

## Significant Digits

**Significant digits** indicate how precisely a number is known. Use the following guidelines to determine the number of significant digits.

- All nonzero digits are significant.
- All zeros that appear between two nonzero digits are significant.
- For a decimal, all zeros that appear after the last nonzero digit are significant. For a whole number, you cannot tell whether any zeros after the last nonzero digit are significant, so you should assume that they are not significant.

Sometimes calculations involve measurements that have various numbers of significant digits. In this case, a general rule is to carry all digits through the calculation and then round the result to the same number of significant digits as the measurement with the *fewest* significant digits. When you calculate with units that cannot be divided into fractional parts, such as number of people, consider only the significant digits of the other number(s).

### EXAMPLE

Perform the calculation. Write your answer with the appropriate number of significant digits.

- a. 
$$\begin{array}{r} 12.6 \\ \times 0.05 \\ \hline 0.63 \end{array}$$
 **3 significant digits**  
**1 significant digit**  
**The product has 2 significant digits.**  
**0.6 Round to 1 significant digit.**
- b. 
$$\begin{array}{r} 840 \\ + 702 \\ \hline 1542 \end{array}$$
 **2 significant digits**  
**3 significant digits**  
**The sum has 4 significant digits.**  
**1500 Round to 2 significant digits.**
- c. \$61.20 restaurant bill  $\div$  6 people  
 The number of people is exact, so consider only the 4 significant digits of the bill, \$61.20. The answer should have 4 significant digits.  

$$\$61.20 \div 6 = \$10.20$$
  
 ▶ Each person pays \$10.20.

### PRACTICE

Perform the calculation. Write your answer with the appropriate number of significant digits.

- $600 + 30$
- $5 - 2.6$
- $12 \cdot 6.75$
- $0.098 + 0.14 + 0.369$
- $3.6053 - 1.720$
- $40 \div 3.5$
- $8.0 - 3.1$
- $31.7 \cdot 6.8 \cdot 0.435$
- $30.5 \cdot 6.40$
- $3.18 + 2.0005$
- $0.088 \div 2.44$
- $8650 + 380 - 49$
- $4016 - 3007$
- $1.35 + 14.8$
- $320 \div 18$
- $38.1 \cdot 3.04 \div 0.024$
- $\$1.45$  per notebook  $\cdot$  12 notebooks
- 10.0 liters of water  $-$  4.5 liters of water
- 260 pints of milk  $\div$  106 students
- 0.5 yard of fabric  $+$  0.87 yard of fabric
- 27,973 books  $\div$  11 libraries
- 12.76 gallons of gas  $+$  6.08 gallons of gas
- $\$6.95$  per ticket  $\cdot$  180 tickets
- 1540 pounds  $-$  160 pounds  $-$  85 pounds