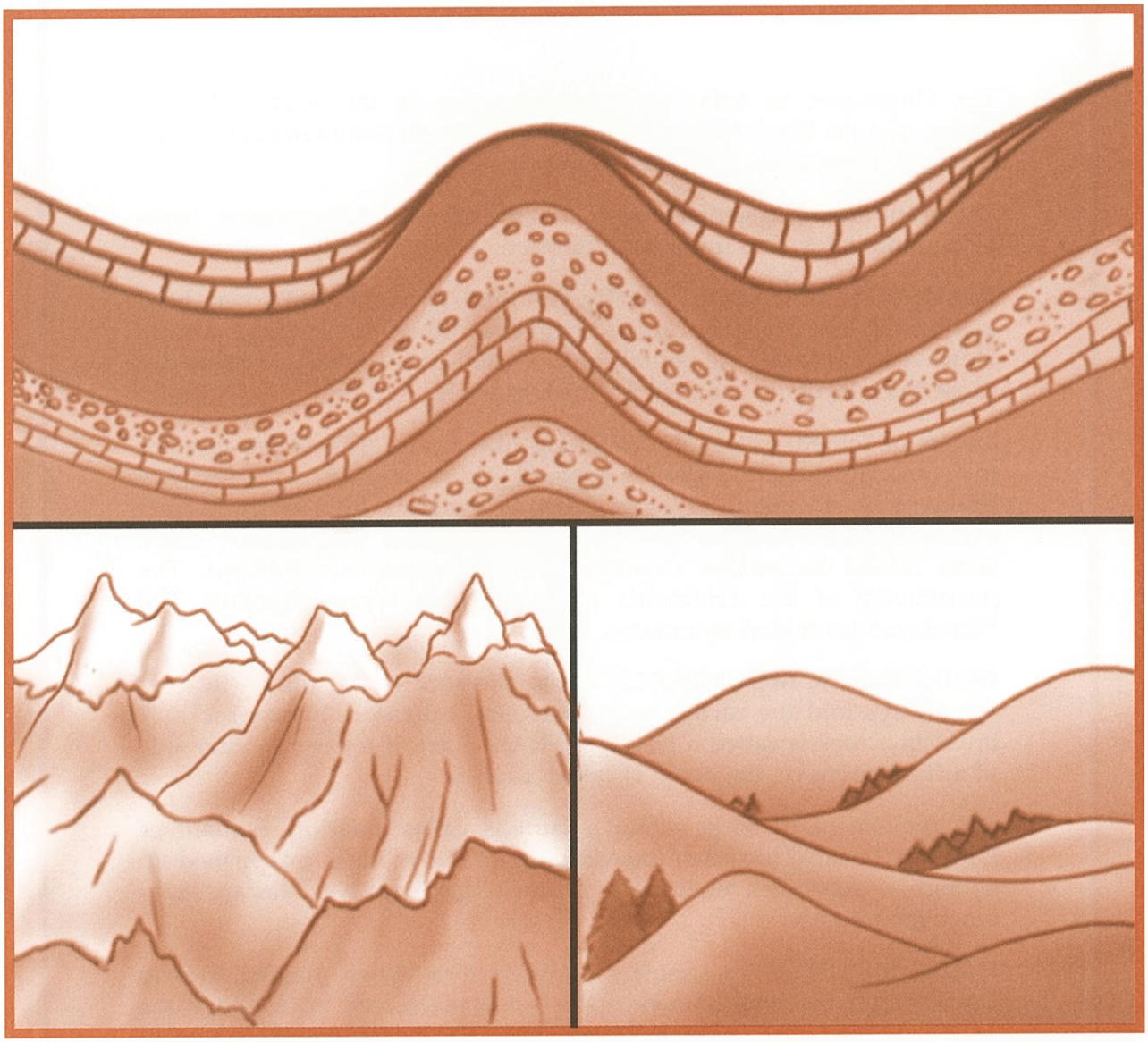
Lesson 24

How are mountains formed?



KEY TERMS

anticline: upward fold

syncline: downward fold

fracture: break in a rock

fault: break in the earth's crust where movement has occurred

LESSON 24 | How are mountains formed?

The Himalayas, in Asia, the Sierra Nevadas, in the western United States, and the Black Hills of South Dakota are all mountains. However, they are different kinds of mountains.

There are three different kinds of mountains: folded mountains, fault-block mountains, and dome mountains.

