AQA

Make the Grade!

Understanding GCSE Geography

for AQA Specification A

Teacher Guide

Ann Bowen
John Pallister

Heinemann
Part of Pearson

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www.heinemann.co.uk

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First published 2009

12 11 10 09
10 9 8 7 6 5 4 3 2 1

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN 978 0 435353 31 5

Edited by Lucy Hyde and White-Thomson Publishing/Kelly Davis and Steven Maddocks
Designed by Pearson Education Ltd
Typeset by HL Studios, Long Hanborough
Word documents by TAG Publishing Services
Original illustrations © Pearson Education Ltd
Illustrated by HL Studios, Long Hanborough
Cover design by Pearson Education Ltd
Picture research by Pearson Education Ltd
Cover photo © G.M.B. Akash/Panos Pictures
Printed in the UK by Ashford Colour Press

Acknowledgements
The authors and publisher would like to thank the following individuals and organisations for permission to reproduce photographs:

All photographs Pearson Education Ltd/John Pallister.

Extracts, diagrams and maps:
P.53 (Figures 3 and 4) "Money, Climate and Environmental Systems" by Unwin Hyman, D C; **pp.225, 252** Ordnance Survey on behalf of HMSO (Her Majesty's Stationery Office); **p.225 (Figure 2)** *The Journal, Newcastle* by permission of NCJ Media; **pp.228 and 251** "Sense of Place: Alternative Workbook 3a" by Boyland, Jones and Beddis (1985), reprinted by permission of Oxford University Press; **p.255** Controller of HMSO (Her Majesty's Stationery Office); **p.259** *New Internationalist*, July 2001 (Issue 336); **p.285 (Figure 1)** "Geography of the Third World" by G G Clarke et al (1996, Routledge), reprinted by permission of Taylor & Francis Books (UK).

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Websites
The websites used in this product were correct and up to date at the time of publication. It is essential for teachers to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that teachers bookmark useful websites and consider enabling students to access them through the school/college intranet.

Contents

The CD-ROM contains all the material. Chapters 1, 2 and 14 have been printed as a representative sample.

The Restless Earth

Scheme of work and delivery

Topic	Introduction	Lesson content	Activities	Extension work	Electronic resources
The unstable crust – plates and plate margins **Student book pages 6–7**	Continental drift – animated sequence of movements of the continents. Video sequences of volcanoes and earthquakes – to demonstrate unstable nature of crust.	World distribution of tectonic plates. Plate margins – destructive, constructive and conservative. Explanation for what is happening at each type of plate margin.	**1** focuses on changed terminology in the new specification. **2** is a summary of key content. **3** and **4** need more thinking through and act as checks on student understanding.	• TG* 1.1 Tectonic activity and plate margins • TG 1.2 Plate margins (Target: Foundation Tier) • Reasons for unstable crust away from plate margins.	ActiveTeach: Animation / Destructive plate margin Animation / Constructive plate margin Animation / Conservative plate margin
Fold mountains and ocean trenches **Student book pages 8–9**	Atlas work – from a global physical map, identify highest point on land and lowest point in the oceans.	World distribution of fold mountains and links to plate margins. Formation of fold mountains. Location and formation of ocean trenches. Outline physical problems of fold mountain ranges for people.	**1** uses key content. **2** is skills-based – drawing a labelled sketch from a photograph (used in exams) and checks understanding. **3** is an overview of the enormous scale of tectonic activity.	• TG 1.3 Problems for people and transport in high fold mountain ranges • Why fold mountains are still growing; why the Himalaya is the highest range.	ActiveTeach: Animation / Formation of fold mountains Further research: www.contentextra.com/aqagcsegeog
Case study of one fold mountain range – the Alps **Student book pages 10–11**	Atlas work – identify the Alpine countries. Ascertain student knowledge of levels of Alpine activities such as skiing.	Formation of fold mountains specific to the Alps. Typical land uses and human activities in an Alpine valley – farming and forestry, tourism, power supply and industry. Comment on opportunities and problems. Summary perspective – how the Alps compare with other fold mountain areas.	**1** and **2** cover case study content, taking new specification wording into account. **3** requires the student to apply general information to the specific case study.	• TG 1.4 Human activities in an Alpine valley • Further references to other fold mountain areas for similarities and differences, e.g. the quite well-populated and mineral-rich, but poor, Andean countries.	Further research: www.contentextra.com/aqagcsegeog ActiveTeach: Interactive globe to locate case study
Volcanoes and supervolcanoes **Student book pages 12–13**	Reference to famous past volcanic eruptions, e.g. Vesuvius destroying Roman cities in 79 AD, or the massive eruption of Krakatoa in 1883 with its worldwide effects. Details of a recent volcanic eruption.	World distribution of volcanoes and links to plate margins. Formation of different types of volcanoes (shield and composite). Supervolcanoes – their locations, characteristics, potential for affecting large areas, example.	**Grade Studio** **1** focuses on differences, for which answers need to be two-sided or comparative (e.g. higher, steeper). **2** requires use of content and student understanding. **3** requires the application of knowledge.	• TG 1.5 Volcanoes (Target: Foundation Tier) • Visit the Alaska Volcano Observatory at www.avo.alaska.edu, the most visited volcano website.	Further research: www.contentextra.com/aqagcsegeog
How volcanoes affect people and human activities **Student book pages 14–15**	Refer back to the photograph on page 5. Could it have been worse? Will it ever get any better? The effects of a recent volcanic eruption.	Destruction and damage caused – negative effects. Usefulness for farming, minerals and tourism – positive effects. Whether or not volcanic eruptions can be predicted.	**1** is skills-based for students to summarise content for a key topic theme. **2** focuses on a topic given more prominence in the new specification. **3** refers to an example, a useful source of specific detail in examination answers.	• TG 1.6 Eruption of Mount Etna in 2001 (Target: Higher Tier) • Draw up a framework for a student case study of volcanoes in southern Italy (Etna, Vesuvius, Stromboli and others in the Lipari islands).	

* Note: 'TG' in the 'Extension work' column refers to teacher guide activity sheets.

The Restless Earth

Scheme of work and delivery

Topic	Introduction	Lesson content	Activities	Extension work	Electronic resources
Case study of one volcanic eruption – Soufrière Hills volcano **Student book pages 16–17**	Match the location of Montserrat to the plate margins in Figure 2, page 6.	What Montserrat was like before the eruptions began in 1995. Immediate changes resulting from the eruptions 1995–7, effects on people and their responses. Longer-term effects and responses resulting from continuing volcanic activity. Economic and social problems caused.	Arranged so that students can select content and rearrange it in a manner suitable for case study use in an exam. The final part (e) focuses more on the personal (social) issues.	Visit the Observatory website for updates and explore it for continuing effects on the island.	ActiveTeach: Animation / Montserrat, Pre-eruption Animation / Montserrat, Post-eruption Further research: www.contentextra.com/aqagcsegeog ActiveTeach: Interactive globe to locate case study
Earthquakes **Student book pages 18–19**	Refer to British earthquakes such as the 5.2 Market Rasen quake in early 2008. Details of a recent major earthquake. Video clip of an earthquake and its effects.	World distribution of earthquakes and links to plate margins. How they are measured (Richter and Mercalli scales). Why their occurrence is greatest at destructive margins. Factors controlling the severity of effects on people. Responses of people to the earthquake hazard.	**Grade Studio** **1** gives practice describing the pattern shown on a world map; the exam tip outlines how students might approach the answer. **2** tests understanding of what happens at different plate margins, while **3** is focused on student understanding of the difference between primary and secondary effects of earthquakes. **4** gives an example of two earthquakes of the same magnitude, but with different effects. Students are asked to identify likely factors to explain.	• TG 1.7 Earthquakes (Target: Foundation Tier) • TG 1.8 Earthquake in Bam (Iran), December 2003 (Target: Higher Tier) • Visit the Wikipedia website http://en.wikipedia.org/wiki/Earthquakes for details of specific quakes, lists of the strongest, most damaging, etc.	ActiveTeach: Animation / San Francisco earthquake
Case studies of earthquakes **Student book pages 20–21**	Introduce the major specification themes illustrated by these case studies – differences in effects and responses between poor and rich countries, and the difference between primary and secondary effects.	Precise details of three earthquakes and their effects – Gujarat, Seattle and Indonesia (responsible for the Asian tsunami of late 2004). Coverage in each example of physical cause and location, effects on people and human responses.	**1** and **2** target student understanding of the major specification themes referred to in the Introduction. In **3** headings are suggested for students to organise content, useful for case study-based exam questions. **4** is more open; students are required to comment on a view, for which there is a fair amount of support in the three examples.	• Replace one or more of the case studies with a more recent example, for which source information is readily available.	Further research: www.contentextra.com/aqagcsegeog ActiveTeach: Interactive globe to locate case study

