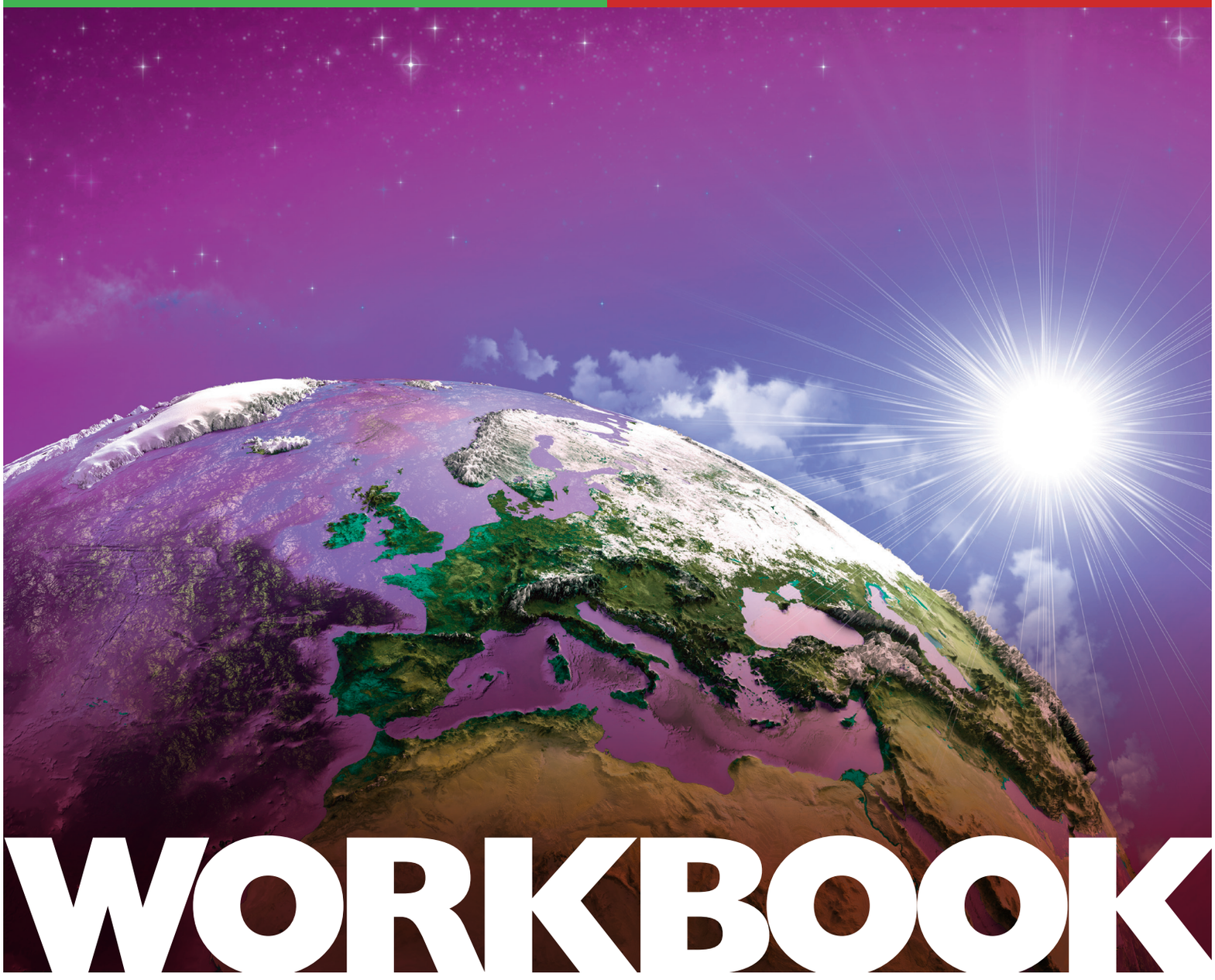
OCR

A-LEVEL



WORKBOOK

Geography 3

Geographical debates

Climate change; Disease dilemmas; Exploring oceans; Future of food; Hazardous Earth

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WORKBOOK

Contents

1 **This workbook** will help you prepare for the OCR AS and A-level Geography examinations. The layout of subject content closely follows that in the published OCR Geography specification.

