



KS3 Science

Carbon and Carbon Dioxide

Mark Scheme

Time available: 40 minutes

Marks available: 40 marks

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Mark schemes

- 1.** (a) (thought to cause) global warming / green house (effect) / climate change
ignore other consequences of global warming
*do **not** accept acid rain / ozone layer / global dimming*
- 1
- (b) any **three** from:
- replant trees / renewable / sustainable
ignore reusable
 - carbon (dioxide) used by trees / photosynthesis
accept trees absorb carbon (dioxide) as they grow
ignore respiration
 - it is a (continuous / carbon) cycle
accept burning wood is carbon neutral
- or**
carbon (dioxide) goes back into the air
*for the **second** and **third** bullet points: accept trees use carbon dioxide which is released when (trees / wood are / is) burnt for **2** marks*
- no new carbon (dioxide) is produced
- or**
no locked up carbon (dioxide) is released
- or**
the carbon (dioxide) was absorbed millions of years ago
- 3
- [4]**
- 2.** (a) (i) sulfur dioxide / SO₂
- 1
- (ii) global dimming
- 1
- (iii) carbon dioxide / CO₂
ignore ozone
- 1
- increases the levels (of carbon dioxide)
*accept it is a greenhouse gas **or** causes global warming / greenhouse effect*
- 1

(b) gas / oil bar correct length

1

coal bar correct length

1

[6]

3.

(a) curve of best fit drawn through

or close to all of the points

1

(b) (i) 313

1

(ii) 1989 +/- 1

1

(c) concentration / amount of carbon dioxide has increased

1

recently the rate of increase is increasing

1

[5]

4.

(a) **Quality of written communication**

for any two ideas sensibly stated

1

any **three** from:

- plants take in (CO_2)
accept photosynthesis uses (CO_2)
- converted to glucose / starch / carbohydrates
ignore carbon compounds by itself
- CO_2 locked up in fossil fuels
accept coal / oil / natural gas / methane for fossil fuels
- CO_2 reacts with / dissolves (sea)water
accept ocean removes CO_2
- producing hydrogencarbonates
accept carbonic acid
- producing carbonates
accept named carbonates
- marine animals use carbonates to make shells
*do **not** accept bones*
- forms sedimentary rocks
accept limestone / chalk
accept marble
*do **not** accept sediments alone*

3

(b) any **two** from:

- burning of fossil fuels **or** cars /
industry / air travel / power stations
ignore increase in population
ignore more use of electricity
- natural processes cannot absorb all the extra CO_2
- deforestation
accept less photosynthesis
ignore volcanic activity
accept burn trees

2

[6]

- 5.** (a) respiration
combustion
1 mark each 2
- (b) methane
water
1 mark each
accept steam
do not accept natural gas for methane
do not accept hydrogen oxide 2
- (c) greenhouse effect (increased)
accept (global) warming
accept polar ice caps melt
accept rising sea levels
accept problems with climatic change
do not accept changes to the weather or acid rain 1
- [5]**

- 6.** (a) (i) burning / breathing / respiration / fuels / food
for 1 mark each 2
- (ii) 1. rock is heated / subducted (owtte) / close to magma / melted
1. rock is decomposed / carbon dioxide released through volcanoes
for 1 mark each 2
- (b) carbon dioxide reacts / dissolves in sea-water / dissolves in rain water
insoluble carbonates / calcium carbonate are / is formed carbon dioxide turned into shells /
coral / limestone / chalk / sediments also soluble hydrogencarbonates (calcium /
magnesium) are formed photosynthesis by plants
any three for 1 mark each 3
- (c) (i) sea unable to absorb all the extra carbon dioxide being produced
more trees being cut down / deforestation increased burning of fuels / more cars /
more industry (*not* more people)
any one for 1 mark 1

- (ii) global warming / greenhouse effect or effects such as melting ice caps / rising sea levels / climatic change / more deserts
(*not* changes to ozone layer)

for one mark

1

[9]

7.

- (a) any **two** 1 mark each

burning / combustion

fossil fuels **or** (locked up) carbon

accept fuel / named fuel

oxygen used

2

- (b) any **three** from

produces (calcium) carbonate

which is insoluble

produces (calcium) hydrogencarbonate

which is soluble

photosynthesis

releases oxygen

3

[5]