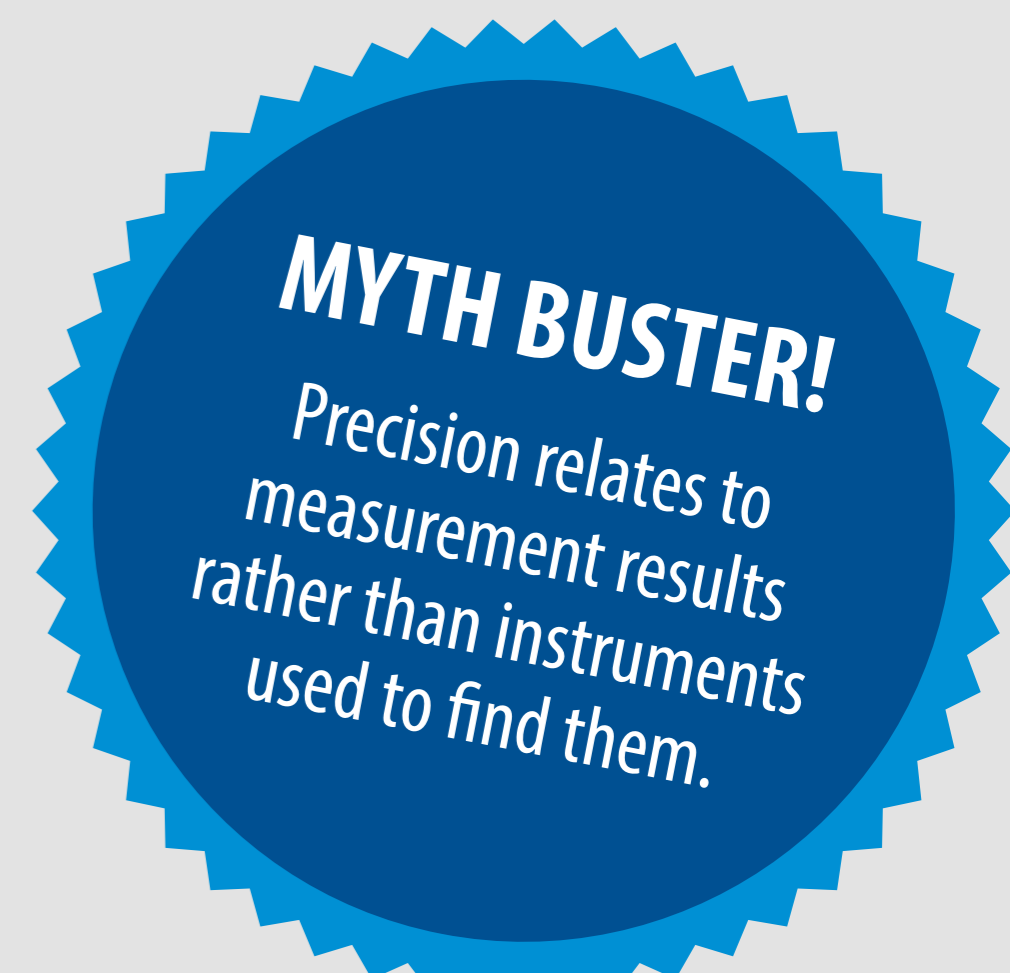


The difference between ACCURACY, PRECISION & TRUENESS

Several words are internationally agreed to describe measurement results. This poster should help you understand some of these words.



Accuracy is the closeness of agreement between a measured quantity value and a true quantity value of a measurand.

Precision is the closeness of agreement between indications or measured quantity values obtained by replicate measurements on the same or similar objects under specified conditions.

