

JAYCE RILEY#, ALLISON MOORE, KEVIN DUDLEY, and ERICA HARVEY, Department of Biology, Chemistry and Geoscience, Fairmont State University, Fairmont, WV, 26554. **Behind the scenes with the solar army: improvements in sample testing technology.**

The Solar Army is looking for affordable metal oxide combinations that will help sunlight quickly and efficiently split water into hydrogen gas and oxygen gas. Hydrogen gas can then be used as a clean-burning chemical fuel. Students researchers across the nation are using SHArK (Solar Hydrogen Activity research Kit, University of Wyoming) and SEAL (Solar Energy Activity Lab, California Institute of Technology) to test metal oxides for photocurrent, and HARPOON (Heterogeneous Anodes Rapidly Perused for Oxygen Overpotential Neutralization, University of Wisconsin - Oshkosh) to test for oxygen evolution. A major focus of our work has been assessing and helping to improve the functionality of the equipment and simplify the testing processes. Our feedback on SHArK 2.0 contributed to significant improvements in SHArK 3.0, which we are now beta-testing. We also will report on some observed differences between copper and graphite conductive tapes for attaching leads to our samples. In addition to testing pre-existing technology, our lab has custom-designed and produced convenient new 3D printed sample holders that permit vertical orientation of samples for both SHArK and SEAL, as well as two new sample holder designs for the HARPOON research kit. The designs are available for use at any outreach site equipped with a 3D printer.