2 **The workbook** focuses on five topics. You need to study one for AS and two for A-level.

3 **You should use** this workbook alongside reading the relevant sections of your textbook and checking through your lesson notes. There are also published study and revision guides that you might consult.

4 **For each topic** you will find a series of review questions that cover the content (enquiry questions and key ideas) as set out in the specification. Marks and lines or spaces are given for each question to give you a 'feel' for their relative importance and challenge. These questions build up to, and finish with, a set of exam-style questions. These should be completed within the times shown.

5 **In each topic** there are questions built around some form of stimulus material (map, diagram, photograph, statistical table or fact file).

6 **Answering the questions** will not only test your knowledge and understanding, but will also help you build your exam skills. Answers to all the questions are available at **www.hoddereducation.co.uk/workbookanswers**

7 **The AS examination** (02) is 1 hour 30 minutes long. You will need to answer a range of questions. Some questions require short answers earning 4 marks while some are longer, earning 6, 8 or 12 marks. You will also have to write a planned, extended prose answer in response to an essay question earning 20 marks. Some questions require reference to stimulus materials provided in a resource booklet.

The A-level examination (03) is 2 hours 30 minutes long. In each option, one question requires a short answer earning 3 marks, which requires reference to stimulus materials provided in a resource booklet, and there are questions requiring two longer answers earning 6 marks and 12 marks. You will also have to write a planned essay using extended prose, earning 33 marks.

8 **The Geographical Debates exam** (03) includes a section in which you will need to make links between an aspect of your chosen options and other areas of the course. Section B Synoptic questions could ask you to refer to material from your chosen Landscape system or from the Changing spaces; making places component (Workbook 1) or from the Earth's life support systems or your chosen options in the Human interaction component (Workbook 2).

Climate change

How and why has climate changed in the geological past?

The Earth's climate is dynamic

Past climate reveals periods of greenhouse and icehouse Earth. Evidence for this comes from sediments, ice cores, tree rings and fossils. Natural forcing has driven climate change in the geological past, including Milankovitch cycles, plate tectonics, solar output and natural variations in greenhouse gases.

1 **Outline the changes in global climate over the last 100 million years.** **3 marks**

2 **Explain the glaciation of Antarctica around 35 million years ago.** **6 marks**

3 **Explain how volcanic activity influences climate change.** **4 marks**

4 **State the three different Milankovitch cycles.** **3 marks**

5 **Under what circumstances do Milankovitch cycles have a particularly significant impact on global climate?** **2 marks**

6 Why are the 11-year cycles of solar output variation insignificant in influencing global climate? **2 marks**

7 Explain how CO_2 levels in the atmosphere vary naturally over both the short and long term. **8 marks**

How and why has the era of industrialisation affected global climate?

Humans have influenced the climate system, leading to a new epoch, the Anthropocene

Anthropogenic greenhouse gas emissions have increased since the pre-industrial period and these have enhanced the natural greenhouse effect. The global pattern of emissions has changed in recent history.

8 Study Figure 1, which shows changes in northern hemisphere snow cover.

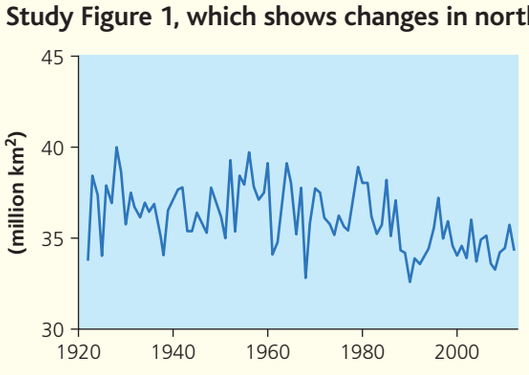


Figure 1

Describe the changes in snow cover shown in the figure. **3 marks**

9 Describe and explain how rising sea level provides evidence that the world has warmed since the late nineteenth century. **6 marks**

10 State the three main reasons why anthropogenic greenhouse gas emissions have increased since the pre-industrial period. **3 marks**

11 Explain how anthropogenic greenhouse gas emissions have enhanced the greenhouse effect. **4 marks**

12 'China produces more greenhouse gas emissions than the USA'. Why might this statement be seen as misleading? **2 marks**

13 Using a case study of either an advanced country (AC), or an emerging and developing country (EDC), describe and explain the recent changes in its greenhouse gas emissions. **8 marks**

Why is there a debate over climate change?

