Solar Level I

Level 1 Badging Assessment

Badge Description

The Solar Level 1 Badge demonstrates that the recipient has an understanding of voltage and current in photovoltaic power systems.

Corresponding Curriculum

slidedeck

Minimum Criteria

The student has received the Intro to Energy Badge or has experience with energy concepts through the T3 Energy Club or other formal training.

Competencies

Student is able to complete the following actions:

- I can explain what electrical energy is and how to calculate the energy demands of a system.
- I can safely work with electricity up to 12 volts and set up an off-grid system with solar panels, batteries, charge controller, and load.
- I can describe photovoltaic applications and explore various career and education pathways needed to work in the solar industry.

Assessment Method

- Students receive
    - PDF assessment instructions
    - Calculator, multimeter, soldering kit, personal nanogrid kit (small volt solar panel, wires, quick connects, charge controller, battery, battery holder, load [LED, DC motors, etc.]), 12v kit (12v battery(s), wiring, solar panel, charge controller, inverter, loads
- The assessment is run in three sections: Electrical Energy Concepts, Solar Nanogrid Setup, and Solar Applications. Each section will take approximately three hours to complete.
- Instructor checks that students have completed all tasks on the PDF assessment.

Introduction to Energy

Level 1 Badging Assessment

Section 1: Electrical Energy Concepts

Demonstrate understanding of the basics of electrical energy

- ☐ Measure current, voltage, and resistance using a multimeter
- ☐ Calculate the current, voltage, and/or resistance of a circuit using Ohm's Law or the power formula
- ☐ Calculate the power an appliance consumes (Watts) based on the volts and amps.
- ☐ Can use vocabulary including: loads, batteries, charge controller, modules, inverter

Section 2: Off-Grid System

Safely work with off-grid systems

- ☐ Complete a circuit that utilizes solar panels
- ☐ Safely build a 12v system that incorporates solar panels, charge controller, batteries, load, and inverter
- ☐ Safely connect solar panels and batteries in parallel or series

Section 3: Solar Applications

Understand how solar panels are used today

- ☐ Visit sites that integrate solar power
- ☐ Explain factors to be considered when siting solar panels
- ☐ Present a plan to power an off-grid system or incorporate solar power into a home, school, or community

I, _____ (Instructor) certify that _____(student) have successfully completed the above assessment and has demonstrated competency of minimum requirements to receive the Laser Cutter T^3 Badge.

Student Signature _____ Date _____

Instructor Signature _____ Date _____