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Solar Cell Sets

Solar Cell Classroom Set #SCS4 - \$410 NEW Updated!

Solar Cell Classroom Sets have all the equipment to allow hands-on explorations of solar power and electricity. They contain enough solar cells, motors, and equipment to engage a classroom full of students. The User Guide explains how to use and maintain the equipment, and includes a number of student exercises for developing an understanding of basic electric theory and the photovoltaic effect.

Activities using the **Solar Cell Classroom Set** range from kindergarten classes experiencing the photovoltaic effect (sunlight makes the motor spin) to colleges and trade schools plotting the IV curves of solar modules. Students can build simple circuits to power a variety of electrical loads. Radios, motors, model cars and homes can be powered with the Solar Cell Classroom Set. Some classes make solar power plants to run miniature “utility grids” in their classroom. Using this set, students develop their scientific observation skills, meet the standards while studying electricity, and learn about renewable energy sources.

The Set can also be used to power:

- **Solar Spinart:** a fun and low cost art project (templates are found at solarschoolhouse.org/spinart).
- **Solar Carnival** creations: Kinetic sculptures powered by sunlight. Solar cells, motors, wheels etc are reclaimed at the end of the project for use with a future group of students.

Most importantly, these activities show students positive alternatives for our energy future, and foster optimism, excitement, and a sense of purpose.

The Classroom Set includes:









- ✓ 40 Solar Cells with wire & clips (0.5V*400mA)
- ✓ 1 Solar Modules with wire & clips (3V*1A = 3 watts)
- ✓ 20 Solar DC Motors (0.5V–5.0V)
- ✓ 20 motor stands
- ✓ 20 propellor fan blades
- ✓ 20 wheels with holes for Carnival projects
- ✓ 20 Solar Sound Modules
- ✓ 1 Radio with speakers (3V)
- ✓ 1 Digital Multi-meter
- ✓ 1 buzzer 3V
- ✓ 1 colored pen set, for Spinart.
- ✓ 100 brass fasteners, for Solar Carnival project
- ✓ 1 roll of double-sided tape, for Spinart
- ✓ Sturdy Organizer Storage Case
- ✓ Users' Guide



