

**ElectrathonOfTampaBay.Org Inc
Junior Solar Sprint Division**



Oak Grove Elementary May 21st 2011, Green STEM Electrathon Festival, Fla State Fairgrounds

Greg Verrill

Director

Greg @JSS.ElectrathonOfTampaBay.Org

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About ETO:

- Florida Non Profit Incorporated in August 2008 to promote Electrathon Racing and Junior Solar Sprint Racing in the (8) Counties of TBART Service Area
- Citrus, Hernando, Hillsborough, Manatee, Pasco, Pinellas, and Sarasota Counties
 - plus Polk County
 - Umbrella Organization of
 - 9 Electrathon Teams
 - 21 Junior Solar Sprint Teams
- [First Event February 14 , 2009 USF Engineering Expo](#)
 - JSS Team Registration at <http://JSS.ElectrathonOfTampaBay.org>

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Today's Topics

- **Junior Solar Sprint Program and Goals**
- **Student Benefits**
- **How We Race and our 2011-2012 Race Schedule**
- **Setting Up a JSS Team**
- **Team Member Roles and Team Tasks**
- **Design Constraints and Fabrication Considerations**
- **Testing and Race Optimization**
- **STEM Aspects of the Photo Voltaic Panel and Electric Motors**
- **Using a Digital Multimeter to Understand the relationship of PV Orientation to Volts and Amps Output**

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JSS Program

The Junior Solar Sprint (JSS) Car Competition is a hands-on educational program for **4th, 5th**, 6th, 7th, and 8th grade students. Student teams apply math, science, and engineering creativity to construct and race model solar-powered car.

The Goals :

- Generate enthusiasm for math, science and engineering (STEM) by fostering teamwork in a competitive technological arena;
- Improve students' understanding of scientific concepts and renewable energy technologies;
- Encourage young people to consider technical careers at an early age.
- Provide a Pathway to [Electrathon](#) Racing

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Student Benefits:

- Students learn to work together in teams learning engineering problem solving skills and project management skills .
- **Mini Entrepreneurial STEM Endeavor.**

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2011-2012 Race Schedule

- **8 Races in the Bay Area plus Season Finale
at Florida Solar Energy Center**
- **Must Participate in 5 of 8 Races to be
eligible for Season's Prizes**



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Suggested Team Roles

- **Faculty Advisor leads classroom activities related to understanding STEM Aspects of JSS.**

- **4 Member Team suggested Roles:**

CEO - Chief Engineering Officer

CFO- Chief Financial Officer

PTO-Procurement and Travel Officer

CSO- Construction Safety Officer

Key Ingredients:

Team Work, Communication and Organization

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JSS Team Tasks

- Design Research and Design Documents
(write-ups and sketches)
- Design Review and Selection
- Car Funding (Team Members need to raise \$100)
- Work Schedule with Task Milestones
- Fabrication and Assembly
- Team Logistics
- Testing

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JSS Design Constraints:

- Mandatory Components
- Vehicle Specifications
 - Steering

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Fabrication Considerations

- **Drilling and Cutting (always Clamp)**
- **Measurements (precise as possible)**
 - **Painting**
 - **Soldering**
- **Gluing, Screws, Nails (holding power ,setting times)**

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Design Considerations

- **Material Weight**
- **Materials Strength**
- **Friction Reduction (aerodynamics,rolling,sliding)**
- **Adjustable Panel and setting determination**
- **Wheels Size, Type and Number**
- **Motor Mounting and Axle placements**
- **Sunlight Augmentation**
- **Gears**

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Testing and Optimizing Performance under Race Conditions

- Track Setup
- Timing (stop watch)*
- Panel Orientation
- Gearing (Wind Direction and track orientation and surface)
- Lubrication

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