

materials in technical drawing

tools

5.1 Technical Drawing tools

Before analysing the specific tools used in Technical Drawing, let's look at the support we use to draw on: paper.

A Paper: the support for Technical Drawing

Drawing paper has a smooth surface and a minimum **stiffness** and is easy to draw on with pencil or ink. It doesn't leave marks when elements are erased.

Drawing paper for Technical Drawings is classified as:

- **White, coloured or opaque paper:** These are what we normally use for drawing. They are all **opaque**.
- **Tracing paper:** Because it is transparent, waterproof and resistant, we use this type of paper for **tracing** pictures.
- **Graph paper:** It has millimetric squares printed on it that help to draw graphs and charts. It can be opaque or transparent.

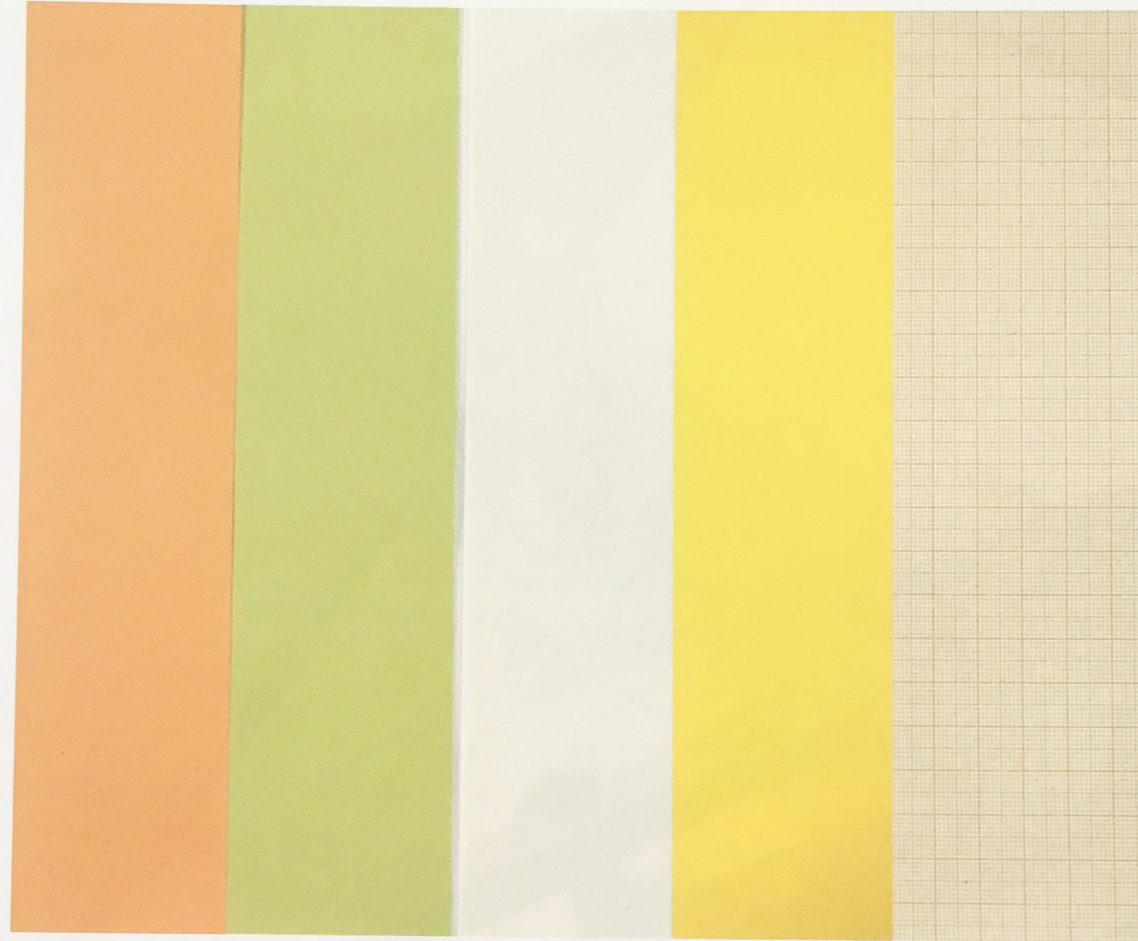
- ☰ **stiffness = not flexible**
- ☰ **opaque = not transparent**
- ☰ **tracing = from trace : to sketch the outline of**

B Graphic instruments

• Graphite pencil

We usually **draw with a graphite pencil**. We can quickly sketch lines that are clear and precise enough that we do not need to trace over later in ink.

