Cambridge Assessment International Education

Interactive

Learner Guide

Cambridge IGCSE™

Environmental Management 0680

Cambridge O Level

Environmental Management 5014

For examination from 2019

Cambridge Pathway

Contents

About this guide

This guide explains what you need to know about your Cambridge Environmental Management course and examinations. You should use this guide alongside the support of your teacher. It will help you to:

- ✓ understand what skills you should develop by taking this Cambridge IGCSE course
- ✓ understand how you will be assessed
- ✓ understand what we are looking for in the answers you write
- ✓ plan your revision programme
- ✓ revise, by providing revision tips and an interactive revision checklist (Section 5).

Section 1: Syllabus content - what you need to know about

This section gives you an outline of the syllabus content for this course. Ask your teacher for more detail about each topic. You can also find more detail in the Revision checklists of this guide.

The syllabus is divided into nine topic which have been designed to help you develop an understanding of both the natural and the human environment. The nine topics are:

1. Rocks and minerals and their exploration
2. Energy and the environment
3. Agriculture and the environment
4. Water and its management
5. Oceans and fisherie
6. Managing natural hazards
7. The atmosphere and human activities
8. Human population
9. Natural ecosystems and human activities

Make sure you always check the latest syllabus, which is available at www.cambridgeinternational.org

Section 2: How you will be assessed

You will be assessed at the end of the course using two papers:

- Paper 1 Theory
- Paper 2 Management in context

Papers at a glance

This table summarises the key information about each paper. You can find details and advice on how to approach each paper in the 'About each paper' sub-section.

Component	Time and marks	Skills assessed	Details	Percentage of qualification
Paper 1 Theory	1 hour 45 minutes 80 marks	• Knowledge and understanding • Information handling and analysis • Investigation skills and making judgements	Section A: short and structured questions – 20 marks Section B: short-answer and extended response questions based on source material – 60 marks	50%
Paper 2 Management in context	1 hour 45 minutes 80 marks	• Knowledge and understanding • Information handling and analysis • Investigation skills and making judgements	Short, and extended response questions based on source material – 80 marks	50%

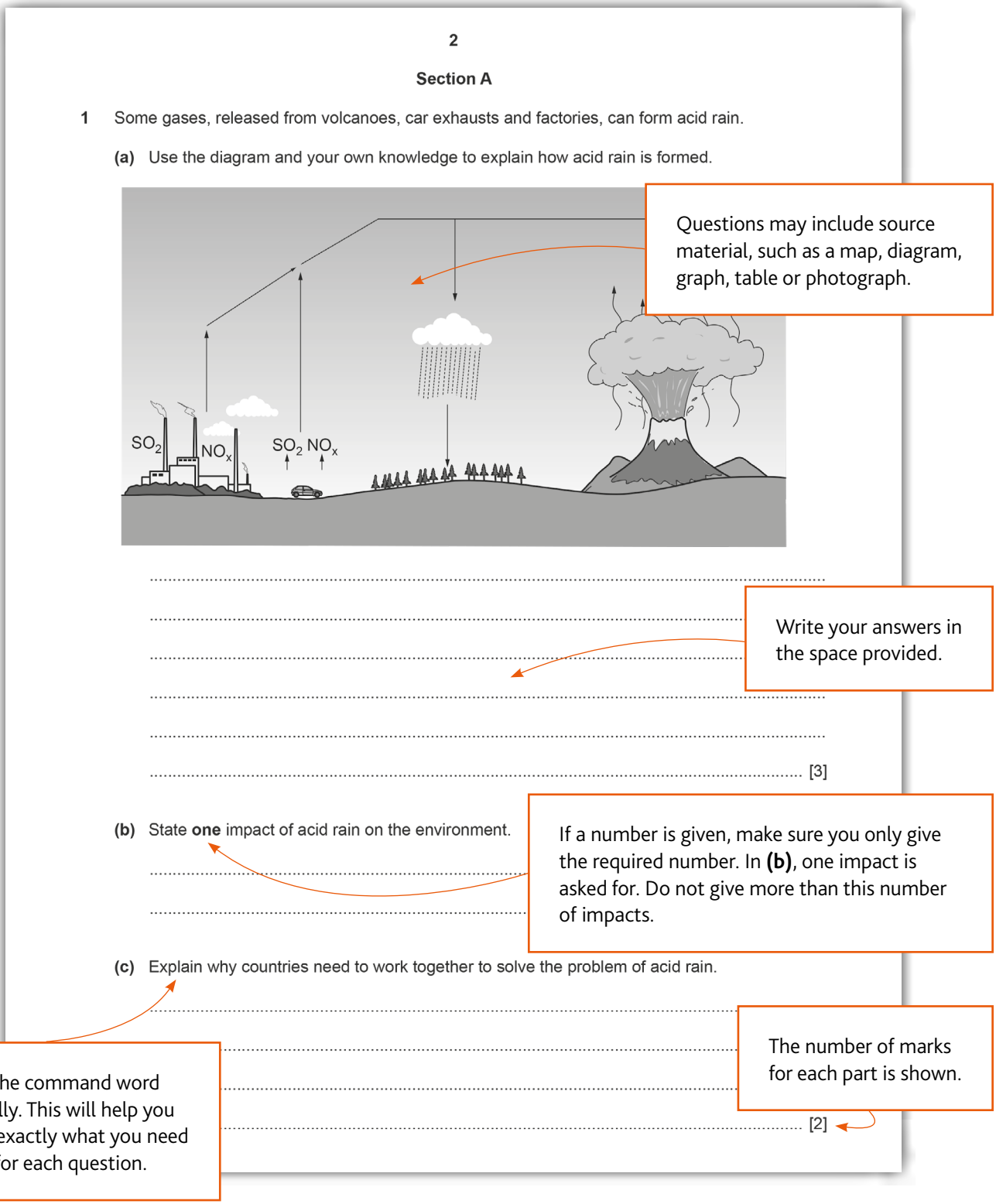
About each paper

Both papers test all three skills – knowledge and understanding (AO1), information handling and analysis (AO2), and Investigation skills and making judgements (AO3). However, it is important that you understand the different types of questions in each paper and how you should approach them.

Paper 1: Theory

There are two sections to this paper, Section A and Section B. You need to answer **all** the questions in both sections. Questions could be set from any of the nine topic areas.

Section A is made up of 3 to 4 short and structured questions with question parts. Each part-question is worth 1 to 4 marks. This section is worth 20 marks and you should answer all the question parts.



2

Section A

1 Some gases, released from volcanoes, car exhausts and factories, can form acid rain.

(a) Use the diagram and your own knowledge to explain how acid rain is formed.

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..... [3]

(b) State **one** impact of acid rain on the environment.

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(c) Explain why countries need to work together to solve the problem of acid rain.

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..... [2]

Questions may include source material, such as a map, diagram, graph, table or photograph.

Write your answers in the space provided.

If a number is given, make sure you only give the required number. In **(b)**, one impact is asked for. Do not give more than this number of impacts.

The number of marks for each part is shown.

Read the command word carefully. This will help you know exactly what you need to do for each question.

3

2 Limestone is a rock extracted from the Earth.

The photograph shows limestone being extracted from the Earth.

Some questions will ask you to use information in a map, diagram, graph, table or photograph.

(a) Name the method of rock extraction shown in the photograph.

..... [1]

(b) Suggest **one** positive effect and **one** negative effect of this method of rock extraction.

positive effect .....

.....

negative effect .....

.....

[2]

If positive and negative effects are asked for, it is important to make it clear which is the positive effect and which is the negative effect.

(c) Describe **two** strategies for the sustainable use of rocks.

1 .....

.....

2 .....

..... [2]

Some questions relate to recall of knowledge.

1 Plate boundaries are where tectonic plates move in relation to each other.

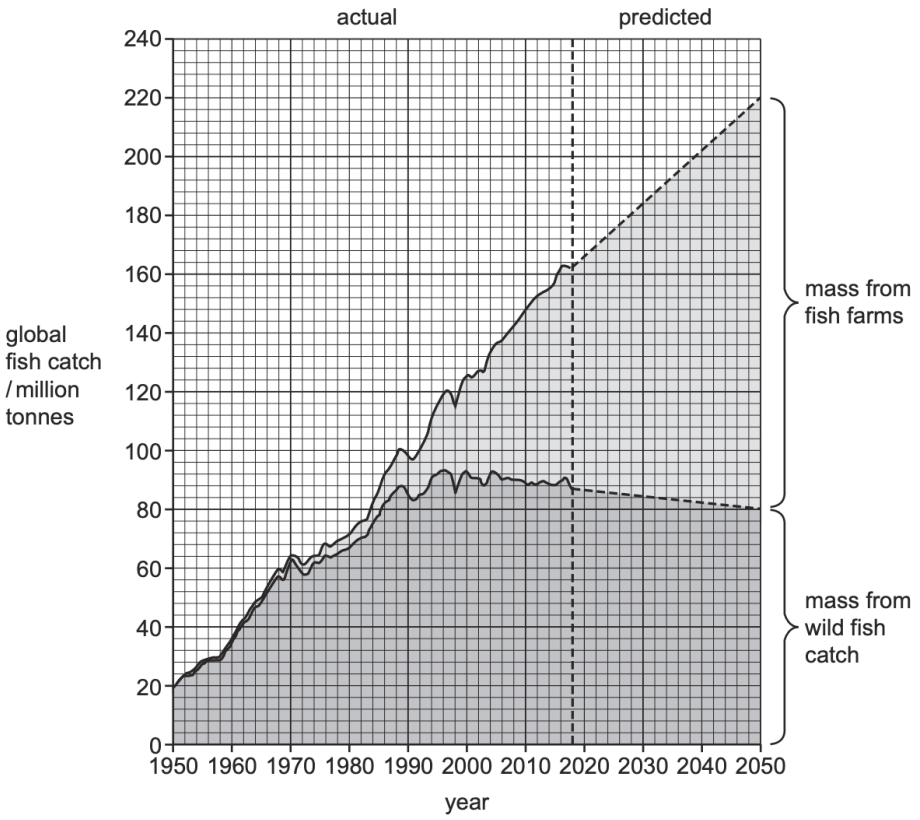
(a) Draw a line from each plate boundary to its matching description.

plate boundary	description
conservative	plates move away from each
constructive	plates slide past each ot
destructive	plates move towards each

[2]

You may be required to complete information on a diagram. These may not have response lines so make sure you do not miss out questions like this.

