

## Types of Plastic

**Thermoplastics** - can be reshaped by heating. They will try and return to their original shape if reheated. (Plastic Memory)

**Thermosetting Plastics** - cannot be reshaped by heating and can withstand higher temperatures than thermoplastics.

All modern plastics are made mainly from oil, coal and extracts from plants. They are synthetic (not natural - man-made) and come in hundreds of types, each with their own set of properties. Most property changes are made by applying additives to the basic plastic. Most thermoplastics can be recycled, e.g. 'PET' used for fizzy drinks bottles is recyclable. Thermoset plastics are not recyclable.

### Thermoplastics

Plastic	Properties	Uses
Polymethyl methacrylate  (Acrylic/ PMMA)	Rigid, hard, durable, polishes to a high shine.	Windows, baths and illuminated signs
Polythene  (PE)	Flexible, soft, feels waxy.	Food bags, buckets, bowls .
Polyvinyl chloride  (PVC)	Tough, resists wear, good chemical resistance.	Guttering, pipes, window frames.
Polyethylene terephthalate  (PET)	Tough, clear, lightweight	Fizzy drinks bottles

### Thermosetting plastics

Plastic	Properties	Uses
Polyester Resin mixed with carbon fibres. (CFRP)	Rigid, hard, brittle, tough when mixed with fibres	Boat and car bodies.
Epoxy resin  (Araldite)	Good chemical resistance. Sticks to other materials	Adhesives/ glues .
Melamine	Hard, scratch resistant, water resistant	Table ware, laminate tops.
Urea Formaldehyde	Good electrical insulator, heat resistant	Electrical plugs & sockets

What are modern plastics made from and how do we change their properties ?

**Answer:** Modern plastics are made from

What is the name of the plastic you are making your phone holder out of?

**Answer:** We are making our phone holder out of \_\_\_\_\_ which is a \_\_\_\_\_ type of plastic.

## Plastics & the Environment

UK households produce millions of tonnes of waste. There is still a great deal of waste which could be recycled that ends up in landfill sites which is harmful to the environment.

Recycling is an excellent way of saving energy and conserving the environment. Did you know that:

- 1 recycled plastic bottle would save enough energy to power a 60-watt light bulb for 3 hours.
- 275,000 tonnes of plastic are used each year in the UK, that's about 15 million bottles per day.
- Most families throw away about 40kg of plastic per year, which could otherwise be recycled.
- Plastic can take up to 500 years to decompose.

What type of Plastic can be recycled.

Thermoplastic OR Thermosetting

**Answer:** The type of plastic that can be recycled is .....

Can you think of a reason why making plastic is not good for the environment?

**Answer:** Making plastic is not good for the environment because.....

What material does this symbol mean, and what is a popular use for it?

(Draw it in your jotter)



**Answer:** This is the symbol for ....., and a popular use for it is .....

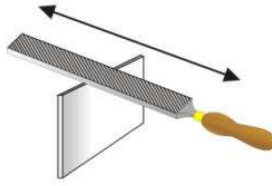
Is it recyclable and how can you tell from the symbol?

## Plastics- Finishing the Edges

The information below shows the steps used when finishing the edge of plastic. Write the steps in the correct order.

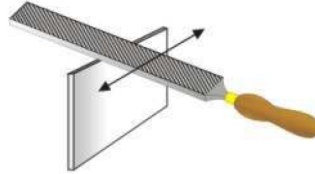
### Step 1

Wrap Wet & Dry round file to produce a smooth blemish free surface



### Step 2

Polish edges with cloth and metal to produce a shiny surface



### Step 3

Cross file to remove excess materials and blemishes.



### Step 4

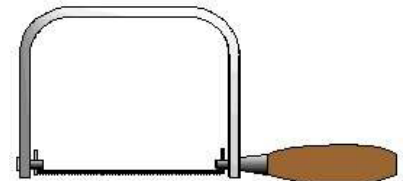
Drawfile to remove cross file marks.



What is the tool on the right called and what is it used for.

Answer;

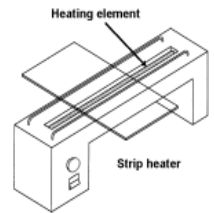
The tool name shown is called a \_\_\_\_\_



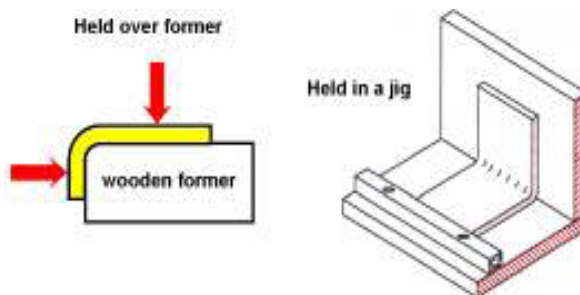
It is used For \_\_\_\_\_

## Bending Plastic

Thermoplastics in sheet form can be heated gently to between 160°C and 180°C and then bent into shape. If the sheet is held in position while it cools it will remain in its new shape while it is at room temperature or below. If the plastic sheet is reheated then it will try to return to its original shape of a flat sheet. This property is known as plastic memory. To bend a straight line use a strip heater. A heating element will heat the plastic only along the area held above it.



When the plastic in the heated area becomes soft it can be removed and held with a former, or a jig, to hold it in shape until it cools.



At what temperature can you bend the Acrylic?

*Answer: Acrylic needs to be heated to between ..... and ..... Before being bent into shape*

*Answer: The piece of equipment used to heat the plastic is a ..... ..*

What is the name of the piece of equipment used to heat up the plastic?

When you reheat the plastic it goes back to its original shape, what is this called?

*Answer: The ability of plastic to go back to its original shape is called ..... ..*

What can you hold the heated plastic with to ensure you get a well formed shape?

*Answer: To get a well formed shape you would hold the heated plastic against a ..... or a ...*