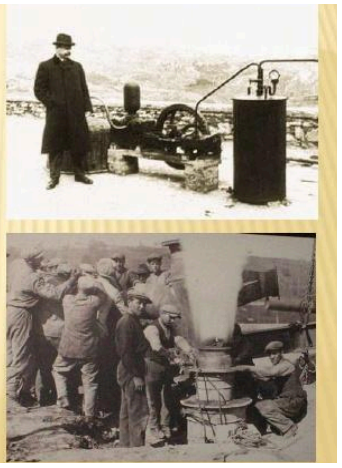
GRADES 1 to 12 DAILY LESSON LOG	School:		Grade Level:	
	Teacher:	Depedtrends.com	Learning Area:	
	Teaching Dates and Time:		Quarter:	

I. OBJECTIVES	
A. Content Standards	The learners demonstrate understanding of volcanoes found in the Philippines.
B. Performance Standards	
C. Learning Competencies Write the LC code for each	The learner should be able to illustrate how energy from volcanoes may be tapped for human use. **S9ES-IIIc-d-29**
D. Learning Objectives	Describe how energy was generated from Geothermal Power Plant.
II. CONTENT	
III. LEARNING RESOURCES	
A. References	
1. Teacher's Guide pages	141
2. Learner's Materials pages	176
3. Textbook pages	
4. Additional Materials from Learning Resource (LR)portal	
B. Other Learning Resources	
IV. PROCEDURES	
A. Reviewing previous lesson or presenting the new lesson **(2 mins.)** **elicit**	Let the learners explain what happens during volcanic eruption based on the discussion last meeting. *Say: Since the Philippines belongs to the pacific ring of fire. What is the importance of geothermal energy?* *Introduce the new lesson (Let the learners read the objective of the new lesson).*
B. **Establishing a purpose for the lesson** **(1 min.)** **Engage**	-Show to the learners a video of geothermal power plant. 1. What can you say about the video? 2. What is your impression about the video? 3. Do you have any idea of our new lesson today? *Suggested video: https://www.youtube.com/watch?v=Bl6S_yi1vvE*
C. Presenting examples/ instances of the new lesson **Explore** **(2-5 mins.)**	-Group the learners into 5. -Each group will be give an idea on how geothermal power generated. -the teacher will provide a rubric for the discussion. -Give time for the students to be ready about the class discussion. -Give each group 3 minutes for their presentation/discussion.
D. **Discussing new concepts and practicing new skills #1** **Explain** **(15 mins.)**	How to generate Geothermal Power Plant Group 1 – Historical Background Geothermal Energy

In **19th century**, the development of technology has allowed the discovery and exploration of groundwater resources. Tuscany geothermal energy was used initially for the production of boron and ammonium compounds. The heat production was of secondary importance.

The **electricity production** began in **1904** thanks to the work of Prince Piero Ginori Conti and in 1913 the **first plant** in **Larderello** had 250 kW installed. Today the complex of Larderello has a power of more than 600 MW and development programs expected to increase the power to 880 MW

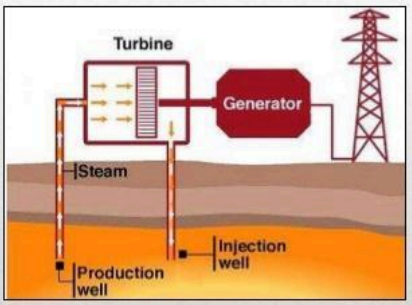
In France from 1960 more than 200.000 apartments are heated by geothermal water



Group 2 – Main Components of a Geothermal Power Plant

Main Components of a Geothermal Power Plant:

- Production Well
- Separator
- Heat Exchanger
- Steam Turbine
- Condenser
- Generator
- Injection Well



