

Paleomagnetism

Standards Covered

NGSS:

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

MS-ESS2-1. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

Common Core:

ELA-

RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Guiding Question

How does studying the history of magnetism relate to archaeological dating?

Procedure

Video – How paleomagnetism relates to plate tectonics

Video – Paleomagnetism with Dr. Amotz Agnon

Junior Archaeologist Assignment

Interactive Homework

Word Wall

Paleomagnetism – The study of Earth's magnetic fields in rocks, sediment, or archaeological materials.

Convection Currents – A current in the liquid that sits below Earth's surface that are caused by heat rising from Earth's core

Theory of Plate Tectonics – The theory that the Earth's crust is broken up in to plates that float on a hot, liquid layer below

Junior Archaeologist Assignment

For this module, you are going to look at different ways that plate boundaries move. You will need graham crackers, fruit roll ups, cake frosting (you can make the frosting red with food coloring), a plate, and wax paper. They represent:

Graham cracker – Continental Crust

Fruit Rollup - Oceanic Crust

Frosting – Asthenosphere

For each type of plate boundary, you will need to lay a big glob of frosting on the wax paper and plate then smooth it out. This will represent the asthenosphere that is located below the lithosphere (where we live). Using your log book, you are going to draw the before and after pictures of what the different arrangements of the graham cracker, fruit rollup, and frosting will be.

Interactive homework

Make sure you check with your parents before performing this experiment to make sure you are able to use all the materials.

For this activity, you are going to model another volcano. You will need: toothpaste, an empty container (think butter, yogurt, small cereal container, etc...), dirt, and scissors.

Cut a small hole in the bottom of your container that is large enough for the mouth of the toothpaste to stick through. Next, place your container on top of your toothpaste tube so that the opening of the container is facing up and the toothpaste would come up. Next, fill your container half way up with loose dirt. Finally, squeeze your toothpaste tube slowly so that the toothpaste starts to slowly come up through the dirt.

Think-how does this look similar to the magma that came up through your Fruit Rollup crust? How would this be different if it were underwater?