A Revision Lesson Plan for this chapter can be found on the next page.

Chapter 1 – Revision Lesson Plan

Getting Started	Development	Extension Task	Question Practice	Plenary
Checklist: *Student book:* Page 24 *Teacher Guide:* Page 13 Students recall the areas they have studied and complete an individual checklist for revision to see which areas they feel comfortable in and which they feel they need to revise further. *Debriefed through whole-class question-and-answer session.*	Refer students to key ideas and terms in the specification. *Student book:* Page 24 *Teacher Guide:* Pages 14–15 Highlight case studies identified in the specification. Students could work in groups to summarise their notes under headings (most useful for GCSE exam questions). *Student book:* Page 24 *Teacher Guide:* Page 12	Students could be asked to check www.contentextra.com/aqagcsegeog for further research and to find out more about recent case studies. Students could also undertake field work in their local area (where relevant) or individual/small-group inquiries and present their findings in the classroom.	Use the Exam Café section at the end of the student book (pages 253–5) and the link to the electronic Exam Café from these pages, as well as the Exam tips throughout Chapter 1 in the student book. These resources will help you identify key components of GCSE exam questions, and they give other guidance on answering questions. For sample exam questions see: *Student book:* Page 22 for Higher Tier and www.contentextra.com/aqagcsegeog for Foundation Tier *Teacher Guide:* Pages 20–24	Whole-class discussion of mark schemes – practice answers needed in line with the mark schemes. Use: *Student book*, pages 256–8 Follow the link to the electronic Exam Café from page 24 in the student book for further whole-class revision. The topic summary on page 16 can be used for further revision of the content in Chapter 1.

1.1 Tectonic activity and plate margins

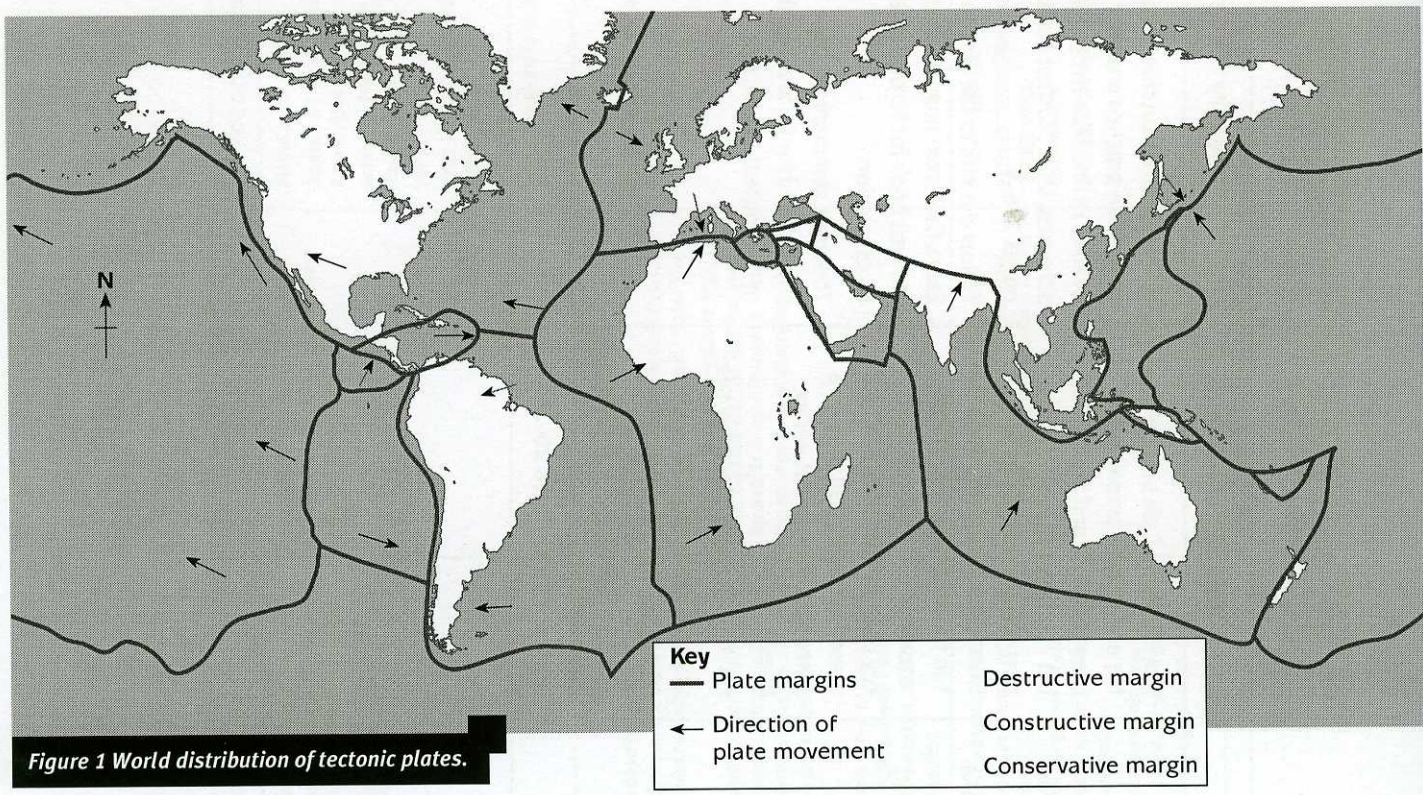


Figure 1 World distribution of tectonic plates.

1 Using **Figure 2** on page 6 in the student book, on **Figure 1**:

(a) on the map name the seven large tectonic plates

(b) use different colours or shading to highlight the three types of plate margin. Complete the key for your map.

2 (a) Describe where destructive margins are located

(i) in Europe _____

(ii) in the Pacific Ocean _____

_____

_____

(b) (i) In which direction is the plate with the UK moving? _____

(ii) Does this mean that earthquakes are even less likely in future?

_____

_____

3 Explain why tectonic activity is concentrated at plate margins.

_____

_____

_____

_____

_____

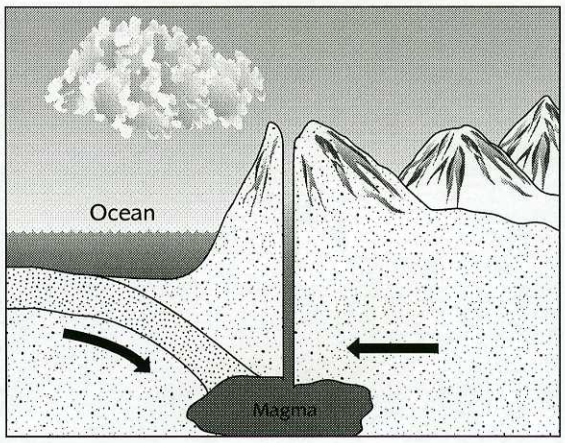
1.2 Plate margins

1 Use the following list of words to complete the paragraphs about the different types of plate margin. All the words are used, but some need to be used more than once.

