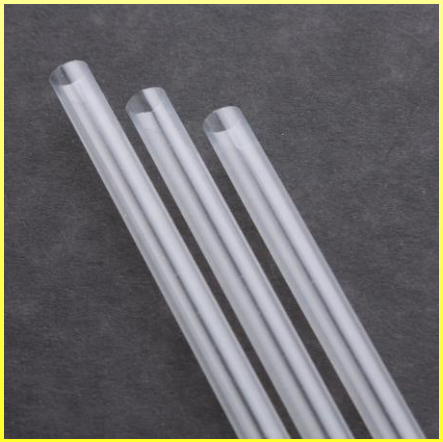
Eggsploration!
Structure of the Earth

Challenge:

- Imagine you are a geologist investigating the structure of our planet by drilling to collect a rock sample from the core
- Use the straw to take a core sample of the Earth egg

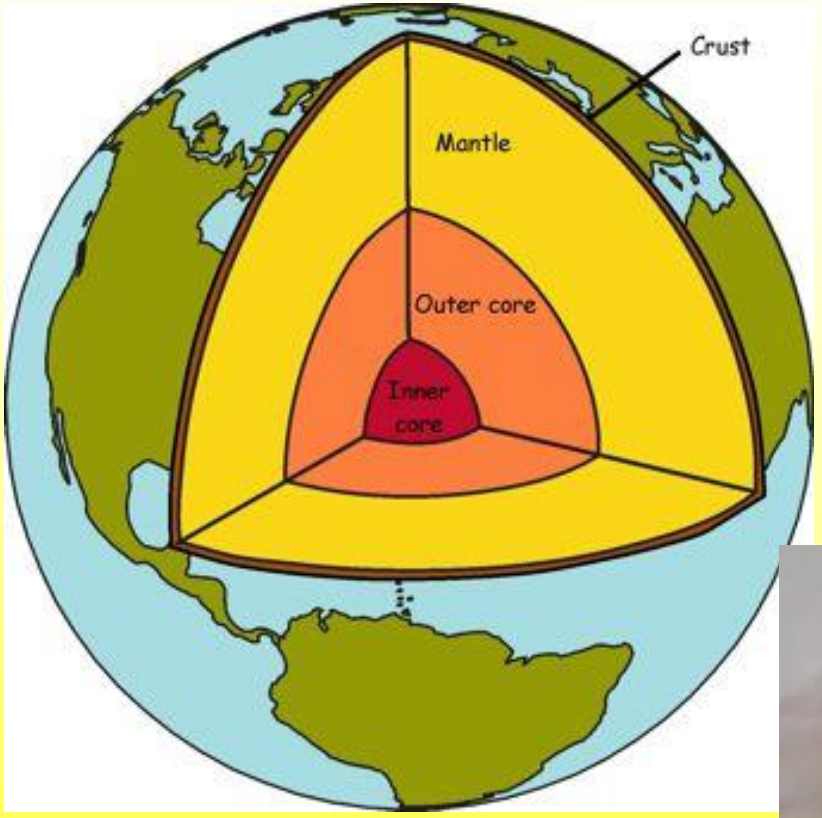


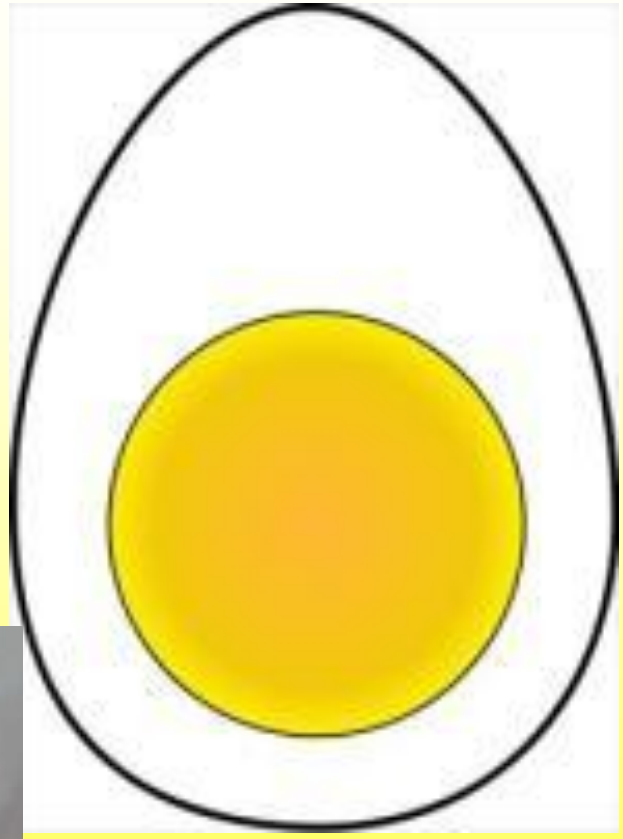
In your Journal:

