

Earth's Interior (+ *Magnetism* section from Plate Tectonics Chapter – use index to find page numbers) – Chapter Questions

MAFIC – igneous rocks whose composition is low in Si and high in Fe, Mg, and Ca – usually found in oceanic volcanic settings like seafloor spreading centers and ocean hotspots. Example: Basalt.

FELSIC – igneous rocks whose composition is high in Si and low in Fe, Mg, and Ca – usually found in continental volcanic settings like subduction zone volcanic arcs, continental hotspots, or continental rifting. Example: Granite.

1. **What happens to seismic waves as they travel from more rigid material into less rigid material? Vice versa?
2. What specifically happens to seismic body waves as they travel through our planet Earth? Describe the physical and chemical changes in the Earth's layers from top to bottom.

Depth (base of layer)	Layer (starting at Earth's surface)	Change in seismic wave velocity	Graph (velocity increases ⇒)
8-70 km	CRUST Lithosphere		
100 km	MANTLE Lithosphere		
	Asthenosphere		
350 km			
400 km			
	Transition Zone		
700 km			
	Lower Mantle (Mesosphere)		
2900 km			
	OUTER CORE		
5270 km			
	INNER CORE		
6370 km			

3. **What happens to P and S waves when travelling into the outer core? Describe P- and S-wave shadow zones.
4. How can we use P and S wave shadow zones to conclusively prove that Earth's outer core is molten?
5. **How is isostatic equilibrium of Earth's crust similar to the floating equilibrium of a cargo ship?
6. What are some natural examples of isostatic equilibrium working on Earth's surface?
7. Explain isostasy? How can we use the Moho's depth around the planet to prove isostasy? (Draw a picture.)
8. **By what two methods can you increase gravity between two objects?
9. What are gravity anomalies? What causes positive anomalies? Negative ones?
10. **What is magnetic polarity?
11. Earth's magnetic field is caused by convecting currents in the Earth's liquid iron outer core. Be sure you understand why. The rotation of the Earth appears to keep the poles of that field close to the rotational poles. The book erroneously indicates that the spin of the Earth is what is causing the field – incorrect. Convection currents cause the field. Be sure you understand the distinction.
12. What's happened to Earth's magnetic field over geologic time (two different things)? Why?
13. What kind of materials align themselves to the Earth's magnetic field? When?
14. **What is **paleomagnetism**?
15. **What are magnetic seafloor anomalies?
16. How can we use magnetic seafloor anomalies to determine plate spreading rates and direction?
17. Where are the slowest spreading centers? How slow? Where are the fastest? How fast?