



PLEASE RECYCLE - PASS ON TO A FRIEND!

2006 Junior Solar Sprint Championship

Over 100 middle school teams brought their model solar electric cars to the June 11, 2006 invitation-only Northeast Championship held at the Springfield Museums in Massachusetts to compete for speed and design awards. Kids qualify when they win top awards at area events held all over the northeastern U.S. each spring. The Northeast Sustainable Energy Association (NESEA) organizes the Championship, supports area events, and offers workshops for teachers and mentors. This year, we were treated to a rare sunny day in a rainy season. The racing action was especially thrilling, with some unexpected twists of luck, including a car that spun around midway down the track and returned to the start line! Check out the pictures throughout this issue.

Winners

Grand Champion

This young man from New Jersey stood out in a highly qualified crowd where approximately 250 kids with 100 cars were each winners in every sense of the word.

"Full Throttle," was designed and built by Eric Martin of the Northwest Christian School from Newton, NJ. His car also took first place awards in Innovation and Technical Merit.

- Continued inside -

Solar Panels: The Basics

Take a close look at a JSS solar panel. Inside the protective plastic covering, you will see the photovoltaic (PV) cells, thin blue or black pieces of a glassy material—silicon. Normally gray, it has been coated with an anti-reflective substance to minimize loss of solar energy through reflection.

- Continued inside -

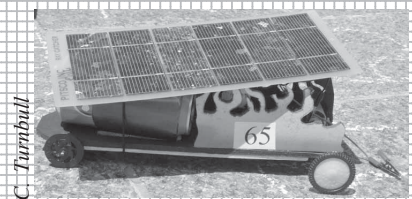


J. Green



C. Turnbull

Eviscerator



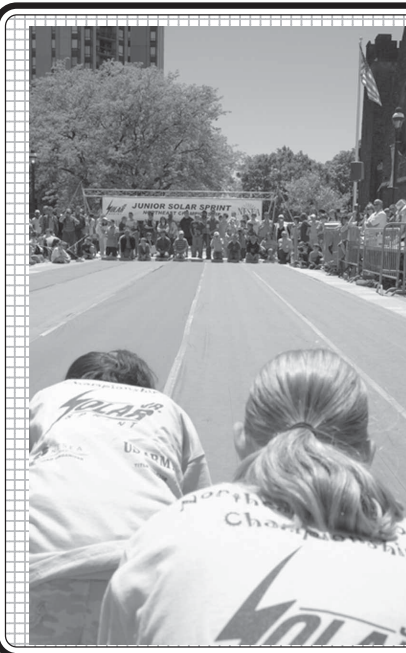
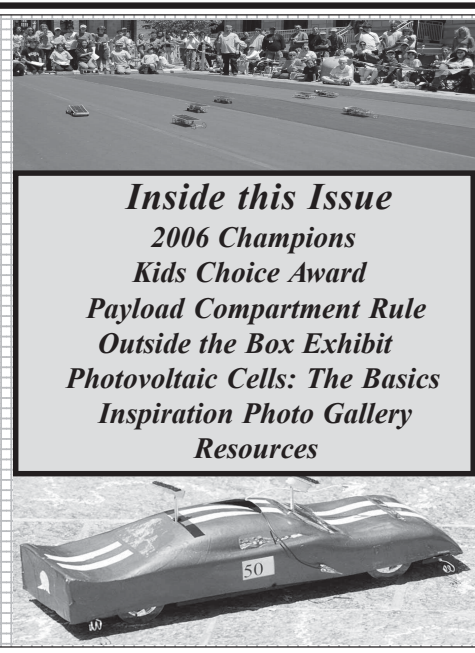
C. Turnbull

Solar Knight

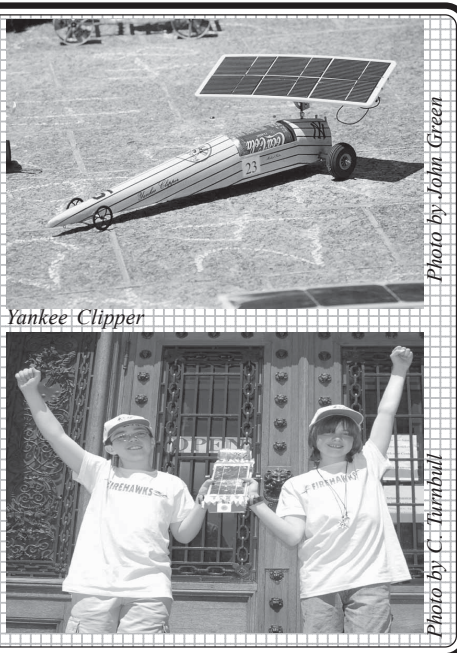


J. Green

Grand Champion with his car, Full Throttle, at judging booth.

