

What is folding?

When two plates of the crust converge, compression causes the strata of horizontal sedimentary layers to become tilted or inclined, so that 'folds' in the rocks are visible. This process is known as **folding**.

Types of folds

- ▶ An 'up' fold is called an **anticline** or **crest**.
- ▶ A 'down' fold is called a **syncline** or **valley**.
- ▶ The sides of the fold are called the **limbs**.
- ▶ Uneven pressure causes more complex folding of the strata.
- ▶ Increasing pressure causes more extreme folding, eventually causing the rocks to crack.
- ▶ **Open folds** form under moderate pressure that is roughly even from both directions. **Overfolds** are formed as a result of uneven pressure and **overthrust folds** are formed as a result of very strong pressure.

Erosion takes place when the folded strata are exposed on Earth's surface. The strata of the anticline cracks during folding, and often the anticline is worn away more quickly than the syncline.

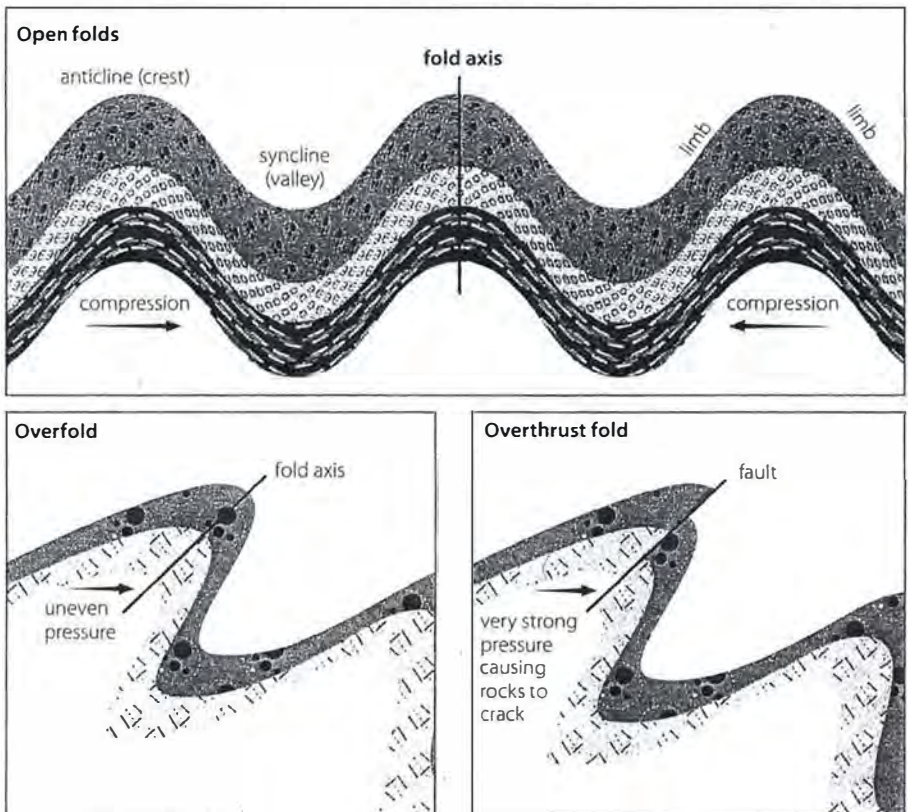
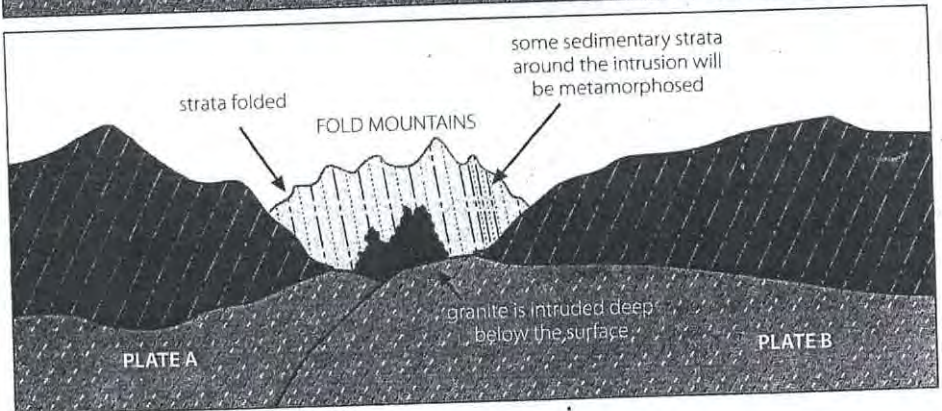
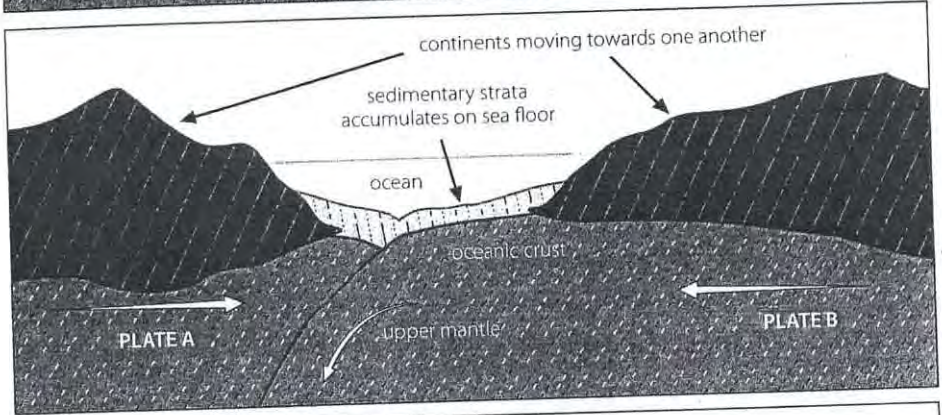
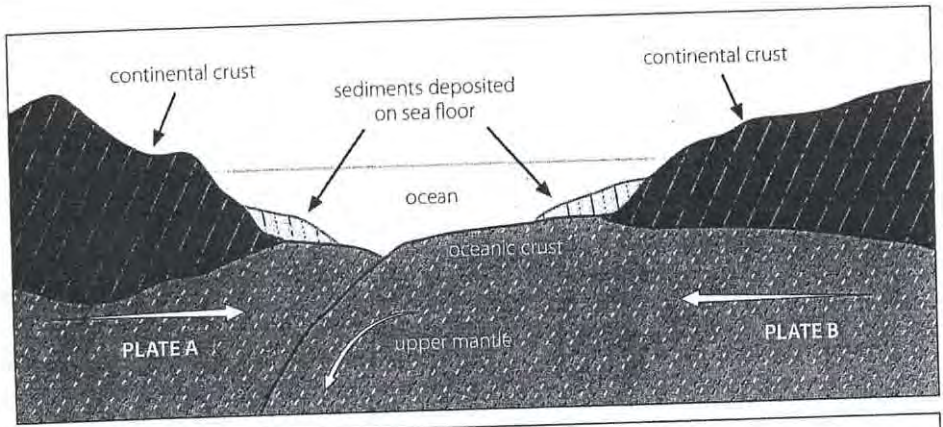


