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Design & Technology
AQA GCSE

Sources and origins

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don’t spend too much time on one question

Good luck!

Q1. What is the purpose of timber seasoning?

A To reduce moisture content

B To increase moisture content

C To reduce sap content

Q2. What is the purpose of debarking in paper production?

A To soften wood fibres for pulping

B To remove outer layers of bark and branches

C To add chemicals for sizing

Q3. What does sizing do to paper?

A Makes it more absorbent

B Stops it from being absorbent

C Strengthens the wood fibres

Q4. What process separates metal from ore using high heat?

A Smelting

B Mining

C Fractional distillation

Q5. What is the main source of polymers?

A Trees

B Crude oil

C Metal ores

Q6. What does fractional distillation do?

A Extracts metal from ore

B Breaks down crude oil into usable elements

C Combines short fibres into yarn

Q7. What is the purpose of carding in textile production?

A To spin fibres into yarn

B To bond fibres with moisture

C To align fibres in the same direction

Q8. Which process twists fibres into yarn?

A Felting

B Spinning

C Combing

Q9. Choose one of the material categories in the table below.

Metal based materials	Paper and boards	Polymers	Textile based materials	Timber based materials

Q9a. Give the source or origin of your chosen material category **(1 mark)**

Q9b. Name one process used to convert your chosen material category into a workable form **(1 mark)**

Q9c. Using notes and/or sketches describe the process you have named above **(4 marks)**

Answers

Q1. A
Q2. B
Q3. B
Q4. A
Q5. B
Q6. B
Q7. C
Q8. B

Q9a.

Material	Source/Origin
Metal based materials	Rocks or Ore
Papers and boards	Trees, forests, woods and plant fibres
Polymers	Crude oil and plants
Textile based materials	Natural fibres
Timber based materials	Trees, forests or woods

Q9b.
See below

Q9c.

Material area	Source / origin	Name a process used to convert your chosen material category into a workable form	Describe how your named process converts your chosen material category into a workable form
Paper and board	Trees and plants	Debarking, chipping, shredding, pulping, sizing	• **Debarking** – removal of outer layers of bark and branches before chipping to make pulp. • **Chipping**/shredding – logs are converted into chips to make more manageable smaller pieces of wood which

			are easier to treat with chemicals before pulping. • **Pulping** – a mechanical/ shredding process involving cooking wood chips in chemicals in large tanks to soften wood fibres and make a pulp. • **Sizing** – a finishing process where the wood pulp is beaten with chemicals and other additives. Sizing stops the paper from being absorbent so it can be printed on
Timber based materials	Trees	Felling or Debarking Conversion & sawing Seasoning	• **Felling** – extracting living trees from forests, • **Debarking** -removal of bark, branches and creation of logs • **Conversion & sawing** – Conversion of logs into planks (rough sawn) to make them more manageable and easier to handle. • **Seasoning** – reduction of the moisture content in timber to make it less prone to shrinkage and movement. Can be naturally or kiln dried
Metal based materials	Rocks and ore	Mining Smelting	• **Mining** – extraction of rocks from the ground (ore) containing

			naturally occurring metal elements. • **Smelting** – heating of metal in ore form at high temperatures in a furnace to extract metal from the rock. The separation process involves the removal of impurities and this is called slag
Polymers	Ground/ earth's crust	Fractional distillation Refining/ cracking	• FD – conversion of crude oil into its more usable elements e.g. diesel and petrol. • Refining/cracking – conversion of long chain hydrocarbons into more usable ones e.g. petrol. Heat and catalysts are used to facilitate this process
Textile based materials	Plants and animals	Carding /combing Spinning Felting/ bonding/ needle bonding	• **Carding** – using staple (short) Fibres they are combed to make sure they all lie in the same direction before twisting to form a yarn. • **Spinning** – where fibres are spun or twisted into a yarn. These can be filament fibres (smooth yarn) or staple fibres (hairy/fluffy yarns). • **Felting/bonding** – laying the fibres randomly in a web, moisture and agitation to mat fibres together