Your notes

GCSE Design and Technology: revision notes

Materials and their working properties

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Papers, boards and timbers

- Papers and boards: layout paper (thin, for sketching), cartridge paper (thicker, for drawing), tracing paper, and bleedproof paper (for marker pens); boards include corrugated card (packaging), duplex board, foil-lined board (food packaging), foam board (models) and corriflute (signs).
- **Hardwoods** come from deciduous trees and are generally dense and durable: oak, ash, beech, mahogany and balsa (which is a **hardwood** despite being very light).
- **Softwoods** come from coniferous trees and grow faster, so they are cheaper: pine, larch and spruce.
- **Manufactured boards** are made from wood waste or veneers: MDF (smooth and stable), plywood (strong, layers at right angles) and chipboard (cheap, used in flat-pack furniture).

Metals

- **Ferrous metals** contain iron and most rust: low carbon (mild) steel, high carbon (tool) steel and cast iron.
- Non-**ferrous metals** contain no iron and don't rust: aluminium (light), copper (conducts electricity well), tin and zinc.
- **Alloys** are mixtures of a metal with other elements to improve properties: brass (copper and zinc), stainless steel (steel and chromium, resists corrosion), high speed steel (for cutting tools).

Polymers and textiles

- **Thermoforming polymers** can be reheated and reshaped many times: acrylic (PMMA), HIPS, PVC, PET and polypropylene.

- **Thermosetting polymers** set permanently when heated and can't be reshaped: epoxy resin, melamine formaldehyde, polyester resin, urea formaldehyde.
- Natural textile fibres: cotton and linen (from plants), wool and silk (from animals). Synthetic fibres: polyester, polyamide (nylon) and elastane (Lycra). Blends combine their properties, such as polyester-cotton.
- Fabrics can be woven, knitted, or non-woven (such as felt).

Properties

- Physical properties: absorbency, density, fusibility (can be melted and joined), electrical and thermal conductivity.
- Working properties: strength, hardness, toughness, **malleability** (can be shaped without breaking), **ductility** (can be drawn into wire) and elasticity.

Key terms

Hardwood	Wood from a deciduous (broad-leaved) tree.
Softwood	Wood from a coniferous tree.
Manufactured board	A board made from wood waste or veneers, such as MDF.
Ferrous metal	A metal that contains iron.
Alloy	A mixture of a metal with other elements.
Thermoforming polymer	A plastic that can be reheated and reshaped.
Thermosetting polymer	A plastic that sets permanently when heated.
Malleability	The ability to be shaped without breaking.
Ductility	The ability to be drawn into a wire.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which of these is a softwood?
2. Why is balsa classed as a hardwood?
3. Which metal is ferrous?
4. What is brass made from?
5. What is a thermoforming polymer?
6. Which is a thermosetting polymer?
7. What is ductility?
8. Why is copper used for electrical wires?

Answers

1. Pine
2. It comes from a deciduous tree
3. Mild steel

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4. Copper and zinc
5. A plastic that can be reheated and reshaped
6. Epoxy resin
7. The ability to be drawn into a wire
8. It is an excellent electrical conductor and ductile

What to do next

Practise 12 questions on this topic

Try 5 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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