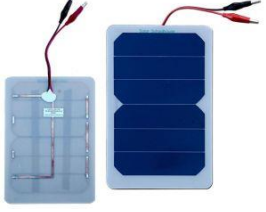



solarschoolhouse.org/solarcellclassroomset



Accessories for the Solar Cell Classroom & Activity Sets

| | | |
|--|--|--|
| <p>Digital Multimeter with clips #SSH-DMM \$27/ea #SSH-DMM10 \$260/set of 10 DMMs</p> | <p>A DMM is a great tool to help assess and quantify the electrical characteristics of solar cell circuits. DMMs can be used to troubleshoot circuits or quantify the performance characteristics of any mystery solar cells and modules. We've chosen a quality, yet economic model and added alligator clips with insulators for ease in making connections.</p> |  |
| <p>2" Yellow Wheels #RGDL-W2-1 \$1.20/ea #SSH-YW10 \$11/set of 10 wheels</p> | <p>2" diameter wheel fits on the solar motor (2mm axle). For experiments and projects. This wheel provides a sturdy connection and a solid surface for building Whirlygigs, Solar Carnivals, and Solar Spinart.</p> |  |
| <p>2" Yellow Wheel w.holes #SSH-YW2H \$1.50/ea #SSH-YW10 \$14/set of 10 wheels</p> | <p>2" diameter wheels with 4 1/8" dia holes for ease in making Solar Carnival or Whirlygig creations using pipe cleaners, or brass fasteners. This bypasses the use of glue, and makes it easier to dismantle a project when finished, and reclaim the materials for use with a new group of students.</p> |   |
| <p>Blue Fan #RGDL-FANBLUE1 \$0.95/ea #SSH-FANBLUE10 \$9/set of 10 fans</p> | <p>Fan, propeller, blue, for solar motor, 1.95mm axle. 90mm (~3.5") Diameter. Soft edges. Make your solar motor come to life with these fans.</p> |  |
| <p>Sound Module #SSH-SM1 \$3.50/ea #SSH-SSM10 \$33/set of 10 sound modules</p> | <p>We've added wires to this music module (like the ones found in a greeting card) so it can easily be powered directly by a solar cell and mounted it on a clue card. Minimum 1V solar cell required. Module plays "You are my Sunshine". Wires are taped to the card for strain relief.</p> |  <div data-bbox="857 1239 1136 1354" style="border: 1px solid black; padding: 5px; font-size: small;"> <p>Solar Schoolhouse Music Module Combine solar cells in series and/or parallel to find a power solution to make this music module sing. Be sure to add sunshine. 🎵 Clue: a 1.0 Volt button battery normally powers this type of music module. Solarschoolhouse.org</p> </div> |
| <p>Solar Motor with wires #RGDL-Motor1 \$3.60/ea #SSH-Motors-10 \$34/set of 10 motors</p> | <p>DC motor operating 0.5 -5v, includes 36" wire with eyelets. Can be used for various experiments and projects. Few mini motors include attached wire. If you don't want to solder on wire yourself, this is one is a great option. One solar cell (0.5v*400mA) will power this motor in direct sunlight, 2 will make it go faster.</p> |  |
| <p>Solar Motor with wires & strain relief #SSH-MT1 \$4/ea #SSH-MT10 \$38/set of 10 motors</p> | <p>Extend the life of your Solar Motor by TAPING THE WIRES TO THE MOTOR BODY TO PROVIDE STRAIN RELIEF. This helps to keep the wires attached to the motor during routine use. For this option, We tape the wires onto the motor body for you. Or purchase the #RGDL-Motors1 above and tape them yourself.</p> |  |



| | | |
|--|---|--|
| | | |
| <p>Solar Module, 3V*1A #SSH-3VMOD1 \$34/ea</p> <p>#SSH-3VMOD1-10 \$320/set of 10 modules</p> | <p>Solar Schoolhouse brand 3 watt (3V*1A) silicon solar module mounted on a fiberglass substrate. Lightweight (127g). Includes wire with alligator clips. Can be used individually to power model solar cars, a class solar circle circuit, or combined to power a solar fountain. Versatile use for solar experimentation and investigation activities. Dimensions: 220 x 145 x 2 mm <i>(Utilizes high efficiency all-back contact solar cells)</i></p> |  |
| <p>Solar Cell #RRE-CELL1 \$4/ea</p> <p>#SSH-CELL1-10 \$38/set of 10 cells</p> | <p>Silicon Solar Cell, 0.5v*400mA, with alligator clips. This silicon solar cell provides the basic building block for classroom experiments. Dimensions: 59 x 37 x 2 mm We recommend having minimum 2 cells per every motor, for solar circuit explorations.</p> |  |
| <p>Motor Stand # SSH-MS1 \$1.10/ea # SSH-MS10 \$10/set of 10 motor stands</p> | <p>Motor Stand. 3/4" PVC coupling, White. With 1/4" Dia hole notched in base for wire. Use with the solar cells (0.5V*400mA) and yellow wheel found in the Solar Cell Classroom Set. Useful for Solar Spinart and ease in conducting solar cell explorations</p> |  |
| <p>Radio # ROCI-Radio \$19/ea</p> <p># SSH-Radio10 \$180/set of 10 Radios</p> | <p>AM/FM Radio, 3V, with speakers. We've added a red wire to the positive terminal plate in the battery compartment for ease in connecting solar cells to the radio. Students create a solar array with the 0.5V*400mA solar cells that meets the voltage and current requirements of the radio.</p> |  |



Solar Fountain Sets


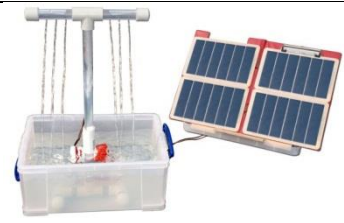
Powering fountains with solar electricity is one of the most effective ways to show the relationship solar electric modules have with the sun. As the solar modules are aimed more toward the sun, the water pumps more vigorously.

