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The Solar Army's mission is to find an alternative fuel source that will replace the burning of fossil fuels. The desired fuel is hydrogen gas, obtained from the reaction of water and sunlight. This reaction happens naturally but needs to be much faster in order to make an abundant source of hydrogen gas. The Solar Army is searching for metal oxides that can act as photoelectrocatalysts to speed up this reaction. Metal oxide sample spots are prepared on glass plates and tested using SEAL (Solar Energy Activity Lab). The plates are coated with FTO (fluorine-doped tin oxide) and are conductive. Metal oxides are baked onto the plate and illuminated with an LED array (SEAL) of 64 "tiny suns" that shine through the plate. Relative photocurrent is measured as the light hits each metal oxide sample spot in turn. Metal oxide combinations that show higher photocurrent than copper oxide and iron oxide standards included on each plate are considered to show initial promise for photoelectrocatalytic activity.

Our research consisted of using SEAL to test plates prepared at outreach events, and uploading the results into an online database. None of the plates we tested had metal oxides that performed better than the standards. Identifying metal oxide combinations that do not show promise allows future researchers to focus attention on different combinations. This portion of the Solar Army research is supported by funding from the NASA WV Space Grant Consortium, and the College of Science and Technology at Fairmont State University.