CHAPTER 1

Earth's Heat

Visitors to Yellowstone National Park ooh and aah as they watch Old Faithful, the park's most famous **geyser**. About once every hour, the geyser shoots thousands of gallons of hot water into the air. As soon as the colossal jet of water stops, steam spews out with a thundering roar. Old Faithful has been erupting in this way for more than 100 years. What causes this fantastic show? Geothermal energy.

Thermal Features

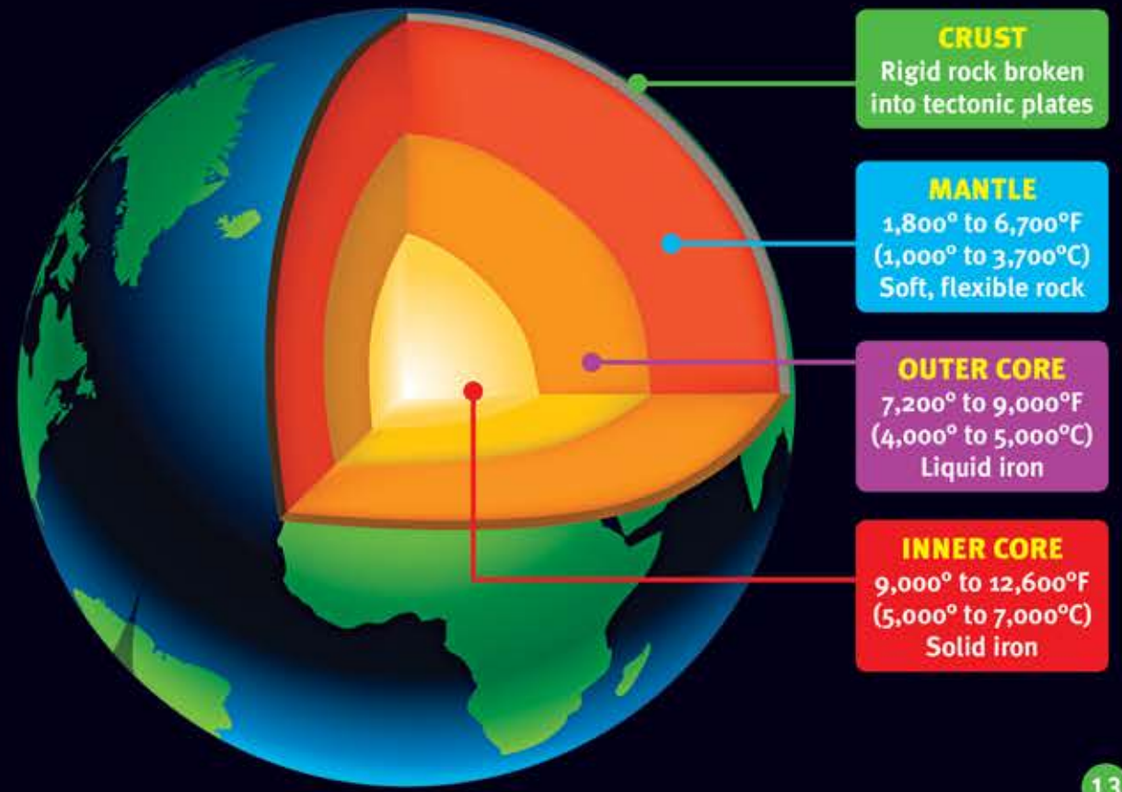
Geothermal heat escapes from underground in many ways. One of the most dangerous is a volcano. A volcano is a vent in Earth's surface. **Magma**, or melted rock, flows up from deep below and collects in pools, or **reservoirs**, beneath the planet's crust. This magma escapes as lava through volcanoes. Hot gases, ash, and fragments of hot rock may also erupt. These substances might shoot out with tons of force, or they might slowly ooze.

Kilauea, a volcano in Hawaii, is almost always erupting.

Earth's Layers

Earth has four basic layers: the crust, the mantle, the outer core, and the inner core. Temperatures are hottest in the inner core. This heat moves outward through the outer core and the mantle to the crust.

Earth's crust is not solid. It is broken into several pieces called **tectonic plates**. These plates push, pull, and slide against one another. Geothermal energy is easiest to reach where two plates meet, especially if those plates are pulling apart.



THE BIG TRUTH!

Sharing the Wealth

Can countries share energy with each other? Iceland sits on top of a boundary where two tectonic plates meet. It is home to hot springs, volcanoes, and plenty of geothermal energy. The country also uses water, wind, and solar power. Other countries, such as its neighbor the United Kingdom, still struggle to cut down on fossil fuels. Through the coming decades, developers plan to build a connection of underwater cables between Iceland and the United Kingdom. This connection, called the IceLink, would allow electricity to flow between the countries. But how will this incredible technology work?

World map

Iceland

- As of 2015, 97 percent of all heat used is geothermal.
- 26 percent of electricity is geothermal.
- Only 0.02 percent of electricity and 2.7 percent of heat comes from oil or other sources.
- Iceland may be able to produce significantly more clean energy than it needs.

IceLink

- The IceLink would be an interconnector. This is a connection between countries that carries electricity or other energy back and forth.
- This would allow Iceland to send extra electricity to the United Kingdom.
- Officials have been discussing building the IceLink for more than 60 years.
- Researchers currently estimate the IceLink could be usable by 2027.
- Construction costs are estimated to be more than $3.5 billion.
- The IceLink would be the longest interconnector in the world at more than 620 miles (998 kilometers).

United Kingdom

- As of 2016, 81.5 percent of all energy comes from oil and other fossil fuels.
- Roughly 9 percent of all energy comes from renewable sources.
- Geothermal energy is slightly more than 1 percent of all renewable energy.
- The country hopes to have 15 percent of its energy come from renewable sources by 2020. Bringing clean energy in from other places can help the country reach this goal.