3 The graph shows the source of the global fish catch and predicted future demand for fish between 1950 and 2050.



(d) Calculate the predicted percentage of the global fish catch in 2050 that will be from fish farms.

. % [2]

You may be asked to calculate something.

Read the question carefully. In this example, the percentage from **fish farms** is asked. The graph shows data for both fish farms and wild fish and you will need to select the relevant data fi st before carrying out the calculation.

(b) A new mine is proposed near a town.

Suggest reasons why some people do **not** want a mine near to where they live.

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..... [3]

You may be asked to suggest reasons. In this type of question, the context of the question might by unfamiliar to you. You should use your knowledge from the syllabus to make a reasoned judgement, conclusion or explanation.

Section B contains between 4 and 6 short-answer and extended response questions with question parts. Each part-question is worth 1 to 7 marks. The questions will be based on source material. The source material will be from both familiar and unfamiliar contexts. This section is worth 60 marks and you should answer all the questions parts.

(ii) In 2010, the Deepwater Horizon oil spill was the largest accidental marine oil spill in the world.

It was estimated that oil was released into the ocean for approximately 85 days.

Calculate the average amount of oil released into the ocean per day.

..... million barrels per day [1]

(iii) Suggest why this average amount of oil was **not** released on every day of the oil spill accident.

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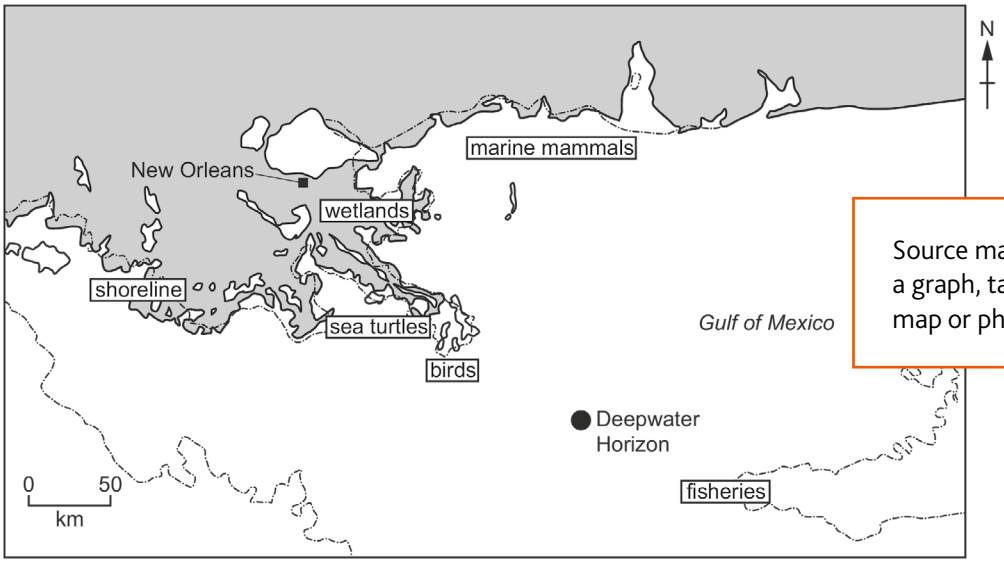
..... [1]

(c) The map shows the area affected by the Deepwater Horizon oil spill.



Source material may be a graph, table, diagram, map or photograph.

Make sure you use any key provided to help you understand what information the source is providing.

Suggest the possible impacts of the Deepwater Horizon oil spill on the coastal ecosystem.

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You will need to use your syllabus knowledge to make reasoned judgements, reach conclusions and suggest reasons in unfamiliar contexts.

8 The table shows population data in some countries in 2013.

country	birth rate per 1000 people	death rate per 1000 people	natural increase per 1000 people
Bulgaria	9.6	14.2	.....
Japan	8.4	9.5	–1.1
Pakistan	25.2	7.3	.....

(a) (i) Complete the table to calculate the natural increase for Bulgaria and Pakistan. One has been completed for you. [1]

(ii) Use the data in the table for 2013 to predict what will happen to the population of Japan if the birth and death rates remain unchanged.

.....

Make sure you do not miss questions that require an answer written in a table or on a diagram.

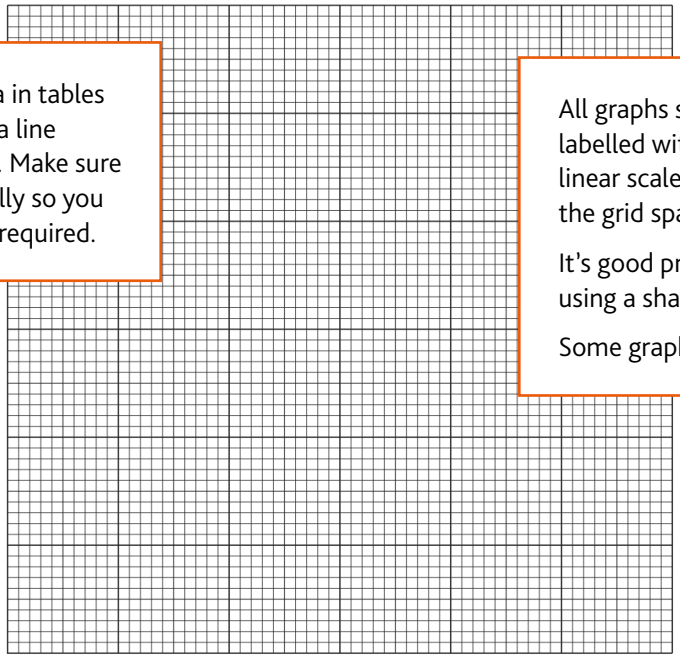
You will need to carry out calculations and use data to reach conclusion.

8 (a) The table shows the mass of farmed fish (aquaculture) produced by four countries in 2010 and 2015.

country	mass of farmed fish in 2010 /1000 tonnes	mass of farmed fish in 2015 /1000 tonnes	difference in mass of farmed fish /1000 tonnes
Finland	11.7	14.8	3.1
Lithuania	3.2	4.4	1.2
Madagascar	10.8	22.6	.....
Portugal	8.2	9.3	1.1

(i) **Complete the table** by calculating the **difference** in mass of farmed fish for Madagascar between 2010 and 2015. [1]

(ii) Plot a bar chart to show the **mass** of farmed fish produced by each country in 2010 and 2015.



[4]

You will need to present data in tables in different formats, such as a line graph, bar graph or pie chart. Make sure you read the question carefully so you know which type of graph is required.

All graphs should have their axes labelled with units. Choose a sensible linear scale that covers more than half the grid space.

It's good practice to complete graphs using a sharp pencil.

Some graphs also need keys.

(c) The student said,

> Harvesting of marine species is being managed sustainably.

To what extent do you agree with this statement? Give reasons for your answer.

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..... [6]

There will be one extended response question worth 6 marks, where you will need to present a reasoned argument both for and against a statement. These questions will ask: 'To what extent do you agree with this statement? Give reasons for your answer.'

This type of question is given a level rather than a mark. The best answers to this kind of question give both sides of the argument and will include relevant details and examples. These questions are a good opportunity to use examples from case studies you have studied.

(iii) Different people in the Philippines made comments after Typhoon Washi.

A Local official in Cagayan de Oro

'The government in Manila, the capital of the Philippines, did not give us advanced storm and flood warnings or money to build enough cyclone shelters.'

B Government official in Manila

'The government has a system to send storm warnings via mobile phone text messages. It was not used for this typhoon because wind strength was too weak to trigger the warnings.'

C National Disaster Management official in Manila

'City officials should never have allowed people to build their own shanty houses on sand banks in the Cagayan River.'

D Environmental group

'Cagayan de Oro was at high risk because it is between steep-sided, deforested mountains and the sea. No flood defences had been built because local officials claimed that typhoons were infrequent in northern Mindanao.'

Suggest whether physical factors, human factors or a combination of both were responsible for the great loss of life in Typhoon Washi.

Support your view with references to the comments made by the different people.

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There will be one extended response questions between 5 to 7 marks which will ask you to use information provided in the question. It is important not to simply repeat what is already in the question. You will need to use your own knowledge to add to any information already provided.

(b) The student wants to summarise the mortality rate data in the article.

Record the data in a suitable table.

