Solar Energy Activities Showcase (Resource Exchange)

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Dr. Jin Ho Jo is a Professor of Technology at Illinois State University, teaching in the Sustainable and Renewable Energy program. Dr. Jo also leads the Sustainable Energy Consortium at the university. Dr. Jo is an honors graduate of Purdue University, where he earned a B.S. in Building Construction Management. He earned his M.S. in Urban Planning from Columbia University, where he investigated critical environmental justice issues in New York City. His 2010 Ph.D. from Arizona State University was the nation's first in sustainability. His research, which has been widely published, focuses on renewable energy systems and sustainable building strategies to reduce the negative impacts of urbanization.

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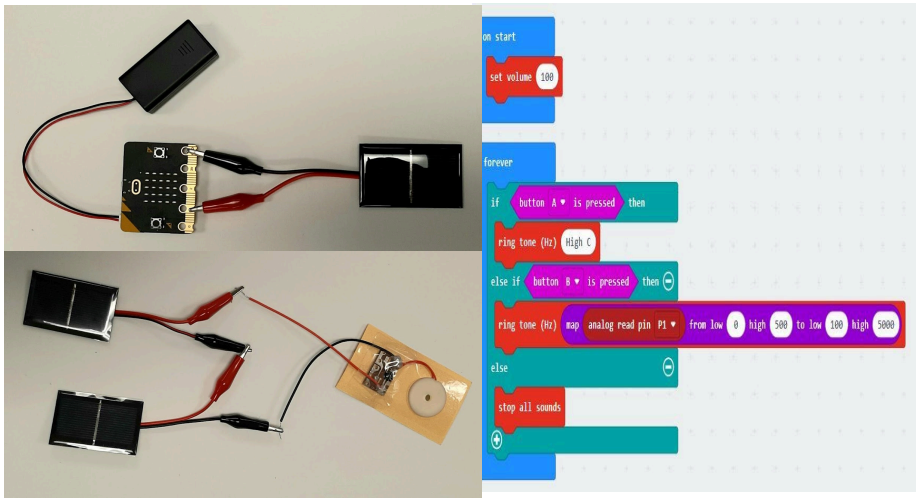
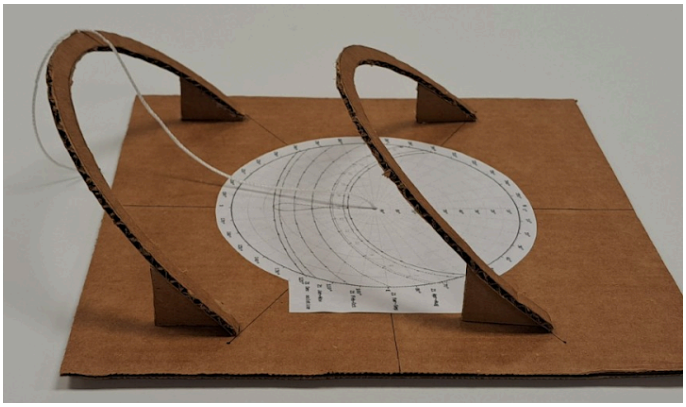
olar Energy Activities Showcase

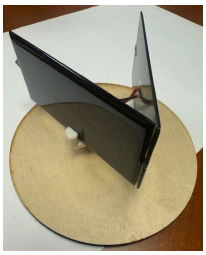
The following activities are examples from a unit of study that focuses on harnessing, using, and controlling energy. These activities were designed for pre-college learners in grades 6-12 in informal learning settings as part of [NSF grant project] by undergraduates at [University]. The goal of [project] is to promote interest in college and career pathways related to engineering, sustainability, and renewable energy technologies. **All activities can be freely accessed at: [REDACTED URL]**



In **Singing Solar Circuits**, students experiment with solar power by using solar cells to create music. They will connect solar cells to a pre-programmed music speaker and create a micro:bit-controlled program that plays different notes depending on the solar cell's voltage. The goal is to learn about solar circuits and how solar cells can power devices and create different outputs.

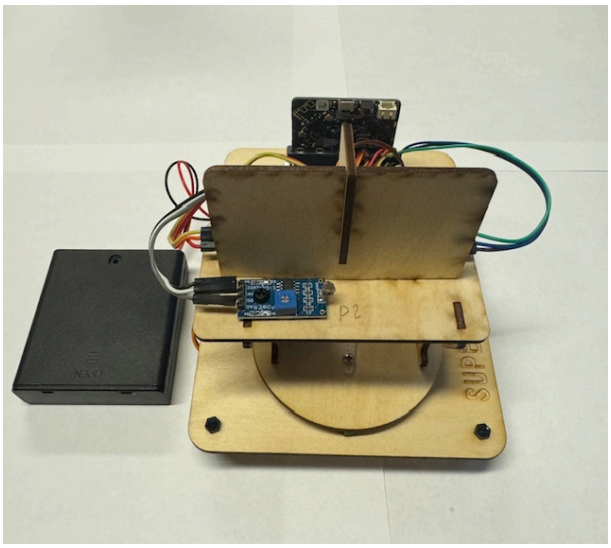


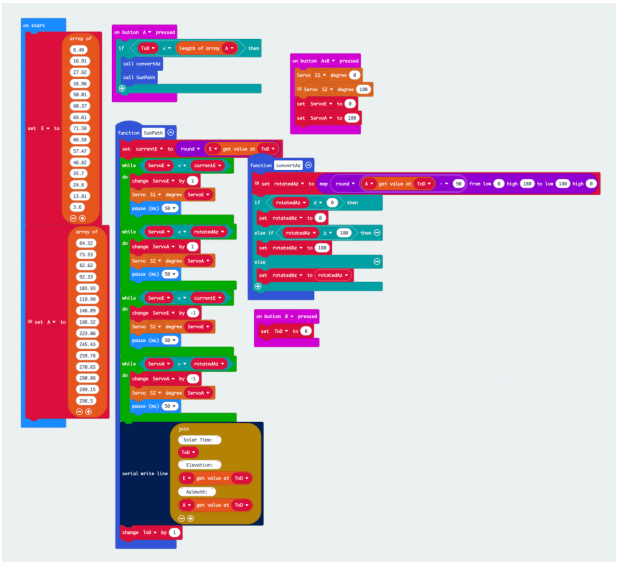
In the **Heliodon** activity, students build a mathematically derived device that models the sun's path throughout the year. Students learn the terminology and calculations for sun angles and how to read sun path diagrams and use them to understand the sun's position in the sky at different times and dates. Then, this information can then be used to optimize the positioning of solar panels for maximum efficiency in other activities.



In the **Unplugged Solar Tracker** activity, students build a solar PV tracker system that doesn't require an external power source (other than light!). Students learn how different wiring connections can change the spinning direction of a DC motor and how to connect two solar panels to control movement without complex programming.

The **Desktop Light Tracker** activity combines concepts of previous activities, including programming, to automatically track the position of the light source using sensors, and can be programmed to move along a programmed path, based on local sun path data.





The final project of the year is the **Dual-Axis Solar Cart**. Students build and program these rolling robotic power stations that can be used in their schools and communities. This project is a culmination of learning activities from throughout the year.

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