

# AIM | What are igneous rocks?

Key

7

There was a time when there were no rocks. Billions of years ago, the earth was just a huge ball of burning gases. As this ball traveled through space it started to cool. The cooling changed the gases to liquids. Then more cooling took place. Some of the liquids changed to solid rock.

Rocks that have hardened from liquids are called igneous [IG nee us] rocks. The word "igneous" comes from the Greek word for fire.

All rocks did not cool the same way. Some cooled slowly, deep under the earth's surface. Others cooled quickly, near or on the surface. Different speeds of cooling made different size crystals.

- Slow cooling formed rocks with large crystals.
- Rapid cooling formed rocks with small crystals.
- Extra-fast cooling formed rocks with no crystals.

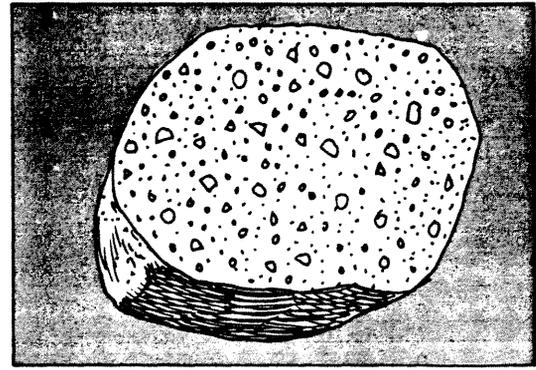
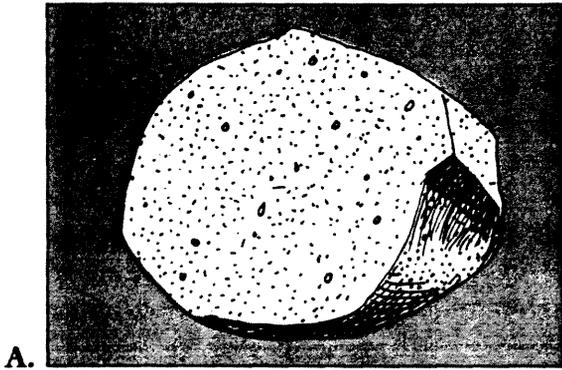
*The longer the cooling, the larger the crystals. The shorter the cooling, the smaller the crystals.* If we know this, we can look at a rock and tell if it cooled slowly or quickly.

In some places, there are still hot, melted minerals in the ground. Some of this is slowly turning to rock. The hot, melted matter under the ground is called *magma* (MAG mah). Sometimes magma forces its way to the surface. Then it is called *lava*. Lava forms cone-shaped mountains. Most people call these mountains *volcanoes*.

NAME \_\_\_\_\_

# SOME IGNEOUS ROCKS

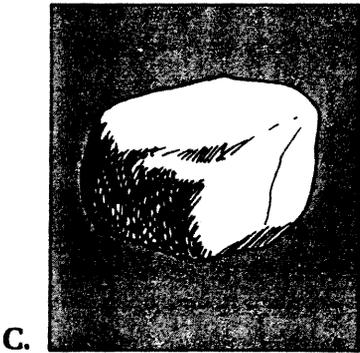
I.



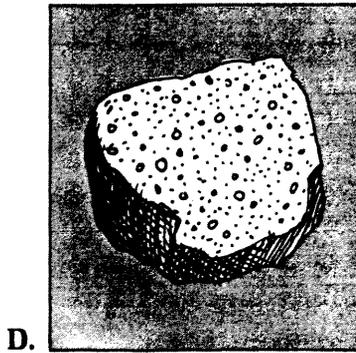
Granite is the most common igneous rock on the earth's surface. Both of these rocks are granite.

1. a) Which one has larger grains? B
- b) This shows that it cooled slowly.  
            slowly, quickly
2. a) Which one has smaller grains? A
- b) This shows that it cooled quickly.  
            slowly, quickly
3. Which one cooled deeper under the ground? B

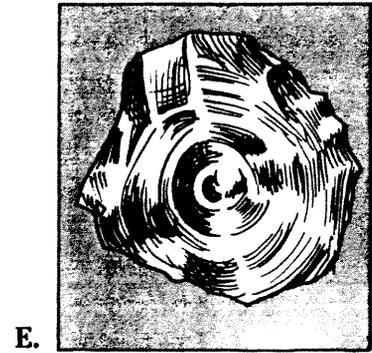
II.



Basalt crystals are very tiny. You need a microscope to see them.



Pumice has many holes. But these holes are not grains. They were made by gases.