You may be asked to draw a table from data that provided. All columns in tables should have a heading and a unit (if appropriate). Do not include units in each cell of a table. These must go in the column heading. The best format to use is to separate the unit from the title with a forward slash, e.g. title / unit.

[3]

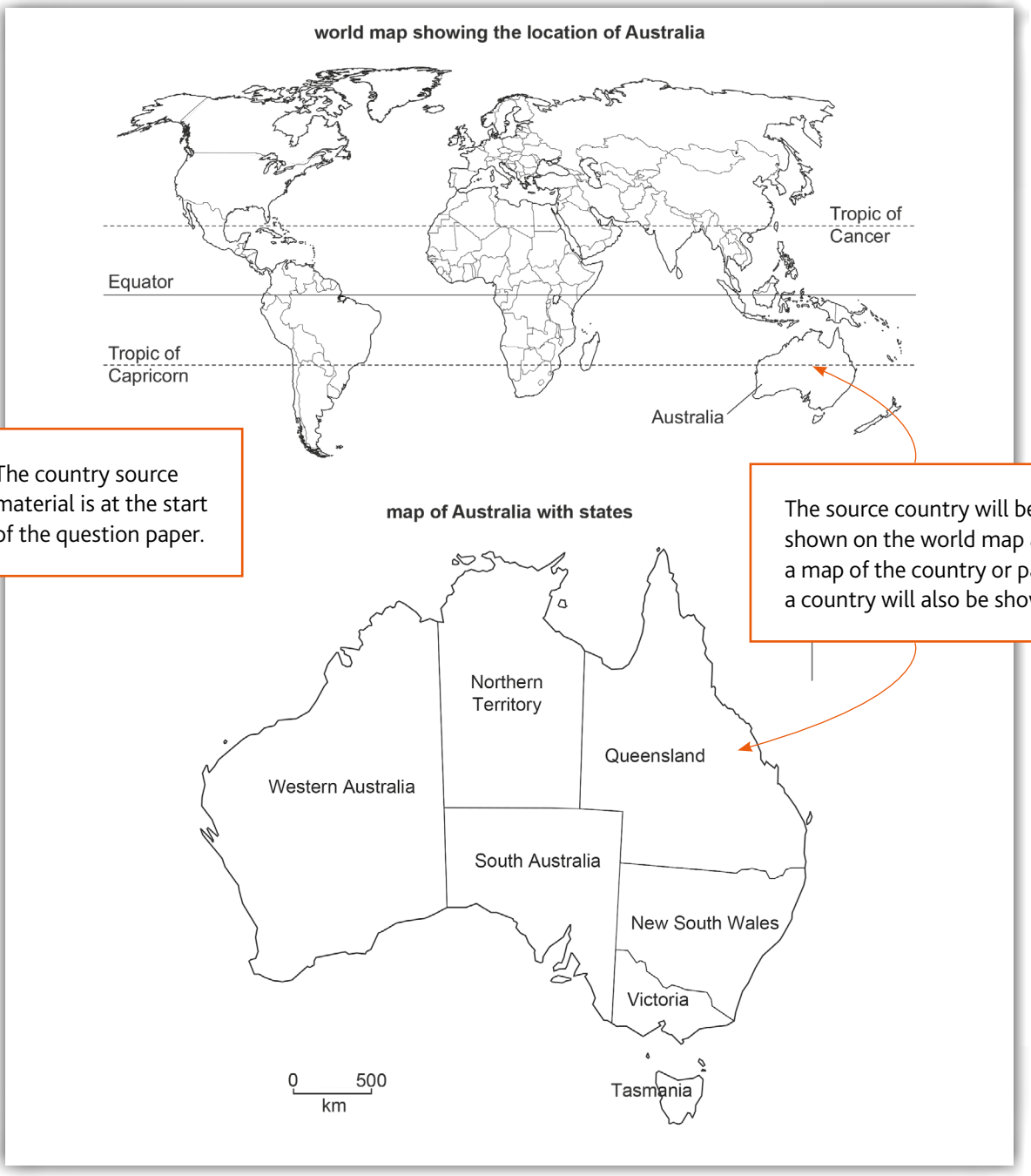
Paper 2: Management in context

The paper has between 2 and 5 short and extended response questions with question parts. You need to answer all the question parts in this paper.

The question paper is based on environmental management issues that relate to one country. Questions could be set from any of the nine topic areas. This paper is worth 80 marks.

The question paper is made up of short and extended response questions. These questions are based on source material and are 'real-life' management in context issues.

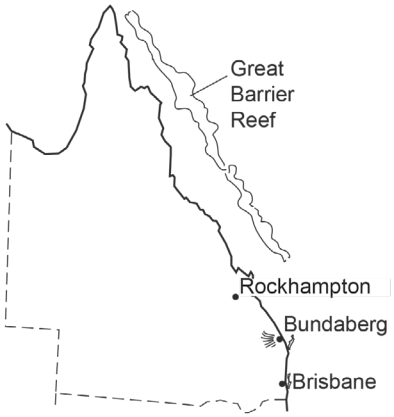
The question paper includes practical based questions that help you demonstrate your fieldwork skills, such as writing a method for estimating biodiversity and populations using pitfall traps, pooters, quadrats and transects. You will need to be able to describe random and systematic sampling and apply these sampling techniques to unfamiliar contexts. You will need to draw tables for data, plot bar charts, line graphs and pie charts and interpret data from maps, diagrams, tables, photographs and text.



The country source material is at the start of the question paper.

The source country will be shown on the world map and a map of the country or part of a country will also be shown.

map of Queensland



Area of Australia: over 7 741 000 km^2

Population: 23.8 million

Children per woman: 1.78

Life expectancy: 81.8 years

Currency: Australian Dollar (1.43 AUD = 1 USD)

Language: English and indigenous languages

Climate of Queensland: wet tropical along the northern and eastern coasts, semi-desert and desert further into the interior

Terrain of Queensland: fertile coastal lowlands, low desert plateau in the interior

Main exports of Australia: coal, iron ore, gold, meat, wool, wheat and machinery

Australia is an island with a large desert interior. Australia has extensive natural resources. Most of the population live close to the east and south coasts. Queensland is a state in Australia. It has an area of nearly 2 million square kilometres and a population of 4.7 million. Queensland has extensive irrigated agricultural areas as well as large coalfields. The coal is mined for domestic power generation and for export, particularly to China.

Information about this country is included. This source material can be used throughout the question paper.

(b) The table shows the 30-year average data for a weather station in northern Queensland.

month	average daily temperature / °C	average monthly rainfall / mm	average number of wet days per month
January	28	277	15
February	28	285	12
March	27	183	10
April	25	84	6
May	23	33	
June	21	36	
July	20	15	
August	21	15	
September	23	18	
October	25	33	
November	27	48	
December	28	137	

You may have to interpret climate data on temperature, sunshine hours and precipitation. The source material at the start of the question paper also includes a summary of the type of climate a country has.

(i) Name the coolest month of the year.

..... [1]

(ii) Name the driest **two** months of the year.

..... [1]

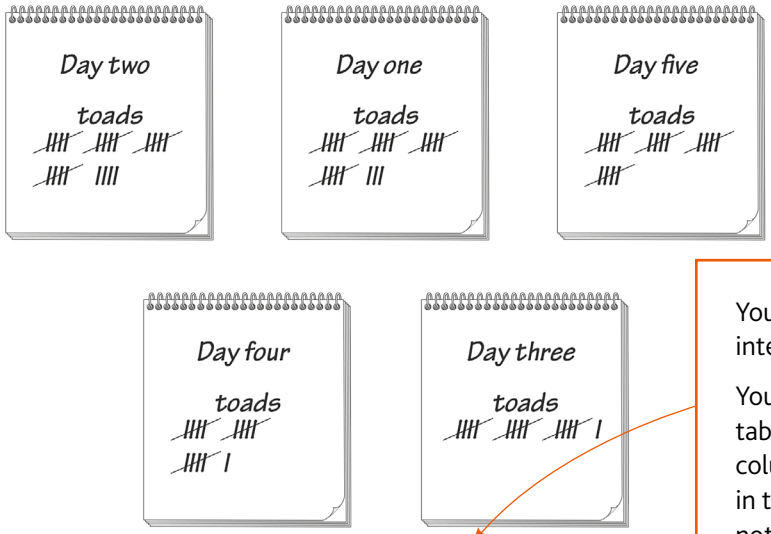
(e) (i) Coal is a non-renewable energy resource.

Name **one** renewable energy resource.

..... [1]

Some questions will be simple recall. Make sure you only give the required number of answers if a number is stated. In this example, **one** renewable energy resource is asked for. You should not try to name more than one.

(c) The student decided to carry out the same survey in two other sugar cane fields. The student recorded the following in a notebook.



(i) Present the student's findings in a suitable table.

You should be able to interpret a tally system.

You may have to draw a table. Remember to include column headings and units in the column headings but not in the cells of the table.

