Look at figure 10 and fill in the blanks in the text using the following words. Then, check your choices with your partner.

subduction • movement • size • split • dense • rigid • warmer • descending • convection • mantle • currents • cooler • falls • floor • pulled

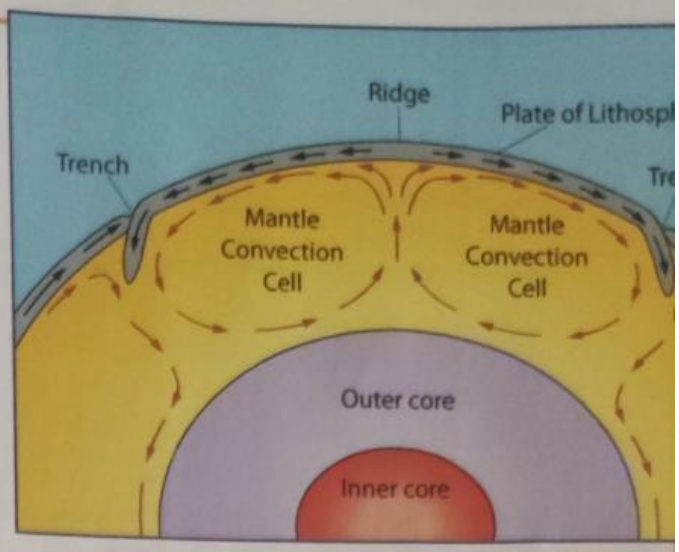

Figure 10. The mantle convection cells.

STUDYING SOURCES

3 The causes of plate movement

"Plates" of _____ lithosphere float on the fluid material, which forms the _____ underneath. Geologists think that plate motion is caused by the underlying hot mantle convection _____.

As it happens to the air in a room, in the same way, in the mantle, the transfer of thermal energy, from the _____ bottom regions to the _____ upper regions, occurs through convection currents. The hot material, less _____ than the cooler material, rises towards the lithosphere, then, once it reaches the base of the lithosphere, it cools down and _____ back down through the mantle. The cool material is replaced by hotter material, so that large "_____ cells" are formed. The presence of these convection cells is thought to be the driving mechanism of plate _____. According to this assumption, on the ocean _____, in coincidence with the rising part of a convection current the ridges are found, whereas, in coincidence with the _____ part, the oceanic trenches are evident. Two processes seem to be involved. The rising part of a convection cell would cause upper and lateral forces, which would force the lithosphere to rise first and then _____, originating the divergent boundaries. Then, the plate would be pushed towards the _____ zone, the horizontal flow of material at the top of the convection cell, contributing to its movement. Conversely, the downward part of the convection cell would force the lithosphere to be _____ downward, originating convergent boundaries.

Although scientists agree with this theory, a few doubts still remain, about how mantle currents originate and what the actual _____ of the convection cells is.

Follow up activity

In groups, make a power point presentation in which the causes of plate movement are explained.

COMPREHENSION QUESTIONS

In groups, take turns to ask and answer the following questions.

1. How does a convection cell work?
2. How is the plate movement related to the mantle convection currents?
3. How is the distribution of volcanoes and earthquakes related to tectonic plate movement?
4. What are convection currents in the mantle, how are they formed and what happens to the crust above them?

LIVEWORKSHEETS