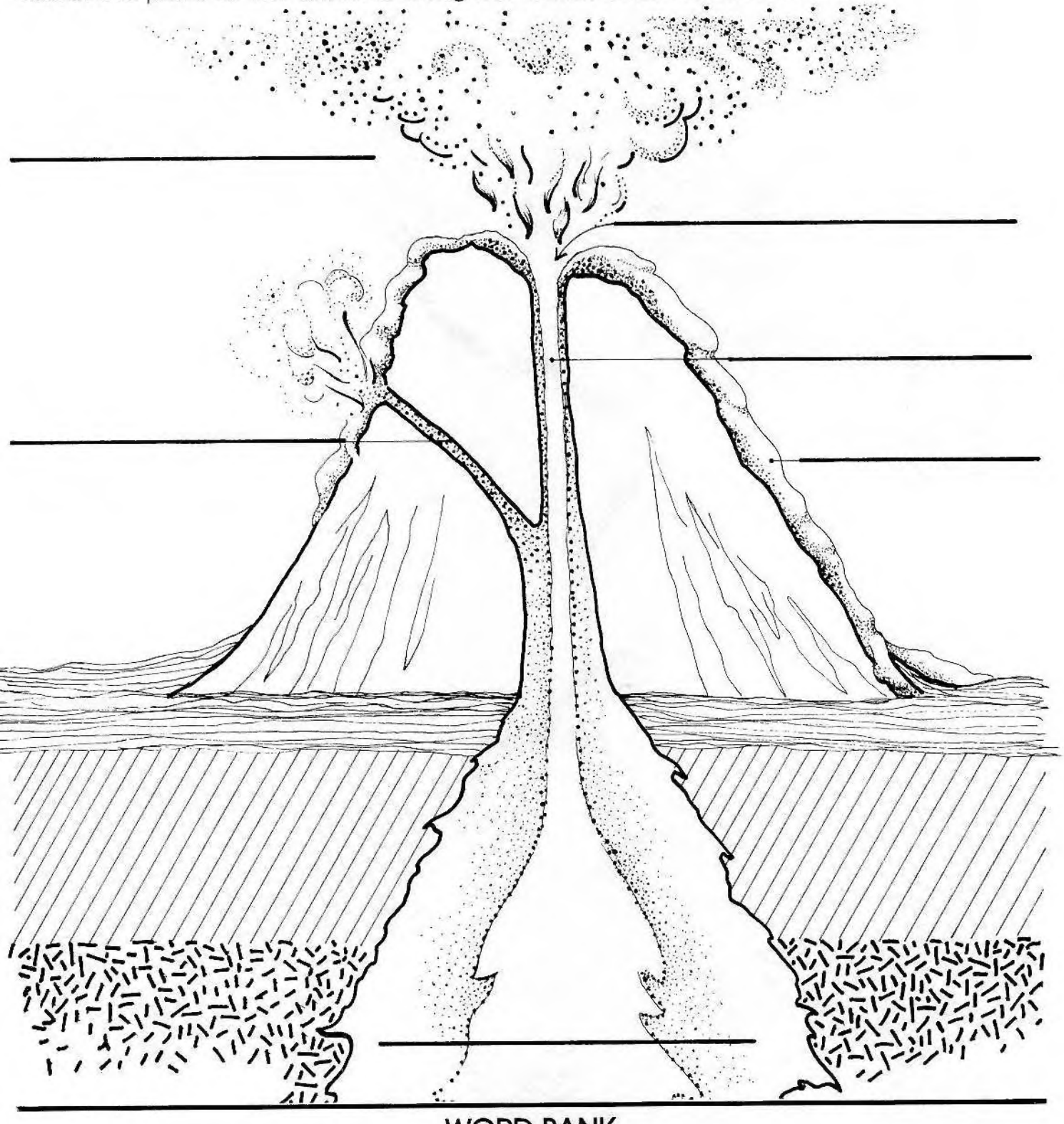
Volcanoes

Name_____

Label the parts of this volcano using the words from the **WORD BANK.**



WORD BANK

central vent	lava	conduit
magma chamber	side vent	gas and dust

