

**Edward Peake Church of England Middle School**

**Design Technology**

**Topic: Twisty Fish**

**Year: 7**

What should I already know?

- The difference between a thermoplastic and thermosetting plastic.
- Examples of plastics and their uses.
- How to work safely in the workshop.
- How to use a coping saw to cut curved and straight lines.
- How to use files and glass paper to smooth the edges of material
- How to evaluate design ideas and a finished design.

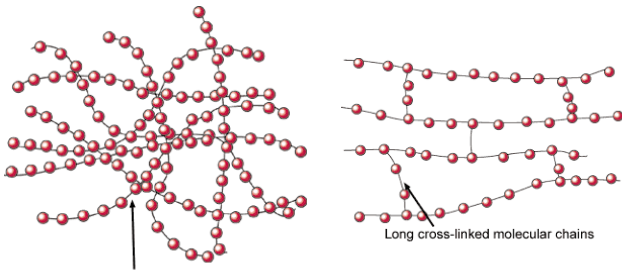
What will know by the end of the unit?

- The difference between the structure of thermoplastics and thermosetting plastics.
- What acrylic is and the properties that make it suitable for line bending.
- How to use a line bender to put bends and twists in acrylic.
- What a template is and why one is used.
- How to make a symmetrical template.
- How to mark out, cut and smooth the edges of acrylic.

**Vocabulary**

Line bending	A process of bending or twisting a piece of acrylic.
Acrylic	A type of thermoplastic.
Thermoplastic	Plastics that can be heated more than once and then reshapes.
Thermosetting plastic	Plastics that once heated are set in shape.
Template	A shaped piece of rigid material used as a pattern.
Molecule	A group of atoms bonded together.
Polymer	A substance which has a long chain molecular structure.
Rigid	Unable to bend or be forced out of shape; not flexible.
Degrading	To break down or deteriorate.
Evaluation	Explaining how a task has gone.

### Thermoplastic and thermosetting plastic



Thermosetting plastic

Thermoset plastic

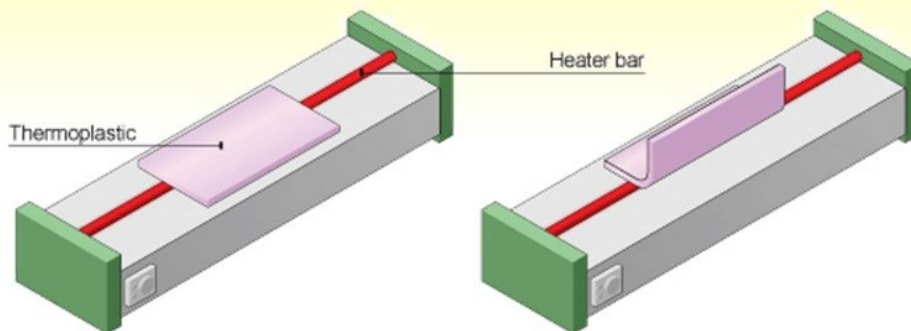
The cross links in the molecular chains give the thermosetting plastic the rigid structure that means they can not be reheated and reshaped.

### Key information

- Another common name for a line bender is a strip heater.
- Acrylic is a thermoplastic used for line bending.
- Line bending involves heating acrylic along a line to soften it, it can then be bent into shape.
- Plastics are polymers, the way the molecular chains are arranged determines whether they are thermoplastics or thermosetting plastics.

### Line bending

Line bending is used to make simple bends in a sheet of **thermoplastic** polymer such as acrylic.



Line bending involves heating the material along a line, using a heating element. The plastic softens as it heats, allowing it to be bent. As the plastic cools it will retain its shape. A wooden former is often used to ensure accurate bending.

### Investigation tasks

1. Find out different types of thermoplastics and thermosetting plastics and produce an information sheet for students learning about plastic.
2. Make a presentation sheet to educate people on alternative materials to plastic.
3. Research other methods of forming plastics and the products made using these methods.