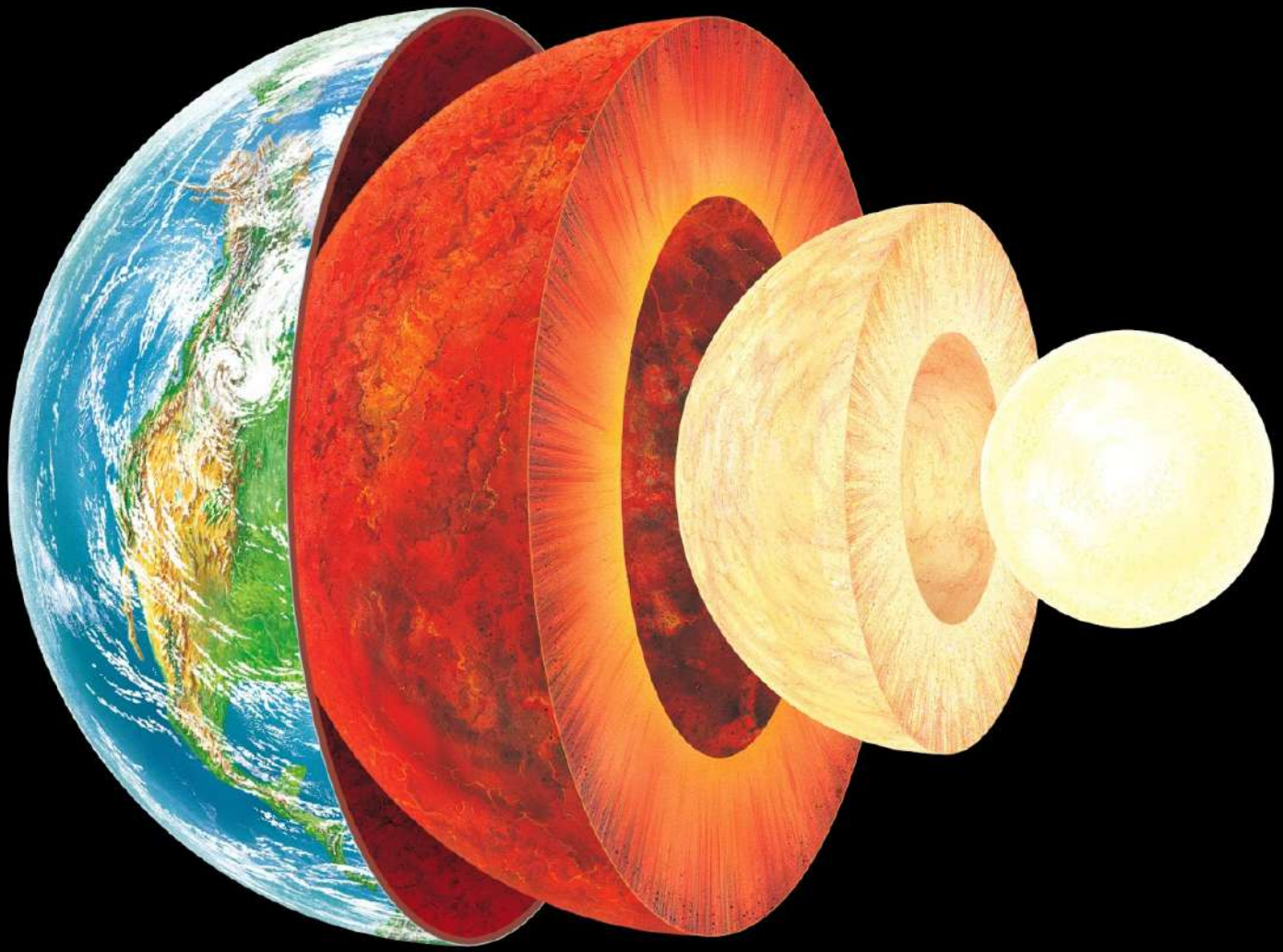
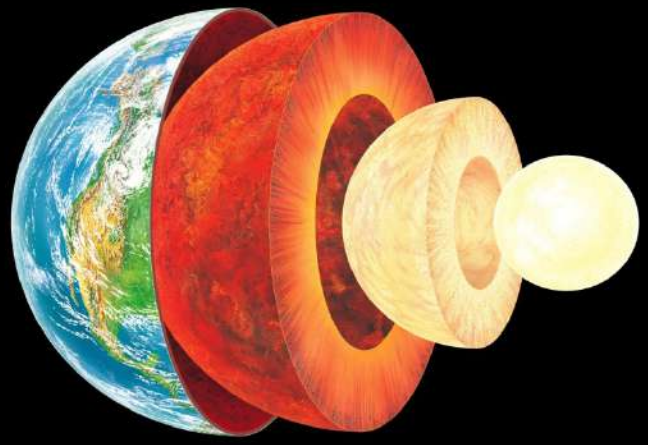
Layers of the Earth



Watch the movie trailer for Journey to the Center of the Earth. Identify characteristics that you think are true and those you think are not true. Be prepared to share.

https://www.youtube.com/watch?v=rQx2wLyagk4



Essential Question: How are layers of the Earth different from one another?

Standard:

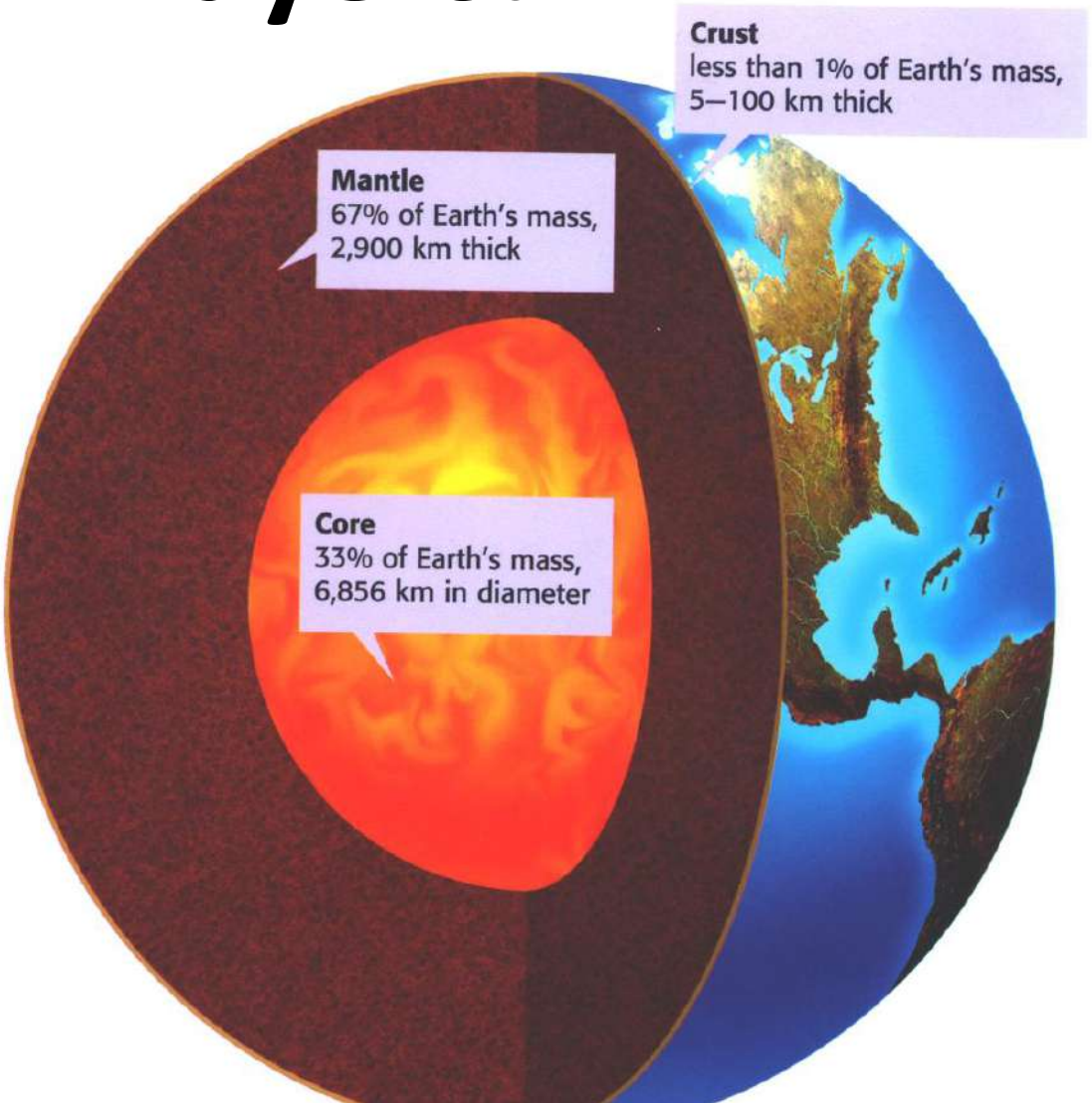
S6E5a. Compare and contrast the Earth's crust, mantle, and core including temperature, density, and composition.