For Technical Drawing, the best pencils to use are hard ones (2H or 3H).



The most common paper sizes we use are:

A-3	420 x 297 mm
A-4	297 x 210 mm
A-5	210 x 148 mm
A-6	148 x 105 mm

• Felt pens

In the classroom, disposable felt pens are more appropriate and come in different thicknesses.

Their tips are made of fibre, felt or nylon.

• Mechanical propelling pencil

It is a plastic or metal tool that has an inner tube that holds a graphite lead. It has a mechanism that stops the lead from sliding back up inside when you push on it while writing or drawing. You don't need to sharpen propelling pencils.

• Stilograph

This is a tool we use for ink drawings. There are two types of stylographs: reusable ones (that have an ink cartridge we can replace when it is empty) or disposable ones with cartridges that cannot be replaced.

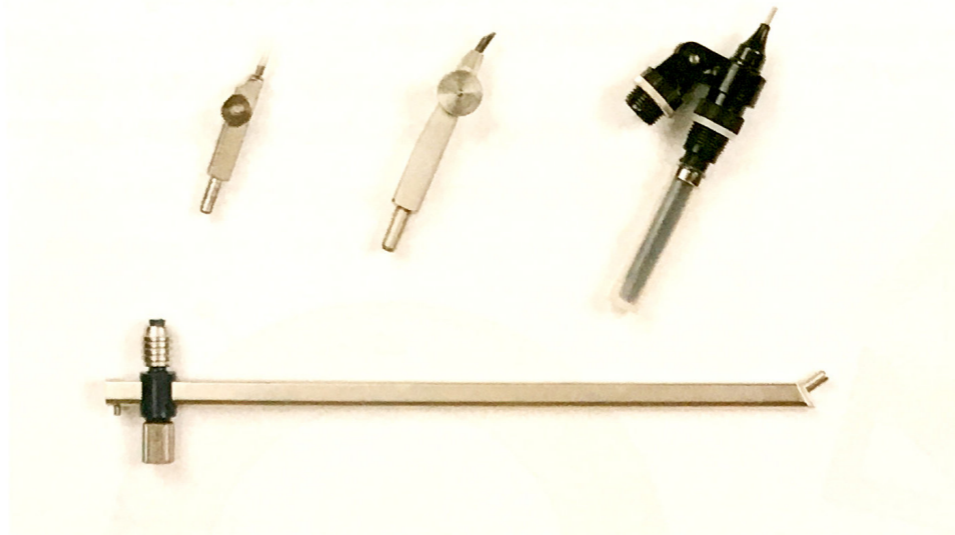
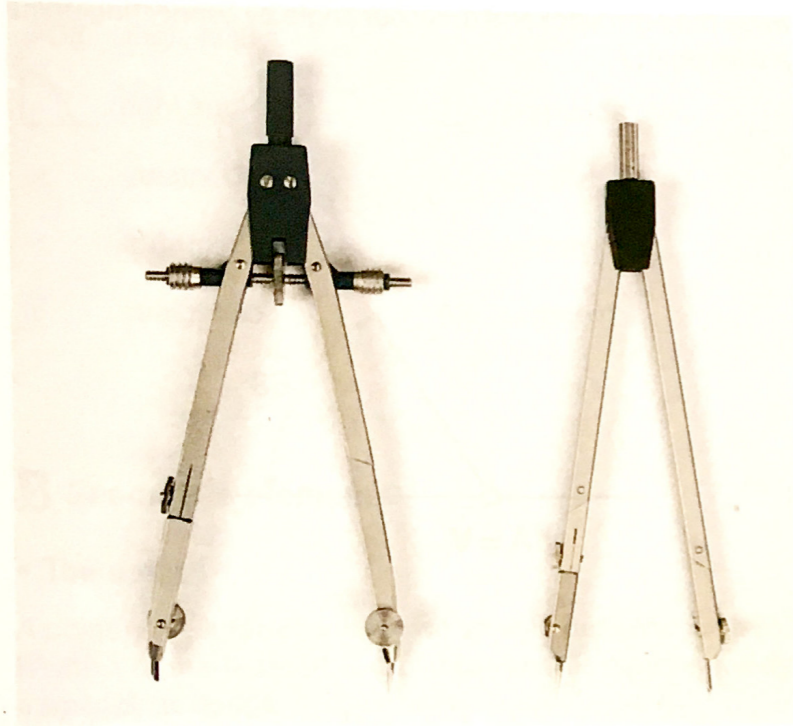
C The rubber or eraser: a correcting tool

A rubber is used to eliminate incorrect or extra lines. There are erasers for each type of pencil hardness (harder erasers are for harder leads).



