

## D&T: Cutting materials

Materials to be cut or drilled should be held securely using a vice, bench hook or G-clamp. Sharp tools are safer than blunt tools when correctly used, as they cut materials more easily. Although primary school children often work in small groups, one child should never hold materials being cut or drilled by another. Chisels are not appropriate for use in primary schools.

### Cutting mats

It is essential to use a cutting mat when cutting materials. It prevents surfaces being damaged, and provides a non-slip surface to cut on.



### Bench hooks

A bench hook helps pupils to cut in straight lines and using a corner bench hook prevents sideways movement. Remember to tell children to maintain the pressure on the hook whilst sawing, to avoid movement.

When cutting materials using a hacksaw and a bench hook, children need space on both sides of the bench hook.

A common mistake is for children to cut too deeply and damage the bench hook. Most bench hooks are designed to be used by left or right handed pupils and are available in different sizes.



Different types of bench hook help children to carry out different cutting tasks, as shown in the photos below.

A bench hook with a cam can help children to get a better grip on materials. The cam is a partially rotating semi-circle of wood which is fixed in place by a shaft. It allows the child to put additional pressure on to awkwardly shaped materials to prevent the material from moving or slipping.



Using a slotted bench hook to cut a right angled cut



Using a slotted bench hook to cut a 45° cut (mitre)



Using a bench hook with a cam to get a better grip on materials.

Clamping bench hooks to the table can help prevent slipping.



Left handed bench hook clamped to table using G clamp (note that the clamp is on the right to allow space for working)



Right handed bench hook clamped to table using G clamp (note that the clamp is on the left to allow space for working)

## Cutting and holding guides

Cutting guides are also known as mitre blocks. These have a slot to take a wooden strip and guide the saw at the chosen angle, usually 90° and 45°. Some bench hooks have cutting guides built into them. Guides can be clamped to the table or held in a vice.



*Lynx jointer*

The Lynx jointer shown in the photos is made of plastic and is used to hold pieces of wood together in the correct position for making accurate 90° and 45° joints. This also helps when fixing an upright or for marking or drilling holes.



## G-clamps and vices

A G-clamp can be used to hold a bench hook, or to keep large objects together while joints dry. It can also be used to hold materials steady when using a drill. Use a piece of scrap wood to stop the clamp marking the table.



A small, lightweight vice can be clamped to the workbench or table. The jaws will hold a round-section object for cutting. It may leave marks on the object. When using a vice to hold materials whilst drilling, the drill should be used close to the jaws of the vice to prevent the material bending.



Always saw close to where the vice grips the wood



A small vice will hold material steady when drilling. Note the position of the drill close to the vice jaws

Bulldog clips can be used for holding light, thin items such as paper and card together. Quick release clamps hold items, such as lollipop sticks, and are simple to use.



Bulldog clips

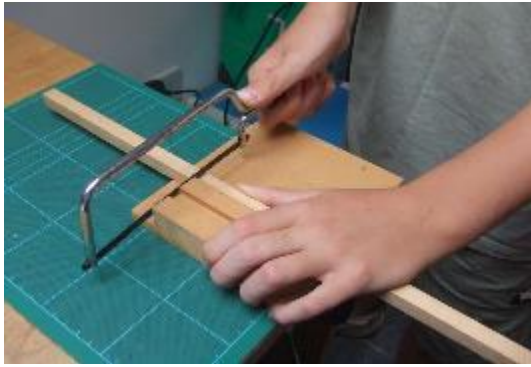


Quick release clamps

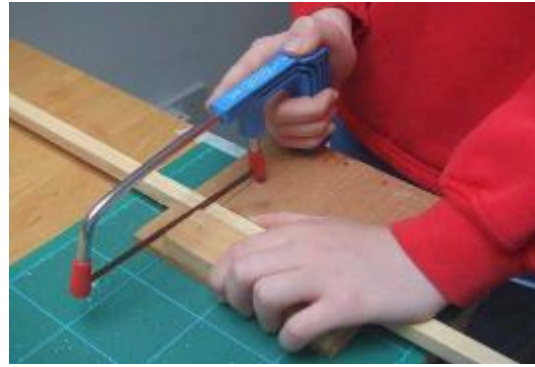
## Saws

Junior hacksaws are available as bent metal frames or with a plastic pistol grip. Using a metal frame saw requires the child to hold it with their knuckles facing downwards which may cause their fingers to be grazed when sawing. Using a pistol grip hacksaw avoids this and gives the user better control. Children should be taught to draw the saw back a couple of times to create a guide notch for sawing. If using a pistol grip saw, encourage the child to rest their index finger along the saw. The pointed finger helps with accuracy and reduces side to side movement.

*(NB. Expanded polystyrene should not be cut with saws as this produces a fine dust which stays in the air for a long time and can be breathed in.)*



Metal junior hacksaw



Junior hacksaw with a plastic pistol grip

Changing the blade on a junior hacksaw should always be done by an adult. Some hacksaws have a lever in the handle to facilitate blade changes. Always ensure that saw blades are securely fitted into the handles. A vice can be used to hold the saw whilst the blade is changed.



Bending the frame of the saw releases the pins on the blade from notches at each end. The blade can then be removed.



Compressing the frame in a similar way enables you to fit the new blade. The blade is fitted with the teeth facing forward as the saw cuts on the forward stroke.

A Tenon saw can be used by older and more experienced children to cut larger pieces of wood. Saws with more teeth per inch are safer and more effective to use, as they cut more easily.

A modelling saw can be used to cut smaller sized pieces of wood. As it is narrow and rigid, it will not bend as easily as a hacksaw and will only cut to a shallow depth.



Tenon saw



Modelling saw

## Cutting with sharp edged tools

***Some educational employers may have banned the children's use of craft knives. You must follow your employer's rules.***

Use craft knives with retractable blades and remove any spare blades from the handle. There should be one-to-one adult supervision when children use a craft knife for the first time. As they become more competent the level of supervision can be decreased. Children must keep fingers behind sharp edges of tools. A grooved metal safety ruler should be used when cutting with a craft knife. Always cut away from

the body or hand holding the material or safety ruler. When cutting materials using a craft knife, always use a cutting mat. If you are cutting thick card, make several light cuts with a knife rather than one heavy cut.



A safety ruler



Using a safety ruler

A rotary cutter uses a sharp-edged wheel, and should be used with the same precautions as a craft knife. Compass cutters are the same as drawing compasses, but use a blade instead of a pencil to cut circles. These should only be used by primary school aged children under very close supervision.



Compass cutter



Rotary cutter