Figure 3.16 Different types of folds

Landforms associated with folding

- ▶ Folding of strata gives rise to **fold mountains**.
- ▶ Compression occurs when two landmasses travelling on different plates converge. The sedimentary rock is compressed and rises.
- ▶ The newly formed fold mountains join the two plates together.
- ▶ Fold mountains have a base of granite, which forms as magma intrudes into the crust as a result of the compression.
- ▶ Heat and pressure on the sedimentary and igneous rocks change them into metamorphic rock.



Sedimentary rock
 Igneous rock
 Metamorphic rock

Figure 3.17 The formation of fold mountains

- ▶ Homoclinal ridges are formed as a result of the tilting of strata during folding.
- ▶ New fold mountains of the world are found near the tectonic plate borders.

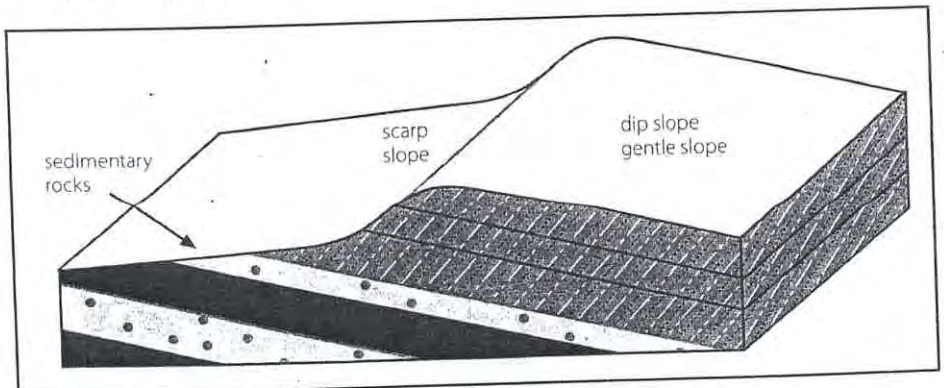


Figure 3.18 A homoclinal ridge

The Himalayas were formed when the Indian Plate moved towards the Eurasian Plate. The Alps in Europe and the Atlas mountains in North Africa were formed when the African and Eurasian Plates converged.