Casting a shadow on the modules will slow or stop the water flow. This immediate response lends itself to practical experiments in solar electricity. Measurements of the flow rate can be made. More sophisticated experiments can be done with digital multimeters. With these meters, voltage and current data can be measured from the modules both when powering the pump and when unloaded.

Solar Schoolhouse makes two models of the Solar Fountain Sculpture Set: the Standard Set and the Deluxe Set.

solarschoolhouse.org/solarfountains/



| | | |
|---|---|--|
| <p>#SSH-SFSS1, Standard Set \$110/ea</p> | <p>Includes: assorted lengths of clear pvc pipe, pvc fittings (elbows, cross, couplings), barbed elbow, flexible tubing, 12v DC bilge pump, wire leads with alligator clips, guide, and a 4L plastic case.</p> | <p><i>You'll need your own solar module for this option. A 15-20 watt 12v module with wires, will work well.</i></p> |
| <p>#SSH-SFSS2, Deluxe Set \$250/ea</p>  | <p>All the ingredients of the Standard Set plus a mini solar array made of 4 3V*1A solar modules mounted on a binder, allowing for a series wiring challenge, and ease in moving panels together. The 9L (liter) plastic box can be used as a water basin. All parts, including the solar array, fit within the box.</p> |  |

The Solar Fountain Sculpture Set can be used for many different grade levels and class subjects. The **Engineering Solar Solutions with the Solar Fountain Sculpture Set** series of challenges has different levels of complexity that can be introduced at the appropriate grade levels.

The Solar Fountain Set can also be used at events as a fun activity demonstrating solar energy. Very little instruction is needed, leaving fountain builders to get creative and come up with their own unique solar kinetic art.



Solar Fountains can also be made as permanent additions to your school garden. Information on how to build these, and other strategies for incorporating Solar Fountains into your classroom, is found at solarschoolhouse.org/solarfountains/





Solar Whirlygigs

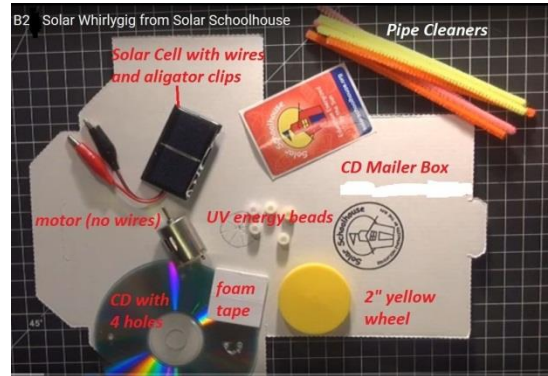
Solar Whirlygigs (aka Solar Kinetic Sculptures or [Solar Carnivals](#)) are a fun project to teach about solar electricity. Connecting solar cells directly to a motor and placing in sunshine is a good start to learning about solar electricity and how it works. Your Solar Whirlygig creations can also be [Solar Spin Art](#) devices. There are many options.



solarschoolhouse.org/whirlygig/

#SSH-WGB2 Solar Whirlygig Kit \$14/ea

The B2 Whirlygig kit includes a CD mailer box to mount motor and solar cell. The white box offers plenty of space to add artwork. Pipe cleaners, UV energy beads, solar cell with wire and alligator clip connectors, motor, yellow wheel, CD with holes, and foam tape are also part of the kit. (no soldering or glue required). Instructions and video tutorial online at solarschoolhouse.org/whirlygig



This kit is fairly simple and has all the parts needed. Students can mark and cut the holes themselves, or you can precut them if needed. A template for marking and precutting holes is included.



