

OCR A-Level

Environmental Impact on Materials and Production (3.2c)

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. Which environmental factor most strongly affects the viability of extracting raw materials such as bauxite for aluminium production?

- A** Proximity to skilled labour
- B** Energy demand and associated carbon emissions
- C** Availability of decorative coatings

Q2. A manufacturer chooses to source timber only from FSC-certified forests. This decision primarily addresses which environmental concern?

- A** Variability in machining tolerances
- B** Biodiversity loss and unsustainable deforestation
- C** Financial incentives for overseas labour markets

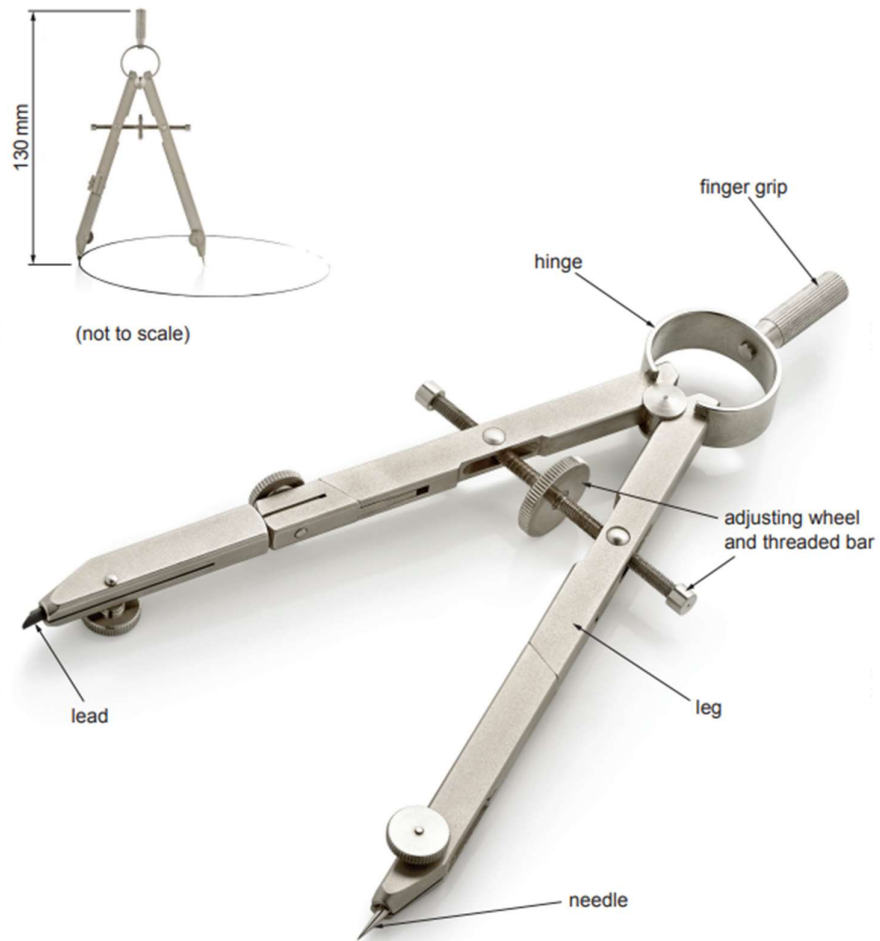
Q3. Which of the following best explains why metals such as aluminium have high environmental processing costs despite being abundant?

- A** They require high-temperature electrolysis, consuming significant electrical energy
- B** They cannot be recycled efficiently
- C** They must be extracted manually without mechanisation

Q4. Improper disposal of polymer waste can create which environmental risk?

- A** Loss of product branding
- B** Microplastic pollution in marine ecosystems
- C** Increased yield in injection moulding

Q5. The image below shows a drawing compass.



Describe how one of the raw materials for the metal alloy would be extracted from its origin. **(2 marks)**

Q6. Developments in design practice and thinking have been influenced by the consideration of a wide range of factors. Identify and explain two effects of using depleting raw materials in design. **(4 marks)**

Answers

Q1. X

Q2. X

Q3. X

Q4. X

Q5.

Possible responses may include:

- Iron ore is mined from earth (1) It is refined/ with smelting in a blast furnace to remove impurities/ separate impurities (1).
- Bauxite ore/ Ore is mined from earth. (1) It is refined using Electrolysis/ smelting/ heat to separate impurities to extract the aluminium (1).
- Any other valid justified suggestion depending on response to part i.

Q6.

Possible effects of using depleting raw materials in design could include:

- The cost of the product increase, as the material is harder to obtain e.g. lithium or oil (1) so this would result in lower profit margins or higher priced products/ services/ energy. (1)
- It could put off some consumers (1) as they will be looking for more environmentally/ fare traded conscious brands and will not buy the product due to awareness of environmental, social or ethical issues (1)
- It is using up materials that may be vital for products to run (1) e.g. lithium, copper and iron – it's important that we try to source materials from recycling sources and save resources/ supplies (1) Increased carbon footprint and environmental or social/ethical issues when vital materials become harder to source (1) e.g. Lithium mining causes soil contamination/ harmful extraction or CT/ gold mining for electronic products has led to conflicts and violence (1)
- Any other suitable response.

Q7.