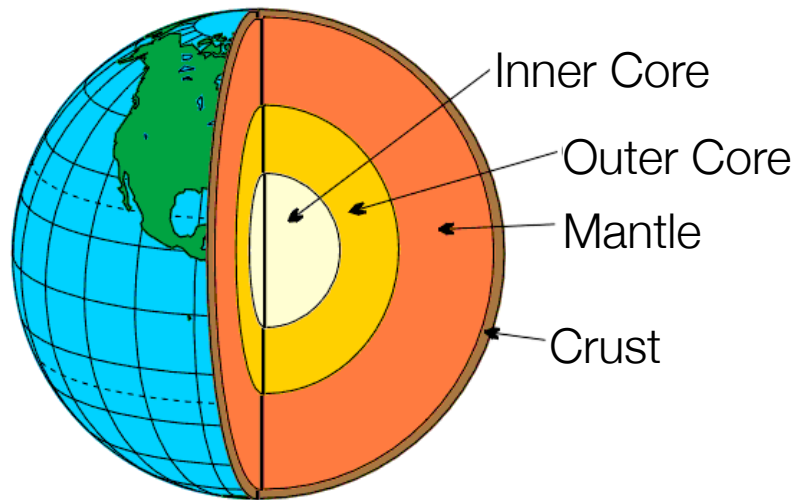


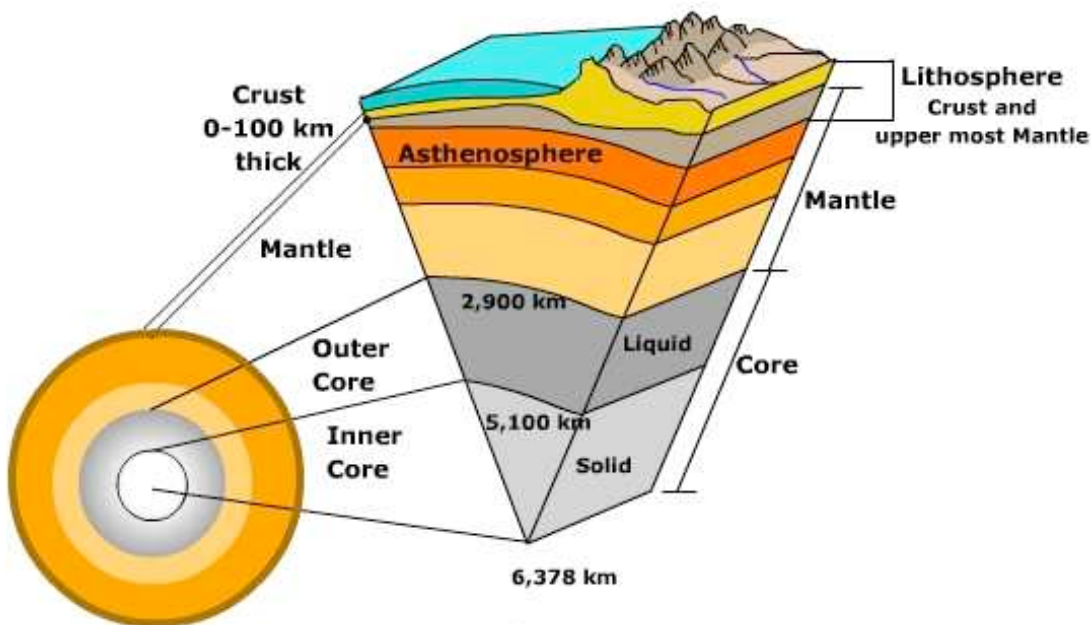
The Earth's Interior

The Earth's interior is made up of four layers (see diagram below)...

- ▶ **Crust:** Solid, outer layer of the Earth
- ▶ **Mantle:** Part solid, part melted layer beneath the crust
- ▶ **Outer Core:** Melted, metallic layer beneath the mantle
- ▶ **Inner Core:** Solid, metallic layer beneath the outer core



The outer-most part of the **mantle** is completely solid and is called the **rigid mantle**. The **rigid mantle** and the crust together make up the **lithosphere**. This solid **lithosphere** “floats” upon the melted part of the **mantle** beneath. This melted part of the **mantle** is called the **asthenosphere**. It is not completely melted into a liquid, it is thick and gooey, like chewed up bubble gum. We refer to this gooey asthenosphere as **plastic**.