If you'd like to add a sound module (music chip), use your own repurposed boxes, include soldering, or need help troubleshooting a solar cell/motor combination, contact us. We can help configure a custom kit for your class or summer camp.



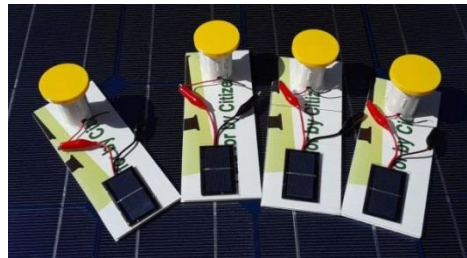
Solar Spin Art Sets

Mesmerize your students with this solar powered art project! A solar cell powers a motor attached to a 2" yellow wheel. Attach a paper disc to the wheel using double-sided tape. Add direct sunshine and colored pens and watch the magic happen. The completed artwork can be attached to a whirlygig project, or to a necklace medallion, or used to create a button, or taped/glued onto/into a nature journal (sketch book).



This is a low cost way to add a solar cell (photovoltaic) experience to your class, after-school program, outdoor school, an event, or summer camp. When sunlight hits a solar cell producing electricity and making a motor spin is a magical moment. By shading the solar cell, one can see the immediate impact on electrical production. Switching the wires you'll discover that polarity matters. The Art project can be used to discuss how this solar cell technology is being used in our world, to help provide clean electricity, reducing Greenhouse Gases (GHGs), and improve our lives. Video tutorials, templates and more at

Solarschoolhouse.org/spinart



#SSH-SSA8, 8 Solar Spin Art Bases: **\$169**

#SSH-SSA4, 4 Solar Spin Art Bases: **\$95**

Each Set of 4 or 8, comes with a roll of double-sided tape and a colored pen set to get started. And a convenient carrying case.

#SSH-SSA1 Individual Solar Spin Art Bases (2v*200mA solar cell with wire & clips, dc motor, wire, wheel, 3/4" pvc coupling, assembled on a coroplast base) are available for **\$25/each**



#SSH-SSA1P – Solar Spin Art Base Parts. Assembly required. Requires soldering & glue gun tools. includes: 2v*200mA solar cell with wire & clips, dc motor, wire, wheel, 3/4" pvc coupling, pre cut coroplast (repurposed campaign signs) base. **\$12/each**





Solar Notebooks

The Solar Notebook Project Family from Solar Schoolhouse is designed to charge a cell phone (or powerbank) with one or more solar modules. All of the Solar Notebooks use one or more 8v*400mA (3.2watt) solar modules as a power source, combined with a USB car charger to convert to a 5Vdc USB compatible output. Soldering is optional for most models, though it's always great to learn to use new tools, when possible. All solar notebook builders are encouraged to become Solar Ambassadors.

| features | NB4 | N42 | NB42E123 | NB4WG |
|--|---|----------------------------------|---|---|
| |  | Looks like NB4 but with 2 panels |  |  |
| Kit Price ¹ | \$32 | \$52 | \$83 | \$32 |
| Solar Panel (8v*400mA), quantity | 1 | 2 | 2 | 1 |
| Power rating | 3.2watts | 6.4watts | 6.4watts | 3.2watts |
| Time to charge Powerbank (2600mAh) or Smartphone in clear direct sunlight | ~5 hours | ~2.5 hours | ~2.5 hours | ~5 hours |
| USB Car Charger(DC-DC converter), 1 port | 1 | 1 | - | 1 |
| USB Car Charger(DC-DC converter), 2 port | - | - | 1 | - |
| 12vdc Autosocket | 1 | 1 | 1 | - |
| Foam Tape, double sided, 6 squares per panel | √ | √ | √ | √ |
| Coroplast, repurposed campaign sign, precut | - | - | 2 | - |
| Wire nuts, for solder-free wire connections | √ | √ | √ | √ |
| Zip ties | √ | √ | √ | √ |
| Rubber bumpers | √ | √ | √ | √ |
| Pencil Pouch, for housing Powerbank, Lights. | - | - | 1 | - |
| Power Bank, 2600mAh, with capacity indicators, and "Saving Sunshine for a Rainy Day" sticker, includes microUSB to USB cable, for charging | - | - | 1 | - |
| Light, USB LED Light Bulb. Area light | - | - | 1 | - |
| Light, USB LED Light Stick. Reading Light | - | - | 1 | - |
| DC motor | - | - | - | 1 |
| 2" yellow Wheel, with holes for pipe cleaners | - | - | - | 1 |
| Velcro for yellow wheel | - | - | - | 1 |
| Alligator clips, Red/black, + short wire | - | - | - | √ |
| Pipe cleaners + UV energy beads for mini Whirlygig | - | - | - | 1 |
| Soldering? | Optional | Optional | Optional | Required |



