



Name: _____

Period: _____

Hot Models

(Exploring Evidence of Earth's Heat Distribution)

Introduction:

Today, we will be developing and using models to understand how scientists have concluded that the core is the hottest portion of the Earth.

Phenomenon: What do you notice and wonder about the graph?

I notice that -

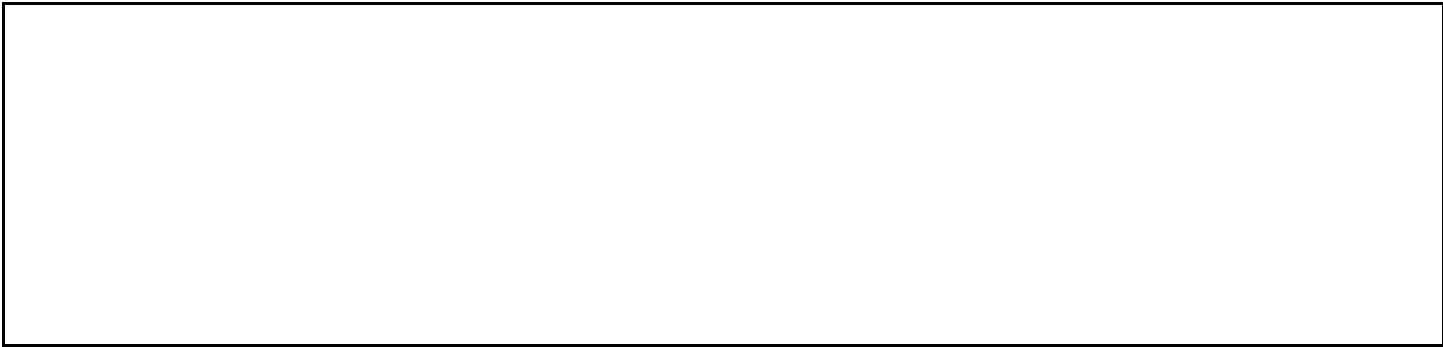
I wonder -

Why is the Earth's interior hot? List two main reasons below.

Reason 1:

Reason 2:

Model Radioactive Decay with a Radioactive Atom. Emphasize the **matter** and **energy**.



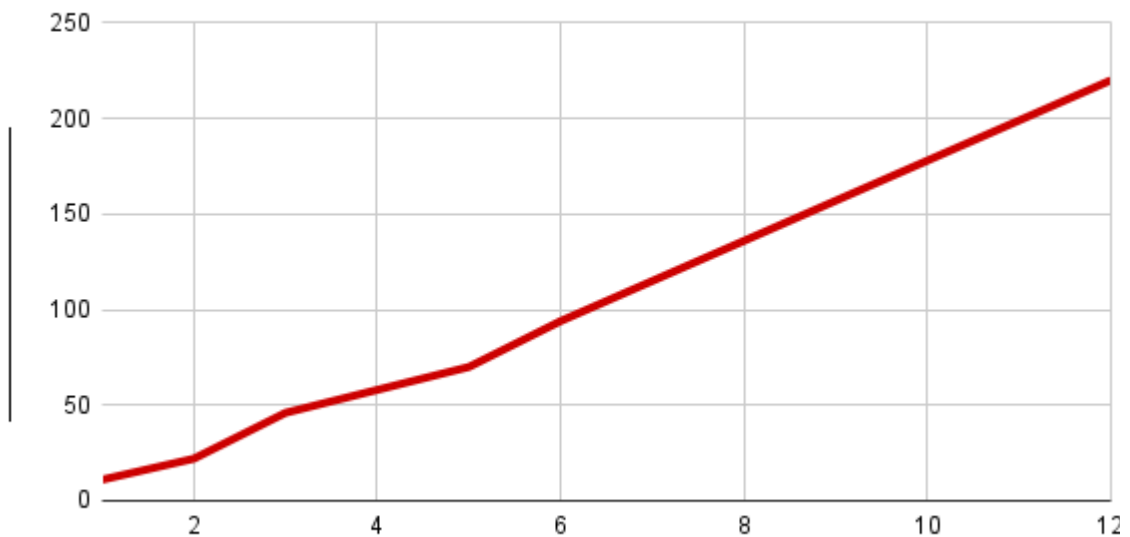
Engage:

How deep was the Kola superdeep borehole?