1. Record your observations
2. Sketch a picture of your core sample
3. Use your book to help you identify the layers you find

- Take care as you perform the core sample to prevent damaging the sample!
- Do not remove your sample from the straw!

What did you discover?





How is this experiment different from how geologist study the earth?

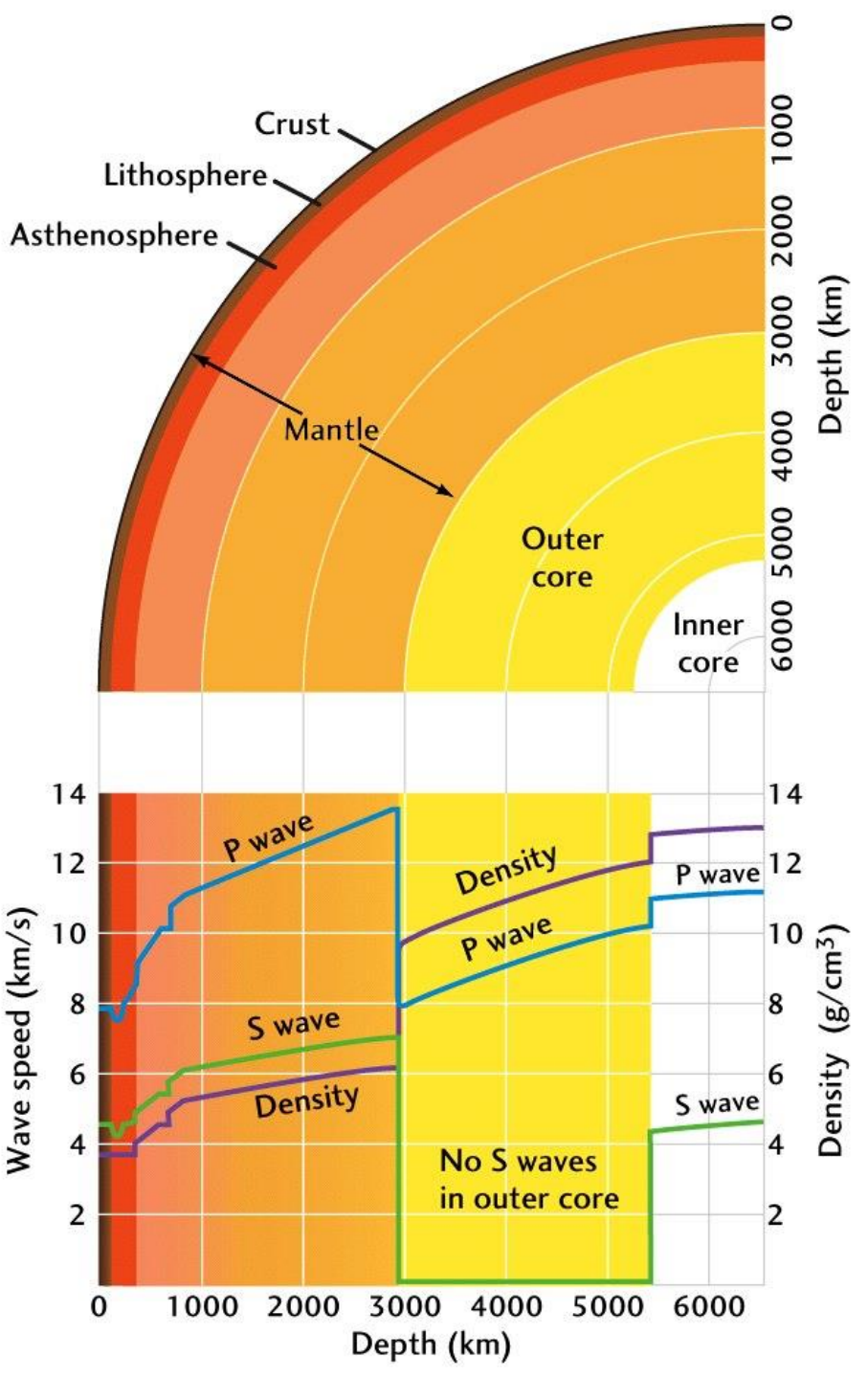
- Drilling helps scientists obtain samples of the rock that makes up the crust ranging from about 5 to 40 kilometers in thickness
- But in order to sample the earths core you would need to drill down nearly 2,900 km!

