



**METALWORKING TOOLS**

**Steel rule**

It is used for setting out straight lines and distances, setting caliper and dividers and for checking edges and surfaces for flatness.



**Engineer's square**

Has a metal blade fitted to a metal stock. It is used for setting out and testing angles of 90°.



**Centre punch**

Has a thicker section and the point is 90°. It is used for marking centers for drilling holes.



**Vee Blocks**

Normally come in pairs and are usually fixed with fasteners to hold the job piece.

It is used to hold up cylindrical work during marking.



**Calipers**

Are used for measuring work, checking and transferring dimensions.

**Outside calipers**

Are used for checking and testing external diameters.



**Inside calipers**

Are used for checking and testing internal diameters.



**Hand Drill Bits**

Many varieties of bit are designed for boring holes. Bits have a round shank to fit into the chuck of the hand drill. The term boring means cutting holes in materials.



**Metalworking Bench**

It is a very essential equipment for any metal workshop. It comes in many designs and shapes and should be strong and firm. Care of the bench must be taken at all times so that the surface remains smooth and level.

It is used for supporting your practical work piece or project while you work on it and during various other operations in completing your tasks and projects



**Bench Vice**

It is made from malleable cast steel. The parts are machined to slide together, or fabricated from mild steel. They are fixed to a work bench and are a common feature in any metal shop.

They are used for holding and supporting the work while cutting, grinding, drilling and welding.



**Marking Out**

It is the process of transferring measurements onto a work piece as the first step in the design process. It consists of transferring the dimensions from the work plan to the work piece then constructing or manufacturing the item.

The use of tools to measure and mark the work play an important role with the aid of rulers, gauges, squares, dividers, pencils, etc. This will determine the accuracy of measuring and marking during practical work.

**Marking off**

It is the process of laying out needed information in the form of center lines, circles, outlines, to show the position and area of work to be done and in setting out the work piece.

**Surface Preparation**

Surfaces are usually prepared to assist in marking and to ensure that the lines are clearly seen. First, oil or grease should be cleaned from machined surfaces, rust or scale brushed from steel plate, and castings dressed to remove sand or any irregularities.

#### ACTIVITY

1. State the use of these metalworking tools
  - A. Bench vice
  - B. Engineers square
  - C. Centre punch
  - D. Vee Block
  - E. Inside caliper