The Earth is made up of 3 main layers:

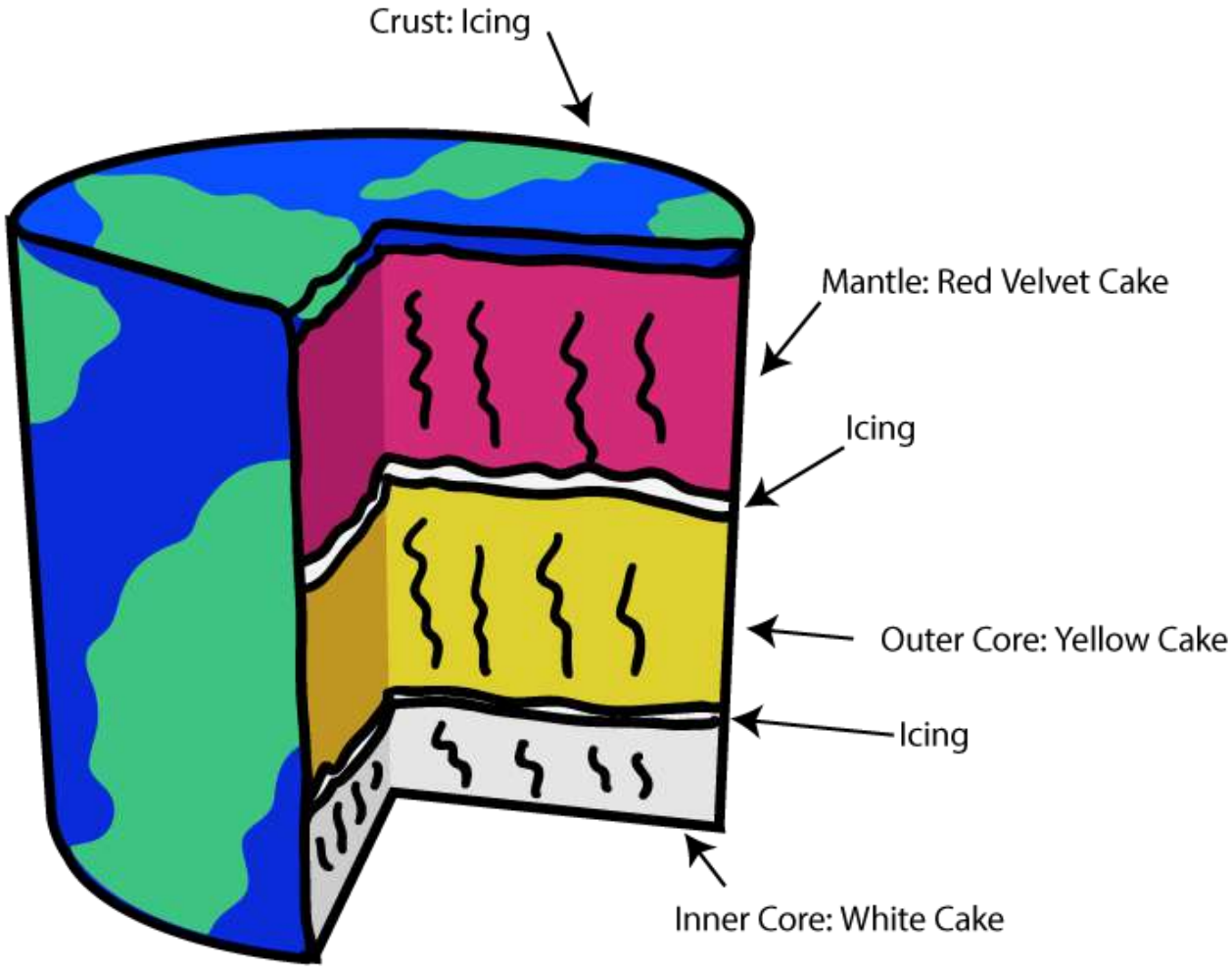
Crust

Mantle

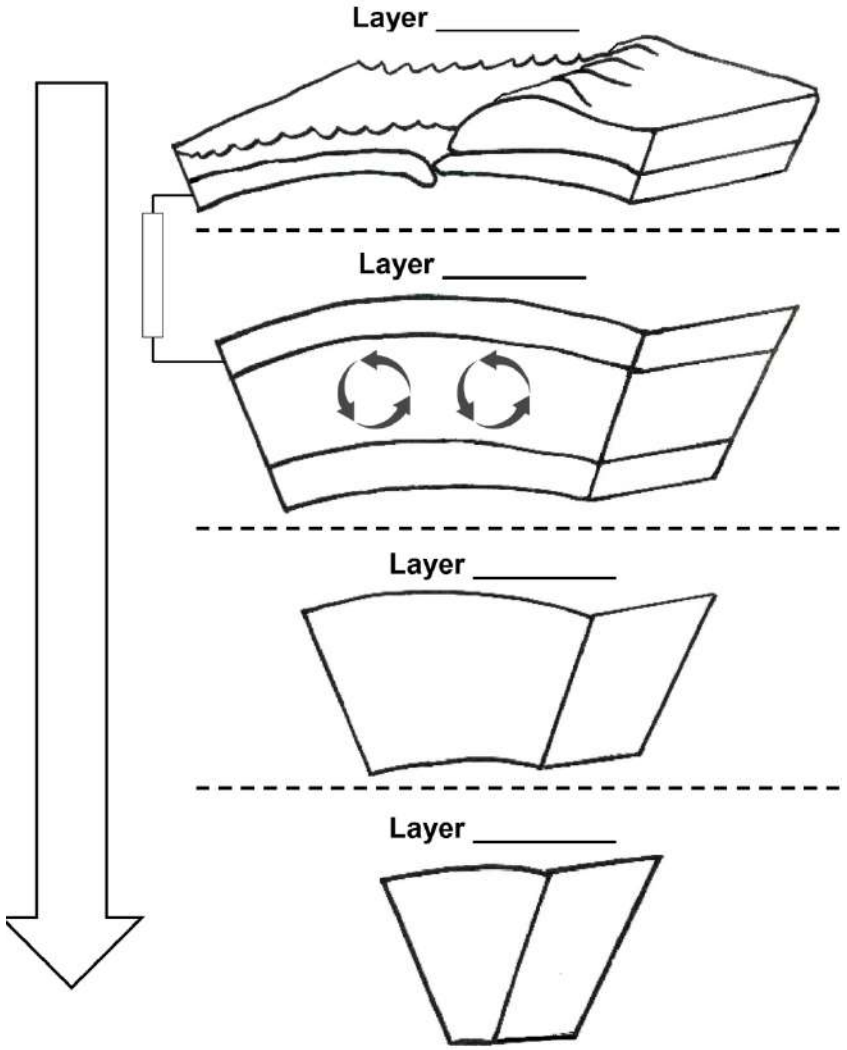
Core

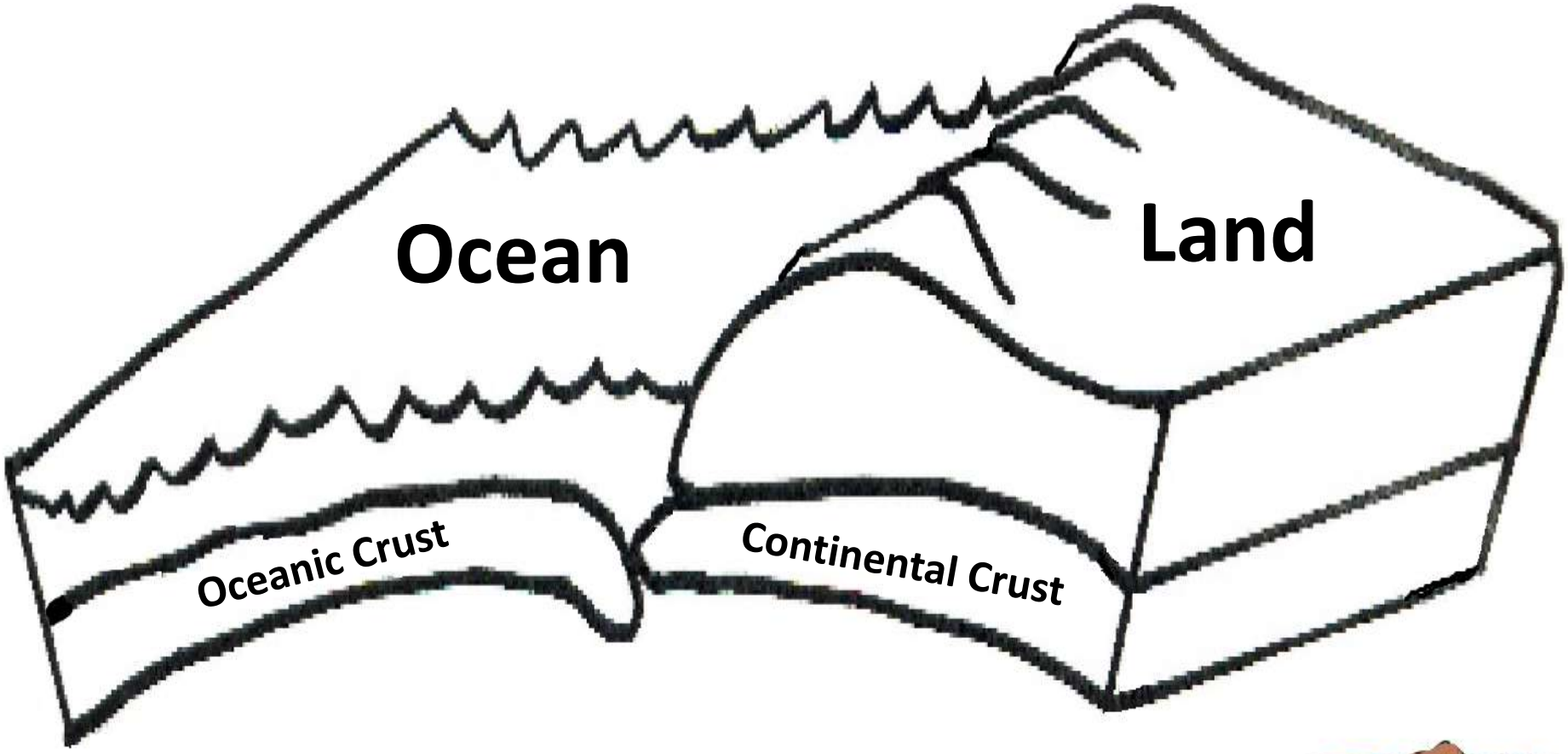


Think of the layers of the Earth like the layers of a cake.

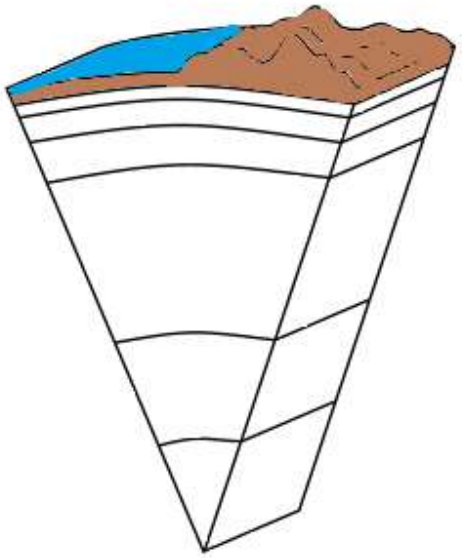


Use the Layers of the Earth Foldable to take notes

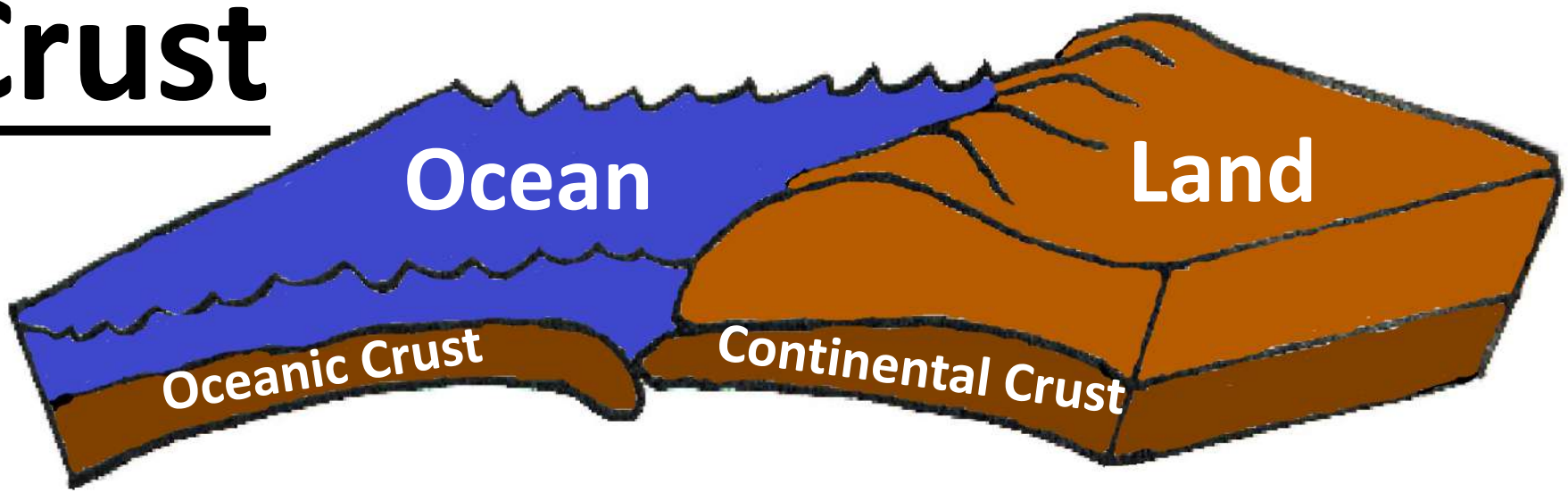




Crust



Crust

