

Chapter 9 Section 2

IGNEOUS ROCKS DAY 4

GLE: Summarize the basic events that occur during the rock cycle.

0707.7.3 Distinguish among igneous, sedimentary and metamorphic rocks and relate these to a simple diagram of the rock cycle.

Essential Questions

- How do we classify rocks?
- How are igneous rocks formed?

Why it's important

- Rocks form the land around us.

Performance Indicator: 0707.7.2 Label a diagram that depicts the three different rock types.

22 A student studying different rock types observed four unidentified rocks. The student wrote a description of each rock under its picture, as shown below.



1. A smooth, glassy rock with sharp edges



2. A light-colored rock that contains fossils



3. A rock with alternating bands of light and dark minerals



4. A rock composed of pebbles and small pieces of rocks cemented together

What
mastery looks
like

Which rock should the student classify as an igneous rock?

F 1

G 2

H 3

J 4

Igneous Rock

<http://www.brainpop.com/science/earthsystem/typesofrocks/>

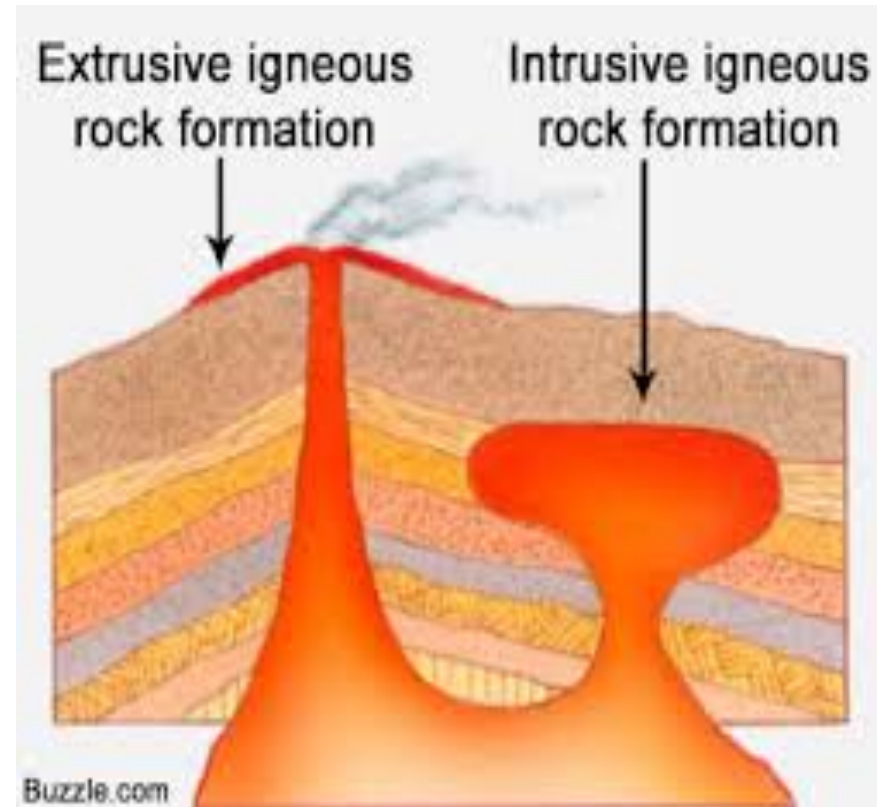
Igneous rocks form when melted rock material from inside Earth cools.

Two Types of Igneous Rocks

□ When melted rock material cools on Earth's surface (lava), it makes an **extrusive** igneous rock.

<https://www.youtube.com/watch?v=rTnCsYh6wPg>

□ When the melt cools below Earth's surface (magma), **intrusive** igneous rock forms.



Igneous Rock classification



- Igneous rocks are classified two different ways:
 - ▣ What they are made from (chemical composition)
 - ▣ Where they were formed

Chemical Composition

- The chemicals in the melted rock material determine the color the the rock.
- **High percentage of silica, and little iron, magnesium, or calcium gives the rock its light color.**

Light colored rocks are called granitic rocks.

(intrusive igneous rock)



- **Less silica, but more iron, magnesium or calcium gives the rock a dark color.**

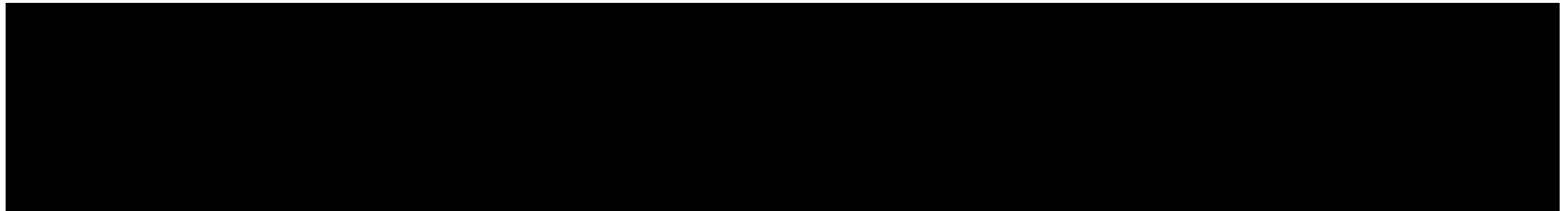
- **Dark colored** rocks are called basaltic rocks.
(extrusive igneous rock)



