

3

SAMPLE CHAPTER

[illegible]DYNAMIC
LEARNING

HODDER
EDUCATION

Contents

1	How are societies governed?	2
2	What are natural hazards and how do societies respond to them?	32
3	How can new technologies affect our identities and relationships?	60
4	Where are all the people?	80
5	What is culture?	106
6	Why do societies experience revolution?	128
	Glossary	150
	Acknowledgements	152
	Index	154

How to use this book

Welcome to Hodder Education's *MYP by Concept* series! Each chapter is designed to lead you through an *inquiry* into the concepts of individuals and societies, and how they interact in real-life global contexts.

The *Statement of Inquiry* provides the framework for this inquiry, and the *Inquiry questions* then lead us through the exploration as they are developed through each chapter.

KEY WORDS

Key words are included to give you access to vocabulary for the topic. **Glossary terms** are highlighted and, where applicable, **search terms** are given to encourage independent learning and research skills.

As you explore, activities suggest ways to learn through *action*.

■ ATL

Activities are designed to develop your *Approaches to Learning* (ATL) skills.

EXTENSION

Extension activities allow you to explore a topic further.

◆ Assessment opportunities in this chapter:

Some activities are *formative* as they allow you to practise certain parts of the MYP Individuals and societies *Assessment Objectives*. Other activities can be used by you or your teachers to assess your achievement *summatively* against all parts of an assessment objective.

Key Approaches to Learning skills for MYP Individuals and societies are highlighted whenever we encounter them.

i Definitions are included for important terms and information boxes are included to give background information, more detail and explanation.

Each chapter is framed with a *Key concept*, *Related concept* and set in a *Global context*.





Links to:

Like any other subject, Individuals and societies is just one part of our bigger picture of the world. Links to other subjects are discussed.

We will reflect on this learner profile attribute ...

- Each chapter has an *IB learner profile* attribute as its theme, and you are encouraged to reflect on these too.

You are prompted to consider your conceptual understanding in a variety of activities throughout each chapter.

We have incorporated Visible Thinking – ideas, framework, protocol and thinking routines – from Project Zero at the Harvard Graduate School of Education into many of our activities.

Finally, at the end of the chapter you are asked to reflect back on what you have learnt with our *Reflection table*, maybe to think of new questions brought to light by your learning.

Use this table to evaluate and reflect on your own learning in this chapter

Questions we asked	Answers we found	Any further questions now?			
Factual					
Conceptual					
Debatable					
Approaches to learning you used in this chapter	Description – what new skills did you learn?	How well did you master the skills?			
		Novice	Learner	Practitioner	Expert
Learner profile attribute(s)	Reflect on the importance of the attribute for your learning in this chapter.				

Take action

- While the book provides opportunities for action and plenty of content to enrich the conceptual relationships, you must be an active part of this process. Guidance is given to help you with your own research, including how to carry out research, guidance on forming your own research question, as well as linking and developing your study of Individuals and societies to the global issues in our twenty-first-century world.

2

What are natural hazards and how do societies respond to them?

- **Societies** can be affected by different types of hazards and require innovative **systems** and **resources** in order to respond effectively to them.

CONSIDER THESE QUESTIONS:

Factual: How is the Earth structured? What are plate tectonics? What are the causes and consequences of earthquakes and volcanoes?

Conceptual: What are the different ways that societies can respond to natural hazards? How do disasters affect the identities of societies?

Debatable: Are wealthy countries safer from disasters?

Now **share and compare** your thoughts and ideas with your partner, or with the whole class.



■ **Figure 2.1** Earthquake damage in Kathmandu, Nepal, 2015

○ IN THIS CHAPTER, WE WILL ...

- **Find out** about the causes and consequences of natural hazards.
- **Explore** case studies of natural hazards and how societies have responded to them.
- **Take action** by raising a campaign to help an area of the world affected by natural hazards.



■ **Figure 2.2** Mount Merapi Volcano in Indonesia

■ These Approaches to Learning (ATL) skills will be useful ...

- Communication skills
- Organization skills
- Information literacy skills
- Media literacy skills
- Transfer skills
- Critical-thinking skills

● We will reflect on this learner profile attribute ...

- Communicators – by exploring the ways that communication can help reduce the severity of disasters.

KEY WORDS

earthquake
hurricane

tsunami
volcano

◆ Assessment opportunities in this chapter:

- ◆ **Criterion A:** Knowing and understanding
- ◆ **Criterion B:** Investigating
- ◆ **Criterion C:** Communicating

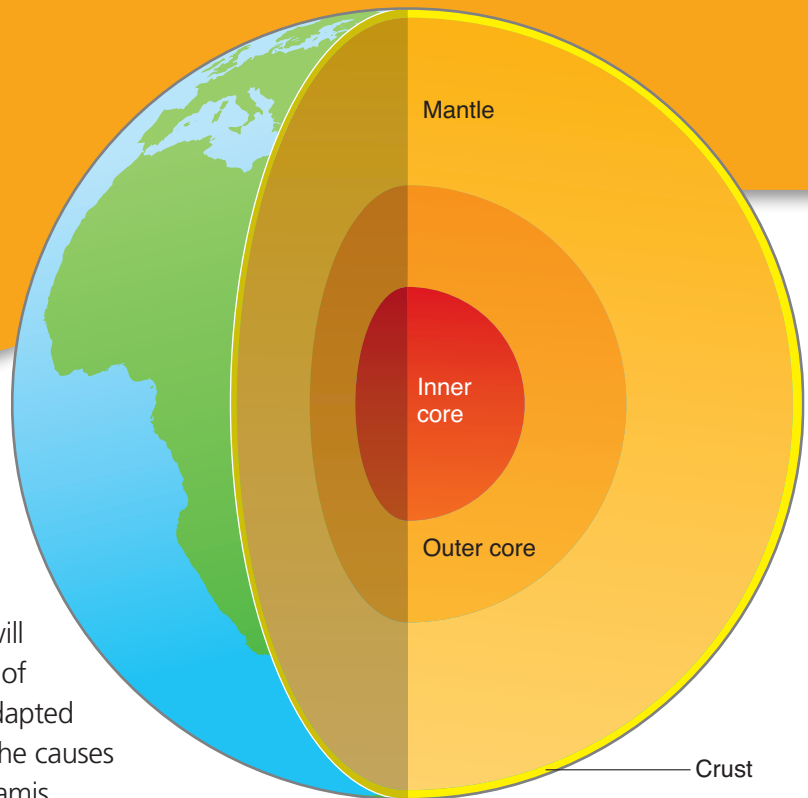
COLOUR–SYMBOL–IMAGE

Consider the topic of this chapter: natural hazards. Individually or in small groups, choose a colour, symbol and image that you feel best represents or captures the essence of the topic.

Be ready to **explain** to others in the class why you decided on the particular colour, symbol and image.

How is the Earth structured?

The Earth we live on is constantly changing, with deep forces at work. Most of the time, these changes aren't noticed as we go about our busy lives but, at times, they can result in natural hazards that can have devastating effects on human societies. In this chapter we will examine the causes and consequences of some of these natural hazards and how societies have adapted to respond to these dangers. We will focus on the causes and effects of earthquakes, volcanoes and tsunamis.



■ **Figure 2.3** The structure of the Earth

THINK-PAIR-SHARE

In pairs, **list** all the different natural hazards that you know of. Share your ideas with the class.

To understand the causes of these natural hazards, we need to look at the structure of the Earth to see what is happening under our feet.

The Earth can be divided into four layers: inner core, outer core, mantle and crust.

- The inner core has a temperature of between 5000 and 6000 degrees Celsius and is the hottest part of the Earth. It is made from iron and nickel and is solid.
- The outer core is a hot liquid material of between 4000 and 6000 degrees Celsius and is made from iron, nickel, sulphur and oxygen. It surrounds the inner core.
- The mantle comprises solid and liquid material and is semi-molten. It is made from iron, oxygen, silicon, magnesium and aluminium, and is the widest section of the Earth.
- The crust is the solid layer of the Earth which we live on. It is very thin compared to the other sections of the Earth. Land is made up of a thicker continental crust and the seas and oceans are on top of a thinner oceanic crust.

