

Earth's Layers

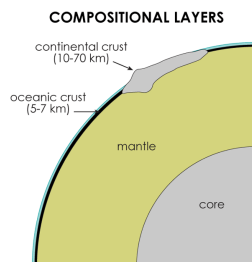


Foldable Layout



Compositional Layers	Mechanical Layers
Crust	Lithosphere
Mantle	Asthenosphere
	Mesosphere
	Outer Core
Core	Inner Core

Compositional (Chemical) Layers



Each layer made of different materials

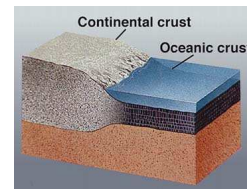
- Crust
- Mantle
- Core

All four terrestrial planets have metal cores and rocky mantles & crusts

- Mercury, Venus, Earth, Mars

Crust

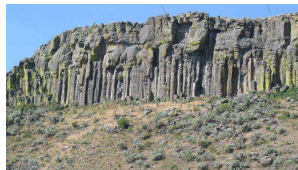
- Oceanic crust: basaltic rocks, 5-7 km deep
- Continental crust: granitic rocks, 10-70 km deep
- Very thin, 1% of Earth's volume
- Up to 400 °C at mantle boundary (Moho)
- We've never drilled past the crust



Basalt (oceanic crust)

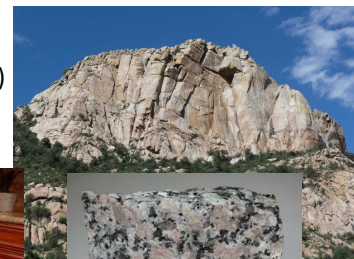


- Fine-grained
- Dark color
- Can exist on continents also



Granite (continental crust)

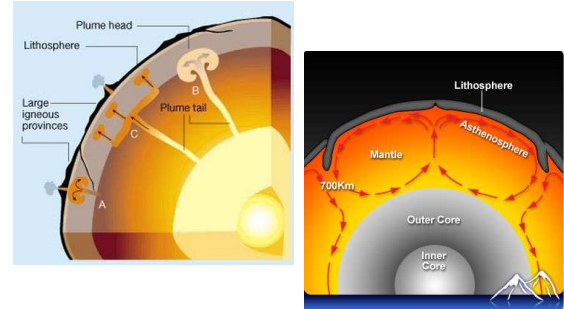
- Coarse-grained (can see crystals)
- Light colored



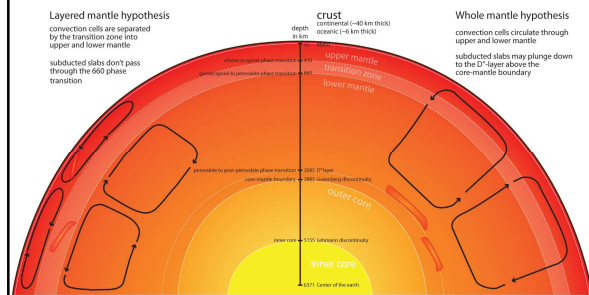
Mantle

- 2,900 km deep, 84% of Earth's volume
- Made of silicate rocks
- Crust-mantle boundary called the **Moho** (short for Mohorovicic Discontinuity)
- 500 °C at Moho to 4,000 °C at core-mantle boundary
- Convection currents in mantle carry heat from the core to the surface

Draw convection currents and a mantle plume on your foldable

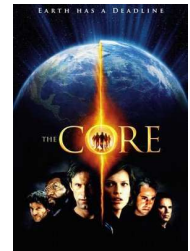


No notes on this page, just some cool science



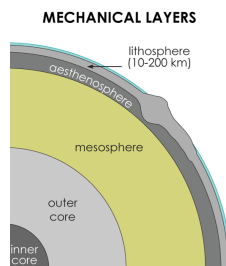
Core

- 6,396 km deep (to the center), 15% of Earth's volume
- Made of metal (iron & nickel)
- 4,030 °C at mantle boundary to 5,400 °C at center (same as surface of the Sun)
- Opposite rotation of inner & outer core generates Earth's magnetic field



Mechanical (Physical) Layers

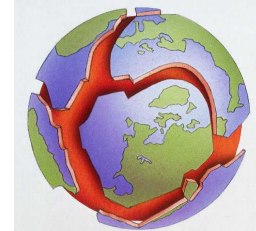
- Layers different by physical properties
 - Lithosphere
 - Asthenosphere
 - Mesosphere
 - Outer core
 - Inner core



Lithosphere

litho = stone

- 10-200 km deep
- Uppermost part of mantle and the crust
- Solid & rigid rock, breaks under pressure
- Broken into plates
- Floats on asthenosphere



Asthenosphere

astheno = weak

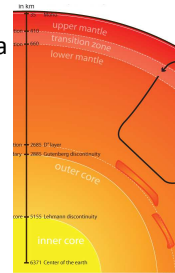
- 660 km deep
- Lithosphere & asthenosphere parts of upper mantle
- Solid & plastic rock, flows very slowly (geologic time)
- Some regions melted into magma



Mesosphere

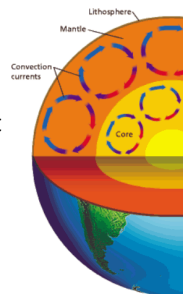
meso = middle

- 2,700 km deep,
- Mesosphere is the lower mantle
- Solid & rigid rock; areas of magma
- **(Draw)** Transition zone: astheno-meso boundary
- **(Draw)** D-zone (or D-layer): core-mantle boundary
- There is also a layer of atmosphere . . . confusing!



Outer Core

- 5,150 km deep
- Liquid & fluid metal
- Convection currents carry heat from inner core to the mantle
- Rotates to the west



Inner Core

- 6,397 km deep to center
- Solid & rigid metal
- Rotates to the east (opposite outer core)
- Wants to be liquid due to temperature, but pressure keeps it solid
- Is slowly growing larger as outer core cools and solidifies

