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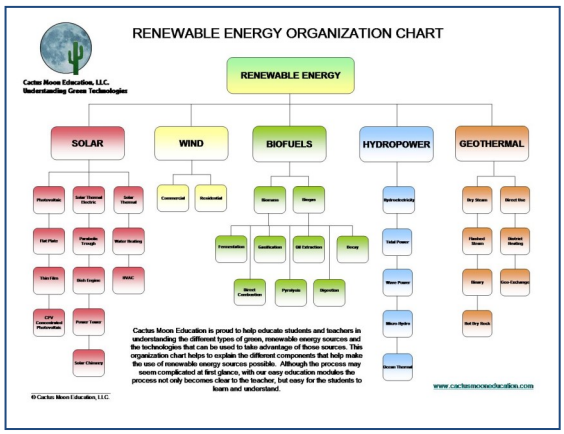
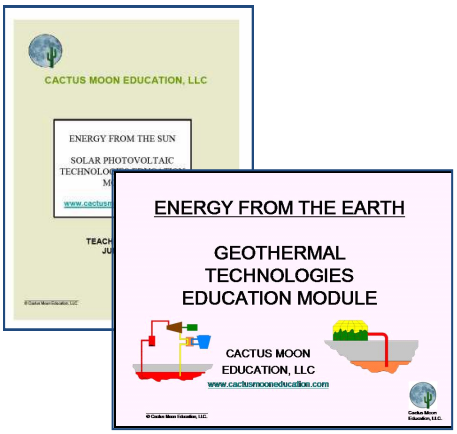
Cactus Moon Education

Informational website



Cactus Moon Education has created power point presentations together with teacher presentation notes and classroom posters for each of the renewable energy sources depicted in our introductory Renewable Energy Organization Chart.

http://cactusmooneducation.com



Additional Resources on the website include fun word-searches, virtual tours and class-room activities focused on energy and renew-able energy topics.

All of the files on the Cactus Moon website are available for download free of charge.

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Circuit Boards

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ELECTRIC CIRCUITS

1. USING: One battery, one switch, one bulb.
   MAKE: The bulb light when the switch is closed.

2. USING: One battery, one switch, two bulbs.
   MAKE: Both bulbs light when the switch is closed.

3. USING: One battery, two switches, one bulb.
   MAKE: The bulb light when either switch is closed.

4. USING: One battery, two switches, one bulb.
   MAKE: The bulb light only when both switches are closed.

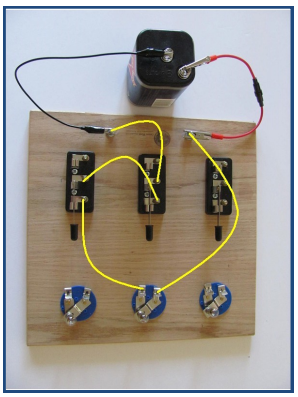
5. USING: One battery, two switches, two bulbs.
   MAKE: Both bulbs light when either switch is closed.

6. EXPERIMENT: There are three switches and three bulbs. Decide what should happen – make it work!

TWO GOLDEN RULES:

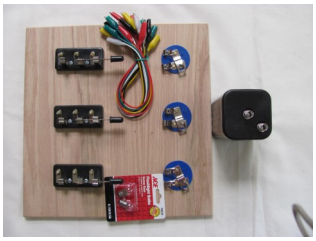
1. HAVE A SUPERVISOR CONNECT THE BATTERY TO THE TWO THREADED RODS USING A BLACK LEAD AND A FUSED RED LEAD.
2. ONLY MAKE CONNECTIONS TO THE TWO THREADED RODS AT THE TOP OF THE BOARD.

Students face a series of increasingly difficult electric circuit design challenges using batteries, light bulbs, switches and connecting wires.



The challenges range from turning on a light bulb when a knife switch is thrown to turning on multiple light bulbs with knife switches connected in series.

Azure Education, Inc. will provide up to four circuit boards for the students to use in addition to all of the necessary batteries, bulbs and wires.



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Classroom Activities

Azure Education can provide a number if classroom activities and interactive presentations for students.
The materials are intended for grade 3 to 6; however, other grades can be accommodated if requested.

Currently, activities include:

Ticket to Ride	Circuit Boards
Electromagnetism	Poster Drawing
Renewable Energy	Garbage

Teachers provide a projector and screen and engage the students on the topic of interest prior to Azure visiting the school.