ACTIVITY: Apples and the structure of the Earth

■ ATL

- Transfer skills: Apply skills and knowledge in unfamiliar situations

For this activity you'll need an apple. Cut the apple in half and then **compare** what you see to the diagram in Figure 2.3. Take a photo of your cut apple and then label the following on the photo.

For the apple	For the Earth
Core	Core
Pulp	Mantle
Skin	Crust

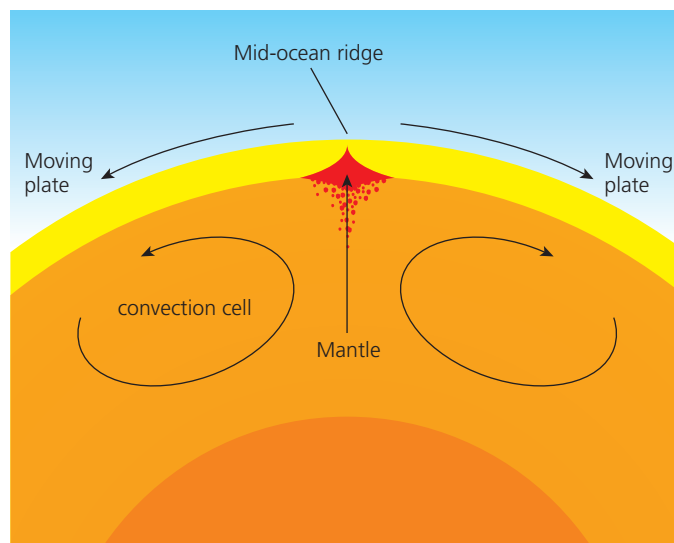


■ Figure 2.4

Discuss the similarities between the apple and the structure of the Earth in small groups.

The crust is divided into plates, which move in different directions. The movement of the plates is caused by **convection currents** in the mantle. This allows the plates to move together, further apart from each other or alongside each other. Crust can be destroyed in places and new crust can be created. Radioactive decay in the mantle leads to heat rising and falling in the mantle, which creates these convection currents.

For more on the structure of the Earth, see *Sciences for the IB MYP 1: By Concept*, p125.



■ Figure 2.5 Convection currents in the mantle

Making annotations

A useful skill to develop in Individuals and societies is how to make annotations. This is a skill that can be used in lots of different contexts. To annotate, put simply, is to label a diagram, image, graph or map with notes, explanations or additional information. It gives the reader an understanding of the key features you want to highlight. There are lots of opportunities to use annotation in different projects that you complete in your school subjects so try to get into the habit of using this skill more often.

What are plate tectonics?

The theory of plate tectonics explains the movement of the plates on the crust, and was developed in the 1950s and 1960s to help explain many geological features of the world, including the likely locations of earthquakes and volcanoes. The map in Figure 2.6 shows the main plates that have been identified and the directions in which they are moving.

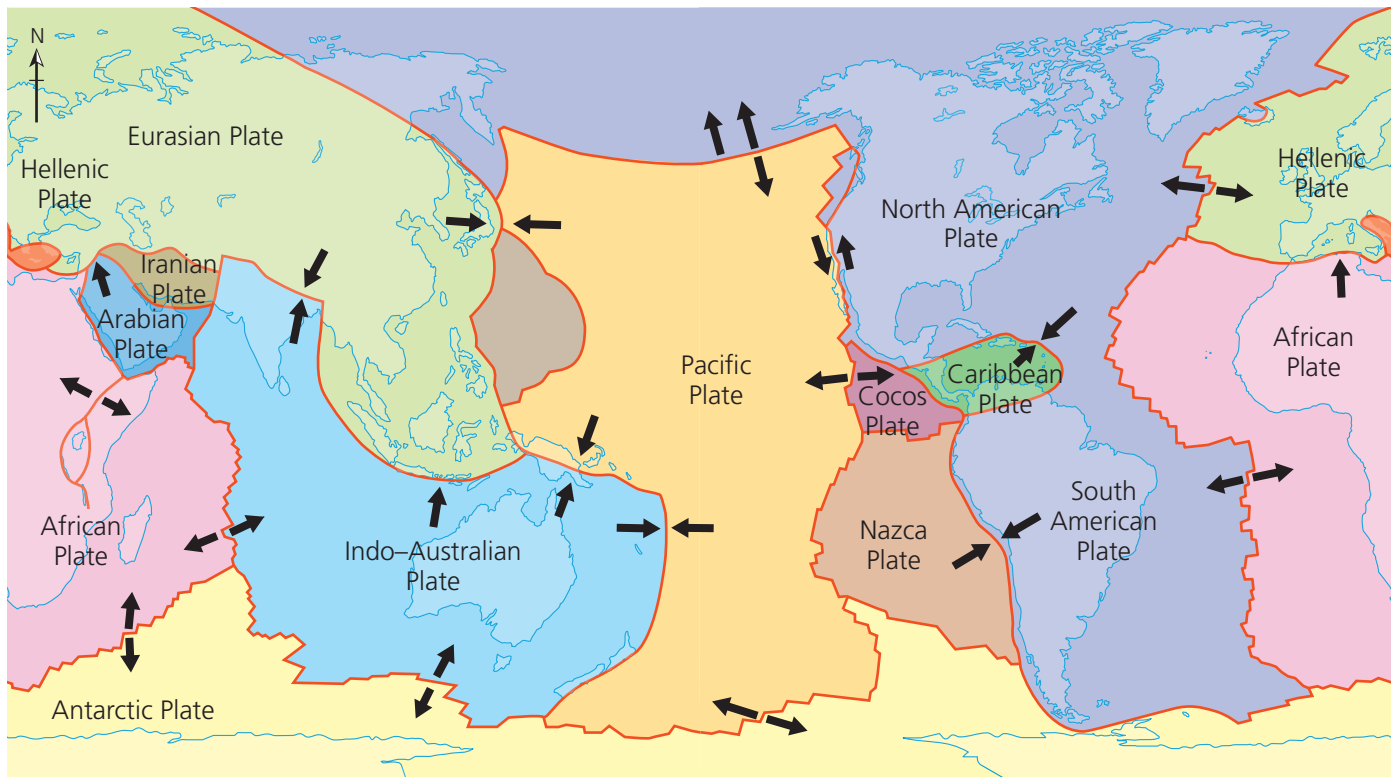
ACTIVITY: Plate tectonics

■ ATL

■ Information literacy skills: Access information to be informed and inform others

Use the map in Figure 2.6 to answer the questions below.

- 1 Find an example of two plates that are moving:
 - a) away from each other
 - b) against each other
 - c) alongside each other.
- 2 From the map **identify** three locations where you would expect there to be a lot of earthquakes and volcanic activity. **Explain** your answer.



Key

— Plate boundary

← Direction in which plate is moving

■ **Figure 2.6** Map showing plate boundaries

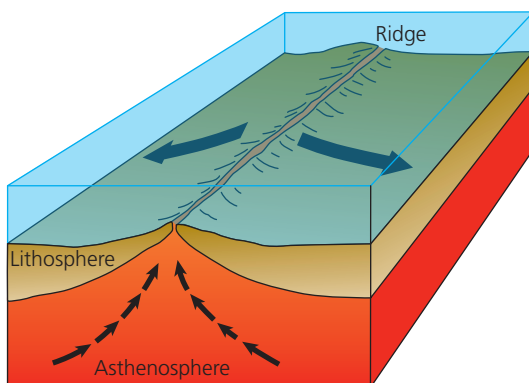
From the map, we can see that there are three main types of plate boundaries. These are called **divergent**, **convergent**, and **transform plate boundaries**.

