MY REVISION NOTES

HODDER EDUCATION

AQA

A-level

GEOGRAPHY

SECOND EDITION

- Plan and organise your revision
- Reinforce skills and understanding
- Practise exam-style questions

Helen Harris

MY REVISION NOTES

AQA A-level GEOGRAPHY

Boost

HODDER EDUCATION

LEARN MORE

My Revision Planner

Introduction

1 Water and carbon cycles
- 9 Water and carbon cycles as natural systems
- 11 The water cycle
- 21 The carbon cycle
- 29 Water, carbon, climate and life on Earth

2 Hot desert systems and landscapes
- 35 Deserts as natural systems
- 40 Systems and processes
- 44 Arid landscape development in contrasting settings
- 48 Desertification

3 Coastal systems and landscapes
- 53 Coasts as natural systems
- 54 Systems and processes
- 61 Coastal landscape development
- 68 Coastal management

4 Glacial systems and landscapes
- 74 Glaciers as natural systems
- 75 The nature and distribution of cold environments
- 83 Glaciated landscape development
- 92 Human impacts on cold environments

5 Hazards
- 97 The concept of hazards in a geographical context
- 100 Plate tectonics
- 104 Volcanic hazards

6 Ecosystems under stress
- 120 Ecosystems and sustainability
- 124 Ecosystems and processes
- 131 Biomes
- 134 Ecosystems in the British Isles over time
- 137 Marine ecosystems
- 138 Local ecosystems

7 Global systems and global governance
- 142 Globalisation
- 148 Global systems
- 150 International trade and access to markets
- 156 Global governance
- 157 The global commons
- 162 Globalisation critique

8 Changing places
- 164 The nature and importance of places
- 167 Changing places
- 170 Place studies

REVISED	TESTED	EXAM READY

Check your understanding and progress at **www.hoddereducation.co.uk/myrevisionnotesdownloads**

9 Contemporary urban environments

173 Urbanisation
179 Urban forms
182 Social and economic issues associated with urbanisation
184 Urban climate
187 Urban drainage
188 Urban waste and its disposal
190 Other contemporary urban environmental issues
191 Sustainable urban development

10 Population and the environment

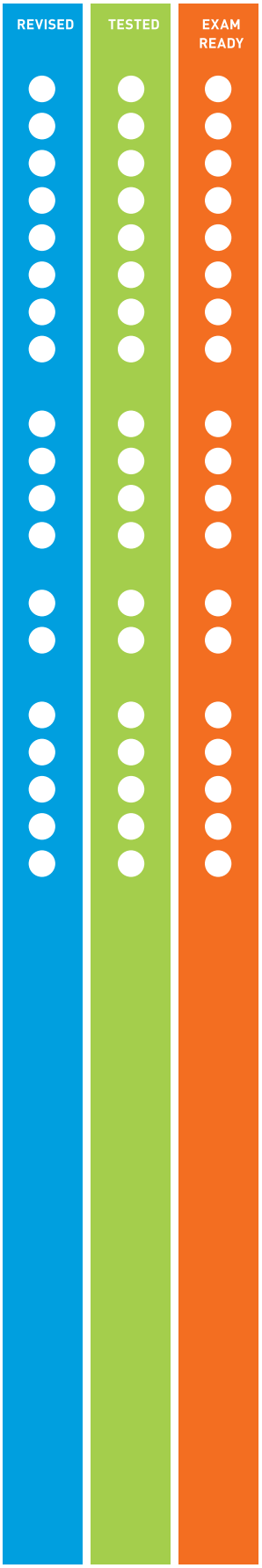
196 Introduction
199 Environment and population
207 Environment, health and well-being
212 Population change
220 Principles of population ecology and their application to human populations
223 Global population futures

11 Resource security

228 Resource development
232 Natural resource issues
238 Water security
243 Energy security
250 Mineral security

Glossary

Now test yourself answers



1 Water and carbon cycles

Water and carbon cycles as natural systems

REVISED

Systems in physical geography

In physical geography, two general approaches are used for explanation: models and systems.

- A **model** is an idealised representation of reality.
- A **system** is a set of interrelated events or components working together. It consists of:
  - **inputs**
  - **stores**
  - outputs
  - a series of flows or connections between the inputs, stores and outputs.

Input The addition of matter and/or energy into a system.

Store A part of the system where energy/mass is stored or transformed.

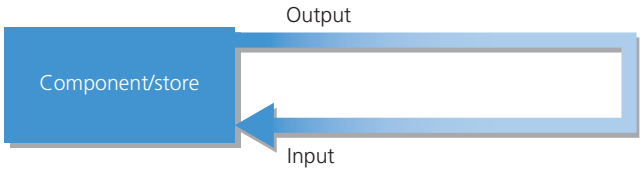


Figure 1.1 A closed system

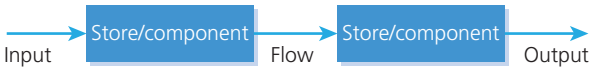


Figure 1.2 An open system

Exam tip

Systems are a core concept in physical geography. They must be understood at a variety of **scales**. For example, for water:

- global hydrological cycle
- drainage basin system
- hill slope drainage system.