Core Sample from Earth

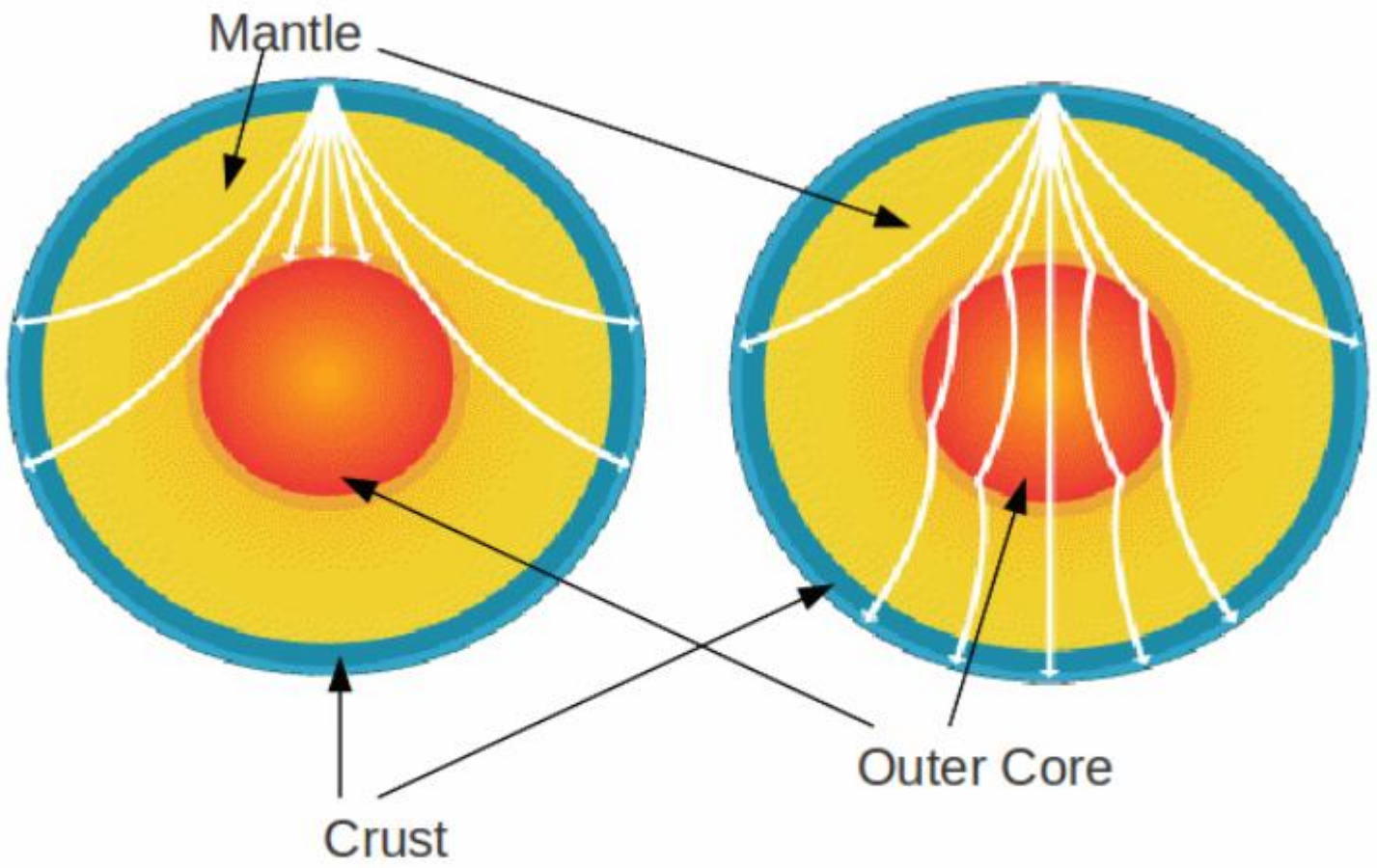
Seismology

- The science of using elastic waves in solids to know about the structure of the earth

