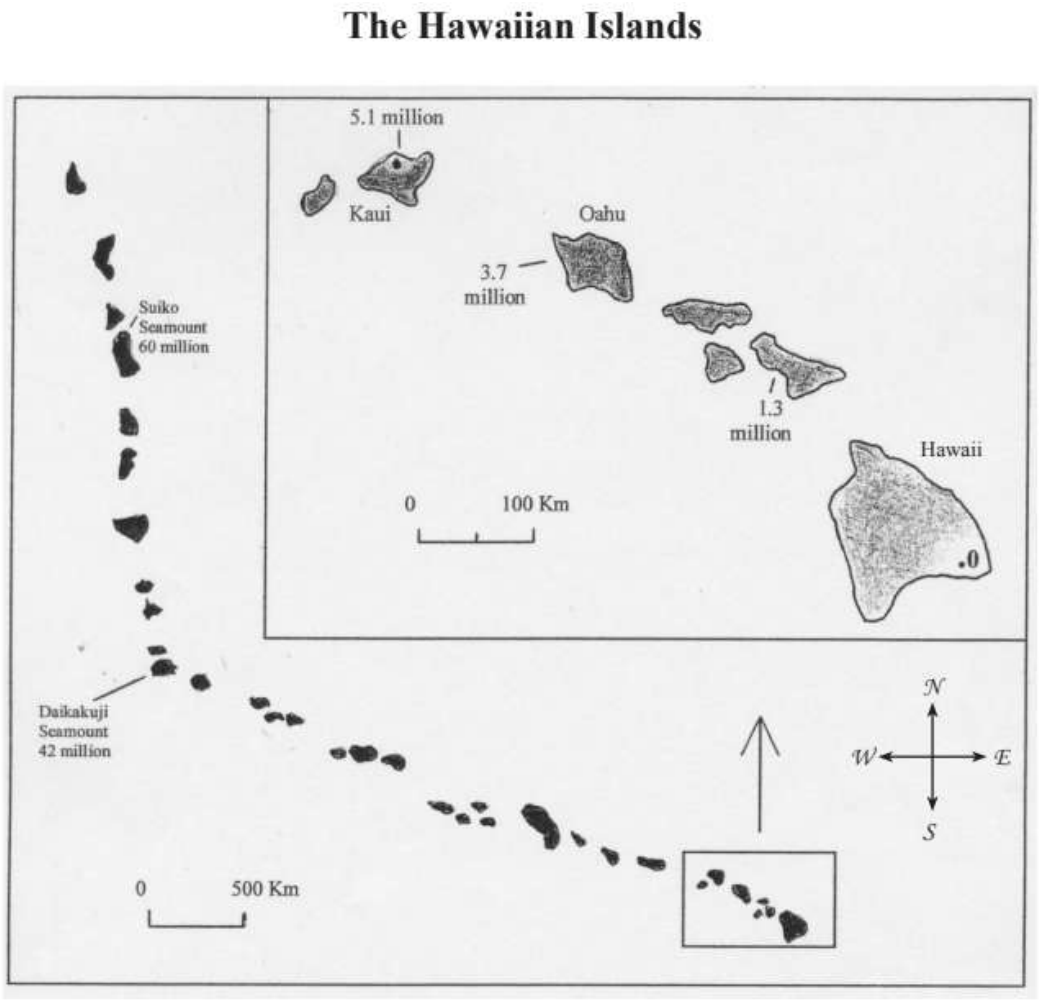
Unit 2 Physics Performance Task

- Complete on a separate sheet of paper and turn in to teacher by the due date.

Part 1: Motion Basics (show all calculations and work!)



The sites of islands, seamounts, and guyots produced by the Hawaiian Hot Spot and the moving Pacific plate.

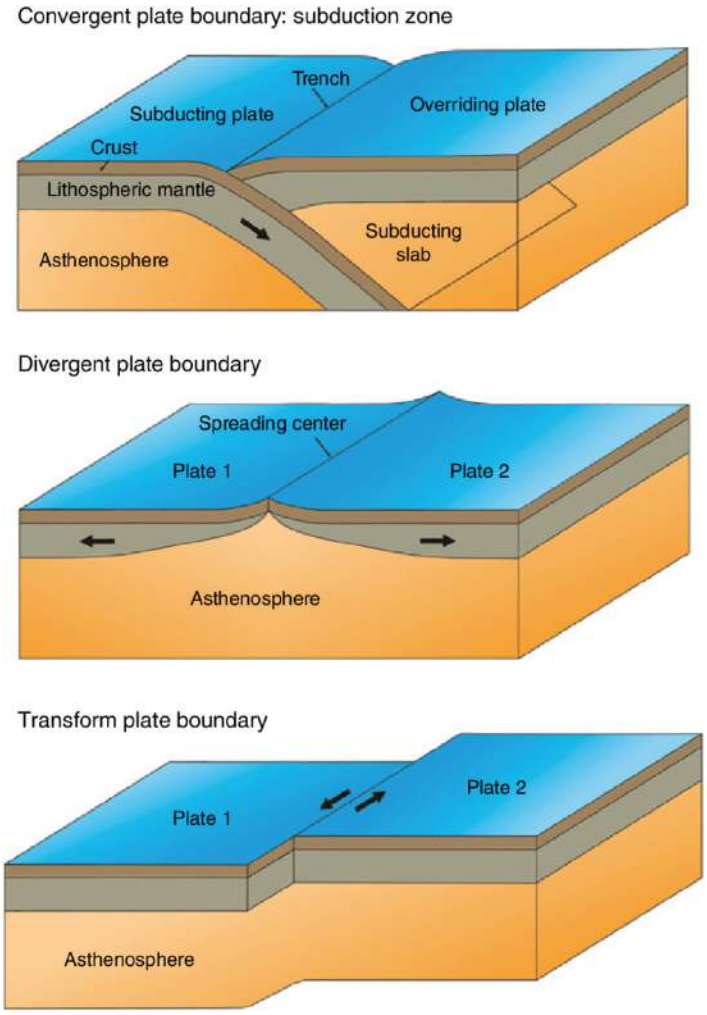
The image above shows the chain of islands and seamounts formed by the Hawaiian Hot Spot as the tectonic plates moved over millions of years. The **.0** mark represents the current hotspot location on the southeastern edge of the main island, Hawaii. The years next to the islands represent how long ago the hot spot was in that location, or the age of that island location in millions of years.

