

- Scientific notation is utilized frequently in all sciences, including chemistry, and serves as a quick method of abbreviation.
- International System of Units prefixes can also be very helpful in writing very large or very small numbers and are added onto the base or derived units to indicate specific value.
- Accuracy is the ability of a measuring device to obtain the correct value, and precision is the ability of a measuring device to obtain the same value with repeated measurements.

2.13 DEFINITIONS

Accuracy

The ability of a measuring device to obtain the correct value

Base units

Units of the International System of Units that are directly measurable.

Calibrate

The process of ensuring that your measuring device is accurate.

Derived units

Units of the International System of Units that are calculated; units that are made up of the product or quotient of base units and/or other derived units.

Imperial units

The official measurement units of Great Britain.

International System of Units

The official measurement units of a large majority of the world as well as the scientific community.

Kelvin

The SI base unit of temperature; 1 K = the change in temperature that results in a change of thermal energy by 1.380649×10^{-23} J.

Kilogram

The SI base unit of mass; the amount of matter defined by a relationship to Planck's constant. (Note: this amount of matter corresponds to the mass of a 47 cm^3 cylinder of platinum-iridium alloy).

Measurement

The assignment of a number to a characteristic of an object or event, which can be compared with other objects or events.

Meter

The SI base unit of measurement; the length of the path that light travels in a vacuum in $1/299,752,458$ second.

Metric system

The previous base 10 measurement system that was subsequently converted into the International System of Units.

Mole

The SI base unit of amount of a substance; the amount of substance of a system which contains $6.02214076 \times 10^{23}$ units.

Precision

The ability of a measuring device to obtain the same result when measuring the same value repeatedly.

Qualitative data

Data which have no numbers or values; subjective information.

13. True or False: the base unit for mass is the mole.
14. Which SI unit relies on the Planck constant for its definition?
15. What makes a derived unit different from a base unit?
16. What is the base unit for temperature?
17. The base units mol/s² define which derived unit?
18. What is "decimal piece x exponential piece" called?
19. Put the following numbers in proper scientific notation.
 - a. 1101258.3.
 - b. 000.0015687
 - c. 98300.2
 - d. 0.0000000012
 - e. 5980000000000000
 - f. 267.15300009
20. Write out the following numbers in their correct numerical form, as well as spell out what the unit was before you converted it. Note that the scientific notation conversions do not require you to spell out what the unit was before you converted it since there is no unit provided. For example, 5.0 fC would be 0.000000000000005 C and the "fC" stands for "femtocoulomb."
 - a. 1.56 pm
 - b. 27 kA
 - c. 206 EJ
 - d. 7.56×10^8
 - e. 12 ns
21. What is accuracy?
22. What is precision?
23. True or False: it is not possible for a measuring device to be precise and inaccurate.