

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ explain the difference between thermoplastics and thermosetting plastics
- ☐ describe the properties and uses of ABS, acrylic, polypropylene and polystyrene
- ☐ describe the properties and uses of urea formaldehyde and melamine formaldehyde
- ☐ describe nylon, polythene and PVC
- ☐ describe elastomers and composites (GRP, carbon fibre)
- ☐ describe methods to identify materials, including what each result tells you
- ☐ explain how materials influence design and manufacture
- ☐ describe developments in new materials and their impact

I DO

Worked example Read how a full-mark answer is built

A child's bike helmet.

1 Identify a suitable thermoplastic for the helmet shell and explain why it is suitable. (3 marks)

Full-mark answer each ✓ is one mark

ABS ✓. It has high impact resistance, so it absorbs a knock without cracking and protects the child's head ✓. It is lightweight, so the helmet is comfortable to wear for long periods ✓.

Examiner tip: 2025 commentaries credited ABS or polypropylene with impact resistance, light weight, colours or scratch resistance.

Why marks are not awarded

"Plastic, because it is strong."

0 marks: no named thermoplastic and "strong" is not explained.

WE DO

Guided practice Use the starters and word bank to help you

Swimming goggles have a silicone strap and seal.

2 Explain why an elastomer is suitable for the strap and seal. (2 marks)

Sentence starters

One reason is ... because ...

Another reason is ... so ...

Word bank

shapes · adjusts · flexible · comfortable ·
stretches · different · tightly · against

Tip: 2 marks = 2 separate, developed points.

YOU DO

On your own No notes. Check your answers afterwards.

3 Quick check: tick one box for each.

a) Which can be reheated and reshaped?

☐ Melamine formaldehyde ☐ Acrylic ☐ Urea formaldehyde ☐ Bakelite

b) Why is nylon used for small gears?

☐ It is transparent, so the teeth can be checked ☐ It is the cheapest plastic to injection mould ☐ It is a thermoset, so it can't soften with heat ☐ It is self-lubricating and wear resistant

c) A flip-top shampoo lid with a living hinge is made from...

☐ Polypropylene ☐ Acrylic ☐ Melamine ☐ Polystyrene

d) Which plastic is used for electrical plugs?

☐ Polystyrene ☐ Polypropylene ☐ Acrylic ☐ Urea formaldehyde

4 Key terms: write the letter of the matching description next to each term.

1. Thermoplastic	_____	A Sets permanently once heated; heat resistant; cannot be reshaped.
2. Thermosetting plastic	_____	B Softens when heated; can be reshaped and recycled.
3. ABS	_____	C Rigid, clear, polishes well. Glass substitute, signs.
4. Acrylic	_____	D Thermoset electrical insulator. Plugs and sockets.
5. Polypropylene	_____	E Tough, impact resistant, high gloss. Toys, casings, helmets.
6. Urea formaldehyde	_____	F Fatigue resistant (living hinges), chemical resistant. Caps, crates.

5 Explain why polypropylene is suitable for a box with a living hinge. (2 marks)

6 Describe methods that could be used to identify the materials used in a product. (4 marks)

Check and reflect

Mark your answers with the answer sheet. Go back to the checklist on the site and re-rate each “I can” statement above. Which one still needs work?