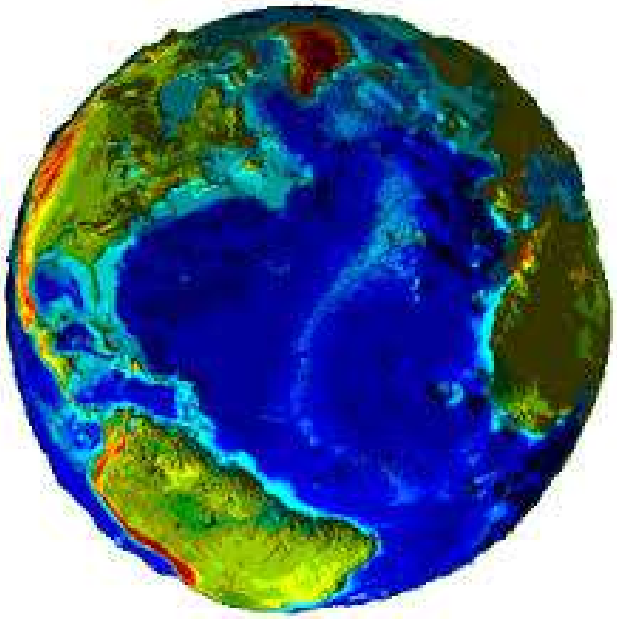


- Thinnest layer of the Earth.
- Made up of large amounts of silicon and aluminum
- Composed of plates on which the continents and oceans rest. These “ride” over molten mantle.
- Crust is part of the lithosphere.
- Two types of Crust: Oceanic and Continental

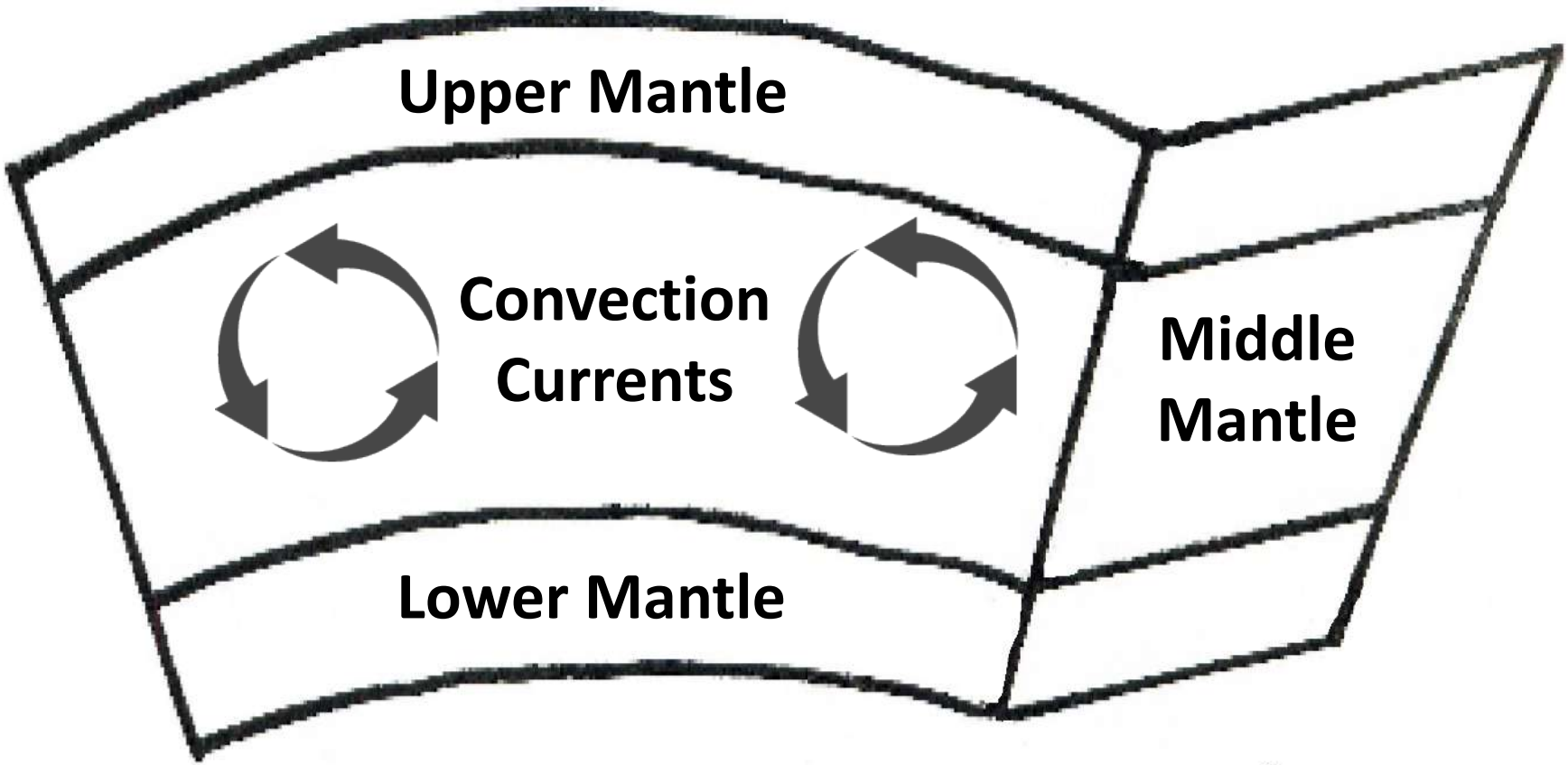
Thickness: 75 miles
State of Matter: Solid
Temperature:
Density: Very heavy and dense.

