# Earth's Interior

Chapter 4
Section 1

# Standard

- S 6.1. b Students know Earth is composed of several layers: a cold, brittle lithosphere, a hot, convicting mantle and a dense metallic core.

# Vocabulary

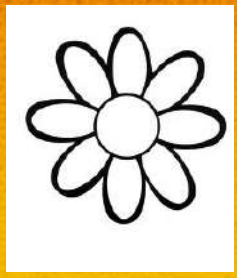
- Seismic Waves- vibrations that travel through Earth carrying the energy released during an earthquake
- Pressure- force exerted on a surface divided by the total area
- Crust- layer of rock that forms Earth's outer surface
- Mantle- a layer of hot, solid material between Earth's crust and core

# Vocabulary

- Lithosphere-uppermost part of the mantle and the crust
- Asthenosphere- soft layer of the mantle where the lithosphere floats
- Outer core- on top of the inner core
- Inner core – solid nickel and iron at the center of the Earth

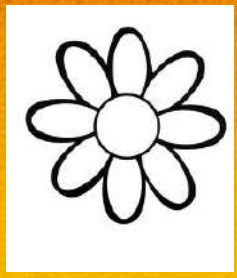
# Anticipatory Lesson

# Exploring Inside Earth



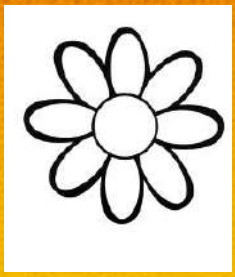
- Geologists have used 2 types of evidence to learn about Earth's interior:
  - Direct Evidence from rock samples
  - Indirect Evidence from recording and studying seismic waves
- Holes drilled several kilometers into the crust will provide direct evidence about Earths interior in the form of rock samples.

