

# Plastics – Vacuum Forming: resource description

The resources consist of:

1. vacuum forming theory in HTML format illustrated with Flash animations for use with computers
2. vacuum forming theory with illustrations in PDF format that enables easy printing, duplicating and issuing to students
3. teachers' notes and lesson plan

The vacuum forming technology notes and animations in this resource explain:

- what is vacuum forming
- the vacuum forming process
- materials used in vacuum forming

## Level

The target groups are KS3 and KS4 students of Engineering, Design and Technology.

## Resource aim

The aim is that students will learn and understand the processes involved with vacuum forming plastics.

## Learning objective

The objective is that students will know:

- thermoplastic sheet materials may be vacuum formed
- the names of thermoplastics that are typically used in vacuum forming
- a typical vacuum forming process
- a typical vacuum forming procedure.

## How to use the resource

- Use the lesson plan to help you structure your lesson.
- Use computers and an interactive white board to view the HTML version of the vacuum forming theory notes and the Flash animation of the vacuum forming process.
- Print the PDF theory notes and issue them to your students.
- Use the suggestions for follow-on activities.

## Differentiation

Differentiation may be achieved through:

- allowing students to use ready made patterns when practicing vacuum forming
- the pace of learning
- the amount of support given to students (by guided questions from the teacher, support from peers during student - student interaction).

## Lesson Plan: Vacuum Forming

Required resource: Computers, interactive whiteboard, Vacuum\_Forming.html on interactive whiteboard and on students' computers  
 Worksheets/ theory notes: Vacuum Forming.pdf duplicated, enough for each student in class.  
 Examples of vacuum formed products.

T = Teacher

S = Student

Lesson length approx. 50 mins + extra for follow on activities

Stage	Activity	Reason	Interaction	Time
Lead-in	Teacher questions students about vacuum forming. 1. Elicits meaning of "vacuum" 2. Elicits meaning of "forming" 3. Elicits description of vacuum forming process.	To check current level of knowledge.	T - S	3 mins
Presentation	Teacher shows examples of vacuum formed products, e.g. egg trays, fruit trays, plastic beakers, plant pots and trays, etc. and asks how they could have been made.	Elicits that vacuum forming process was used to form example products.	T - S	3 mins
Controlled practice	Students are shown how to use computers to view the vacuum forming animation. Students view vacuum forming animation and read the html notes.  Students are issued printed PDF vacuum forming notes for their notebooks.	So that students know: <ul style="list-style-type: none"> <li>• a typical vacuum forming process</li> <li>• that batches of products can be vacuum formed at the same time to minimize waste.</li> </ul>	T – S Individually	10 mins
Free practice	Students are given small pieces of resistant material, e.g. softwood or MDF (tell/remind students about hazards, safety precautions and PPE) or clay and tell them to model a small pattern that will be vacuum formed.	Students learn to create chamfered patterns.	Individually S - S	30 mins
Production	Teacher gives a practical demonstration of vacuum forming process, tells students of hazards of hot parts of vacuum former and vacuum formed plastics. Students arrange their patterns in vacuum former and vacuum form batches of patterns.	Learning by doing. Students practice vacuum forming procedure.	S - S	
Review	Teacher questions students about vacuum forming process, undercuts, hazards, materials used for vacuum forming.	To inform teacher and students about learning progress.	T - S	4
Follow on activities	Homework: students use notes and sketches to describe the stages involved in vacuum forming. Students choose a DMA involving vacuum forming. Students answer past exam questions about vacuum forming.	To develop knowledge, understanding and D&T capability.	Individually S - S	