FOLDED MOUNTAINS Usually, you think of rock as being very hard and brittle. You probably cannot imagine bending, or "folding," a rock. However, over very long periods of time (millions of years), pressure can cause thick layers of sedimentary rock to buckle and fold.

Layers of folded rock look something like waves. They have upward folds and downward folds. An upward fold is called an **anticline** [AN-tih-klyn]. A downward fold is called a **syncline** [SIN-klyn]. Folded mountains are anticlines that rise high above the land around them. Most folded mountains formed when the continents collided. The movements of the continents squeezed rock layers together. The Himalayas are folded mountains.

FAULT-BLOCK MOUNTAINS Great pressure inside the earth does not always fold the earth's crust. Sometimes pressure breaks rocks. A break in a rock is called a **fracture** [FRAK-chur]. If rocks on either side of a fracture move, the break is called a **fault**.

The movement of rocks along a fault is called faulting. Sometimes faulting lifts large blocks of the earth's crust. If the blocks are pushed up enough, a fault-block mountain is formed. The Sierra Nevadas are fault-block mountains.

DOME MOUNTAINS Some mountains form when magma tries to rise through the crust. However, in some places, the rock above the magma is extra strong. The magma pushes, but it cannot force its way to the surface. As pressure builds, the magma bulges. This bulge forces the rock above it to bulge also. The land on the surface rises. A dome mountain is formed. Dome mountains are oval or round. The Black Hills are dome mountains.

HOW CAN WE SHOW FOLDING?

You can use a stack of colored paper to show how sedimentary rock can be folded. First, arrange the stack in layers of different colored paper (Figure A, top).

Next, slowly but firmly push both ends of the stack of paper toward the center (Figure A, bottom).

1. What do the different colored layers of paper stand for? _____
2. What happened to the layers as the pressure builds up on the ends of the stack? _____

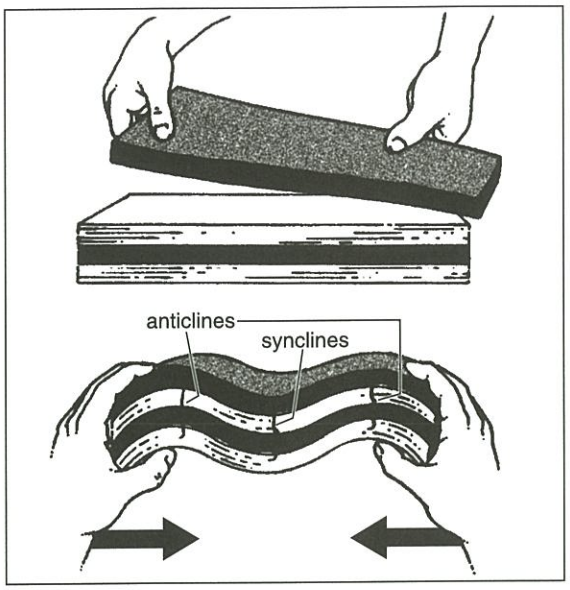


Figure A

WHAT DOES THE DIAGRAM SHOW?

The diagram below shows folded rock layers. Study the diagram. Then answer the questions.