California fault together Iceland apart oceans oceanic ocean trench
subduction jerk earthquake magma islands fold

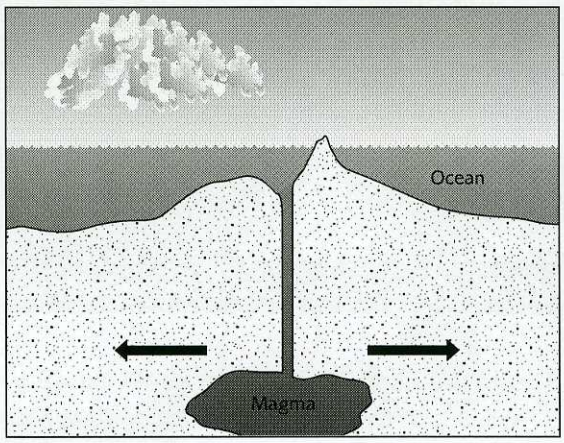
Destructive plate margins

At a destructive plate margin the plates are moving _____ . The denser _____ crust sinks below the lighter continental crust. The oceanic crust sinks into the _____ and it melts in the _____ zone. Energy is released by the movement, which may be felt on the surface as an _____ , while the molten _____ may rise upwards causing a volcanic eruption. The continental crust is crumpled up into _____ mountains.



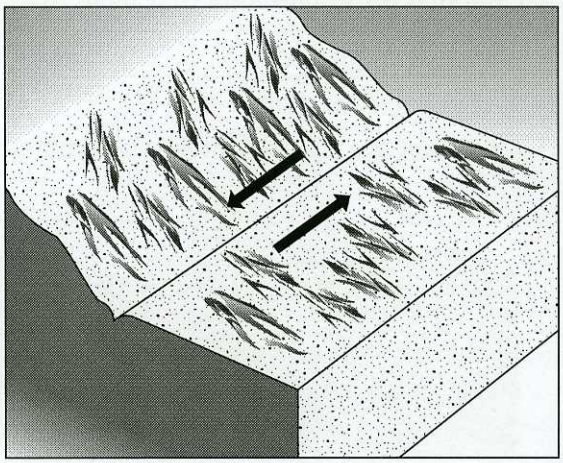
Constructive plate margins

At a constructive plate margin the plates are moving _____ . This type of movement mostly happens under the _____ . The gap left is filled by _____ rising up from the mantle below to form volcanoes. Some of these volcanoes have grown high enough to form volcanic _____ , such as Hawaii and _____ .



Conservative plate margins

Here the plates are sliding past each other. The line of weakness where the two plates meet is known as a _____ . Pressure builds up until the two plates _____ past each other. This causes an _____ and the land around it becomes crumpled and ridged. A good example is the San Andreas fault in _____ .



2 Choose from the same list of words to correctly label the diagrams.

1.3 Problems for people and transport in high fold mountain ranges

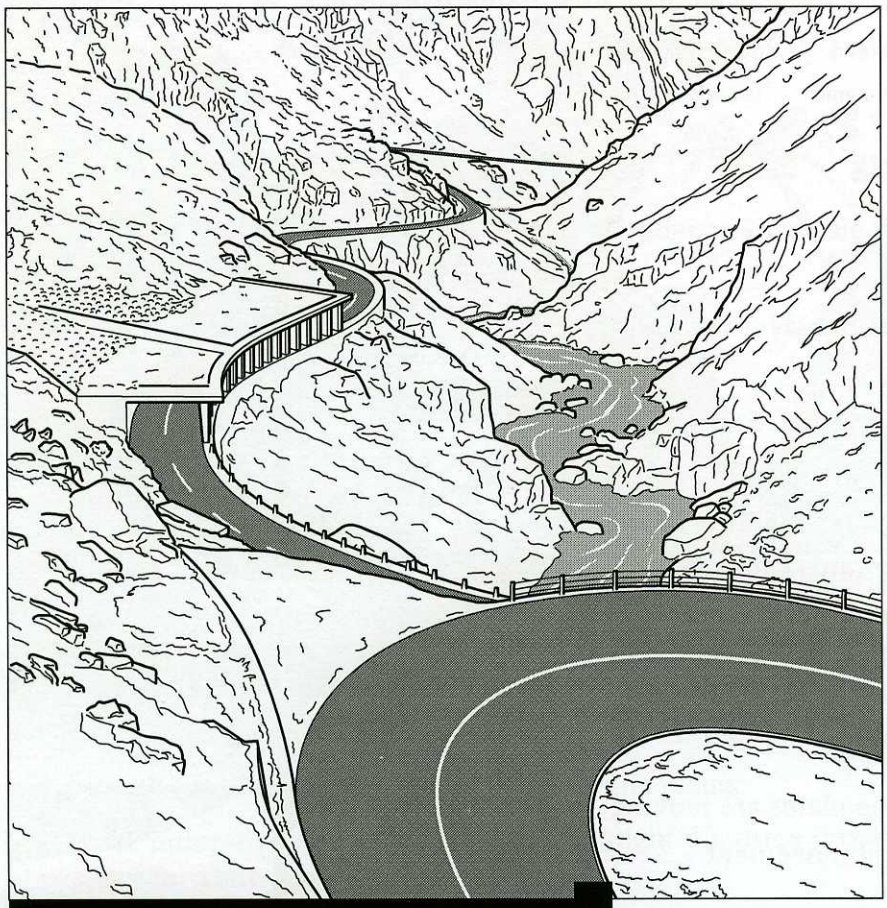


Figure 1 St Gotthard Pass between Switzerland and Italy.

1 Add labels to **Figure 1** to show the physical problems for people and transport in high mountain areas like this.

2 Give two improvements that have made the road easier and safer to use.

_____ _____

3 **(a)** What are the advantages of replacing mountain roads like this with road tunnels?

_____

_____

_____

(b) State two problems associated with long road tunnels under mountains.

_____

_____

1.4 Human activities in an Alpine valley

1 (a) What is the snow line?

(b) State the height of the tree line (upper limit of tree growth) in this area.

(c) What are Alpine meadows used for in **(i)** summer **(ii)** winter?

(d) (i) Describe the farming on valley floors in the Alps.

(ii) Explain why the valley floor is the best area for farming in the Alps.

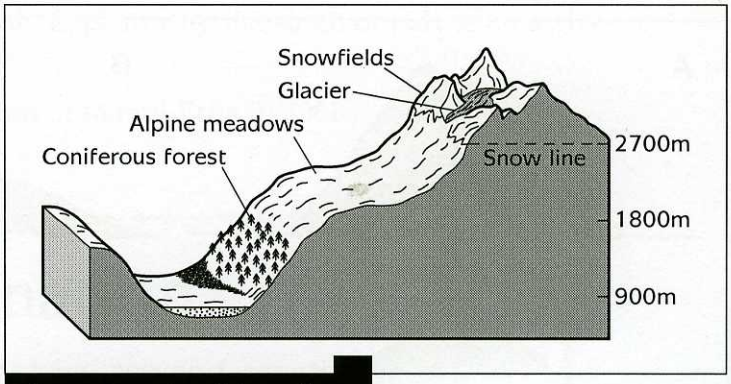


Figure 1 Part of an Alpine valley.

2 (a) Where is the HEP station sited?

(b) Describe what the company has done to obtain water for driving the turbines in the HEP station.

