

Reading Assignment **Loihi: Hawaii's Newest Island**

1. Cut the reading sheet in half vertically. Using two pages in your notebook, glue them each on the left side of the page, leaving the right side open as a column to write your answer in.
2. Skim (do a quick-read) through the article. As you come across the following words, highlight them and then define them in the empty space to the right. Choose 3 of these words to also create a quick, simple illustration of. (Define all 6, but choose 3 to also illustrate)
 - **Seamount** - a mountain rising from the ocean floor that does not reach to the water's surface
 - **Caldera** - a large depression formed when a volcano erupts and collapses
 - **Summit** - the highest point of a hill or mountain
 - **Manned submersible dives** - A submarine expedition that is controlled by a person inside the sub, not remotely.
 - **Oceanographers** scientists studying the physical and biological process of the ocean
 - **Hydrothermal vents** - vents pouring hot, mineral-rich fluids from beneath the seafloor, commonly found in volcanically active places
 - **Submarine** - existing, occurring, or being used under the surface of the ocean
3. Re-read the article, slowly this time. For each paragraph, underline (with a highlighter or colored pen) what you think is the most important sentence or phrase.
4. Create a space somewhere on your notebook page that says MOST IMPORTANT FACTS and list 3-5 things that you thought were the most important takeaways from this article. *These could come from your highlighted phrases, but should be in your own words.*
5. Create another space on your notebook page that says MAIN IDEA and use that space to write a 1-2 sentence summary of what you think was the main idea of this article.
6. Use Google Maps (www.maps.com) to explore the island of Hawaii and find the location of the it's recently active volcanoes: **Mauna Kea**, **Mauna Loa**, **Kilauea**, **Hualalai**, and **Kohala**. If you cannot find the names by zooming in, then try typing them into the search bar and see where that takes you. Label their location on the map you were given. Based on their surroundings (is there bare rock or plant growth?), color in red for the ones you believe are still actively erupting in the past thousand years.
7. Illustrate on that same map the rough area where **Loihi** exists as a seamount - search it in Google Maps and then view in satellite mode - you'll see the seamount, as well as others.

Loihi: Hawaii's Newest Island

Coming soon to the Pacific Ocean!

Well, coming soon in earth-time, but not so soon in human-time. You may never be able to visit Loihi in your lifetime, but if the hot-spot theory is correct, the next volcano in the Hawaiian chain should be currently forming east or south of the Island of Hawai'i. Loihi is currently a seamount located about 20 miles off the south coast that rises 10,100 feet above the ocean floor to within 3,100 feet of the water surface. It is located above the Hawaiian hot spot, a plume of magma pushing up through Earth's crust. Underwater mapping shows that it's relatively flat summit apparently contains a 3 mile wide caldera.

Evidence indicates that Loihi is slowly growing, as expected. Samples have been collected of rock created by lava flow. Although the exact ages of the sampled Loihi flows are not yet known, geologists believe they cannot be more than a few hundred years old. Since 1959, seismic detector technology has recorded multiple large earthquakes. Between July and August of 1996 more than 4,200 earthquakes were detected within Loihi's location. Ninety-five of these earthquakes had magnitudes of 4.0 or larger, and three of them were felt onshore by residents on the nearby island of Hawaii. This activity suggests that the seamount is very much active and working to make its way closer to the surface of the ocean.

The intense 1996 earthquake activity at Loihi prompted oceanographers at the University of Hawaii to make submarine expeditions in the months following the heavy seismic activity, to explore any changes that may have occurred. These manned-submersible dives, along with radar technology onboard oceanographic ships, were able to map the surface of the seamount, make closeup observations, and collect lava samples. They found that part of Loihi's summit had collapsed, forming a new pit crater, about 1,800 feet across and 900 feet deep.

Several new hydrothermal vents were observed within the crater, with the hottest vent waters ever recorded for Loihi vents (about 390°F). From the regular earthquake activity and associated changes in structure, Loihi appears to be an actively growing, but still submarine, volcano.

No one knows for sure when Loihi will erupt above the surface and become a volcanic island, although it is unlikely it will happen anytime in your lifetime. Even once an island, it wouldn't resemble what we know as a beautiful, lush, tropical Hawaiian island. With hot lava flow, bare rock, and no vegetation, it wouldn't make for an ideal vacation spot for at least a few hundred thousand years.

The other Hawaii Islands

The six largest Hawaiian Islands—the Big Island (Hawaii), Maui, Lanai, Molokai, Oahu, and Kauai—are all also the newest Hawaiian Islands. They form a chain of islands running to the northwest, and that chain includes many more islands to the northwest that are older and heavily eroded away. The islands appear in this line because they were formed one after the other as the Pacific (tectonic) plate moved over the hot spot.

The Big island of Hawaii is the newest and largest, and it is still active because it's still over the hot spot. At one point in its lifetime, it was nothing more than the seamount that Loihi is today. The future the Big Island of Hawaii looks like the others (Maui, Lanai, Oahu, etc) as it will get smaller over time as millions of years of erosion, both above and below the water, have it's effect. As it moves further from the hotspot, it will eventually no longer be volcanically active and the regions of bare lava rock that it has today will eventually fill in with lush tropical forests. Then someday, it will sink entirely below water, leaving behind nothing but the coral reefs that have formed around it. This is the evolution of volcanic islands on Earth, and Loihi will follow in the same footsteps as Hawaii, literally.

The "Big Island Hawaii's Active Volcanoes:

