**HOT SPOT ACTIVITY: DETERMINING THE SPEED OF THE PACIFIC PLATE**

Directions

1. Using a ruler and the map provided, measure the distance between the first volcano (Kilauea) and the other island volcanoes.

2. Convert the measurements into kilometers, using the scale on the map.

3. Record the distance on the table “Age of the Hawaiian Islands and Outer Seamounts.”

4. Create a graph with distance in kilometers on the “Y” axis and age in millions of years on the “X” axis, and plot your data.

5. Draw a line to represent the best fit of your data.

Analysis and Discussion Questions

1. Is there a trend in the data? (The answer is “yes”) How can this trend be explained?

2. Explain how these data are consistent with the “hot spot” hypothesis.

3. Calculate the slope of the line: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kilometers/millions of years.

This is the average speed of the plate over time.

4. Convert the slope of the line into centimeters per year: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(divide the answer in #3 by 10)

5. Using the following formula, calculate the approximate speed at which the crust plate was moving between the times that each of the islands formed. Enter your data in Data Table 2.

Speed of crustal movement (cm/yr) = Distance between the two islands (in cm)

Difference in ages of the two islands (in years)

|  |  |
| --- | --- |
| **ISLANDS/SEAMOUNTS** | **SPEED in cm/yr** |
| Hawaii (Kilauea) and Maui |  |
| Maui and Molokai |  |
| Molokai and Oahu |  |
| Oahu and Kauai |  |
| Ojin and Jingu |  |
| Jingu and Nintoku |  |
| Nintoku and Suiko |  |

6. According to your data, did the crustal plate always move at the same speed? Did it speed up? Did it slow down? Explain your answer

7. What happened about 40 million years ago?

What might have caused this?