



Teaching DC Electricity with a Stand-Alone Solar PV Lab



Demonstration Board

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CHALLENGES



- Spring 2020 – Moving lab course to 100% online.
- How do we teach and demonstrate use of solar board to an online student audience?
- Created short videos demonstrating how to use the board.
- Created power point presentations.
- Modified CREATE worksheets to fit a college student audience.
- Posted information to course D2L site.

BENEFITS

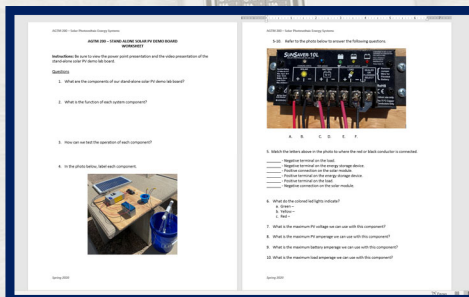
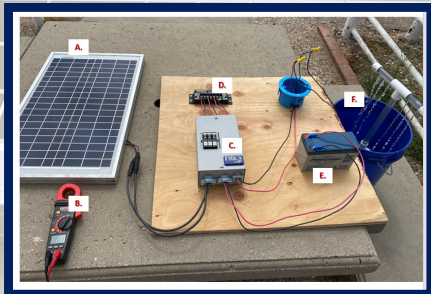


- Effective method to instruct college students on how components of an off-grid solar photovoltaic (PV) function.
- Boards are portable.
- Components are relatively inexpensive and readily accessible.
- Provide students with hands-on experience in using tools and materials to create sustainable teaching tool.
- Teaching materials are available online from CREATE.
- Students can wire components, swap out electrical load.

FUNDING SOURCE



- Primary funding for materials came from local institutional grant, UA Green Fund Committee.
- A total of eight demonstration boards were constructed and tested by UA students in AGTM 200 – Solar PV Energy Systems Course in Spring 2019.
- Materials included:
 - 20-Watt solar PV module
 - Charge controller
 - Solar battery
 - Electrical load (lamps, fountains)
 - Triple-gang switch box with single pole switches
 - Wiring materials
 - Service disconnect box (upgraded-version)



INSTRUCTOR TRAINING



- Solar PV board was demonstrated during Solar PV professional development workshop at Shoreline CC in Shoreline WA in 2018.
- Hands-on lab activity documented with photos and material list developed.
- Webinars hosted by CREATE included instructor presentations of teaching materials including worksheets for the solar demonstration board.
- Professional development training from CREATE is FREE to STEM instructors.

TARGET AUDIENCES



- Our board is designed for college students and secondary instructors.
- We shared our demonstration board activity with Arizona Agriculture Teachers Association (AATA) during summer conference of 2019.
- We have presented our demonstration board to general public attending solar PV energy system workshops hosted by county cooperative extension centers.
- We plan to use our boards with secondary students in competing in FFA Agriculture Technology Mechanical Systems (ATMS) Career Development Events.

FUTURE PLANS



- With additional fund from UA Green Fund Committee, we will secure materials to construct and demonstrate additional solar boards with 4-H leaders from three tribal communities in Southern Arizona.
- We seek to fund a state professional development workshop for our agricultural educators to build sets of boards for their own classrooms to use.
- We will help teachers create an instructional unit to utilize with their agriculture technology courses to introduce STEM topics.

