



QUESTION WORKBOOK

The carbon cycle and climate change

Ecology, populations and environmental change · Unit B20

OCR A 4.2.1, 6.3.1 · Edexcel A 4.1, 5.12, 5.13, 5.14, 5.15, 5.16, 5.21, 5.22, 6.1, 6.2 · Edexcel B 10.4 i

14 questions · 46 marks

NAVY SCREEN EDITION

Every question in this book has a code beside its number.
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SECTION A · Short, 1 to 2 marks

A1 State the difference between a carbon store and a carbon transfer, giving an example of each. [2]

CCPD-Q14

A2 The following are all part of the carbon cycle: the atmosphere, photosynthesis, sedimentary rock, respiration, fossil fuels, decomposition. Identify which three of these are stores and which three are transfers. [2]

CCPD-Q15

SECTION B · Standard, 3 to 5 marks

B1 The northern limits of several British insect species have moved north over the past fifty years. Suggest why, and suggest why this may still lead to a fall in biodiversity overall. [4]

CCPD-Q1

B2

CCPD-Q7

Compare carbon dioxide with methane as greenhouse gases, referring to how each warms the surface, to how much of each is in the air, and to where the added gas comes from. [4]

B3

CCPD-Q8

A student says that because the carbon people add to the air each year is less than a tenth of the carbon photosynthesis removes, the human contribution cannot matter. Discuss this claim. [4]

B4

CCPD-Q9

A woodland bird times its egg-laying by day length, but its chicks hatch just after the peak abundance of the caterpillars it feeds them. Suggest why this mismatch has developed as the climate has warmed, and suggest one consequence for the bird population. [4]

B5

CCPD-Q10

Climate change requires many species to shift the area they occupy, but habitat fragmentation can prevent a population from reaching a newly suitable area. Suggest how connecting fragments of habitat with a wildlife corridor could reduce the resulting loss of biodiversity, and suggest one situation in which a corridor would not solve the problem. [4]

B6

CCPD-Q11

Explain why the rise in atmospheric carbon dioxide cannot be explained by population growth on its own, referring to what else the environmental pressure a population creates depends on. [4]

B7

CCPD-Q2

Name the process that transfers carbon from the atmosphere into living organisms, the process that returns it from living organisms to the atmosphere, and the process that returns carbon locked in dead organisms to the atmosphere. [3]

B8 Explain how coal was formed, and explain why the carbon in it had not been
CCPD-Q3 returned to the atmosphere before people began to mine it. [3]

B9 Photosynthesis removes about 120 gigatonnes of carbon from the atmosphere
CCPD-Q4 each year and respiration and decomposition return about 120 gigatonnes. Burning fossil fuels adds 10 gigatonnes and deforestation adds 1.5 gigatonnes, while oceans and land plants absorb 6.0 gigatonnes of the addition. Calculate the mass of carbon added to the atmosphere each year, and calculate this as a percentage of the carbon removed by photosynthesis. [3]

B10 The concentration of carbon dioxide in the atmosphere falls slightly during the
CCPD-Q5 northern hemisphere summer and rises again during the northern winter. Explain this pattern. [3]

B11 Explain why the ocean both takes up carbon dioxide from the air and releases it back, and explain why a warmer ocean is expected to hold less dissolved carbon dioxide. [3]

CCPD-Q12

B12 Explain what happens to a coral reef when sea temperature rises above a threshold, and explain why the loss of a reef reduces biodiversity beyond the corals themselves. [3]

CCPD-Q13

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