

First make your sawing table...

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Are we sometimes teaching pupils to use the wrong tools in the wrong way? Jan Hudtloff Nielsen suggests two ways of improving practice and outcomes and saving money too

I have for some time been wondering how much acrylic is being wasted in technology classrooms country-wide by frustrated children breaking it to pieces when trying to cut key fobs, electronic faces and intricate jewellery using a standard coping saw and a workshop vice.

Teachers may cry “Careful — not too much force, keep it down in the vice, support the material with your left hand on the tricky bits...” but it seldom has the desired effect for long. And yet few teachers will admit that in fact we are showing our pupils to use the wrong tool under the wrong conditions.

Don’t misunderstand me — of course it *can* be done, if you exercise ultimate restraint, control and care, and if you are a trained adult who knows where the tricky bits are, how not to apply pressure and yet saw, and if you are patient enough to ‘rasp’ your way back on track before the carefully drawn figure’s most important parts are severed from the rest. But then, how many craftsmen would cut sheet material in any shape or form locked upright in a vice? The answer is ‘None’. And yet that is the way that we show pupils to do it, and by doing so may be responsible for generations of children who after leaving school confidently and with a 6 points per inch saw attack a brittle piece of nasty sheet metal in a vice and get flying splinters in their eyes.

When did you last cut hardboard or chipboard standing it up against a door frame? Having tried this method, you would either have given up or settled for a very shabby sawcut. Sheet material should lie down, be well supported and cut with a suitable saw. For a small application, a fretsaw and a cutting table as shown in the figure will give children a chance to achieve a reasonable result. You will get good results with a coping saw too, although unfortunately coping saws are not readily available with a variety of blades like the fretsaw. Coping saws with finer teeth or wider blades for a straighter cut do exist, however: I finally managed to track down some blades from Draper Tools, but they are not sold loose to the public in shops. In all I have seen four different blades:

- The standard blade
- Finer blades which could be used for acrylic
- Finer blades which could be used for aluminium or copper

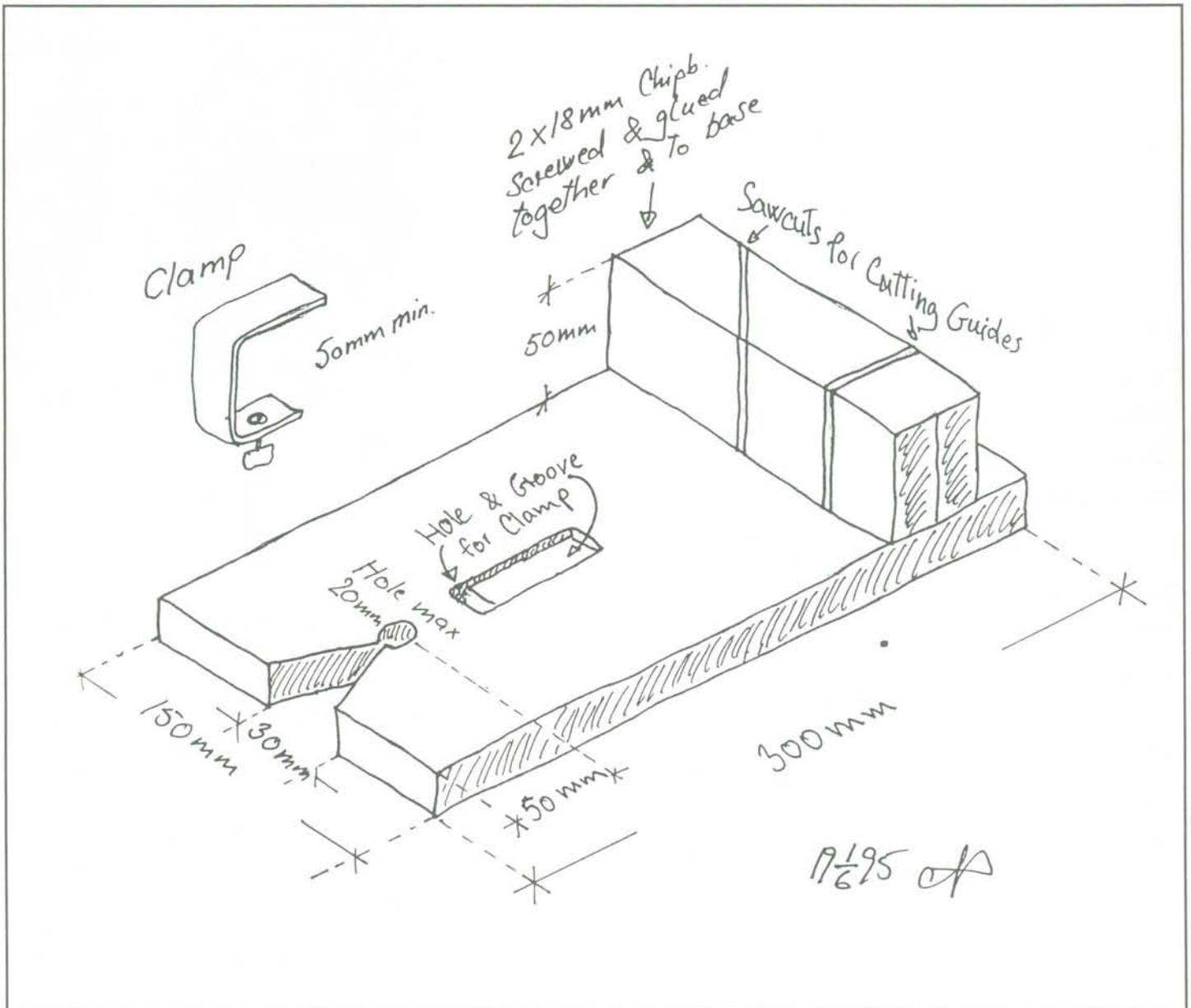
- A wider blade like the junior hacksaw blade, which aids straight cutting.

