

Part 2: The Earth's Crust

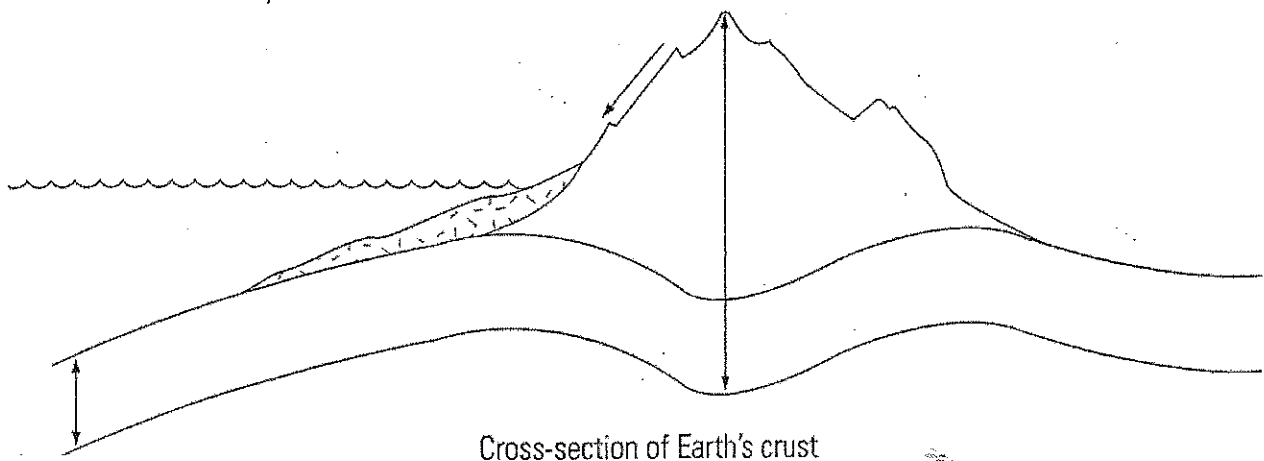
What exactly is the Earth's crust made of? The answer varies depending on where you are. As the Earth cooled billions of years ago, some parts cooled quickly to form light rocks such as granite, containing mixtures of light minerals such as silicon and aluminum. Other rocks cooled more gradually to form heavy combinations of silicon, iron, and magnesium. A 10-km-thick layer of these denser, heavier rocks, called basalt, form the ocean floor. The lighter, crustal rocks of the continents are up to 64 km thick, and float on top of the basalt rock like ice floats on water.

But what force could be powerful enough to move these massive plates of rock? The secret lies deep below us, where giant convection currents of hot semi-molten rock (which move like a soft plastic) are driven by uneven temperatures within the upper mantle. These currents slowly circle underneath the hard crustal surface of the Earth. Although slow, they have so much power that they push and pull the plates around, cracking the crust into pieces. Pressurized hot magma forces its way up through the cracks in the crust, causing shocking earthquakes and mighty volcanoes.

4. a) From what you know so far about the lighter parts of the Earth's crust "floating" on a dense layer of heavy basalt, add the following labels to the diagram below. For help, check the diagrams at the bottom of Atlas page 123.

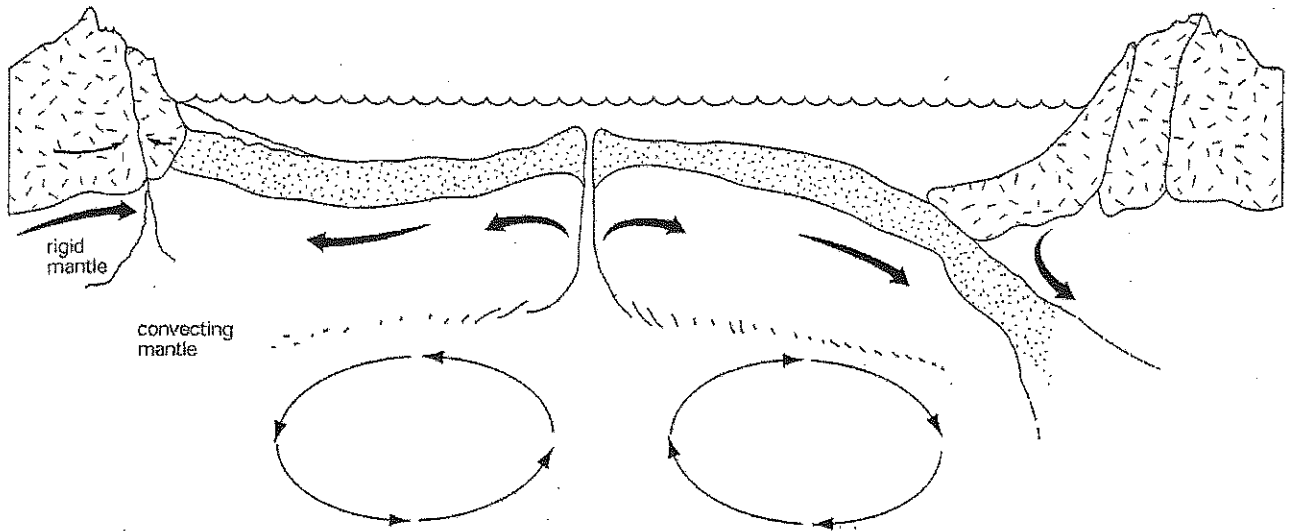
- crust
- mantle
- ocean floor
- dense basalt
- continent
- light granite
- erosion
- deposits of sediments

- b) Use information from the text above to add labels showing the thickness of the crust on the ocean floor and on land (next to the arrows).



5. Refer to the diagrams at the bottom of Atlas pages 122-123 and the text above. Accurately place the following labels on the diagram of Earth, below.

- magma
- ocean
- deep focus earthquakes
- ocean-floor spreading
- fold mountains
- mid-oceanic ridge
- colliding plates
- subduction zone (crust melts here)
- separating plates
- ocean trench
- convection current



Cross-section of Earth showing plate tectonics