

# ACTIVITY 2

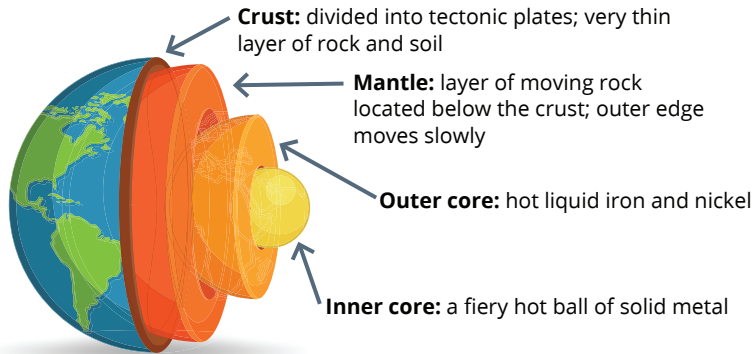


# VOLCANOES AND GEOTHERMAL ENERGY

Volcanic eruptions can wreak havoc on the earth's landscape and climate. But can the power they generate work to our advantage? Read the information below and complete the activities.

## PART 1: VOLCANOES: A SPECTACULAR DISPLAY OF GEOTHERMAL ENERGY

If someone asked you to picture a volcanic eruption, you would probably visualize a massive explosion of liquid fire and a huge cloud of steam and ash shooting up toward the sky. But what causes volcanoes to erupt? Can we harness their awe-inspiring power – which has the ability to nurture life *and* destroy it – to power our daily lives?



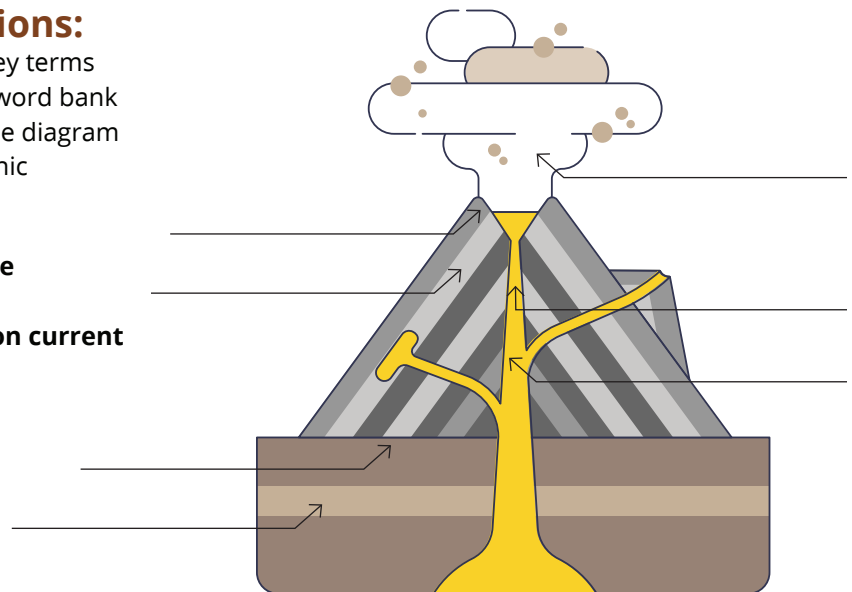
Earth is made up of four layers. The **inner core**, as hot as the surface of the Sun, is a solid ball of metal. The **outer core** consists of fiery liquid metal. The next layer, the **mantle**, is extremely hot, not-quite solid rock that shifts and flows very slowly. The **crust**, the solid outer layer, is broken up into seven huge pieces called tectonic plates. **Convection currents** beneath the crust transfer heat by moving large masses of hot, liquified rock (magma). This causes the tectonic plates to move slowly atop the magma and can cause intense pressure to build.

A volcano forms when the intense heat and gas pressure in the magma builds up and bursts through an opening in the earth's surface. When a volcano erupts, it generates an incredible amount of energy. The most violent explosions cause a catastrophic amount of damage. Lava, rock particles, ash, dust, and toxic gas are launched into the atmosphere. This debris can poison the air, contaminate water, and impact weather worldwide, blocking out sunlight and turning summer days cold. Eruptions may also cause earthquakes, mudslides, wildfires, and avalanches.

### Directions:

Use the key terms from the word bank to label the diagram of a volcanic eruption.

**ash plume**  
**lava**  
**convection current**  
**magma**  
**summit**  
**crust**  
**mantle**



## PART 2: HOW CAN WE HARNESS GEOTHERMAL ENERGY TO WORK FOR US?

Geothermal energy is the natural heat stored in rocks and fluids deep beneath the earth's surface. It can be used to heat homes directly or to generate electricity. To produce power from geothermal energy, wells are dug deep into underground reservoirs, often located near active volcanoes or hot spots. This provides access to a plentiful – and renewable – supply of steam and hot water, which are used to drive turbines connected to electricity generators. Research the difference between **geothermal plants** and **hydraulic fracturing** (fracking) and create a poster or multimedia presentation weighing the pros and cons of each option.

- What are some ways that geothermal plants operate to produce energy?
- Why do you think hydraulic fracturing (fracking) is considered controversial?