E. Discussing new concepts and practicing new skills#2
(10 mins.)

Group 3 – Types of Geothermal Power Plants

Types of Geothermal Power Plants

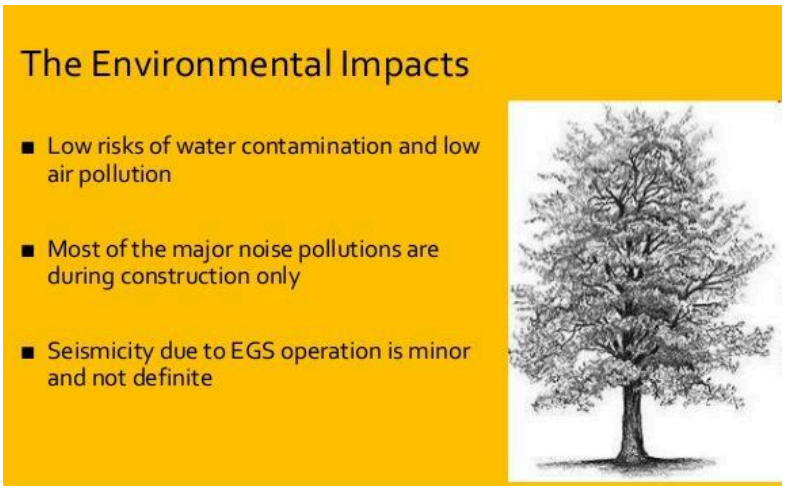
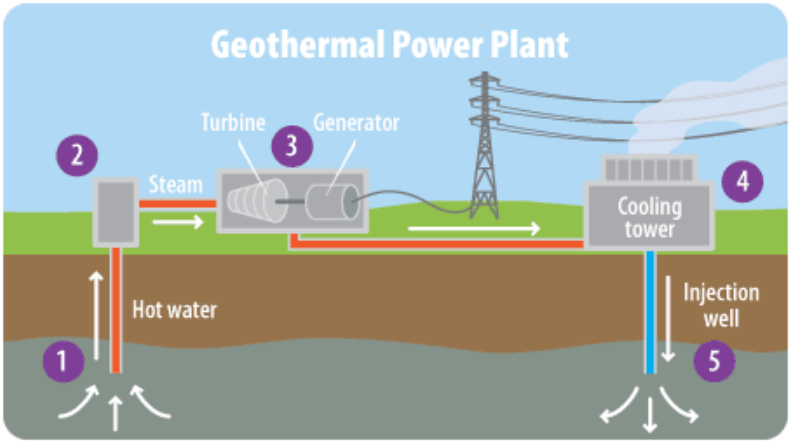
There are three different types of Geothermal power plants system designs :

- **Dry Steam Power Plants**
- **Flash / Steam Plants**
- **Binary cycle power plant**

Group 4 – Advantages of Geothermal Power Plant

Advantages of Geothermal Energy

- No chance of contamination from solid discharge.
- Geothermal fluids contains less harmful greenhouse gases.
- No Nitrogen Oxide and Sulfur Dioxide. Less acid rain.
- Binary Plants have no Carbon Dioxide, however others have 0.2lb/kW-h.

	Group 5 – The Environmental Impacts of Geothermal Power Plant 
F. Developing mastery **(Leads to Formative Assessment 3)** **(12 mins.)** **Elaborate**	• Based on the discussion, how do you generate geothermal power plant? How is Geothermal useful?
G. Finding practical applications of concepts and skills in daily living **(3 mins.)**	Who uses Geothermal and why? What is the future of geothermal energy if there is a continuous process?
H. Making generalizations and abstractions about the lesson **(3 mins)**	Upon discussing Geothermal Power Plant how can you consider the further development of deep geothermal energy?
I. Evaluating learning **(8 mins)**	
J. Additional activities for application or remediation **(1 min)**	**Describe the how energy was generated from geothermal power plant from the given picture.** 

V. REMARKS	**Geothermal Energy Pros and Cons** Instead of using natural gas or oil and as an alternative to incurring high electricity bills, geothermal energy works to draw off the Earth's constant core temperature to both heat and cool the home. At first glance, incorporating geothermal energy into a house or business would seem like a no-brainer and while there are definite cost and economic savings involved with the process, for your additional activities, based on your learnings write atleast five (5) definitive geothermal energy pros and cons.

Pros	Cons
Environmentally friendly compared to gas or oil furnaces (no combustion).	High upfront costs with implementing geothermal energy. ($10,000-$20,000)
Not a significant source of pollution.	More suitable for new home builds as retrofitting involves large scale excavation.

Example:

VI. REFLECTION	
A. No .of learners who earned 80% on the formative assessment	
B. No. of learners who require additional activities for remediation.	
C. Did the remedial lessons work? No. of learners who have caught up with the lesson.	
D. No .of learners who continue to require remediation	
E. Which of my teaching strategies worked well? Why did these work?	
F. What difficulties did I encounter which my principal or supervisor can help me solve?	
G. What innovation or localized materials did I use/discover which I wish to share with other teachers?	

Prepared by:

Checked by

Teacher

School Head

Observed by: