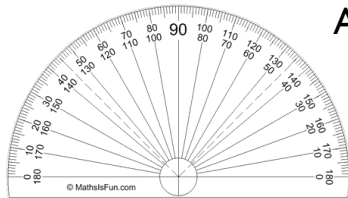
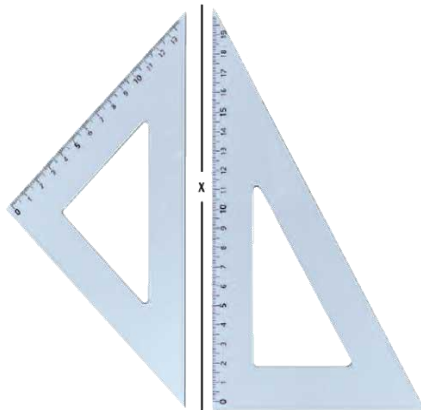
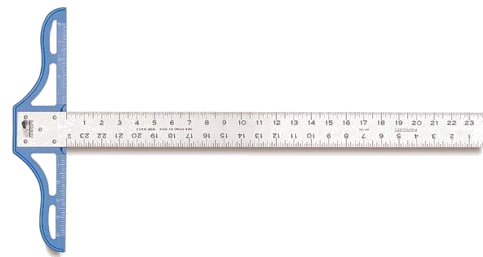


A **compass** is an absolute essential piece of equipment. It is well worth buying a good set which includes at least two compasses allowing the drawing of small and large circles. The best ones are a 'bow' compass as they stay at the set size. They are used for drawing circles very accurately. A good, quality compass set will last a life time.



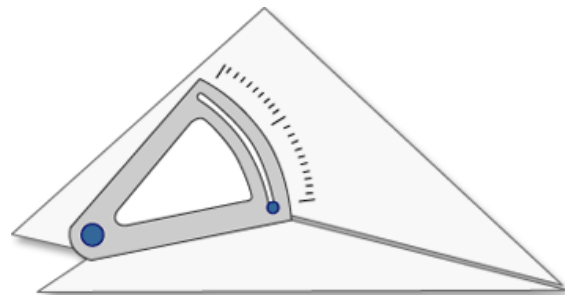
A **protractor** is used to measure angles. A typical protractor is a semi-circular piece of plastic with 180 degrees printed around its curve. It is used for constructing accurate angles.

T-Squares are used to draw horizontal lines when it is used with a drawing board. They are used to construct accurate orthographic drawings. It is built into some drawing boards as a parallel motion mechanism.



Set Squares are used to draw accurate angles. The most common are 45 and 30/60 degrees. When using set squares they should always be used along with a T-Square. The Set-square rests on the straight edge of the T-Square and this ensures when the angle is drawn that it is accurate. The 30/60 degree set squares are used to draw Isometric drawings. The 45 degree set squares are used to draw in oblique.

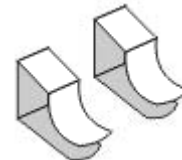
An **Adjustable Square** is a set square which can be adjusted to almost any angle. When adjusted a small screw is hand tightened, locking the set square in position. This means that there is no need to have both 45 and 30/60 degree set squares. They are much more expensive than normal set squares.



A ruler is possibly one of the most important pieces of drawing equipment. Rulers should be used to measure dimensions in millimeters (mms.) They can be shaped to stop ink smudging when using drawing pens.



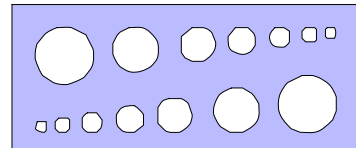
Board clips are used to hold your drawing paper in the correct position on your drawing board. They simply clip on to the board holding the paper firmly. Alternatively masking tape can be used.



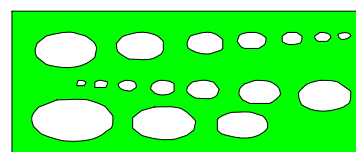
A black fine liner pen is used to draw permanent, accurate lines. Fine liner pens are available with various thicknesses of 'tips'. They are used when drawing orthographic drawings. The thicker pens are used to add a weighted outline (0.7), internal lines thinner (0.5) and hidden detail and dimensions thinner again (0.3). They are also used for printing notes alongside your designs sketches.

Circle templates are very useful. They are plastic with a number of accurate circles cut out and have marks to show the centre lines of each circle. They are used to draw circles of set diameters and are particularly useful if the circle is very small.

CIRCLE TEMPLATE



ELLIPSE TEMPLATE



Ellipse templates are similar to circle templates and these are useful for drawing ellipse (oval) shapes accurately.



Pencil sharpeners are essential for sharpening pencils. Accurate drawings cannot be produced unless they are sharp. However, when shading a blunt pencil is often better to use.



French Curves are purchased in sets of three or four. They are used to draw curves by finding the section of curve that matches the desired shape on the profile of the curve. Some French Curves also have either circles or ellipses of various sizes cut out. These can be used in the same way as circle or ellipse templates.

A **Flexi-curve** is used to draw curves. It can be formed into almost any curve as it is flexible. Flex-curves are useful as they are simply shaped to form the desired curve. They are useful when constructing an ellipse or joining up loci points.



The Basic Parallel Motion Drawing Board.



Drawing using a drawing board can be quite difficult and requires practice.

Today we use **CAD software** to help us do a lot of drawing instead of using a drawing board.

