

Calculating the Velocity of the Pacific Plate

Standard 3.5: Investigate types of volcanism, its associated geologic features, hazards and effects evident in the state of California and the Pacific Rim.

Standard 3.6: Analyze the explanation for the location and properties of volcanoes that are due to hotspots and those that are due to subduction.

Instructions

1. Plot the data from the *table* below on the graph on the *separate* sheet provided.

Ages of some of the Hawaiian Islands and outer seamounts

Volcano Number	Volcano Name	Distance from Kilauea along chain (km)	Best K-Ar age (Ma)
1	Kilauea	0	0
3	Mauna Kea	54	0.375
5	Kohala	100	0.43
6	Haleakala	182	0.75
7	Kahoolawe	185	1.03
8	West Maui	221	1.32
9	Lanai	226	1.28
10	East Molokai	256	1.76
11	West Molokai	280	1.9
12	Koolau	339	2.6
13	Waianae	374	3.7
14	Kauai	519	5.1
17	Nihoa	780	7.2
23	Necker	1058	10.3
27	Brooks Bank	1256	13
37	Northampton Bank	1841	26.6
65	Colohan	3128	38.6
67	Daikakuji	3493	42.4
69	Yuryaku	3520	43.4
74	Southern Koko	3758	48.1
81	Ojin	4102	55.2
86	Nintoku	4452	56.2
90	Southern Suiko	4794	59.6
91	Central Suiko	4860	64.7

Name _____ Period _____

2. Fit a straight line through the data points (as best you can) and find the slope of that line.

$$SLOPE = \text{_____} \text{ Ma / km}$$

3. Convert the slope unit from millions of years (Ma) per kilometer (km) into year per cm.

$$\text{_____} \frac{Ma}{km} \times \frac{1 km}{100,000 cm} \times \frac{1,000,000 yr}{1 Ma} = \text{_____} \frac{yr}{cm}$$

4. Use slope to find the velocity of the Pacific plate in units of CENTIMETERS per YEAR.

$$PLATE VELOCITY = \text{_____} \text{ cm / yr}$$