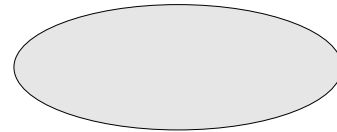


In science, we make our living as it were by measuring. As a human activity, measurement involves some errors. When making measurements, there are (usually) three potential sources of error:

The person who is making the measurement could make a mistake. The same person who measures the same thing more than once is likely to record different measurements for each trial. Likewise if different people measure the same thing, they are likely to record different measurements.

The object being measured may change between measurements or a slightly different dimension may be measured at different times.

The measuring tool may not be completely reliable.



Sources of error: Scientist, tool, object

Because of this error, scientists report measurements along with an estimate of uncertainty. The person who is reading the results can use this estimate to decide how believable the data are. For high school physics uncertainty of $\pm 5\%$ is generally acceptable.

When reporting a measurement, a physicist may record the following:

1.00 ± 0.01 m to represent a measurement of a board (perhaps being used as a ramp in an experiment). This would mean “the actual length of the board is between .99 m and 1.01 m. If measuring with a meter stick with the usual millimeter marks, then any competent physics student would be able to record a measurement with greater precision.