Based on the information in the video, what happens to the temperature of Earth's crust the deeper we bore?

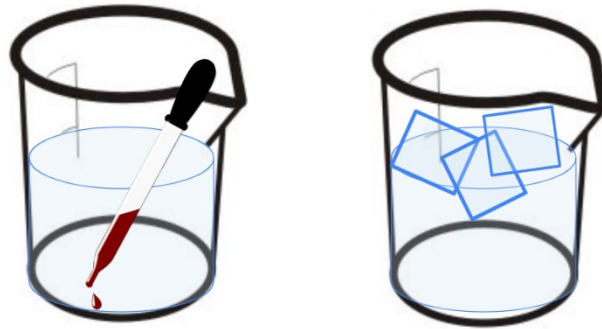
Using the data from the PowerPoint, model the temperature changes with depth on the following graph. Label the temperature as the Y-axis and depth as the X-axis.

Temperature (C) vs. Depth (km)



Is this graph good evidence of the theory that the core is the hottest layer of the Earth?

Explore: You'll be given 2 beakers of water, some hot water colored red, ice, and a pipet (water dropper).



Using the pipet (water dropper), gently squeeze some hot water colored red into the bottom of one of the beakers of room temperature water. What do you observe?

Develop a model: Label the food coloring water as a higher-density or a lower-density matter. Also, label what water is hot or cold in the model (identify high or low energy).

Next, take some colored ice and place it into the other beaker of room-temperature water. What do you observe?

Develop a model: Label the food coloring water as a higher-density or a lower-density matter. Also, label what water is hot or cold in the model (identify high or low energy).

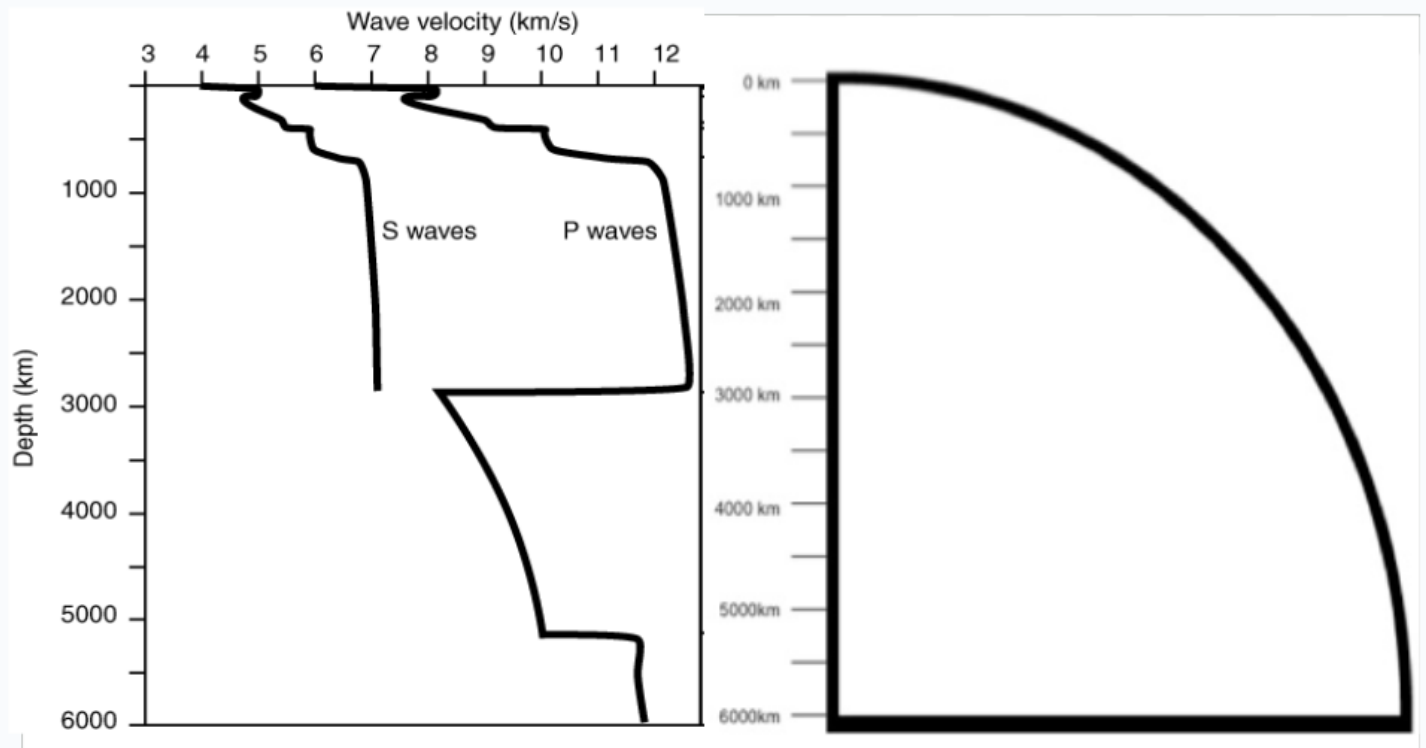
Using the information from the lab, explain how the matter in Earth's interior would behave if it were near the cooler crust or if it were near the hot core.