- A Seismograph is used to measure different types of waves

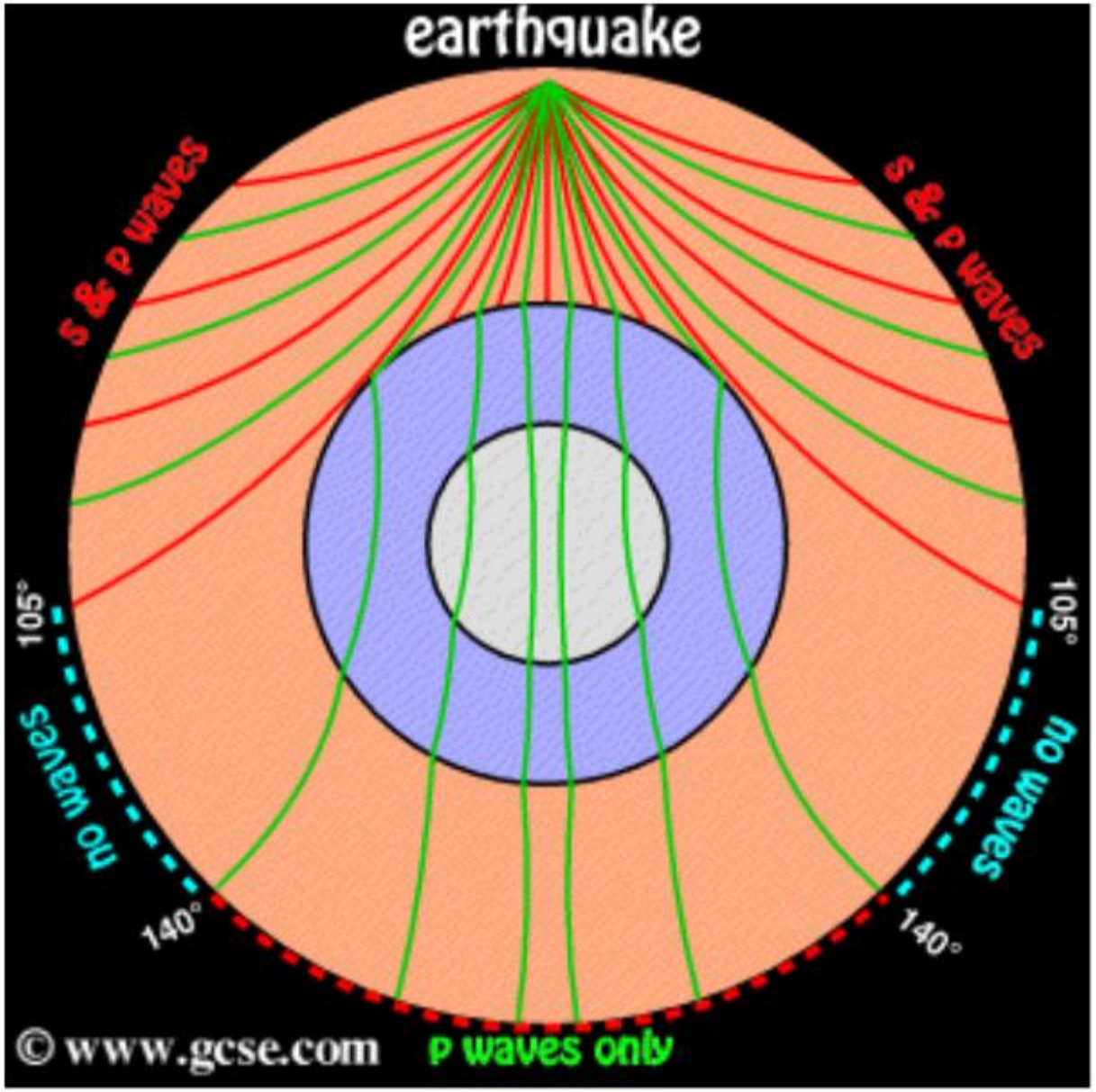


S waves (secondary) **P waves (primary)**



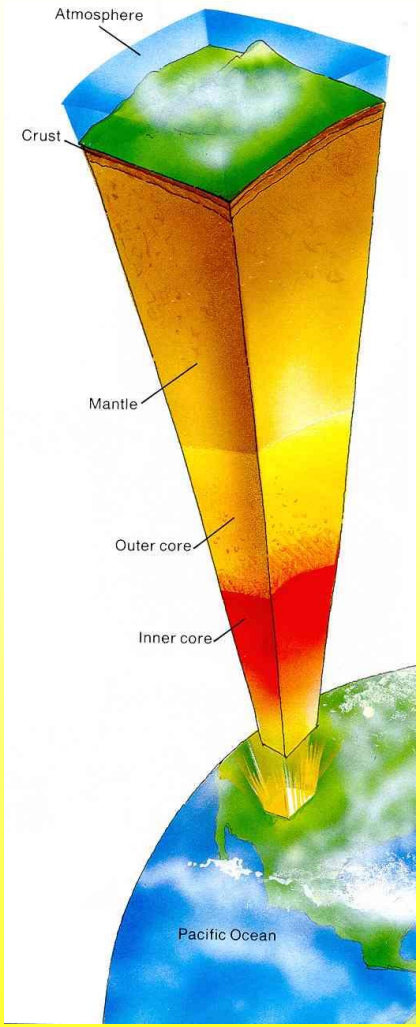
Cannot travel through <u>liquid.</u>

