



If the decimal place is Present...
count from the **left**, ignore zeros, till your first non zero and count everything else.

If the decimal place is Absent...
count from the **right**, ignore zeros, till your first non zero and count everything else

Examples:	Sig Figs?			Sig Figs?
125			0.4	
1.25			0.04	
1.250			0.040	
1250			0.0400	
12500			0.04000	

Calculations

1. Multiplication or division, the number of significant figures in the result is the same as the number in the least precise measurement used in the calculation. For example, consider the calculation

$$4.56 \times 1.4 = 6.38$$

the limiting item (1.4) has 2 significant figures and so the correct answer would be 6.4 where the answer is limited to 2 significant figures.

2. Addition and subtraction, the result has the same number of decimal places as the least precise measurement used in the calculation (smallest decimal place). It can be helpful to line up the measurements and draw a line down where the smallest decimal is. For example, consider the sum

$$\begin{array}{r}
 12.11 \\
 18.0 \\
 +1.1013 \\
 \hline
 31.123
 \end{array}
 \qquad
 \begin{array}{r}
 12.1|1 \\
 18.0| \\
 +1.1|013 \\
 \hline
 31.1|23
 \end{array}$$

The correct result is 31.1, since 18.0 has only one decimal place.

Rules for rounding

- In a series of calculations, carry the extra digits through to the final result, then round.
- If the digit to be removed
 - is less than 5, the preceding digit stays the same. For example, 1.33 rounds to 1.3.
 - is equal to or greater than 5, the preceding digit is increased by 1. For example, 1.36 rounds to 1.4.

Significant Figures Worksheet

1. Determine the number of significant digits in each of the following:

- | | | |
|----------------|--------------|---------------|
| a) 6.571 g | f) 30.07 g | k) 54.52 cm |
| b) 0.157 kg | g) 0.106 cm | l) 0.12090 mm |
| c) 28.0 mL | h) 0.0067 g | m) 2.690 g |
| d) 2,500 m | i) 0.0230 cm | n) 43.07 cm |
| e) 0.0700000 g | j) 26.509 cm | |

2. Add:

- | | |
|---------------------------------|---|
| a) $16.5 + 8 + 4.37$ | d) $0.0853 + 0.0547 + 0.0370 + 0.00387$ |
| b) $13.25 + 10.00 + 9.6$ | e) $25.37 + 6.850 + 15.07 + 8.056$ |
| c) $2.36 + 3.38 + 0.355 + 1.06$ | |

3. Subtract:

- | | |
|---------------------|---------------------|
| a) $23.27 - 12.058$ | c) $350.0 - 200$ |
| b) $13.57 - 6.3$ | d) $27.68 - 14.369$ |

4. Multiply:

- | | |
|--------------------------------------|------------------------------------|
| a) 2.6×3.78 | e) 3.08×5.2 |
| b) $6.54 \times .037$ | f) 0.0036×0.02 |
| c) $3.15 \times 2.5 \times 4.00$ | g) $4.35 \times 2.74 \times 3.008$ |
| d) $0.085 \times 0.050 \times 0.655$ | h) $35.7 \times 0.78 \times 2.3$ |

5. Divide:

- | | | |
|----------------|------------------|--------------------|
| a) $35 / 0.62$ | c) $0.58 / 2.1$ | e) $3.76 / 1.62$ |
| b) $39 / 24.2$ | d) $40.8 / 5.05$ | f) $0.075 / 0.030$ |

6. Express the Following in Scientific Notation:

- | | | |
|---------------|---------------|-------------|
| a) 0.00003 | c) 55,000,000 | e) 0.000007 |
| b) 8, 000,000 | d) 0.002 | f) 65,000 |

7. Do the Following Calculations Using Scientific Notation and Using Correct Significant Figures:

- | | |
|---|--|
| a) 0.0005×0.002 | g) $0.008 / 0.00002$ |
| b) $5,000,000 \times 6, 000$ | h) $(60,000 \times 7,000) / 1,000$ |
| c) $65,000 \times 0.003$ | i) $(0.0006 \times 0.002) / 0.0003$ |
| d) $750,000 \times 20,000 \times 3,000$ | j) $(0.0006 \times 8,000) / 120$ |
| e) $9,000 / 300$ | k) $(400,000 \times 0.0008 \times 3,000) / (0.0002 \times 0.0006)$ |
| f) $400 / 20,000$ | l) $(0.08 \times 200 \times 0.004) / (800 \times 300)$ |

Answers:

- 4, 3, 3, 2, 6, 4, 3, 2, 3, 5, 4, 5, 4, 4
- 29, 32.9, 7.16, 0.1770, 55.35
- 11.21, 7.3, 200, 13.31
- 9.8, 2.4, 32, 0.0028, 16, 0.00007, 35.9, 64
- 56, 1.6, 0.28, 8.08, 2.32, 2.5
- 3×10^{-5} , 8×10^6 , 5.5×10^7 , 2×10^{-3} , 7×10^{-6} , 6.5×10^4
- 1×10^{-5} , 3×10^{10} , 2×10^2 , 5×10^{13} , 3×10^1 , 2×10^{-2} , 4×10^2 , 4×10^5 , 4×10^{-3} , 4×10^{-2} , 8×10^{12}