| Name(s) | Project Number |
|---|---|
| **Kaia R. Yager** | |
| | 35580 |

**Project Title**

## Using Water Flowing under Bridges to Replace Hydroelectric Dams

**Abstract**

**Objectives/Goals**

My objective was to test the feasibility of replacing hydroelectric dams with multiple small turbines in free flowing rivers.

**Methods/Materials**

A pelton wheel turbine generator was constructed by affixing coiled wire to a board, rare earth magnets to a foam core circle attached to an axle, and hot gluing spoon bowls into a cork, attached to same axle. A bucket and chute system was built for the water to flow down past the turbine with adjustable angle. The speed of the water was calculated by videotaping a floater going down the chute at different slopes, and by dividing the distance it went by the time it took. Finally, the speed of the water was compared to the electricity being made by connecting a multimeter to my turbine generator.

**Results**

At a water speed of 0.58 meters per second, which is comparable to the speed of the Mississippi River at its headwaters, 0.54 meters per second, I was able to produce an average of 14 millivolts of electricity. At a water speed of 1.37 meters per second, which is comparable to the Mississippi at New Orleans, 1.34 meters per second, I was able to produce an average of 70 millivolts of electricity.

**Conclusions/Discussion**

My conclusion is that it is feasible to make electricity at speeds comparable to those of a free flowing river. As a continuation of this project, I would like to test it in situ to find how many turbines would be needed to be comparable to a dam.

**Summary Statement**

My project is about testing whether or not electricity can be made by a turbine generator at speeds of water similar to those of a free flowing river.

**Help Received**

My dad helped me construct the generator and chute, and he also videotaped me performing the trials. My mom helped me proofread my written components, and helped put my display board together.