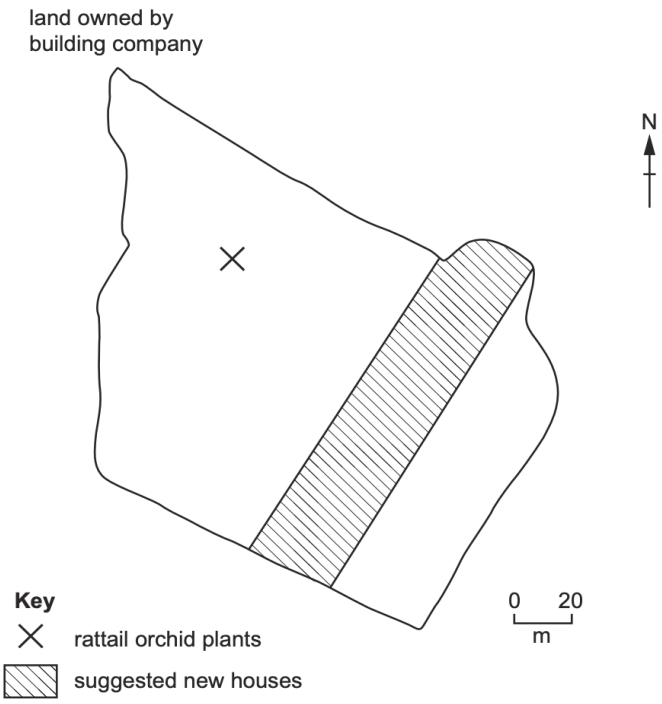
(c) A report stated that 112.4 million tourists visited Florida in 2016 and 116.5 million tourists visited in 2017.

(i) Calculate the percentage increase in tourists visiting Florida from 2016 to 2017.

..... % [2]

You will need to carry out calculations from data.

(iv) The map shows the suggested location of the new houses and the location of an endangered plant species called the rattail orchid.



The local government says that the new houses **must** be a minimum distance of 80 m away from the rattail orchid plants.

Use the map to determine whether the building company can build at the suggested location.
Give a reason for your answer.

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..... [2]

You may need to interpret scales on maps or diagrams and reach a conclusion based on your scale calculations.

Local people were asked to fill in a questionnaire to find out their views about the proposed development of the new opencast mining project.

The table shows the results.

	percentage responses to questionnaire		
	yes	**no**	**do not know**
1. Do you expect more local people to be employed by the mining project?	42	46	12
2. Do you think the mining project will improve the transport links in the area?	60	25	15
3. Have you any worries about the environmental impact of the mining project?	35	55	10

(i) Suggest how people could have been selected for this questionnaire.

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..... [2]

You should be familiar with sampling techniques and how to construct questionnaires.

(ii) Describe how the data from this questionnaire was processed.

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..... [1]

(iii) Suggest why the majority of local people had no worries about the environmental impact of the opencast mining project.

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..... [2]

You may have to write a conclusion based on information given in a questionnaire or table.

(b) A farmer investigates the effect of using two fertilisers, **X** and **Y**, on the yield of tomato plants.

Fertiliser **X** is an organic fertiliser and fertiliser **Y** is an artificial, non-organic fertiliser.

The farmer uses this method:

- select three fields, **1**, **2** and **3**, that have no planting history and have not previously been used to grow tomatoes
- use fertiliser **X** on the soil in field **1**
- use fertiliser **Y** on the soil in field **2**
- do not use fertiliser on the soil in field **3**
- plant the same variety of tomato plant in each field
- record the average yield of tomatoes per plant from each field
- repeat the method after 5 years and 20 years of planting history.

You will need to interpret sampling methods and suggest improvements. You will also need to write conclusions based on data provided.

field	average yield of tomatoes per plant in first year / g	average yield of tomatoes per plant after 5 years / g	av… tom… after 20 years / g
field **1** – fertiliser **X**	1372	1392	1072
field **2** – fertiliser **Y**	1642	1672	1421
field **3** – no fertiliser	956	952	723

(i) Suggest why the farmer does **not** use fertiliser in field **3**.

.....

..... [1]

(ii) Fertilisers are used to increase agricultural yields.

Use the table to write a conclusion on the effect of fertilisers **X** and **Y** on the yield of the tomato plants.

.....

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.....

..... [2]

(c) **(i)** A student wants to estimate the population of Alaskan lupine plants in a field.

The student has:

- a 50 m length of string
- small wooden markers
- a tape measure
- notebook and pencil.

Describe how the student could use this equipment to estimate the population of Alaskan lupine plants in the field.

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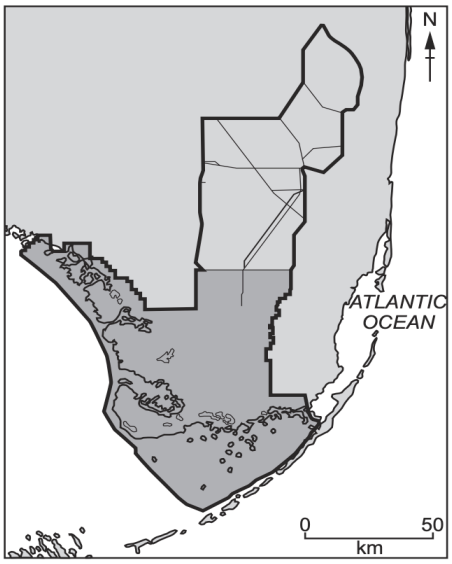
..... [3]

You will need to write methods for how to estimate biodiversity and populations in unfamiliar contexts.

(b) A fact sheet shows information about the Everglades.

The Everglades

The Everglades is a popular tourist destination in Florida, with over 1 million visitors each year.
An environmental protection area has been established around the Everglades.
Part of this area was made a national park in 1947. The national park covers an area of 6 110 km^2.



All tourists can take a guided boat tour of the Everglades wetlands, but tourists must have a special permit to hire a boat without a guide.

Plant species that are not native to Florida are removed from the Everglades by controlled burning of land.

Signs encourage people to report sightings of injured wildlife such as manatees.

Make sure that in questions that provide text as a source, you do not simply copy out the text in your answer. You need to add your own knowledge and viewpoint to your response.

Do you think the strategies for protecting the Everglades are effective?

Use information from the fact sheet to support your answer.

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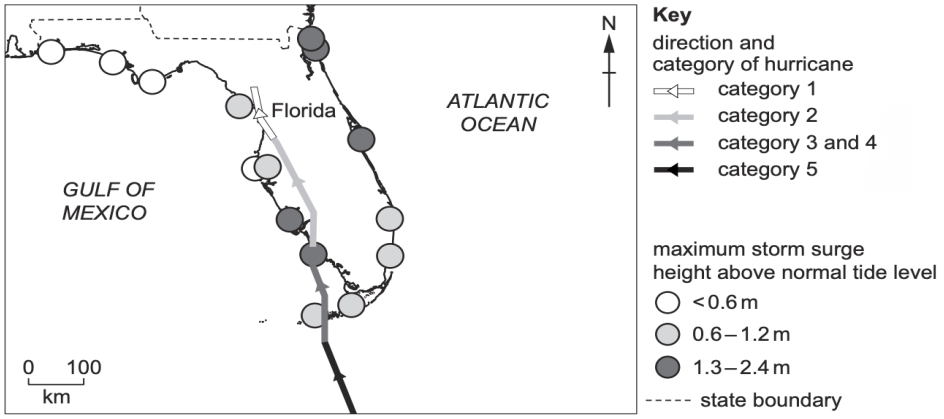
(c) In 2017, Hurricane Irma hit Florida.

The map shows some data for Hurricane Irma.



The category of hurricane is based on wind speed, as shown in the table.

category of hurricane	wind speed in km/h
1	119–153
2	154–177
3	178–208
4	209–251
5	≥ 252

(i) Describe what the map shows about Hurricane Irma.

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..... [4]

You may need to describe trends or patterns in data or distributions of data.

Section 3: What skills will be assessed

The areas of knowledge, understanding and skills that you will be assessed on are called **assessment objectives** (AO).

The examiners take account of the following skills areas (**assessment objectives**) in the examination papers.

- AO1 Knowledge and understanding
- AO2 Information handling and analysis
- AO3 Investigation skills and making judgements

It is important that you know the different weightings (%) of the assessment objectives, as this affects how the examiner will assess your work.

For example, assessment objective 3 (AO3 Investigation skills and making judgements) is worth 20% of the total marks in Paper 1 and 30% in Paper 2.

The approximate weightings of the assessment objectives (AOs) are summarised below.

