



**ANSWER KEY**

**Exercise: 1**

**Instructions:** Craters of the Moon national monument was established to preserve its unique volcanic features. It protects 83 square miles of land and is a great educational setting. It is home to many species of plants and animals adapted to live in dry volcanic habitats. By doing this exercise, you will become very knowledgeable about this unique area.

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A. Definitions: Define the following terms.

1. aa lava- Lava flow that has a rough, jagged appearance.
2. block lava– Is basaltic lava in the form of a chaotic assemblage of angular blocks.
3. caldera– Formed when earth sinks down to replace space once filled by hot lava.
4. crust– The outer layer of the earth that consists of hard rock, it can vary in thickness from place to place.
5. kipuka– An Island of vegetation that is surrounded by a lava flow. Such islands of vegetation are often protected from grazing by these jagged lave fields and may contain plant communities more typical of the Snake River Plain 200 years ago.
6. pahoehoe lava– Lava flow that has a smooth, ropy, or billowy surface.
7. lava flow- Area of lava that cooled after it spilled onto the surface of the earth.
8. magma- Molten rock under the surface of the earth

B. Questions: Answer the following questions.

1. Where are the Craters of the Moon located?

The Craters of the Moon is located at the north edge of the eastern Snake River Plain.

2. Briefly describe how and when the Craters of the Moon became a National Monument.

The Craters of the Moon became a national monument in 1924. It was made a national monument to preserve its unique volcanic features.

3. What is the Great Rift? How is it related to the Craters of the Moon?

The Great Rift is a zone of cracks in the earth's crust running northwest to southeast across the eastern part of the Snake River Plain. The great rift extends through the Craters of the Moon and it is made apparent by the linear arrangement of the cinder cones.

4. What is the "hot spot"? How is it related to the Craters of the Moon?

The Yellowstone hot spot is a place where the earth's crust is thin. This hot spot allows the emergence of a "plume" of molten rock (magma) which rises buoyantly to the surface of the earth. The North American 'plate' of the earth has moved over the hot spot for many millions of years. Roughly 8 million years ago, the hot spot was under the Craters of the Moon, which was a time of violent eruptions in this area.

5. Are the Craters of the Moon volcanoes extinct, or dormant? Explain your answer.

The Craters of the Moon volcanoes are dormant, but they have gone through eight different eruptive periods and could erupt again within the next thousand years.

6. How did the cinder cones form?

Cinder cones were formed from expanding gases in the lava during eruptions that threw bubbly rocks hundreds of feet into the air. In some cases these cinders showered the ground and cooled to form cones at the vicinity of where they came out of the ground.

7. What is a volcanic bomb? Briefly describe the four types of volcanic bombs found at the Craters of the Moon.

A volcanic bomb is a glob of molten rock that gets thrown into the air. A twisted glob is called a spindle bomb. If it is long, thin, and twisted, it is called a ribbon bomb. If gases expand and break the outside, it is a bread crust bomb. If it does not solidify in flight, it is a cow-pie bomb.

8. What is a tree mold? (Distinguish between biological molds and the Craters of the Moon variety)

'Tree molds' are formed when lava encased trees and the trunks left impressions in the rock. In some places the trees remained standing as they were encased.

9. Did Native Americans ever live at the Craters of the Moon?

Because of the harsh conditions, none of the local Indian tribes made a permanent home in the lava flows. However, numerous Northern Shoshoni artifacts, temporary shelters, and hunting blinds have been found in the monument. This indicates that they did venture into the area occasionally, probably to hunt and gather tachylite (a very dense form of basalt) for arrow points.

10. What makes the Craters of the Moon so special geologically?

The Craters of the Moon is literally an outdoor classroom to study volcanic geology. The Craters of the Moon lava field is the largest basaltic, dominantly Holocene (last 10,000 years) lava field in the lower 48 states. It has nearly every type of feature associated basaltic systems and park trails give convenient access to most of them. So short of going to Alaska or Hawaii, this is one of the best places in the United States to study this type of volcanism.

11. Did NASA astronauts really train at the Craters of the Moon?

The second group of astronauts to walk on the moon visited the Craters of the Moon in 1969. Although they did not actually train here, they did study the volcanic geology. They were also able to explore an unusual and harsh environment in preparation for their trip into space.