

From crude oil to plastics and fibres

Grade 8 science (Year 9 · Class 8) · Test answers (mark scheme)

Marks are shown in each model answer. Accept any equivalent wording that is scientifically correct, and apply error-carried-forward where a later part uses an earlier wrong value.

Level: Grade 8 science (Year 9 · Class 8) · **Curriculum:** MS-PS1-3

Question 1 Key words (2 marks)

- a. A monomer is a **small molecule that joins with others to make a polymer.**
- b. **Polymerisation.**

Marking: 1 mark each.

Question 2 Raw material (2 marks)

- a. **Crude oil.**
- b. A **refinery.**

Marking: 1 mark each.

Question 3 Density (3 marks)

- a. $\rho = 18.4 \div 16.0 = \mathbf{1.15 \text{ g/cm}^3}$.
- b. It **sinks**, because 1.15 is greater than 1.00.

Marking: 1 mark for the formula and substitution, 1 for 1.15 g/cm³; 1 mark for sinks.

Question 4 Float or sink (2 marks)

- a. Block **Y**.
- b. It sinks, so its density is more than that of water, while X floats because its density is less.

Marking: 1 mark each.

Question 5 Recycling rate (3 marks)

- a. $160 \div 640 \times 100 = \mathbf{25 \%}$.
- b. $640 - 160 = \mathbf{480 \text{ kg}}$.

Marking: 1 mark for the method, 1 for 25 %; 1 mark for 480 kg.

Question 6 Conservation of mass (2 marks)

- a. **140 g.**
- b. No atoms are lost or gained, so mass is conserved.

Marking: 1 mark each.

Question 7 Natural versus synthetic (3 marks)

- a. Synthetic materials can be made with **chosen properties**, such as being stronger or lighter than wool or silk. They are usually **cheaper** and can be produced in large amounts, so they do not depend on harvests or animals.

Marking: 1 mark for each reason, 1 mark for a clear link to a property or example.

Question 8 Environmental impact (3 marks)

- a. **Plastics last for centuries and break into microplastics**, which spread through water and harm wildlife.
- b. Sort plastic for recycling, or stop using single-use bottles.

Marking: 1 mark for each problem; 1 mark for a sensible action.