

ACTIVITY 4: Building a Model Geothermal Plant

Activity Objective: Using information from the text and www.youtube.com videos build or design a Geothermal Plant model that actually generates electricity or simulates the generation of electricity

Materials: Chapter 10, paper, computer, printer, Internet Access, other materials as shown in the videos

Definition: Geothermal energy is energy derived from the heat of the earth. The earth's core is a distance of approximately 4000 miles and is so hot that it is molten. Temperatures are believed to be at least 5000 degrees centigrade. Thermal energy is the energy that determines the temperature of matter. A well is drilled to the core and heat from the earth's core heats water into steam that drives a turbine to drive an AC generator to produce electricity.

A geothermal heat pump can excerpt enough heat from shallow ground anywhere in the world to provide home heating. However, industrial systems need the higher temperatures of deep resources. Thermal efficiency is sensitive to temperature. For an industrial project, you need drill a well into a hot aquifer. An aquifer is an underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using a water well. If no adequate aquifer is available, an artificial one may be built by injecting water to hydraulically fracture the bedrock.

REVIEW VIDEOS:

1. Geothermal Plant Model: <https://www.youtube.com/watch?v=I4xSkhZxEQc>
2. Mack's Geothermal Simulator: <https://www.youtube.com/watch?v=8BtlYkcqz9E>
3. How to make Steam Power Generator - a cool science project with easy way: <https://www.youtube.com/watch?v=L3XAFSMdVWU>

Procedure:

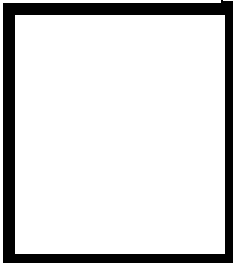
1. Work as partners or small teams.
2. Research the building of a model geothermal electricity plant.
3. Build or design a geothermal electricity plant and document each step of the process.
4. Develop a video or Power point presentation on your results.



4 World-Class Learner	3 Proficient Learner	2 Developing Learner	1 Emergent Learner
-----------------------------	----------------------------	----------------------------	--------------------------

RUBRIC

Learner at this level has gone beyond mastery of knowledge, skills, & attitudes described in project. World-class learner consistently exhibits high-quality performance.	Learner at this level has had opportunities to apply knowledge, skills, & attitudes of component of project. Proficient learner has mastered essential attributes, thus proving mastery.	Learner at this level has been exposed to & had opportunity to apply knowledge, skills, & attitudes of project. Developing learner may have only a few essential attributes to master before mastery.	Learner at this level may or may not have been exposed to knowledge, skills, & attitudes required by academic standards of the project.
--	---	--	--



- 1= Emergent Learner**
- 2 = Developing Learner**
- 3 = Proficient Learner**
- 4 = World-Class Learner**