity

## No Need to Count Your Pennies

Have you ever saved pennies, nickels, or dimes? If you have, you probably took them to the bank in paper wrappers provided by the bank. Tellers at the bank could take the time to open each roll and count the coins to determine their dollar value. However, counting is not necessary because tellers use a better system. They use the properties of the coins instead.

A penny, a nickel, and a dime each has a particular mass and thickness. Therefore, a roll of coins will have a certain mass and length. These two properties—mass and length of a roll of coins—are often used to determine the dollar value of the coins in the roll.

### Strategy

You will develop measuring skills using a balance and a metric ruler.

You will use graphing skills to make interpretations about your data.

You will compare the relationships among the mass, length, and number of coins in a roll.

### Materials

10 coins (all of the same type)

balance

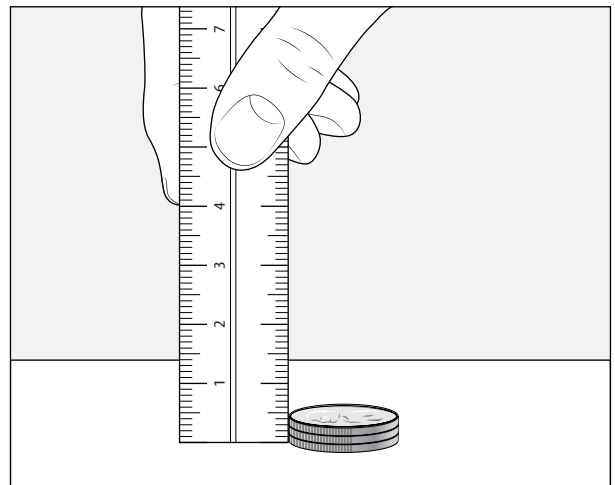
metric ruler

roll of coins

### Procedure

1. Using the balance, determine the mass of 1 coin, 2 coins, 3 coins, 4 coins, 6 coins, 8 coins, and 10 coins to the nearest 0.1 g. Record the masses in Table 1 in the Data and Observations section.
2. Measure the thickness of 1 coin, 2 coins, 3 coins, 4 coins, 6 coins, 8 coins, and 10 coins to the nearest 0.5 mm. See Figure 1. Record these values in the table.
3. Record the number of coins in the roll on the table. Use the balance to find the mass of the roll of coins. Measure the length of the roll. Record these values in the table.

Figure 1



## Laboratory Activity 2 (continued)

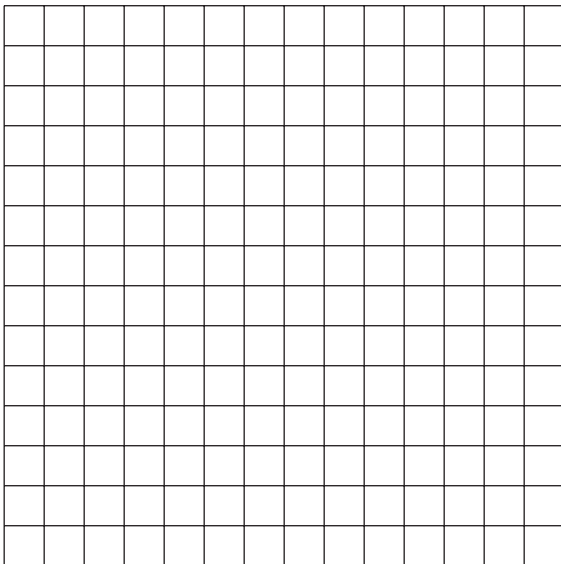
### Data and Observations

1. Make two graphs of the information in Table 1. On Graph 1, show the number of coins on the  $x$ -axis and the mass of the coins on the  $y$ -axis. Graph 2 should compare the number of coins ( $x$ -axis) to the total thickness of the stacked coins ( $y$ -axis). Be sure to label each axis.
2. Draw a line connecting the points on each graph.

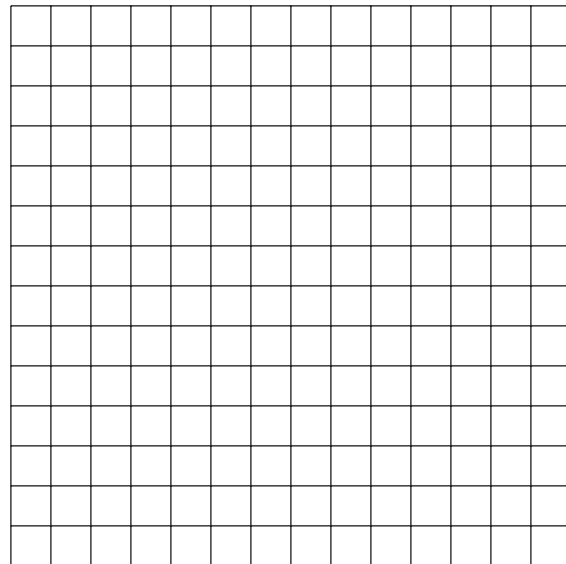
Table 1

Number of coins	Mass (g)	Thickness (mm)
1		
2		
3		
4		
6		
8		
10		
roll =		

Graph 1



Graph 2



**Laboratory Activity 2** (continued)**Questions and Conclusions**

1. Describe the appearance of the curve or line in each graph.

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2. What errors could exist in your measurement of the mass and the length of the coin roll?

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3. Which of the errors in question 2 would have real importance for a bank teller?

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4. Do your data show a difference in the mass of different coins? Explain your answer.

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5. Do your data show a difference in the thickness of different coins? Explain your answer.

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6. Could you use the mass of 1 coin to determine the mass of 2, 3, 4, 6, 8, and 10 coins? Why or why not?

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**Strategy Check**

\_\_\_\_\_ Can you develop measuring skills using a balance and a metric ruler?

\_\_\_\_\_ Can you use graphing skills to make interpretations about your data?

\_\_\_\_\_ Can you compare the relationships among the mass, length, and number of coins in a roll?