Check for understanding

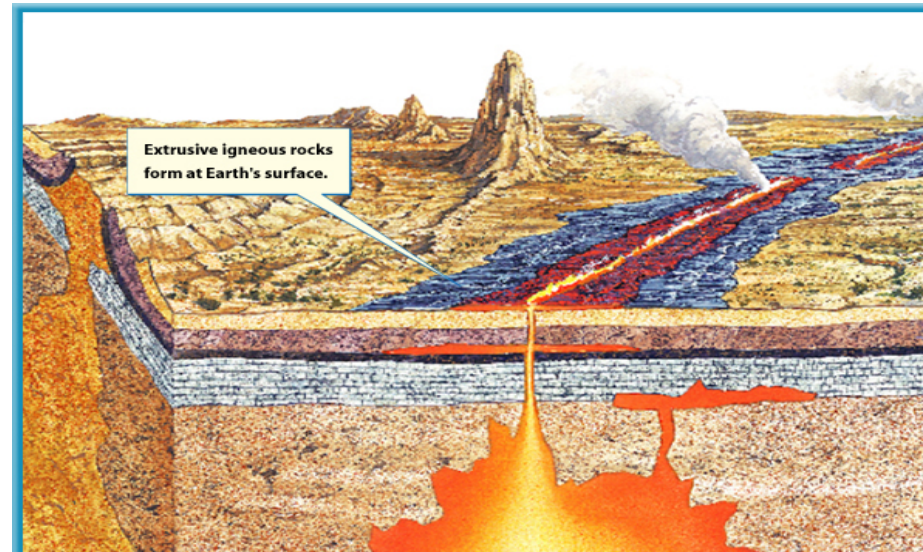
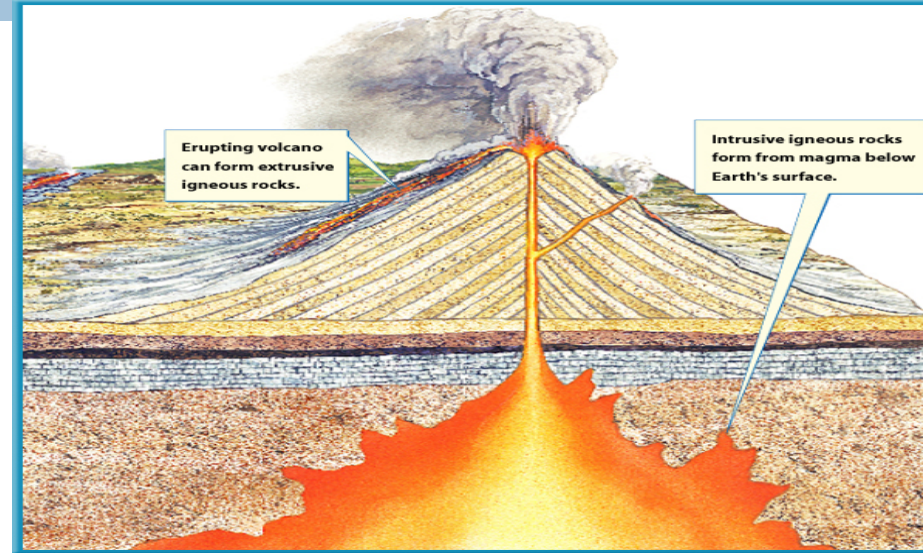


What determines the color of igneous rock?



Rocks from lava

- Extrusive igneous rocks, or volcanic, form when magma makes its way to **Earth's surface** called lava.
- This type rock forms in two ways.
- One way is volcanoes erupt and shoot out lava and ash.
- Another way is called **fissure**. Large cracks in the Earth's crust open up.
- The lava oozes out onto the ground or water from a fissure or volcano called a **lava flow**.
- The fastest cooling lava forms no grains at all. This is how obsidian, a type of volcanic glass, forms.



Types of extrusive rocks

- Basalt- most crystals are no visible to unaided eyes. They sometimes have holes because they cool quickly.
- Rhyolite - similar to granite but formed from lava that cooled quickly. – few visible mineral crystals.



Rocks from Magma

- Intrusive igneous rocks –
 - form when a huge glob of magma from inside the Earth is forced upward toward the surface but never reaches it.
 - cooling takes million of years and cools so slow that it forms large crystals.
 - Most intrusive rocks have large, well formed crystals. The mineral crystals within them are large enough to see without a microscope.
 - Examples of intrusive igneous rocks are granite, gabbro and diorite.
- Using the diagram, explain why intrusive igneous rocks have large, visible crystals.



Types of Intrusive rock

- Granite – cools slowly inside Earth, forming large mineral crystals
- Gabbro – intrusive rock with large mineral crystals that show it cooled slowly.



Gabbro



Think – Pair - Share

- Partner A – explain to partner B what you learned about intrusive rocks **Ex where they are formed, chemical composition, and an example**
- Partner B – explain to partner A what you learned about intrusive rocks
- **Ex where they are formed, chemical composition, and an example**

Oral assessment:

- ▣ **How can you distinguish extrusive from intrusive rocks?**

National Geographic

- Read the captions, and examine the pictures on page 280.
- How do sills and dikes differ?
- Which is older, the sill or the rock surrounding it?
- Explain.

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Which rock can be classified as igneous?

How do you know?

Which rock should the student classify as an igneous rock?

- F 1 ←
- G 2
- H 3
- J 4