D The bow compass: a tool for drawing curves

This tool is used to make arched lines and circles. It has two articulated arms that come together where the handle is.



• Bow Compass accessories

- Extension bar (used to make large arcs or circles)
- Ruling pen holder (for stylographs or felt pens)
- Graphite lead insert
- A container for spare leads

E Tools for making straight lines: the ruler and the triangular set square

The most common tools used for making straight lines are: the graduated ruler and the 45 and 60 degree set squares.

• Graduated ruler

This is a precision tool we use to measure distances. It is usually made of plastic and has a bevelled edge with the measurements marked in millimetres.

To avoid breaking your ruler, do not use your compass directly on it while measuring.

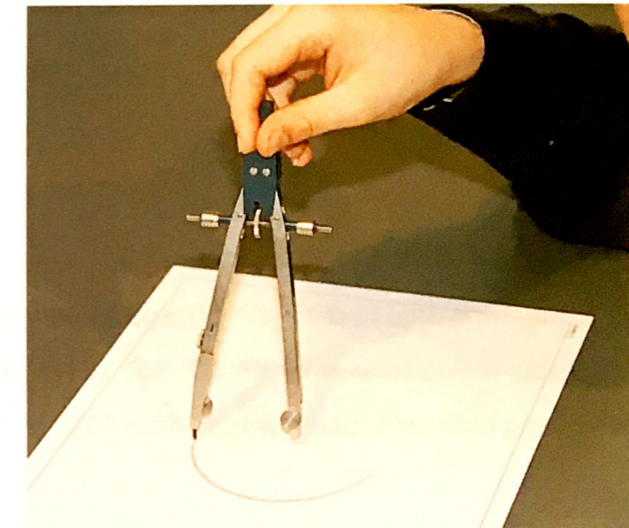
• Triangular set squares

Triangular set squares consist of two triangles, though we call them triangular set squares: the 45° set square and the 60° set square.

- The 45° set square is an isosceles triangle. Two sides make a 90° angle and its hypotenuse forms a 45° angle with each of the other two sides.

• Using a bow compass

- Sharpen the graphite lead with a bevelled edge and place it in the lead insert.
- The point of the compass must be slightly longer than the graphite lead.
- When drawing the arc or circle, the graphite lead (or pen) and the compass point must both be perpendicular to the paper.
- Hold the handle of the compass between your thumb and finger and rotate it gently in a clockwise direction. Put the compass at a 10° to 15° angle in the direction you are turning.

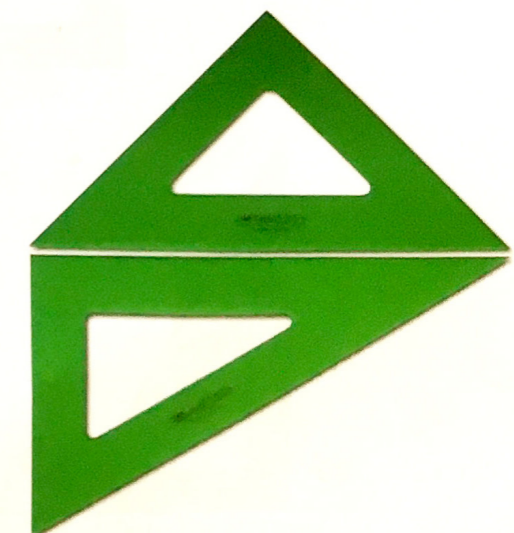


 bevelled edge = sloping edge



- The 60° set square is a scalene triangle. Its shorter edge is half of its hypotenuse. The two sides make a 90° angle; yet, the hypotenuse makes a 60° angle with one of the sides and a 30° angle with the other.

The 45° and 60° triangular set squares form a set when the longest side of the 60° triangle is the same as the hypotenuse of the 45° triangle.





vocabulary

graduated ruler

set square

compass

Graphite pencil

eraser/ rubber

paper

felt pen /

marker