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Electromagnetism

Using an iron nail, some copper wire, and a small battery, students work in groups to make an electromagnet and use it to pick up as many paper clips as they can from a pile on the table.

Each group counts the number of wire turns on their magnet and completes a chart showing the number of turns and the quantity of paper clips they were able to pick up.

Each group starts with a different length of copper wire and so will have a different number of wire turns on their magnet.

The chart should show that magnets with the most wire turns can pick up the most paper clips.

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Site Visits

We encourage site visits to infrastructure facilities such as:
Wastewater Treatment Plants, Landfills, Material Recycling Facilities (MRF), Solar plants, Wind farms and Animal Feed Lots (CAFO)

Azure Education, Inc. will assist teachers by coordinating site visits for their students. We can make a visit to the facility before hand to ensure that a site tour would be appropriate for the students and assist teachers with student engagement prior to making the site visit if requested.

Teachers will be responsible for coordinating student transportation and for obtaining parental releases etc.
Teachers should also commit to engage the students prior to the site visit and to have a follow-up exercise for the students after the visit.

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Solar Car Races

Miniature solar powered Lamborghini cars race down a twelve foot track—with a difference. Large shade structures cast shadows onto the racetrack which the cars cannot cross without some assistance. Students use hand mirrors to reflect sunlight onto the cars to help them move out of the shade.

Students take on the roles of finish-line judges, scorekeepers and, of course, mirror handlers.

AZure provides a twelve foot long racetrack, solar race cars, shade structures and hand mirrors for up to 20 students.

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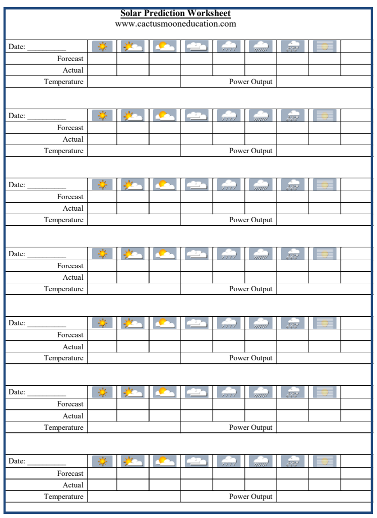
Solar Prediction


Solar Prediction Worksheet
www.cactusmooneducation.com

Date: ________		
Forecast		
Actual		
Temperature	Power Output	
Date: ________		
Forecast		
Actual		
Temperature	Power Output	
Date: ________		
Forecast		
Actual		
Temperature	Power Output	
Date: ________		
Forecast		
Actual		
Temperature	Power Output	
Date: ________		
Forecast		
Actual		
Temperature	Power Output	
Date: ________		
Forecast		
Actual		
Temperature	Power Output	
Date: ________		
Forecast		
Actual		
Temperature	Power Output	

The objectives of the Solar Prediction Activity are to:

1. Correlate predicted and actual weather conditions.
2. Correlate a solar power system performance to actual weather conditions.
3. Use the information from 1 and 2 above to predict the performance of the solar system.

There are no right or wrong answers in this activity—the goal is for the students to be able to defend their predictions.

Detailed instructions and the activity worksheet can be downloaded from the Cactus Moon Education website at:

http://cactusmooneducation.com/wp-content/uploads/2018/09/solar-prediction-exercise.pdf

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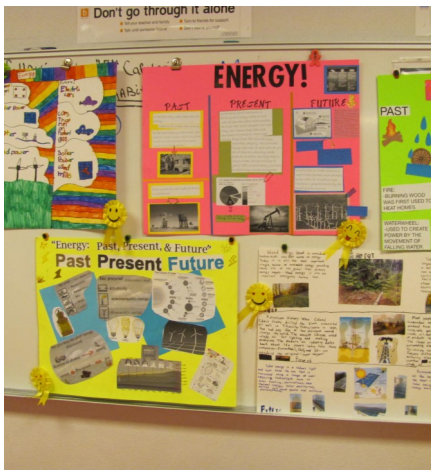
S.T.E.A.M Poster Contest



The poster contest is designed to involve third grade students in a way that provides them with a fun exercise that encourages creativity, planning and a little research.

The students will create 22" x 17" posters which depict an energy theme such as —**Energy: Past, Present, and Future.**

The posters will be judged by an external team of judges who will select the five best posters submitted.

To celebrate the competition a pizza lunch will be provided to all the participants.