DIVERGENT PLATE BOUNDARIES

Divergent plate boundaries occur when two plates are moving away from each other. This happens above areas of rising convection currents in the mantle. This occurs on both oceanic crust and continental crust with varied effects.

When this occurs on oceanic crust, it creates a ridge as the layer under the crust, the **lithosphere**, is raised. New crust (or new seabed) is formed at these places. Often there is volcanic activity and the chance of earthquakes. An example of an oceanic divergent plate boundary is the Mid-Atlantic Ridge.

When the same process occurs over continental crust, a rift valley is created. The process of the continental crust moving apart other creates large valleys and uneven topography that can also lead to the creation of lakes. If it happens extensively over time, new seas and oceans can be formed. An example of a continental divergent plate boundary is the East Africa Rift Valley.

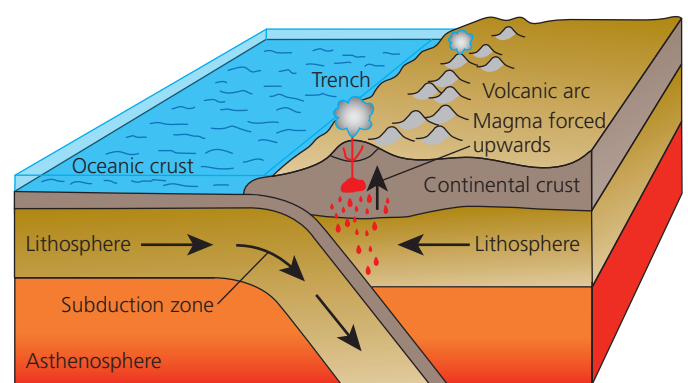


■ **Figure 2.7** A divergent plate boundary

CONVERGENT PLATE BOUNDARIES

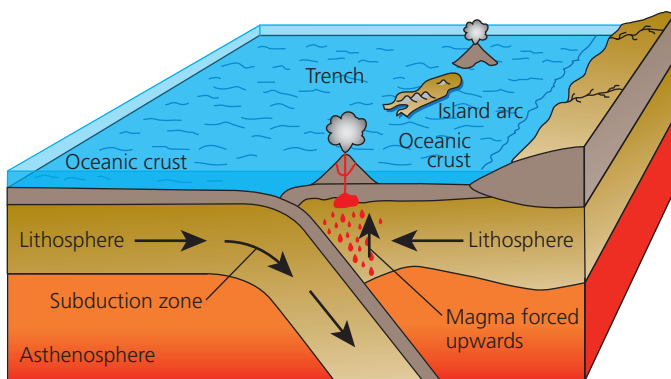
Convergent plate boundaries occur when two plates are moving towards each other. This can occur in three different ways: continental meeting continental crust, oceanic meeting oceanic crust and oceanic meeting continental crust. Each has different effects.

When oceanic crust collides with continental crust, an interesting process takes place called subduction. As the oceanic crust is thinner and less dense than the continental crust it is forced downwards in the meeting of the plates. This subduction process leads to the destruction of oceanic crust as it melts into the mantle. At the same time, magma is forced upwards by this process and can break through the surface as a volcanic eruption. An example of this type of plate boundary is the meeting of the Nazca and South American Plates.



■ **Figure 2.8** A convergent plate boundary where oceanic crust meets continental crust

When two oceanic crusts meet at a plate boundary, a slightly different process occurs. Subduction takes place again, and it will typically be the less dense crust that is subducted. Once again magma is forced upwards and this can create at first volcanic eruptions on the seabed. Over time this can lead to the creation of volcanic islands. For example, many of the Caribbean and Japanese islands were formed due to this process.

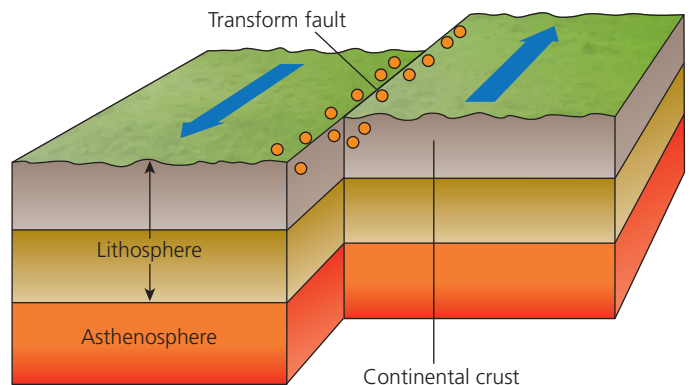


■ **Figure 2.9** A convergent plate boundary where oceanic crust meets oceanic crust

Finally, when two plates collide which are both continental crust, a different process takes place. Rather than subducting, the crust is forced upwards, cracks and moves in different directions. This can create vast mountain ranges. An example where this is taking place at the moment is the meeting point of the Indo-Australian and Eurasian Plates. Where the two plates meet is the location of the Himalayas, which have formed as a result of this collision. In this area earthquakes are quite common but volcanoes don't usually occur.

TRANSFORM PLATE BOUNDARIES

Transform plate boundaries are where two plates slide past one another rather than directly towards each other. In this situation, new plate isn't created or destroyed but the tremendous energy that is produced from the plates sliding past each other occasionally results in earthquakes. The crust at these boundaries is damaged, and geological features form, including fault valleys on land and undersea canyons. An example of a transform plate boundary is the San Andreas Fault, which forms the boundary between the Pacific Plate and the North American Plate.



■ **Figure 2.10** A transform plate boundary

ACTIVITY: Plate boundaries

■ ATL

- Information literacy skills: Present information in a variety of formats and platforms

1 Identify which description and which example match up with each type of plate boundary.

Type of plate boundary	Description	Example
Divergent	Where two plates slide against each other, sometimes resulting in earthquakes	San Andreas Fault, California
Convergent (oceanic and continental)	Where two plates meet each other and subduction does not occur. Mountains can be formed by the pushing upwards of the crust at the plate boundary.	Mid-Atlantic Ridge
Convergent (continental and continental)	Where two plates move away from each other. New crust is formed due to this process.	Meeting point of the Nazca and South American Plates
Transform	At this boundary, oceanic crust is subducted under the continental crust. Volcanic activity can occur due to magma that is forced upwards in this process.	The Himalayas, the meeting of the Indo-Australian and Eurasian Plates

2 Using the information on pages 37–38, do some modelling to recreate the processes taking place at the different types of plate boundaries. You could use modelling clay for this. Create a model of the different plate boundaries, photograph your work and label what is happening.

◆ Assessment opportunities

- ◆ In this activity you have practised skills that are assessed using Criterion A: Knowing and understanding (strand i).

What are the causes and consequences of earthquakes and volcanoes?

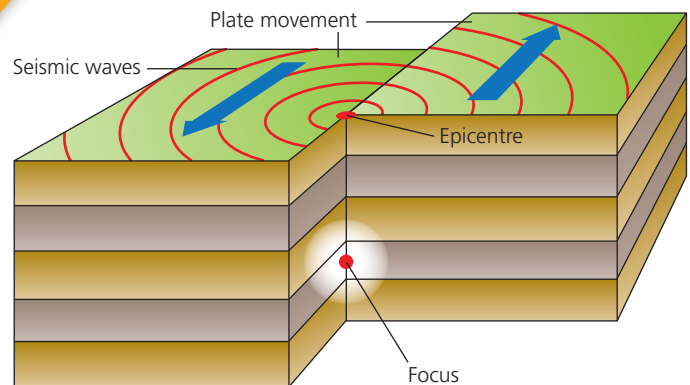
EARTHQUAKES

Causes

Earthquakes are the result of stored energy inside the crust. When released, this energy results in earthquakes of different levels of intensity. They happen along all types of plate boundary.

