

 PROJECT #1 PROPOSAL

**Name(s): Alex Leslie and Matthew Coull**

**Team Name: The "EH" Team**

**Part A: Project Ideas & Objectives**

**Ideas**

Design and build a comprehensive system of water turbines to continuously generate electricity and a series of companion lights to accompany it.

* Design and build a turbine generator that mounts on the stern of a small boat (Canoe, Kayak) and generates enough power to charge your phone, as well as other compatible batteries (rechargeable NI-CAD, etc...)
* Design and build a portable system around a 5-gallon bucket that can self-pressurize the water (using gravity) in it and run it through a turbine
* Design and build a charging system compatible with most rechargeable batteries
* Design and build a series of camp lights, as well as a boat headlamp, to enable navigation in the dark. Both types of lights will be compatible with the batteries.
* Incorporate voltage regulators in the charging systems in order to facilitate even cell charging with the added benefit of extending the batteries lives.

**Objectives**

* Learn about 3d printing and how apply it to solve engineering or mechanical problems
* Learn about CAD design
* Learn how to incorporate environmentally conscious materials into our project
* Learn how to solder
* Create a portable renewable energy source for anyone off the grid
* Create an effective charging system that evenly charges cells and doesn't damage the battery

**Part B: Electronic Resources (Make sure hyperlinks are active!)**

<http://www.instructables.com/id/Portable-Wind-Generator-As-a-Cell-Phone-Charger/>

<https://www.peakprosperity.com/discussion/92509/gravity-fed-5-gallon-bucket-mini-hydro-generator>

<https://www.engineeringforchange.org/>

<http://www.engineering.com/ElectronicsDesign/ElectronicsDesignArticles/ArticleID/9460/Hydroelectric-Power-in-Water-Pipes.aspx>

<https://www.greenoptimistic.com/hydroelectric-generator/>

<https://www.hunker.com/12201924/how-to-build-a-homemade-water-turbine-generator>

<http://www.instructables.com/id/The-Super-Quiet-Electric-Canoe/>

<http://www.instructables.com/id/DIY-1000-watt-wind-turbine/>

<http://www.popularmechanics.com/science/environment/how-to/g118/make-your-own-miniature-wind-turbine/>

**Part C: Materials & Designs (anything in bold we need to order online or source locally)**

* 3d printer and filament
* Solder and soldering iron
* Wires
* **Variable voltage regulator ($14)** [https://www.amazon.ca/dp/B00SY37S00/ref=twister\_B00UGYJXUI?\_encoding=UTF8&psc=1](https://www.amazon.ca/dp/B00SY37S00/ref%3Dtwister_B00UGYJXUI?_encoding=UTF8&psc=1)
* **1" pvc pipe ($10)**
* **5-gallon bucket ($5)**
* **Rechargeable batteries ($10-$25)** [https://www.amazon.ca/EBL-Capacity-Rechargeable-Batteries-Included/dp/B01E0QMTWG/ref=pd\_cp\_23\_2?\_encoding=UTF8&refRID=F1KF9HJ0064K3S0VXG2E&th=1](https://www.amazon.ca/EBL-Capacity-Rechargeable-Batteries-Included/dp/B01E0QMTWG/ref%3Dpd_cp_23_2?_encoding=UTF8&refRID=F1KF9HJ0064K3S0VXG2E&th=1)
* **Led's and resistors ($10)**
* **Water turbine #1 ($28)** [https://www.amazon.ca/power-Driven-Generator-Dynamo-Hydraulic/dp/B01LZU2NH0/ref=sr\_1\_7?ie=UTF8&qid=1505337284&sr=8-7&keywords=dc+generator](https://www.amazon.ca/power-Driven-Generator-Dynamo-Hydraulic/dp/B01LZU2NH0/ref%3Dsr_1_7?ie=UTF8&qid=1505337284&sr=8-7&keywords=dc+generator)
* **Water turbine #2 ($10)** [https://www.amazon.ca/Yosoo-Generator-Hydroelectric-Charging-battery/dp/B01A0A2BKG/ref=sr\_1\_4?ie=UTF8&qid=1505337284&sr=8-4&keywords=dc+generator](https://www.amazon.ca/Yosoo-Generator-Hydroelectric-Charging-battery/dp/B01A0A2BKG/ref%3Dsr_1_4?ie=UTF8&qid=1505337284&sr=8-4&keywords=dc+generator)
* Hose and seal
* AA battery holders (Already in Makerspace?)

**Designs:**



