Important Concepts . . .

Preview Review

Science *Grade 7* *TEACHER KEY*

W3 - Lesson 4: Plate Tectonics and Related Events

V5-07

Important Concepts of Grade 7 Science

W1 - Lesson 1 ..... Interactions and Interdependencies
W1 - Lesson 2 ..... Nutrient Cycles, Energy Flows, and Changes in Ecosystems
W1 - Lesson 3A ..... Environmental Impacts of Human Activities
W1 - Lesson 3B ..... The Particle Model of Matter, Temperature, Heat, and Change of State
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W3 - Quiz.....

Materials Required.

Textbook:
Science in Action 7

Science Grade 7
Version 5
Preview/Review W3 - Lesson 4 TEACHER KEY

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Preview/Review Concepts
for
Grade Seven Science

TEACHER KEY

W3 - Lesson 4:

Plate Tectonics and Related Events

OBJECTIVES

By the end of this lesson, you should be able to

- identify and list the characteristics of the Earth's layers
- explain the Theory of Plate Tectonics
- explain how earthquakes occur and how we collect information about them
- describe the different types of volcanoes and the reasons they form
- explain how mountains form

GLOSSARY

earthquake - sudden release of built up energy in the earth causing vibrations in the ground

faulting - the breaking of rock beds

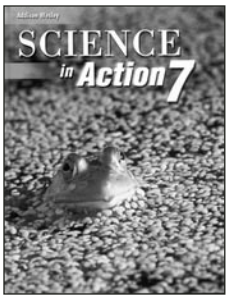
plate tectonics - the movement of the plates of the Earth's crust

volcano - an opening in the Earth's crust that allows the release of molten rock, gases, etc.

W3 - Lesson 4: Plate Tectonics and Related Events

The Earth has a constantly changing surface. It moves, and in the process various well known events occur. These include mountain building, volcanic eruptions, and earthquakes.

To understand how and why these things happen, you must first understand something of the structure of the Earth. Read pages 355 and 356 *Science in Action 7*.



1. Label the layers of the following model of the Earth. Be sure to note the major characteristics of each layer.

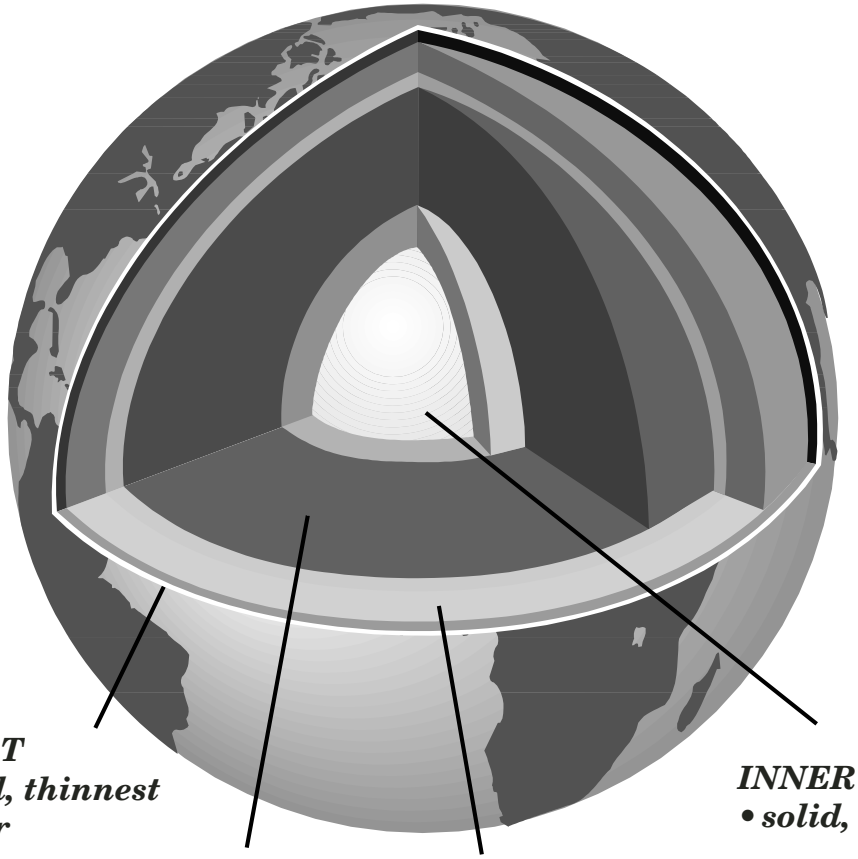


Plate Tectonics

Humans have known for some time that the Earth's crustal sections move. Since that became accepted knowledge, our understanding of what is happening has changed. At first, it was thought that just the continents moved. This was called the theory of **Continental Drift**. Read page 394. We now feel that the theory of **Plate Tectonics** is a more accurate description of what happens. Read more about this theory on pages 395 to 400 of *Science in Action 7*.