As the plates move together, apart or against each other, they can sometimes get stuck. This leads to a build-up of pressure which creates earthquakes when it is released. The location where this occurs in the crust is called the **focus**. On the surface of the Earth, the centre of the earthquake is called the **epicentre**. The closer to the epicentre, the higher is the level of intensity of the earthquake (and subsequently the greater is the extent of the damage). This gradually weakens, the further you are from this point.

The strength of an earthquake is measured on the Richter Scale, using an instrument called a seismometer. This measures the strength of the seismic waves that spread from the focus.



■ **Figure 2.11** The location of an earthquake, showing the focus and epicentre



■ **Figure 2.12** Los Angeles earthquake

EXTENSION

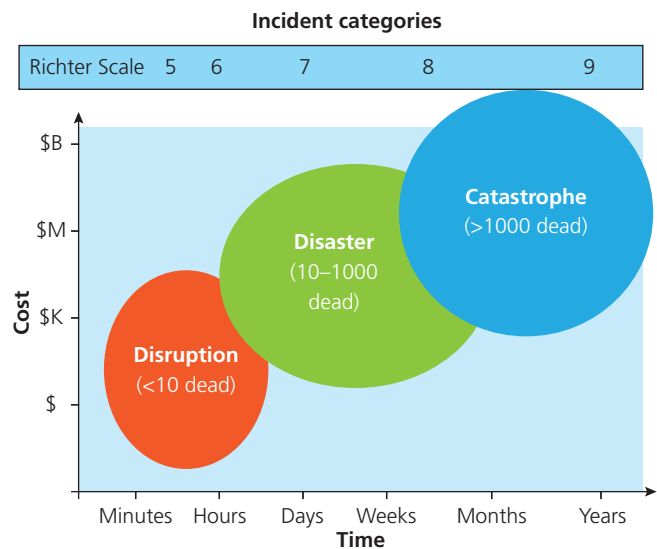
The Richter Scale

The Richter Scale is used by seismologists to record the strength of earthquakes. Each earthquake is given a numerical value from 1 to 10. The number indicates the intensity of the earthquake. The strength of the earthquake goes up ten times between each level. So a Richter Scale 2 earthquake is ten times the strength of a Richter Scale 1 earthquake. This exponential growth means that by the time you get to earthquakes above 7 on the Richter Scale, the forces are extremely powerful and destructive.

The highest ever reading on the Richter Scale took place in Chile in 1960 when the Valdivia Earthquake measured somewhere between 9.4 and 9.6 on the scale.

THINK-PAIR-SHARE

Why do you think it is important to classify earthquakes according to their strengths?
What do you think is the purpose of this?



■ **Figure 2.13** Richter Scale and the impact of different-category earthquakes



■ **Figure 2.14** Damage done during the Valdivia Earthquake in Chile, 1960

Consequences

Earthquakes have different consequences depending on their intensity and the location in which they occur. Low-intensity earthquakes happen all over the Earth all the time, and often people do not really notice them or they are only a minor concern. However, high-intensity earthquakes can cause all sorts of problems.

- The shaking of the ground due to an earthquake can cause significant damage to the infrastructure, including buildings, roads and communication systems.
- Earthquakes are dangerous to humans. They can cause injury and death. People can be trapped in the remains of damaged buildings. Emergency services are typically extremely busy in the aftermath of a severe earthquake, looking for survivors.
- Due to the damage to infrastructure done by earthquakes, diseases can spread easily in the aftermath of an earthquake. If water systems are damaged, people can catch illnesses such as cholera as a result of exposure to unsanitary water.
- Earthquakes can also have secondary effects such as the spread of fire, landslides in elevated areas and flooding. If the epicentre of the earthquake occurs close to or at sea, tsunamis can occur, causing further devastation.
- Earthquakes can also lead to a temporary increase in crime levels. Looting can take place as shops and homes can be robbed by people looking to take advantage of the situation for their own personal gain.
- Earthquakes also have long-term effects. The damaged places have to be rebuilt and new systems have to be set up.

ACTIVITY: The consequences of earthquakes

■ ATL

- Critical-thinking skills: Draw reasonable conclusions and generalizations
- Collaboration skills: Encourage others to contribute

In pairs or groups, copy and complete the following table using the information from this section of the chapter and any of your own ideas. Half of the group should consider the immediate effects, and the other half should consider the longer-term effects. Share your answers with the group.

	Human and social impact	Economic and political impact	Environmental impact
Immediate effects			
Longer-term effects			

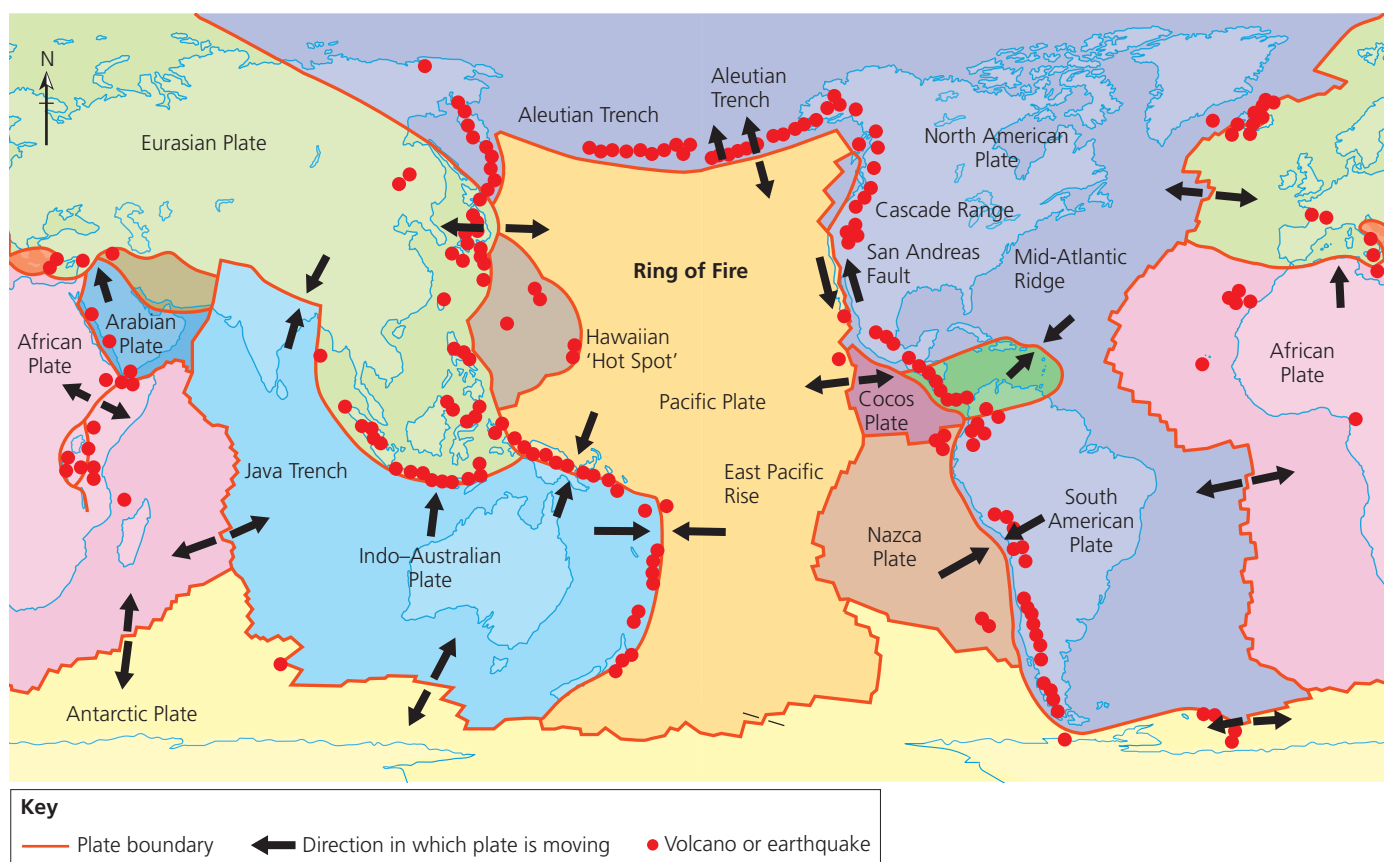
VOLCANOES

Volcanoes can be found all over the world but tend to occur on divergent and convergent plate boundaries. A particularly active region for volcanic activity is known as the 'Ring of Fire'. It is the boundary of the Pacific Plate and includes Japan and Indonesia.

