

Classroom Activities

10 Big Questions - How does the Earth work?

Make your own geothermal power plant model or watch it at:

<http://www.youtube.com/watch?v=Bi8m84QKBdc>

Do not attempt this alone! You will need an adult to assist you with this project!

1. Child's pinwheel
2. Aluminium foil
3. Empty soup can or similar sized tin can with one end cut off
4. A wooden ruler
5. Small cooking pot
6. Hot plate
7. Hammer
8. 10p nail
9. Tape or rubber bands
10. Mitten type of pot holder

Take hammer and nail and carefully punch a hole in the end of the tin can near the edge. Punch another hole directly across the top from it. The two holes should not be bigger than 1/8 inch across.

Tape or attach the ruler to can with rubber bands.

Put water into the pot and cover the top of the pot with two layers of tin foil. Tightly crimp the tin foil around the edges so it seals the top tightly.

Using the nail, punch a hole in the top of the tin foil cover in the very centre about 1/16 inch across. Put covered pot to side.

Put the pot onto the hot plate and bring to a boil.

Put on the mitten pot holder, and when steam starts coming out of the top, carefully hold the pinwheel over the one hole. Notice how fast the wheel spins.

Take the can on the ruler and place it on the top of the pot so that the hole is in the centre of the open end of the can. Steam should now be coming out of the top of the can through the two holes.

Carefully hold the pinwheel. Turn the pinwheel so that the holes are on opposite sides of the pinwheel. Notice how fast the pinwheel turns.

Take pot off the hot plate and let cool. Carefully take off the tin foil, add more water to the pot and put tin foil top back on. Take the nail and poke lots of holes all over the tin foil. Punch 5 holes close to the edge away from the centre hole, repeat the experiment with ten holes around the edge, 20 holes around the edge.

Bring the pot back up to boiling. Hold the pinwheel over only the one centre hole. How much steam do you see? How fast is the pinwheel turning?

With one hole the pinwheel, how fast did the pinwheel turn? With the can making the steam hit the wheel equally on either side, what happened? When you punched more holes in the tin foil what happened?

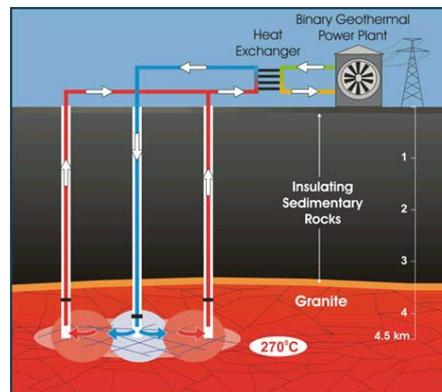


Image from:

(<http://www.treehugger.com/files/2008/08/one-percent-australian-geothermal-potential-26000-years-energy.php>)

In a geothermal power plant, steam is used to turn a turbine. The turbine is attached to a generator to make electricity. There are two places in the world where natural steam is found under ground and is used to make electricity. One is in Italy. The other is north of San Francisco in an area called The Geysers. The Geysers produces enough energy to power a city of about one million people. But in recent years, the amount of steam produced by the area has decreased. Some people think that it's because there are too many "holes" in the ground like the pot cover with 20 holes. It's like having a soda with 20 straws in it and all of your friends and you sipping at the same time. The soda glass will be drained VERY fast. That's what some people think is happening to the Geysers...that it's running out of steam.

(Adapted from Science Projects in Renewable Energy & Energy Efficiency written by the National Renewable Energy Laboratory, published and copyright 1991 by the American Solar Energy Society, and distributed by the National Energy Foundation.)

* To find out more about the 10 Big Questions, go to:

<http://www.sciences.adelaide.edu.au/learning-teaching/10bq/>

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