LENGTH MEASUREMENT

HISTORICAL NOTE

Measurements became important when people began to trade with each other and began to buy things like corn, cloth, etc. This led to the state taking an interest in measurements, particularly the tax gatherers. Measurement also became important when people began to pay for things using a specific weight of gold of a specific quality, i.e., money. In this case the government of the Ancient Greeks ensured that all the coins were of the correct weight and correct fineness.

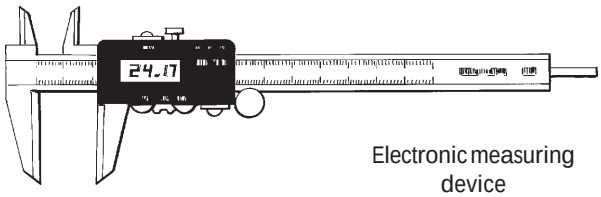
In Britain, the system which is still in general use was inherited from the Romans with some addition from Celtic practice and its present form was largely standardised around 1305.

In 1968, the British government voted in favour of the adoption of the metric system in the UK. However, the public at large have not been nearly so ready to dispose of 2000 years of tradition.

MEASURING LENGTH

Most people in everyday life use a ruler or tape measure for measuring things or marking out distances. Using these things is only as accurate as the divisions marked or stamped on them and our ability to line up the markings with things we measure.

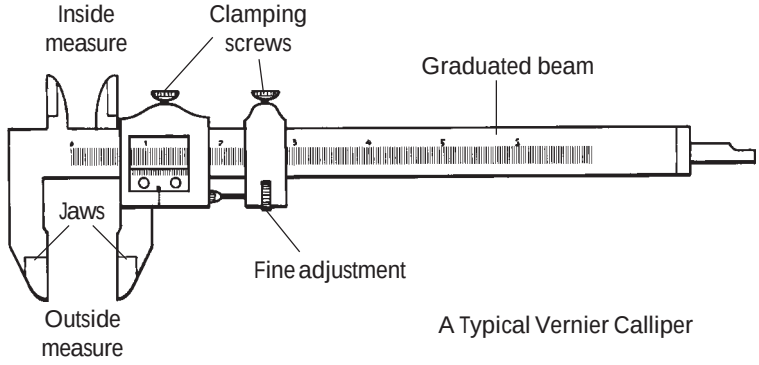
In engineering, a vast range of more precise measuring devices is available. Many of these now involve electronics and provide a very accurate digital display of numbers. Some more advanced measuring instruments use computers to interpret data from sensors.



Electronic measuring device

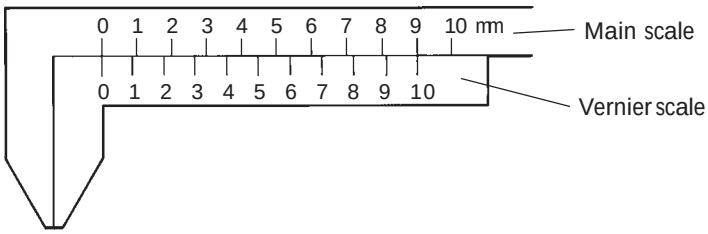
Most of the precision workshop measuring instruments you might come across and use are likely to be mechanical and will use either the vernier or micrometer principles. The cost of digital read-out instruments is still quite high - although in time they may well replace mechanical instruments as calculators have replaced slide rules for calculations.

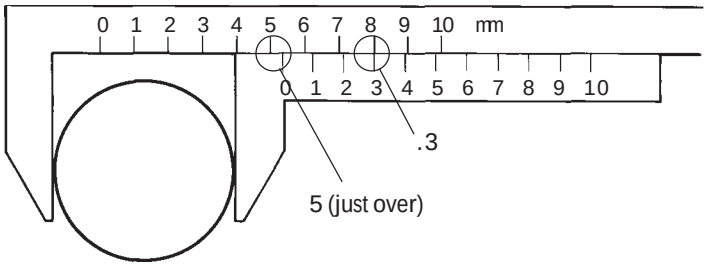
The Vernier Calliper



A Typical Vernier Calliper

A vernier calliper consists of a beam with a fixed jaw and a jaw that can slide along it. The beam has a graduated scale and the sliding jaw has a shorter one. An enlargement of a simplified vernier calliper will show how it works.





You will see first of all that the small scale is 1/10 mm shorter than it should be. This shortening is the key to the vernier principle .

When you measure something, the '0' graduation on the small scale moves to a point on the main scale. The example shows that we are measuring something just over 5 mm across. How much is it 'just over' ? Look along the small scale until you come to the point where a graduation coincides with one on the main scale. This figure is the additional length in units of 1/10mm. The overall reading in the example is therefore 5 mm + 3/10 mm = 5.3 mm.

On a real vernier calliper, the divisions on the two scales are finer than those shown in the example.