## Earth’s Interior and Convection Webquest

#### Part 1: Earth's Interior

Earth is many thousand kilometers in depth. If you could travel deep into the earth's surface you would find that it contains three main layers; the crust, mantle and core. To learn more about the layers of Earth, click the following links and answer the questions that follow.

Go to [The Earth's Interior](http://www.learner.org/interactives/dynamicearth/structure.html)

1. The upper mantle is divided into 2 parts.
   1. What are they called?
2. There are two areas where the crust is different- where is each and what is the thickness of each?
3. Name the five layers of the earth in order from the outside to the center of the earth.
4. Describe the mantle.

#### Part 2: Convection Currents and the Mantle

Heat transfer is the movement of heat from a warmer object to a cooler object. There are three ways in which heat can be transferred; conduction, convection and/or radiation. Click on the links below and answer the questions that follow.

[Convection, Conduction and Radiation](http://www.mansfieldct.org/schools/mms/staff/hand/convcondrad.htm) & [Heat Transfer](http://www.school-for-champions.com/science/heat_transfer.htm)

* How is heat transferred by conduction?
* Explain the process of convection.
* How is heat transferred by radiation?
* If air is a fluid, why isn't convection responsible for transferring heat to Earth from the sun?

As you already know, the earth's mantle contains two layers; the stratosphere (tough liquid part of the outer mantle) and the lithosphere (the stiffer outer mantle and the crust). Because of the intense pressure and temperature in the mantle convection currents occur. To learn about what influence these convection currents have on Earth, read the Web page below and answer the questions that follow.

* [Convection currents in the mantle video](http://www.sciencebook.dkonline.com/11.html)
* [Plate Tectonics](https://www.khanacademy.org/science/cosmology-and-astronomy/earth-history-topic/plate-techtonics/v/plates-moving-due-to-convection-in-mantle)
* Describe how convection currents occur in Earth's mantle.
* As the mantle’s convection currents work what moves?  Why?

**Part 3: Drifting Continents**

The theory of continental drift originated from a German scientist named Alfred Wegener who proposed that there was once a supercontinent called Pangaea ("all lands"). Wegener proposed that over time the continents drifted apart. Read through the following link to learn about Wegener's theory of continental drift.

[Continental Drift](https://www.livescience.com/37529-continental-drift.html)

* What does the continental drift theory try to explain?
* What was the name of Wegener’s book written in 1915?
* What evidence did Wegener have to show that the continents were once joined?

#### Part 4: Sea-Floor Spreading

The movement of plates caused by convection currents causes both constructive and destructive forces beneath the ocean floor. To learn more about this topic click on the link below and answer the questions that follow.

* [Sea-Floor Spreading Video](https://www.youtube.com/watch?v=k-_Z6p5cjKg)
* [Sea-Floor Spreading](http://education.nationalgeographic.com/education/encyclopedia/seafloor-spreading/?ar_a=1)
* What is a mid-ocean ridge?
* What is subduction?
* What is the Mid-Atlantic Ridge?
* How do subduction and sea-floor work together to do what? How?

#### Part 5: The Theory of Plate Tectonics

The theory of plate tectonics was formulated in the 1960s and 1970s when new information was discovered about the inside of Earth. To learn more, click on the links below, read the Web page and answer the questions that follow.

[Plate Tectonics](http://www.cotf.edu/ete/modules/msese/earthsysflr/plates1.html)

* What new information led to the theory of plate tectonics?
* What does the theory of plate tectonics state?
* About how fast do the plates move in relation to each other each year?
* What is it called when two plates meet?

[Convergent Boundaries](http://www.cotf.edu/ete/modules/msese/earthsysflr/plates2.html)

* What are convergent boundaries?
* What occurs when a continental and an oceanic plate collide?
* When an oceanic plate digs into Earth's hot interior, what occurs?
* How were the Andes Mountains in South America formed?

[Divergent Boundaries](http://www.cotf.edu/ete/modules/msese/earthsysflr/plates3.html)

* What are divergent boundaries?
* Explain how volcanoes form in the central valley of a divergent boundary?
* How much does the Atlantic Ocean widen per year due to divergent boundaries?

[Transform Boundaries](http://www.cotf.edu/ete/modules/msese/earthsysflr/plates4.html)

* What are transform boundaries?
* Name one of Earth's most famous transform boundary? Where is it located?
* True or False?
  + Due to transforming plates, Los Angeles will break away from California. Explain your answer.