Convection and the Mantle

Chapter 4
Section 2

Standards

- S 6.4 Students know heat from Earth's interior reaches the surface primarily through convection.

Anticipatory Set

- Have you every looked closely at fire and seen the blue color in the center of the flame?
- The outer part of the flame is actually cooler than the blue center.

Vocabulary

- Radiation
- Conduction
- Convection
- Density
- Convection current

Types of Heat Transfers

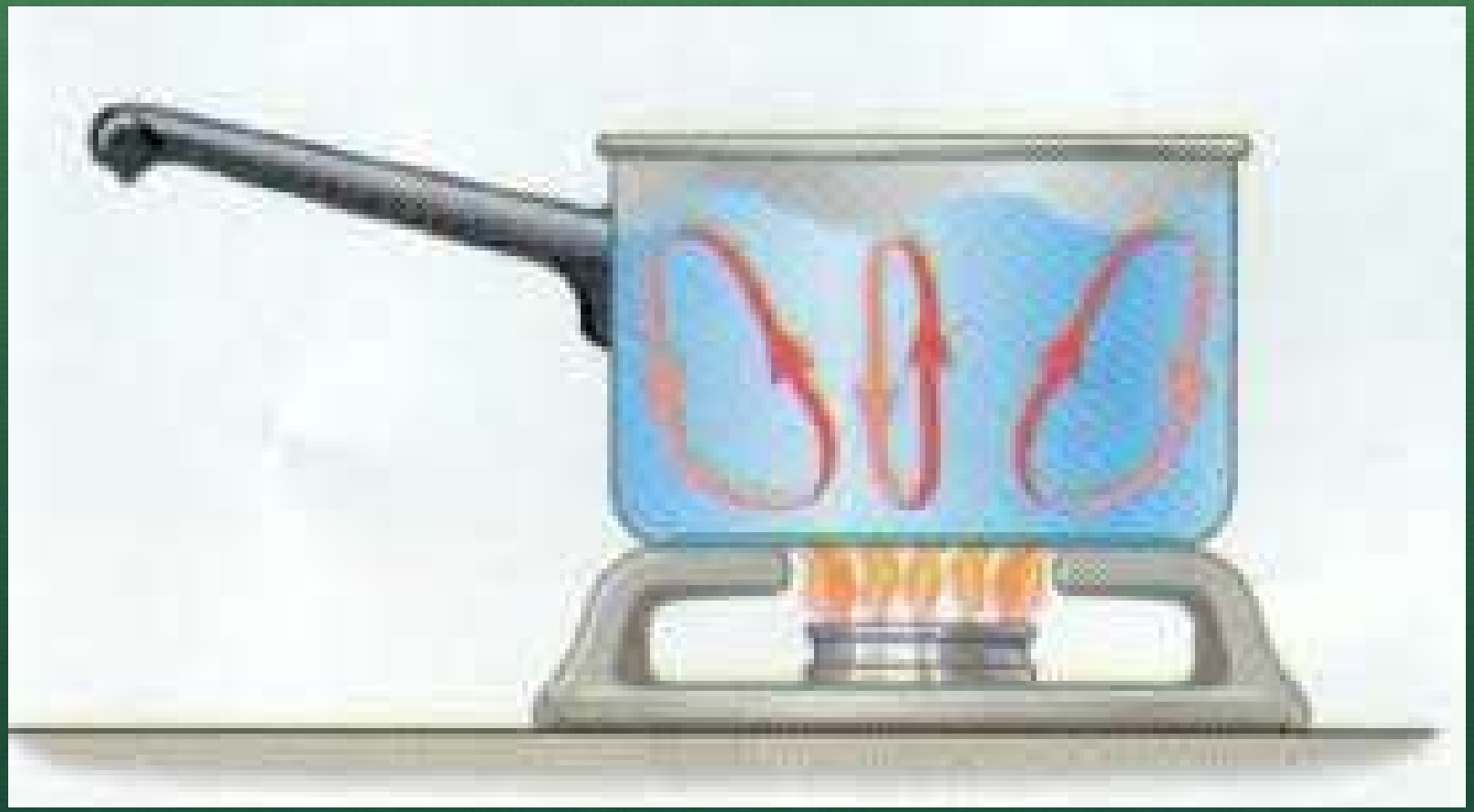
- 3 types of heat transfer
  - Radiation- no direct contact between a heat source and an object
  - Conduction- heat moves from the hot soup and the particles bump into each other and they heat up what they bump into.
  - Convection- Headed particles begin to flow. Heat transfer from one object to another object.

Convection

- Heat transfer within a fluid takes place by convection currents.
- Density: the measure of how much mass there is in a volume of a substance.
- When the heat source is removed from a fluid, convection currents in the fluid will eventually stop.