# Observation

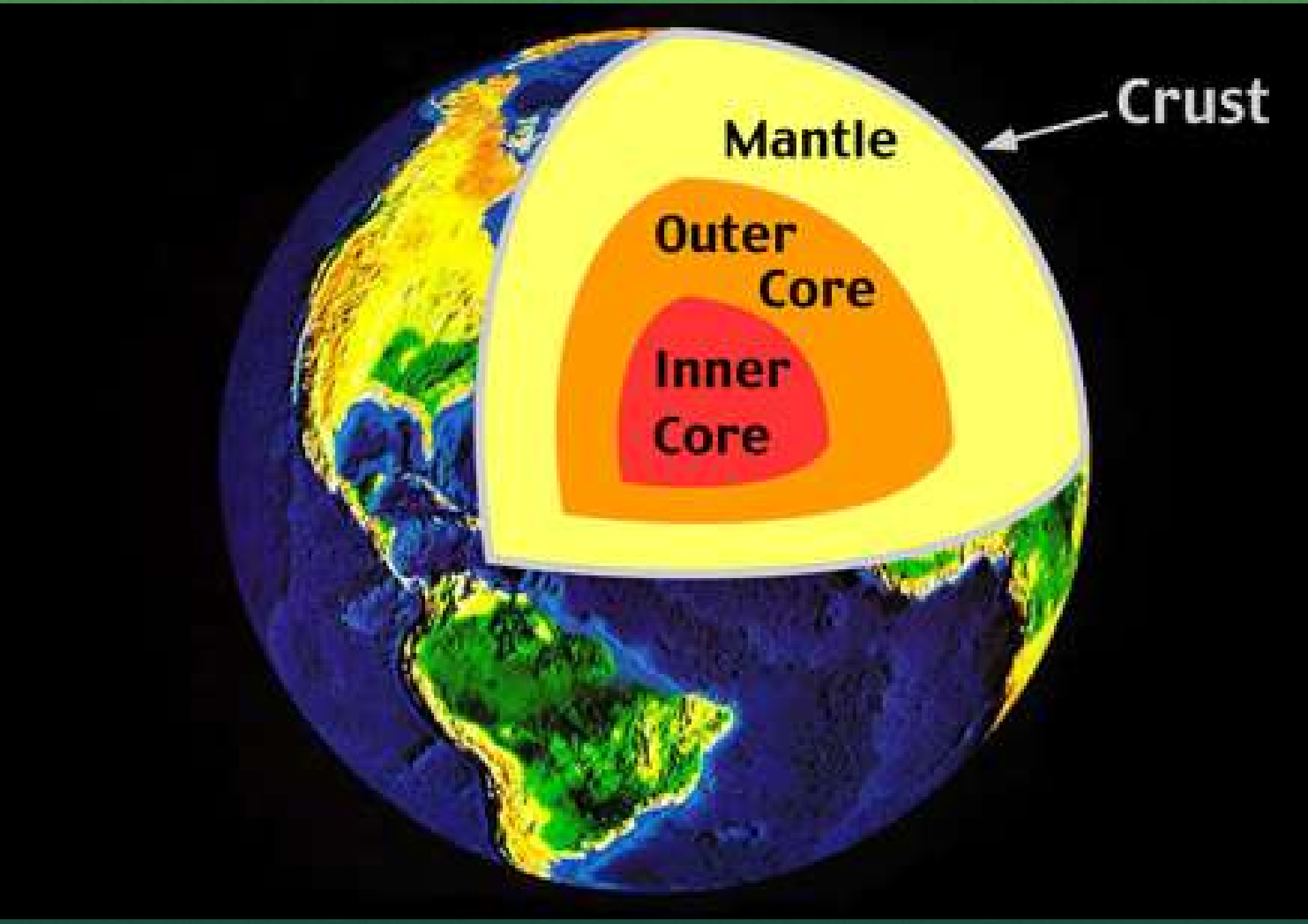


- We cannot look inside the Earth
- You need indirect observation
- When an Earthquake occurs, they produce seismic waves.
- They record the wave and how they travel through Earth.
- The speed of the waves and the paths they take shows the structure of our planet.

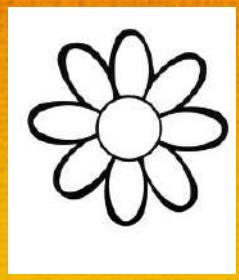
# Layers of Earth



- The 3 main layers of Earth from the outside to the inside are
  - The Crust
  - The mantle
  - The outer core
  - The inner core
- These layers vary in size, composition, temperature, and pressure.