Assessment objectives as a percentage of the qualification

Assessment objective	Weighting in IGCSE %
AO1 Knowledge and understanding	40
AO2 Information handling and analysis	35
AO3 Investigation skills and making judgements	25
Total	100

Assessment objectives as a percentage of each component

Assessment objective	Weighting in components %	
	Paper 1	**Paper 2**
AO1 Knowledge and understanding	40	40
AO2 Information handling and analysis	40	30
AO3 Investigation skills and making judgements	20	30
Total	100	100

Assessment objectives (AO)	What does the AO mean?	What do you need to be able to do?
AO1 Knowledge and understanding	Remember and understand facts and information.	You need to show that you can use your knowledge and understanding of concepts. You can do this by: • defining key terms • recalling impacts, effects, factors, methods and strategies
AO2 Information handling and analysis	Use facts and information and be able to explain information and develop points.	You need to show that you can use facts and information in different formats. You can do this by being able to: • locate, select, organise and present information from different sources • use information from different sources e.g. graphs, maps, tables, diagrams, text, photographs, numbers • work with numerical data by carrying out calculations • interpretating and analysing numerical data • describing trends and patterns and making conclusions

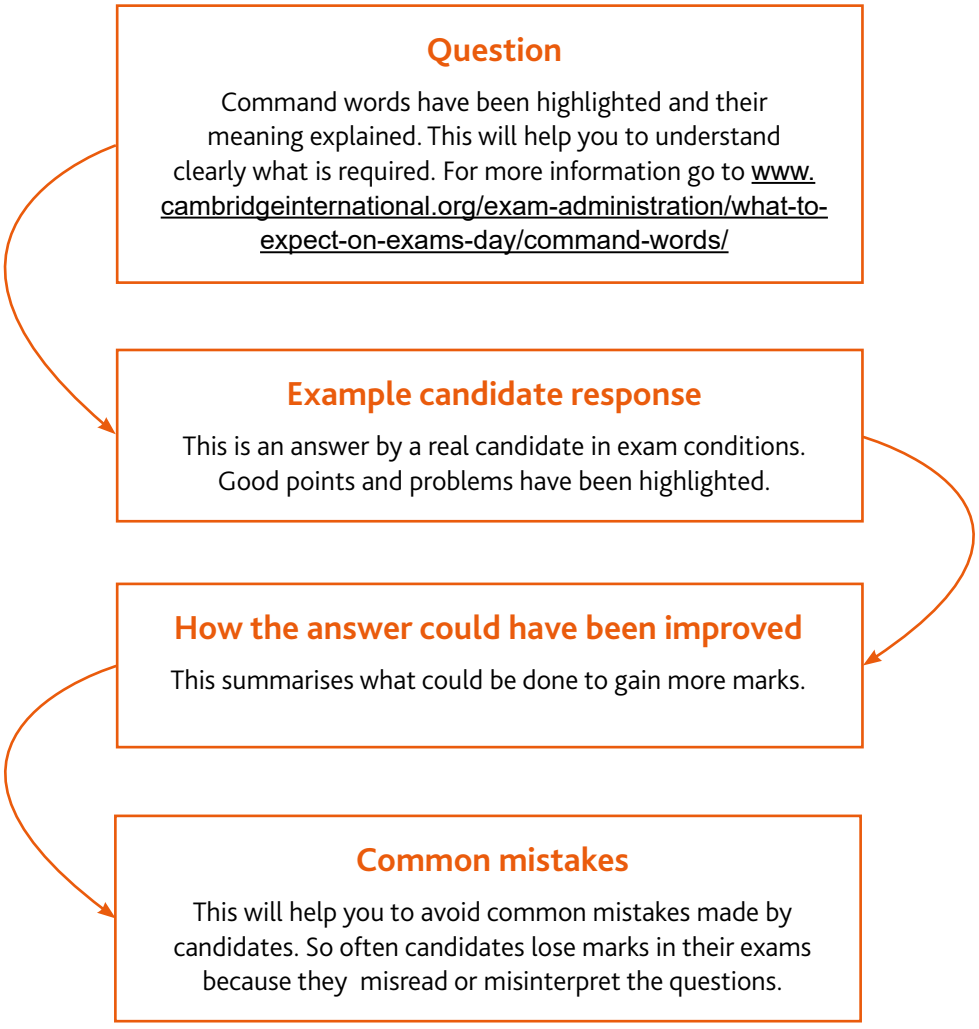
Assessment objectives (AO)	What does the AO mean?	What do you need to be able to do?
AO3 Investigation skills and making judgements	Be familiar with investigation skills in practical contexts. Be able to make judgements based on information.	You need to show that you can analyse different information and use information to make a decision or choice. You can do this by: • planning investigations • identifying limitations with methods and suggest improvements • presenting reasoned explanations for patterns and relationships • making reasoned judgements and reaching conclusions

Section 4: Example candidate response

This section takes you through an example question and learner response from a Cambridge 0680 / 5014 past paper. It will help you to see how to identify command words within questions and to understand what is required in your response. A command word is the part of the question that tells you what you need to do with your knowledge. For example, you might need to describe something, explain something, argue a point of view or list what you know.

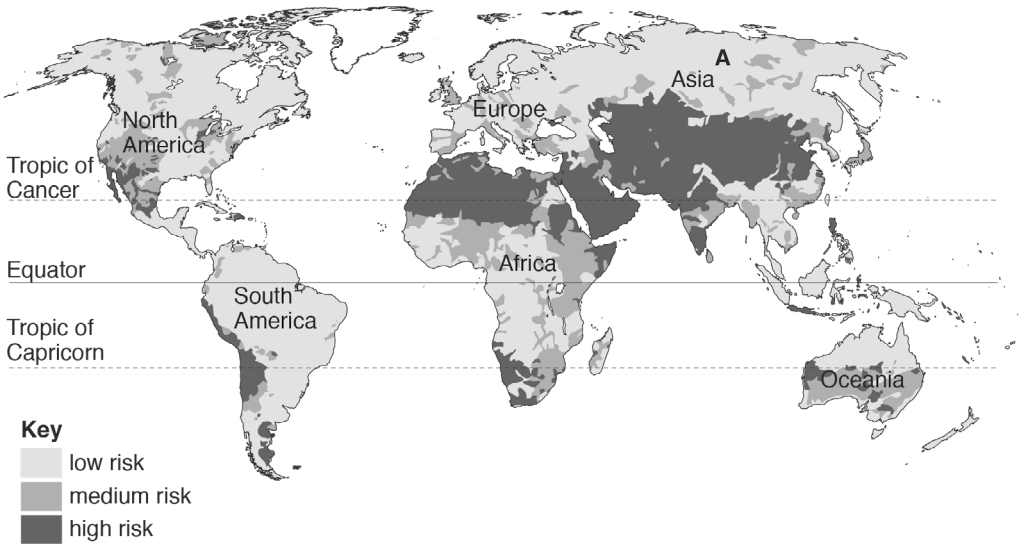
All information and advice in this section is specific to the example question and response being demonstrated. It should give you an idea of how your responses might be viewed by an examiner but it is not a list of what to do in all questions. In your own examination, you will need to pay careful attention to what each question is asking you to do.

This section is separated as follows:



Question

2 The map shows areas with a low, medium or high risk to water supplies. The risks to water supplies include low annual rainfall, risk of drought, pollution of supplies and overuse of water.



(a) Describe the location of the areas with a high risk to water supplies in South America.

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..... [2]

Describe means the examiner will be expecting you to state the main points. You should give the characteristics and main features in a description.

(b) Suggest reasons why there is a low risk to water supplies at location **A**.

Suggest is used in two ways. It means there is no single, unique answer and a range of valid answers will be allowed. It also means that you expected to apply your knowledge of the syllabus to an unfamiliar context. Many data response and problem-solving questions are of this type. Questions that require a judgement are usually 'suggest questions'.

In this example, you are not expected to be familiar with location **A** or water risks in that area. Instead, the examiner is expecting you to use the data provided to suggest reasons why there is a low risk to water supplies.

(c) Explain why there is overuse of water in some parts of the world.

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Explain means you should clearly set out reasons or make a relationship between things clear. You should support your answer with relevant evidence or examples. You need to make it clear to the examiner why or how something is happening.

(d) State **two** strategies farmers can use to prepare for the impacts of drought.

1 .....

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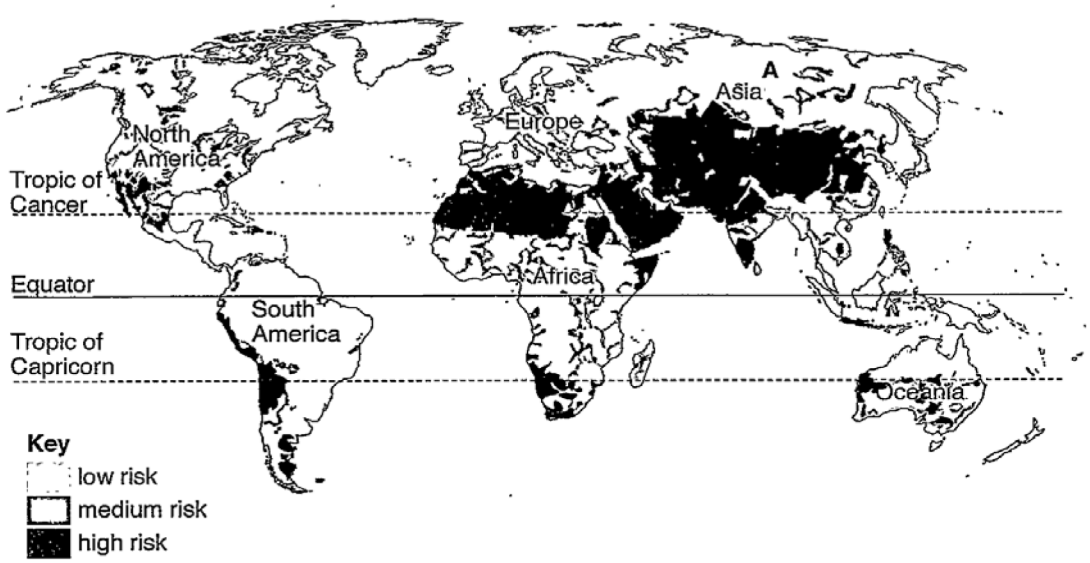
[2]

State means you should express your answer in clear terms in a concise manner. It is often used for simple recall of syllabus knowledge or for a numerical answer that can be found by looking at data provided.

2 The map shows areas with a low, medium or high risk to water supplies. The risks to water supplies include low annual rainfall, risk of drought, pollution of supplies and overuse of water.



