

## Appendix A: Significant Figures

Here are some guidelines to determine the number of significant figures in a measurement or a calculation.

- 1 All nonzero digits are significant, for example, 4.583 has four significant figures.
- 2 All zeroes between two nonzero digits are significant, for example, 101 contains three significant figures.
- 3 All zeroes to the left of a decimal and to the right of a nonzero digit are significant, for example, 100.0 contains four significant figures.
- 4 All zeroes to the right of the decimal point and to the right of a nonzero digit are significant, for example, 2.010 has four significant figures.
- 5 The number of significant figures does not depend on the position of the decimal, for example, 0.00225 m and 0.225 cm both contain three significant digits.
- 6 When making a measurement, record all significant figures, for example, when using a meter stick to measure a length of 75.0 cm, it should be recorded as 75.0 cm and not 75 cm.
- 7 When adding or subtracting measurements, the result should be recorded to the same number of decimal places regardless of the number of significant figures. That is, the sum or the difference should have the same number of decimal places as the measurement with the fewest decimal places, for example,  $50.5 + 0.32 = 50.8$ , not 50.82.
- 8 When multiplying or dividing, the result should be recorded to the same number of significant figures. The number of significant figures in a product or quotient cannot be larger than the quantity with the least significant figures, for example,  $2.504 \times 2.0 = 5.0$ , not 5.008.

**Caution:** To avoid introducing additional error do not round off numbers before using them in a calculation; round to the correct number of significant figures only when stating the result of the calculation.

- 9 If you are counting items, and the number ends in zero, such as 30 students, the final zero is significant.