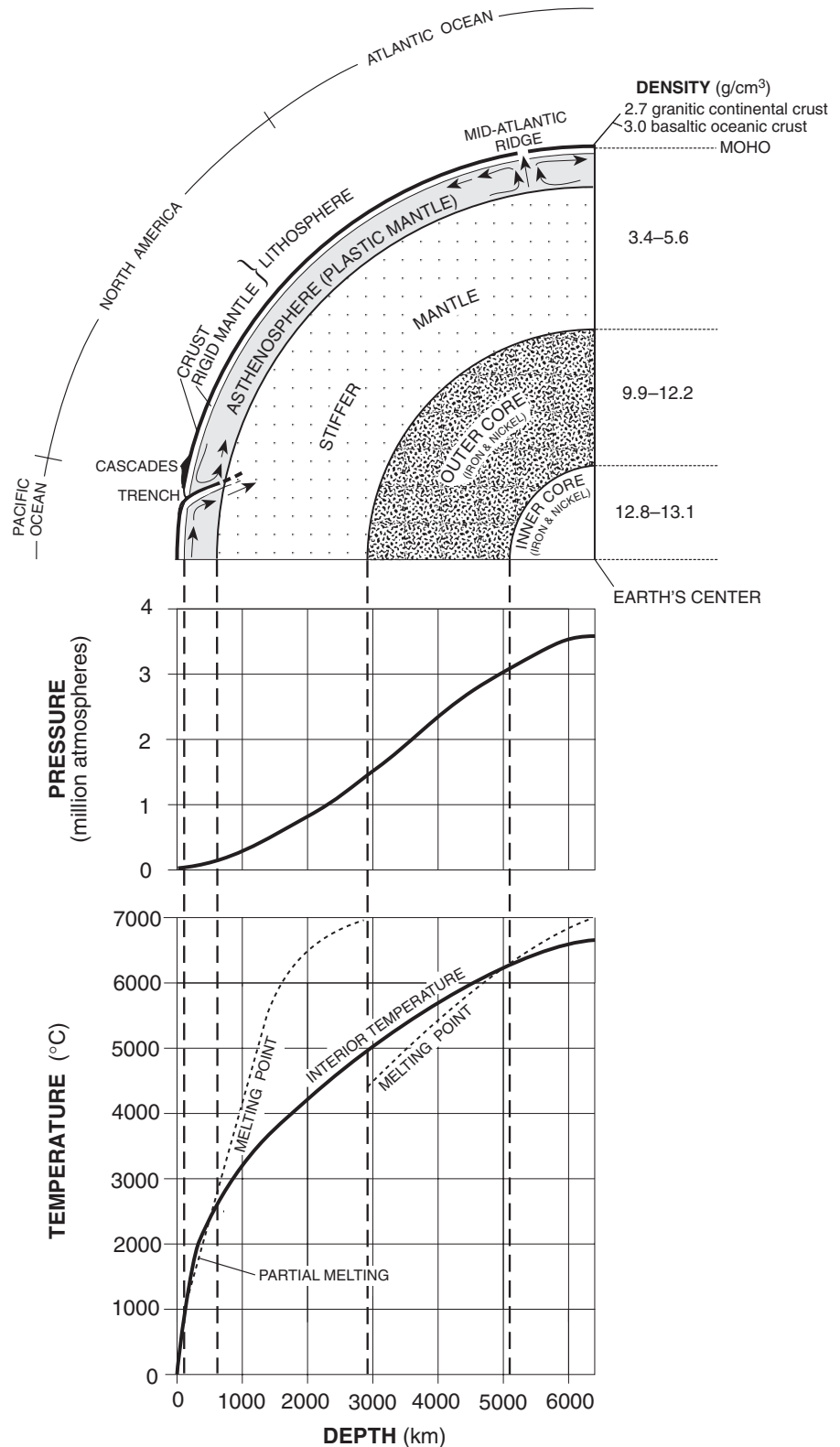


Earth Structure
(Not to Scale)

Inferred Properties of Earth's Interior

The diagram seen to the right can be found on page 10 of your reference tables. Pay attention to the following details:

- ▶ As you travel deeper down, from the crust to the inner core, the materials get increasingly dense.
- ▶ As you travel deeper down, from the crust to the inner core, the pressure increases.
- ▶ As you travel deeper down, from the crust to the inner core, the temperature increases.
- ▶ The **MOHO** is the boundary between the crust and the mantle.
- ▶ There are two types of crust:
 - ▶ **Continental crust** which is made of a **very thick** layer of the rock **granite** and is less dense (2.7 g/cm^3)
 - ▶ **Oceanic crust** which is made of a very **thin layer** of the rock **basalt** and is more dense (3.0 g/cm^3)
- ▶ Wherever the **interior temperature** is higher than the **melting point**, the material is a liquid (see the outer core).



