

Introduction to Physical Science ▪ *Reading/Notetaking Guide***Mathematics and Science** (pp. 30–33)

This section describes math skills scientists use in collecting data and making measurements. It also describes math skills that help scientists analyze their data.

Use Target Reading Skills

Before you read, look at the red headings in this section of the textbook. Then complete the graphic organizer by writing each red heading and a question about that topic. Answer your questions as you read.

Mathematics and Science		
Heading	Question	Answer
Estimation	What does estimation have to do with science?	

Estimation (p. 30)

1. A(n) _____ is an approximation of a number based on reasonable assumptions.
2. Is the following sentence true or false? An estimate is based on known information.

3. When do scientists have to rely on estimates?

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Accuracy and Reproducibility (p. 31)

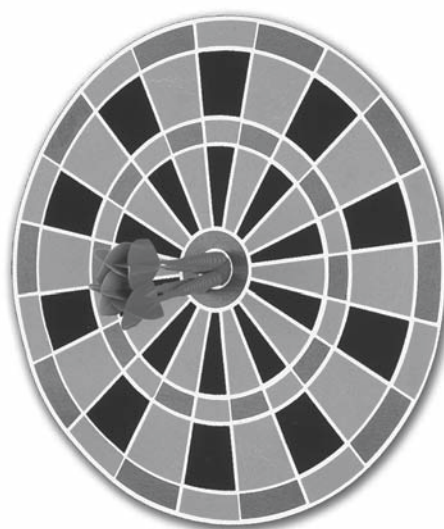
4. _____ refers to how close a measurement is to the true or accepted value.

5. What is reproducibility?

6. Is the following sentence true or false? Only reproducibility is important when making scientific measurements. _____

7. Circle the letter of the description that is true about the darts in the dart board below.

- a. reproducible but not accurate
- b. neither reproducible nor accurate
- c. both reproducible and accurate
- d. accurate but not reproducible



Significant Figures and Precision (pp. 32–33)

8. Circle the letters of the digits in a measurement that are significant figures.

- a. one digit whose value has been estimated
- b. five digits whose values have been estimated
- c. all digits that have been measured exactly
- d. all digits to the right of the decimal point

9. Is the following sentence true or false? A measurement should contain only those numbers that are significant. _____

10. What is precision?

11. Is the following sentence true or false? Scientists use significant figures to express precision in their measurements. _____

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12. Circle the letter of the rule about significant figures when adding or subtracting measurements.
- a. The answer can have only as many figures after the decimal point as the measurement with the fewest figures after the decimal.
 - b. The answer can have only the same number of significant figures as the measurement with the fewest significant figures.
 - c. The answer can have only as many figures after the decimal point as the measurement with the most figures after the decimal.
 - d. The answer can have only the same number of significant figures as the measurement with the most significant figures.

13. Suppose you add a measurement of 7.2 mL to a measurement of 15.37 mL. How many decimal places should the answer have? Explain your answer.

14. What is the rule about significant figures when multiplying or dividing measurements?

15. Suppose you multiply a measurement of 4.52 kg by a measurement of 6.0 kg. How many significant figures does the product have? Explain your answer.