Crust
Mantle
Outer Core
Inner Core

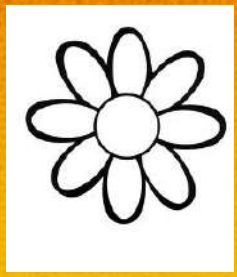
# Temperature/Pressure



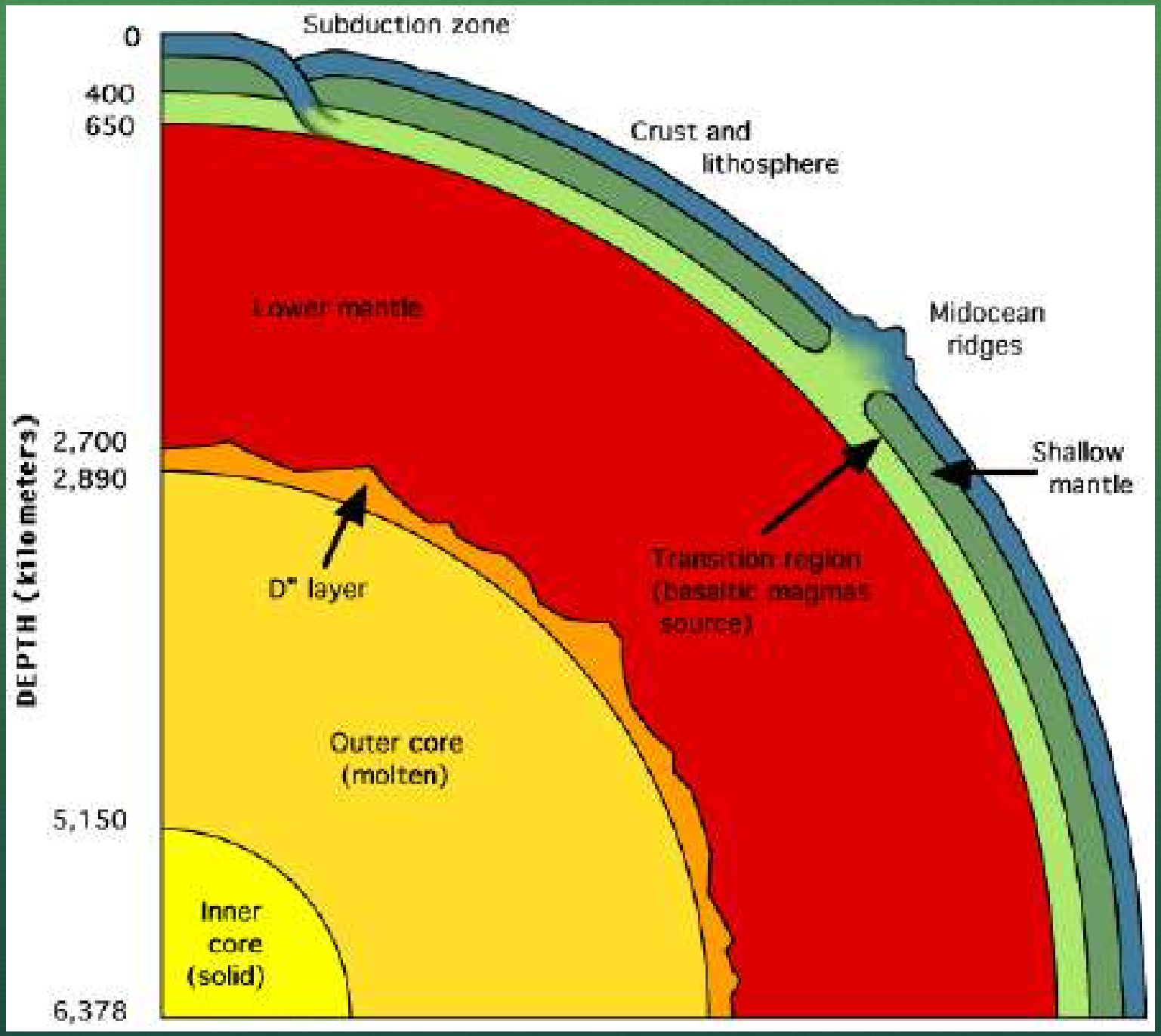
- Temperature
  - As you go down to the inner core, the temperature gets hotter.

- Pressure
  - The weight of the rock above increases the pressure
  - Just like diving into a swimming pool.

