

# Oxford Revise | Geography | Answers

## Chapter 4 How do plate tectonics shape our world?

All exemplar answers given are worth full marks.

1

- (a) The internal structure of the Earth is made up of a series of layers. The outer layer consists of oceanic crust, which is high-density basalt and continental crust, which is low-density granite. Next comes the mantle, which is made up of silica-based rocks. Beneath this lies the outer core, which is liquid and mainly made up of iron and nickel. The inner core at the centre of the Earth is also made of iron and nickel but is solid.
- (b) The oceanic crust is much thinner than the continental crust.
- (c)
  - (i) Eurasian Plate
  - (ii) Eurasian Plate and North American Plate
  - (iii) Nazca Plate and South American Plate
- (d) destructive
- (e) Conventional explanations of tectonic plate movement have concentrated on convection cycles in the mantle. Hotspots around the core create convection currents, which rise before spreading, cooling, and sinking again. This carries along the lithospheric plates on top. These currents are still thought to be important, but they are not the only ones responsible for the movement of tectonic plates. The ridge and slab theory suggests that new crust rises through the mantle because it is warm and thin, creating a ridge, pushing older crust away from the ridge. Old crust is cooler and thicker than the hot mantle, so it sinks into the mantle.

2

- (a) C
- (b) Hotspots are places where magma rises through the mantle and forces through the crust, creating a volcano.
- (c) Some of the Earth's internal energy may be primeval. That is what is retained by the ball of dust and gas from which the Earth evolved. The greatest source of heat energy within the Earth comes from radioactive decay of uranium and other elements within the core.

(d) This question is level-marked:

Level	Marks	Description
3	5–6	<ul style="list-style-type: none"> <li>• Thorough knowledge, understanding or analysis of the issue, process or concept.</li> <li>• Uses well-developed ideas and line of reasoning is clear and logically structured.</li> <li>• Information presented is relevant and substantiated.</li> </ul>
2	3–4	<ul style="list-style-type: none"> <li>• Reasonable knowledge, understanding or analysis of the issue, process or concept.</li> <li>• Uses developed ideas and line of reasoning with some structure.</li> <li>• Information presented is mostly relevant and supported by some evidence.</li> </ul>
1	1–2	<ul style="list-style-type: none"> <li>• Basic knowledge, understanding or analysis of the issue, process or concept.</li> <li>• Uses simple ideas with no developed points made.</li> <li>• Information is basic, unstructured, and supported by limited evidence.</li> </ul>
	0	No response or no response worth of credit.

*Example answer: Earthquakes form at different plate boundaries. The least destructive earthquakes happen at conservative boundaries because small tremors occur all the time as the plates slide beside each other. There are only major earthquakes if the plates get stuck and do not move for a long time, building up pressure until there is major movement. Destructive earthquakes are found at destructive margins because of the shock waves caused by the plates moving together and hitting each other. This can result in tsunamis. The most destructive volcanic eruptions are found at destructive boundaries, although less powerful eruptions can occur at constructive boundaries as the magma rises to the surface.*

- (e) At constructive plate boundaries, the magma from the fissures created is chemically basic and is very hot and fluid, which allows the lava to flow a long way before cooling. This results in broad gentle sided shield volcanoes. The subduction of the oceanic crust forms magma at great depth, which is acidic, sticky, and full of gas. This makes it very explosive, resulting in steep sided composite volcanoes.
- (f) When an oceanic plate is subducted beneath a continental plate, there is a great deal of friction between the two plates. If the plates get stuck for any period, there is a build-up of pressure. Eventually this will lead to sudden, violent shaking of the ground, causing an earthquake.
- (g) The crust is the outermost layer and consists of two types. An oceanic crust is made of high-density basalt. It is thinner than a continental crust, which is made of granite which has a low density. The mantle is the largest of the Earth's layers, the density of which increases with depth. It is largely made of silica-based rocks.

### Questions referring to previous content

3

- (a) Primary consequences are the direct result of the natural hazard event and are experienced during the event. Secondary consequences are indirect and are experienced in the following days and weeks or even longer.

**(b)** Droughts are extended periods when there is much less precipitation than is usual for an area. They are linked to long periods of high pressure and are increasing in frequency due to long-term climate change. Their significance is most highly felt in LDCs where, because of crop failure, the population are likely to experience malnutrition or even famine. Drought is responsible for increased frequency of wildfires which can be dangerous to people but do a great deal of damage to the environment and ecosystems. In ACS, they increase the need for regular irrigation which is additional cost for farmers to pay. Eventually, this will increase the costs, which have to be passed on to the consumers with more expensive foods in the supermarket.