

ANALYSIS

- 1. Organizing Data** Using your data from the first data table, calculate the volume of the wooden block for each trial. The equation for the volume of a rectangular block is $volume = length \times width \times thickness$.
- 2. Analyzing Data** Use your data from the first table and your results from item 1 above to answer the following questions.
 - a. For each block, what is the difference between the smallest length measurement and the largest length measurement?
 - b. For each block, what is the difference between the smallest calculated volume and the largest calculated volume?
 - c. Based on your answers to (a) and (b), how does multiplying several length measurements together to find the volume affect the precision of the result?
- 3. Analyzing Data** Did the block always fall from the same height in the same amount of time? Explain how you found the answer to this question.
- 4. Constructing Graphs** Using the data from all trials, make a scatter plot of the distance versus the time of the block's fall. Use a graphing calculator, computer, or graph paper.

CONCLUSIONS

- 5. Drawing Conclusions** For each trial in the first data table, find the ratio between the mass and the volume. Based on your data, what is the relationship between the mass and volume?
- 6. Evaluating Methods** For each type of measurement you made, explain how error could have affected your results. Consider method error and instrument error. How could you find out whether error had a significant effect on your results for each part of the lab? Explain the role of human reaction time in your measurements.

EXTENSION

- 7. Evaluating Data** If there is time and your teacher approves, conduct the following experiment. Have one student drop the wooden block from shoulder height while all other class members time the fall. Perform three trials. Compare results each time. What does this exercise suggest about accuracy and precision in the laboratory?