Volcanoes are formed when magma breaks through the Earth's crust due to a build-up of pressure. When magma erupts through the crust it becomes lava, a molten rock that oozes out of the ground. When it cools, it forms rock. Volcanoes also occur underwater and can be found on the ocean floor. The build-up of cooled rock from multiple eruptions leads to the creation of the cone shape that is distinctive of volcanoes.



■ **Figure 2.15** A man watches as Mount Sinabung spews pyroclastic smoke in Indonesia, October 2014



■ **Figure 2.16** World map showing the site of volcanoes and earthquakes and the Ring of Fire

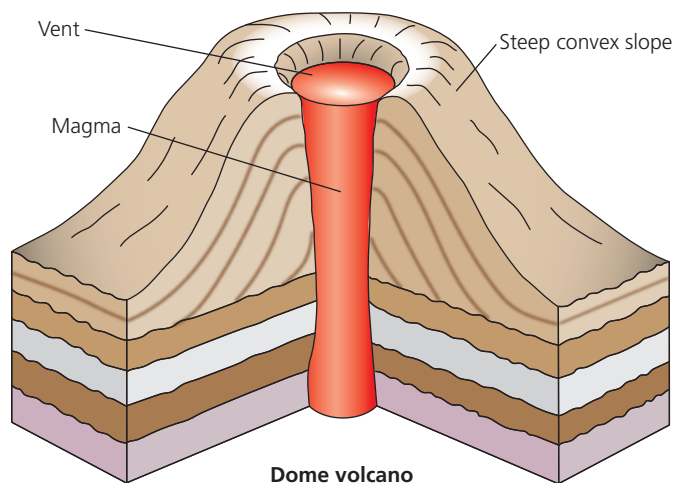
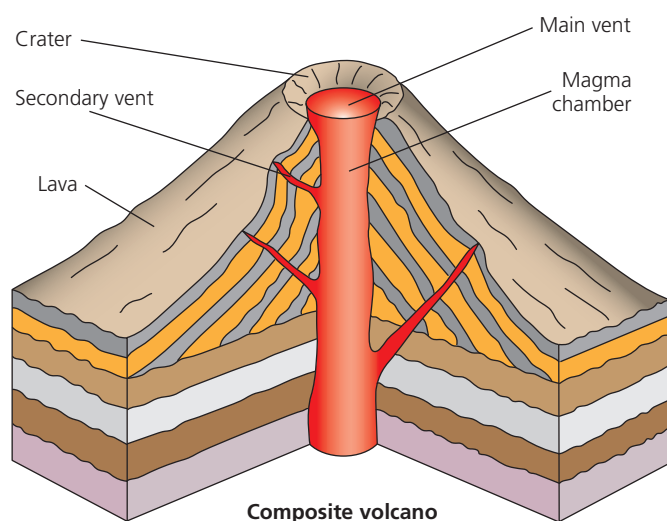
Types of volcano

Not all volcanoes are the same as different factors are at play during their creation and as they change over time. A **shield volcano**, for example, has gentle sloping sides and is formed from gentle eruptions of lava in the place where the crust has been broken through. Shield volcanoes tend to be quite large and stretch widely over an area. Fernandina Island in the Galapagos Archipelago is an example of an active shield volcano. Shield volcanoes are usually found at divergent plate boundaries or on hot spots (areas where the mantle under the plate is hotter than in other areas nearby).

Another type of volcano is a **composite volcano** (also known as a stratovolcano). These are the most common type of volcano and are well known for their steep sides and explosive eruptions. They are built up over time due to an accumulation of ash, rock debris and lava, and are usually found at convergent plate

boundaries. They can grow to be very high. A famous example of a composite volcano is Mt St Helens in the USA. Composite volcanoes' powerful eruptions can result in a **pyroclastic flow**. This is an outpouring of a hot mixture of ash, lava and gases that moves at speed down the sides of the volcano. Composite volcanoes can also erupt from secondary vents on the side of the volcano. The explosive force of an eruption from a composite volcano can be disastrous for communities living nearby. For example, when Mt Vesuvius erupted in 79CE, the city of Pompeii was completely buried under the pyroclastic debris.

A third type of volcano is called a **cinder cone volcano**, which is a fast-growing volcano with steep sides. They can often grow on the sides of shield or composite volcanoes. The range of types of volcano is shown in Figure 2.17.



■ **Figure 2.17** Types of volcano

Consequences of volcanoes

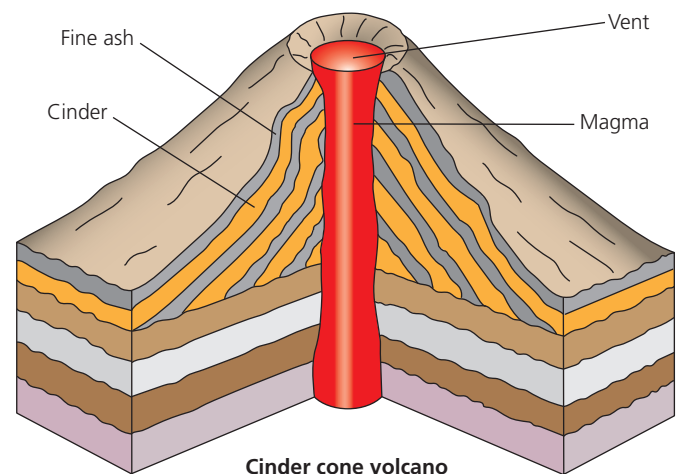
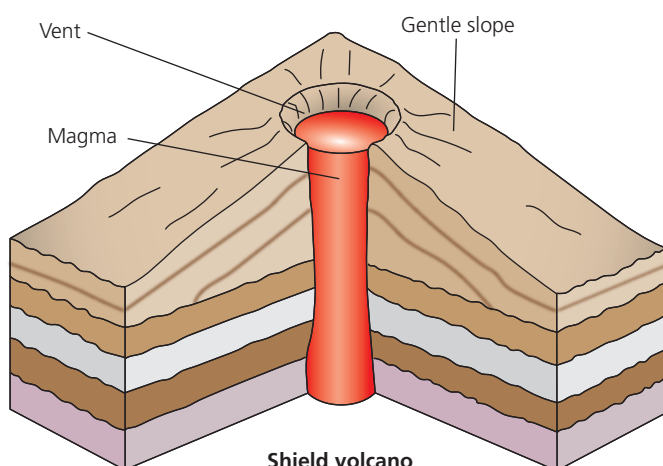
When volcanoes erupt they can have a significant effect on the nearby environment and the lives of the people who live there. You might think that there are only negative consequences, but there are also some positives.

Positive consequences

- Volcanic eruptions can benefit farming considerably. The debris emitted from a volcano can, over time, create a very rich and fertile soil, which is ideal for growing a range of crops.
- Volcanoes can be good for tourism. People are curious about volcanic areas of the world as there is usually a rich diversity of geological formations of interest. Popular sites such as Mt Vesuvius and Krakatoa generate significant sums of money from tourist revenue.

Negative consequences

- Volcanic eruptions can lead to considerable human suffering. Fast-flowing lava can kill people, and suffocation can result from being exposed to the gases and debris in the air.
- Volcanic eruptions and the subsequent hazards can lead to the destruction of plant and animal life. This can lead to an imbalance in the local ecosystem.
- Human settlements and agricultural land can be destroyed as a result of volcanic eruptions. Mudslides can make areas inhospitable for years to come. For example, the volcanic eruption in Montserrat in the Caribbean in the mid-1990s has led to half the island being unfit for human habitation.