Systems can be classified as:

- **isolated:** there are no interactions with anything outside the system boundary – there is no input or output of energy or matter
- **closed:** there is transfer of energy into and beyond the system but no transfer of matter (see Figure 1.1)
- **open:** both energy and matter transfer freely into and out of the system (see Figure 1.2)
- **subsystem:** a component of a larger system. The Earth system has four subsystems, each of which is an open system with interrelationships between them (see Figure 1.3).

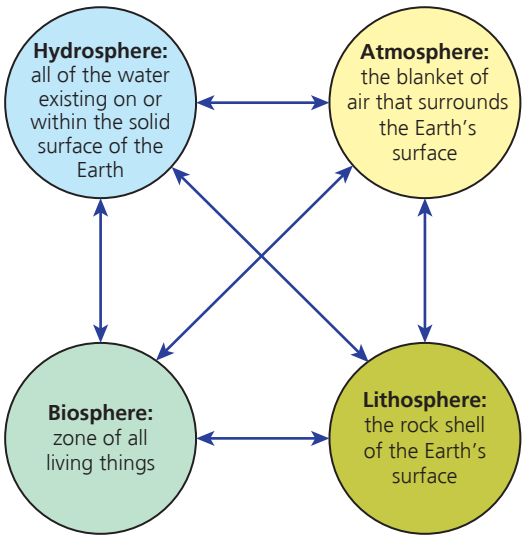


Figure 1.3 The four subsystems of the Earth system

Dynamic equilibrium is where there is a balance between inputs and outputs. For example, wave currents remove and replace sand on a shoreline but the beach apparently stays the same.

Feedback occurs when a change in one part of the system causes a change in another part. There are two types of feedback:

- **Negative feedback:** a feedback which keeps a system in its original condition – for example, increase in CO_2 → increase in temperature → increased plant growth → increased uptake of CO_2 → reduction in CO_2, which counterbalances the initial increase.
- **Positive feedback:** a feedback where there is a progressively greater change from the original condition of the system – for example, increase in temperature → increase in oceanic temperature → dissolved CO_2 released from warmer oceans → increase in CO_2 → further atmospheric warming.

Exam tip

The concepts of positive and negative feedback must be applied to a range of concepts. Correct sequencing is important – remember, the same catalyst can lead to both positive and negative feedbacks.

Now test yourself TESTED

1 What is the difference between an open and a closed system?

2 Explain the links between the following subsystems:
   a) atmosphere and hydrosphere
   b) lithosphere and biosphere
   c) cryosphere and lithosphere.

Answers on p. 258

Application of the system concept to the water and carbon cycle

Four vital cycles connect the Earth's subsystems. These are the:

- water cycle
- carbon cycle
- oxygen cycle
- nitrogen cycle.

They are all fundamental to life on Earth and to a study of physical geography. Both the carbon and the water cycles are under pressure from growing populations and climate change.

Making links

Atmospheric CO_2 levels have a direct link to air temperature and thereby all major water stores.

Revision activity

Create flow diagrams to explain how different catalysts (e.g. increased water vapour) lead to positive and/or negative feedback in the water and carbon cycles. An example for the water cycle is:

Temperature increase → more evaporation → more water vapour in the atmosphere → greater cloud cover and more → greater absorption of long-wave radiation → further temperature increase. Positive feedback.

Exam practice

1 Outline **two** of the processes that transfer carbon from one pool to another. [4]
2 Explain the climatic feedback between water vapour and climate change. [4]
3 Outline **two** challenges associated with safe levels of groundwater abstraction. [6]
4 Assess the need for land-use planning in flood risk areas. [6]
5 Examine the importance of forest trees in the carbon cycle. [6]

Answers and quick quizzes online

Exam skills

Opportunities to practise geographical skills within this topic include:

- analysis of specific graphs such as:
  - flood hydrographs
  - soil budget graphs
  - line graphs showing seasonal changes in water storage and surface runoff
- geospatial data, i.e. global maps showing:
  - oceanic warming and cooling
  - oceanic circulation flows
  - global levels of forestry.

Summary

- Be clear on the systems approach and the concepts of positive and negative feedback and dynamic equilibrium.
- For both the carbon and water cycles understand the meaning of the lithosphere, hydrosphere, cryosphere, atmosphere and biosphere, the major stores of carbon and water, their size and geographical distribution.
- Key processes affect the flows and transfers of both water (evaporation, condensation, cryospheric processes) and carbon (photosynthesis, respiration, decomposition, combustion, carbon sequestration and weathering).
- The cycling of water exists at the global, drainage basin and slope scale. There are a number of common inputs, outputs, stores and flows.
- Be clear on the concepts of water balance and carbon budgets and the factors affecting them.
- Be able to analyse and interpret hydrographs showing river regimes and storm responses.
- Natural and human factors lead to changes in the water and carbon cycles over time.
- Understand the impacts of changes on the water and carbon cycles – these may be economic, social or environmental.
- There are key links between the water and carbon cycles and the atmosphere – linkage of knowledge is a key feature of A-level geography.
- A combination of initiatives is needed to mitigate the impact of climate change.
- It is important to develop a view/opinion on possible futures.