Continental Crust

Composition: Granite
Thickness: 2 miles
States of Matter: Solid
Temperature:
Density: Less dense

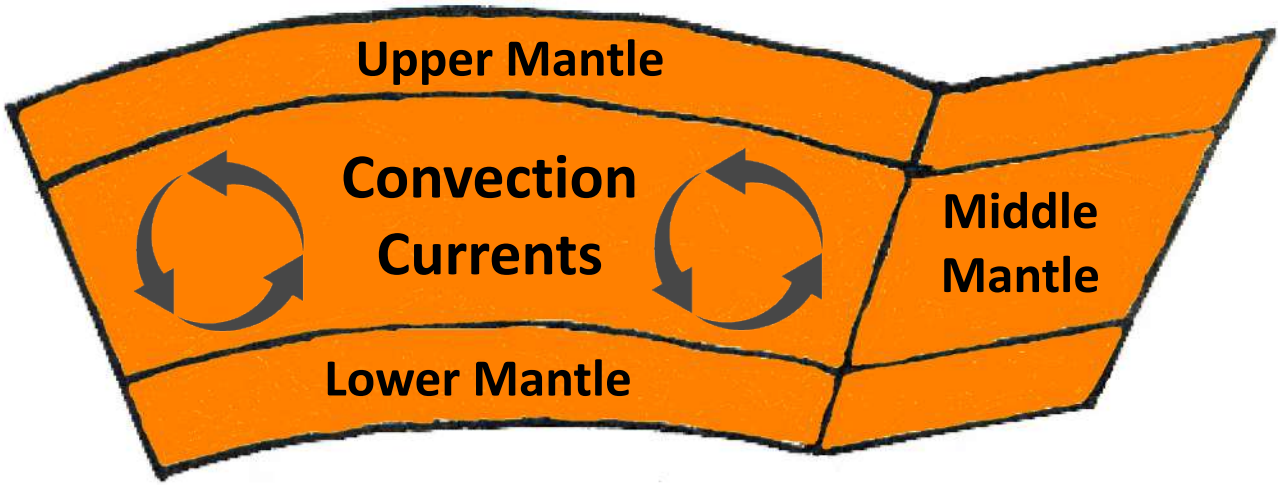


The Earth’s crust is like the skin of an apple.

