





CRUST --The thin, outermost layer of the earth is called the crust. It makes up only one percent of the earth's mass. This consists of the continents and ocean basins. The crust has varying thickness, ranging between 35-70 km thick in the continents and 5-10 km thick in the ocean basins. Within the crust, intricate patterns are created when rocks are redistributed and deposited in layers through the geologic processes. The crust is composed mainly of alumino-silicates.

MANTLE -- The mantle is a dense, hot layer of semi-solid rock approximately 2,900 km thick and is composed mainly of ferro-magnesium silicates. This is where most of the internal heat of the Earth is located. Large convective cells in the mantle circulate heat and may drive plate tectonic processes.

CORE - Below the mantle is the core. It makes up nearly one third the mass of the earth. The Earth's core is actually made up of two distinct parts: a 2,200 km-thick liquid outer core and a 1,250 km-thick solid inner core. The outer core is made of iron and is very dense. As the Earth rotates, the liquid outer core spins, creating the Earth's magnetic field. The inner core is made of solid iron and nickel. Many scientists believe it is kept in the solid state because of the extreme pressure from the other layers.

In your groups you will make a density column to model the layers of the earth by density.

## Procedures

- Tape the cut out of the earth to your plastic cup.
- To represent the inner core you are going to use the densest liquid the dishwashing liquid. Gently fill the cup until you reach the inner core mark. The density of Dishwashing liquid is 1.03 g/cm3
- To represent the outer core you are going to use the 2<sup>nd</sup> densest liquid the water. Gently fill the cup until you reach the outer core mark. The density of water is 1.00 g/cm3
- To represent the mantle you are going to use the 3ed densest liquid the cooking oil. Gently fill the cup until you reach the mantle mark. The density of cooking oil is 0.93 g/cm3
- To represent the crust you are going to use the least dense liquid the Isopropyl alcohol. Gently fill the cup until you reach the crust mark. The density of 91% Isopropyl alcohol0.786 g/cm3

## After completing your model fill out the chart and answer the following questions

Layer	Of layer of the earth Density (g/cm3)	Model liquid	Density of model liquid (g/cm3)
Crust	2.2 g/cm3		
Mantle	3.4 g/cm3		
Inner Core	9.9 g/cm3		
Outer Core	12.8 g/cm3		

- 1. Why does the solid lithosphere stay "a float" on the soft asthenosphere? Lithosphere – the rocky solid part of the earth includes crust and the upper mantle Asthenosphere- the lower part of the mantle has soft liquid rock that flows called magma.
- 2. Which layer of the earth's interior has the lowest density? How do you know?
- 3. Which layer of the earth's interior has the highest density? How do you know?

A group of students make a model showing the how the layers of the earth float on top of each	Liquid	${f Density}\ (g/mL^3)$
other.	Q	0.84
	R	0.92
	S	1.26
	Т	0.80
	U	0.76

Write a letter into each blank box to compare the densities of the liquids in the graduated cylinder. Then write the letter that represents each part of the Earth's interior.