(a) Describe the location of the areas with a high risk to water supplies in South America.

high risk to water suplies is located at west of South America also south of south America

[2]

The question part is worth two marks, so this indicates that two points are needed in the answer. This candidate has described two locations, identifying the west of South America and the south of South America.

Mark awarded = 2 out of 2

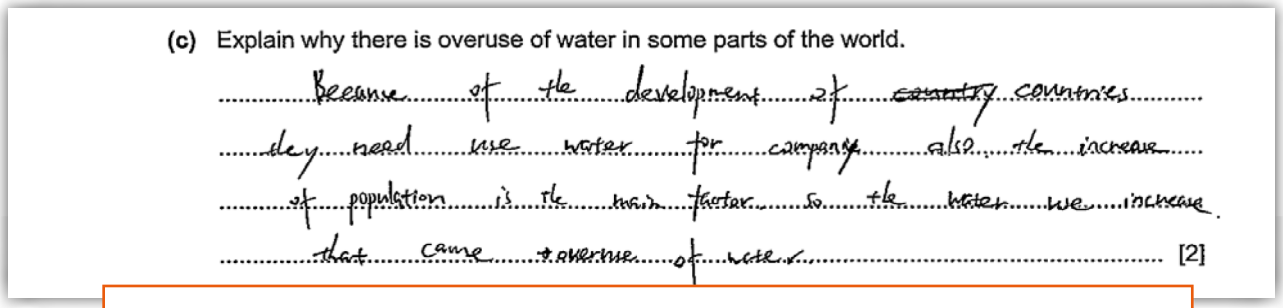
(b) Suggest reasons why there is a low risk to water supplies at location **A**.

Because at location A there has high rainfall every year. environment there are not polluted so the water there are very clean

[2]

The question part is worth two marks so two reasons were expected. This candidate has identified the high level of precipitation correctly. Their second reason is incorrect.

Mark awarded = 1 out of 2

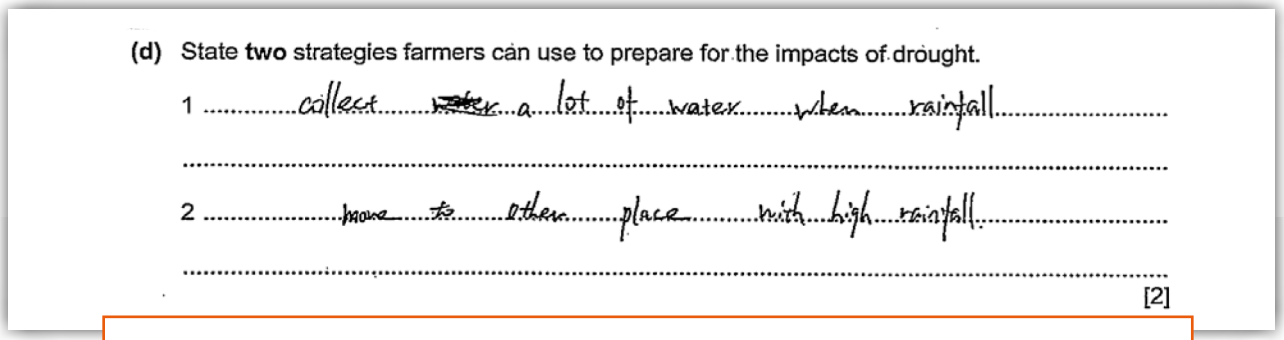


(c) Explain why there is overuse of water in some parts of the world.

Because of the development of ~~country~~ countries they need use water for company also the increase of population is the main factor so the water we increase that came overuse of water. [2]

The question part is worth two marks so two explanation points were expected. This candidate has correctly explained that an increase in population is a valid explanation for overuse of water. Their point about 'development of countries…for company' needs further clarification and explanation to clearly indicate high water use.

Mark awarded = 1 out of 2



(d) State **two** strategies farmers can use to prepare for the impacts of drought.

1 collect ~~water~~ a lot of water when rainfall

2 move to other place with high rainfall

[2]

Two strategies are asked for and this is indicated by the **'two'** in the question and the number of marks. The fi st strategy does not provide enough detail. The second strategy is not practical.

Mark awarded = 0 out of 2

How the answer could have improved

(a) It helps to use bullet points to structure your responses. This will help you give the sufficient number of answers in your response. Use the number of marks as a guide to the number of points you need to give.

(b) As a suggest question you are not expected to know the details of the location shown but you should use your syllabus knowledge to help answer this question. The map shows location A above the Tropic of Cancer, in the northern hemisphere so this would suggest a colder climate and long periods of cold weather, which would mean there is less likelihood of drought. Any reasonable reason for a low risk to water supplies would be acceptable, such as a low population, so there is less use of available water.

(c) If the response explained why the development of countries leads to overuse of water then this would have gained the second mark. For example, 'development of countries leads to more industries' or 'development of countries leads to more disposal income so people can use water in swimming pools'.

(d) As a 'state' question, the strategies are in the syllabus and required recall. Some candidates find it useful to write revision notes using the syllabus as a guide to all the strategies they should be familiar with.

Common mistakes

(a) Take time to make sure you are using the key correctly. In this question, some candidates read the key incorrectly and took the lighter low risk shading to be the high risk.

(b) The most common mistake in explain questions is to not give enough detail in your response.

(c) Giving more than the number of strategies asked for as an incorrect answer can contradict a previously correct one.

General advice

In order to do your best when answering a question, make sure you:

- address the question being asked, stay focused
- think carefully about how to define a given term, ensuring your answer is clear and precise, so that definitions cannot be confused with other terms
- relate any knowledge to the question being asked, i.e. consider the context of the information you are giving
- are clear and direct in any judgement or conclusions you are making as the examiner cannot make assumptions about what you mean
- support any conclusions with accurate and relevant information or data from the source context provided
- answer every question, including those where there are no response lines e.g. on a diagram, in a table, or on a grid
- complete diagrams and graphs using a sharp pencil and ruler
- use a calculator to help you with calculations but check your answer makes sense. You should give numerical answers to an appropriate number of significant figu es or decimal places.

Section 5: Revision

This advice will help you revise and prepare for the examinations. It is divided into general advice for all papers and more specific advice for Paper 1 and Paper 2.

Use the tick boxes ☐ to keep a record of what you have done, what you plan to do or what you understand.

General advice

Before the examination

- ☐ Find out when the examinations are and plan your revision so you have time to revise. Create a revision timetable and divide it into sections to cover each topic.
- ☐ Find out how long each paper is, how many questions you have to answer, how many marks there are for each question, and work out how long you have for each question.
- ☐ Know the meaning of the command words used in questions and how to apply them to the information given. Look at past examination papers and highlight the command words and check what they mean. The syllabus has a glossary of terms used in science papers.
- ☐ Make revision notes. Try different styles of notes.
- ☐ Work for short periods then have a break. Revise small sections of the syllabus at a time.
- ☐ Test yourself by writing out key points.
- ☐ Make sure you define terms accurately.
- ☐ Definitions must not euse the words to be defined. E.g. *land pollution* means the contamination (*pollution*) of the earth's surface (*land*) by the unplanned or illegal disposal of waste substances.
- ☐ Make your own dictionary or draw up a glossary of key terms and definitions for each section of the syllabus.
- ☐ Look at maps, diagrams, tables, etc. to find out what they show and practise using and interpreting keys.
- ☐ Practise drawing clear, simple, neat, fully-labelled diagrams.
- ☐ Learn to spell syllabus terms correctly.
- ☐ Have a look at past questions so that you are clear of what to expect in an examination.
- ☐ Look at mark schemes to help you understand how the marks are awarded for each question.

In the examination

- ☐ Read the instructions carefully and answer the right number of questions from the right sections.
- ☐ Do not give more answers than asked for in the questions, as this will not gain you more marks in the examination. For example, if **two** impacts are asked for, only give **two** impacts!
- ☐ Plan your time according to the marks for each question. For example, a question worth three marks requires less time and a shorter answer than one worth 7 marks. If a question has several parts, then the parts with more marks will need more time and more developed answers.
- ☐ Do not leave out questions or parts of questions. Remember, no answer means no mark.
- ☐ Read each question very carefully.
  - Identify the command words – you could underline or highlight them.
  - Identify the other key words and perhaps underline them too.
  - Try to put the question into your own words to understand what it is really asking.
- ☐ Read all parts of a question before starting your answer. Think carefully about what is needed for each part. You will not need to repeat material.

- [ ] Look very carefully at the resource material you are given.
  - Read the title, key, axes of graphs, etc. to find out exactly what it is showing you.
  - Look for dates, scale, and location.
  - Try using coloured pencils or pens to pick out anything that the question asks you about.
- [ ] **Answer the question.** This is very important!
- [ ] Use your knowledge and understanding.
- [ ] Do not just write all you know, only write what is needed to answer the question.
- [ ] Plan your answers. Clear, concise, well-ordered, well-argued, well-supported answers get more marks than long, rambling, muddled, repetitious answers. Quality is better than quantity.
- [ ] Use syllabus terms in your answers as much as possible.
- [ ] Use the resource material given in the question to support your answer.
- [ ] Make sure your writing is clear and easy to read. It is no good writing a brilliant answer if the examiner cannot read it!