Can travel through <u>liquids</u> and <u>solids</u> but will bend when moving through.

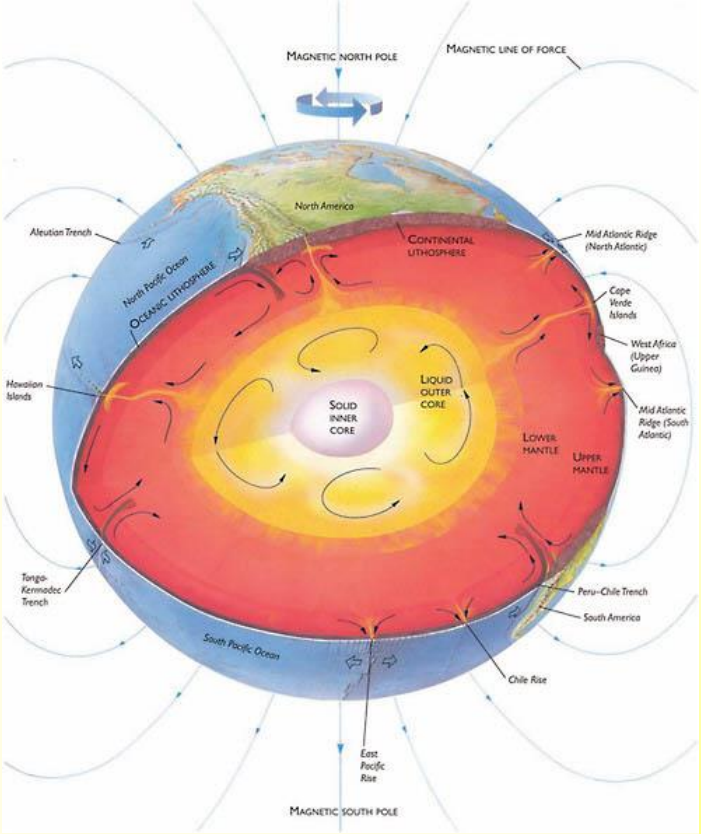

earthquake
S & P waves
S & P waves
105°
105°
no waves
no waves
140°
140°
© www.gcse.com
P waves only

