

# Line Bending Project: Tooth Brush Rack

## 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

Most people use a tooth brush to clean their teeth. One way of storing tooth brushes is in a rack.

## Design brief

Design a rack for two or more tooth brushes that can be fixed to the bathroom wall.

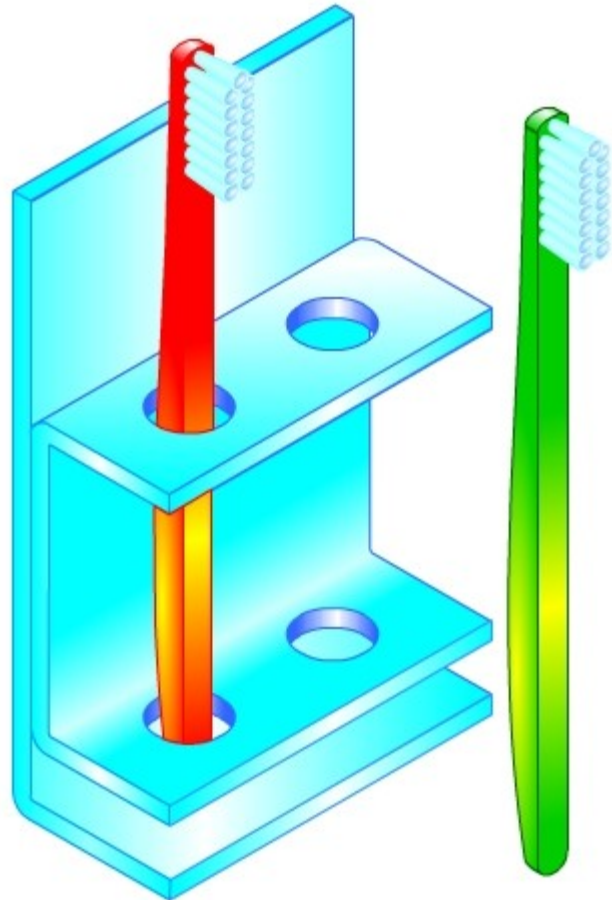
## Specification

The tooth brush rack must:

- Be made from plastic sheet materials that have been formed by line bending
- Hold at least two tooth brushes
- Hold tooth brushes apart so that they do not touch
- Allow tooth brushes to be removed and replaced easily
- Allow the rack to be removed easily from the wall to enable it to be washed thoroughly
- Allow the rack to be replaced easily after washing
- Be stylish and demonstrate quality in design and manufacture.

The tooth brush rack 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 tooth brush rack.
- Write your own design brief, stating how many brushes your tooth brush rack should hold
- Research the size of tooth brushes
- If the tooth brushes will be held in holes in the plastic sheet, research the size that the holes should be
- Research how holes may be drilled in plastic sheet without shattering the sheet
- Research ways that plastic sheet materials may be joined
- Use notes and sketches to illustrate designs for a tooth brush rack 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 could 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 your tooth brush rack
- 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.