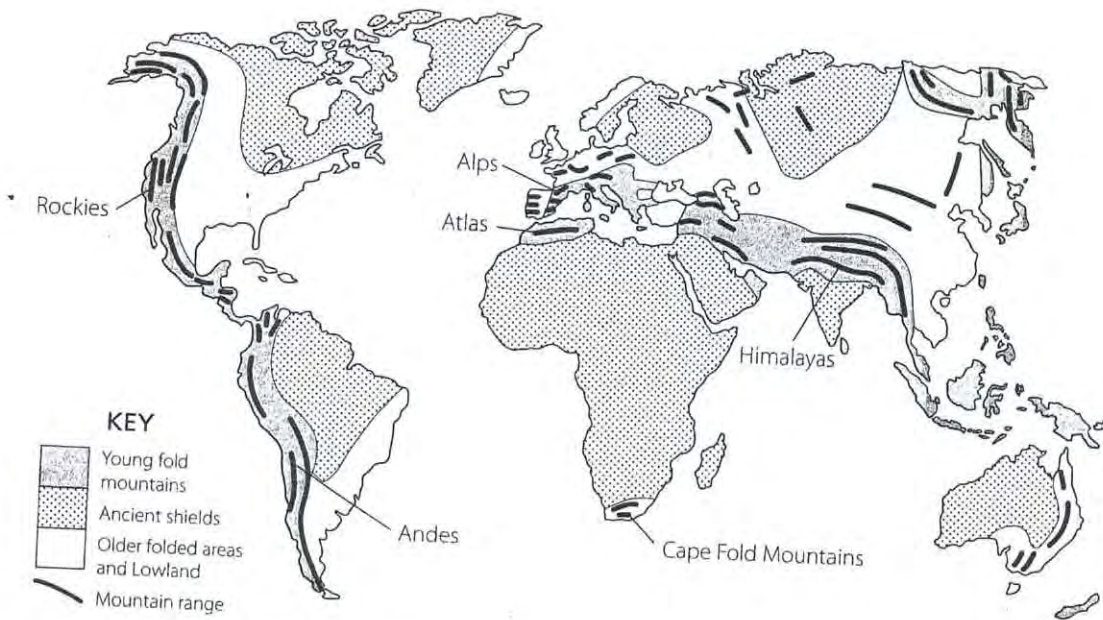


Figure 3.19 Fold mountains of the Earth

EXAM TIP

You need to be able to say whether rocks will fold or fault when pressure is applied in different ways.

What is faulting?

- ▶ When strong pressure is applied to rocks that are rigid they break along faults or cracks in the crust.
- ▶ Pressure can be in the form of:
 - ▶ **Tension:** When two plates move away from one another.
 - ▶ **Compression:** When two plates of the Earth's crust move towards one another and magma intrudes into the crust.

Types of faults

There are three types of faults:

- ▶ Compression forces create **reverse faults**. In a reverse fault the roof is the part that moves up.

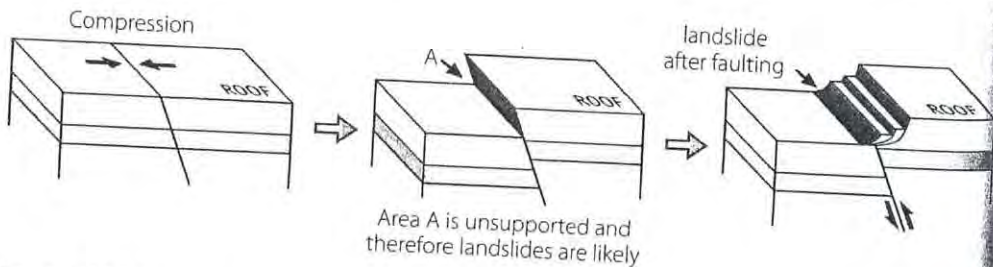


Figure 3.20 (a) Reverse fault

- ▶ Tension forces create **normal faults**. In a normal fault the roof is the part that moves down.

