



Advent Calendar

Completion time: 3 Lessons

Materials and Resources:

- 2 inch thick sheet foam material, pencil, ruler, paper, card, scissors, and sandpaper
- Drill press with 3mm and 1.5mm drill bits
- Craft glue, various craft materials, sharp knife, and sweets
- Formech vacuum forming machine
- Suitable vacuum forming plastic material (ABS or HIPS is recommended)
- <https://formech.com/case-studies/special-t-lighting-brings-vacuum-forming-capabilities-house>

Skills at a glance:

Mathematics

Measurement

Language

Reading, listening

Thinking skills

Adhering to a given brief, independent thought, choosing decorative elements based on a theme

Science

Heating plastics and effects, plastic/polymer material knowledge

Project Outline:

Students will produce an advent calendar, with 25 individual windows to then be filled with sweets and enjoyed each day throughout December in the countdown to Christmas Day. The principal mould material will be foam, with just a few simple tooling techniques required to shape it. Students will have opportunity to add individual decoration which expands upon the Christmas theme. A perfect gift to take home for family, or simply for students to enjoy themselves. This is a great lesson for students of all abilities, which follows a very simple method. It also provides each student with skills and ideas for future projects.

Method:

Students will begin by cutting a sheet of building insulation foam to a rectangular or square shape. This will need to be 3 inches smaller in both length and width than the Formech machine's forming area to ensure a successful vacuum form.

Students can draw and cut out a 3 cm square of card. This single square will act as a stencil with which to draw 25 squares onto the foam material.

Moving the square of card around the surface of the foam material, students can draw around it, marking the foam and creating clear guidelines for future tooling. Ensuring that squares are evenly spaced and a minimum of 2 cm apart, 25 squares can be drawn.

Taking a piece of paper which is the same length and width of the foam material, this can be placed on the surface of the material and the location of the 25 squares traced lightly in pencil. This will make up the front of the completed advent calendar. This paper can now be set aside to be decorated later.

Using a drill press, the foam material can now have each of the 25 prepared squares hollowed out. With the foam material lay flat on the table of the drill press, drop a moving 3 mm drill bit into the foam material to a depth of just 2 cm within one of the prepared squares. Students can now slowly move the material around the table, milling out the square. Repeat this process for the remaining 24 squares.



Homework Tasks:

To reduce project completion time during school hours, students might take the decorative paper portion of their project home with them, to decorate independently. They may be advised to conduct internet research to observe popular advent calendar themes and decoration.

Optional Extras:

This project sees students produce a snack filled calendar with the Christmas holiday as its theme, although there is scope to apply this project to other themes, holidays, or religious festivals. It could also be used as a class behavioural incentive tool, with students who perform well invited to open a window and receive a reward, or even as a reward tool for younger children in the home when they complete homework or household chores.

Method: (Continued)

Before the foam material can be vacuum formed, each hollow square will need venting holes applied, using the drill press with a 1.5 mm drill bit. In every corner of each square, a hole can be drilled which penetrates the material from front to back.

The foam mould is now complete and can be vacuum formed, and any excess material can be trimmed off.

Going back to the sheet of paper used earlier, students can now decorate this however they choose, ensuring that they clearly identify the location of the squares, numbering them 1 to 25.

Each of the 25 squares can now be filled with sweets. The front of the plastic material can have an even layer of craft glue applied, with care taken not to allow any glue to enter into the sweet filled recesses. The decorated paper front can now be carefully placed on top, ensuring that each window aligns perfectly with the square below, and smoothed flat.

Once dry, the advent calendar is now ready to be displayed and enjoyed in the countdown to Christmas Day, with each square being punctured daily to retrieve the snacks inside.

Student Accomplishments:

- The production of an advent calendar
- Demonstrating capabilities with a pillar drill
- Choosing appropriate methods for cutting foam material
- Utilise and demonstrate a variety of different skills and tools within the workshop
- Using foam as a principal material
- Practical hands on experience using a vacuum forming machine, and understanding its wider application
- Adding personal and creative detail to a given brief

Teachers notes:

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