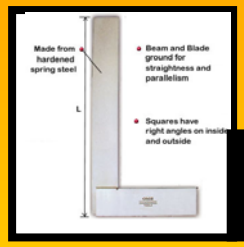
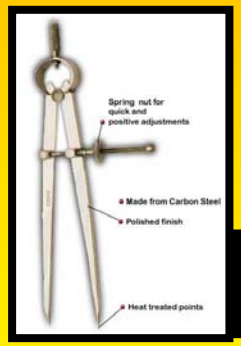
MARKING OUT - METAL



ENGINEERS' SQUARE



DIVIDERS

CENTRE PUNCH

ODD LEG CALIPERS

SCRIBER

Before cutting, shaping, drilling or just about doing anything to a piece of sheet metal, you should clearly mark out guidelines to help you work accurately.

There is a whole range of tools designed specifically to help you mark out your metal more easily. You will need to know how to describe these tools for the exam. Learn their names, their individual parts and learn how to describe how they are used.

Click on the black squares above to find out more about the marking out tools used in metalwork.

SCRIBER

WHAT IS IT ?

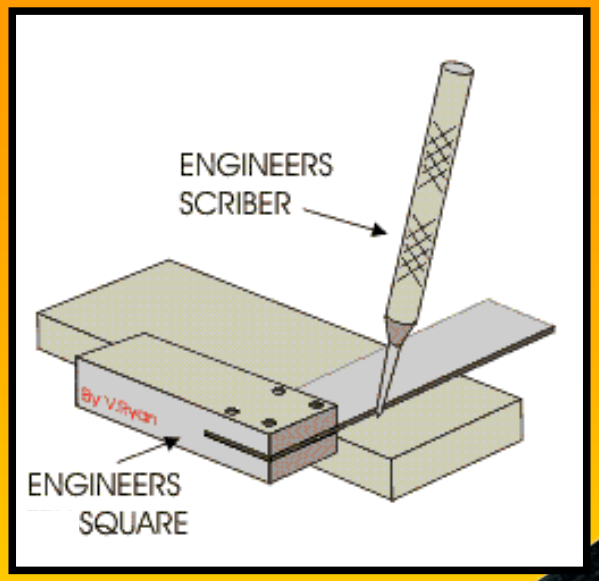
A scriber – this one is double ended although they can be single ended.

WHAT IS IT USED FOR ?

It is basically used as a pencil when marking out in metalwork. If a pencil or pen was used to mark out in metalwork, the lines would easily rub off. The scriber scores a more permanent line on the surface of the metal which is easier to work with.