Define convection and whether it has more or less density from the heat source.

Convection -

Does it have **more** or **less** density by the heat source?
(Circle the correct answer)

Develop a model for convection that shows matter and energy changes:



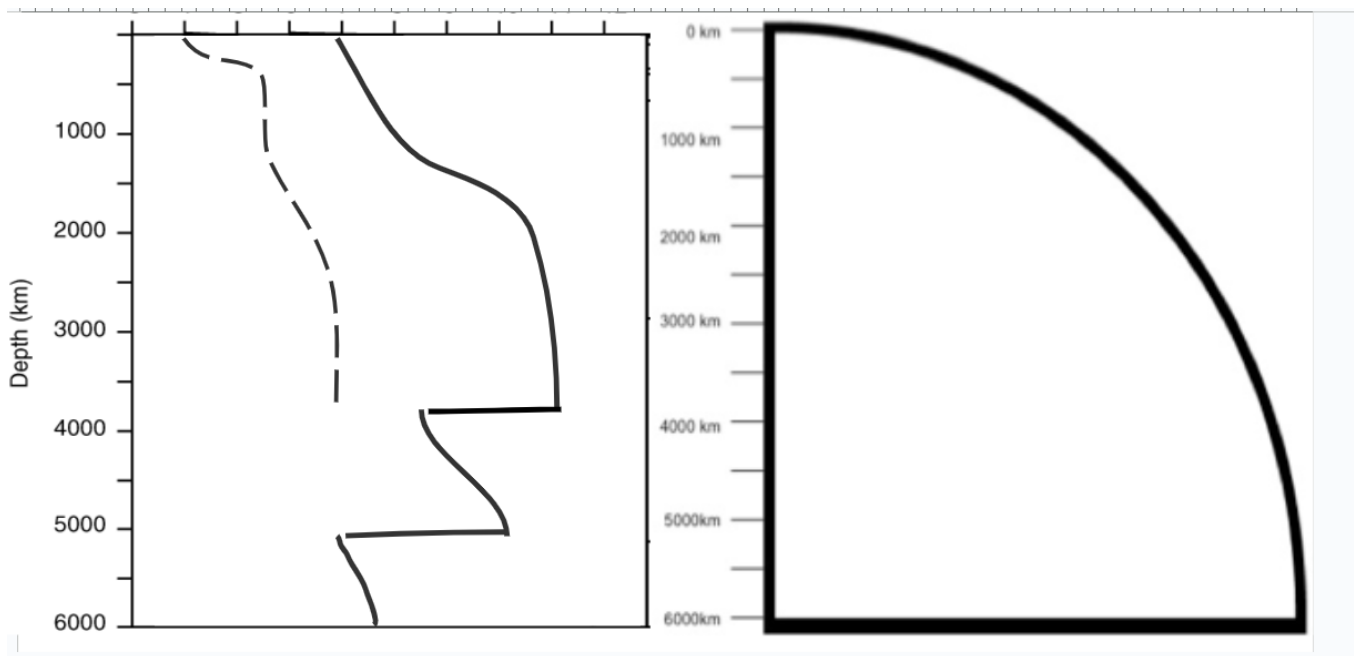
Explain: List the three pieces of evidence contributing to our understanding of the layers and temperatures inside the Earth.