■ **Figure 2.18** Mayon Volcano in the Philippines erupting in 2009 – an example of a composite volcano

ACTIVITY: Profile of a volcano

■ ATL

■ Communication skills: Organize and depict information logically

- 1 Go online and research the following volcanoes. Write down what type of volcano each one is:
 - a) Eldgjá, Iceland
 - b) Mauna Loa, Hawaii
 - c) Mount Fuji, Japan
 - d) Wizard Island, USA
- 2 Choose one of the volcanoes from Question 1 and create a profile of the volcano, including the following information:
 - An annotated diagram of this type of volcano
 - Photographs of the volcano
 - A written description of how the volcano was formed and what state it is in today
 - Any interesting facts, figures or stories about the volcano

Include a bibliography showing the resources you used to gather the information. **Present** the work to a high standard, showing clear organization of your work and clarity of written communication.

◆ Assessment opportunities

- ◆ In this activity you have practised skills that are assessed using Criterion A: Knowing and understanding (strands i and ii) and Criterion C: Communicating (strands i, ii and iii).

What are the different ways that societies can respond to natural disasters?

FACTORS INFLUENCING THE IMPACT OF A NATURAL DISASTER

In order to minimize loss of human life and damage to infrastructure, societies need to prepare for the different hazards they may face. However, the impact of the hazard can depend on a variety of factors.

Wealth and level of development



■ Figure 2.19

An important factor in determining the impact of a natural disaster is the level of development and wealth of a particular country. Developed countries tend to have the resources to respond effectively to disasters, such as emergency services, specially designed buildings, etc., whereas developing countries may lack the resources to respond and may rely on overseas aid.

Time



■ Figure 2.20

Time is an important factor in determining the impact of a natural disaster. For example, if an earthquake happens at night, it can potentially be more devastating as people do not have time to get outside to a safe area away from buildings. Equally, if a disaster strikes during a rush hour in a city, the volume of people can be difficult to manage and potentially very hazardous.

Population



■ Figure 2.21

The population size can also determine the impact of a natural disaster. Countries with high population levels can be hit particularly badly when disasters such as earthquakes and volcanoes hit.

THINK–PAIR–SHARE

Are wealthy countries safer from disasters?

In pairs, **list** the reasons why wealthier countries may be better able to deal with the consequences of natural disasters than poorer countries. **Discuss** these reasons with your class. Then **discuss** and **list** the reasons why the level of development might not make a difference to the impact of a natural disaster. Think about what other factors may play a significant role. Finally write an overall response to this inquiry question.

Weather and climate



■ **Figure 2.22**

The weather and climate can also affect the impact of a natural disaster. Very hot weather or large amounts of rainfall can lead to the spread of diseases as the infrastructure struggles to cope with the effects of the disaster.

Be it an earthquake, volcano or an extreme weather event, societies need to respond effectively. The response is usually divided into short-, mid- and long-term measures.

■ **Table 2.1** Short-, mid- and long-term responses to natural disasters

Short-term responses	Mid-term responses	Long-term responses
<ul style="list-style-type: none"> • Get people into safe and secure locations • Rescue any people trapped or in danger • Put out any fires and use emergency services to deal with any dangerous places • Ensure that there are supplies of clean water, food, shelter and medical equipment • Ask for help from the international community and aid agencies (e.g. Red Cross) 	<ul style="list-style-type: none"> • Ensure that transport links are functioning so that aid can reach the people in need • Make sure water supplies and electricity are working • Open schools and hospitals • Rebuild houses 	<ul style="list-style-type: none"> • Begin the process of rebuilding roads, buildings and various services • Develop education programmes for how people should react at times of natural disasters • Create buildings and structures that are better designed to deal with the effects of hazards • Improve warning systems • Receive long-term aid from other countries if needed

ACTIVITY: Responding to a disaster

■ ATL

- **Organizational skills:** Use appropriate strategies for organizing complex information

Imagine you are a government official who has just received news that a magnitude 7.0 earthquake has struck your country. Close to the epicentre, people are trapped in buildings, and entire villages have been flattened as a result of the earthquake. People are in need of essential services and plans need to be made for the long-term redevelopment of the affected area. Your brief is to write a 300-word action plan detailing the priorities for your government. Decide what needs to be done and in what order. **Explain** the short-term, mid-term and long-term strategies.

◆ Assessment opportunities

- ◆ In this activity you have practised skills that are assessed using Criterion C: Communicating (strands i, ii and iii).

CASE STUDY – NEPAL EARTHQUAKE, 2015



■ **Figure 2.23** Temple damaged during the earthquake



■ **Figure 2.24** People being rescued in the aftermath of the earthquake

In April 2015 a magnitude 7.8 earthquake struck Nepal in South Asia. The shockwave from the earthquake was massive and caused an avalanche many miles away at Mount Everest, leading to the loss of 22 lives on the mountain. The earthquake completely wiped



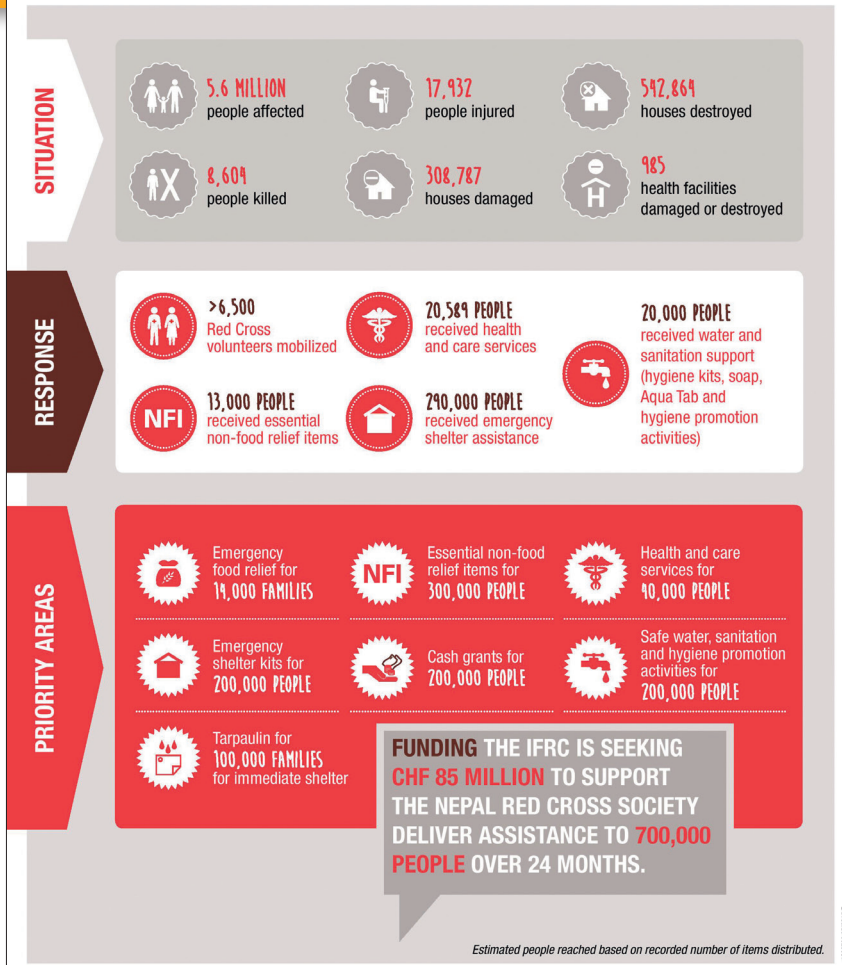
■ **Figure 2.25** Map showing the location of the Nepal earthquake

out all settlements in the areas in close proximity to the epicentre. Many important heritage sites were destroyed, including temples in Kathmandu, Nepal's capital. After the initial 7.8 earthquake, there were a series of aftershocks that also had considerable effects on the area. One of the reasons for the extensive damage done in the earthquake was that the focus was at a shallow depth under the ground. Nepal lies on a plate boundary between the Indo-Australian and Eurasian Plates, where two continental crusts push against each other, which leads to occasional earthquakes. The last major earthquake in Nepal prior to 2015 was in 1934 and it is thought that the two earthquakes are linked.