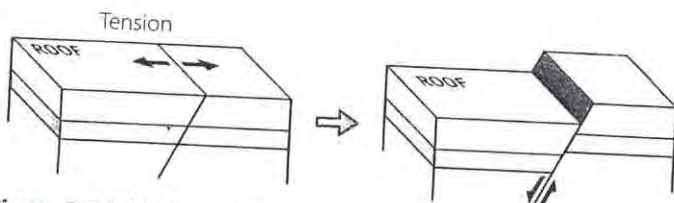


Figure 3.20 (b) Normal fault

Transverse forces occur at transverse plate borders when two plates slide past one another.

- ▶ **Transverse forces** create tear faults or **transverse faults**. In a tear fault there is no vertical movement of the rock masses – the rock masses move past one another.

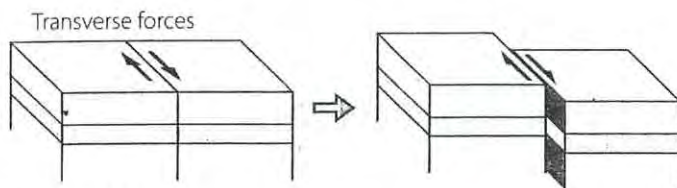


Figure 3.20 (c) Tear or transverse fault

Landforms associated with faulting

Block mountains and rift valleys form when land moves up or down along a fault.

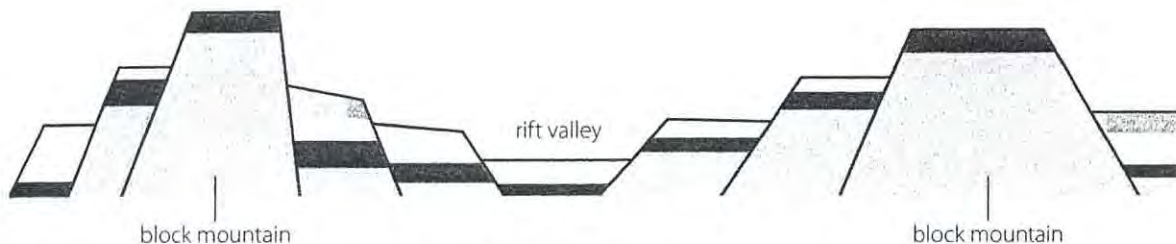


Figure 3.21 A rift valley and block mountains

Test yourself

Folding and faulting

1. Look at the sketch in Figure 3.22:

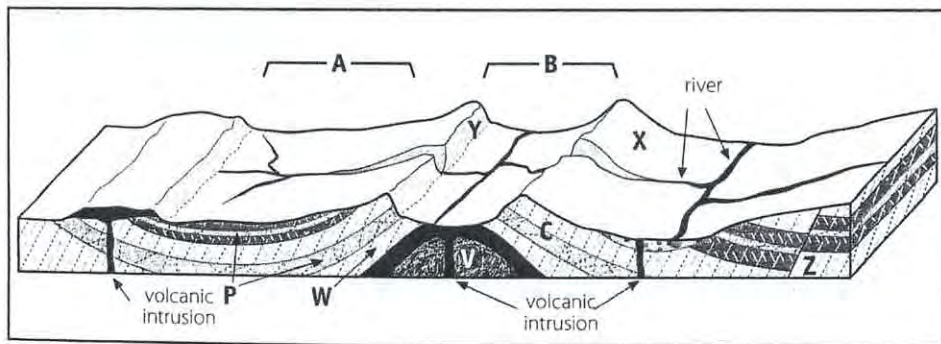


Figure 3.22 Folded strata

Refer to Module 3, Unit 3 on pages 47–49 to help you answer question 2.

- a. Label A and B as the anticline and syncline. (2)
 - b. Label X and Y as the scarp and dip slopes. (2)
 - c. Identify the fold feature at C. (1)
 - d. Identify the rock at V. (1)
 - e. What type of pressure caused the rocks to become inclined? (1)
 - f. What would have happened to the rock at W? Explain your answer. (3)
 - g. Identify the type of fault at Z. Give a reason for your answer. (2)
 - h. Why did this fault form? (2)
 - i. To which main group do the rocks at P belong? Motivate your answer. (2)
2. Write a paragraph explaining how folding caused the Himalayas to form. (18)

[34 marks]