MINOR DESIGN PROJECT
ALTERNATIVE ENERGY VEHICLE
PROJECT SPECIFICATIONS
Due Thursday September 29 – Design Proposal
Due Wednesday October 5 – Test your Prototype
Due Thursday October 13 – Competition!
Due Thursday October 20 – Written Report

PROBLEM STATEMENT
The problem is that islanders on the Solomon Islands in remote villages walk 2-3 hours to collect kerosene for their lamps and cooking stoves, time they could be using to grow crops or to do other productive work. Farming is their way of life. They grow cassava (a starchy root, similar to a potato), dalo (herb), bananas and other foods. The climate is hot and tropical. Cash is a rare, precious resource. Bank accounts are unusual, borrowing is atypical and saving money is unheard of.

DESIGN OBJECTIVE
Design and build a small-scale prototype of a vehicle powered by alternative energy that can carry kerosene safely back to the remote village along a dirt road. Your vehicle must start from a stopped position and it cannot be initially pushed. It must transport a small container of water (to be provided) along a straight path for 4 feet and then up a 5° incline for 2½ feet (Figure 3).
DESIGN CONSTRAINTS

- Human-power (pedaling, pushing, pulling, carrying, etc) is not allowed.
- Store-bought car kits are not allowed.
- Your team can spend up to $10 maximum on the project.
- Your vehicle cannot be powered by store-bought batteries.
- Your vehicle can be powered by an electric motor as long as you generate the electricity with an alternative energy source to run the motor.
- Your vehicle can use a drive train from a purchased toy (as long as it does not use batteries) but your final design must be at least 50% of your own original work.
- The method for powering your vehicle cannot be hazardous or require any cleanup.
- You may not use any open flames or combustion processes (no burning of a fuel!).
- Your vehicle must be less than 12 inches long x 10 inches wide x 8 inches tall.
- Your vehicle must carry a small Tupperware of water (to be provided).
- Safety of all participants and observers is most important. Your vehicle shall not have any sharp edges, broken parts or be made from hazardous materials.
- University property must not be damaged during the demonstrations.

GRADING CRITERIA

- Design Proposal – 10% ................................................................. due September 29
- Competition (performance, aesthetics) – 60% .................................................. due October 13
- Written Report – 30% ................................................................. due October 20

SPECIFICATIONS & REQUIREMENTS

You must plan, draw (using sketches and AutoCAD), design, and construct this vehicle with 1-2 partners in your class section. You may choose your own partner(s) or ask to be assigned to a group. Your team must work together on this project, not divide the work.

Your vehicle will be demonstrated in the classroom. One week prior, you will have access to the ramp to test your design in class. You will then have an opportunity to revise, correct and improve your design, if needed. Your design must be original even though there are many kits available in stores and online. Use these for ideas and inspiration, but make your design original, creative and professional quality as much as possible.

In addition to meeting the basic challenge given for 60% of the credit, additional points are given for excellence. The “categories of excellence” for additional points are:

1. Speed – be one of the top three (3) fastest vehicles.
2. Cargo – points are earned if your vehicle can carry 3 times the load or more.
3. Design – exceptionally creative or original design.
4. Control – the vehicle travels 2½ meters up the ramp and stops without falling off the ramp.