Azure Education, Inc. will coordinate the competition, schedule the judges, provide the pizza lunch, and, as a token of our appreciation will present the participating teachers with a back-pack of classroom supplies.

Azure Education will provide the scoring rubric and score tally sheets.

The web sites (www.cactusmooneducation.com) & (www.azureeducation.org) are free for teachers to use as reference sources to teach students about renewable energy.

Teachers will engage the students in the competition and will select a day for the competition judging.

The teachers will provide the art materials for the students to use and will number the posters for anonymous identification.

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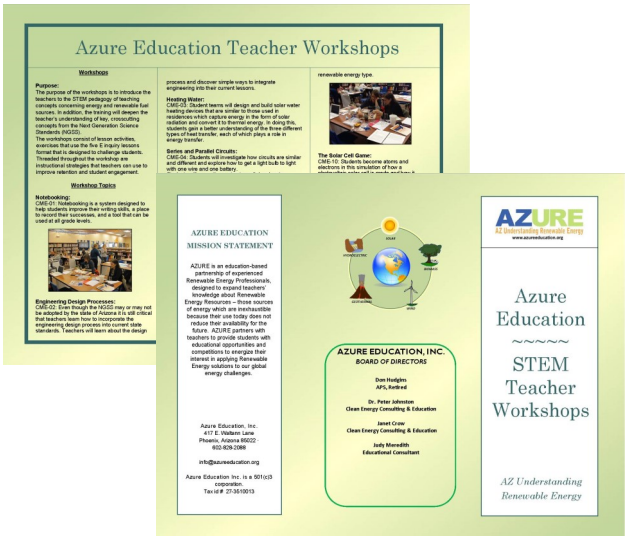
Teacher Workshops



Azure Education, Inc. provides one day workshops for science teachers to introduce them to the Inquiry based STEM pedagogy of teaching concepts concerning energy and renewable fuel sources.
Threaded throughout the workshop are instructional strategies that teachers can use to improve retention and student engagement in the classroom.

The workshops are presented by qualified professional trainers and teachers receive Professional Development Credits for attending.

Azure Education, Inc. will provide all of the workshop materials in addition to breakfast, lunch , and snacks throughout the day.

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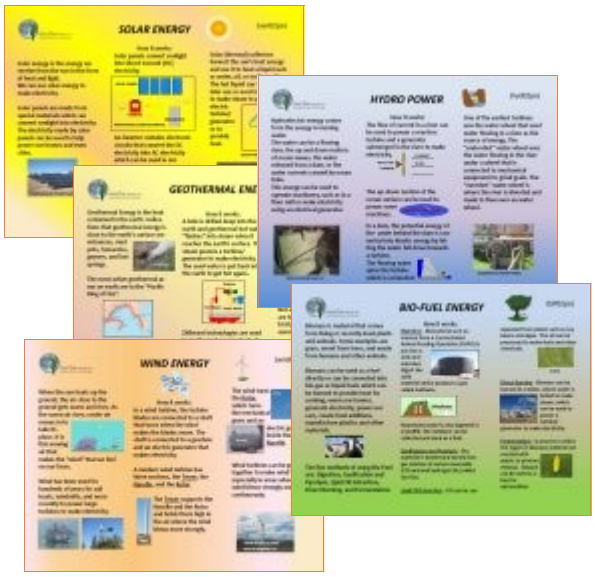
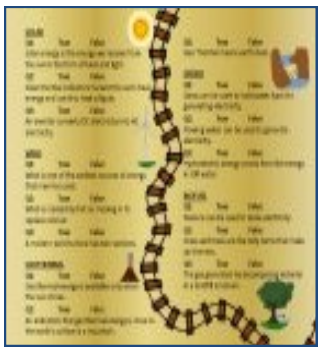
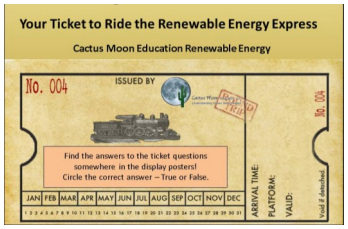
TICKET TO RIDE

the Renewable Energy Express



The **Ticket to Ride** activity is a fun and educational graphic scavenger hunt in which students search for answers to a series of True/False questions about the five renewable energy resources. The answers can be found on five color posters that contain basic information on each of the resources. Team work is encouraged, providing interaction between the students.





Azure provides the posters and questionnaires/tickets for the students.

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