Paper 1 and 2 advice

- [ ] Practise plotting graphs, bar charts and pie charts. Make sure you know how to label axis and include units if appropriate. Separate the quantity and unit by a forward slash e.g. time / s.
- [ ] Graphs should always have a suitable linear scale that takes up more than half the grid.
- [ ] Plots should be crosses or small dots with a circle around them.
- [ ] Make sure you can draw a best-fit line or curve on a graph.
- [ ] Pie charts should be drawn in sectors in rank order, with the largest first, beginning at 'noon' and going in a clockwise direction.
- [ ] Bar charts should have bars that are not touching and are of equal width. Make sure you include a key if more than one set of data are plotted.
- [ ] Practise drawing tables. Units should be included in the column headings. Separate the quantity and unit by a forward slash e.g. time / s
- [ ] Know the different between independent and dependent variables.
- [ ] Know how to calculate percentages and percentage change.
- [ ] Be able to work out a mean (average) and a range .
- [ ] When a question asks you to use the data in a table, or information in a diagram, make sure you refer to this in your answer.
- [ ] When you are asked to make a decision, it is important to make one. Many candidates assume that simply stating 'yes' or 'no' are a judgement. Make sure you can explain the reasons behind this statement.

Revision checklists

In the next part of this guide we have provided some revision checklists. These include information from the syllabus that you should revise. They don't contain all the detailed knowledge you need to know, just an overview. For more detail see the syllabus and talk to your teacher.

The table headings are explained below:

Topic	You should be able to	R	A	G	Comments
These are the nine topics of the syllabus, expected knowledge, gathering data and mathematical requirements from the syllabus.	Content in the syllabus you need to cover	You can use the tick boxes to show when you have revised an item and how confident you feel about it. R = RED means you are really unsure and lack confidence; you might want to focus your revision here and possibly talk to your teacher for help. A = AMBER means you are reasonably confident but need some extra practice. G = GREEN means you are very confiden . As your revision progresses, you can concentrate on the RED and AMBER items in order to turn them into GREEN items. You might find it helpful to highlight each topic in red, orange or green to help you prioritise.			You can: • add further information of your own, such as names of case studies needed • add learning aids, such as rhymes, poems or word play • pinpoint areas of difficulty you need to check further with your teacher or textbooks • include reference to a useful resource

Note: the tables below cannot contain absolutely everything you need to know, but it does use examples wherever it can.

Paper 1 Theory and Paper 2 Management in Context

Topic	You should be able to	R	A	G	Comments
Expected Knowledge	Candidates should be able to identify and name the world's continents and oceans: • Africa, Antarctica, Asia, Europe, North America, Oceania and South America • Atlantic Ocean, Pacific Ocean, Indian Ocean, Arctic Ocean and Southern Ocean	☐	☐	☐	
1 Rocks and minerals and their exploitation					
1.1 Formation of rocks	• describe and interpret the rock cycle • state and explain the formation and characteristics of named igneous, sedimentary and metamorphic rocks	☐	☐	☐	
1.2 Extraction of rocks and minerals from the Earth	• describe the following methods of extraction of rocks and minerals from the Earth: – surface mining – subsurface mining • discuss the factors that affect the decision to extract rocks and minerals	☐	☐	☐	
1.3 Impact of rock and mineral extraction	• describe and explain the environmental, economic and social impacts of rock and mineral extraction	☐	☐	☐	
1.4 Managing the impact of rock and mineral extraction	• describe and evaluate strategies for restoring landscapes damaged by rock and mineral extraction	☐	☐	☐	
1.5 Sustainable use of rocks and minerals	• define sustainable esource and sustainable development • describe and evaluate strategies for the sustainable use of rocks and minerals	☐	☐	☐	
2 Energy and the environment					
2.1 Fossil fuel formation	• describe the formation of the fossil fuels: coal, oil and gas	☐	☐	☐	

Topic	You should be able to	R	A	G	Comments
2.2 Energy resources and the generation of electricity	• classify the following energy resources as nonrenewable or renewable: fossil fuels, nuclear power, biofuels, geothermal power, hydro-electric power, tidal power, wave power, solar power, wind power • describe how each of these energy resources is used to generate electricity • describe the environmental, economic and social advantages and disadvantages of each of these energy resources	☐	☐	☐	
2.3 Energy demand	• describe and explain the factors affecting the demand for energy	☐	☐	☐	
2.4 Conservation and management of energy resources	• describe and explain strategies for the efficient management of energy resources • research and development of new energy resources	☐	☐	☐	
2.5 Impact of oil pollution	• describe the causes and impacts of oil pollution on marine and coastal ecosystems	☐	☐	☐	
2.6 Management of oil pollution	• discuss strategies for reducing oil spills in marine and coastal ecosystems • discuss strategies for minimising the impacts of oil spills on the marine and coastal ecosystems	☐	☐	☐	
3 Agriculture and the environment					
3.1 Soil composition	• describe and explain the composition of soils	☐	☐	☐	
3.2 Soils for plant growth	• describe soils as a medium for plant growth • describe the differences between a sandy and clay soil	☐	☐	☐	
3.3 Agriculture types	• describe the different types of agriculture	☐	☐	☐	
3.4 Increasing agricultural yields	• describe techniques used to increase agricultural yields	☐	☐	☐	
3.5 Impact of agriculture	• describe and explain the impact of agricultural practices on the environment and people	☐	☐	☐	

Topic	You should be able to	R	A	G	Comments
3.6 Causes and impacts of soil erosion	• describe the causes of soil erosion • describe and explain the impacts of soil erosion	☐	☐	☐	
3.7 Managing soil erosion	• describe and explain strategies to reduce soil erosion	☐	☐	☐	
3.8 Sustainable agriculture	• describe and explain strategies for sustainable agriculture	☐	☐	☐	
4 Water and its management					
4.1 Global water distribution	• describe the distribution of the Earth's water	☐	☐	☐	
4.2 The water cycle	• describe and interpret the water cycle	☐	☐	☐	
4.3 Water supply	• describe the sources of fresh water used by people	☐	☐	☐	
4.4 Water usage	• describe the different ways in which fresh water can be used	☐	☐	☐	
4.5 Water quality and availability	• compare the availability of safe drinking water (potable water) in different parts of the world	☐	☐	☐	
4.6 Multipurpose dam projects	• describe and evaluate multipurpose dam projects	☐	☐	☐	
4.7 Water pollution and its sources	• describe the sources of water pollution	☐	☐	☐	
4.8 Impact of water pollution	• describe and explain the impact of pollution of fresh water on people and on the environment	☐	☐	☐	
4.9 Managing pollution of fresh water	• describe and explain strategies for improving water quality	☐	☐	☐	
4.10 Managing water-related disease	• describe the life cycle of the malaria parasite • describe and evaluate strategies to control malaria • describe strategies to control cholera	☐	☐	☐	

Topic	You should be able to	R	A	G	Comments
5 Oceans and fisheries					
5.1 Oceans as a resource	• outline the resource potential of the oceans	☐	☐	☐	
5.2 World fisherie	• outline the distribution of major ocean currents	☐	☐	☐	
	• explain the distribution of major marine fish populations	☐	☐	☐	
	• describe the El Niño Southern Oscillation (ENSO) phenomenon and its effects on fisheries along the Pacific coast of South America	☐	☐	☐	
5.3 Impact of exploitation of the oceans	• describe and explain the impact of exploitation of fisherie	☐	☐	☐	
	• describe how farming of marine species reduces the exploitation of fisherie	☐	☐	☐	
5.4 Management of the harvesting of marine species	• describe, explain and evaluate strategies for management of the harvesting of marine species	☐	☐	☐	
6 Managing natural hazards					
6.1 Earthquakes and volcanoes	• describe the structure of the Earth	☐	☐	☐	
	• describe and explain the distribution and causes of earthquakes and volcanoes	☐	☐	☐	
	• understand magnitude and the Richter scale	☐	☐	☐	
6.2 Tropical cyclones	• describe and explain the distribution and causes of tropical cyclones (storms, hurricanes and typhoons)	☐	☐	☐	
6.3 Flooding	• describe and explain the causes of floodin	☐	☐	☐	
6.4 Drought	• describe and explain the causes of drought	☐	☐	☐	
6.5 The impacts of natural hazards	• describe and explain the impacts of natural hazards on people and the environment	☐	☐	☐	
6.6 Managing the impacts of natural hazards	• describe and evaluate the strategies for managing the impacts of natural hazards before, during and after an event	☐	☐	☐	
6.7 Opportunities presented by natural hazards	• describe and explain the opportunities presented by natural hazards to people	☐	☐	☐	

Topic	You should be able to	R	A	G	Comments
7 The atmosphere and human activities					
7.1 The atmosphere	• describe the structure and composition of the atmosphere • describe the natural greenhouse effect	☐ ☐	☐ ☐	☐ ☐	
7.2 Atmospheric pollution and its causes	• describe and explain the causes of atmospheric pollution, with reference to: – smog – acid rain – ozone layer depletion – enhanced greenhouse effect	☐	☐	☐	
7.3 Impact of atmospheric pollution	• describe and explain the impact of atmospheric pollution	☐	☐	☐	
7.4 Managing atmospheric pollution	• describe and explain the strategies used by individuals, governments and the international community to reduce the effects of atmospheric pollution	☐	☐	☐	
8 Human population					
8.1 Human population distribution and density	• identify where people live in the world	☐	☐	☐	
8.2 Changes in population size	• describe and explain the growth curve of populations • describe and explain the changes in human populations	☐ ☐	☐ ☐	☐ ☐	
8.3 Population structure	• describe population structure in MEDCs and LEDCs	☐	☐	☐	
8.4 Managing human population size	• evaluate strategies for managing human population size	☐	☐	☐	
9 Natural ecosystems and human activities					
9.1 Ecosystems	• define the terms *ecosystem*, *population*, *community*, *habitat* and *niche* • describe the biotic (living) and abiotic (nonliving) components of an ecosystem • describe biotic interactions • describe the process of photosynthesis	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	