Solar Notebook Kit #SSH-NB42E123

for your emergency go bag or routine use.

This complete kit has all the components needed to build a working portable solar charger – for your cell phone or a powerbank. This kit includes a 2600 mAh powerbank which can be used to store the sun’s energy and then charge your phone OR power an LED Light Bulb or Stick (included).



| <i>features</i> | <i>NB42E123</i> |
|--|-----------------|
| Solar Panel (8v*400mA), quantity | 2 |
| Power rating | 6.4watts |
| Time to charge Powerbank (2600mAh) or Smartphone in clear direct sunlight | ~2.5 hours |
| USB Car Charger (DC-DC converter), 2 port | 1 |
| 12vdc Autosocket | 1 |
| Foam Tape, double sided, 6 squares per panel | √ |
| Coroplast , repurposed campaign sign, precut | 2 |
| Wire nuts, for solder-free wire connections | √ |
| Zip ties | √ |
| Rubber bumpers | √ |
| Pencil Pouch , for housing Powerbank, Lights. | 1 |
| Power Bank , 2600mAh, with capacity indicators, and “Saving Sunshine for a Rainy Day” sticker, includes microUSB to USB cable, for charging | 1 |
| Light, USB LED Light Bulb . Area light | 1 |
| Light, USB LED Light Stick . Reading Light | 1 |

Assembly instructions posted online at
<https://solarschoolhouse.org/notebook/>

You Provide: Duct Tape, 3” wide is best, but 2” wide can work. Pick some colored options for better looking result (vs. Grey only). Uline.com is a good source for 3” wide tape. Optional: stickers, or clipped art from solar magazines to create collage/message on outside of Solar Notebook. Requires glue stick & clear packing tape to cover the design.

Tools Required: Wire Cutter/stripper, Rulers, Markers, sharp pointed tool for making holes in cardboard/coroplast (or small Philips screwdriver or kabob stick), utility knife (or snap knife). Soldering is optional for NB42E123.





Solar Notebook Options

#SSH-NB4 \$32/ea. Includes (1) 8v*400mA (3.2 watts) solar module laminate, (1) single port USB car charger, (1) autosocket, foam tape, zip ties, wire nuts. You provide: paper or plastic cardboard, duct tape.

High school students attending the annual SunPower Summer Academies routinely use this kit



#SSH-NB42 \$52/ea. Includes (2) 8v*400mA solar module laminates (total 6.4 watts), (1) single port USB car charger, (1) autosocket, foam tape, zip ties, wire nuts. You provide: paper or plastic cardboard, duct tape. This is basically the same as NB4 but with a second panel, which increases the charging speed 2x.