Center of the Earth- The Core

- 2 Layers
- Scientists debate the composition of Earth's core
- Most agree it is primarily composed of Iron and Nickel
- Additional evidence suggests other less dense elements such as Silicon, Oxygen, Sulfur, Sodium and Magnesium are present
- More research needed!



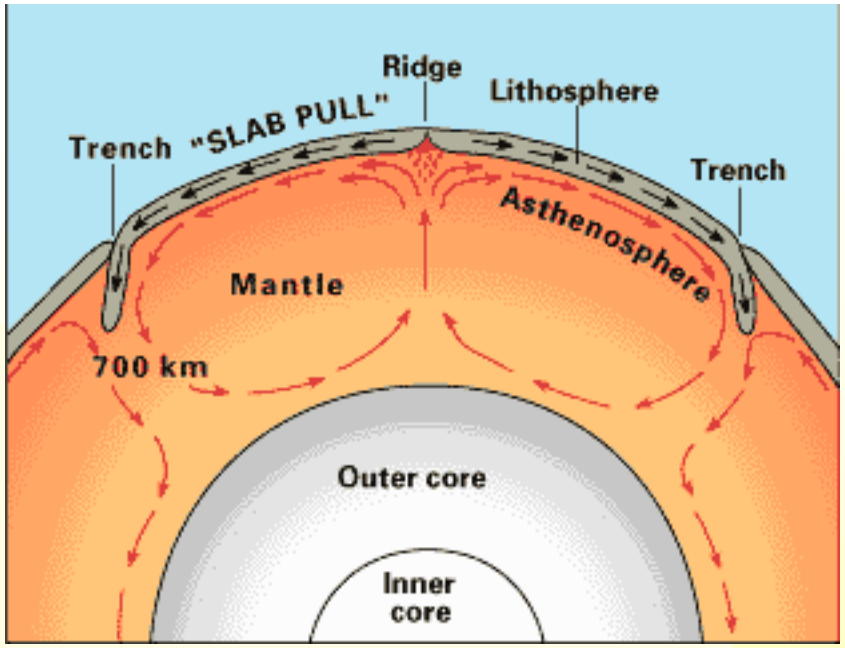
Layers of the Core



- The inner core
  - Innermost layer
  - A sphere of hot solid metal
  - Held solid by extreme pressure

- The outer core
  - Surrounds the inner core
  - Hot enough to turn metal into a liquid