Topic	You should be able to	R	A	G	Comments
	• describe energy flow using food chains, food webs and trophic levels	☐	☐	☐	
	• describe and explain ecological pyramids based on numbers and energy	☐	☐	☐	
	• describe the process of respiration	☐	☐	☐	
	• describe the carbon cycle	☐	☐	☐	
9.2 Ecosystems under threat	• describe and explain causes and impacts of habitat loss	☐	☐	☐	
9.3 Deforestation	• describe and explain the causes and impacts of deforestation	☐	☐	☐	
9.4 Managing forests	• describe and explain the need for the sustainable management of forests	☐	☐	☐	
9.5 Measuring and managing biodiversity	• describe and evaluate methods for estimating biodiversity	☐	☐	☐	
	• apply sampling techniques to unfamiliar situations	☐	☐	☐	
	• evaluate national and international strategies for conserving the biodiversity and genetic resources of natural ecosystems	☐	☐	☐	
Gathering of data	• formulate aims and hypotheses	☐	☐	☐	
	• design questionnaires that can be oral or written to gain information from an individual or a group of individuals (consideration should be given to factors influencing the successful design of questionnaires, e.g. layout, format of questions, the appropriate wording of questions and the number of questions. The practical considerations of conducting a questionnaire, e.g. the sampling methods, pilot survey and location of survey should also be discussed)	☐	☐	☐	
	• design a simple experiment using suitable controls	☐	☐	☐	
	• understand and evaluate random and systematic sampling techniques.	☐	☐	☐	
Mathematical requirements	• add, subtract, multiply and divide	☐	☐	☐	

Topic	You should be able to	R	A	G	Comments
	• use averages, decimals, fractions, percentages, ratios and reciprocals	☐	☐	☐	
	• understand the terms *mean* and *range*	☐	☐	☐	
	• use standard notation, including both positive and negative indices	☐	☐	☐	
	• understand significant figu es and use them appropriately	☐	☐	☐	
	• recognise and use direct and inverse proportion	☐	☐	☐	
	• draw tables, charts and graphs from given data	☐	☐	☐	
	• interpret charts and graphs	☐	☐	☐	
	• determine the gradient and intercept of a graph	☐	☐	☐	
	• select suitable scales and axes for graphs	☐	☐	☐	
	• make approximate evaluations of numerical expressions	☐	☐	☐	
	• understand the meaning of angle, curve, circle, radius, diameter, area, circumference, square, rectangle and diagonal	☐	☐	☐	
	• understand map scale and the use of the scale line.	☐	☐	☐	

Section 6: Useful resources

The resources listed below will help you to revise and study for your Cambridge Environmental Management 0680 course.

These resources have not been through the Cambridge quality assurance process but have been found suitable for use with various parts of the syllabus. This list includes website links providing direct access to internet resources. Cambridge is not responsible for the accuracy or content of information contained in these resources. The inclusion of a link to an external website should not be understood to be an endorsement of that website or the site's owners (or their products/services).

1 Rocks and minerals and their exploitation

https://www.worldatlas.com/articles/what-is-the-environmental-impact-of-the-mining-industry.html

www.learner.org/ – search for 'rock cycle'.

www.greatmining.com/ – search under 'Surface mining' and 'Underground mining'.

https://www.oxfam.org.au/what-we-do/mining/impacts-of-mining/

https://www.gold.org/about-gold/gold-supply/gold-development/positive-impacts-mining-case-studies

2 Energy and the environment

www.eia.gov – search 'What is energy? Explained' for a summary of renewable and non-renewable resources

www.need.org – search 'Secondary energy infobook'

www.world-nuclear.org – search 'nuclear power'

www.ufl.edu – search 'biogas'

www.nrdc.org – search 'wind power'

www.onpower.is – search 'geothermal power'

http://nationalgeographic.org – search 'Education: hydroelectric'

www.need.org – search 'Secondary solar factsheet'

www.alternative-energy-news.info – search for 'wind power', 'solar power', 'wave power'.

http://nationalgeographic.org – search 'Hydroelectric and geothermal: benefits and drawbacks'

3 Agriculture and the environment

www.rhs.org.uk – search 'soil types'.

www.bbc.co.uk/education – search for 'farming in rural environments'

www.fao.org – search for 'How to feed the world in 2050'.

www.bbc.co.uk/news – search for 'The disappearing Aral Sea' and the short clip 'Aral Sea – Duzbay's story'.

www.un.org – search for 'desertification day'

4 Water and its mangement

http://asi.ucdavis.edu/ – search 'Sustainable agriculture activity guides'.

www.leafuk.org/leaf/home.eb – search 'Simply sustainable soils'.

www.usgs.gov – search 'Where is Earth's water?'

https://thewaterproject.org/ – search 'create a mini water cycle'.

www.klickitatpud.com/ – search 'Packwood Lake Hydro Project'.

www.water-pollution.org.uk – search 'types of water pollution' and 'causes of water pollution'.

https://healingearth.ijep.net/water/case-study-river-ganges

http://www.greenpeace.org.uk – search 'Hidden consequences: The unseen price of water pollution'.

5 Oceans and fisheries

www.climate.gov/ – search 'El Nino status'.

www.climate.gov/ – search 'What is El Nino in a nutshell?'

http://wwf.panda.org/ – search 'unsustainable fishin '.

http://advocacy.britannica.com/blog/advocacy/ – search 'pros and cons of fish farming'.

6 Managing natural hazards

www.volcanodiscovery.com/ – search 'live volcano webcams'.
http://earthquake.usgs.gov/ – search 'Measuring the size of an earthquake'.
www.bbc.co.uk/news – search 'Japan earthquake: tsunami hits north-east'.
http://floodlist.com/
http://earthquake.usgs.gov – search 'A comparison of two Bay Area earthquakes: 1989 v. 1906'.
www.youtube.com/ – search 'Fertility of the Nile – Nile – BBC' (BBC Earth).

7 The atmosphere and human activities

www.haze.gov.sg/
www.esrl.noaa.gov/ – search 'South Pole ozone hole'
www.theozonehole.com/
https://vimeo.com/104321114 – 'The Antarctic ozone hole' video by Patrick Cullis.
https://www.epa.gov/acidrain
https://climate.nasa.gov/effects/
www.metoffice.gov.uk/ – search 'what is climate change?' and 'Impacts of climate change'.
www.globalccsinstitute.com/ – search 'understanding carbon capture and storage'.
www.gcsescience.com/index.html – search 'catalytic converters'.
http://powerplantstechnology.blogspot.co.uk/ – search 'Flue gas desulfurization'.

8 Human population

www.differencebetween.com/difference-between-afforestation-and-reforestation/
www.earthtimes.org/encyclopaedia/environmental-issues/deforestation/
www.s-cool.co.uk/ – search 'populations'.
www.youtube.com/ – search 'Human population through time'.
www.youtube.com/ – search '[Channel 4 News] Population explosion causes poverty crisis'.
www.worldwatch.org/ – search 'Nine population strategies'
www.japanfs.org/en/news/archives/news_id034953.html – search 'depopulation of society in Japan'
www.bbc.co.uk/ – search 'How Ethiopia slowed its population growth'
http://geography.about.com/ – search 'China's one child policy'.

9 Natural ecosystems and human activities

www.bbc.co.uk/education/subjects – search 'photosynthesis and respiration'.
www.saps.org.uk/ – search 'Animation – respiration and photosynthesis'.
www.scienceaid.co.uk/biology/ecology/ – search 'food chains and energy'
www.rspb.org.uk/ – search 'pyramids of numbers'.
www.nationalgeographic.com/environment/ – search 'Photo gallery: rain forest deforestation'.
www.shutterstock.com/search/deforestation

Sampling techniques

www.amentsoc.org/ – search 'Make a pooter activity for kids'.
www.saps.org.uk/ – search 'Questions about quadrats'.
www.youtube.com/ – search 'quadrat sampling'.
www.saps.org.uk/ – search 'Ecology practical 2: The distribution of species across a footpath'.
www.rgs.org/HomePage.htm – search 'sampling techniques'

www.saps.org.uk/ – search 'Ecology practical 1: Measuring abundance and random sampling'

www.saps.org.uk/ – search 'Ecology practical 3: abundance and random sampling at Waun Las Nature Reserve, Wales'.

You can find a esource list, including endorsed resources to support Cambridge IGCSE / O Level Environmental Management on our public website [here]

Endorsed resources have been written to be closely aligned to the syllabus they support, and have been through a detailed quality assurance process. All textbooks endorsed by Cambridge International for this syllabus are the ideal resource to be used alongside this Learner Guide.

In addition to reading the syllabus, you should refer to the past and specimen papers.

Cambridge Assessment International Education
The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA, United Kingdom
t: +44 1223 553554
e: info@cambridgeinternational.org www.cambridgeinternational.org