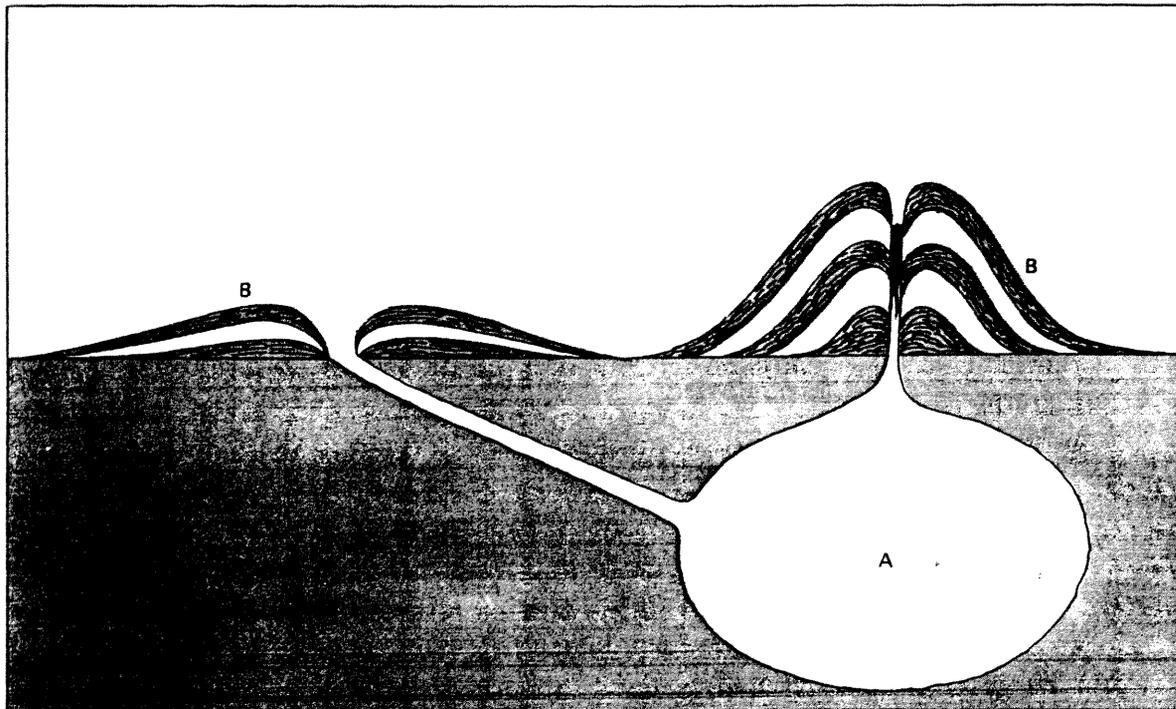
Obsidian is called "natural glass."

Pumice and obsidian have no crystals.

4. Basalt grains are small because of fast cooling.  
            fast, slow
5. Pumice and obsidian cooled extra.  
            extra fast, extra slow

# WHAT DOES THE DIAGRAM SHOW?

Study this diagram. Then answer the questions below. You will have to figure out the answers from facts you have learned.



This diagram shows two mountains built from underground materials. It also shows the underground materials that built them.

1. Lava is found at B.  
A, B
2. Magma is found at A.  
A, B
3. Magma cools slowly because it is under the ground.  
slowly, rapidly      under the ground, above the ground
4. Lava cools rapidly because it is above the ground.  
slowly, rapidly      under the ground, above the ground
5. Large-grain rocks form from magma.  
lava, magma
6. Rocks with small grains or no grains at all form from lava.  
lava, magma
7. Granite has large grains.  
large, small, no
8. Pumice has no grains.  
large, small, no
9. Granite may form at A.  
A, B
10. Pumice may form at B.  
A, B

NAME \_\_\_\_\_

## COMPLETING SENTENCES

Complete the sentences with the choices below. Two of these may be used twice.

large  
magma  
small

melted  
lava  
volcano

granite  
crystal  
slowly

1. Igneous rocks were formed from melted minerals.
2. Melted rock under the ground is called magma.
3. Melted rock that comes to the surface is called lava.
4. Lava may form a mountain called a volcano.
5. An example of an igneous rock formed from magma is granite.
6. Granite grains are large in size because granite cooled slowly.
7. Grain size is another way of saying crystal size.
8. Basalt crystals are small in size.
9. Melted minerals that cool slowly form large size crystals.
10. Melted minerals that cool rapidly form small size crystals.

## MATCHING

Match the two lists. Write the correct letter on the line next to each number.

- |                          |                                     |
|--------------------------|-------------------------------------|
| 1. <u>d</u> magma        | a) grain                            |
| 2. <u>c</u> lava         | b) from fast cooling                |
| 3. <u>a</u> crystal      | c) melted minerals on the surface   |
| 4. <u>e</u> large grains | d) melted minerals below the ground |
| 5. <u>b</u> small grains | e) from slow cooling                |

## TRUE OR FALSE

Write T on the line next to the number if the sentence is true.  
Write F if the sentence is false.

1. F Magma is solid.
2. T Magma contains minerals.

3.   T   All rocks were once liquid.
4.   F   Magma is melted rock that has come to the surface.
5.   T   Lava cools faster than magma.
6.   T   Granite formed underground.
7.   F   Granite cooled rapidly.
8.   F   Granite has small grains.
9.   F   Lava rocks usually have large grains.
10.   T   Fast cooling causes small grains.
11.   T   Basalt is an igneous rock.
12.   F   Basalt cooled slowly.
13.   T   Basalt has small grains.
14.   F   Pumice was formed deep underground.
15.   T   Pumice has no grains.

**THROW ONE OUT** In each of the following sets of terms, one of the terms does not belong. Circle that term.

1. granite,   fine grain  , coarse grain
2. granite, slow cooling,   fast cooling
3. granite,   formed above ground  , formed underground
4.   very slow cooling  , very fast cooling, no crystals
5. lava,   underground  , above ground

**REACHING OUT** One of the rocks discussed in this Aim can float on water.

1. Which rock is it?           pumice
2. Why can it float?           there are pockets of air bubbles

NAME           in the rock to make it float