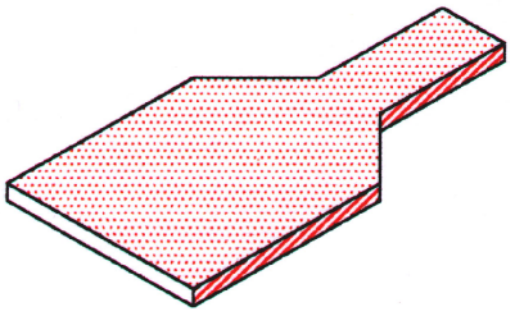
COMMERCIAL PRODUCTION

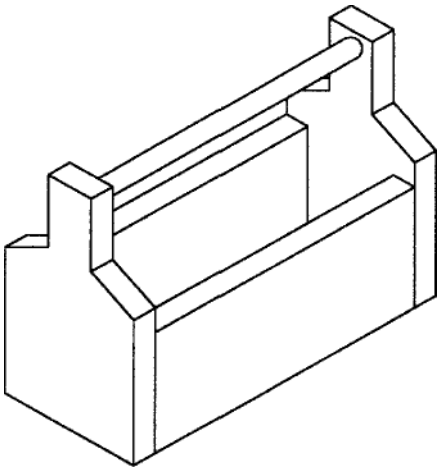
Most products are produced in large numbers, each being identical to the planned design. Dimensional accuracy is very important, especially when parts have to fit together. When a product is being handmade as a one-off, a common cause of error is incorrectly measuring when using a ruler. When a product is produced by mass or batch production methods, the need to measure using a ruler is removed by the use of **Templates** and **Jigs**.

TEMPLATES

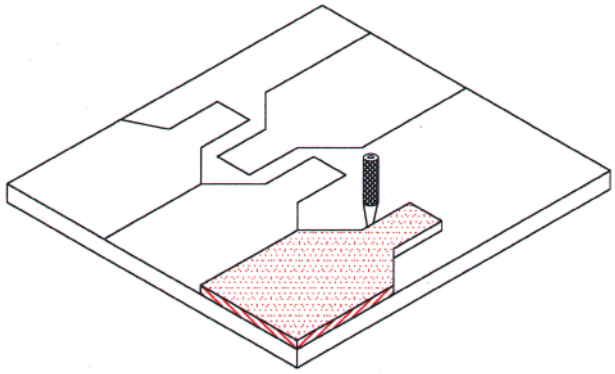
A template is an accurately formed shape, made from a rigid material. The template can be drawn around or followed repeatedly without wearing.



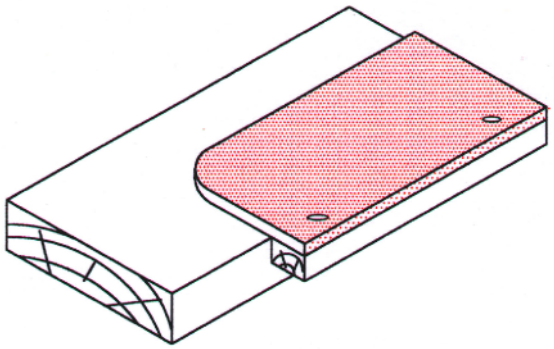
A template made from hardboard, used to mark out the ends of a bottle carrier.



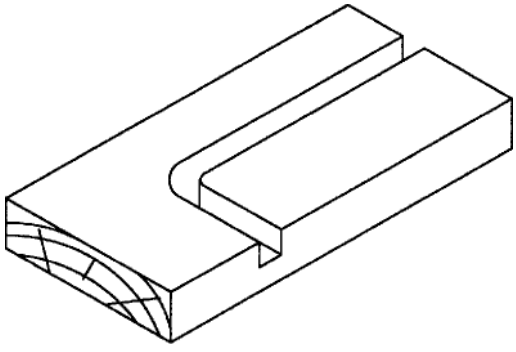
The template can also be used to save on waste when marking out a number of identical shapes on a sheet of material. When the shapes are drawn linked together, they are said to be **tessellated**.



Templates can also be used during the production process to guide a cutting tool.