(c) Explain why they needed to do this.

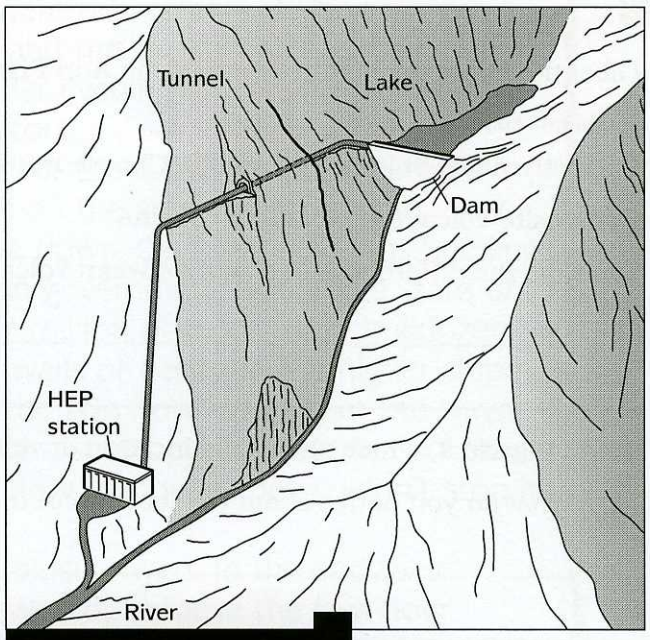


Figure 2 HEP station in Austria.

3 State two precipitation advantages of generating hydro-electric power in the Alps.

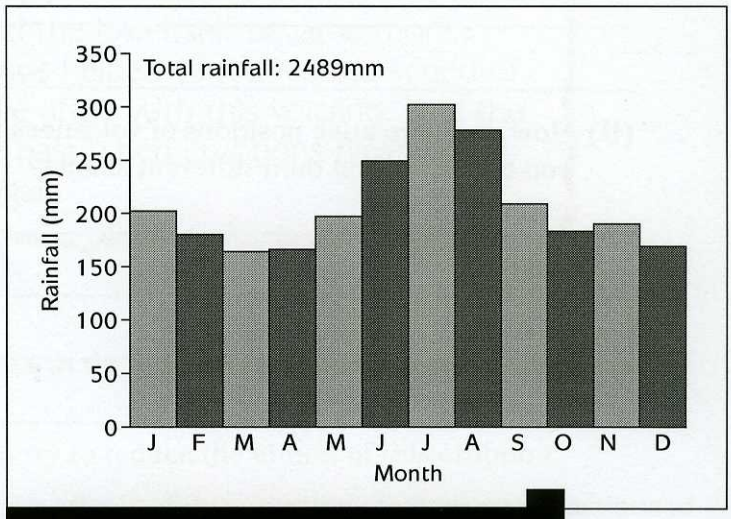


Figure 3 Precipitation in an Alpine weather station (2500 metres above sea level).

1.5 Volcanoes

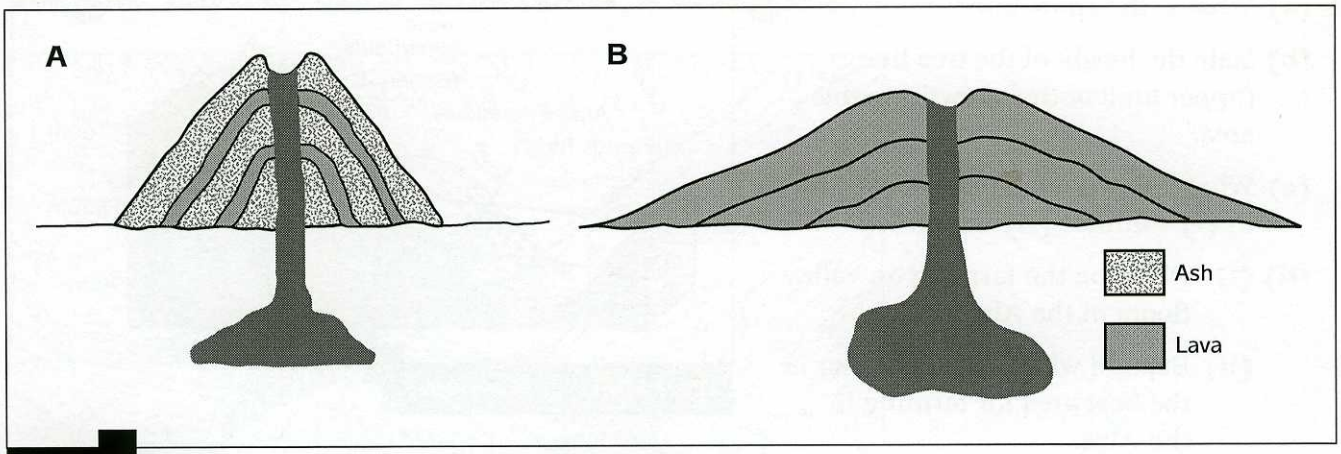


Figure 1

1 (a) Label the following features on volcano A in **Figure 1**:

Magma chamber Vent Crater

(b) Correctly name volcanoes A and B. Choose from the following types of volcano:

Composite volcano Shield volcano

(c) Describe the differences in shape between volcanoes A and B in **Figure 1**.

_____

_____

(d) Study **Figure 2**, which shows the location of volcanoes A and B.

(i) What do you notice about the location of the two volcanoes?

_____

_____

_____

_____

_____

(ii) How do the relative positions of volcanoes A and B help you to understand their different shapes?

_____

_____

_____

_____

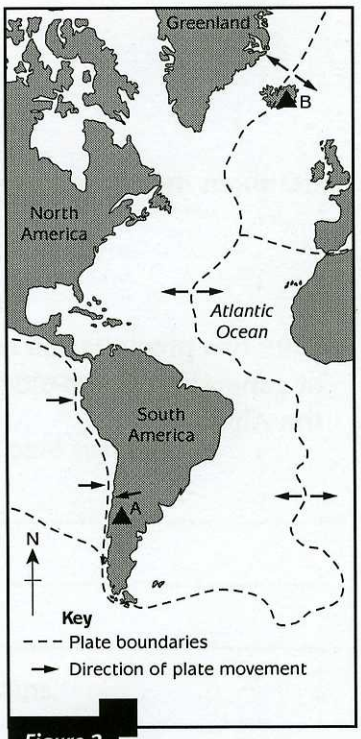


Figure 2

1.6 Eruption of Mount Etna in 2001

1 Study **Figure 2** on page 6 in the student book. Explain why the south of Italy is an active volcanic region.

2 Read the newspaper report about the eruption of Mount Etna in 2001.

People against nature

When a volcano begins to erupt lava, ash and gas, the people living close by are forced to take note. In Catania, a city of 380 000 people located on the coast of Sicily, about 50km from the top of Mount Etna, there were two effects of the volcano: a fine ash settled on everything, and the explosions and flows of glowing lava provided spectacular evening entertainment which made the city a magnet for visitors.

The threat was much greater for the 6300 people who lived in the town of Nicolosi, higher up on the side of the volcano, only 20km from the start of the lava flows. One lava flow was heading straight for the town. The Italian government declared a state of emergency and provided US$ 7 million of help. Thirty bulldozers worked night and day building walls of earth on the higher slopes above Nicolosi to try to divert the lava flow away from the town. Two aeroplanes and a helicopter also dropped water to cool the lava and decrease its speed of flow, although they couldn't stop it destroying the ski-lifts.