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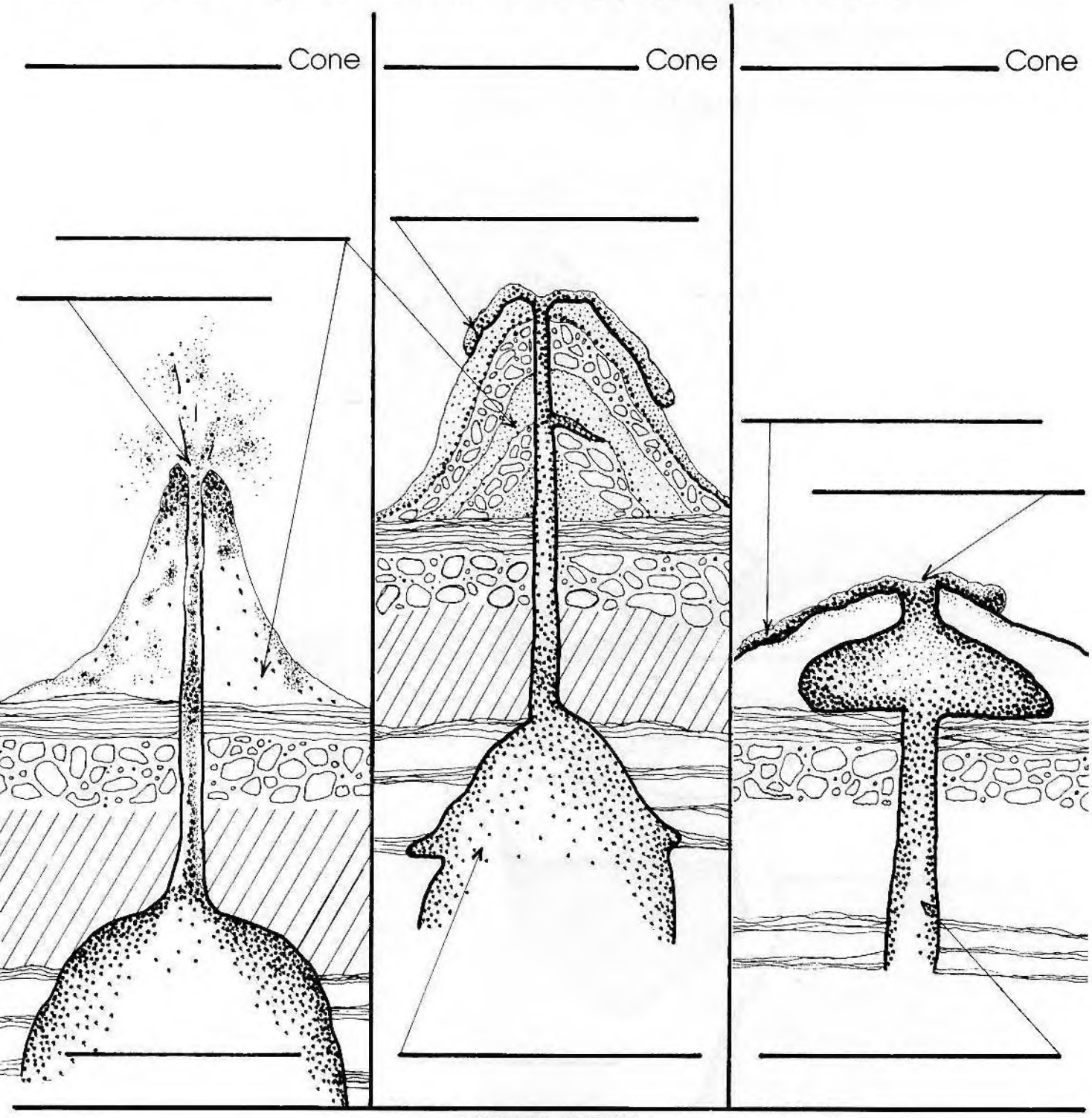
Volcanic Cones

Name_____

Volcanic cones can be classified by their shapes. Label the three different kinds of volcanic cones pictured below. Label the parts of the volcanoes.