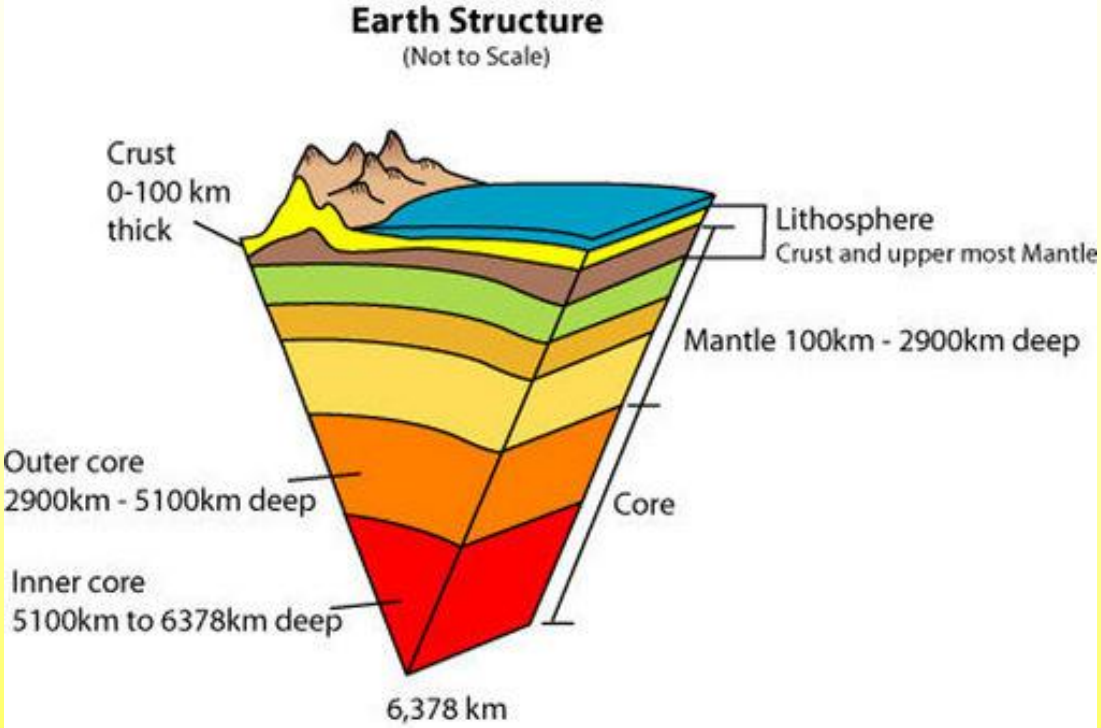
Mantle



- Thick layer surrounding the core
- Composed of hot but mostly solid material
- Less dense than the core
- Mantle is soft and can flow slowly but remains solid
- High viscosity- thick, resistant to flow
  - Low viscosity- water
  - High viscosity- honey