Meanwhile the people of Nicolosi prayed. In the end their prayers seem to have been answered, because the lava flow stopped 4km from the town. A new crack opened up on the side of the volcano, which took some of the lava away from the flow that was moving towards Nicolosi. The volcanic activity decreased, the lava flow became wider and the lava itself became more dense. Each of these three things helped to reduce the speed of flow of the lava. 'We have a love affair with this volcano,' said the mayor of Nicolosi. 'Even in the past when eruptions have ruined some property, we just start again.'

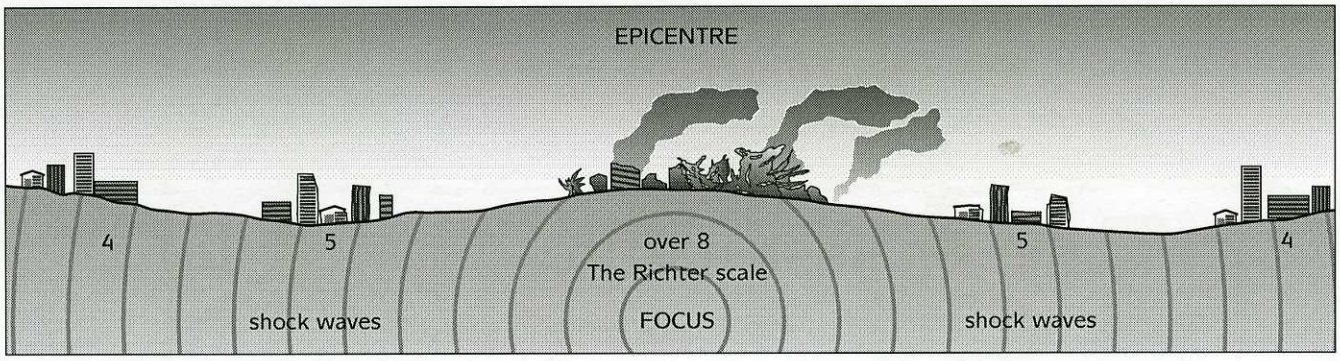
(a) From this report and **Figure 1** on page 14 in the student book, describe the damage caused by Mount Etna's eruption in 2001.

(b) Describe how local people responded to try to reduce the effects of this eruption.

(c) Which was more important in limiting the effects of this eruption – nature or the actions of people? State and explain your view.

1.7 Earthquakes

A: Primary effects of an earthquake



1 Use the diagram to fill in the gaps.

The place underground where the earthquake first happened is the _____ . The point on the surface above it with the strongest shock waves is the _____ . This was a strong earthquake because it measured _____ on the Richter scale. The strength of the shock waves _____ with distance from the centre.

2 Describe the damage shown

(a) in the centre _____

(b) further away from the centre _____

_____

B: Secondary effects of an earthquake

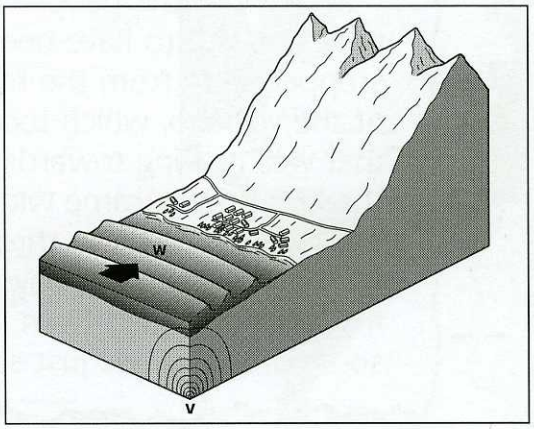
3 What happened at V?

_____

4 What is the name for the big wave W? _____

5 What will the big wave do when it reaches this coast?

_____



6 (a) If there is a warning, what should people living on the coast do?

_____

(b) Suggest two things they definitely should not do.

_____

_____

1.8 Earthquake in Bam (Iran), December 2003

1 Study **Figure 1**.

Iran is in a high-risk zone for earthquakes. Why?

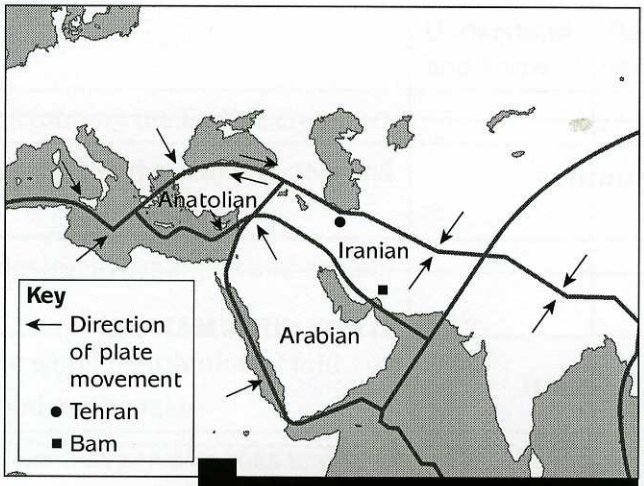


Figure 1 Plate margins in Western Asia.

2 Study **Figures 2** and **3**.

Date	26 December 2003
Magnitude	6.5 on the Richter scale
Deaths	estimated 30 000
Damage	a large part of the city was flattened

Figure 2 Information about the earthquake in Bam.

(a) Explain why the items provided by the Iranian authorities are the type of supplies needed after an earthquake.

(b) How far do you agree with the headline that builders killed the people of Bam? Explain your answer.

(c) How likely is it that the next earthquake in Iran will cause just as much loss of life?

(d) Tehran, the capital, contributes 40 per cent of the national income of Iran each year. One big earthquake here could wreck Iran's economy. One suggestion is to move the whole city of 12 million people to a safer location. How practical a solution to the earthquake risk is this?

Did builders kill the people of Bam?

Buildings collapsed on top of people as they slept. In Bam, a lot of the building work is done by the property owners themselves, using untrained local workers. The cost of cement is high so people do not use much; often a mixture of mud and lime is used to hold bricks together.

There had been a recent housing boom in Bam. Rapid migration from poorer rural areas led to a shortage of housing. Builders tried to meet the demand by adding extra floors to existing houses or building cheap new houses. Neither of these obeyed Iran's building regulations. Because the need for housing was so great, the authorities overlooked the code of building designed to make new houses resist earthquake shocks.

Compare what happened in Bam with what happened in an earthquake of similar strength three days earlier in California. Thanks to safer construction methods and regulations that were enforced, only three people died.

The authorities in Iran have a lot of experience of dealing with earthquakes and their aftermath. Their response was quick and efficient. With the help of aid from overseas, supplies including about 20,000 family tents, 30,000 plastic sheets, 200,000 blankets, 40,000 kitchen sets, 400,000 water purification tablets, 30 generators and 20,000 kerosene heaters reached Bam within two weeks.

The more serious problem is the lack of sustained efforts to prevent such events happening again. Plans for the future are made after every tragedy, but six months later the authorities have forgotten about implementing them.

Figure 3 Newspaper article.

Revision notes for a tectonic case study (volcano, earthquake, tsunami)

Exam Café

Topic(s) _____

Location – place and country

_____

CASE STUDY INFORMATION

Basic details about the event

Cause(s)

Effects on people (primary and secondary)

Responses of people (immediate and long-term)

Revision guide for the student: The Restless Earth

Checklist for revision	Understand and know	Need more revision	Do not understand
I can name several large plates forming the Earth's crust.			
I know the differences between destructive, constructive and conservative plate margins.			
I can name two landforms at destructive margins and explain their formation.			
I know the main features of the world distribution of fold mountains, active volcanoes and earthquakes.			
I can state two differences between supervolcanoes and other volcanoes.			
I can give the effects of volcanoes on people using these headings – primary, secondary, positive, negative.			
I know the two different ways of measuring earthquakes.			
I can explain why earthquakes cause more loss of life in poor than in rich countries.			
Case studies			
Fold mountains – I can name one mountain range, explain its formation, give some of the physical problems for people, and know about four human activities found there.			
Volcanic eruption – I can name an example, explain how it was caused, state its effects (good and bad) on people, and write out what people have done (their responses).			
Earthquakes in both rich and poor countries – I can explain why the earthquake happened there, I can write about the damage and destruction (effects) that resulted, and what was done after the quake.			
Tsunami – I can explain the cause of the Asian tsunami, I can name some of the places affected and the damage it did (the effects), and describe how people responded to the disaster.			