Convection Currents

- Scientist think that convection currents flow in Earth's mantle.
- Heating and cooling of the fluid, changes in the fluids density and the force of gravity combines to set convection currents in motion.
- When you heat up soup, the bottom gets hot and expands. Meaning it becomes more dense. The less dense soup moves upward and floats. Gravity pulls this cooler soup to the bottom and a cycle begins.

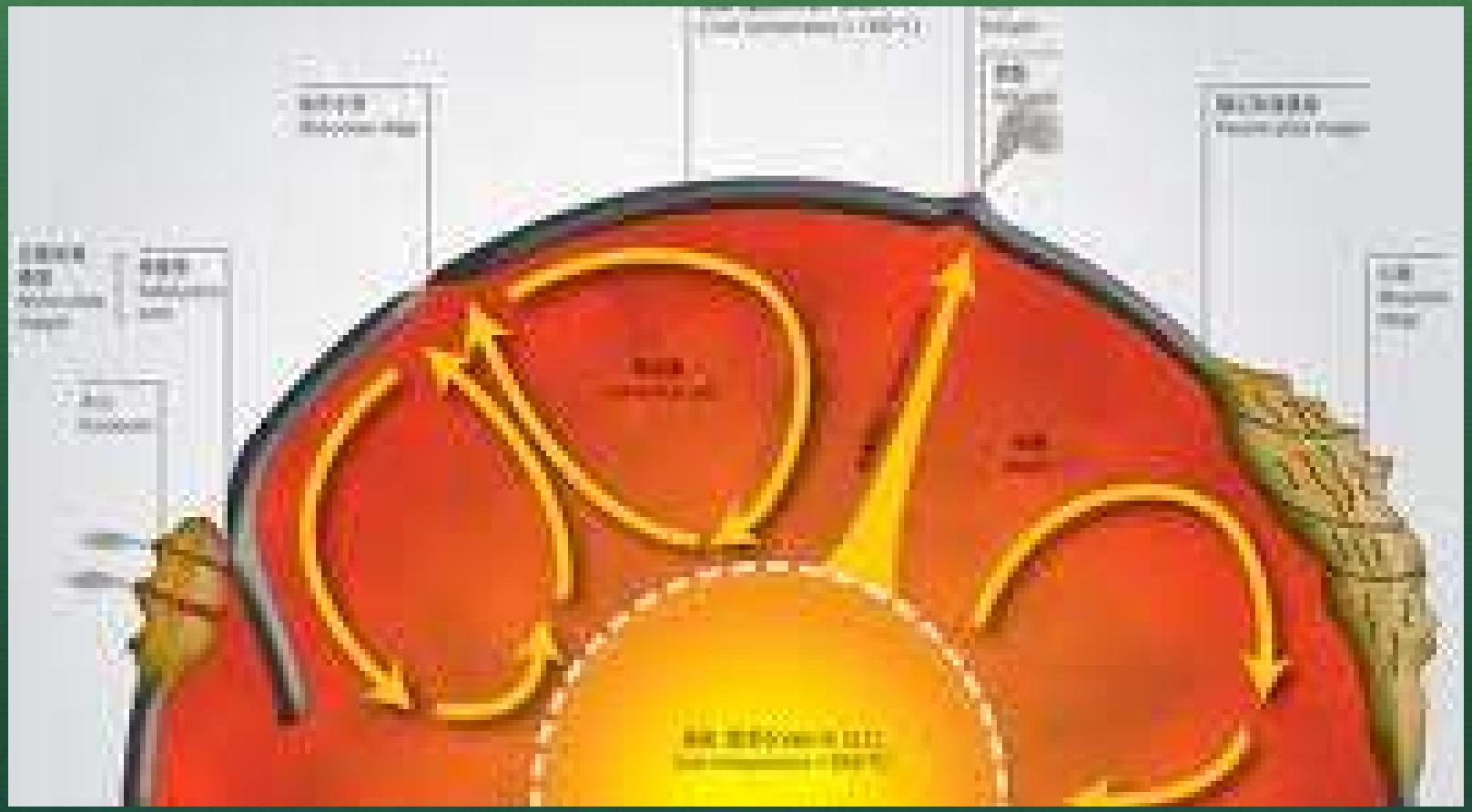


- When you touch a hot pot or pan, energy moves from the pot to your hand. This is called heat transfer.
- The transfer of energy through empty space is called radiation.


Radiation
Radiation

Convection Currents in Earth

- Heat from the core and the mantle itself causes convection currents in the mantle.
- Solid mantle rises slowly from the bottom towards the top. The hot rock cools and sinks back to the mantle.
- It's a cycle of rising and cooling.



Checking for Understanding

- What are the 3 types of heat transfer?
- Name 2 layers of Earth in which convection currents take place?
- What happens to the density of a liquid as it becomes hotter?

Guided Practice
Independent Practice

- Guided Practice: page 76 #4-10
- Stop! Come see Ms. Graham for a STAMP.
- Independent Practice: page 77# 11-14