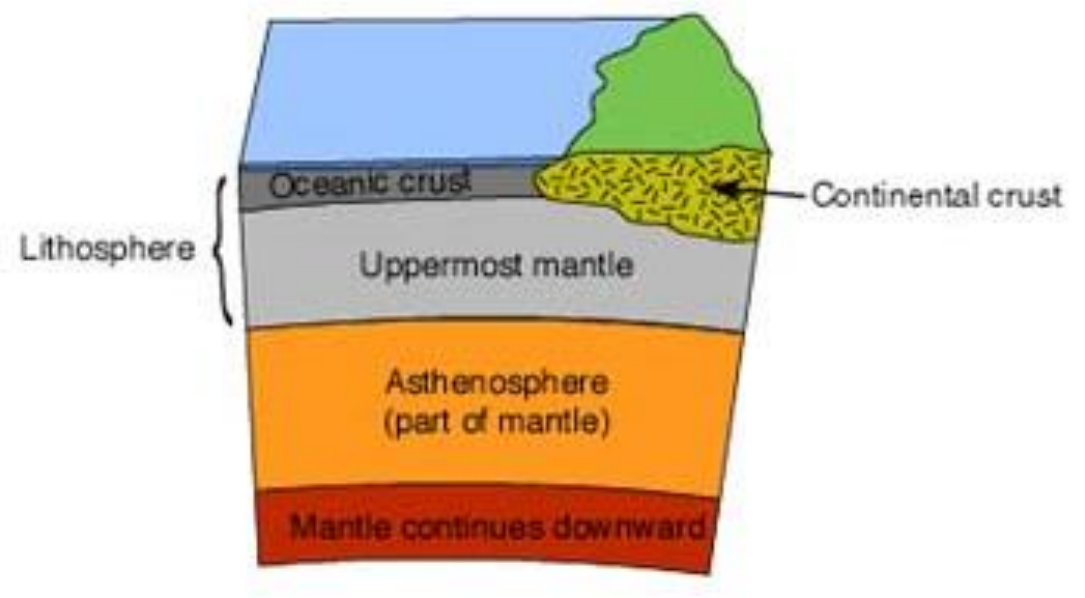
Outermost Layer- Lithosphere and Crust

- The rigid outer covering of the Earth
- Thin rock layer of lithosphere

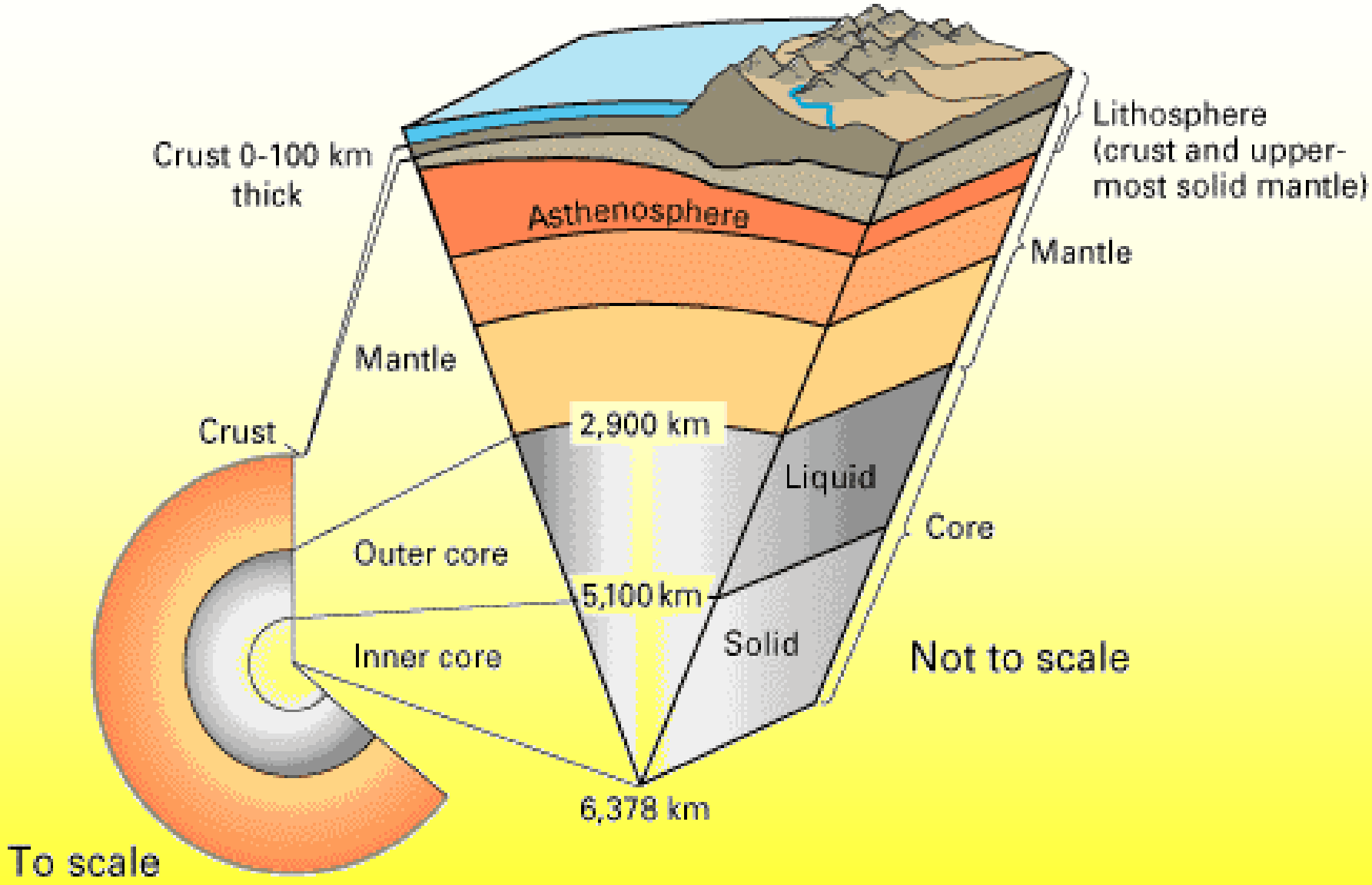


- Lithosphere includes the uppermost part of the rigid mantle down to about 100 km

There are 2 types of Crust



- Continental- thicker and less dense
- Oceanic- thinner and more dense


Crust 0-100 km thick
Asthenosphere
Lithosphere (crust and upper-most solid mantle)
Mantle
Mantle
Crust
2,900 km
Liquid
Core
Outer core
5,100 km
Solid
Inner core
Not to scale
6,378 km
To scale