Key words from the specification for The Restless Earth – Test yourself

Exam Café

General terms

LIST OF TERMS

fertile soils
evacuate people during the eruption
people killed by falling ash and rocks from the eruption
people killed by flood water after mountain snow melts during the eruption
farmland ruined by covering of ash
set up tiltmeters around the crater

Read the list of terms above. Choose one for each of the following:

primary effect _____ _____	secondary effect _____ _____
positive effect _____ _____	negative effect _____ _____
immediate response _____ _____	long-term response _____ _____

Plates and plate movements

LIST OF TERMS

continental crust, ocean crust, plate margin, conservative margin, constructive margin
destructive margin, core, convection currents, mantle, subduction zone

Read the list of terms above. Choose the terms that match these definitions:

Trench where a rock plate is sinking, melting and being destroyed _____

Where two rock plates move towards each other and collide _____

Transfer heat from the Earth's hot interior towards the crust _____

Denser rock plate, which sinks at a destructive margin _____

Layer consisting of a large mass of molten rock inside the Earth _____

continued ...

Exam Café

Volcanoes

1 Lava that pours out at constructive margins and flows long distances – is it acid or basic lava?

_____ The other type is different because _____

_____

2 A high cone composed of both lava and ash – is it a composite or shield volcano?

_____ The other type of volcano is different because _____

_____

3 Massive eruptions, about every 100 000 years, with global effects – volcano or supervolcano?

_____ The other one is different because _____

_____

Earthquakes

LIST OF TERMS

epicentre focus shock waves Mercalli scale Richter scale seismograph

Read the list of terms above. Match each term with its definition.

	Term
Vibrations of the Earth's surface	_____
Used to measure what people felt and the impact on buildings	_____
Instrument that measures the magnitude of an earthquake	_____
Point on the Earth's surface directly above the source of an earthquake	_____
Value for the magnitude of an earthquake	_____
Underground source for an earthquake	_____

Topic summary: The Restless Earth

Exam Café

- The question for this topic will be Question 1 in Paper 1.

Main theme: plate margins are zones of great tectonic activity (dynamic zones).

Plate margins

Three types; different movement at each one

Fold mountain ranges

- World distribution
- Formation

Volcanoes

- World distribution
- Formation of composite and shield volcanoes
- Effects on people:
  (a) Primary and secondary
  (b) Positive and negative
- Responses of people:
  (a) Immediate and long-term
  (b) Monitoring and predicting

Earthquakes

- World distribution
- Formation, features and measurement
- Effects on people: primary and secondary
- Responses of people:
  (a) Immediate and long-term
  (b) Predict, protect and prepare

Case study: one range of fold mountains

- Location and cause
- Opportunities for people (e.g. farming, mining, HEP, tourism)
- Problems (e.g. steep relief, poor soils, limited communications)
- Adaptations of people to overcome them

Case study: a volcanic eruption

- Location and cause
- Effects on people (primary and secondary) (positive and negative)
- Responses of people (immediate and long-term)
- Monitoring and prediction

Case study: two earthquakes 1 Rich country; 2 Poor country

- Locations and causes
- Effects on people (primary and secondary)
- Responses of people (immediate and long-term)
- Contrasts in effects and responses between the two

Special studies

(a) Supervolcanoes

- What could be the global consequences of an eruption?
- Can people do anything?

(b) Tsunamis

- What causes them?
- Why can their effects be so great?
- What can people do?

Mark scheme: practice GCSE questions (page 22 in the student book)

Higher Tier

1 (a) (i) A Shield B Composite
2 × 1 mark **(2 marks)**

(ii) Cone shape – A wide base, gentle sides, moderate height
B tall cone, steep sides
Composition – A lava only
B built of ash and rocks as well as lava, different layers of deposits
A two-sided difference with information about both = 2 marks
A basic difference stated (e.g. A higher than B) = 1 mark
No direct difference stated = 0 mark
Either 2 + 1 marks or 3 × 1 marks **(3 marks)**

(b) (i) Name – Composite volcano = 1 mark
Physical features visible relevant to type include:
almost perfect cone shape, lava flows on sides are steep,
cones look high due to snow-covered top
For credit, points must be based on what can be seen in photo
2 × 1 mark **(3 marks)**

(ii) Destructive plate margins are the key to the answer.
Explanation of what is happening at a destructive margin – plates colliding, oceanic plate subducted and destroyed, rock melted into magma.
References to fold mountain formation as accumulated sediments are crumpled up into mountain ranges by the great force of movement, and volcanoes as magma from rock melt forced to surface.
Scale of the tectonic activity forms both.
Level 1 (Basic) 1–2 marks
Gives some explanation for fold mountains and/or volcanoes
Level 2 (Clear) 3–4 marks
Focus on destructive margins with relevant explanation.
Links the formation of both landforms to activity at destructive margins. **(4 marks)**

(c) (i) About 200km **(1 mark)**

(ii) How? Over 70 per cent of Pisco in ruins near the epicentre, and many badly damaged buildings in Ica not very far away, whereas in Lima no major damage was reported.
Why? Physical reason – shock wave is strongest at the epicentre, above the underground focus where the plate movement happened.
With distance from the centre, shock wave strength decreases.
Human reason – houses in Pisco built of adobe/mud bricks, which collapse easily in an earthquake. In a big city like Lima buildings are more likely to be made from modern materials and be earthquake resistant.
Level 1 (Basic) 1–2 marks
Reference to 'how' more than 'why'.
Simple statements.

continued ...

Grade Studio

Level 2 (Clear) 3–4 marks
Damage linked well to distance in both parts of the question.
Explanatory points developed.
More likely to mention human as well as physical factors. **(4 marks)**

(d) Actual content will depend on the case studies being used.
Factors under human control for deaths in earthquakes:
- building materials, quality of construction work, regulations and how well they are supervised and implemented, measures taken to make even tall buildings withstand earthquake shocks
- training and preparation of rescue teams/fire services and other emergency services, practice of emergency drills
- education programmes/information for people about what to do in an earthquake/ emergency supplies available
- speed and organisation of rescue in immediate aftermath

All depend on a country's wealth and level of economic development.
Physical factors (such as earthquake strength and depth) are less relevant to this question.

Level 1 (Basic) 1–4 marks
Describes factors for deaths in earthquakes without distinguishing clearly between rich and poor countries.
Statements are general, without a clear focus on differences.

Level 2 (Clear) 5–6 marks
Factors applied in a two-sided manner to rich and poor countries so that differences are clearly distinguished.
There are either passing references to case studies or more detail about just one of them.

Level 3 (Detailed) 7–8 marks
Answer well focused on differences between rich and poor countries covering a range of factors.
Contrasts between well and poorly prepared countries are clear.
Detailed reference to at least two relevant case studies. **(8 marks)**

Total: 25 marks

Foundation Tier

1 (a) (i) **1** A lava B lava and ash
2 A is lower, more gentle sides, wider or vice versa any one of these points 2 × 1 mark **(2 marks)**

(ii) A = 1 mark
Valid reason = 1 mark **(2 marks)**

(b) (i) Cone shape, steep sides, high and snow-covered, lava flows at bottom.
Two points described from **Figure 2** 2 × 1 mark **(2 marks)**

(ii) Composite – with any attempt to justify **(1 mark)**

(c) together, subduction zone, magma, sediments **(4 marks)**

(d) (i) Off the coast/near/next to Pisco **(1 mark)**

(ii) About 200km **(1 mark)**

continued ...