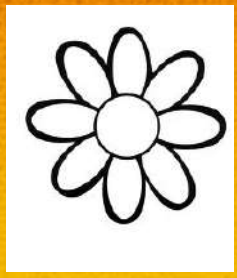
# The Crust



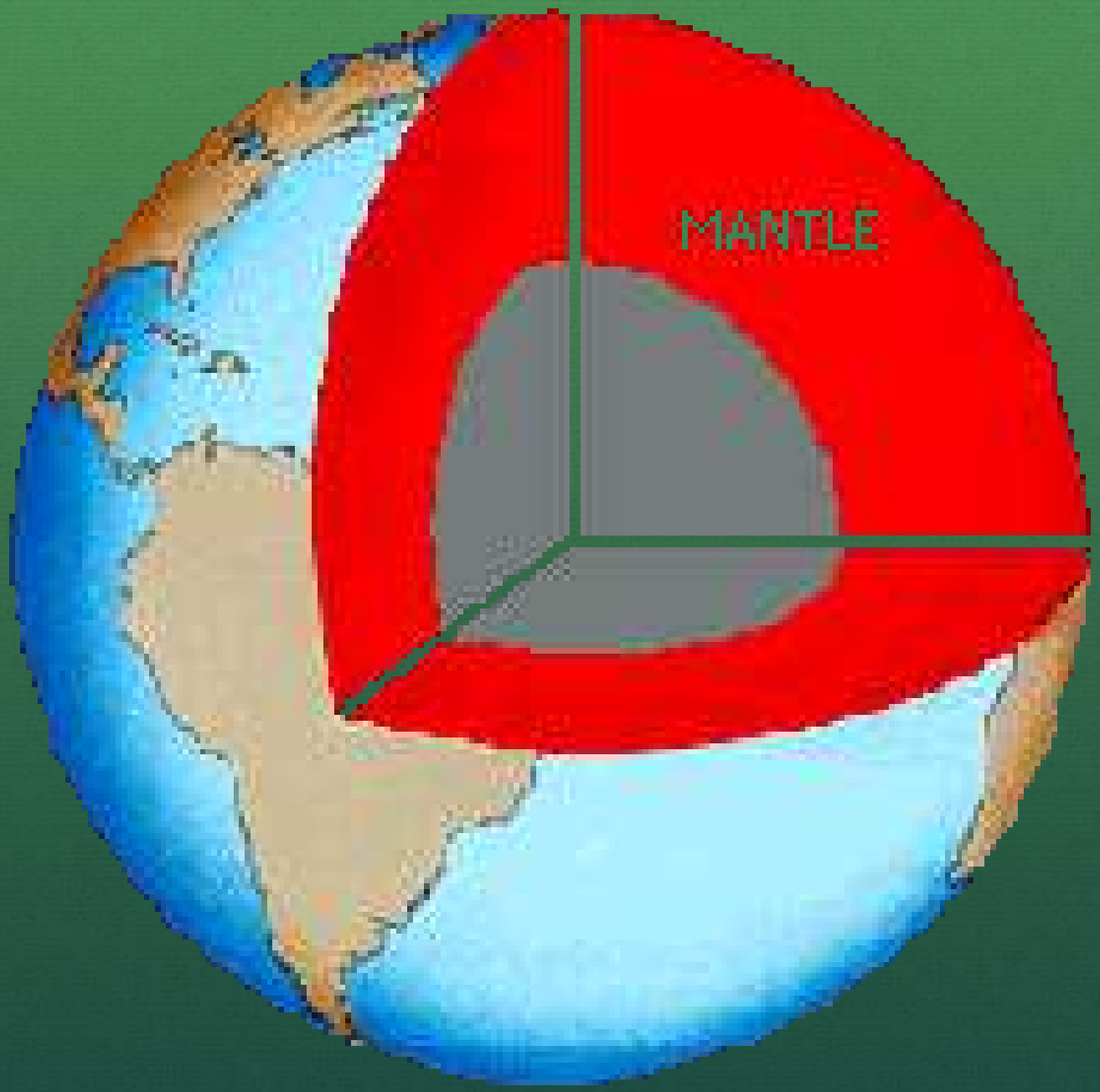
- The crust is a layer of solid rock that includes both dry land and the ocean floor.
- Crust: the layer of rock that forms Earth's outer skin.
- The Earth's crust can be compared to the paper thin skin of an onion.


Subduction zone
0
400
650
Crust and lithosphere
Lower mantle
Midocean ridges
2,700
2,890
Shallow mantle
D" layer
Transition region (basaltic magmas source)
DEPTH (kilometers)
Outer core (molten)
5,150
Inner core (solid)
6,378