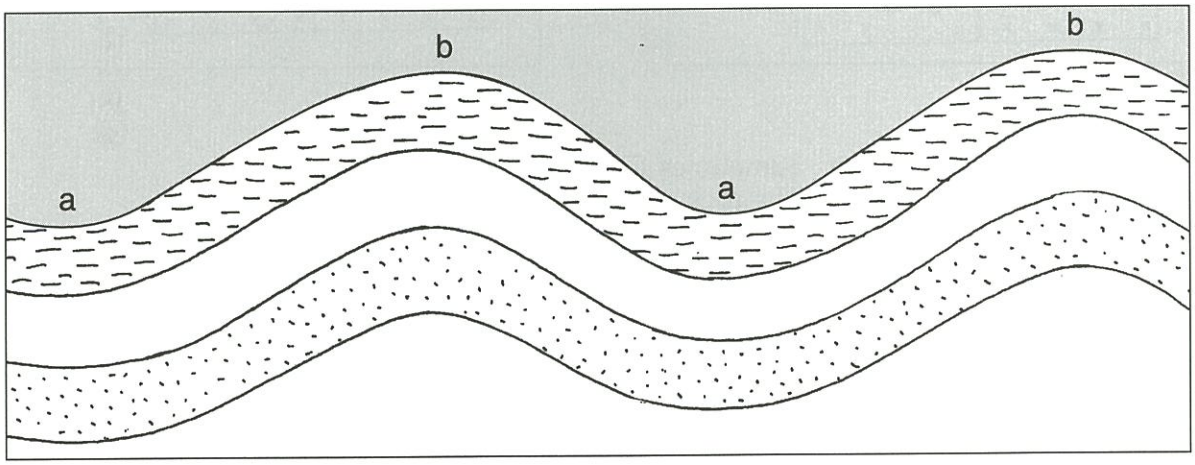


Figure B

1. The upfolds are lettered _____.
2. The downfolds are lettered _____.
3. The anticlines are lettered _____.
4. The synclines are lettered _____.
5. Moving plates can squeeze rock layers together into mountains. The mountains are called _____ mountains.

Horizontal faulting
Side-to-side

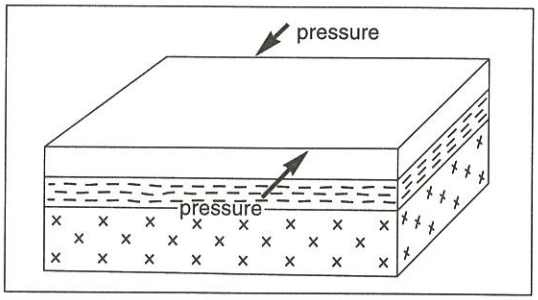


Figure C

Vertical faulting
Up-and-down

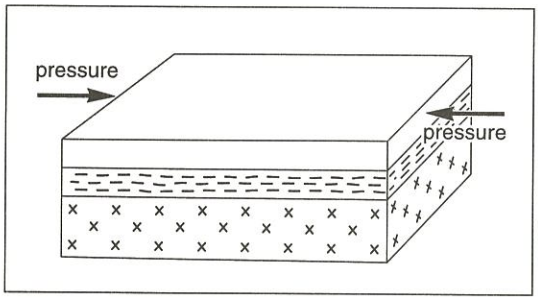


Figure D

- Forces inside the earth press against rocks.

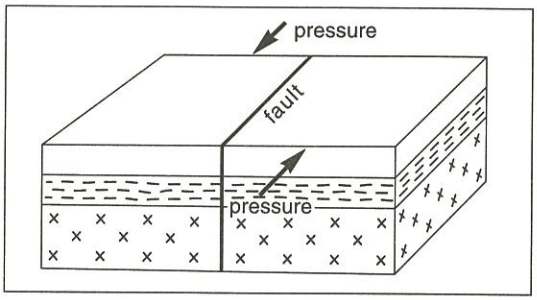


Figure E

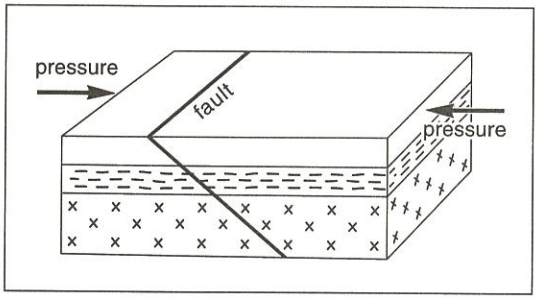


Figure F

- Sometimes the pressure is too great.
- The rock cracks.
- But the split parts do not move yet.

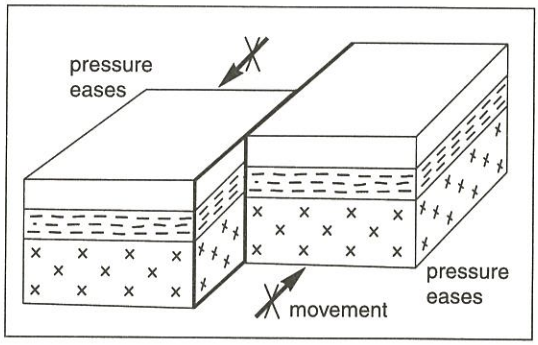


Figure G

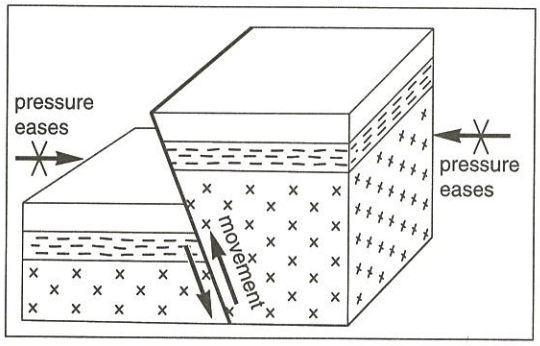


Figure H

- More pressure builds.
- Then the pressure eases.
- Suddenly, the blocks move in opposite directions.

