

**What are the layers of the Earth?**

**What are the characteristics of each layer?**



# The Composition of Earth

- The Earth is divided into several layers with different composition and physical properties.
- Composition: Earth's layers are made of different mixtures of elements.
- Physical Properties: Temperature, density, and viscosity (ability to flow).



# The Composition of Earth

- The Earth can be divided into three layers by the composition of each layer.
- These three layers are the CRUST, MANTLE, and CORE.

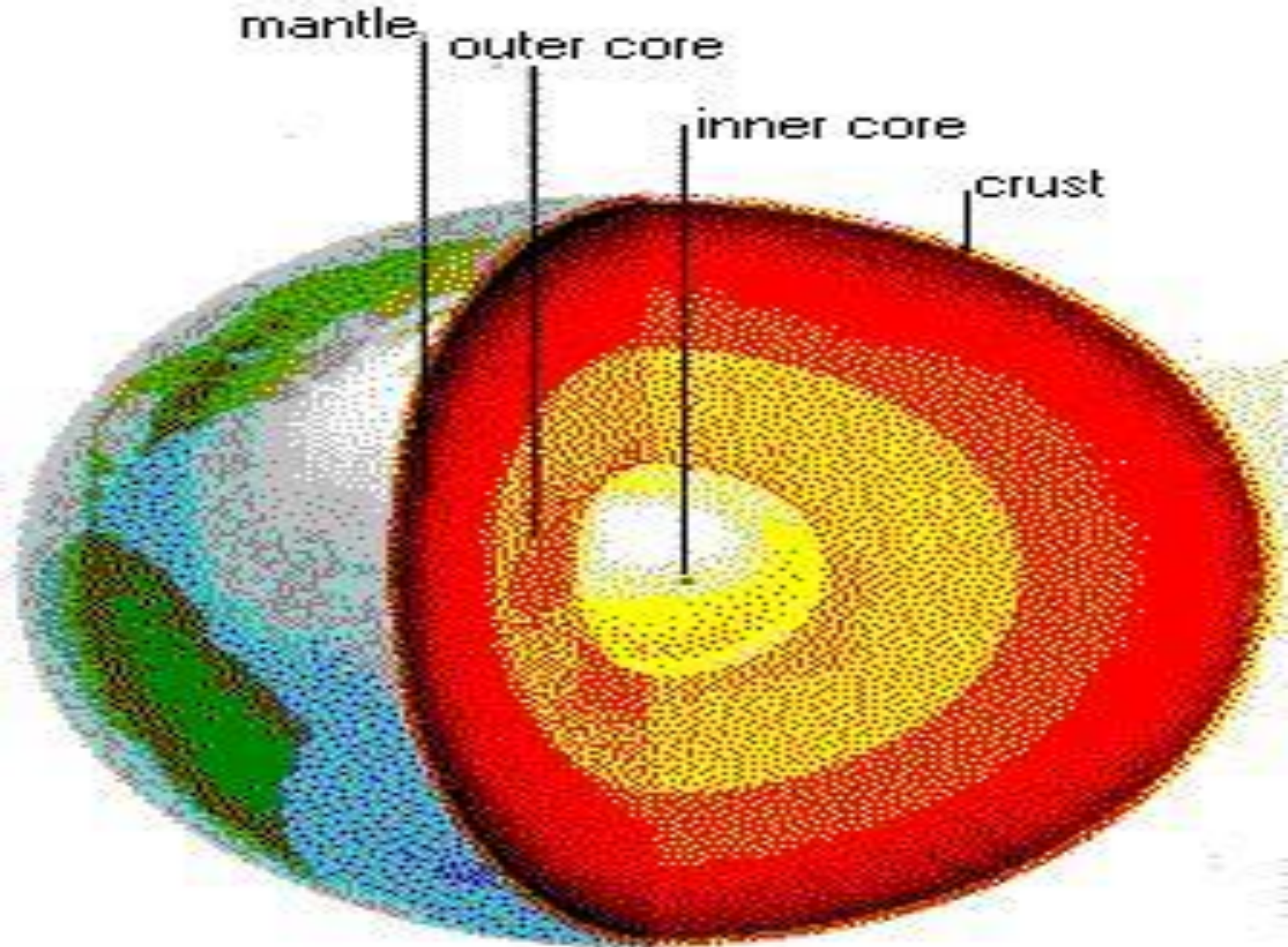


mantle

outer core

inner core

crust



# The Composition of Earth

- The lightest materials make up the outermost layer. The more dense material make up the inner layer.



# The Crust

- The outermost layer
- Ranging from 5-100 km thick
- Thinnest layer of Earth – less than 1% of the Earth's mass
- Least Dense
- Temperature ranges from 20°C to 870°C.
- Made of two layers.



# The Crust

- Top layer is primarily granite. Bottom layer is primarily basalt.
- Two types of crust: Continental and Oceanic.
- Both layers found under continents.
- Only basalt layer under the oceans.