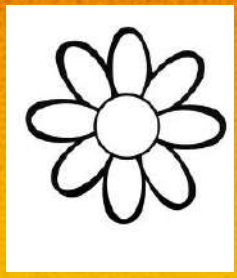
# The Mantle



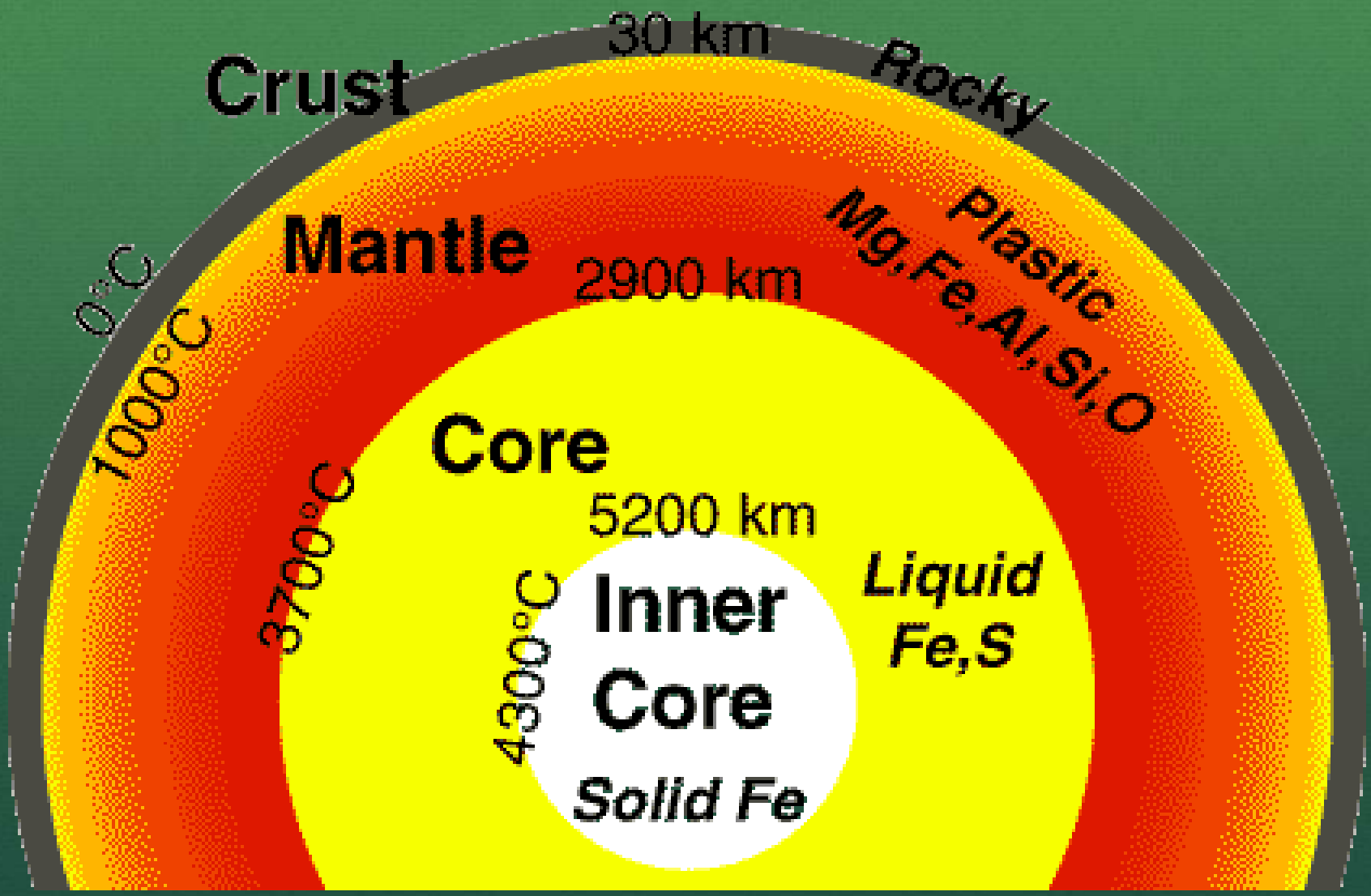
- A layer of hot rock
- It is made up of rock that is very hot, but solid. Different layers of the mantle have different physical characteristics.
- 3,000 kilometers thick
- Lithosphere- stone, upper most part of the Mantle
- Asthenosphere- soft layer, weak
- Lower Mantle- extends all the way to the core


MANTLE

# The Core



- The core is mostly of the metals iron and nickel.
  - A liquid outer core and a solid inner core
- Outer Core- layer of molten metal that surrounds the inner core (liquid)
- Inner core- a dense ball of solid metal.
- Earth's magnetic fields results from movements in the outer core.
- Core- iron, nickel, oxygen, sulfur, and silicon


Crust
30 km
Rocky
0°C
1000°C
Mantle
2900 km
Plastic
Mg,Fe,Al,Si,O
3700°C
Core
5200 km
4300°C
Inner
Core
Solid Fe
Liquid
Fe,S

# Checking for Understanding

- 1. What are the 4 layers of Earth (outside to inside)
  - A. crust, outer core, inner core, mantle
  - B. mantle, outer core, inner core, crust
  - C. crust, mantle, outer core, inner core.
  - D. outer core, inner core, crust, mantle
- Answer C.

# Checking for Understanding

2. Earth's mantle is
   - A. a layer of molten metal
   - B. a layer of hot rock
   - C. a dense ball of solid metal
   - D. a layer of rock that forms Earth's outer skin

- Answer B.

# Checking for Understanding

3. Earth's magnetic field results from movement in the
   - A. mantle
   - B. outer core
   - C. inner core
   - D. Crust

# Guided Practice
# Independent Practice

- Guided Practice pg 71 # 8-10
- Independent Practice: pg 71-71 # 11- 21
- Homework: Earth's Interior