

**Design & Technology**  
**AQA A-Level**

# Conservation of energy and resources

## Materials required for questions

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- Pencil
- Rubber
- Calculator

## Instructions

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- 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

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- 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 a key goal of the circular economy?

- A** Increase product disposal rates
- B** Maximise the use of fossil fuels
- C** Keep materials in use and reduce waste

**Q2.** Which of the following helps reduce the environmental impact of raw material extraction?

- A** Using virgin materials
- B** Designing for single-use
- C** Selecting recycled or renewable materials

**Q3.** What is one way a product can be designed to reduce energy use during its lifetime?

- A** Using complex, sealed components
- B** Including energy-efficient features or standby modes
- C** Avoiding modular construction

**Q4.** What is a sustainable way to manage manufacturing by-products?

- A** Disposing of off-cuts in landfill
- B** Reusing or recycling excess materials and heat
- C** Ignoring water usage



## Answers

Q1. C

Q2. C

Q3. B

Q4. B

Q5.

- CAD modelling to simulate material tessellation prior to cutting on CNC machinery.
- Greater use of CNC machinery for greater accuracy and therefore less waste.
- Low energy lighting factories.
- Electrical equipment going into standby when not in use.
- PIR sensors in lighting.
- Use of renewable sources of power.
- Use of recycled materials wherever possible.
- Use of rapid prototyping to produce testable prototypes before full scale production.
- Use of Mould Flow Analysis to check mould designs will fill prior to investment.
- Reduction of parts (combination) to reduce assembly requirements.
- Use of redistribution production techniques wherever possible.
- The use of reusable metal moulds when forming products removes the need for reproduction.
- Manufacturing plants make use of renewable energy sources, such as solar/wind to power factories.
- Use of cavity wall insulation on buildings to reduce heat loss and the amount of energy required to heat buildings.