

Line Bending Project: Desk Tidy

Objectives

Students will develop their D&T capability by designing and making an original product of good quality that satisfies the requirements of the design brief.

By the end of the assignment, students will know that:

- Shapes can be formed by bending
- Thermoplastics soften and may be bent when heated
- Thermoplastics remain bent / deformed after cooling
- A strip heater / line bender is used to heat thermoplastic sheet materials along a straight line
- Jigs may be used to aid bending thermoplastics
- Jigs may be used to hold heated thermoplastics after line bending
- Hot parts of strip heaters and heated plastics will burn skin so:
 - risk assessments of the hazards should be carried out
 - safe working practices should be adopted.

Success criteria

Each student:

- Has designed and made an original product that satisfies the given design brief and specification
- Has used tools safely and has strived to achieve quality in marking out, cutting, shaping, finishing and joining their chosen materials
- Knows that thermoplastics can be softened by heating
- Knows that line benders are used to heat (relatively) narrow areas of thermoplastic sheet materials
- Knows that thermoplastics soften and can be bent when heated and become rigid again when cooled.
- Knows that jigs may be used to:
 - aid bending thermoplastics
 - hold heated thermoplastics after line bending until the plastic is cool
- Has assessed the risks associated with working with strip heaters and hot thermoplastics and has worked safely throughout the assignment
- Shows evidence of having evaluated his/her work.

Situation

Students working on design and technology assignments need a range of pens, pencils and drawing instruments to illustrate their design work.

These instruments are often left on a desk or stored loosely in a drawer at home.



Design brief

Design a "desk tidy" that will hold all the pens, pencils and other drawing instruments required for doing good quality art and design work at home.

The desk tidy will be kept on a student's desk at home. The desk tidy should look stylish and must allow the pens, pencils and drawing instruments to be removed easily.

Specification

The desk tidy must:

- Be made from plastic sheet materials that have been formed by line bending
- Store a range of pens, pencils and brushes
- Store a range of instruments including:
 - a 300 mm. ruler
 - a protractor
 - a pair of compasses
 - a pencil sharpener
 - an eraser
 - any drawing aids you may have, e.g. radius templates, ellipse templates, geometric shapes template.
- Allow the pens, pencils and instruments to be removed from the desk tidy easily
- Be stylish and demonstrate quality in design and manufacture.

The desk tidy must not:

- Fall apart in use
- Be dangerous to use
- Have unsightly joints

What you must do

- Analyse the design brief and specification and pick out the essential requirements.
- Analyse ways that thermoplastic sheet materials may be used to make the desk tidy.
- Research the size of pens, pencils, rulers, pencil sharpeners and the drawing instruments and templates that will be stored in the desk tidy.
- Use the information to plan how the pens, pencils and instruments may be stored.
- Use notes and sketches to illustrate designs for a desk tidy that meet the requirements of the design brief and specification.
- Develop your best idea into a final design. Your design should have sufficient detail so that it can be clearly understood and made by someone other than yourself
- Prepare a cutting list of the materials that are required to make your product
- Prepare a Risk Assessment of the hazards involved with making and using your product
- Make a jig that will enable the plastic sheet to be bent accurately and to be held until cool
- Make your design
- Evaluate the final product, e.g.:
 - how good the design looks
 - how well the design works
 - discover what others think about your product
- Work safely and complete the assignment on time.