1. Using the southeastern edge of the main island, Hawaii, as the location of the current hot spot, determine the distance (in km) between Hawaii and Kuai, where the hot spot was located in the past. Hint: use the map scale

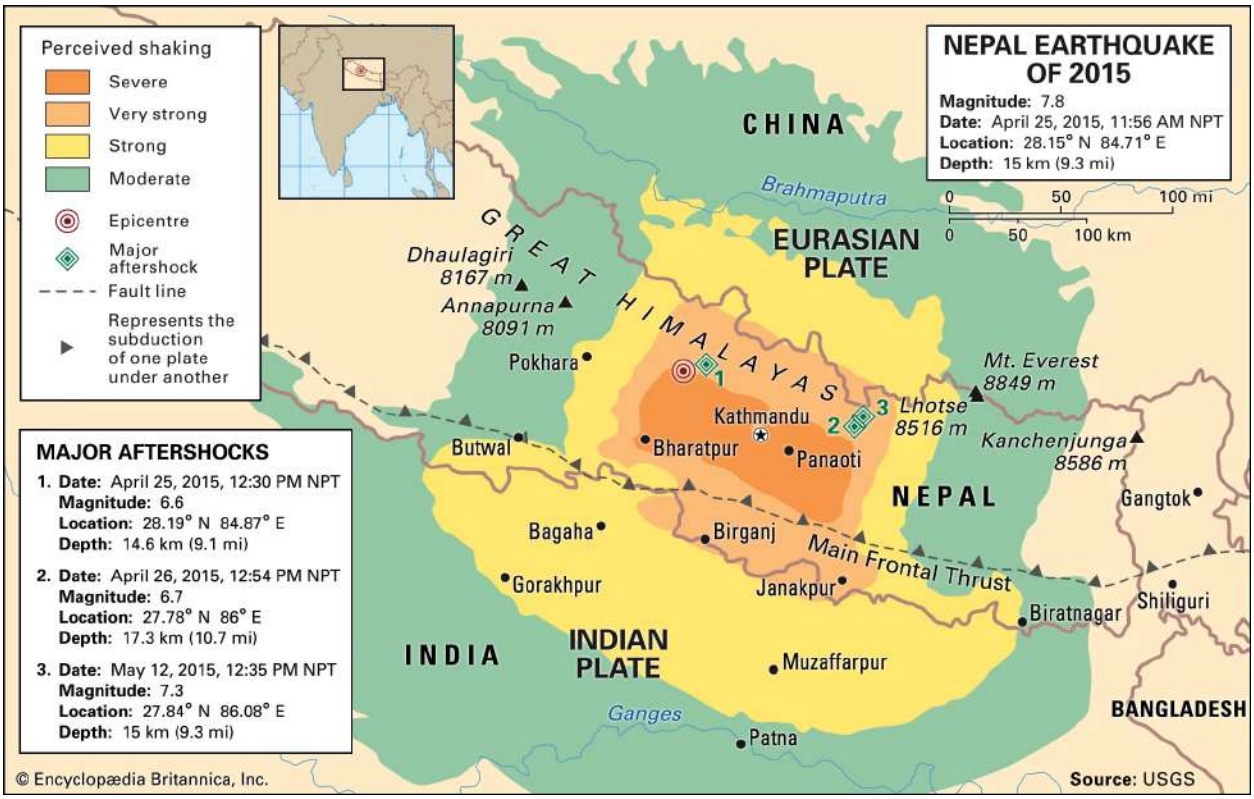
2. Using the southeastern edge of the main island, Hawaii, as the location of the hot spot, determine the average rate of plate motion (speed) between now and the time that island Kaui was located at the hot spot.
3. What is the average rate of plate motion (speed) for the last 42 million years (use the Daikakuji Seamount location)?
4. Looking at the entire pattern of the Hawaiian-Emperor chain, what information does it provide about the history of movement of the Pacific Plate (in addition to plate rate)?

Part 2: Forces

1. For each of Newton's Three Laws, describe how each law relates to plate movement (see the image for reference). You are not applying the three laws to each type of plate movement, however, you are required to explain each of Newton's Laws in reference to the type of plate movement.



Part 3: Energy



Explore the map above, which represents the Nepal Earthquake of 2015 and subsequent Earthquakes above. Subduction is another name for convergent plates- see the reference image from Part 2.

1. Locate the epicenter of the earthquake and major aftershocks. How do these relate to the transfer of energy? Be specific.
2. Potential energy is stored in the plates and then transferred into kinetic energy. Why does it make sense it is transferred into kinetic energy? What other types of energy is it converted into?