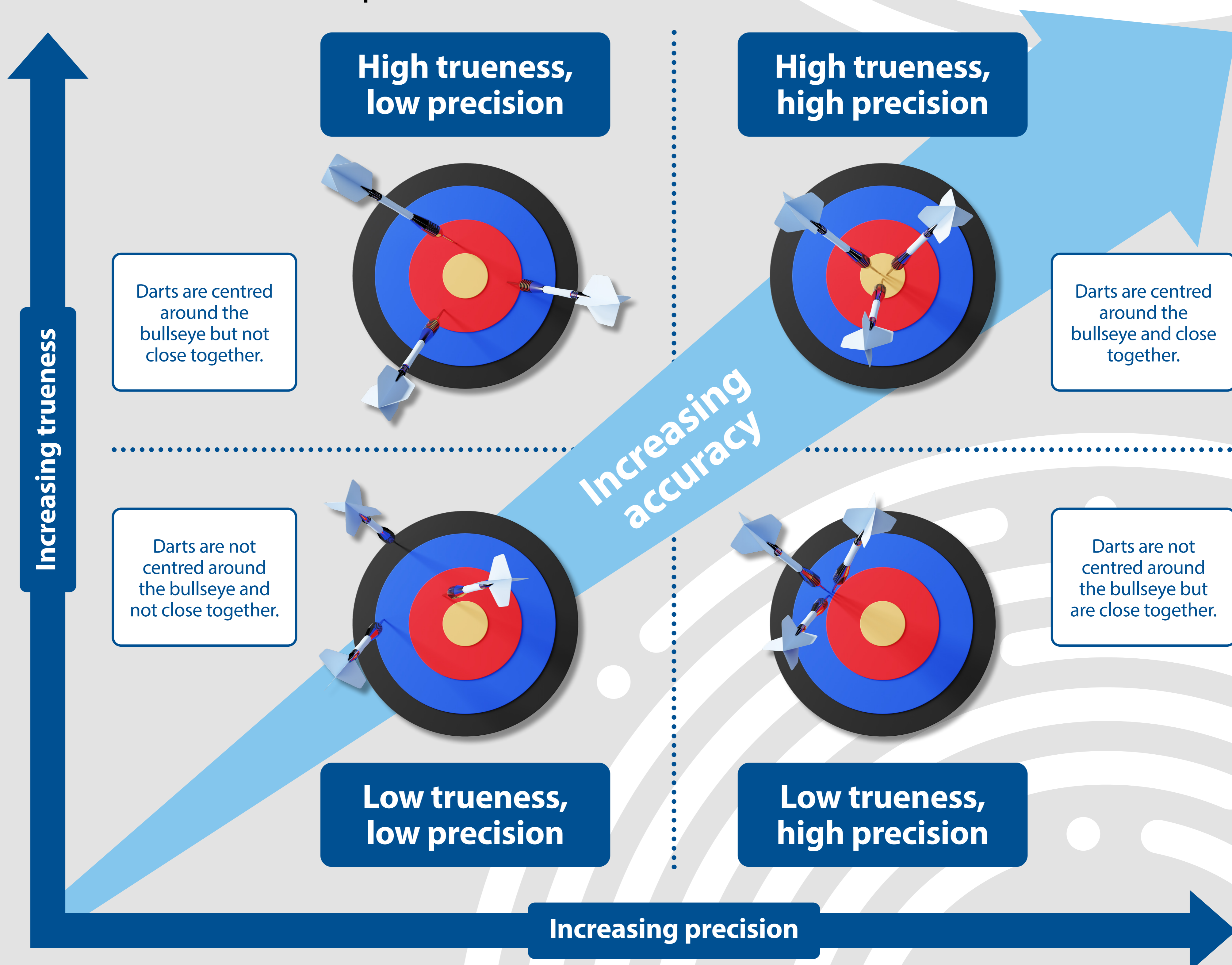
Trueness is the closeness of agreement between the average of an infinite number of replicate measured quantity values and a reference quantity value.

High **accuracy** is a combination of high **precision** and high **trueness**.

Even when we have **precision** and **trueness**, there will still be some uncertainty in our measurements (where uncertainty describes the range within in which the true value can be expected to lie).

The challenge for people doing measurements is to find the uncertainty and ensure it is acceptable for a particular application. For example, an uncertainty of a millionth of a gram is not needed to measure cake ingredients, but may be required in some scientific experiments.

In the illustrations below, darts represent measurements. For trueness, the centre of the target represents the reference value. Precision describes how close the repeated results are to each other.



Did you know?

The National Physical Laboratory (NPL) develops and maintains the UK's primary measurement standards, which are used to check the accuracy of instruments used by thousands of other organisations making millions of measurements.



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