2. Define the following terms.

   a. plates ***large sections of the Earth's crust***

   b. boundaries ***edges of the plates***

3. What evidence led Wegener to develop the idea of continental drift?

   Continents look like puzzle pieces that fit together.

4. Describe the theory of plate tectonics.

   The Earth's crust is broken into large pieces which move around through time.

5. What caused the Earth's plates to move?

The movement of material in the partly melted mantle.

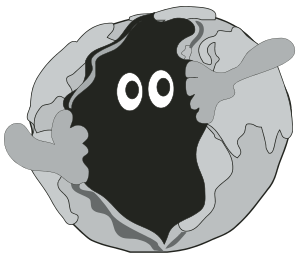
6. Give an example of a diverging boundary.

The Mid-Atlantic Ridge

7. Give an example of a converging boundary.

Ocean trenches, the convergence that caused the Himilayan Mountains.

Earthquakes



Sometimes when forces act on a plate of the Earth's crust, it can get "stuck" rather than move. Pressure keeps building because the forces are still being applied. At some point, the build-up of pressure will overcome whatever was keeping the plate from moving. Then the ground will move, and waves of energy will rush out from the center of the action (the focus). This movement and energy is called an earthquake. Earthquakes can cause various amounts of damage depending on a variety of factors. They include the amount of movement and energy released plus the condition of the Earth's surface they go through. In areas where people live, the materials and design of their buildings also determine how much damage is done. More information on earthquakes is found on pages 357 to 359 of the textbook.

8. What is an epicentre?

The point on the Earth's surface above the focus.

9. What scale is used to communicate the strength of earthquakes?

Richter Scale

10. How much stronger is a magnitude 3 earthquake than a magnitude 1 earthquake?

100 times larger. Each number represents a tenfold increase over the number beneath it.

11. How are scientists able to determine an earthquake has occurred somewhere on Earth?

by recording, at seismic stations, energy waves from the earthquake

Volcanoes

Volcanic eruptions are among the more dramatic events in nature to watch. Images of hot lava flowing down slopes and through towns make a gripping news story.

When lava escapes the Earth's crust, a volcano forms. There are three types of volcanoes.

- A **cinder cone** is made from "cinder"- bits of lava thrown from the volcano. It forms a relatively small, steep-sided cone. Paricutin in Mexico is a classic cinder cone volcano.
- **Shield cones** form large, gently sloping cones. The Hawaiian islands are made by this type of volcano.
- **Composite cones** have alternating layers of lava and cinder. Mt. Fuji in Japan is a composite cone.

More information on volcanoes can be found on pages 360-362, 397 and 399 of *Science in Action 7*.

12. What materials besides lava can be released through a volcano?

gases, ash, solid rocks

13. If you were looking at a world map that showed the Earth's tectonic plates, where would you predict volcanoes will be found?

along plate boundaries

14. Why would you expect to find volcanoes at those locations?

There would be pressure and melted material from the subducted plate.

15. How would part of the ocean crust become material that is eventually spewed from a volcano?

If it slides under another plate, it will melt as it gets deep enough and turn into magma. If the magma erupts from a volcano it is called lava.

16. How and where do volcanoes form new oceanic crust?

At diverging boundaries, the ocean plates are moving apart and lava escapes, forming a ridge such as the mid-Atlantic Ridge.

17. What sorts of signs occur which indicate an eruption will happen soon?

bulges develop on the volcano, the ground my tilt, there may be small earthquakes around the volcano

Mountain Building

When volcanoes erupt, they form mountains. But that is not the only way mountains are made. Two other ways are the **collision of plates** and **faulting** of the crust. When two plates collide, the more dense plate slides under the less dense one. The top crust crumples from the pressure. The folds from this action become mountains. Rock beds can also fault or break. Then sections can be pushed up to become mountains. Read pages 402 to 408 of the textbook and answer the following questions.

18. Define the following terms.

a. fold ***a bend in rock***

b. fault ***a break in rock***

19. What is the difference between an anticline and a syncline?

An anticline is an upfold in rock; a syncline is a downfold in rock.

20. Where did the sediments of the rock in the Rocky Mountains come from?

They were deposited in a shallow sea at the Western edge of the North American plate.

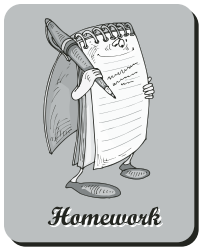
21. How were the Rocky Mountains formed?

The North American plate and the Pacific plate collided. The North American plate buckled and in places broke, and formed the mountains.

22. How can solid rock fold without breaking?

The rock was softened by heat and pressure deep in the Earth.

If you have time, you may want to begin lesson 5 because you will be writing a quiz tomorrow on what you learned this week in our Preview/Review Science 7.



Homework

23. Ask people you know if they have ever experienced an earthquake or seen a volcanic eruption. What were some of the things they remember about the experience? Did they feel in danger? How did they deal with the situation?

Answers will vary.