1st piece of evidence -

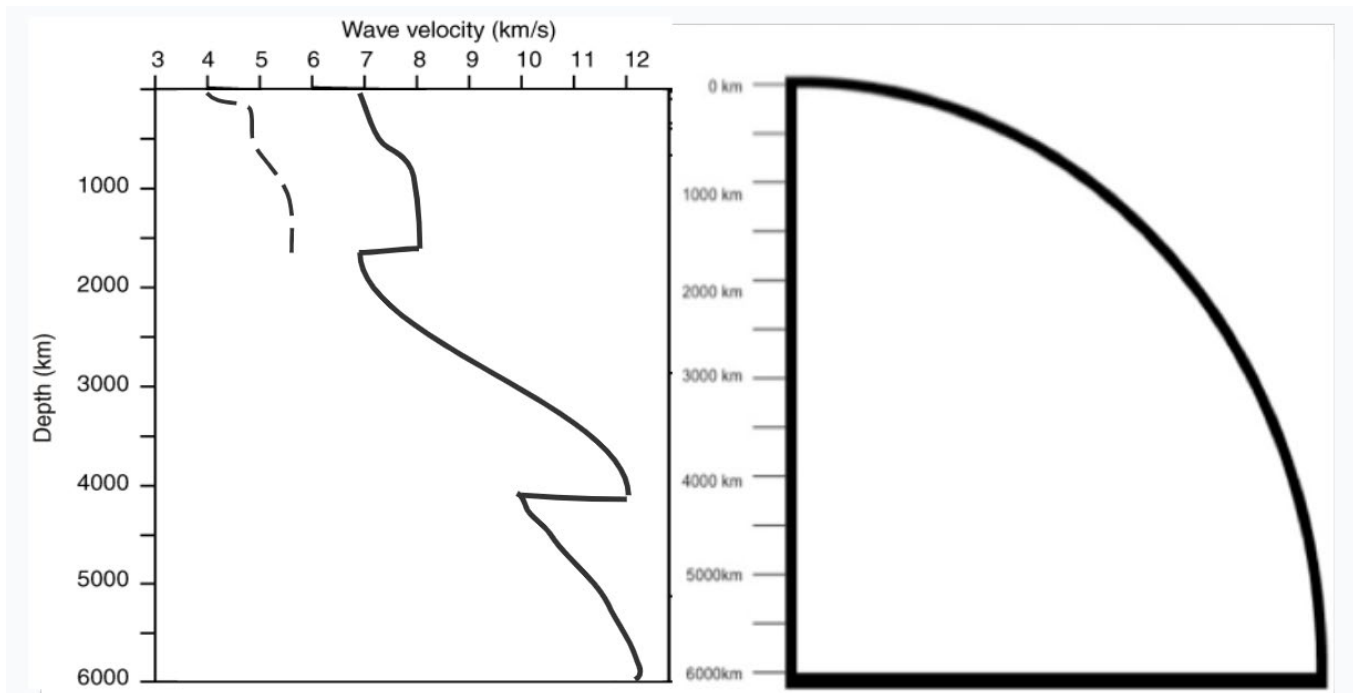
2nd piece of evidence -

3rd piece of evidence -

Based on the S and P wave data, what would the **layers, temperature, and thermal convection** currents look like in the newly discovered planet below? S wave --- P wave —



Alternative



The Kola superdeep borehole only nicked the crust of the Earth. How do we know the temperatures and layers further down inside the Earth?