

Intermediate Science 7
Unit 4: Earth Crust
Topic 6: Classification of Rock



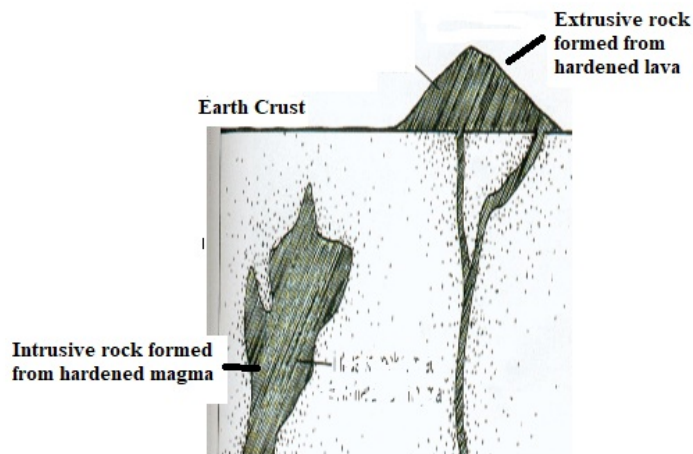
Student Name _____

Rocks are divided into three basic types, igneous, sedimentary and metamorphic, depending upon how they were formed. Plate tectonics provides an explanation for how rocks are recycled from igneous to sedimentary to metamorphic and back to igneous again.

1) Igneous Rocks- “Born of fire”

a type of rock that is formed due to the cooling of Magma. Magma refers to the hot rock found at great depths below the earth's surface. Sometimes magma comes to the top of the earth's surface. As it breaks the earth's crust it loses some of the dissolved gases and vapor, and is now called lava. For example, lava comes from volcanoes.

There are two main types of Igneous Rocks. There are:



1) Intrusive Rock: A type of rock formed from magma that hardens beneath the earth's surface.

Examples: Basalt, Rhyolite, Obsidian and Pumice

2) Extrusive Rock: A rock formed from lava that hardens on the earth's surface.

Examples: volcanic rock, Granite, Gabbro, Diabase and Pegmatite



Sedimentary Rocks - “ Layer upon Layer”

- type of rock formed by the build up of sediments over time. Most layered rock is sedimentary rock, made from small fragments of rock material closely packed and cemented together.

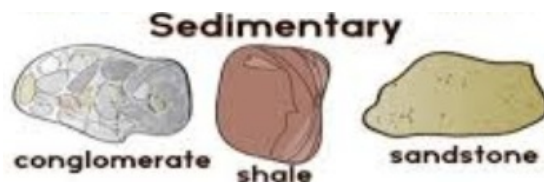
Lithification : How Sedimentary Rock is formed:

- Small fragments of the earth’s surface are constantly being worn away and moved from one place to another by erosion(Wind, ice , water).
- Over a long period of time large amounts of eroded materials are carried from the land into lakes and oceans, where they eventually settle to the bottom.
- the layered appearance of sedimentary rock is produced by slow collection of sediment settling on top of other sediment.
- This build up sediment on top of each other produces horizontal layers of called beds.
- The layers of rock are pushed together or compacted by the mass of sediments and water on top of them. This pressure causes these sediments to form rock.

Sedimentary rock is less plentiful than igneous rock in the earth’s surface. Nevertheless, Sedimentary Rock makes up about 75% of the rock that is exposed on the surface of the land.

The different types of sediments that can be used to form different sedimentary rock:

- 1) It can be made of compressed mud that is a mixture of clay and silt (fine particles of mineral matter). Example Shale
- 2) Large granules of sand. Example: Sandstone
- 3) Rounded pebbles and small stones. Example: Conglomerate

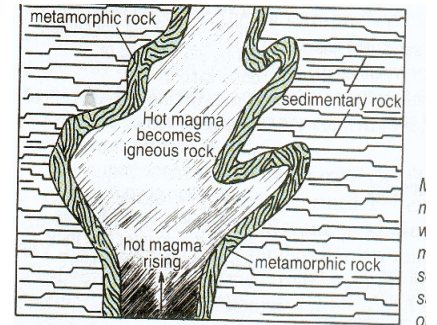


Metamorphic Rock- “Changing Form”

Metamorphic Rock forms from the other two main types; igneous and sedimentary. Metamorphic rock forms when heat or pressure, or both, cause changes in the "parent" rock. A parent rock is usually a Igneous or Sedimentary rock that changes form and becomes a Metamorphic Rock.

Metamorphic rock may be formed by:

- 1) Hot Magma that heats and squeezes the surrounding areas.
- 2) The burial of the rocks deep in the earth's crust.
- 3) Movements in the earth's crust may also affect the rock by deforming it.



