

Types of Volcanoes

Most people have never seen a real volcano but have learned about them through movies or books. So when most people think of a volcano, they usually conjure up the Hollywood version: a huge, menacing conical mountain that explodes and spews out masses of lava which falls on rampaging dinosaurs, screaming cave people, or fleeing mobs of betogaed Romans--depending on their favorite volcano disaster movie. While those types of volcanoes do indeed exist, they represent only one "species" in a veritable zoo of volcano shapes and sizes.

Some types of volcanoes are easily recognizable and some are not. The "Hollywood" types are easily recognized. Many are located in populated areas and have well-known names: Vesuvius, Krakatoa, Fujiyama, and Mount St. Helens (Figure 2). These volcanoes are typically tens of miles across and ten thousand or more feet in height. As illustrated in Figure 1, they have moderately steep sides and sometimes have small craters in their summits. Volcanologists call these "strato-" or composite volcanoes because they consist of layers of solid lava flows mixed with layers of sand- or gravel-like volcanic rock called cinders or volcanic ash.

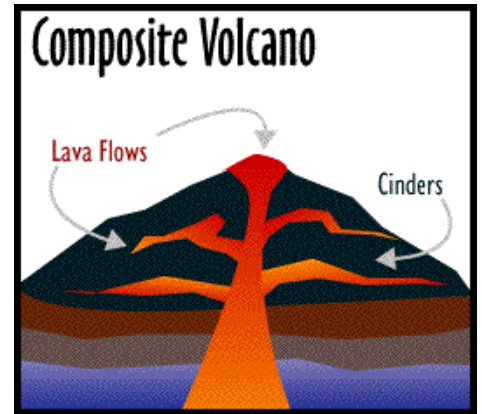


Figure 1



Figure 2: Mt. Saint Helens in Washington.

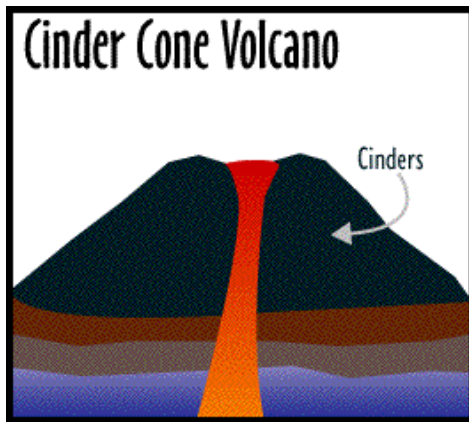


Figure 3

Another easily recognized type of volcano (Figure 3) is the "cinder cone." As you might expect from the name, these volcanoes consist almost entirely of loose, grainy cinders and almost no lava. They are small volcanoes, usually only about a mile across and up to about a thousand feet high. They have very steep sides and usually have a small crater on top. An example is Sunset Crater near Flagstaff, Arizona (Figure 4).



Figure 4: Sunset Crater in Flagstaff, Arizona.

A third easily recognized volcano may be familiar to you from news reports from Hawaii: the "shield" volcano (Figure 5). This type of volcano can be hundreds of miles across and many tens of thousands of feet high.

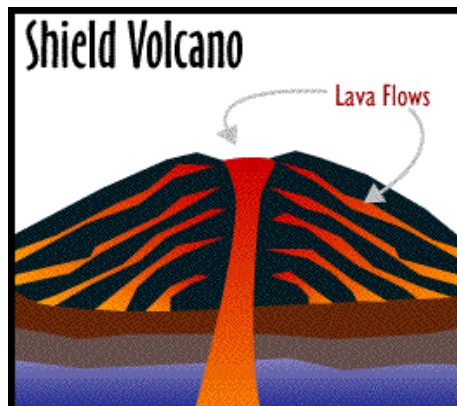


Figure 5

The individual islands of the state of Hawaii are simply large shield volcanoes. Mauna Loa, a shield volcano on the "big" island of Hawaii, is the largest single mountain in the world, rising over 30,000 feet above the ocean floor and reaching almost 100 miles across at its base. Shield volcanoes have low slopes and consist almost entirely of frozen lavas. They almost always have large craters at their summits. Figure 6 shows another example: the island of Kahoolawe, Hawaii.

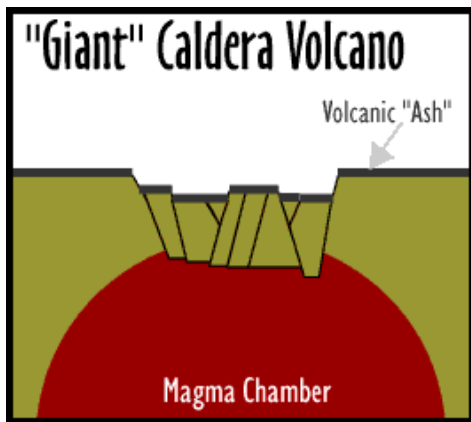


of

Figure 6: Kahoolawe, Hawaii.

Two important types of volcano are difficult to recognize, especially when they are very large. The first of these is the

"giant caldera" (Figure 7). Calderas, which are simply circular depressions, are found on the summits of many volcanoes. "Giant" calderas are the largest of these: huge craters up to many tens of miles across. Giant Calderas form by collapse in gigantic eruptions that spew volcanic rocks out hundreds or even a thousand miles in all directions. Sometimes the



calderas are so filled with lava and volcanic ash that there is no recognizable depression at all. These can only be found by carefully locating the big fractures or "faults" in the ground that mark the edges of the caldera. One such caldera nearly fills Yellowstone National Park. In other cases, the edges of the caldera remain as large cliffs or ridges surrounding the central depression. However, the

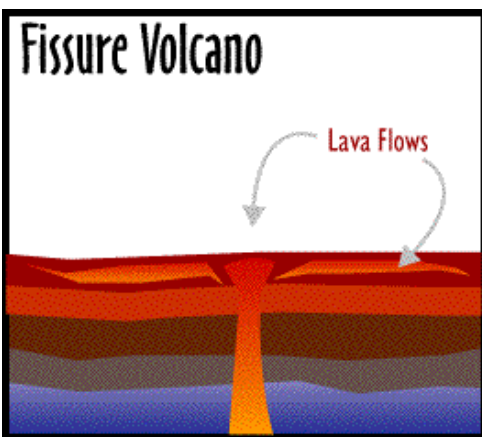
depression is so large that a person standing in the middle of it could hardly see the edges and would only recognize them if they were pointed out. These giant calderas can best be seen in images taken from space, like the one of the Valles Caldera in New Mexico (Figure 8).



Figure 8: A satellite image of the Valles Caldera in New Mexico.

Figure 7

The second type of volcano which is difficult to recognize either from the ground or from space is the "fissure eruption" (Figure 9). In this type, there is no central crater at all. Instead,



giant cracks open in the ground and expel vast quantities of lava that spread far and wide to form huge pools that can cover almost everything around. When these pools of lava cool and solidify, the surface remains mostly flat. Since the source cracks are usually buried, there is often nothing "volcano-like" to see--only a flat plain. The fissure eruption shown below was at Los Pilas volcano in Nicaragua in 1952 (Figure 10).



Figure 10: Los Pilas volcano in Nicaragua.

Figure 9