#SSH-NB42E123 \$83/ea. Includes (2) 8v*400mA solar module laminates (total 6.4 watts), (1) dual port USB car charger, (1) autosocket, foam tape, zip ties, wire nuts, pencil pouch, (1) USB LED Light Bulb, (1) USB LED Light Stick, (1) 2600mA PowerBank with indicator lights, and precut coroplast. You provide: duct tape. By directly charging a powerbank with the solar notebook, instead of the phone, one can continue using your phone while the powerbank is charging. The powerbank also provides battery power for lighting – for camping or for emergency preparedness purposes – a solar charger that provides for communications (phone) AND lighting, this is the one for your go-bag.



#SSH-NB4WG \$32/ea. Includes (1) 8v*400mA solar module laminate, (1) single port USB car charger, (1) autosocket, foam tape, zip ties, wire nuts. Plus motor, wheel, wire, pipe cleaners, uv beads, alligator clips. You provide: paper or plastic cardboard and duct tape. **Soldering is required.** This model incorporates a Whirlygig for demonstrating solar electricity in action.





Accessories for Solar Notebooks

Powerbank #RTEN-PBT2600S \$9.90/ea. 2600mAh capacity. With 4 LED capacity indicators. Includes "Saving Sunshine for a Rainy Day" sticker. Includes microUSB to USB charging cable. This is included in NB42E123, but not the other kits.



1ft USB 2.0 A Male to A Female Extension Cable. #RSFC-USB1 \$2.60/ea
For use with USB Power Meter (Keweisi).



USB Power Meter (Keweisi) (# RFT-USBMTR) \$14/ea. For measuring charging characteristics of Solar Notebook to powerbank or cellphone. Measures Volts, Amps, Charging Time, and Energy (mAh). Invaluable when evaluating different solar charging conditions – to determine what is best.



USB LED Light Bulb (# RNDS-USBLightBulb). \$3.50/ea.

Add ambient light source to your solar charger set. This is included in NB42E123, but not the other kits.



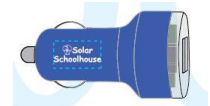
USB LED Light Stick (# RNDS-USBLightStk) \$4.50/ea. Add focused reading light source to your solar charger set. This is included in NB42E123, but not the other kits.



USB Car Charger, single port. (#RNDS-USBChrger) \$5/ea This USB car charger (max 1 amp) converts solar module input (ranging from 6v to 21v) and converts it to a USB safe 5 volts. It's a simple and low-cost dc-dc converter for your cellphone and powerbank charging needs. "Solar Schoolhouse" logo imprinted on side.



USB Car Charger, dual port. (#RNDS-USB2PortChg) \$8/ea This USB car charger converts solar input (ranging from 6v to 21v) and converts it to USB safe 5 volts. It's a simple to use dc-dc converter for your cellphone and powerbank charging needs. You can charge 2 USB devices at the same time. "Solar Schoolhouse" logo imprinted on side.





Posters

Start some great conversations by decorating your classroom walls with these colorful posters.



Solar Poster Classroom Set

One of each of the following posters for your classroom walls.

#SSH-PosterSet4 \$25/for set of all 3. (rolled)

The Magic of Solar Cells

Highlighting the many applications of Solar Cells around the world. 24" x 36"

Includes a video and suggestions for classroom lesson.

solarschoolhouse.org/magicsolarcells/

Your Solar Home

Highlights many of the topics covered in the Your Solar Home book and video. It includes photos of six homes built for the Solar Decathlon. 22" x 28"

solarschoolhouse.org/yshsg/

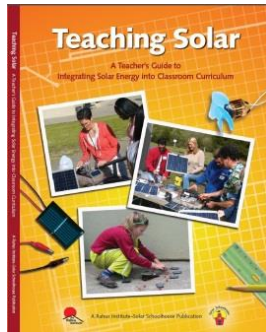
Photosynthesis & Photovoltaics

The process by which a plant produces its energy from sunlight parallels the way a photovoltaic panel produces solar electricity. This poster presents the various similarities and differences between the two processes. 22" x 28"

The Magic of Solar Cells Poster is also available individually **#SSH-PosterMSC** (folded) for \$6/ea



Books



#SSH-TS \$26/ea.