Debates of climate change are shaped by a variety of agendas

The climate change debate has evolved over time, largely as understanding of both the evidence and the causes of change have improved. Governments and international organisations have played a role in shaping the debate, as have the media and different interest groups.

14 **Outline the development of scientific understanding of the greenhouse effect during the nineteenth century.** 3 marks

15 **What is the Keeling Curve and what data is it derived from?** 2 marks

16 **What was the focus of the climate change debate during the 1970s?** 2 marks

17 **What evidence is typically used to demonstrate that there is now a consensus in the scientific community that climate change is taking place?** 1 mark

18 **Explain the concept of a 'threshold' in global temperature change.** 2 marks

19 **Outline the role of the United Nations (UN) in the climate change debate.** 5 marks

20 **What is meant by the term 'false balance' in media reporting?** 2 marks

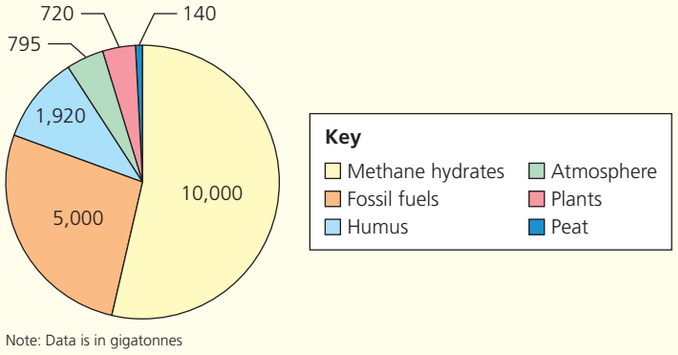
21 **Using examples, explain the potential bias in the media when reporting on climate change.** **6 marks**

In what ways can humans respond to climate change?

An effective human response relies on knowing what the future will hold

Climate modelling is used to demonstrate the importance of the carbon cycle to climate change, as well as the influence of positive and negative feedback. A number of future emissions scenarios are used to indicate the potential impacts on global temperatures and sea levels.

22 **Study Figure 2, which shows the size of global carbon stores.**



Note: Data is in gigatonnes

Figure 2

a **Calculate the total size of the biosphere store.** **1 mark**

b **Explain why there are concerns about how much carbon is in the atmosphere, despite its relatively small amount.** **4 marks**

23 Outline one positive feedback mechanism in global climate change modelling. 2 marks

24 Why are different Representative Concentration Pathways (RCPs) used by the IPCC in its climate change projections? 6 marks

The impacts of climate change are global and dynamic

Impacts include changes to ecosystems, human health and extreme weather. These impacts are influenced by the vulnerability of people and the environment.