WHAT DOES THE PICTURE SHOW?

The rocks in this diagram have faulted. One block has moved up. The other block has moved down. Study the diagram of the layers carefully, then answer the questions.

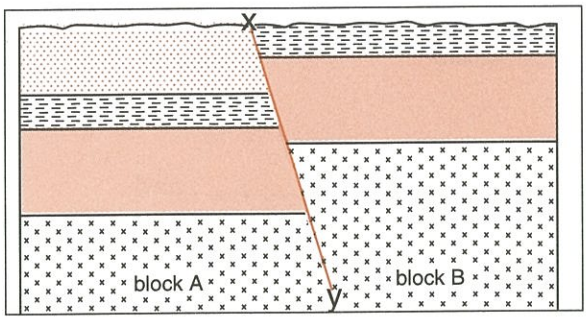


Figure I

1. Block A has moved _____.
2. Block B has moved _____.
3. What is line XY called? _____
4. The movement of rocks along a fault is called _____.
5. This is an example of _____ faulting.

HOW A DOME MOUNTAIN IS FORMED

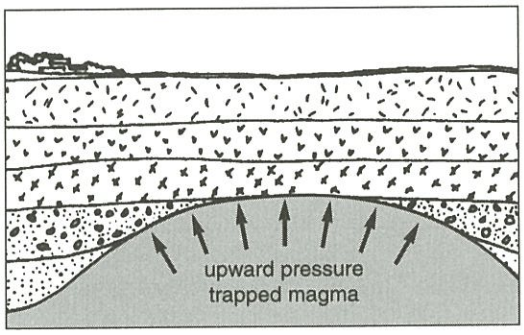


Figure J *Trapped magma builds strong upward pressure.*

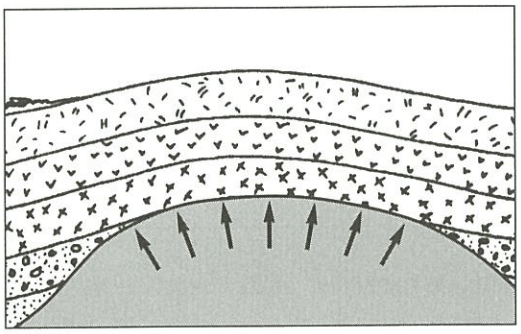


Figure K *The pressure bulges the land above it.*

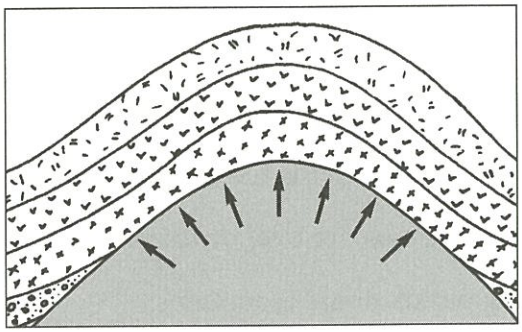


Figure L *Finally, a great dome mountain is formed.*

FILL IN THE BLANK

Complete each statement using a term or terms from the list below. Write your answers in the spaces provided. Some words may be used more than once.

horizontal	bulge	fault-block	vertical
dome	folded	syncline	faulting
anticline			

1. Three kinds of mountains are _____, _____, and _____.
2. The movement of rock along a fault is called _____.
3. The force of trapped magma can make the land above it _____.
4. An upfold in rock is called an _____.
5. Land pushed up high by trapped magma forms a _____ mountain.
6. A downfold in rock is called a _____.
7. Up-and-down faulting also is called _____ faulting.
8. Side-to-side faulting also is called _____ faulting.

TRUE OR FALSE

In the space provided, write "true" if the sentence is true. Write "false" if the sentence is false.

_____ 1. Magma always reaches the earth's surface.

_____ 2. Pressure can split rocks.

_____ 3. Pressure will always fold rock.

_____ 4. Pressure will always split a rock.

_____ 5. Most folded mountains formed when the continents collided.

_____ 6. Dome mountains are oval or round.

_____ 7. Faulting builds dome mountains.