

Snake River Plain-Yellowstone Hot Spot Migration

(Otherwise known as How the Cake Moves)

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Target Audience: Middle Level Earth Science

Objectives:

To make a timeline showing the progression of the migration of the Snake River Plain-Yellowstone Hot Spot.

To place the different volcanic fields in the proper place on the map of idea to demonstrate the geographic relationship between location of the various volcanic fields and the migration of the hot spot.

To understand a time/distance/spatial relationship of the migration of the hot spot.

Standards met:

I 1.1-1.2; I2.1-2.3; I6.4, 6.6; I8.1; IV1.1; IV1.2

Materials:

string, meter stick, colored index cards or different colors of flagging, table of volcanic activity, Idaho map, paper clips

Procedure

1. Use the table provided to figure the scale measurement converting time to a length. The scale is 1 million years = 20 cm.
2. Create an index card for each volcanic episode with the name of the volcanic field, approximate age of the eruptive episode, and location.
3. Place index card on string with paper clip on the string at the spot that you have calculated where it should go.
4. Find the geographic location of each volcanic episode and write on the map where each should be placed.

Table

Name of Volcanic Field	Age in Millions of Years	Age converted to centimeters	Location
McDermitt Volcanic Field	16.1		West of Idaho-Oregon border on Oregon-Nevada border
Owyhee-Humboldt Volcanic Field	13		Idaho-Oregon-Nevada border
Bruneau-Jarbridge Volcanic Field	12.5		South of Mountain Home
Twin Falls Volcanic Field	11?		Twin Falls and northward
Picabo Volcanic Field	10.3		Northwest of Pocatello and west of Blackfoot
Heise Volcanic Field	6.5		Northwest of Idaho Falls
Rexburg Volcanic Field	4.3		West of Rexburg
Huckleberry Ridge Volcanism	2.1		Southern portion of Island Park area
Henry's Lake Volcanism	1.3		Northern portion of Island Park area near Henry's Lake
Yellowstone Plateau Volcanism	0.6		Yellowstone National Park
Blackfoot Volcanic Field	3		Northwest of Soda Springs
Gem Valley Volcanic Field	0.6-50,000		Near Grace, Idaho
Hell's Half Acre	5300		Between Blackfoot and Idaho Falls
Great Rift Fissure Zone (King's Bowl eruption)	2,222		Between Carey and Arco extending southeast
Craters of the Moon	2,100		Between Carey and Arco, north of the Great Rift

Calculations

Find the average rate of movement of the crust of the North American plate as it moves over the hot spot.

What is the general direction of the plate movement? Describe how the migration of the hot spot demonstrates this.

Summary

Describe in a complete paragraph the relationship between movement, distance and time of the Snake River Plain/Yellowstone Hot Spot.

Propose an idea where you think the hot spot might next erupt based on the time/distance spatial relationship of the migration of the hot spot.