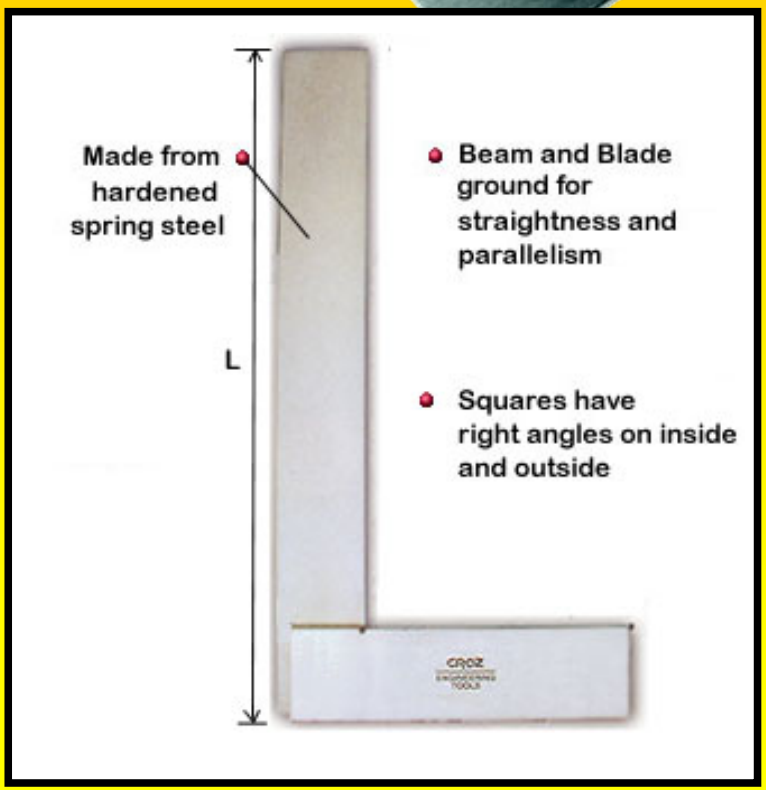
CRAFT & DESIGN

ENGINEERS` SQUARE



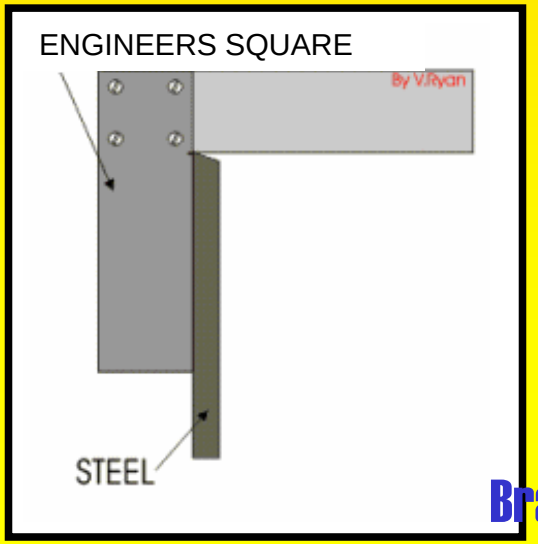
WHAT IS IT ?

An engineers` square is a metalwork tool used to mark out lines at right angles to an edge on metal.



WHAT IS IT USED FOR ?

The square is pushed against a straight side of the material (e.g. steel). An engineers scriber is then used to scratch a line onto the surface of the metal at right angles to the edge. Sometimes engineers blue (a dye/ink) is wiped onto the surface first so that the scratched line can be seen easily. The material is then cut down to this straight line.



Look closely at an engineers` square, you should see an interesting feature. There should be a small slot that has been cut into the stock. This prevents small burrs caused by filing from altering the try-squares accuracy. Dirt can also collect on metal surfaces, again the slot helps prevent measuring angles inaccurately.

In the example seen opposite, the engineers` square is used to test that a $90^0$ angle exists across the edge of the steel. Although a burr exists on the edge of the steel it fits into the slot and does not affect the way the engineers` square is used.

ODD LEG AND OTHER CALIPERS

ODD LEG CALIPERS

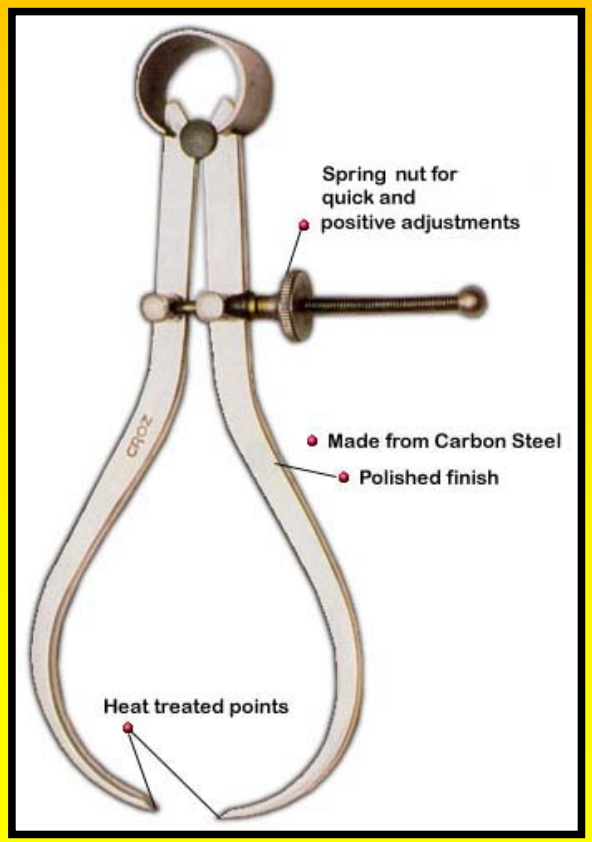
are used to draw lines on metal parallel to an edge. They do the same job in metalwork as a marking gauge does in wood. The bent leg runs along the side of the metal and the pointed leg scribes the line.

INSIDE CALIPERS

are used to measure the diameter of the inside of a hole in a piece of metal. You can see them being used in the photo above. Once the size is gauged, the distance between the points on the calipers is measured with a rule.

OUTSIDE CALIPERS

are used to measure the outside diameter of round objects. The points are opened and closed by turning the nut.