Grade Studio

(iii) How? Over 70 per cent of Pisco in ruins near the epicentre and many badly damaged buildings in Ica not very far away, whereas in Lima no major damage was reported.

Why? Physical reason – shock wave is strongest at the epicentre, above the underground focus where the plate movement happened.
With distance from the centre, shock wave strength decreases.
Human reasons – houses in Pisco built of adobe/mud bricks, which collapse easily in an earthquake. In a big city like Lima buildings are more likely to be made from modern materials and be earthquake resistant.

Level 1 (Basic) 1–2 marks
Reference to 'how' more than 'why'.
Simple statements.
Level 2 (Clear) 3–4 marks
Damage linked well to distance in both parts of the question.
Explanatory points developed.
More likely to mention human as well as physical factors. **(4 marks)**

(e) (i) Actual content will depend on the case studies being used.
Reasons include:
- building materials/whether or not buildings are designed to withstand earthquake shocks
- training/preparation of rescue teams/emergency services
- education of people about what to do in an earthquake
- speed and organisation of rescue in immediate aftermath

Poor countries lack the money and resources for these.

Level 1 (Basic) 1–4 marks
Gives reasons for what causes loss of life in poor countries.
Statements are general, sometimes relying upon just one or two reasons.
Level 2 (Clear) 5–6 marks
Reasons are given, related separately to both poor and rich countries.
There are clear references to case studies in both rich and poor countries. **(6 marks)**

(ii) No mark for the answer 'yes' or 'no'. Choice of 'no' is easier to explain.
'No' – earthquakes cannot be predicted, too many houses already built that are not earthquake resistant, countries and people not rich enough to take all precautions before an event that might not happen.
These or similar points 2 x 1
'Yes' – possible to design earthquake-proof buildings, move people out of known earthquake zones ..... It will be a struggle to gain more than 1 mark, since they are less realistic than for the 'no' answer. **(2 marks)**

Total: 25 marks

Practice GCSE questions

Grade Studio

Resources for Higher and Foundation Tiers

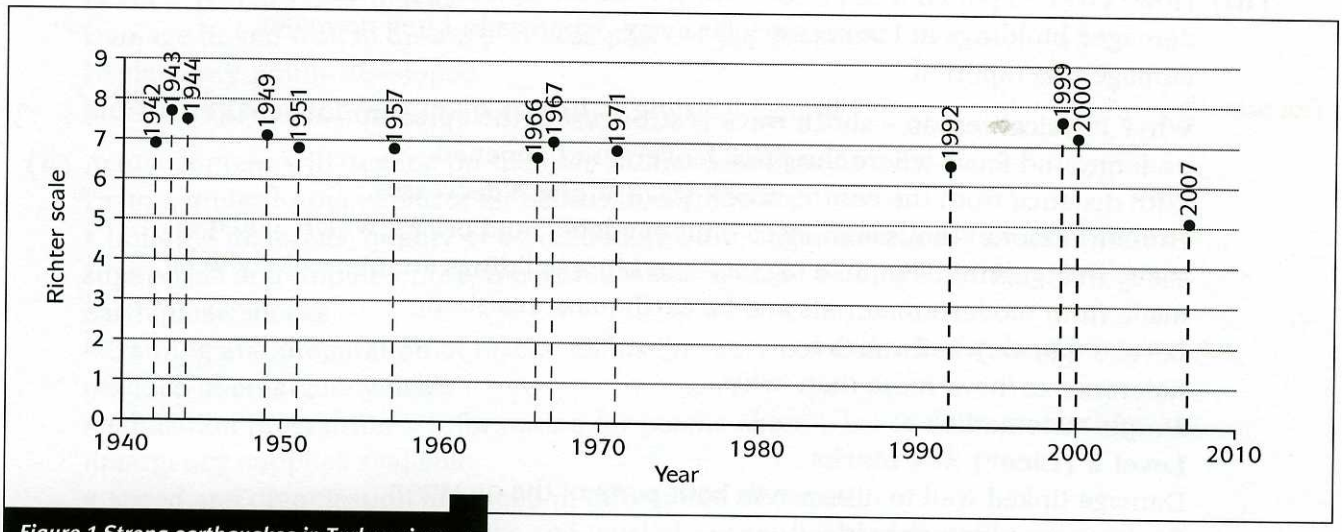


Figure 1 Strong earthquakes in Turkey since 1940 (above 5.0 on the Richter scale).

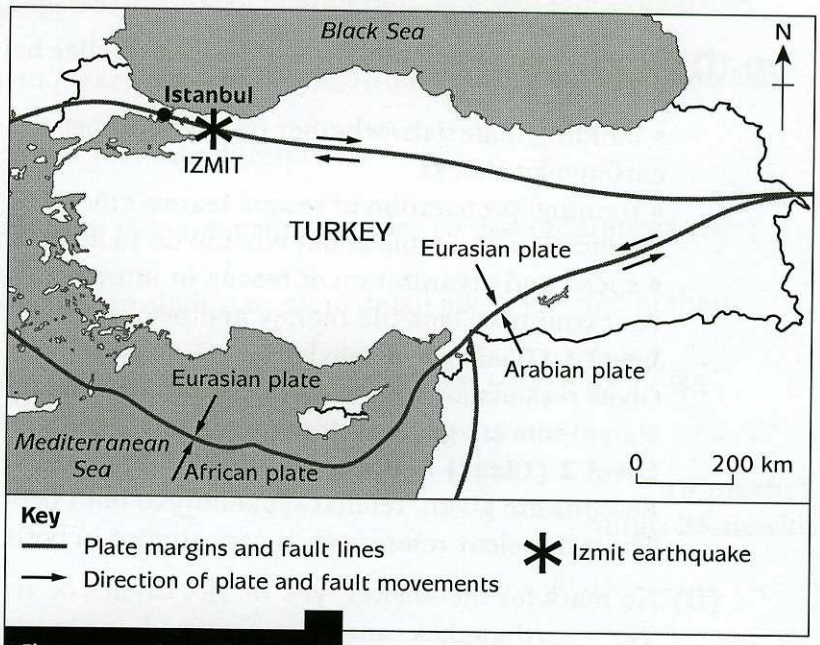


Figure 2 Location of Turkey.

'I am angry with the builders who put up the tall apartment blocks. People were crushed as they slept when cheap houses fell down on top of them.'

'I blame corrupt local officials as well. They took bribes from builders to pass the buildings as meeting the laws about earthquake-proof buildings.'

'The government and army are supposed to be in charge of rescue operations after earthquakes in Turkey, but they arrived late and failed to provide trained rescue workers and effective equipment.'

'People who put up those blocks of flats are guilty of mass murder.'

Figure 3 Comments from survivors of the Izmit earthquake (1999).

Grade Studio

Higher Tier

1 **(a)** Study **Figure 1**, which is a record of strong earthquakes (above 5.0 on the Richter scale) in Turkey since 1940.

(i) What was the magnitude of the earthquake in 1999? **(1 mark)**

(ii) Describe what **Figure 1** shows about the frequency of strong earthquakes in Turkey. **(4 marks)**

(b) Study **Figure 2**, which shows the plate margins and major fault lines in Turkey. Explain why there is a high risk of earthquakes in Turkey. **(4 marks)**

(c) Read the comments in Figure 3 from survivors of the earthquake that hit Izmit (located on **Figure 2**).

