

Igneous Rocks

Chapter 1

Igneous rocks (IG-nee-us) that form during violent volcanic eruptions are some of the most beautiful and deadliest natural events on Earth. All igneous rocks were once molten rock that formed during volcanic eruptions or cooled underground. The amount of quartz in the rock determines the type of igneous rock that forms.

There are four broad categories of igneous rocks based on their quartz content.

- **Basalt** — 45% to 54% quartz.
- **Andesite** — 54% to 62% quartz.
- **Dacite** — 62% to 69% quartz.
- **Rhyolite** — 69% to 80% quartz.



People viewing lava flow on Kilauea 2018 NPS

Magma, which is molten rock underground, becomes lava when it reaches the surface of the Earth. Gases in magma expand as it reaches the Earth's surface forcing the molten rock out of the volcano during volcanic eruptions. Pyroclastic rock is a general term given to all rock that forms during

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volcanic eruptions. Individual names of pyroclastic rocks are based on their size.

- Ash is as fine as flour or as large as a grain of rice. It is gritty to the touch.
- Scoria (cinders) are larger than a grain of rice up to the size of a golf ball.
- Blocks and bombs are the largest pyroclastic rocks. Blocks are chunks of rock blown out of a volcano during violent eruptions that can be as large as a house.
- Lava bombs are molten clots of lava blown out of a volcano that cool while in the air. They often take on a football shaped appearance.

Shield volcanoes, stratovolcanoes, dome volcanoes and cinder cones are all types of mountains formed by volcanic eruptions. Shield volcanoes form when basalt flowing out of a volcano's vent forms thin layers of lava creating a volcano with gentle slopes that remind people of a warrior' shield. The Hawaiian Islands are shield volcanoes.



Lava Butte, a cinder cone in the Cascade Mountains MLM

Volcanic Rocks

Activity 1

Introduction

Volcanoes erupting rivers of lava that flow down the slopes of a volcano and molten rock cooling deep underground are examples of igneous rocks. In this activity you will be studying twelve important igneous rocks and making notes about them.



Lava cast of a tree in Lava Cast Forest. MLM

Materials

- Hand lens or small microscope
- Rocks in your kit or samples of 12 rocks listed in this activity
- Paper
- Pencil

Directions

1. Read the information about the twelve rocks on the following pages.
2. After reading about the rocks take out each rock and examine it carefully
3. Make short notes about each rock on your **Notes on the Chapter** page that follows the activity pages.
4. Here are some ideas of things you might include in your notes.
 - a. Is the rock a solid color or does it have spots?
 - b. Is the rock rough or smooth when you run your fingers over the rock?
 - c. When you pick up the rock, does it feel heavy or light compared to the other rocks in your kit?
 - d. Is the surface of the rock shiny or dull?
 - e. Did it form in a lava flow or during an explosive eruption?
 - f. List several facts that will help you remember the name of the rock.
 - g. You can use this information you gathered in future chapters.

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