

C1 Assessed Task

1. Two power stations, A and B, use different fuels to produce electricity.

(a) Power station A burns natural gas.

Natural gas contains methane.

Methane contains only carbon atoms and hydrogen atoms.

(i) What is the name given to chemicals that contain only carbon atoms and hydrogen atoms?

.....[1]

(ii) When natural gas is burned, two main products are made.

What are the names of these two products?

1

2[2]

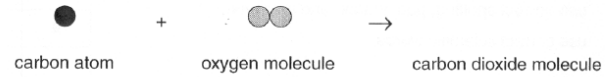
(b) Power station B burns coal.

Coal contains mostly carbon.

It burns in a plentiful supply of air to form carbon dioxide, which enters the atmosphere.

(i) The diagram shows the reaction between carbon and oxygen.

Finish the diagram to show what is produced in this reaction.



[1]

(ii) Which of these processes removes some of the carbon dioxide from the atmosphere?

Put a (ring) around the correct answer.

combustion
decomposition
respiration
photosynthesis

[1]

(c) Coal and natural gas contain sulfur.

When these fuels are burned in power stations the sulfur produces the pollutant gas sulfur dioxide.

How could members of the public reduce the sulfur dioxide pollution produced by burning coal or natural gas in power stations?

Put a tick (✓) in each of the correct boxes.

Use electricity instead of natural gas for central heating.

Turn off appliances when not in use.

Use a gas cooker instead of an electric cooker.

Insulate homes to a higher standard.

[2]

[Total: 7]

2. Nitrogen dioxide is a gas that pollutes the air. The main source of this pollutant gas is car engines.

(a) These sentences describe how nitrogen dioxide is made, but they are in the wrong order.

- A Nitrogen monoxide is released from the car exhaust and mixes with gases in the air.
- B Nitrogen monoxide reacts with oxygen to make nitrogen dioxide.
- C Air and petrol vapour are mixed and enter the car engine.
- D At high temperature nitrogen and oxygen join to make nitrogen monoxide.
- E Petrol burns, heating up the car engine.

In the boxes write the letters to show the correct order for the sentences.

The first letter has been written for you.

C				
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[3]

(i) Much of this reduction has resulted from the use of catalytic converters in car exhaust systems.

Which of the following reactions take place in a catalytic converter?

Put a tick (✓) in each of the correct boxes.

Nitrogen monoxide is converted into nitrogen and oxygen.

Nitrogen monoxide is converted to nitrogen dioxide.

Carbon dioxide is converted to carbon monoxide.

Carbon monoxide is converted to carbon dioxide.

[2]

(ii) Which of the following developments have also helped to reduce the nitrogen dioxide released into the air from car exhausts?

Put a tick (✓) in each of the correct boxes.

Having legal limits to emissions which are enforced by the use of MoT tests.

Improvements in the design of car engines.

Reduction in the price of public transport.

[1]

(c) What pollutant is made when nitrogen dioxide dissolves in water?

.....
[1]
 [Total: 7]

3)

This question is about nitrogen dioxide, NO₂, and petrol engine cars.

(a) Nitrogen dioxide is formed at high temperatures.
 The temperature inside car petrol engines is high enough for this reaction to take place.
 Nitrogen dioxide is formed from gases found in the atmosphere.

Describe the steps in the formation of nitrogen dioxide.

.....

[2]

(b) The amount of nitrogen dioxide emitted by cars has decreased over the last 20 years.

State **two** technological developments that have helped to achieve this.

1

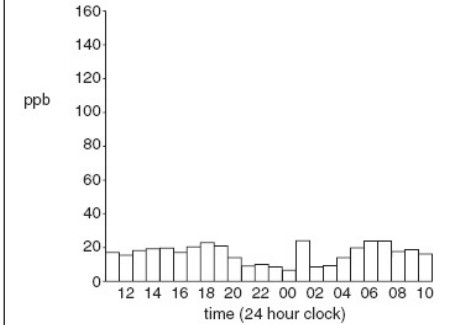
 2
[2]

The graphs show the level of nitrogen dioxide in parts per billion (ppb) in each street on the same day in August 2003.

Gonville Place



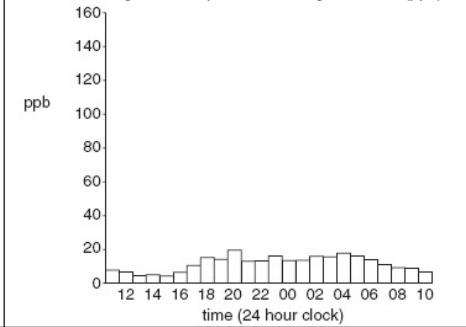
Gonville Pl. Air pollution - Nitrogen Dioxide (ppb)



Regent Street



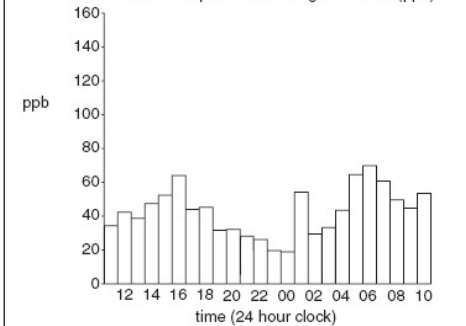
Regent St. Air pollution - Nitrogen Dioxide (ppb)



Silver Street



Silver St. Air pollution - Nitrogen Dioxide (ppb)



- (i) It has been suggested that there may be a correlation between nitrogen dioxide concentrations and volume of traffic at these sites.

What other data would you need to show that there is a correlation?

.....
.....[1]

- (ii) Additional data shows that there is a correlation between nitrogen dioxide levels and volume of traffic.

What other data would you need to show that petrol engines are the major **cause** of pollution by nitrogen dioxide?

.....
.....
.....[2]

[Total: 7]

Grade	Per Cent
A*	95
A	85
B	75
C	65
D	55
E	45