# Continental vs. Oceanic Crust

- Makes up Earth's continents.
- Thickest layer of the Earth's crust.
- Least Dense.
- Composition similar to Granite.

- Makes up the ocean floor.
- Not as thick as continental crust.
- More dense than continental crust.
- Composition similar to Basalt.



# Mantle

- The layer of Earth beneath the crust is called the mantle.
- Approximately 67% of Earth's mass is found in this layer.
- The top boundary, the MOHO, is made up of solid rock. In the center of the mantle, the rock is viscous..it flows like syrup.



# Mantle

- Scientists have been able to examine the molten rock from active ocean volcanoes to gather most information about this layer.
- It is made up mostly of iron and magnesium.
- Temperatures range from  $870^{\circ}\text{C}$  to  $2200^{\circ}\text{C}$ .



# Core

- The core extends from the bottom of the mantle to the center of the Earth.
- Approximately 33% of the Earth's mass.
- This layer is divided into two parts: the liquid outer core and the solid inner core.



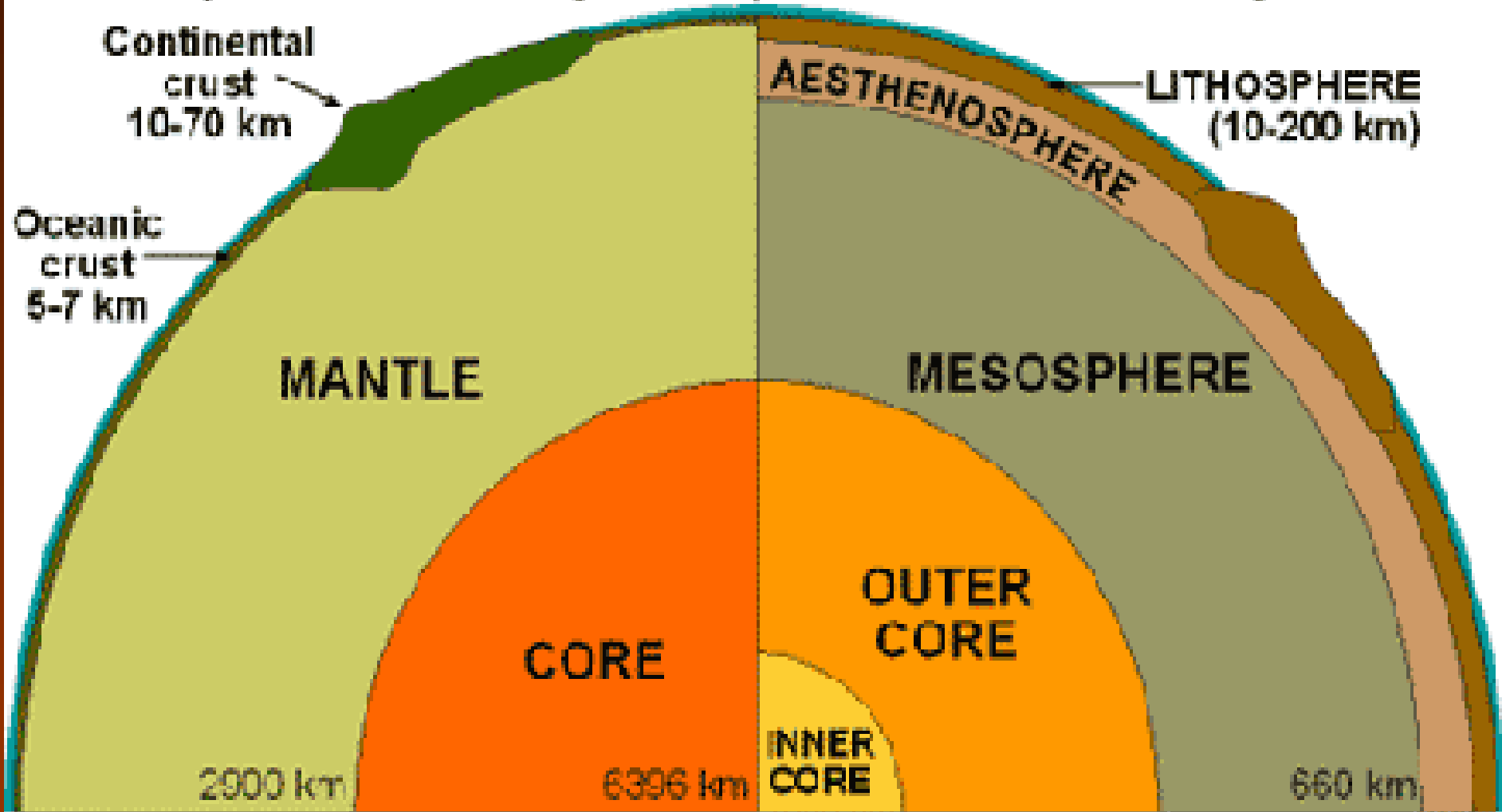
# Core

- The diameter of Mars is almost the same as the diameter of the Earth's core.
- The core is responsible for the Earth's magnetic field.
- Temperatures range from  $2200^{\circ}\text{C}$  to  $5000^{\circ}\text{C}$ .



