

Design & Technology

Edexcel GCSE

Fossil Fuels

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. Identify the source of renewable energy.

- A** Coal
- B** Hydro-electrical
- C** Natural gas

Q2. Which energy source is finite?

- A** Biomass
- B** Solar
- C** Oil

Q3. Which one of the following statements is true?

- A** Oil is extracted from the ground to produce petroleum
- B** Coal is used to generate hydro-electric power
- C** Gas is a renewable resource extracted from the ground

Q4. In a fossil fuel power station, what turns the generator?

- A** The furnace
- B** The transformer
- C** The turbine

Q5. Which fossil fuel releases the most carbon dioxide when burned to generate electricity?

- A** Natural gas
- B** Coal
- C** Hydrogen

Q6. Which one of the following is a renewable resource?

- A** Metal ore
- B** Natural gas
- C** Water

Q7. The table below shows the United Kingdom's (UK's) energy consumption by fuel type.

Oil	40%
Natural gas	36%
Renewables	14%
Nuclear energy	7%
Coal	3%

Q7a. State the least consumed fuel type. **(1 mark)**

Q7b. Calculate the total percentage of non-renewable energy sources consumed. Show all workings. **(3 marks)**

Q7c. Give one reason why the UK needs to decrease its use of oil as an energy source. **(1 mark)**

Q8. Give two reasons why fossil fuels are considered bad for the environment. **(2 marks)**

1

2

Q9. Explain the disadvantages of extracting fossil fuels as a source of energy. **(3 marks)**

Answers

Q1. B

Q2. C

Q3. A

Q4. C

Q5. B

Q6. C

Q7a.

Coal (1 mark). Only acceptable response.

Q7b.

One mark for each correct step in the calculation (3 marks). Three marks can be awarded for a correct calculation process with the correct final answer.

- Coal + Oil + Nuclear energy + Natural gas (1)
- 3% + 40% + 7% + 36%, or 100% - 14% (1)
- Total = 86% (1)

Credit any appropriate approach to calculating the total percentage.

Q7c.

Answers must be related to oil as a source of energy (1 mark). For example:

- Oil is extracted from the earth and is therefore a fossil fuel (1)
- Fossil fuels will eventually run out and cannot be replaced (1)
- Burning oil produces waste products which are pollutants (1)
- Burning oil contributes to global warming (1)
- Inhaling pollutants from burning oil can cause respiratory diseases (1)

Credit any other appropriate response.

Q8.

Two from (2 marks), e.g.:

- Burning fossil fuel creates waste products such as sulphur dioxide gas/nitrogen dioxide (1)
- Creates air pollution (1)
- Contributes to global warming as it creates carbon dioxide when burnt (1)
- Transportation of oil/coal can cause pollution (1)

Q9.

3 marks: a range of detailed disadvantages identified with clarity, showing knowledge of issues associated with the extraction of fossil fuels as a source of energy. 2 marks: disadvantages identified in brief. 1 mark: one correct simple disadvantage. Indicative content:

- Mining of coal produces lots of waste (slag heaps) and pollution (of water courses)
- Visual pollution associated with open cast mining, and the location of power plants near rivers (water needed for cooling)
- Pollution associated with extraction of fossil fuels deep in the ground leads to atmospheric pollution
- Shale gas extracted by pumping pressurised water and chemicals deep into the ground (fracking) is believed to cause earthquakes/seismic shocks and damage to water courses
- Drilling for oil can lead to pollution of marine ecosystems, e.g. the Deepwater Horizon disaster in 2010 in the Gulf of Mexico

Accept all other valid responses.