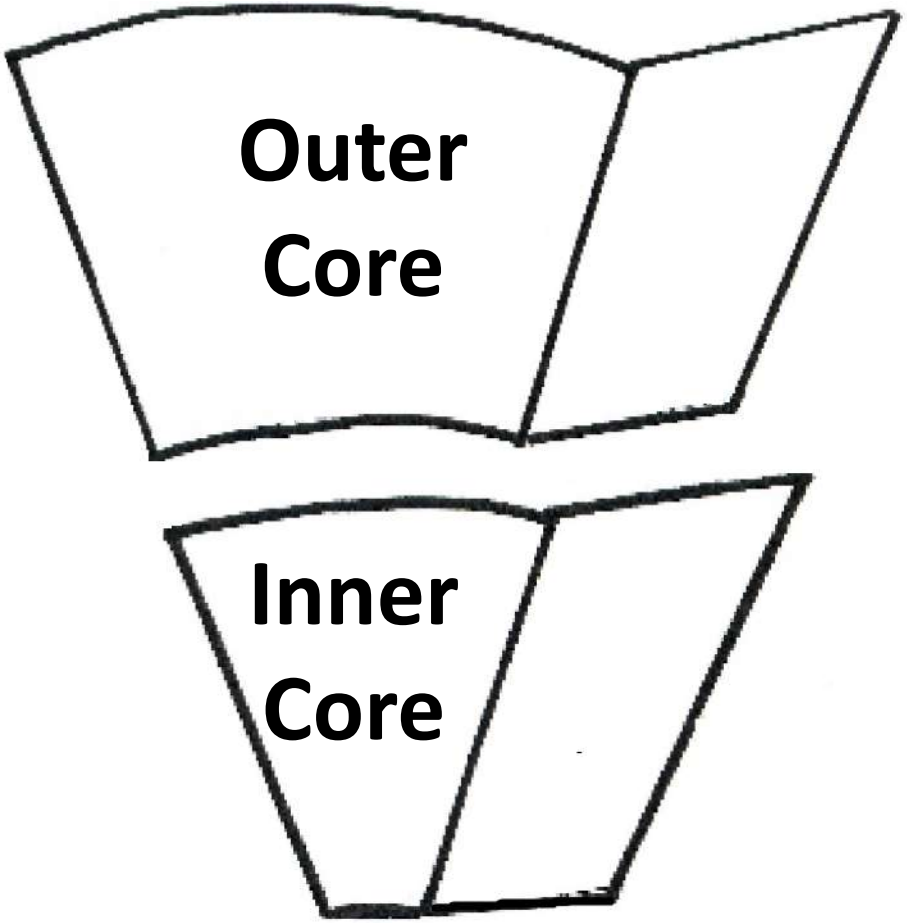

Upper Mantle
Convection Currents
Middle Mantle
Lower Mantle

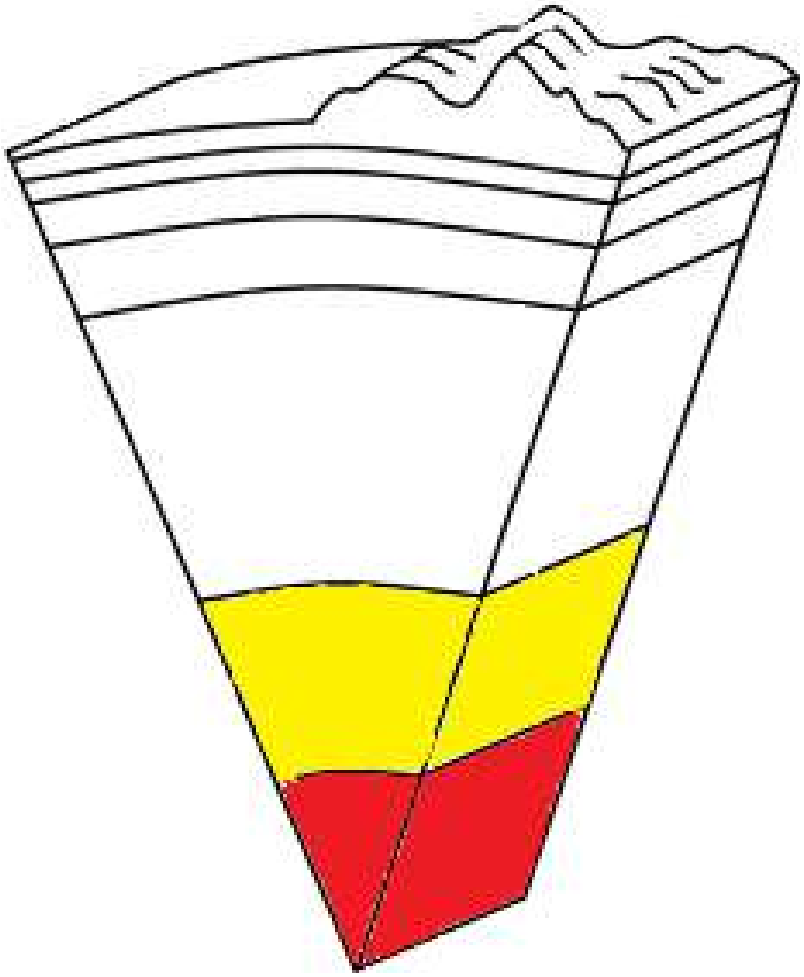
Mantle

Mantle



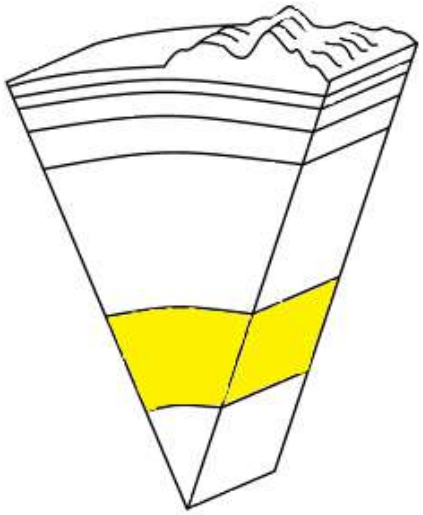
- Solid but capable of flow (like fudge)
- Thickest layer of the Earth
- The hot magma rises then cools and sinks.
- These convection currents cause changes in the Earth's surface.
- Conveyor belt for the tectonic plates.





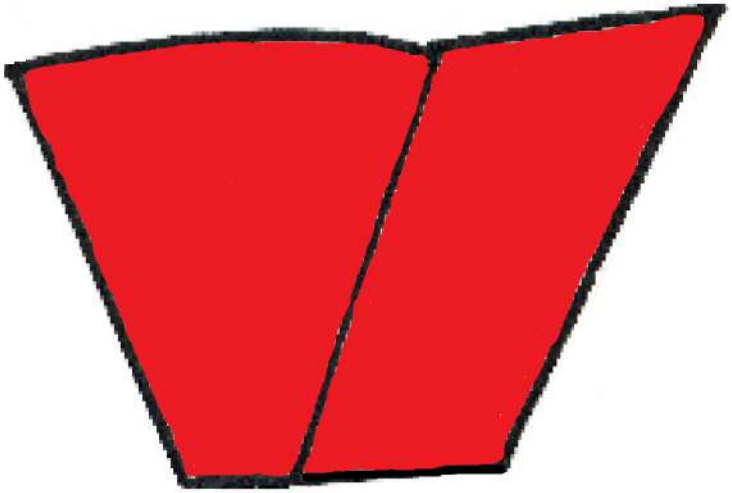
Core

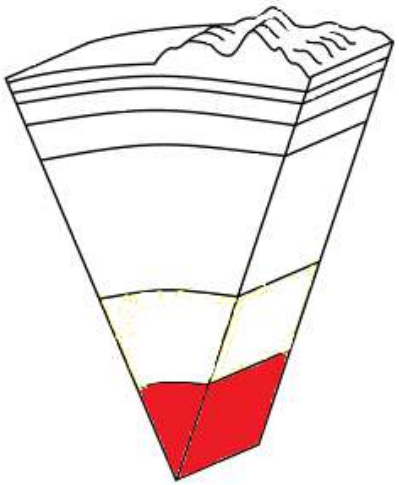
Outer Core



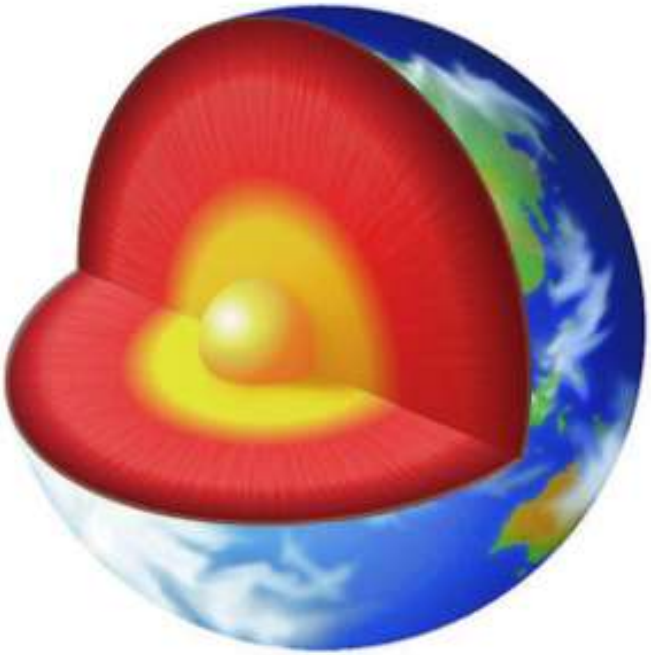
- Composition: Molten (liquid) metal that is about 4,700°C (8,500°F)
- Thickness: 1,400 miles thick
- State of Matter: Composed of the melted metals nickel and iron
- Located about 1,800 miles beneath the crust.

Inner Core

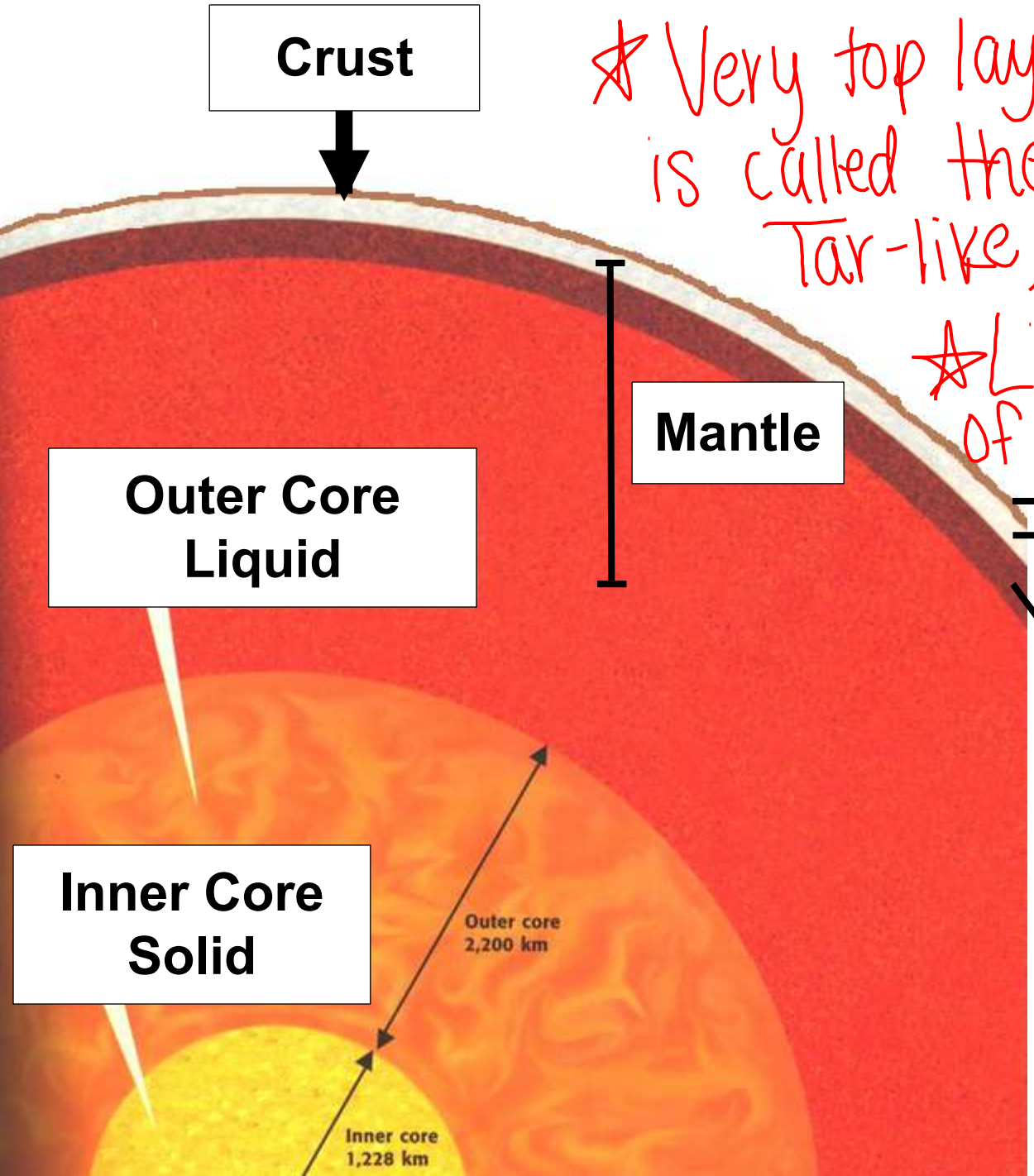




- Solid sphere made mostly of iron
- It is believed to be as hot as 6,650°C (12,000°F)
- Heat in the core generated by the radioactive decay of uranium and other elements
- It is solid because of the pressure from the outer core, mantle, and crust compressing it.



