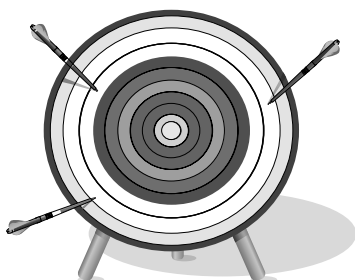


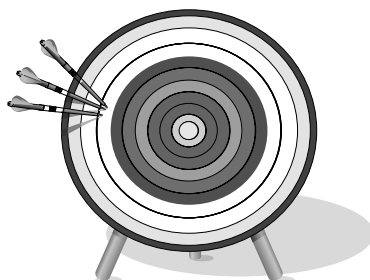
Section 2.3 How reliable are measurements?

In your textbook, read about accuracy and precision.

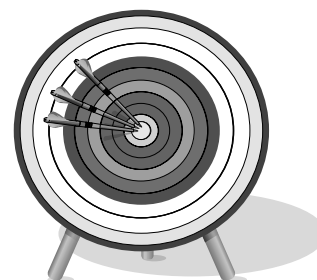
1. Use the terms *precise* and *accurate* to describe the following figures. You may use both terms for some figures. If a term does not apply to a figure, leave the space blank.



a. _____



b. _____



c. _____

Circle the letter of the choice that best completes the statement or answers the question.

2. The difference between an accepted value and an experimental value is called a(n)

a. error. c. measured value.
b. percent error. d. precise measurement.

3. The ratio of an error to an accepted value is called a(n)

a. accuracy-to-precision value. c. percent error.
b. accuracy. d. precision.

4. When you calculate percent error, you can ignore the

a. accepted values. c. experimental values.
b. measured values. d. plus and minus signs.

5. If two measurements are very close to each other, then they are

a. accurate. c. both accurate and precise.
b. precise. d. accepted values.

6. Which of the following is most likely to produce data that are not precise?

a. a balance that is not set to zero
b. not reading a graduated cylinder at eye level
c. altering the procedure during an experiment
d. making the same error with each trial

Section 2.3 *continued*

In your textbook, read about significant figures.

Use each of the terms below just once to complete the statements.

| | | | |
|---------------------|---------------------|--------------|-------|
| counting numbers | estimated | non-zero | zeros |
| scientific notation | significant figures | placeholders | |

7. The digits that are reported in an answer are called _____.
8. The numeral 9.66 has three significant figures, two known figures and one _____ figure.
9. _____ numbers are always significant.
10. All final _____ to the right of the decimal place are significant.
11. Zeros that act as _____ are not significant.
12. _____ have an infinite number of significant figures.
13. When you convert to _____, you remove the placeholder zeros.

In your textbook, read about rounding off numbers.

14. Round the following to four significant figures.

| | | | |
|--------------------|-----------------|-----------------|---------------------|
| a. 12.555 km _____ | b. 1.0009 _____ | c. 99.999 _____ | d. 23.342 999 _____ |
|--------------------|-----------------|-----------------|---------------------|
15. Round 12.783 456 to the requested number of significant figures.

| | |
|--------------------------------|--------------------------------|
| a. 2 significant figures _____ | c. 6 significant figures _____ |
| b. 5 significant figures _____ | d. 7 significant figures _____ |
16. Round 120.752 416 to the requested number of significant figures.

| | |
|--------------------------------|--------------------------------|
| a. 3 significant figures _____ | c. 5 significant figures _____ |
| b. 4 significant figures _____ | d. 7 significant figures _____ |
17. Complete the following calculations. Round off the answers to the correct number of significant figures.

| |
|---|
| a. $51.2 \text{ kg} + 64.44 \text{ kg}$ _____ |
| b. $6.435 \text{ cm} - 2.18 \text{ cm}$ _____ |
| c. $16 \text{ m} \times 2.82 \text{ m} \times 0.05 \text{ m}$ _____ |
| d. $3.46 \text{ m}/1.82 \text{ s}$ _____ |