

Design & Technology

Edexcel GCSE

Environment

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 one of the following contributes to global warming?

- A** Using renewable sources of energy
- B** Using fossil fuels
- C** Improving efficiency in manufacturing

Q2. Products designed to be more efficient are developed by

- A** batch production
- B** planned obsolescence
- C** continuous improvement

Q3. When manufacturers focus on the reduction of waste during production, it is called

- A** lean manufacture
- B** batch manufacture
- C** mass manufacture

Q4. Which one of the following statements is true?

- A** Continuous improvement is the concept of storing waste
- B** Pollution is created by the burning of fossil fuels
- C** Global warming is due to decreasing levels of carbon dioxide

Q5. Which one of the following has a positive impact on the environment?

- A** Reducing waste
- B** Global warming
- C** Pollution

Q6. How does just in time (JIT) production help the environment?

- A** Products are made as quickly as possible
- B** Less stock is stored, damaged or thrown away
- C** Factories run 24 hours a day

Q7. A manufacturer is developing and releasing a new games controller to replace its original controller.

Explain two environmental issues related to the development and release of the new games controller. **(4 marks)**

1

2

Q8. Explain how global warming may be considered before designing and manufacturing new products. **(2 marks)**

Q9. Responsible design should consider social issues in the design and manufacture of products.

Analyse and evaluate how pollution caused by the manufacture, use and disposal of products can impact the environment.

Give examples in your answer.

(8 marks)

[illegible]

Answers

Q1. B

Q2. C

Q3. A

Q4. B

Q5. A

Q6. B

Q7.

Any two explanations that reference environmental issues (1 mark) and a linked justification of the issues (1 mark), up to 4 marks. Possible points include:

- New materials are required to make the bodies for new games controllers (1), therefore putting pressure on the extraction/mining of finite resources to make plastics (1)
- Many old controllers are not correctly disposed of/dumped (1), which adds to landfill/increased demand on space/takes hundreds of years to break down (1)
- Games controllers should be properly disposed of/WEEE regulations (1), which means they are broken down/rare materials taken out for recycling because they contain hazardous substances/reducing the amount of materials going to landfill/incineration (1)
- Demand for energy used for materials/during manufacture/fuel for transportation (1), which results in additional demand on finite resources/pollution generated (1)

Q8.

2 marks for one point of understanding in detail or two simple points; 1 mark for one simple correct point. Possible points include:

- Designers don't want to heat up the planet or make products that damage it
- They don't want to add to conditions that create extreme weather/drought
- Designers/manufacturers may want to cut CO2 emissions as they know it leads to global warming

- They may use strategies and techniques that do not contribute to global warming, e.g. not using fossil fuels to power factories
- Manufacturers may promote a product as 'climate friendly' because it has lower CO₂ emissions, e.g. car and TV manufacturers
- Designers and manufacturers may calculate the carbon footprint of their business or product and aim for net-zero carbon dioxide emissions

Accept all other valid responses.

Q9.

Analysis: identification of the characteristics of each type of pollution.

Evaluation: judgement on the impact of each type of pollution on the environment. Indicative content includes:

Oceanic pollution

- Pesticides and fertilisers washed from the land by rain and carried by rivers into the sea
- Chemicals and toxic materials like mercury and lead find their way into oceans, then enter the food chain and poison water supplies
- Plastic which does not degrade is carried by rivers into the sea, creating large pools of rubbish where sea currents meet
- Pollution of the seas from oil spills during extraction and tanker accidents
- Oil and sewage pollution can still contaminate ecosystems and marine life, e.g. coastlines
- Microbeads (banned in UK cosmetics since 2018) are under 1 mm, so cannot be removed by water treatment and reach the oceans, harming sea life

Atmospheric pollution

- Acid rain: nitrogen oxide and sulphur dioxide combine and fall as acid rain, raising acidity in lakes (killing fish and marine life) and in soil (destroying plant life)
- Carbon monoxide contributes to greenhouse gases and raises the global temperature
- Carbon dioxide emissions from vehicles using fossil fuels lower air quality, affecting the health of the young, elderly and those with breathing problems
- Particulates released into the atmosphere can cause 'global dimming', restricting light reaching the Earth's surface
- Lower air quality increases healthcare costs and mortality rates; affected groups are told to stay indoors on poor air quality days

Accept other valid responses.

Level	Marks	Descriptor
0	0	No attempt or nothing worthy of credit.

1	1-2	One or two limited points considering oceanic and/or atmospheric pollution. Very limited analysis, evaluation and no examples.
2	3-4	Basic analysis of oceanic and/or atmospheric pollution. Expect an imbalance between the two types of pollution. One or no evaluative point. Simplistic or vague attempt to include examples.
3	5-6	A good analysis of both oceanic and/or atmospheric pollution and the impact on the environment. Some evaluative points given in response to the analysis. Good example(s) to support the response.
4	7-8	A fully detailed analysis and evaluation of oceanic and/or atmospheric pollution and the impact it can have on the environment. Several good examples to support the response.