Layer	Starting Depth (km)	Ending Depth (km)	Thickness (km)	Pressure Range (atms)	Density (g/cm ³)	Temp. Range (C)	Phase
Lithosphere							
Asthenosphere							
Stiffer Mantle							
Outer Core							
Inner Core							

- Which 2 layers make up Lithosphere? _____
- Where is the crust thicker, oceans or continents? _____
- Where is the crust denser, oceans or continents? _____
- What is the outer core believed to be made up of? _____
- What is the inner core believed to be made up of? _____
- What 2 layers of the Earth are either partially or totally melted? _____
- Between which 2 layers do you find the MOHO? _____
- What rock is continental crust made up of? _____
- What rock is oceanic crust made up of? _____
- Why are there ???'s on this chart? What does this mean? _____
- What happens to the temperature as you travel deeper into the Earth? _____
- What happens to pressure as you travel deeper into the Earth? _____
- Why do we call the Asthenosphere "the plastic mantle" ? _____
- What are the 3 layers of the Mantle? _____
- Plates move together or apart at mid ocean ridges? _____
- Plates move together or apart at trenches? _____
- Mountains are found at mid ocean ridges or trenches? _____

Which statement best describes the continental and oceanic crusts?

- A) The continental crust is thicker and less dense than the oceanic crust.
- B) The continental crust is thinner and more dense than the oceanic crust.
- C) The continental crust is thinner and less dense than the oceanic crust.
- D) The continental crust is thicker and more dense than the oceanic crust.

According to the *Earth Science Reference Tables*, at 4,500 kilometers below the surface of the Earth, the pressure is estimated to be

- A) 1.4 million atmospheres
- B) 2.0 million atmospheres
- C) 2.8 million atmospheres
- D) 3.1 million atmospheres

According to the *Earth Science Reference Tables*, in which group are the zones of the Earth's interior correctly arranged in order of increasing average density?

- A) crust, mantle, inner core, outer core
- B) crust, mantle, outer core, inner core
- C) inner core, outer core, mantle, crust
- D) outer core, inner core, mantle, crust

According to the *Earth Science Reference Tables*, the temperature of rock located 1,000 kilometers below the Earth's surface is about

- A) 200°C
- B) 2,100°C
- C) 2,800°C
- D) 3,200°C

According to the *Earth Science Reference Tables*, as the depth within the Earth's interior increases, the

- A) density, temperature, and pressure decrease
- B) density increases, but temperature and pressure decrease
- C) density and temperature increase, but pressure decreases
- D) density, temperature, and pressure increase

A part of which zone of the Earth's interior is inferred to have a density of 10.0 grams per cubic centimeter? [Refer to the *Earth Science Reference Tables*.]

- A) outer core
- B) inner core
- C) crust
- D) mantle

According to the *Earth Science Reference Tables*, in which zone of the Earth's interior is the melting point of the rock inferred to be lower than the actual temperature of the rock?

- A) outer core
- B) mantle
- C) inner core
- D) crust

The composition of some meteorites supports the inference that the Earth's core is composed of

- A) magnesium and potassium
- B) silicon and oxygen
- C) iron and nickel
- D) aluminum and calcium

The data table below shows the origin depths of all large-magnitude earthquakes over a 20-year period.

Data Table

Depth Below Surface (km)	Number of Earthquakes
0–33	27,788
34–100	17,585
101–300	7,329
301–700	3,167

According to these data, most of these earthquakes occurred within Earth's

- (1) lithosphere
- (2) asthenosphere
- (3) stiffer mantle
- (4) outer core

Which combination of temperature and pressure is inferred to occur within Earth's stiffer mantle?

- (1) 3500°C and 0.4 million atmospheres
- (2) 3500°C and 2.0 million atmospheres
- (3) 5500°C and 0.4 million atmospheres
- (4) 5500°C and 2.0 million atmospheres