Materials 1—Polymers (Keyring)

Key knowledge

Thermoforming polymers can be heat-formed to change their shape.

Only thermoforming polymers can be recycled.

Acrylic is highly recyclable and can be recycled without degrading.

Its properties are that it can withstand a range of temperatures, highly weather resistant, withstands UV and it is an electrical insulator.

Acrylic can be used as a replacement for glass and can be used to store food and drink at normal room temperatures.

Acrylic is a group 7 plastic—a group that is labelled “other” which includes difficult to recycle plastics.

It is difficult to find somewhere to recycle it. Acrylic is often recycled at the end of the production line.

A specification is a description of the design and materials for a product.

A design must meet the specification. Explain how your design meets each of the criteria and annotate this on your design.

A machine tool must be fitted with a guard and this must be in place when the machine is used.

PPE is worn to protect the user by keeping material off the skin and clothing.

Key Skills

Annotate designs: sketch your design and label with features. Describe the features and then explain why you have added them and how they will work.

When using equipment follow the safety instructions given and the methods shown.

We follow **5S** for efficiency and safety:

SORT—Get rid of unnecessary equipment—only collect what you need for the activity.

SET—Give a specific home to every item—also organise your work space .

SHINE—Clean and inspect—Clean up your work station at the end of a practical session so it is safe and ready for the next person to use. Report any damage or wear and tear of equipment.

STANDARDISE—Follow the 3 above! Tidy away all equipment to the correct place so that others can find it.

SUSTAIN—Make it a way of life!

Key vocabulary

Design—a plan or specification for the construction of an object or product.

Evaluate—to assess or determine the quality of a product against its specification.

Polymer—a material made from large molecules.

Plastic—synthetic material containing polymers.

Acrylic sheet—a widely used polymer that can be cut using a laser cutter.

5S—a system for organising spaces so work can be performed efficiently, effectively, and safely. SORT—SET—SHINE—STANDARDISE—SUSTAIN

Thermoforming polymer—can be heated and reformed

Thermosetting polymer—can not be heated and reformed

PPE—Personal protective equipment—this may be safety glasses, aprons, hair bobbles or gloves.

Machine Guard—a cover to protect the machine operator and other people. Hazards may be moving parts, nip points or flying material.

6Rs—Rethink, Refuse, Reduce, Reuse, Repair, Recycle

Recycle—putting a material through a process so that the material can be used again instead of being wasted.