WORD BANK

Shield	Composite	Cinder	magma
vent	lava flow	cinders	

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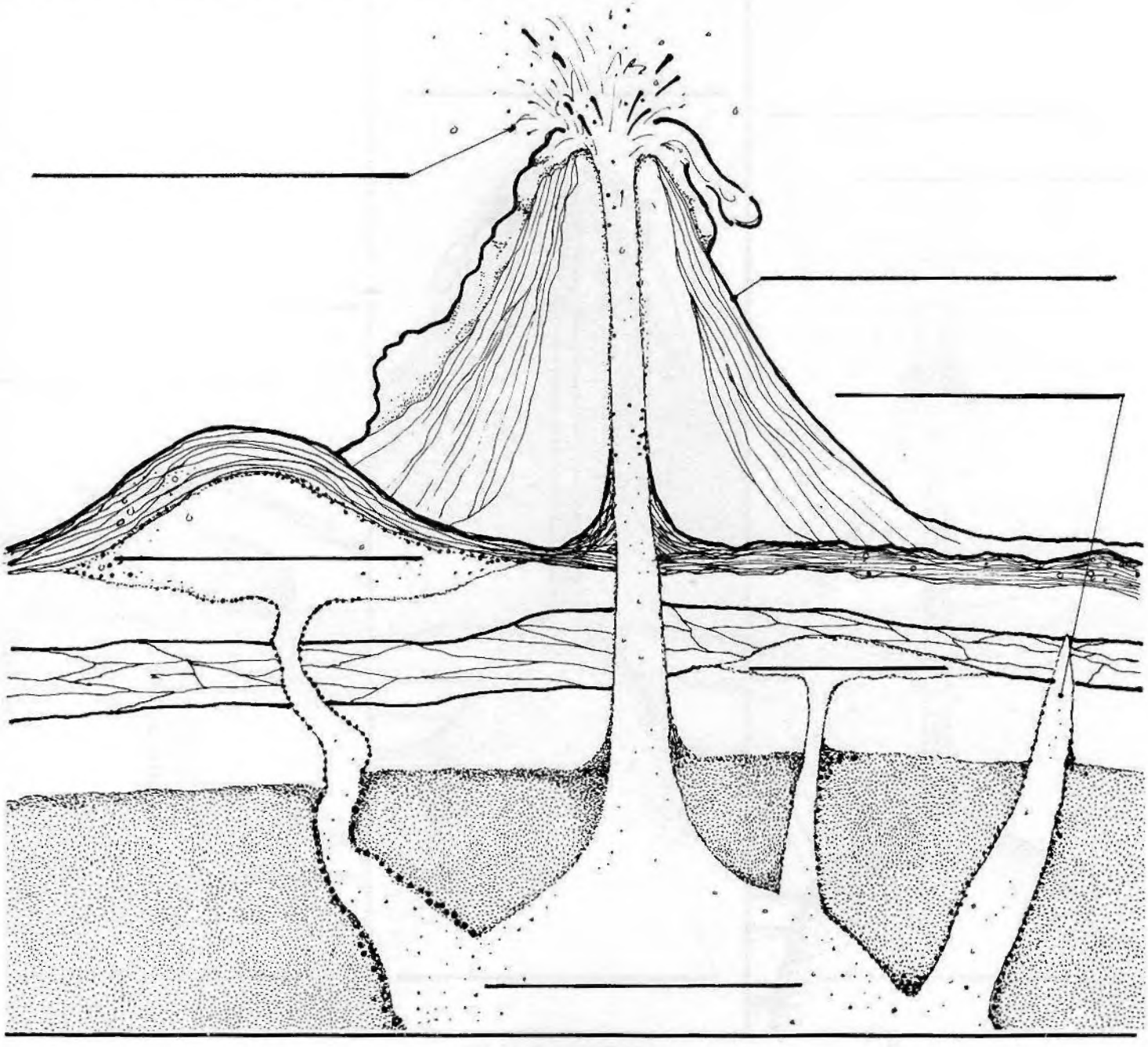
Forming Igneous Rock

Name _____

Igneous rock is one of the three major types of rock. It is formed by the hardening of molten rock (magma). Magma does not always reach the earth's surface as lava erupting from a volcano. It often forms other igneous rock structures underground.

Label the igneous rock structures shown here.



WORD BANK

laccolith	sill	dike	batholith
lava	volcano		

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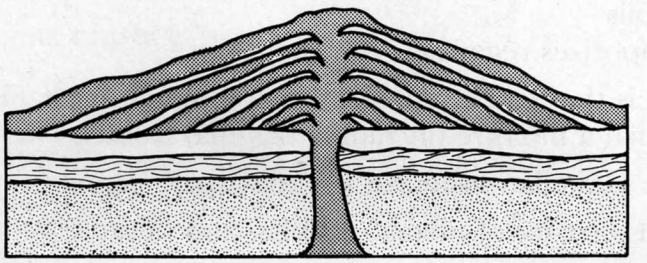
What Causes an Explosive Volcano to Erupt?