Inside this Issue
2006 Champions
Kids Choice Award
Payload Compartment Rule
Outside the Box Exhibit
Photovoltaic Cells: The Basics
Inspiration Photo Gallery
Resources



C. Turnbull

Photo by John Green

Yankee Clipper

Photo by C. Turnbull

12 Great Reasons to Bring Junior Solar Sprint to Your Classroom

1. Help your kids prepare for mandatory science testing! Starting in 2007-2008, all states are required to test students in science—which will include technological design. Junior Solar Sprint offers a highly motivating way to teach physical science concepts.
2. Cover many state and national science, engineering, technology and social studies frameworks all at once.
3. Promote high quality work and sportsmanship through friendly competition.
4. Explore air pollution, resource depletion, and global warming in context.
5. Learn together through an inquiry approach.
6. Encourage innovation and creativity.
7. Empower kids to solve problems.
8. Develop skills in craftsmanship.
9. Provide youth with quality engineering education.
10. Experience firsthand how renewable solar energy works.
11. Network with other educators in collaborative endeavors.
12. Access FREE curriculum and workshops.

Many thanks to the financial support of our Title Sponsor, the U.S. ARMY, the donations of materials from Pitsco, and the countless hours from our generous volunteers.

"Outside the Box" Exhibition

Four students from Powder Mill School were the first to take part in the experimental "Outside the Box" exhibition. They demonstrated their model hydrogen fuel cell car, which had won top awards in the Middle School division of the Hydrogen Fuel Cell Model car competition held at NESEA's Tour de Sol in Saratoga Springs, NY in May 2006.

Share your genius, too! Student innovators incorporating clean renewable energy into a project are invited to apply for exhibit space at the JSS Championship next June.

Contact
Susan Reyes,
sreyes@nesea.org
no later than
May 20, 2007
if interested.



Model Fuel Cell Car Exhibit

J. Green

Solar Panels: The Basics

- Continued from front page -

You'll note that there are no moving parts; the special materials enable electricity to be produced directly from the energy of the sun! For each cell, crystals of almost pure silicon are grown with very small amounts of other elements deliberately included to change their characteristics. There are two layers of silicon, the top one incorporating a little phosphorous throughout its crystalline structure, and the bottom layer similarly "doped" with a little boron.

The chemistry and physics that occurs at the junction of these two layers of silicon enables electrons, energized by photons from the sun, to cross the junction and travel in a single direction, flowing from the bottom of the cell to the top. In sunlight, each photovoltaic cell can produce about 0.5 volts of electricity between the top and bottom of the cell.

On top of each cell, you will see thin metal lines called fingers. There is also a metal layer that covers the entire bottom of each cell. These top and bottom metal contacts enable the PV cells to be linked together. To make a JSS panel, six cells are connected in series—the bottom of one cell is connected to the top of the next—forming a chain. When wired in series, the

voltage of all cells is added to make a 3-volt panel.

You will notice that two lead wires are connected to the panel. If you look real close, you can see that one (black, if colored) is attached to the conductive fingers on the cell at one end of the chain—where electrons exit—and the other (red, if colored) to the bottom of the cell at the other end of the chain—where electrons

flowing in the circuit re-enter. When you connect the wires to the electric motor, the flowing electrons are put to work—powering the JSS car!

Look to future editions of Northeast Regional News for a continuing series of articles: PV Volts and Amps; The PV p-n Junction; Solar Panel Manufacture, and PV Applications.

How photovoltaic cells work can be understood on different levels, given increased knowledge of electricity, quantum mechanics, and other areas of physics, chemistry, and materials science. You can explore a variety of sources on the topic together with your students. Here are a couple to look at:

Solar Energy International's "Kid's Info" site: www.solarenergy.org/resources/olderkids.html, or the U.S. Department of Energy at www.eren.doe.gov/pv/howworks.htm.



Yellow Stinger
C. Turnbull



Silver S.P.E.A.R.
C. Turnbull

Winners (Cont. from front page)

Speed

Cars are hooked onto heavyweight fishing line and zip, crawl or sometimes flip or stall on the 20-meter track—exciting to watch, and sometimes tense. The top team survived the double elimination format race right till the last of 33 races.

1st Place: "Sun Streak," designed and built by Marcelina Pyzik, Kasia Filipkowska, and Donovan Carrasquillo from Slade Middle School, New Britain, CT

2nd Place: "A Rod," designed and built by Ely Banos, Olivia Rapisarda, Luz Rodrigues, and Joe Dipinto of Slade Middle School in New Britain, CT.