Teaching Solar, Book & Video.

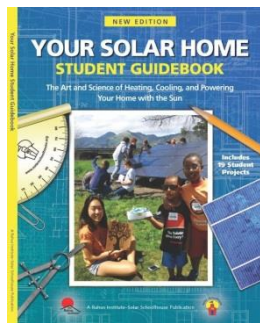
"A Teacher's Guide to Integrating Solar Energy into Classroom Curriculum" (176 Page Book, 50 Minute Video):

This guide and DVD present engaging new solar curricula that have evolved based on the experiences of teachers in their classrooms. It details the step-by-step Solar Schoolhouse approach of teaching solar based on experimentation. Although the basic principles for using the sun's energy are fairly simple, the applications of these principles are constantly evolving. Nothing gets students, and teachers, more excited than to actually experiment with solar technology by powering electrical loads or cooking with sunlight.

Additional Features:

- Video tutorials and interviews with teachers discussing their experiences teaching about solar energy
- Worksheets & Project Guides
- Outdoor Environmental Activities Guide
- Solar Science Fair Project Ideas
- Solar Discovery Faire Activities Guide
- Solar Schoolhouse Olympics Guidelines

View the complete *Teaching Solar* Table of Contents [\[PDF\]](#)



#YSH-GV3 \$18/ea

Your Solar Home Student Guidebook & Video: *The Art and Science of Heating, Cooling and Powering Your Home with the Sun*

128 Page Book, 26 minute Video

Use this comprehensive textbook in class to teach the scientific principles behind the many ways the sun's energy can be used to heat, cool and power your home. A perfect resource for renewable energy year-long, semester-long or module courses. Includes informative diagrams, review questions, a glossary and 15 solar projects.

Topics Include:

- Solar orientation through the seasons
- Principles of energy and heat transfer
- Passive solar heating and cooling
- Heating water with the sun
- Cooking with sunlight
- Solar electricity
- Historical references and interesting solar energy facts



How to Order Materials

1. Educational institutions and schools may order using a Purchase Order. Please fill out the [QUOTE request form](#) and email to orders@solarschoolhouse.org. The Rahu Institute (the parent organization for Solar Schoolhouse) will provide a quote that includes shipping costs. The Quote is good for 60 days and can be used to create a Purchase Order.

Purchase Orders are sent via email to orders@solarschoolhouse.org or FAXED to 707-827-8361. **POs must include an email option for submitting invoices (as PDF) and a contact person and phone number responsible for payments. The PO must be on school or organizational letterhead.**

2. Purchasing via Credit or Purchase Card. Please fill out the [QUOTE Request form](#) and email to orders@solarschoolhouse.org. The Rahu Institute (the parent organization for Solar Schoolhouse) will create an e-invoice and send a link to pay via Paypal's credit card processing path. As soon as we receive payment, materials will be shipped.
3. Non school or educational organization purchases. We currently only sell to school or educational institutions, though occasionally we'll post Clearance Sale options for sale on the website that anyone can purchase.

About Solar Schoolhouse

The Solar Schoolhouse is a K-12 energy education program developed by The Rahu Institute starting in 2001. The program introduces students to the concepts of solar energy in a fun, intriguing, and meaningful way. Using hands-on, project-based teaching tools, the program seeks to raise the energy literacy in schools throughout the country by educating students about solar and renewable energy, energy resource conservation, and other energy topics.

www.solarschoolhouse.org



About The Rahu Institute

Founded in 1998, The Rahu Institute is a 501c3 non-profit, research and educational organization with a focus on resource efficiency. The word, Rahu (raw-hoos) is derived from the name of the Egyptian sun god, 'Ra' combined with the Norwegian word for house 'hus'; literally, sun house. Our motto, Solutions for a Sustainable World, sums up our guiding goal to create a better world and better lives through the use of clean technology and intelligent implementation. www.rahus.org



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