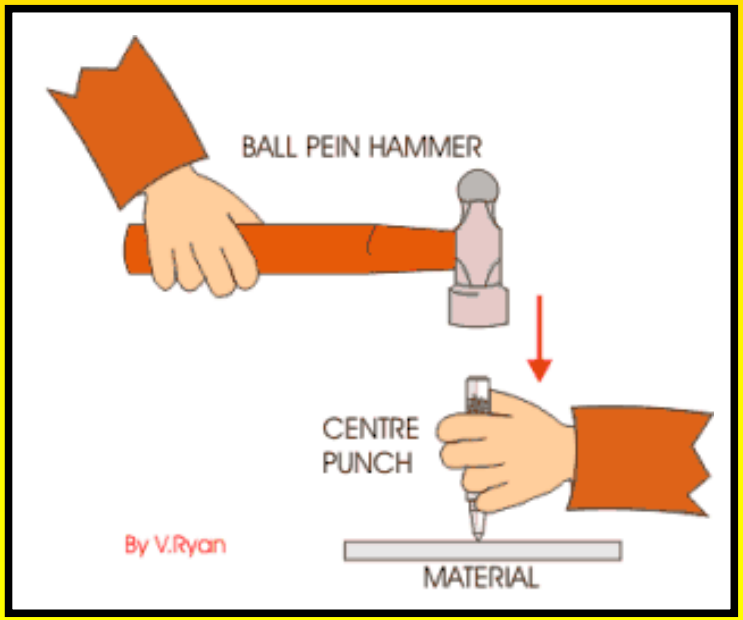


CENTRE PUNCH

Square section striking head with knurled body and polished ends. Manufactured from carbon steel hardened and tempered.

WHAT IS IT ?

A centre punch is a metalworking tool which is used to produce a small dent in metal which acts as a starting point for any hole to be drilled.



WHAT IS IT USED FOR ?

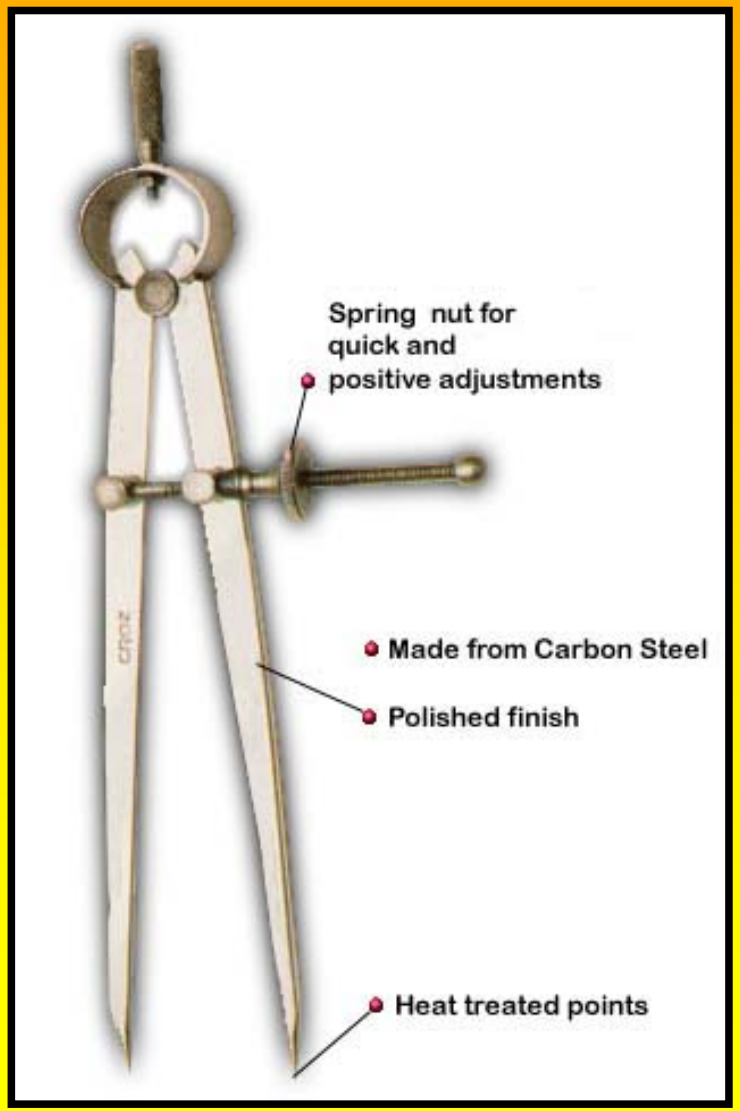
A ball pein hammer is used to tap the head of the centre punch and this delivers enough force to the point of the punch to put a small dent into the surface of the material.
It is important to have the material supported underneath by a solid surface.

some more

marking out tools

The centre punch shown above is an `Automatic` centre punch. A spring inside the punch means that when downward pressure is put on the punch by hand, it automatically `clicks`, producing the required dent without the need for a hammer.

DIVIDERS



WHAT ARE THEY ?

Dividers are a Metalwork marking out tool. They look and behave a lot like compasses. They have two legs which are hinged and can open and close by rotating a small nut. Instead of a point and a pencil, Dividers have two points. Both points are hardened to stay sharp for longer.

WHAT ARE THEY USED FOR ?

Dividers are used to mark out shapes onto sheet metal. They are used just like compasses to scrape circles and arcs onto the metal.

They work best if a small indent is placed on the sheet metal using a centre punch for one of the legs to rest in.