

Heat Moves Earth

Trace how internal energy sets Earth materials in motion.

5.8.a "Earth's internal energy causes movement of material within the Earth;"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline four phrases that show the sequence from Earth's internal energy to moving plates. Write the numbers 1 through 4 beside the phrases in order.

A Slow Motion Engine

- ① Far below Earth's surface, rocks are hot enough to soften and flow very slowly. This layer, called the mantle, is heated by energy inside Earth. Some energy remains from Earth's early formation, and some comes from radioactive atoms. Heat does not make the whole mantle melt. Instead, it can make solid rock move over millions of years.
- ② Warmer mantle material becomes a little less dense than cooler material around it, so it slowly rises. Near the cooler upper mantle, it loses heat and becomes denser. Then it sinks again. This repeated rising and sinking is called convection. A convection current moves material in a loop, although the motion is far too slow for people to see.
- ③ Earth's outer rocky layer is broken into huge plates. Convection currents in the mantle can help move these plates above them. Where plates push together, pull apart, or slide past each other, the crust can change. Mountains, volcanoes, and earthquakes often occur near plate boundaries. Earth's internal energy therefore starts a chain: it heats mantle material, moves that material, and helps move plates.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What are the two sources of Earth's internal energy named in the passage?

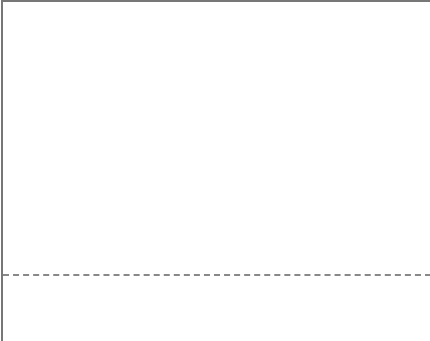
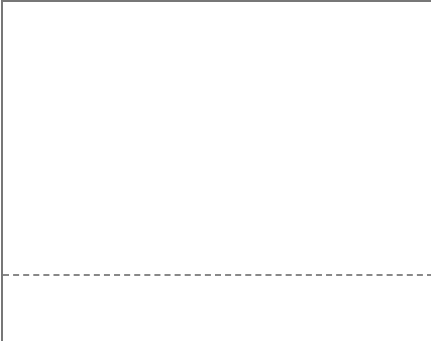
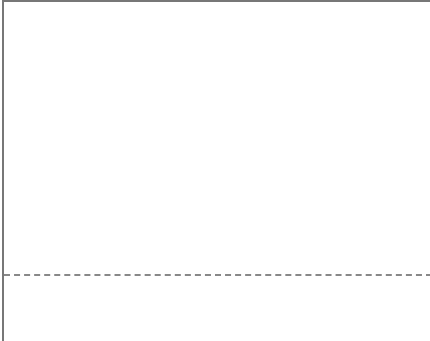
2 Why does warmer mantle material rise, according to the passage?

3 What happens to mantle material after it loses heat near the upper mantle?

4 How can convection currents in the mantle affect Earth's outer rocky layer?

3 YOUR TURN _____ Your own words

Create a three-panel sketch of a convection current below an Earth plate. In Panel 1, show internal heat warming mantle rock. In Panel 2, show warmer rock rising and cooler rock sinking. In Panel 3, show the moving mantle helping move a plate. Add arrows and labels, then write two sentences explaining how the cycle transfers energy into motion.

		
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PART 1 • READ AND MARK

Underline four phrases that show the sequence from Earth's internal energy to moving plates. Write the numbers 1 through 4 beside the phrases in order. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What are the two sources of Earth's internal energy named in the passage?	Energy left from Earth's early formation and energy from radioactive atoms.
2	Why does warmer mantle material rise, according to the passage?	Warmer mantle material is a little less dense than the cooler material around it, so it rises.
3	What happens to mantle material after it loses heat near the upper mantle?	It becomes denser and sinks again.
4	How can convection currents in the mantle affect Earth's outer rocky layer?	Convection currents can help move Earth's plates. Plate movement can change the crust where plates meet.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1 shows hot mantle rock deep inside Earth, Panel 2 shows warmer rock rising while cooler, denser rock sinks, and Panel 3 shows the current helping move a plate. Internal heat changes the rock's density, so the repeating current transfers energy into motion.

Accept equivalent descriptions of internal heat causing mantle convection, including warmer material rising and cooler, denser material sinking. In the sketch, look for a labeled heat source, a looping current with arrows, and plate movement connected to the current.