The Earth is like a peach or a boiled egg. Turn to a seat partner and discuss these analogies. Come up with another analogy and be prepared to share.



★Very top layer of Mantle is called the asthenosphere Tar-like, allows movement

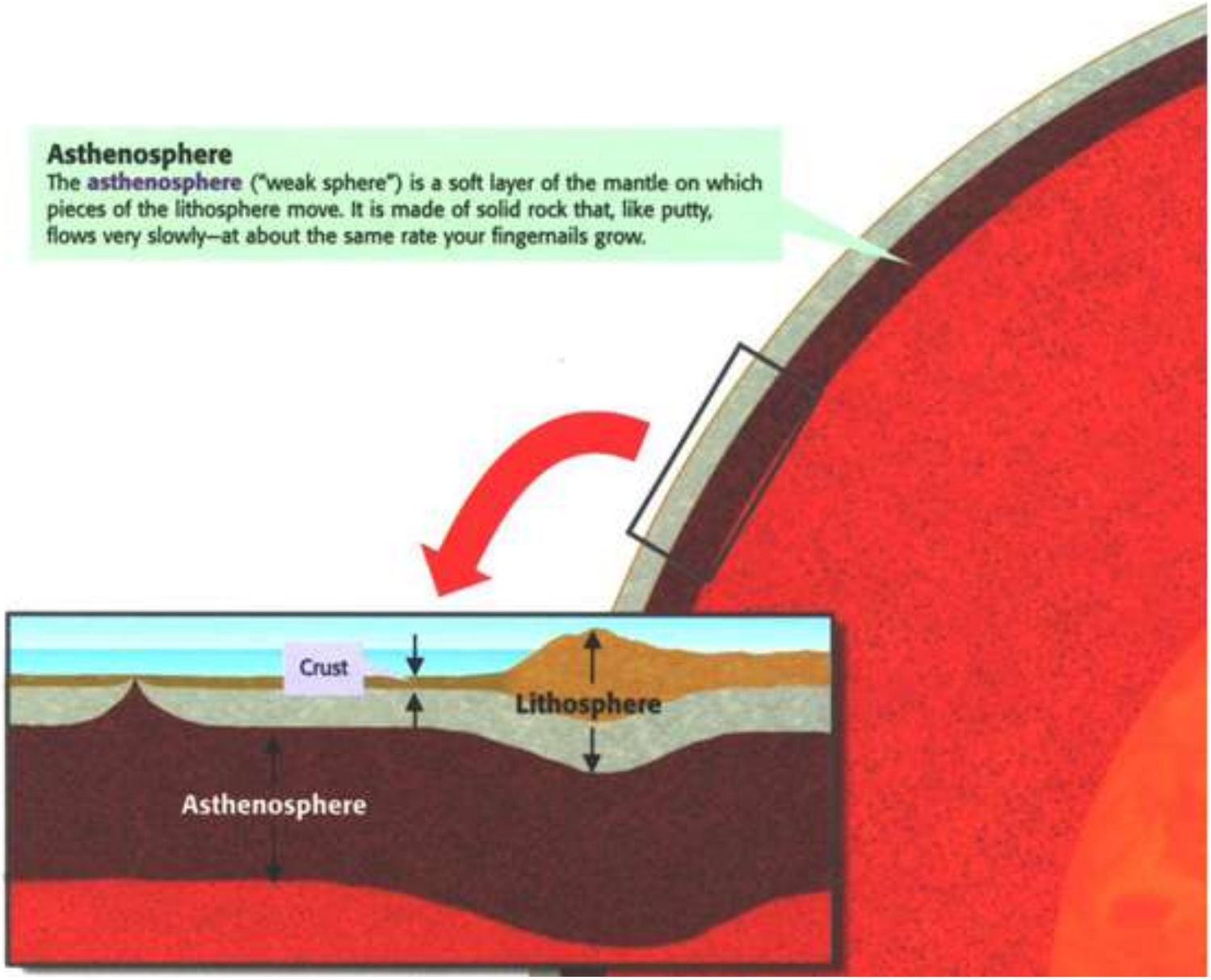
★Lithosphere on top of mantle. Crust.

Lithosphere – Crust and Upper Layer of the Mantle

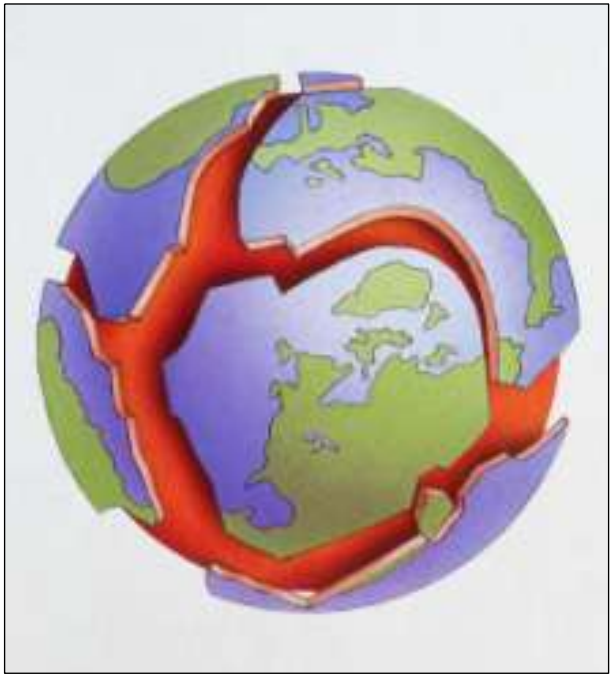
Layer of the Mantle (asthenosphere) that consists of hot rock of tar-like consistency, which slowly moves

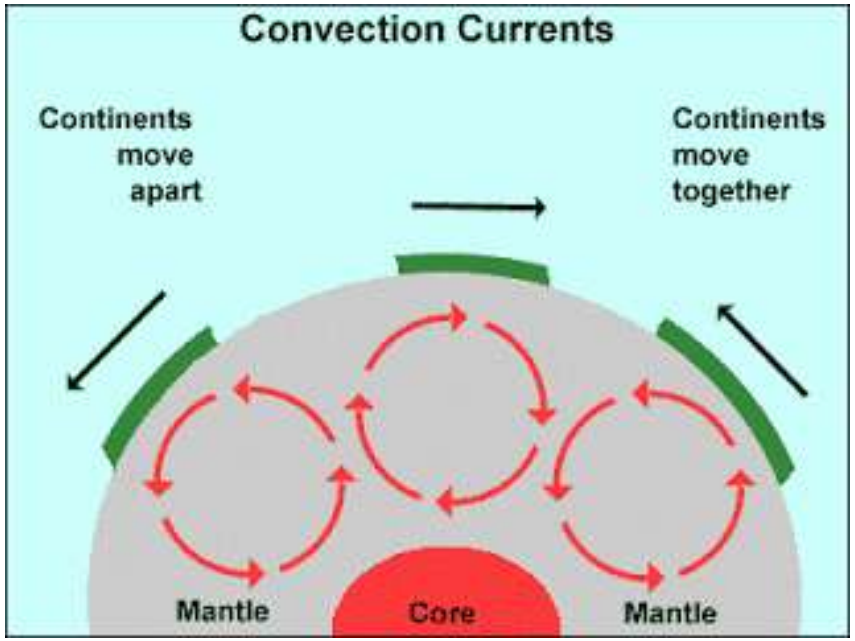
Asthenosphere

The **asthenosphere** ("weak sphere") is a soft layer of the mantle on which pieces of the lithosphere move. It is made of solid rock that, like putty, flows very slowly—at about the same rate your fingernails grow.

