

## ACTIVITY 1: Building a Hydroelectric Generator

**Activity Objective:** Build or design a miniature hydroelectric generator.

**Definition:** Hydroelectricity is defined as converting the energy of flowing water into the mechanical energy of a turbine to turn an AC hydroelectric generator to generate electricity. In 2015, hydroelectricity generated 16.6% of the world's total electricity and 70% of all renewable electricity, and is expected to grow to 3.1% each year for the next 25 years. It is produced in 150 countries.

Most hydroelectric power comes from the potential energy of dammed water driving a water turbine and an AC generator. The power extracted from the water depends on the flow volume coming from the head of water or the difference in height between the source and the water's outflow. A large pipe or penstock delivers water from the reservoir to the turbine.

### REVIEW VIDEOS:

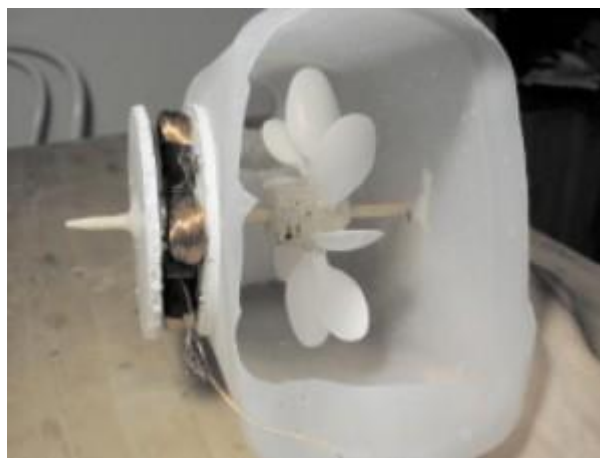
1. **How electricity is made through use of water flowing through turbines:**  
**Hydropower in a pipe:** <https://www.youtube.com/watch?v=JgGaB068ayM>
2. How to make electricity with water: [https://www.youtube.com/watch?v=QkPCIx\\_fFBc](https://www.youtube.com/watch?v=QkPCIx_fFBc)

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

WEB LINK: <https://www.greenoptimistic.com/hydroelectric-generator/#.WFvnzYWcGUk>

### Procedure:

1. Work as partners or small teams.
2. Research the Internet for ideas on how to build a miniature hydroelectric generator.
3. If you do not find a suitable project follow the below link to build one in this project: : <https://www.greenoptimistic.com/hydroelectric-generator/#.WFvnzYWcGUk>
4. As an option you can design your own hydroelectric generator in detailed plans and chronical your project by creating a power point presentation.

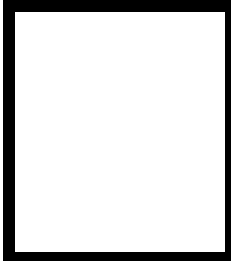


**Figure 1**



RUBRIC

| <b>4<br/>World-Class<br/>Learner</b>  | <b>3<br/>Proficient<br/>Learner</b>  | <b>2<br/>Developing<br/>Learner</b>   | <b>1<br/>Emergent<br/>Learner</b>   |
|---|--|---|---|
| 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