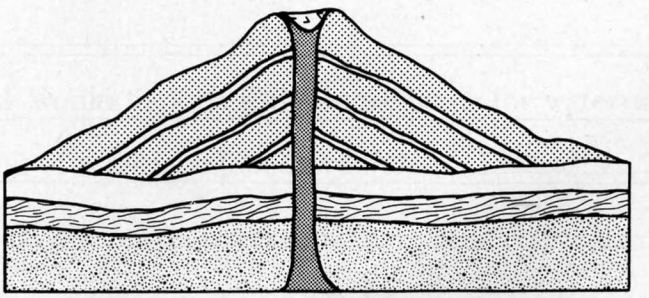
In May 1980, Mount St. Helens, a volcano in the state of Washington, erupted explosively. Have you ever wondered why?

There are basically two types of volcanic eruptions: quiet eruptions and extremely explosive eruptions. Quiet eruptions may seem quite explosive and violent, but they are really calm when compared to the explosive type of volcano. Tremendous energy is released when an explosive volcano erupts.

Quiet eruptions with many lava flows are common in the Hawaiian Islands. These volcanoes, which build up in a form shaped like a broad shield, are called shield volcanoes. Over millions of years a volcano made from quiet eruptions would look similar to the diagram below.



Some volcanoes are made from the repeated eruptions of cinder. These volcanoes are called cinder cones. Cinder cones look similar to the diagram below.



Another type of volcano is the composite cone. It is made from the repeated eruptions of ash, lava, cinders, bombs, and all manner of volcanic debris. Most of this debris is called pyroclastics. Composite volcanoes usually are large in size and shaped like a tall cone. Examples of composite volcanoes are Mount Rainier in Washington, Mount Hood in Oregon, and Mount Egmont in New Zealand. Most composite volcanoes look similar to the diagram on the following page.

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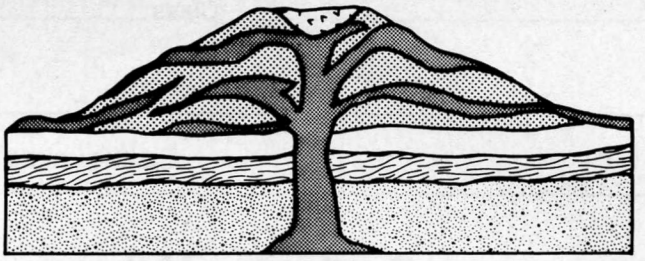

Once in a while, composite volcanoes erupt with tremendous violence. Examples of these violent eruptions are Krakatoa in the East Indies, Mount Vesuvius in Italy, Mount Etna in Sicily, and Mount St. Helens.

Part A

The data listed below will help you formulate a hypothesis about why certain volcanoes erupt violently. Read through the data and in the space provided, write the theory you have formulated.

1. There are two main types of magma—wet (granitic) and dry (basaltic).
2. There are several critical temperatures in nature.

0°C	water freezes
100°C	water boils
376°C	water vaporizes regardless of the pressure

3. The eutectic point is the temperature at which minerals crystallize. It is the lowest temperature at which a mixture (including magma) freezes.
4. The magma of the Hawaiian Islands is dry (basaltic) magma.
5. Magma is a molten mixture of metals, sulfides, and silicates.
6. Magma is liquid because its temperature is between 600 and 1200°C.
7. Magma contains the elemental ingredients to form water. These ingredients would form water if the temperatures were not so high. If water could form, 6 to 8 percent of the magma would be water. This is why wet magmas (granitic) are "wet."
8. Magma can hold no more than 8 percent water.

Name _____ Class _____ Date _____

Part B

Answer the following questions.

1. Name three different types of volcanoes.

   a. _____

   b. _____

   c. _____

2. Name two types of magma.

   a. _____

   b. _____

3. Which type of magma causes quiet volcanoes?

   _____

4. Which type of magma causes explosive volcanoes?

   _____

5. What is the name for the temperature at which a mixture freezes? _____

6. Is granitic magma wet or dry? _____

7. Is basaltic magma wet or dry? _____

8. What two factors seem to be most important in the formation of an explosive eruption?

   a. _____

   b. _____

9. What do you think would happen if the ingredients for water were present in wet magma and cooling of the magma occurred? _____

   _____

   _____

   _____

10. What do you think is meant by "flash freezing" in relation to your answer to question 9? _____

    _____

    _____

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