Example of formations of Metamorphic rocks:

Example 1:

A bed may start out as fine grained, compact rock called shale (Sedimentary Rock). As a result of pressure and/or heat the shale may become a another kind of rock called Slate. Slate is a fine grained compacted rock that is much harder than its parent rock “Shale”.

Example 2:

Marble is a Metamorphic rock formed from the sedimentary rock called limestone.



PART A: MULTIPLE CHOICE

Instructions: Shade the letter of the correct answer on the computer scorable answer sheet provided.

1. What are the names of the 3 types of rocks?
 - (A) Pebbles, boulders, mountains
 - (B) Diamonds, rubies, pearls
 - (C) Igneous, sedimentary, metamorphic
 - (D) Sand, gravel, clay

2. What term refers to rocks made from hot melted rock that cools and hardens?
 - (A) Compound
 - (B) Igneous
 - (C) Metamorphic
 - (D) Sedimentary

3. What is the molten liquid rock called inside of a volcano?
 - (A) Ash
 - (B) Igneous
 - (C) Lava
 - (D) Magma

4. Which of the following rocks formed from the cooling and hardening of lava?
 - (A) Igneous rocks
 - (B) Fossils
 - (C) Metamorphic rocks
 - (D) Sedimentary rocks

5. Obsidian, granite, and basalt are rocks formed from molten rock that has cooled. What kind of rocks are they?
 - (A) Igneous rocks
 - (B) Fossils
 - (C) Metamorphic rocks
 - (D) Sedimentary rocks

6. Which of the following refers to when magma pushes into surrounding rocks below Earth's surface and cools?
 - (A) Extrusive Igneous Rock
 - (B) Insidious Igneous Rock
 - (C) Intrusive Igneous Rock
 - (D) Sidious Igneous Rock

7. What must happen to magma and lava for igneous rocks to formed?
 - (A) Crystallizes
 - (B) Erodes
 - (C) Undergoes radioactive decay
 - (D) Weathers

8. Magma that cools very slowly deep beneath the surface forms minerals with what type of crystals?
 - (A) Cubic
 - (B) Large
 - (C) Small
 - (D) Very hard

9. Which of the following rocks is formed when layers of sand, silt, clay and mud are pressed and cemented?
 - (A) Compound
 - (B) Igneous
 - (C) Metamorphic
 - (D) Sedimentary

10. Which of the following refers to small pieces of rock, mud, sand, clay and silt that are carried by water from one place to another?
- (A) Alloys
 - (B) Fossils
 - (C) Germs
 - (D) Sediments
11. Which of the following is true for sedimentary rocks?
- (A) Formed from magma
 - (B) A type of foliated igneous rock
 - (C) Formed because of changes in temperature and pressure, or the presence of hot watery fluids
 - (D) formed when loose materials become pressed or cemented together or when minerals form from solutions
12. What rock is made of pebbles?
- (A) Conglomerate
 - (B) Limestone
 - (C) Marble
 - (D) Shale
13. How are metamorphic rocks formed?
- (A) Colour
 - (B) Density
 - (C) Physical structure
 - (D) Heat and pressure
14. Which of the following is a metamorphic rock?
- (A) Marble
 - (B) Obsidian
 - (C) Sandstone
 - (D) Shale
15. Which correctly matches the rock type with the process involved in forming the rock?
- (A) Fossils - molten rocks and magma
 - (B) Igneous - pressure and heat
 - (C) Metamorphic - heating and melting
 - (D) Sedimentary - erosion and weathering

PART B : MATCHING

[5]

Match each thermometer on the left with the best Descriptor on the right. Each Descriptor may be used only once. Place your answer on the scantron

<u>Term</u>	<u>Descriptor</u>
16. ___ Igneous rocks	A. types of rocks formed by compacting and/or cementing sediment (loose material)
17. ___ Metamorphic rocks	B. Solid material that is moved and deposited in a new location. It can consist of rocks and minerals,
18. ___ Sedimentary rocks	C. The process in which sediments compact under pressure, and become solid rock.
19. ___ Lithification	D. types of rocks produced when heat, pressure, or fluids change one type of rock into a new form
20. ___ Sediments	E. the type of rock that forms when hot magma or lava cools and becomes solid

PART C: WRITTEN RESPONSE

1. Where is intrusive rock formed?

2. Where is extrusive rock formed?

3. What is the difference between magma and lava?

4. What are three examples of igneous rock?

5. Describe how igneous rock forms. **P339**

6. What are three examples of sediments?

7. What are the two main processes that form sedimentary rocks?

8. What is an example of sedimentary rock that has

(a) small particles?

(b) medium particles?

(c) large particles?

9. What types of rock can become metamorphic rock?

10. What are three conditions that can form metamorphic rock?

11. What is a parent rock?

12. What are three examples of metamorphic rocks and their parent rocks?
