

Name _____

The Composition of Planet Earth

Have you ever wanted to dig a hole to the center of the Earth? Many young children imagine that they can do just that! So did scientists almost 40 years ago. They imagined a hole through the Earth's crust to the mantle. The Moho project drilled about a kilometer below the floor of the North Atlantic. Geologists discovered more about Earth's structure than they had ever learned before.

But of course, one hole was not enough. From 1967 until 1983, the drill ship *Glomar Challenger* continued the work of the original Moho project. It drilled over 19,000 cores in the crust, as deep as 1700 meters below the ocean floor. Through analysis of the cores, scientists confirmed that the Atlantic Ocean was spreading, and that Alfred Wegener's theory of plate tectonics was correct.

The Deep-Sea Drilling Project (Ocean Drilling Project) continued with the ship JOIDES Resolution. That ship has drilled to a depth of 2100 m in over 590 different sites from the Arctic Ocean to the Weddell Sea in Antarctica. It continues to measure the age, type, and temperature of the crust.

But drilling cannot tell us about the deeper layers of the Earth. Ocean drilling has not even gone half way to the mantle. Other data about deep structure comes from analysis of impacts (such as earthquakes). As the vibrations move through the core, we can measure how fast they travel and how they change. Geologists can use that data to determine the density and nature of material. Based on the data received geologists can construct a model of an "imaginary" hole to the center of the Earth.

You can read more about ocean drilling at <http://www-odp.tamu.edu/resolutn.html>.

Research the layers of the Earth on your own. You may use any sources that are available. With your team, fill in the following chart with information about the layers of the Earth.

Layer	Thickness	Composition	Other Properties (Temperature, Density)
Lithosphere			
Mantle- Aesthenosphere			
Mantle- Mesosphere			
Outer Core			
Inner Core			

What sources did you use to find your information? _____

Building a Model

Imagine that you could drill a core all the way to the center of the Earth. Draw the core that you would obtain. Label each layer with the type and consistency of the material there. Make sure that your drawing is proportional. Label the side of your core with distances.

