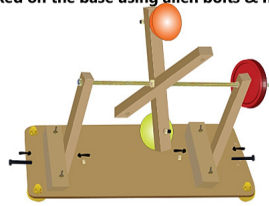
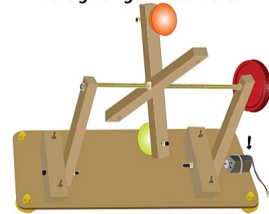


HOW TO MAKE A HYDRO-TURBINE MODEL

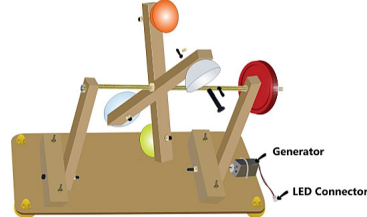
- 1 Take the semi-assembled structure consisting of wooden sticks, turbine blades and a big pulley. Mount the two wooden sticks vertically with the blocks fixed on the base using allen bolts & nuts.



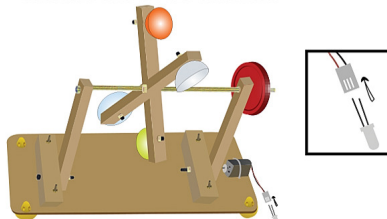
- 2 Look for the two holes on the base, just below the bigger pulley. Passing tie pin through these holes, place the given generator here.



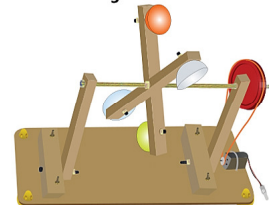
- 3 Fix the two half cut balls at the two ends of the turbine blades. The direction of bucket should be same.



- 4 Insert LED into the LED connector.



- 5 With the shaft of the generator, a small pulley is fixed. Connect this smaller pulley with bigger one using rubber band.



Working:- Keep the turbine blades (buckets) under a running water tap to make the blades rotate. The mechanical energy from the blades will be used to generate electricity.



Future STEM Explorers

Hydro Turbine



Learning Outcomes:

Students will be able to

- Understand the use of turbine and its importance in ancient times
- List down the limitations of turbine
- Identify the types of turbines
- Understand how does a turbine

Water turbines or hydro turbines are machines that use the energy of flowing water or falling water to turn it. The axle of the turning turbine can then power other machines to do work or by connecting it with generator, electricity can be produced.

Types of hydro turbines:

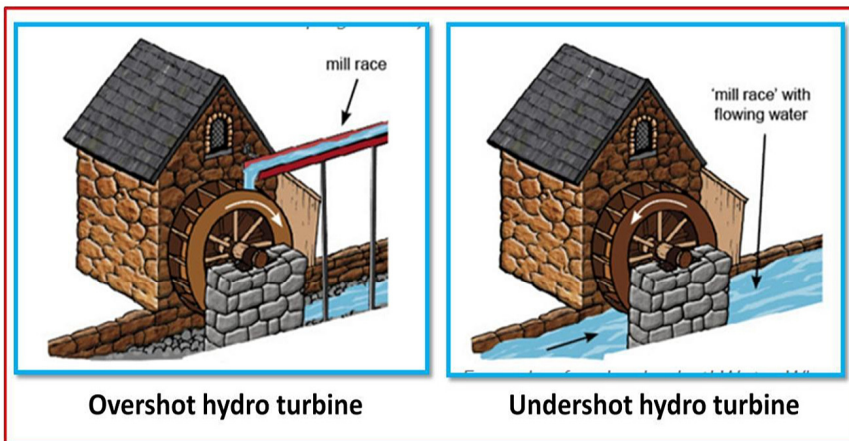
There are two types of hydro-turbines- **overshot turbines** and **undershot turbines**.

Overshot turbines:

In overshot turbine setup, the water falling from the top strikes the paddle or blades of the turbine and turns it. This type of turbine is more efficient as the force of flowing water as well as the weight of the water turns it easily and faster. It uses the potential energy of the falling water. These type of turbines are normally used at hydro-power plants to generate electricity.

Undershot turbines:

In undershot turbine setup, the bottom of the turbine is kept inside the flowing water. The flowing water hits the turbine blades or paddles and turns it. Here, the fast running water is required to turn the turbine faster.



Science behind the activity:

The kinetic energy of falling water is converted into mechanical energy by turning the blades of the turbine. If connected with generator, this mechanical energy is converted into electrical energy.



1. In which of the following circumstances, the turbine would rotate faster?

Sources of flowing water	Observation
Under the tap	
Under the shower	
In the flowing river	

2. Replace the blades (caps or half cut balls) with something else and place under flowing water and write down your observation in the box given below:

Object	Rotation of wheel per minute

3. Increase or decrease the number of blades (caps or balls) and write down your observation in the box given below:

No. of blades	Rotation of wheel per minute
2	
4	
6	
8	
10	