(i) Why is the earthquake risk particularly high in Izmit? **(1 mark)**

(ii) Describe what can be done to make buildings more resistant to earthquake shocks. **(3 marks)**

(iii) A Turkish government official said 'The earthquake shock was so strong, and the scale of the disaster so great, that any country, not just Turkey, would have had problems coping with it'.
How far do you agree with the official? Explain your views. **(4 marks)**

(d) With reference to one range of fold mountains, explain how people have overcome the physical problems to allow human activities to be carried out. **(8 marks)**

Total: 25 marks

Foundation Tier

1 **(a)** Study **Figure 1**. It shows strong earthquakes in Turkey since 1940.

(i) What was the value on the Richter scale of the earthquake in 1999? **(1 mark)**

(ii) Which ten-year period had the greatest number of earthquakes? **(1 mark)**

(iii) When was the longest time without an earthquake? How many years was it? **(1 mark)**

(b) State **one** primary and **one** secondary effect of an earthquake. **(2 marks)**

(c) **(i)** Study **Figure 2**, which shows the plate margins and major fault lines in Turkey. Explain why there is a high risk of earthquakes in Turkey. **(4 marks)**

(ii) Why is the earthquake risk very high in Izmit? **(1 mark)**

(d) Read the comments in Figure 3. They came from survivors of the Izmit earthquake.

(i) According to the survivors, what was wrong with the rescue efforts and the apartment blocks? **(2 marks)**

(ii) Describe how rescue workers can be well prepared for earthquakes. **(2 marks)**

(iii) Describe what can be done to make buildings resist earthquakes better. **(3 marks)**

(iv) Although the earthquake risk is high, Turkey is not well prepared for earthquakes. Suggest two reasons for this. **(2 marks)**

(e) Human activities in areas of high fold mountains:
Farming Mining Tourism HEP and industry
Choose three of these activities. For one range of fold mountains, explain why they are important activities for people living there. **(6 marks)**

Total: 25 marks

Mark scheme: practice GCSE questions (page 20 in the teacher guide)

Grade Studio

Higher Tier

1 (a) (i) 7.6 **(1 mark)**

(ii) Occur regularly – average one about every five years, longest gap is twenty years, 1980s only decade without any, three in three years in the 1940s.
Occur erratically – no pattern discernible, short or long gaps.
1 mark for a valid general statement.
Further marks for use of years along lines suggested above.
4 × 1 **(4 marks)**

(b) Plate margins between Eurasian and African plates, and between Eurasian and Arabian plates are destructive.
A major fault line (plate margin) runs east–west across the centre of Turkey; blocks on side of faults moving past each other in opposite directions (conservative margins).
Turkey lies on and near active tectonic zones.
Further detail about what happens along margins like these.
Level 1 (Basic) 1–2 marks
Describes locations/names type of margins.
Simple statements about these, without linked explanation.
Level 2 (Clear) 3–4 marks
Plate margin recognition leads to explanation of tectonic activity.
Statements linked to explain why earthquakes often result. **(4 marks)**

(c) (i) Right on the fault line/plate margin with plates moving in opposite directions, creating unstable crust. **(1 mark)**

(ii) Description of earthquake-resistant construction methods such as steel frames, damping and bracing systems to absorb shocks, foundation piles for flexibility when shaken, or keeping building low (only one or two storeys), etc.
1 mark for method, 1 mark for further description.
3 × 1 or 2 + 1 **(3 marks)**

(iii) Strength of earthquake – comment about likely damage from a 7.6 quake, which is considerable/high impact on Mercalli scale, especially when an urban area takes a direct hit.
Evidence of non-preparedness from the survivor comments – some under official control, e.g. training of and equipment for rescue teams.
No excuses because of high risk of earthquakes in Turkey.
Evidence of local corruption regarding building regulations; no good having regulations for earthquake-proof buildings if they are not enforced.
Level 1 (Basic) 1–2 marks
Repeats rather than uses comments from the survivors.
Covers only part of the scope of the question.
Strong on views, but weak on supporting explanation.
Level 2 (Clear) 3–4 marks
Amount of agreement or otherwise made clear.
Linked statements to give an explanation matching views. **(4 marks)**

continued ...

Grade Studio

(d) Actual content will depend on case study chosen.
Most likely human activities are farming, tourism, mining, power supply and industry, transport.
Physical features that give problems include high and steep relief, deep valleys, movement between one valley and the next, glaciers, climate becoming colder, wetter, more precipitation as snow, windier with height, small areas of good soil between rock outcrops.
Areas rich in natural resources like minerals still have to overcome problems of access and transport out of the mountains. Naturally good conditions for HEP still need to be harnessed for human use.
Level 1 (Basic) 1–4 marks
Describes problems/human activities without a focus on explanation.
Limited coverage of these, imprecise case study references.
Statements are general, links between problems and activities are poor.
Level 2 (Clear) 5–6 marks
Appropriate links are made between problems and activities.
Narrow coverage of activities but precise on the case study details.
Broad coverage of activities but weak on case study details.
Level 3 (Detailed) 7–8 marks
Answer well focused on physical problems and human responses to overcome them.
Detailed references to activities for the chosen case study. **(8 marks)**

Total: 25 marks

Foundation Tier

1 (a) (i) 7.6 **(1 mark)**

(ii) 1942–51 or the 1940s **(1 mark)**

(iii) 1972–91 twenty years (allow nineteen) **(1 mark)**

(b) Primary – one such as deaths, property damage, fires, etc.
Secondary – one such as tsunamis, disease, etc.
2 × 1 **(2 marks)**

(c) (i) Plate margins between Eurasian and African plates, and between Eurasian and Arabian plates are destructive.
A major fault line (plate margin) runs east–west across the centre of Turkey; blocks on side of faults moving past each other in opposite directions (conservative margins).
Turkey lies on and near active tectonic zones.
Further details about what happens along margins like these.
Level 1 (Basic) 1–2 marks
Describes locations/names types of plate margins.
Simple statements about these, without linked explanation.
Level 2 (Clear) 3–4 marks
Plate margin recognition leads to explanation of tectonic activity.
Statements linked to explain why earthquakes often result. **(4 marks)**

(ii) Lies right on the plate margin/fault line. **(1 mark)**

continued ...

Grade Studio

(d) (i) Rescue efforts – arrived late without trained rescue workers and effective equipment. Apartment blocks – cheap and badly built, not meeting the regulations on earthquake-proof buildings.
2 × 1 **(2 marks)**

(ii) Taking part in training courses, having regular practices, being provided with emergency equipment, e.g. for lifting, having trained sniffer dogs, etc.
2 × 1 **(2 marks)**

(iii) Built with steel frames, damping/bracing systems, flexible foundations, not many storeys, proper building materials (instead of mud bricks), etc.
3 × 1 **(3 marks)**

(iv) Poor country/no money, corruption/people taking bribes, government does not enforce the building regulations, many people build their own homes, etc.
2 × 1 **(2 marks)**

(e) Actual content will depend on activities and case study chosen.
Farming – mainly on valley floors where it is flatter, warmer, deeper soils; high pastures good for/only suitable for grazing.
Mining – natural resources, examples of minerals present.
Tourism – good scenery (lakes in valley, peaks and glaciers above), winter skiing on higher snow-covered benches and slopes.
HEP and industry – high, steep relief and plenty of precipitation are good for generating HEP; minerals and timber are useful raw materials for industries such as metal smelting and paper.

Level 1 (Basic) 1–4 marks
Describes activities with little explanation.
Limited coverage of the three activities.
Fuller coverage of activities, but weak on case study references.

Level 2 (Clear) 5–6 marks
Answer well focused on explaining the importance of three chosen activities.
Specific references included to the chosen fold mountain range. **(6 marks)**

Total: 25 marks