Finer teeth mean that there is less vibration, slower sawing and less likelihood of cracking the acrylic or thin MDF. Just by changing the blades on your coping saw, you could prolong the enthusiasm of many pupils in working with resistant materials. If you combine changed blades with laying the material down flat and supporting it well, the cutting table enables quite fine and accurate work. With a fine blade you can cut copper or aluminium for jewellery. But remember, fingers *behind* the saw blade, or pupils will soon end up with minor flesh wounds. They may also need to be seated to work at the saw table.

The cutting table itself is an excellent project for pupils to make in Year 7 and may be useful for home use as well. The skills involved would fall into the focused task category, prior to developing competence. The cutting table can of course be made without the mitre block at the back, but its presence makes it much more versatile.

Ideally you should use hardwood, but 18mm chipboard is a more realistic option. The total cost should be approximately £1.50, including the clamp. Final designs can obviously vary, but options include a fixing to join it to a vice rather than a table, methods of straddling a worktable, and variations on the mitre block (although the larger this is, the smaller the other work area). Depending on the final design, pupils will gain the following experiences:

- Measuring out correctly
- Sawing straight lines for the V-cut in front (using a tenon saw or a coping saw with a wider blade)
- Drilling out two small holes and sawing a hole for the clamp
- Making a chisel groove for the clamp (or drilling 4mm down in four places with a brace and tidying up with a partially retracted Stanley knife)
- Gluing together two pieces of chipboard for the mitre block; using a pilot hole and two screws
- Sanding the bottom edges at right angles for the mitre block before fixing it to the cutting table (manual sanding and the use of a set square



works, but a sanding disc is more effective)

- Gluing and screwing the mitre block to the baseplate (with a pilot hole in the baseplate you could demonstrate the use of different screws to find which is best)
- Placing the screws so they do not interfere with the saw cuts
- Sawing straight across the top and at right angles to the baseplate when making the cuts in the mitre block (you may need to 'start' pupils off in order to achieve a good success rate)
- Sawing at 45 degrees
- Sanding and finishing.

The time it takes varies from five to ten hours, depending on the final design and how much preparation is done in advance. What you end up with is an item that can be used in the workshop or even in an ordinary classroom, and which may be taken home and used for working on hobbies. Two things are necessary to achieve the cutting table — the first is coping saw blades with fine teeth, and the second is the desire to make it a priority in Year 7. Finally, you can buy cutting tables, or course, usually without a mitre block but sometimes including a fret saw and a fretdrill, but these cost about £8 each and in buying one you miss out on the fun of making it and using it afterwards.