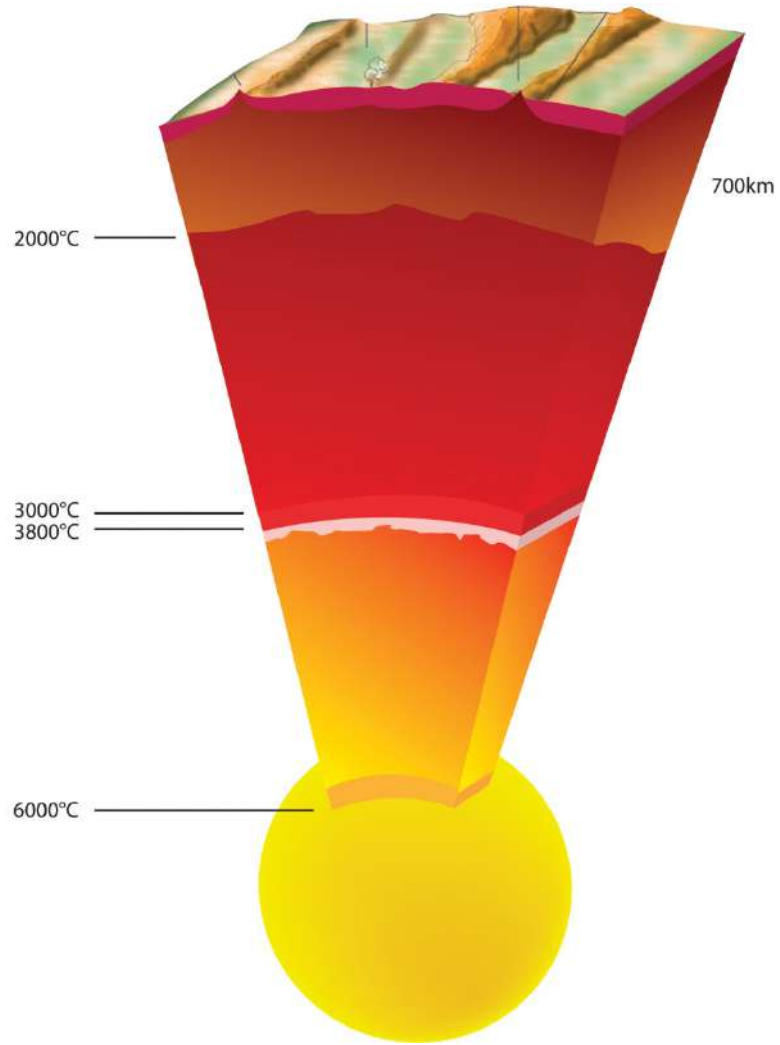


The lithosphere (crust and upper mantle) is divided into separate plates which move very slowly in response to the “convecting” part of the mantle.

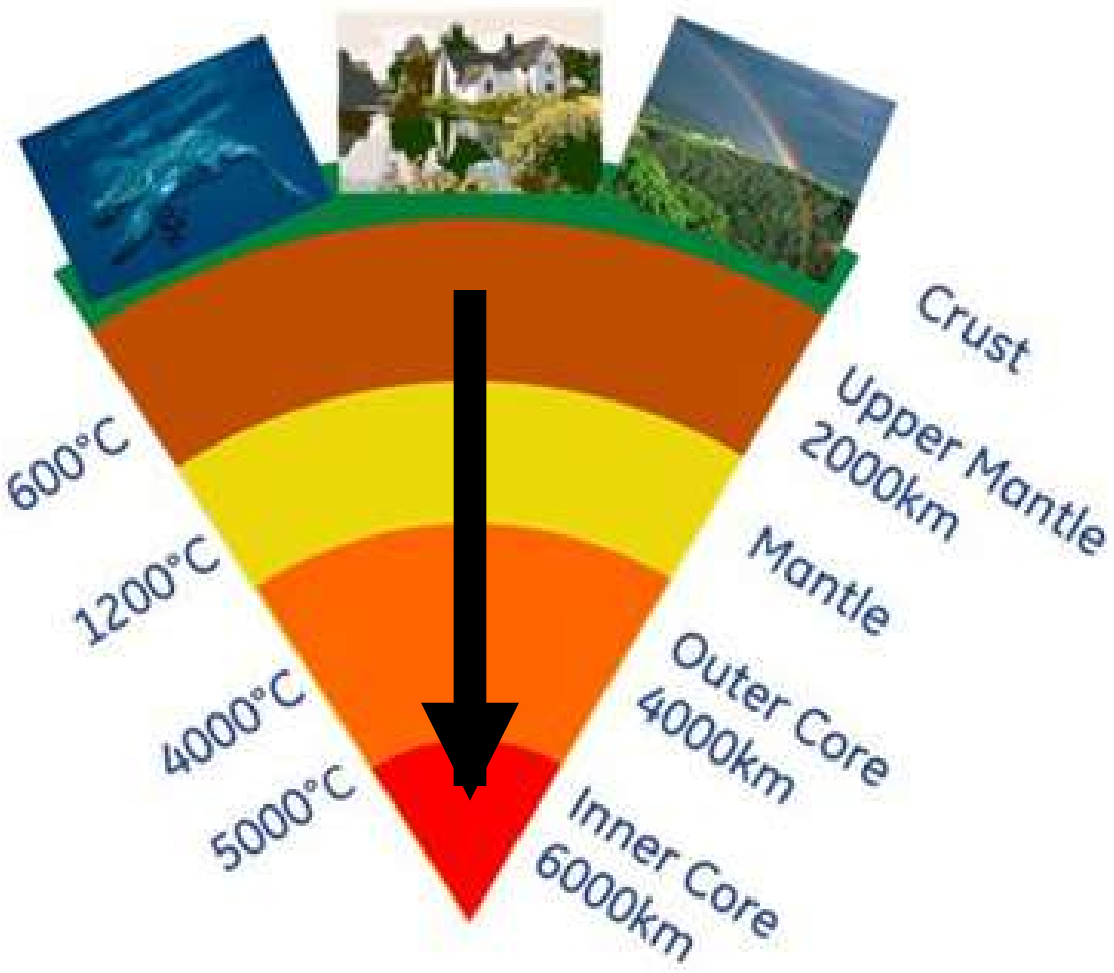




What do these two images tell us about the layers of the Earth?



Temperature increases as depth increases



Look at the information in the graph and table below. What's the relationship between depth and density/pressure?