The effects of the 2015 earthquake were devastating, with just under 9000 people losing their lives and 20000 people injured. Avalanches and mudslides were particularly devastating in the aftermath of the earthquake. The main airport in Kathmandu had to be closed several times due to the dangers of the earthquake, which hindered the aid efforts. Women were particularly affected after the earthquake as there was an increase in human trafficking of vulnerable people. Aid agencies including Médecins Sans Frontières and the Red Cross played a key role in many aspects of short-term recovery as did governmental aid from other countries.

As of 22 May 2015

NEPAL EARTHQUAKE



■ **Figure 2.26** The work of the Red Cross in the aftermath of the Nepal earthquake (as of May 2015)

CASE STUDY – MOUNT MERAPI VOLCANIC ERUPTIONS, INDONESIA, 2010

In October 2010 a series of eruptions occurred at the active volcano Mt Merapi in central Java, Indonesia. 'Merapi' means 'the one making fire' and Merapi is one of the most active volcanoes in Indonesia. Throughout history there have been many eruptions from Mt Merapi but the 2010 incidences were particularly severe.

The volcanic eruptions at Merapi are due to the subduction of the Indo-Australian Plate under the Eurasian Plate. This is an ongoing process that makes areas of Indonesia very volcanically active.

The eruptions in 2010 led to a number of hazardous pyroclastic flows as well as toxic ash clouds being released into the atmosphere. They also led to a

number of lahars, which are very dangerous flows of mud. Ash fell into areas a long way from the volcano, including the UNESCO heritage site of Borobudur, leading it to be closed for clean-up operations.

The 2010 eruptions at Merapi were particularly devastating because of the number of settlements of people living close to the slopes of the volcano and in other nearby areas. It is estimated that around 350,000 people were evacuated due to the eruptions and there were 353 fatalities, the highest number of fatalities from a volcanic eruption in the twenty-first century. The eruptions also affected aviation as the ash cloud disrupted a number of flight paths over Java.



■ **Figure 2.27** Location map for Mt Merapi in Indonesia

People responded to the disaster at Mt Merapi in a number of different ways. Many evacuation centres were set up temporarily to look after people whose homes had been destroyed by the volcano. Many of the evacuation centres were public buildings such as schools, churches and government buildings. International aid organizations deployed essential supplies and services to the area to help with the relief effort. This included the provision of food, water, shelter and medical supplies. The Indonesian government also took a variety of short-term and long-term measures to help the people affected. One potential long-term benefit of the eruptions is that the volcanic fall-out will eventually benefit the fertility of the land in the area, with a long-term positive impact on agriculture.



■ **Figure 2.28** Mt Merapi erupting

SOURCE A

Summary of the immediate effects of the Merapi eruptions in 2010 from www.thejakartapost.com/news

The volcanic ash also affected residents in nearby towns. In Surakarta, Central Java, residents were shocked by the sight of volcanic ash covering streets, gardens and roofs. The ash rain continued until around 10 a.m. on Monday.

Surowedanan village in Boyolali, located around 17 km from the peak of Mount Merapi, was also covered by volcanic ash. 'This morning, when I went out of the house at around 5 a.m., I saw ash everywhere,' said Veronica Maria Sayektiana, of Surowedanan. According to Veronica, residents were wearing masks when they ventured out of their homes as the ash was still falling along with the drizzle.

Separately, general manager of Surakarta's Adi Soemarmo Airport, Abdullah Usman, said the volcanic ash from Mount Merapi did not disrupt flights at the airport, as the weather was clear and wind velocity was normal.

However, the airport authorities remained on alert and cleaned the runway twice in the morning. Abdullah said the wind blowing from the north was quite helpful as it blew the volcanic ash away from the airport.

Mount Merapi is one of the most active volcanoes in Indonesia. In 2010 its eruptions left more than 300 people dead and forced almost 400 000 people to take refuge at 639 shelters in Klaten, Magelang, Sleman and Boyolali. The 2010 eruptions also killed the volcano's spiritual keeper Ki Surakso Hargo, known as Mbah Maridjan.

DISCUSS

According to Sources A and B, what were the different ways that the eruptions of Mt Merapi affected individuals and societies who lived in the area?

SOURCE B

News article on the impact of the 2010 eruptions on the village of Bronggang close to Merapi

Soldiers joined rescue operations in hardest-hit Bronggang, a village nine miles from the crater, pulling at least 78 bodies from homes and streets blanketed by ash up to one-foot deep.

Crumpled roofs, charred carcasses of cattle, and broken chairs – all layered in white soot – dotted the smoldering landscape.

The volcano, in the heart of densely populated Java island, has erupted scores of times, killing more than 1,500 people in the last century alone. But tens of thousands of people live on its rolling slopes, drawn to soil made fertile by molten lava and volcanic debris.

Its latest activity started nearly two weeks ago. After Friday's explosion – said by volcanologists to be the biggest since the 1870s – officials announced by loudspeaker that the mountain's danger zone had been expanded to 12 miles.

Previously, villages like Bronggang were still considered to be in the 'safe zone'.

'The heat surrounded us and there was white smoke everywhere,' said Niti Raharjo, 47, who was thrown from his motorbike along with his 19-year-old son while trying to flee.

'I saw people running, screaming in the dark, women so scared they fell unconscious,' he said from a hospital where they were both being treated for burns.

'There was an explosion that sounded like it was from a war ... and it got worse, the ash and debris raining down.'

The greatest danger posed by Merapi has always been pyroclastic flows – like those that roared down the southern slopes at speeds of up to 60 miles per hour.



■ **Figure 2.29** Effects of the Indian Ocean tsunami

CASE STUDY – INDIAN OCEAN EARTHQUAKE AND TSUNAMI, 2004

On 24 December 2004 an earthquake occurred on the seabed of the Indian Ocean close to the Indonesian island of Sumatra. It had a magnitude of 9.2 on the Richter Scale, one of the highest recordings in human history. The earthquake released a series of devastating tsunami waves that affected many coastal areas of the Indian Ocean including Indonesia, Thailand and Sri Lanka. This event has gone down as one of the worst natural disasters in human history with around 230 000 people dying as a result. The waves that reached different coastal areas were massive, in some areas as high as 30 metres, and many travelled far inland. Subsequently, many people did not stand a chance.

At the time, there was no early warning prediction system on the Indian Ocean for these types of hazards. The earthquake had caused the seabed to suddenly rise, leading to huge volumes of water being displaced and causing the tsunami waves. Tsunami waves are difficult to predict as when they are over deep water they are not noticeably big, but when they reach shallower areas near the coast, their size suddenly magnifies, as does the devastation they bring.

Some people were given a natural warning that a tsunami was about to hit. In some areas a 'disappearing sea' effect occurred, where the tide went far out. Many people were able to see this as a sign that a dangerous tsunami was on its way. There are stories of heroism from this day, including the actions of Tilly Smith, a ten-year-old girl, who spotted the signs that a tsunami was approaching. She told her parents and they were able to evacuate the beach they were on in Thailand. It is likely that hundreds of lives were saved due to this action.



■ **Figure 2.30** The huge area affected by the tsunami

Unfortunately, in some areas, people walked out towards the sea to observe what was going on, giving them little chance when the wave arrived.