25 Explain three impacts of rising sea surface temperature (SST) on marine ecosystems. 6 marks

26 Study Figure 3 on page 9, which shows the projected spread of malaria by 2050.

a Describe the pattern in the spread of malaria by 2050. 4 marks

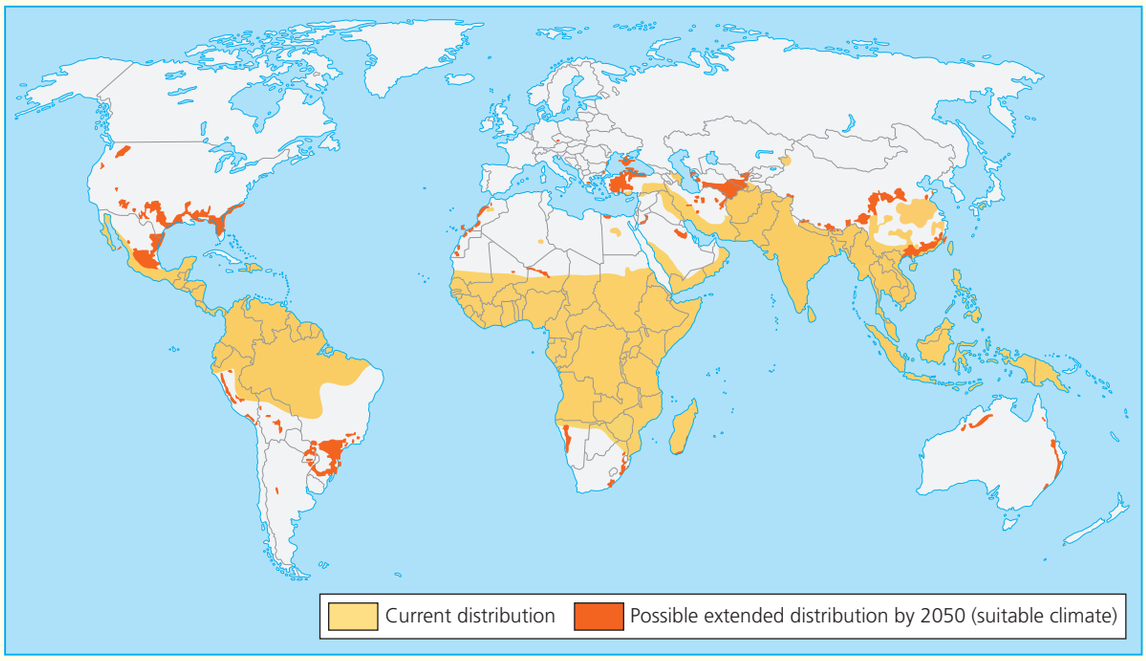


Figure 3

b **Suggest two reasons for this pattern.** **4 marks**

27 **Outline the two factors that largely determine the vulnerability of people to climate change.** **4 marks**

28 **Which ecosystems are most vulnerable to climate change?** **2 marks**

29 **Explain two ways in which climate change could affect plant productivity.** **6 marks**

Mitigation and adaptation are complementary strategies for reducing and managing the risks of climate change

Mitigation strategies aim to control the concentrations of greenhouse gases in the atmosphere in order to reduce climate change. Adaptation strategies aim to reduce the vulnerability of human populations to the risks of climate change.

30 **Explain two ways countries can try to improve energy efficiency and conservation.** **4 marks**

31 **Using an example, describe how a country can move towards the use of low-carbon energy sources.** **4 marks**

32 **Explain how each of the following can help reduce the concentration of greenhouse gases in the atmosphere:** **6 marks**

Forestry strategies

Carbon capture and storage

33 **What is geoengineering?** **2 marks**

34 **Explain the purpose of one geoengineering strategy.** **3 marks**

35 a **Using case studies of two countries at contrasting levels of development, such as AC and low-income developing country (LIDC), or AC and EDC, or EDC and LIDC, outline the opportunities and threats each country faces from climate change, under the following headings.** **8 marks**

Socioeconomic

Environmental

Country 1 name:	Country 2 name:
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

b **For each country, explain the strategies being used to adapt to climate change under the following headings.** **12 marks**

Technological

Socioeconomic

Political

Country 1 name:	Country 2 name:
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
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Can an international response to climate change ever work?

Effective implementation depends on policies and cooperation at all scales

Geopolitics has an important influence on our attempts to manage climate change. This applies at a range of scales, international, regional, national and subnational.

36 a **Outline the agreements made at one UN Climate Change Conference.** **4 marks**

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b Suggest why the agreements made may not be/have not been entirely effective. **6 marks**

37 Explain the purpose of carbon trading and carbon credits. **6 marks**

38 Using an example, describe and explain the strategies used to manage climate change at a subnational scale. **6 marks**

Exam-style questions

39 Table 1 shows CO_2 emissions for selected countries.

Table 1

Country	CO_2 emissions (m tonnes)
Argentina	191
Brazil	451
Gambia	0.3
Italy	331
Russia	1,469
Saudi Arabia	1,506
United Kingdom	390
Vietnam	206

a Identify three limitations of Table 1 as a source of information about CO_2 emissions.

4 **3 marks**

b Explain how past climates can be reconstructed.

8 **6 marks**

40 Examine how climate change influences the water cycle in the Arctic tundra. Continue your answer on a separate sheet of paper.

18 **12 marks**

41 'The media play an unbiased role in the current climate change debate'. How far do you agree?

Answer this question on a separate sheet of paper.

45 **33 marks**