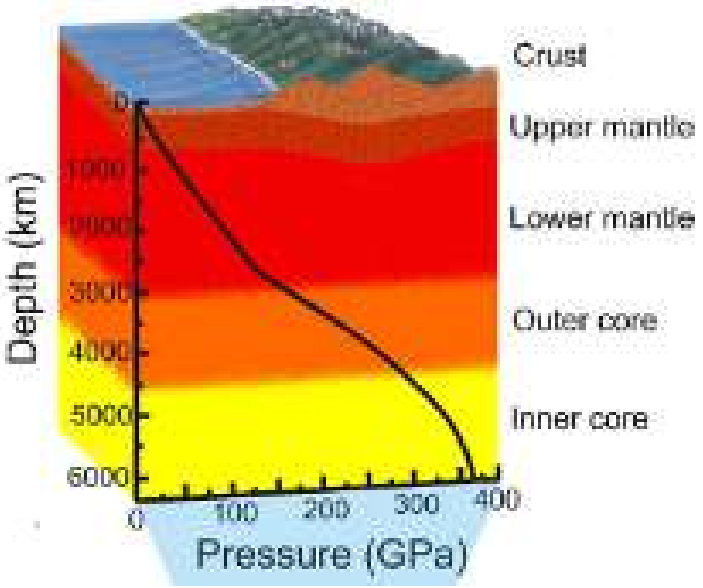
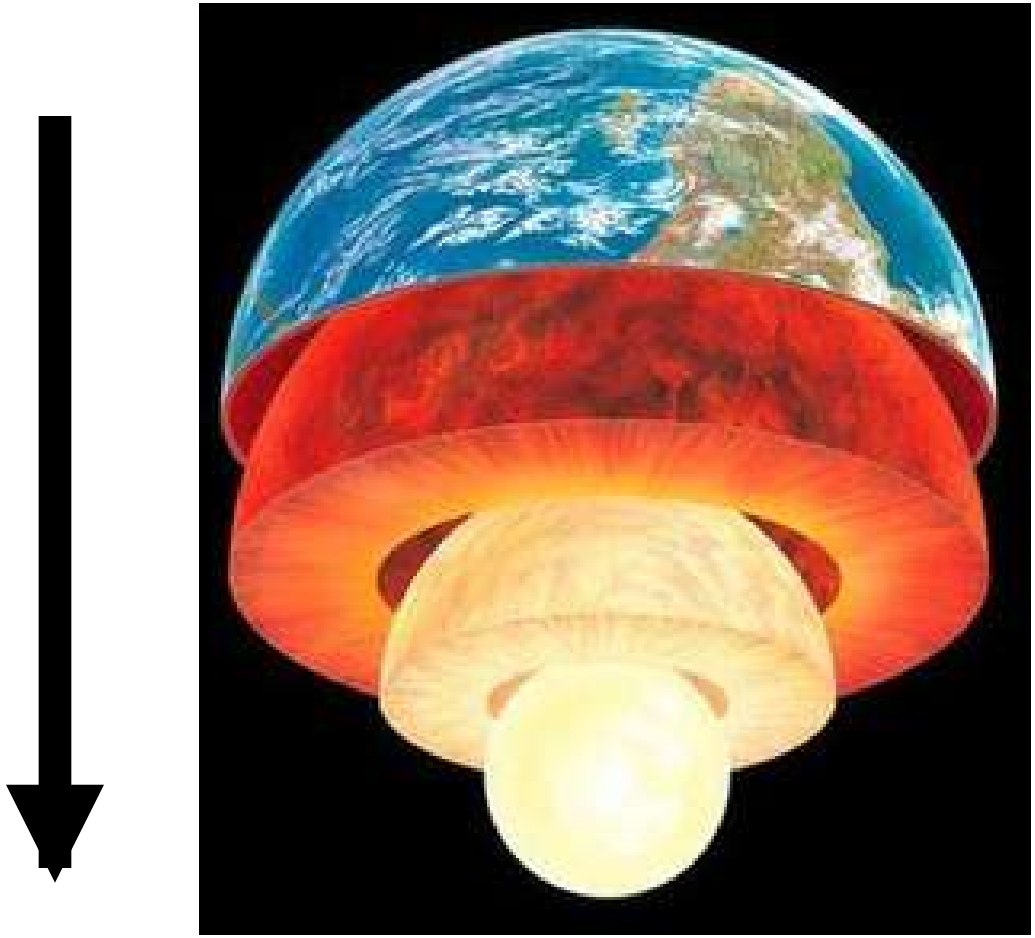
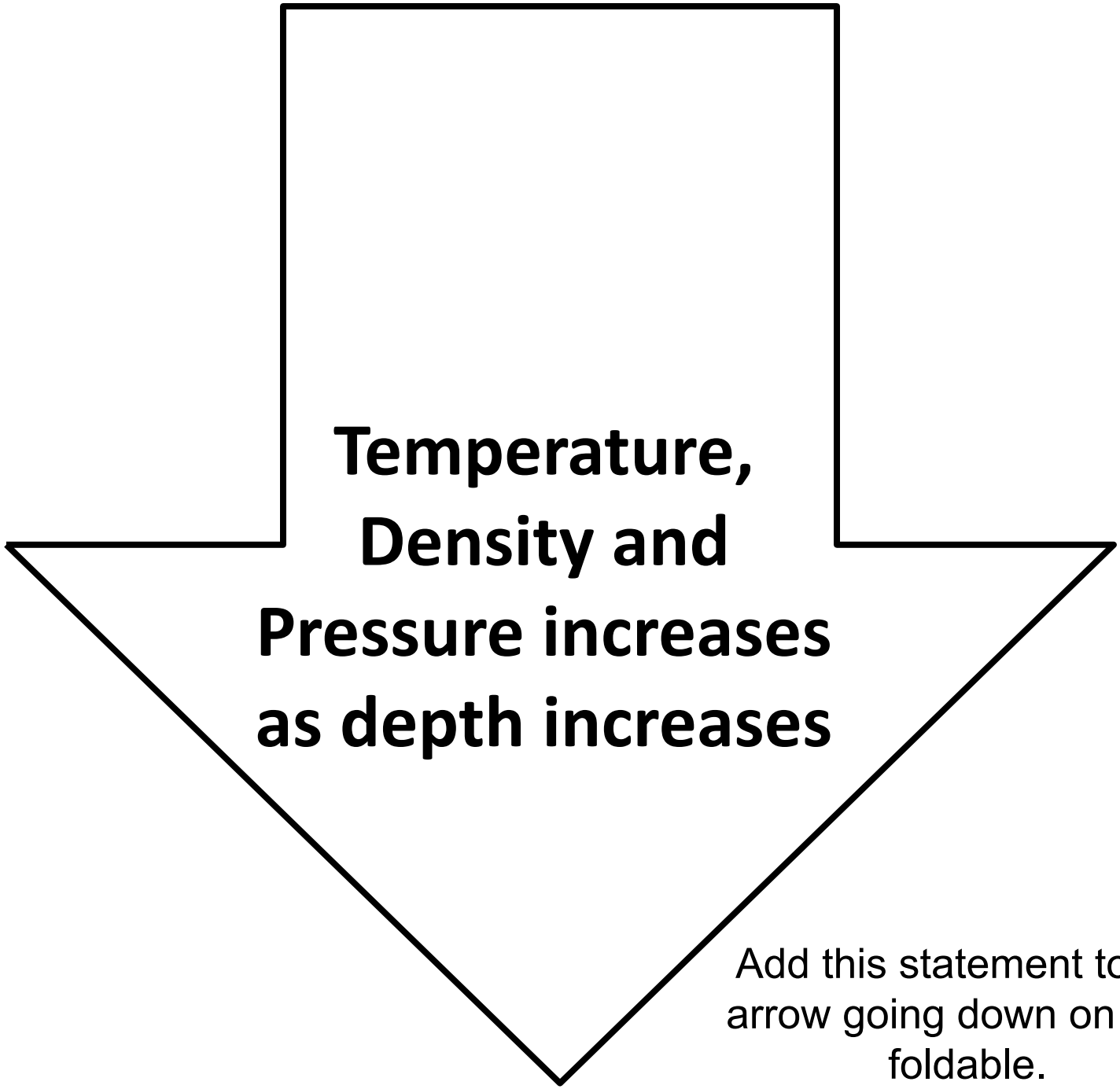


TABLE 1 Interior Properties of Earth

Property	Crust	Mantle	Core
Fraction of Earth	<1% of mass	~70%	~30%
State	"Broken rock"	Plastic	(Semi-)liquid
Depth (kilometers)	0–30	30–3030	3030–6370
Density (grams/cubic centimeter)	2.7	3.5–5.5	10–12
Representative chemical composition	SiO_2	$(Fe,Mg)SiO_4$	Fe, Ni
Temperature (Kelvin)	300–500	500–3,000	3,000–5,300
Pressure (atmospheres)	1–1,000	10^3–10^6	10^6–10^7

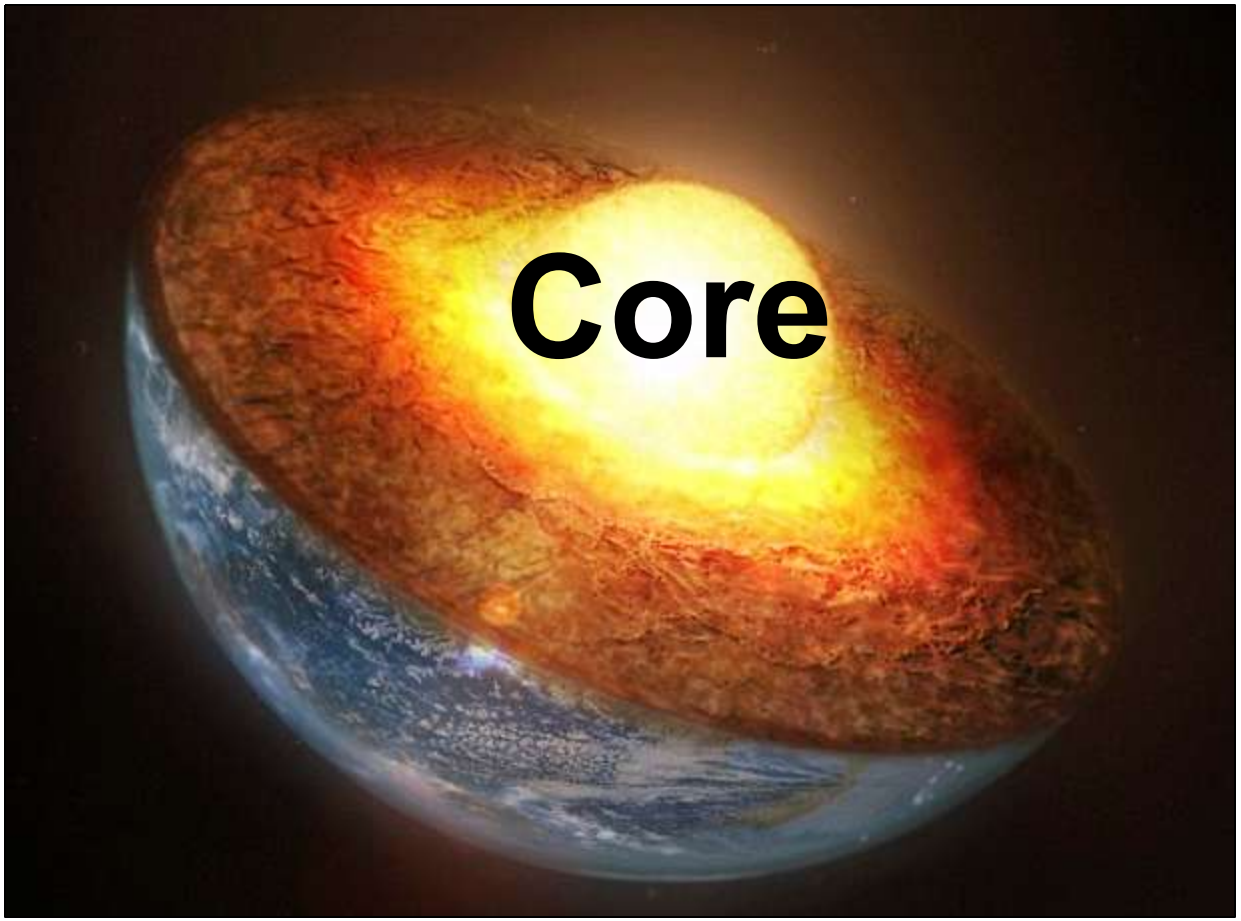
Density and Pressure increase as depth increases





Add this statement to the arrow going down on your foldable.

Which layer of the Earth has the greatest temperature, pressure, and density?



Earth's Layers Rap

https://youtu.be/HOd7PRJMkkQ