Formech
Perfectly formed

School Emblem

Completion time: 3-4 Lessons

Materials and Resources:

- Pencil, paper, a ruler, a range of mould making materials
- An image of the school /emblem
- Appropriate hand and/or machine tools to shape material, a strong, sharp blade (e.g. Stanley knife), sandpaper
- Suitable sheet plastic material (1.5mm ABS or HIPS is recommended)
- Formech vacuum forming machine
- https://formech.com/case-studies/get-inside-the-walls-of-the-columbia-college-fablab-with-formech

Skills at a glance:

Mathematics

Measurement, scale, numeracy

Language

Listening, following instructions

Thinking skills

Design, expression, reasoning, material and tool selection, independent thought, research and development

Science

Heating plastics and effects, plastic/ polymer material knowledge

Project Outline:

This project sees higher grade students demonstrate their knowledge of a range of materials, and the appropriate tooling techniques each one requires. They must take the school emblem or logo, and design and make a mould which will be vacuum formed, creating a 3D piece for display, suitable to be put up around the school or in classrooms. Students can use whatever materials they wish in creating their moulds, so long as they are able to justify why and how they are beneficial to use in the vacuum forming process. This might include wood, MDF, clay, resin, metal, foam, or indeed any other material which they deem appropriate. With students being granted free reign as to their design choices, this provides opportunity for real insight into their existing skills and knowledge, and understanding of the vacuum forming process.

Method:

Students must begin with thorough research before entering into the design stage. This can be completed through internet based research, utilising the Formech Vacuum Forming Guide for the Classroom, and viewing videos from the Formech Case Study Video archive. All of these will give students a clear idea of their design options and mould making considerations.

Once students have an idea of the materials and techniques they wish to use to make their mould, they can now move onto the design stage. Using pencil and paper, students must sketch out their design for their mould, using a scale of 1:1. Their design must clearly identify what materials they intend to use for each part of the finished mould. Students may opt to use a variety of different materials to make their mould, or simply use a single material to demonstrate its versatility. Available mould materials may also be at the discretion of the teacher. Teachers may need to observe class designs carefully, to ensure that material choices made and proposed tooling techniques are suitable, and adhere to aspects of successful mould production. Draft angles, venting, and undercuts will need to be considered.

Once the design is complete, students may begin to make their mould drawing upon their exisiting knowledge and tooling skills within the workshop.

Having completed their mould, students must present it to the teacher and justify their design, material, and tooling choices, as well as demonstrate that they have considered draft angles, venting, undercuts etc.

Moulds can now be vacuum formed using 1.5mm HIPS or ABS. Excess material can be trimmed off, and the school emblem displayed around the school.

Homework Tasks:

This project due to its size and level of detail, might take a number of lessons. Teachers can reduce the amount of lessons by allocating a degree of the research, design or drawing as homework activities. With research tasks in mind, students might imagine their products as something which might be displayed outdoors, just as shops, businesses and institutes do all around the world. Students can be tasked with finding and photographing similar items around their community, which have been moulded in plastic using the vacuum forming process. This will aid them in their design process providing inspiration, and also give them a deeper understanding of the wide application and presence of vacuum forming in the world around them.

Optional Extras:

This project focuses on students working alone on their own final product, although there is scope to make this project group based. This will save time and reduce the amount of lessons needed for completion, and also allow students to draw upon each other's skills and problem solve as a team. In addition, this project could be complimentary to an electronics project. If the final vacuum form were to be completed using an appropriate clear and heat resistant plastic material, students can go further by making a simple circuit which is capable of powering either small bulbs or LEDs. Fixed appropriately behind the vacuum form, this makes for an interesting back-lit display, as well as a more in depth, long-term project drawing upon more aspects of other school subjects.

Student Accomplishments:

- Designing and manufacturing a professional display of their school's emblem or logo
- Using applied materials knowledge to make informed choices
- Opportunity to showcase and demonstrate their existing skills and knowledge
- Utilise a range of different tooling techniques
- Work creatively, interpreting a brief artistically and innovatively
- Conduct a degree of market research
- Practical hands on experience using a vacuum forming machine, and understanding its wider application

Teachers notes:

Share pictures and videos of your Formech project across social media, using **#formechmade**

Need materials for this project?

Visit **https://formechdirect.com**

Download your free Vacuum Forming Guide for the Classroom

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