The 2004 Indian Ocean tsunami had a devastating effect on many levels:

- **Humanitarian impact** – Due to the high numbers of casualties and injuries caused by the tsunami, this event has been viewed as one of the worst in history. Aid agencies quickly responded with resources to keep people fed and hydrated, and to reduce the spread of diseases. Various countries provided financial aid to help with the disaster relief.
- **Economic impact** – The economic impact of the tsunami was significant. Some areas were affected more than others, such as the province of Banda Aceh in Indonesia, which was very close to the epicentre of the earthquake. Around the countries of the Indian Ocean, local economies were affected. Fishing industries were damaged as boats were destroyed by the tsunami. Tourism was also affected as many accommodation facilities (hotels, resorts, hostels, etc.) were damaged or destroyed.
- **Environmental impact** – The tsunami also had a severe environmental impact. In many areas the waves reached far inland, as far as two kilometres in places. This affected local ecosystems (for example, destroying mangrove forests), as well as bringing an increase in pollution.

How do disasters affect the identities of societies?

There are many countries in the world that are more prone to disasters than others. They may lie on a plate boundary and so experience more earthquake and volcanic activity. They may have very low-lying flat ground and so experience flooding in their coastal areas. Regular exposure to specific natural disasters can have interesting effects on the identity and culture of a society. Here are a few examples:

- **Tourism** – Ironically, areas that are prone to natural disasters can actually benefit from increased visitor numbers. This is especially the case for volcanic areas where the geological features are often stunning. This affects the identity of a society in terms of the local economy.
- **Arts and culture** – Regular exposure to natural disasters has an effect on people's sense of cultural expression. Disasters affect the environments of places and this is reflected in many different cultural ways but especially the arts. Japan, as an earthquake-prone country, has an earthquake subculture where many works of art, music and literature reflect this important part of their societal identity.
- **Religion and belief** – Areas prone to disasters can experience historical ties with specific religious and supernatural beliefs about the disaster. This includes folklore and sagas about catastrophic events in the past and even gods. For example, Vulcan is the Ancient Roman god of volcanoes and Pele is the Hawaiian fire goddess.



■ **Figure 2.31** Lithograph of the Great Kanto earthquake that struck Japan in 1923 – it struck when many people were cooking, so there were many fires as a result



▼ Links to: Arts

The effect of natural disasters on societies often has an impact on the visual and performing arts in that culture. On these pages there are examples of Japanese art inspired by natural disasters. Research

other examples of this in your arts classes. Perhaps **create** your own piece of art or drama that reflects the impact of a disaster on a society or how a society is affected by disasters.



■ **Figure 2.32** 'The Great Wave off Kanagawa', by Hokusai, c. 1829–1833

ACTIVITY: News report on a natural hazard

■ ATL

- Information literacy skills: Present information in a variety of formats and platforms
- Media literacy skills: Demonstrate awareness of media interpretations of events and ideas

For this summative assessment task you need to **create** a 5–7-minute news bulletin and feature about a natural hazard event of your choice.

You could choose one of the case studies in this book or a different example:

- Nepal earthquake, 2015
- Mt Merapi volcanic eruptions, Indonesia, 2010
- Indian Ocean earthquake and tsunami, 2004
- Bam earthquake, Iran, 2003
- Wenchuan earthquake, China, 2008
- Mt Pinatubo volcanic eruption, Philippines, 1991
- Montserrat volcanic eruption, Caribbean, 1995

Your news bulletin should answer the following guiding question:

‘**Explain** the causes and consequences of the [name] volcanic eruption/earthquake/tsunami in [place] in [date].’

The creation of the news bulletin can be completed in groups. The following steps will help you with the planning process:

- Choose a natural hazard event.
- Research the event – find relevant facts, statistics and images/film footage. Your research should detail the causes, processes and consequences of the event.
- Write a script. Make sure everyone in the group has a role/responsibility.

- Begin filming and be creative!
- Edit the film.

Individually, **create** an action plan and an **evaluation** of the process and results.

■ **Table 2.2** Action plan and evaluation

Action plan	Evaluation
<p>The action plan should show how you have organized your work, carried out your research and created the film. It should show how you focused on and followed the research question. You could include:</p> <ul style="list-style-type: none"> ● Time frame of the project ● Group members’ roles and responsibilities ● Research process and notes ● Your resources in the form of a reference list ● Film creation and editing process (storyboarding would be an effective strategy here) 	<p>Once you have completed the news bulletin, write an evaluation of the process and results. Include:</p> <ul style="list-style-type: none"> ● What went well? ● Challenges and how you overcame them ● Things you might do differently next time ● Overall comment on your progress and the quality of the news bulletin

◆ Assessment opportunities

- ◆ In this activity you have practised skills that are assessed using Criteria A: Knowing and understanding (strands i and ii), Criterion B: Investigating (strands ii and iv) and Criterion C: Communicating (strands i, ii and iii).

! Take action

- ! Look at a news website to find out if any natural hazards have happened in the world recently that require international help. As a class, **organize** a campaign at school to raise awareness of the situation and to offer support to those involved. You could **explore** how social media can be used to inform others about how disasters affect people. You could **explore** how sites such as Twitter and Facebook can be used as vehicles of activism.

Reflection

In this chapter we have looked at the causes and consequences of natural hazards, with a focus on earthquakes and volcanoes. We have discussed the ways that societies respond to these hazards and what factors determine their severity. We have also explored case studies of natural hazards and taken the opportunity to create works based on our understanding.

Use this table to reflect on your own learning in this chapter					
Questions we asked	Answers we found	Any further questions now?			
Factual: How is the Earth structured? What are plate tectonics? What are the causes and consequences of earthquakes and volcanoes?					
Conceptual: What are the different ways that societies can respond to natural hazards? How do disasters affect the identities of societies?					
Debatable: Are wealthy countries safer from disasters?					
Approaches to learning you used in this chapter:	Description – what new skills did you learn?	How well did you master the skills?			
		Novice	Learner	Practitioner	Expert
Communication skills					
Organization skills					
Information literacy skills					
Media literacy skills					
Transfer skills					
Critical-thinking skills					
Learner profile attribute(s)	Reflect on the importance of being a good communicator for your learning in this chapter.				
Communicators					

Individuals & Societies

This sample chapter is taken from Individuals and Societies for the IB MYP 3

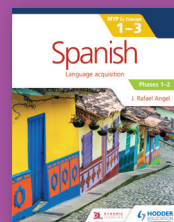
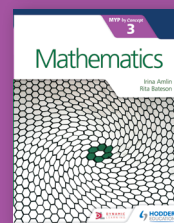
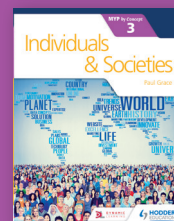
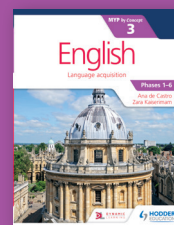
A concept-driven and assessment-focused approach to Individuals and societies teaching and learning.

- Approaches each chapter with statements of inquiry framed by key and related concepts, set in a global context.
- Supports every aspect of assessment using tasks designed by an experienced MYP educator.
- Differentiates and extends learning with research projects and interdisciplinary opportunities.
- Applies global contexts in meaningful ways to offer an MYP Individuals and societies programme with an internationally-minded perspective.

Paul Grace teaches IB History, Theory of Knowledge and MYP Individuals and Societies at Renaissance College, Hong Kong. He is also an examiner for IB History. Paul has written History for the IB MYP 4&5 Teaching and Learning Resources as well as authoring articles for the *IB Review*.

Series editor: Paul Morris

The MYP by Concept Series provides a concept-driven and assessment-focused approach to print and digital resources. Titles in the series include:



Dynamic Learning

This book is fully supported by Dynamic Learning – the online subscription service that helps make teaching and learning easier. Dynamic Learning provides unique tools and content for:

- streamlining planning and sharing lessons
- independent, flexible student study



Sign up for a free trial – visit: www.hoddereducation.com/dynamiclearning