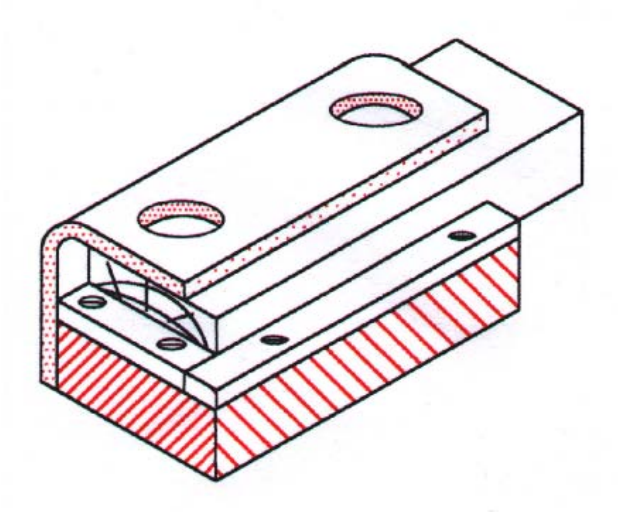


A plywood template can be used to guide the cutting of a groove, using a router.

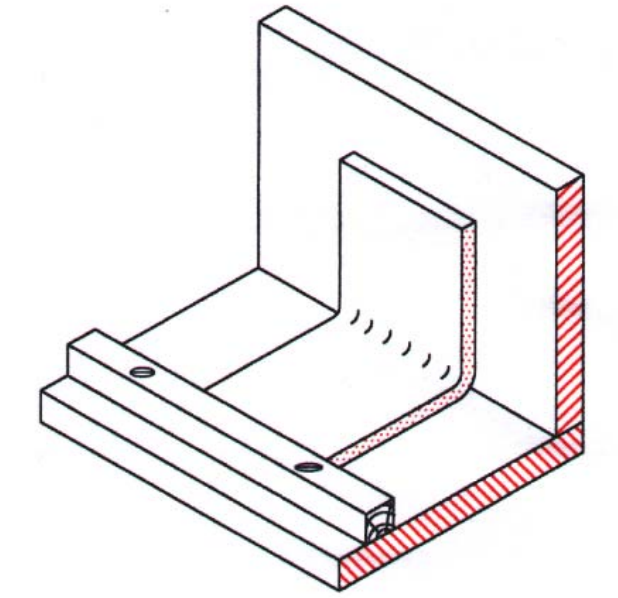


JIGS

Jigs are used to ensure that dimensions are always accurate. They are particularly useful when the positioning of holes and bends are important. They are designed so that they either hold the work piece in the correct position or guide the cutting tool into the correct position. It should be possible to line up the jig with the work piece and clamp them together to stop slippage.



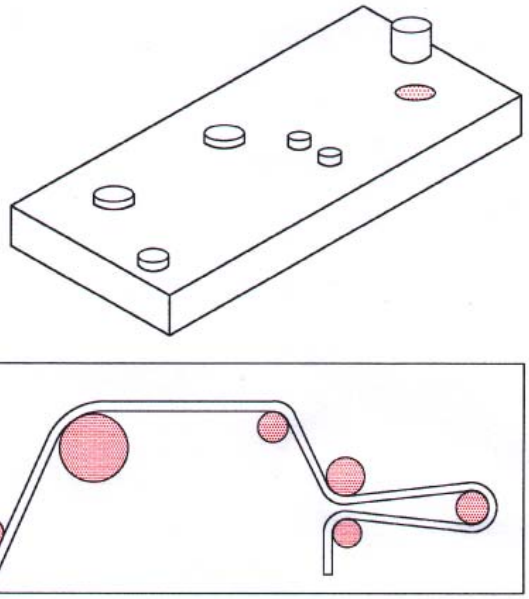
A jig made in school for lining up holes when making dowel joints.



A jig for bending heated plastic sheet in the correct position every time.

KEY WORDS Template: Tessellation: Jig:

Below is a jig used for bending steel rod to make junior hacksaw frames. The jig is made from mild steel. The pins are removable to allow the rod to be bent into position. The pin for the end of the handle is shown removed from its locating hole.



The completed frame

1. Give an example of when dimensional accuracy is important.
2. What is a common cause of error when products are handmade?
3. Describe a template.
4. Show a template being used to draw tessellations (draw your own example).
5. Apart from drawing shapes, what else can a template be used for?
6. Why is a jig used?
7. Give two examples of what a jig can be used for.
8. What can happen that stops a jig being an accurate guide?
9. Why are some pins removable in the junior hacksaw frame bending jig?
10. What material is the hacksaw frame bending jig made from?

A. Design a jig to line up the hole used to locate the handle in the ends of the bottle carrier (shown in the first column). Show how the jig will locate with the end piece and be held in place. Name the materials used for the jig.

B. Design a jig, or jigs to allow the correct bending of sheet acrylic to produce the recipe holder shown.

Height 200mm
Width 180mm
Depth 200mm