3rd Place: "Jungle Jim," designed and built by Brian Davies, Bart Halbig, and Brett Olsen of Greenhills School, Greendell, NJ.

Craftsmanship

Care and precision in workmanship can make or break a car.

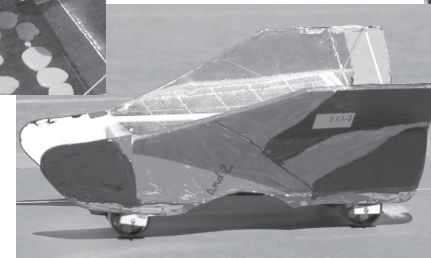
1st Place: "Eviscerator," designed and built by Jesse Oberg and Ryan



Shish-Ka-Bob
J. Green



Solar Oven
C. Turnbull



AND2
C. Turnbull

Perst of the Northwest Christian School in Newton, NJ.

2nd Place: "Yankee Clipper," designed and built by Mike Faber and Bryan Stankovich of Northwestern Christian School in Newton, NJ.

3rd Place: "Yellow Stinger," designed and built by Halay San Giacomo, Eric Wollers, Faith Levzarder, and Alisha Brinkerhoff of Northwest Christian School in Newton, NJ.

Innovation

Clever and unique takes top awards.

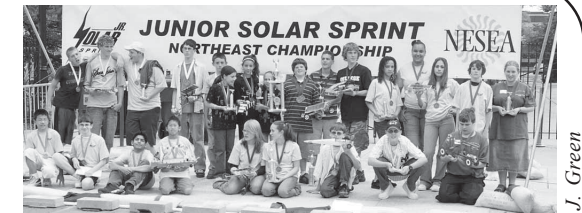
1st Place: "Full Throttle," designed and built by Eric Martin of the Northwest Christian School from Newton, NJ.

2nd Place: "Shish-Ka-Bob," designed and built by Albert Lowe and Dezirae Lowe of ALAD Home Learning in Winterport, ME

3rd Place: "T and J," designed and built by Josh Rivard and Tyler Grieve of the Lancaster School, in Lancaster, NH

A NEW Payload Compartment Rule

was instituted in 2006 and enforced by our fastidious inspectors. Though the repair table was busy, no one was turned away. A 3-D compartment must be constructed for the empty 12 ounce soda can. Download 2007 Rules at www.nesea.org/education/jss



Winners 2006
J. Green

Technical Merit

The combined score of three separate judges makes the grade. Cars are scrutinized for the quality of three performance systems: wheel and guidance arrangement; power transmission, and utilization of a standard solar panel.

1st Place: "Full Throttle," designed and built by Eric Martin of the Northwest Christian School from Newton, NJ.

2nd Place: "Yellow Stinger," designed and built by Halay San Giacomo, Eric Wollers, Faith Levzarder, and Alisha Brinkerhoff of the Northwest Christian School in Newton, NJ.

3rd Place: "T and J," designed and built by Josh Rivard and Tyler Grieve of the Lancaster School, in Lancaster, NH.

Honorable Mention: "Yankee Clipper," designed and built by Mike Faber and Bryan Stankovich of Northwestern Christian School in Newton, NJ.

Resources:

TO GET YOU STARTED

www.nesea.org/education - Look for a JSS workshop near you.

www.nrel.gov/education/jss_hfc.html - For a Power Point on how to build your first car.

http://eagle.csd49.org/middle/jss/Course_Instr.htm - To download 14 JSS lessons.

MOTOR AND PANELS

www.pitsco.com - Go to Alternative Energy, then Solar, then Kits 800-358-4983

www.solarworld.com - Junior Solar Sprint Kit 719-635-5125

MORE RESOURCES

www1.eere.energy.gov/education/competitions.html - For lists of relevant student competitions.

www.energyteachers.org - More great links.

www.howstuffworks.com - Information on gears, solar panels, and bearings.

NEW ! The Clean Green Power Learning Experience

Learn about a great way to kick-off your JSS with an introduction to clean, renewable energy. Interview a clean energy hero or heroine. Visit a clean energy site with your kids. Do a project. Download the Clean Green Power Teaching Guide for FREE. Get started at www.nesea.org/ycleanenergy Get ideas for types of places to visit from NESEA's Green Building Open House listing: www.nesea.org/buildings/openhouse/

NEW ! Kids' Choice Award

For the first time at the Championship, kids got a chance to vote for their favorite car – any except their own! There were many favorites, but the one with the most votes was "DA Boat MMMX" by Kevin Wu, Arvin Alaigh, Anthony Chen, and Steven Flynn of Warren Middle School in Warren, NJ.



Kids' Choice
Photo by D. Barclay