



Desk Tidy Tray

Completion time: 3 Lessons

Materials and Resources:

- Paper, pencil and ruler
- Sheet MDF material - 1cm thickness, wood glue
- A range of sawing and cutting tools
- Drill and 1.5mm drill bit
- Disc sander, sandpaper
- Formech vacuum forming machine
- Suitable plastic material (1.5mm ABS or HIPS recommended)
- <https://formech.com/case-studies/forming-lessons-oakland-high-school-illinois>

Skills at a glance:

Mathematics

Measurement, scale, using appropriate angles

Language

Listening skills, following instructions

Thinking Skills

Design, problem solving, independent thought, tool selection

Science

Heating plastics and effects, plastic/polymer material knowledge

Project Outline:

Students will produce a simple yet perfectly functional desk tidy tray, which will have shallow recesses for paper clips, pens, and any other small stationery items that clutter up the average desk. Students will be able to follow the simple method, although will be able to make their own choices as to sizes and shapes, to ensure their tray is completely individual. Sheet MDF will make up the principal mould material, allowing the class experience cutting and shaping it using a variety of tooling methods to cut and join material at angles.

Method:

Students can design their tray at a scale of 1:1 on paper, incorporating dividing partitions within which will keep pieces of stationery separate. Recommended might be a rectangular desk tidy tray with a long thin recess to hold pens or pencils, and two other recesses to hold paper clips or pins. Right angles are advisable for the ease of cutting and joining materials.

Students can take their scale drawing and turn to cutting sheet MDF to size, the first piece being the element which will make the base of the tray. Students can use any cutting, sawing or sanding methods they have available to them.

With the base measured and cut, students can cut smaller and slimmer pieces of MDF material which will make up the outer edges and inner partitions of their desk tidy tray. Any internal partitions will require slight draft angles applying to their sides before being glued in place using wood glue.

The MDF mould can now have draft angles applied to its outer edges using a disc sander, and any sharp corners or edges sanded by hand.

This mould has recesses for stationery to be stored, and for the plastic material to be allowed to form within these recesses, venting holes will need to be applied. Using a 1.5mm drill bit, students must drill a hole through the MDF material in the centre and around the base of every recess. This will encourage airflow through the mould material during the vacuum forming process and produce a high definition formed product.

The completed mould is now ready to be vacuum formed using any suitable plastic material, although 1.5mm ABS or HIPS is recommended. Any excess plastic material can be trimmed off, leaving students with their completed desk tidy tray.

Homework Tasks:

Once students have been introduced the task at hand and to the method that they will be using to produce their tray, there is no reason why students can not design their scale desk tidy tray at home and independently. This will greatly reduce the amount of time taken in class to complete this project. They might also use the Formech Vacuum Forming Guide for the Classroom to guide and inform them as to their design choices.

Optional Extras:

This project produces a small and functional desk tidy tray, but there is no reason why teachers or students can not extend this plan to produce a much larger tray, for use within a drawer in a workshop to keep tools or materials organised. With this in mind, students might scale up this project plan and create a large tray with a range of purposes, or specific tools to organise in mind. This project also only explores right angles to ensure ease and speed of production, but should teachers wish to explore joins and joints which involve the consideration of different angles, students might be asked to create a tray or recesses that are not square nor rectangular.

Student Accomplishments:

- The production of a desk tidy tray
- Experience using MDF as a mould material
- Choosing appropriate tooling methods
- Applying independent design choices to a prescribed brief
- Experience using a range of sawing, cutting and sanding methods
- Practical hands on experience using a vacuum forming machine, and understanding its wider application

Teachers notes:

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https://formech.com/wp-content/uploads/Vacuum_Forming_Guide.pdf

