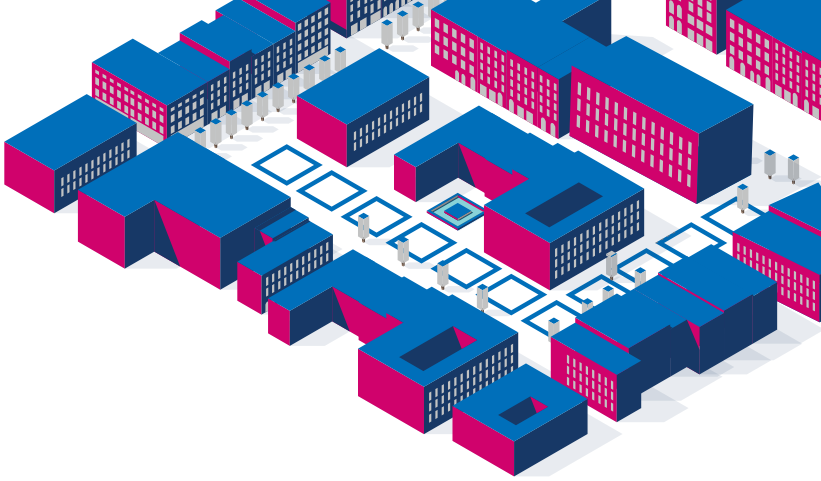
Formech
Perfectly formed



3D Country Map

Completion time: 2 Lessons

Materials and Resources:

- Pencil, paper, and a ruler
- A map of the chosen country
- Thick cardboard, and card of varying thicknesses
- Scissors, string, newspaper, glue, and a pin
- Formech vacuum forming
- Appropriate vacuum forming plastic material (HIPS recommended for display purposes, PVC recommended for food moulds)
- https://formech.com/case-studies/formech-at-the-italian-blind-association-catania-2

Skills at a glance:

Mathematics

Measurement, scale

Language

Discussion, reading, listening

Thinking skills

Design, applied thought, research and development material selection, independent thought, creativity, and problem solving.

Science

Heating plastics and effects, plastic/polymer material knowledge, and understanding geographical land features.

Project Outline:

Students are to mould and vacuum form a 3D map of a country, using thick cardboard as their principal mould material. This design should reflect not only the shape of the country, but also the land gradients, mountain ranges, and terrain of the different areas. Cardboard can be cut and layered in varying patterns and heights to represent these landscape features. This project is great for use within both History and Geography classes. These vacuum formed maps may be used for wall displays, gifts, or even food moulds.

Method:

Individually or in small groups, students can begin this project by looking at an existing country map, examining both the country's shape and topography. Discussion around the distinctive land features, and decisions about what to include can be noted.

Using a large piece of thick cardboard, which fits within the forming area of the vacuum forming machine, students must accurately draw the shape of the country with a pencil, and carefully cut this shape out. This provides the base of their mould to be vacuum formed later.

Using the map and observations made earlier, students can now begin cutting to shape smaller pieces of cardboard to represent land features, and begin the layering process, gluing each piece securely as they go

If the country has larger mountains, then these will require more layering of cardboard, cut in decreasing sizes and layered to represent their size and shape.

In layering the cardboard, students can go relatively high and may choose to accentuate physical land features rather than represent them to scale for increased visual effect.

If a country has lakes, rivers, or other flatter land features, these might be represented by gluing string to the mould to outline their shape or path.

If a country has heavily wooded or forest areas, these might be represented with small balls of scrunched up newspaper, glued securely in place. Once completed, students' moulds should be allowed to dry completely before being vacuum formed.

Homework Tasks:

Students might be tasked with researching the physical land features of the chosen country prior to the initial lesson, and independently map and draw the country at home. This will mean they have a much clearer and in-depth knowledge about the geography and features of the country before starting the mould design process in class.

Students can perhaps research their country history, and having produced their vacuum formed 3D map, write about and identify where a certain historical event took place within their country, which can then be presented to the class.

This element of the project links in with other subjects, such as History, or Geography.

Optional Extras:

Once the final vacuum formed product has been produced, it will be rich in texture and clearly display the land features of the chosen country. In addition to the mould making and vacuum forming processes, students may also wish to decorate their pieces. This can be done using a variety of paints (e.g. acrylic). Using a variety of suitable colours, students are able to represent water, dense woodland or forest, desert, and snow accurately and inform the person observing the piece as to the physical features of the land.

Method: (Continued)

To increase the definition obtained during the vacuum forming process, venting holes may be added around the completed mould. This can be done very simple using a long pin, pushing it through the mould material from top to bottom applying holes around any area with indentations or fine detail.

The mould can now be vacuum formed using plastic material suitable for the finished product's intended purpose (display purposes, or food mould etc.)

The mould can now be removed from the completed vacuum formed piece, and students will now have a finished 3D map of their chosen country.

Student Accomplishments:

- The production of a 3D map
- Understanding of land features, gradients, and water
- Map reading
- Creativity within material selection
- Multi-media design and manufacture
- Develop skills using a variety of small hand tools and materials
- Following instructions
- Practical hands on experience using a vacuum forming machine, and understanding its wider application
- Potential to examine country history

Teachers notes:

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

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