



## 1.8 — Categorisation of Ferrous and Non-Ferrous Metals

Pearson Edexcel GCSE (9–1) Design and Technology

### Answer Sheet — Explain Questions

Qualification: Pearson Edexcel GCSE (9–1) Design and Technology

Chapter: 1.8

#### Answers

Correct answers are shown. Award 1 mark per bullet. Accept equivalent wording — the student must both state a point AND explain it.

**Q1**

Explain one working property of aluminium that makes it an appropriate choice of material for the camping stove body rather than mild steel. **(2)**

**Mark scheme:**

- Award 1 mark for: aluminium has a low density / is lightweight compared to mild steel
- Award 1 mark for: so the camping stove body is easy to carry in a rucksack without adding unnecessary weight for the user on a trip

*Examiner's note: A 1-mark response names a correct property (e.g. 'lightweight') without linking it to the product — the second mark requires the student to explain why that property benefits this specific product.*

Source: 1.8.2 Non-ferrous metals — Aluminium: aluminium is malleable, ductile, and corrosion resistant; low density makes it ideal for portable products.

**Q2**

Explain one disadvantage of using mild steel for the outdoor garden gate latch. **(2)**

**Mark scheme:**

- Award 1 mark for: mild steel is susceptible to corrosion / rusting when exposed to moisture
- Award 1 mark for: so the gate latch would degrade over time outdoors, becoming difficult to operate and eventually failing unless a protective finish such as galvanising or paint is applied

*Examiner's note: Students who only state 'it rusts' without explaining the consequence for the product score 1 mark — full marks require a clear link to product performance or maintenance.*

Source: 1.8.1 Ferrous metals — Mild Steel: mild steel is tough, ductile and malleable but will corrode (rust) if not protected.

**Q3**

Explain one reason for using stainless steel for the surgical instrument tray used in a hospital. **(2)**

**Mark scheme:**

- Award 1 mark for: stainless steel is resistant to corrosion / does not rust
- Award 1 mark for: so the tray can be repeatedly sterilised using high-temperature steam or chemical solutions without deteriorating, keeping it hygienic and safe for medical use

*Examiner's note: Naming 'corrosion resistance' alone scores 1 mark — the second mark requires explaining why this matters specifically in a hospital sterilisation context.*

Source: 1.8.1 Ferrous metals — Stainless Steel: stainless steel is hard, tough, and resistant to corrosion.

**Q4** Explain one reason why cast iron is a suitable material for the jaws of a workshop vice. **(2)**

**Mark scheme:**

- Award 1 mark for: cast iron is hard / resists deformation and indentation
- Award 1 mark for: so the vice jaws maintain their shape and precise flat surfaces when clamping workpieces under high force, ensuring accuracy and preventing the jaws from wearing down during repeated use

*Examiner's note: Stating 'cast iron is strong' without specifying hardness scores 0 — the mark is for naming or clearly implying hardness (resistance to deformation, indentation, or scratching); the second mark requires explaining how this benefits the product.*

Source: 1.8.1 Ferrous metals — Cast Iron: cast iron is hard and has good compressive strength. 1.8.3 Properties — Hardness: the ability of a material to resist deformation, indentation, or scratching.

**Q5** Explain one reason for using copper for the water pipe fittings in a central heating system. **(2)**

**Mark scheme:**

- Award 1 mark for: copper is malleable / can be bent and shaped without fracturing
- Award 1 mark for: so the pipe fittings can be formed to precise angles and curves to route the heating pipes around obstacles in walls and floors without the need for additional joining pieces

*Examiner's note: Simply stating 'copper is malleable' without a linked reason scores 1 mark — the second mark requires explaining how malleability helps in the context of pipe installation.*

Source: 1.8.2 Non-ferrous metals — Copper: copper is malleable, ductile, and a good conductor of heat and electricity; commonly used for water pipes and electrical wire.

**Q6** Explain one reason why brass is used for bathroom tap fittings. **(2)**

**Mark scheme:**

- Award 1 mark for: brass is resistant to corrosion / does not rust or tarnish in wet conditions
- Award 1 mark for: so the tap fittings remain functional and retain their appearance in a wet bathroom environment without deteriorating, reducing the need for replacement over the product's lifetime

*Examiner's note: Naming 'brass is an alloy of copper and zinc' alone scores 0 — the mark is for a named property such as corrosion resistance; the second mark requires explaining why that property makes brass suitable for tap fittings in a wet environment.*

Source: 1.8.2 Non-ferrous metals — Brass: brass is an alloy of copper and zinc, with good corrosion resistance and an attractive golden colour. Common uses include bathroom fittings, musical instruments, and door handles.

**Q7** Explain why ductility is an important property in a metal used to manufacture electrical cables. **(2)**

**Mark scheme:**

- Award 1 mark for: a ductile metal can be drawn out into long, thin wires without fracturing
- Award 1 mark for: so the metal can be formed into the continuous fine strands needed for electrical cables, which must be flexible enough to route through walls and appliances without snapping during installation or use

*Examiner's note: Simply stating 'ductile metals can be stretched' scores 1 mark — the second mark requires explaining why this characteristic is needed specifically for the manufacturing or end-use of electrical cables.*

Source: 1.8.3 Working properties — Ductility: the ability of a material to deform by stretching or drawing into a wire without breaking. Copper is a key example, commonly used for electrical cables.