# Compositional Layers

# Mechanical Layers



# The Mechanical Layers

Look At My Old Chevy & Isuzu Car.

- The Earth can be divided into five main mechanical layers.
- These five layers are the: Lithosphere, Asthenosphere, Mesosphere, Outer Core, and Inner Core.



# The Lithosphere (LOOK)

- The outermost, rigid layer of the Earth.
- Made of two parts: the crust and the Moho (upper solid part of the mantle).
- Divided into pieces called tectonic plates.



# The Asthenosphere (AT)

- The soft layer of the mantle on which the lithospheric plates move.
- It is made of solid rock like putty that flows very slowly – about the same rate your fingernail grows.






# The Mesosphere/Mantle (MY)

- The strong, lower part of the mantle.
- The middle layer.
- Extends to the Earth's core.



# Outer Core (OLD CHEVY)

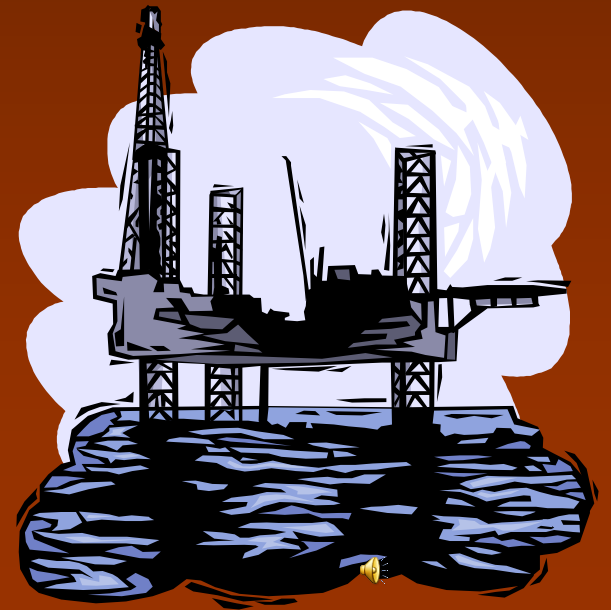
- The outer core extends from the bottom of the mantle and surrounds the inner core.
  - Hot!
  - It is approximately 2,270 kilometers thick.
  - It is a liquid.
  - It is composed of liquid iron and nickel.
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# Inner Core (ISUZU CAR)

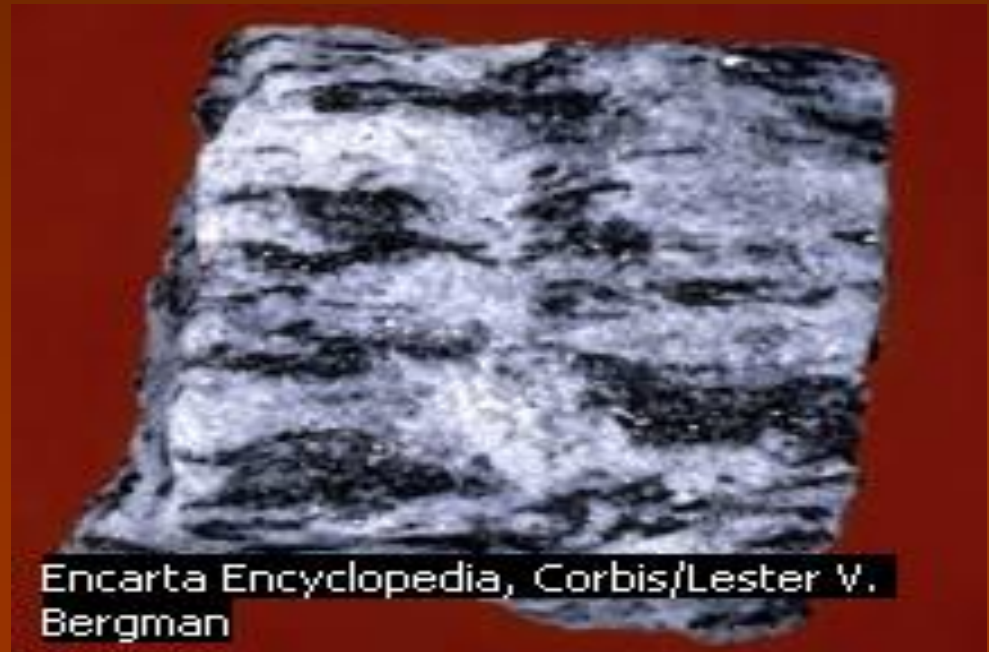
- 1216 kilometers thick
- Solid (Due to pressure from upper layers.)
- Composed of iron.
- Hotter than the Sun!!



A drilling rig can dig down 6 kilometers. What layer of Earth would you more than likely be in?



Which type of crust is composed of mostly basalt?



Encarta Encyclopedia, Corbis/Lester V. Bergman