



## Rules and Regulations for 2011

### Northeast Regional Championship Junior Solar Sprint Competition

#### Spirit of the Sprint

Junior Solar Sprint offers students an opportunity to learn by means of a friendly competition against their peers where students take responsibility for the design, construction, and performance of a model solar electric vehicle.

The role of the adult is to nurture the spirit of excitement and the joy of discovery and learning that awaits students. Adults should let students assume the responsibility for design decisions, construction, and maintenance of their vehicle, performance at a race, and winning or losing.

#### Materials and vehicle specifications:

1. The Ray Catcher solar panel sold by Pitsco and the JSS Solar Panel sold by Solar Made may be used. Panels cannot be shaved, drilled or delaminated. The motors supplied with these panels (Mabuchi #280-2865 and Mabuchi #260-18130) may be used. Motors may not be re-wound or disassembled. Solar panels used in 1995-2010 and motors used in 1996-2010 may be re-used this year. Any other panels and motors may not be used in the competition. All parts mentioned here must be used without modification, though reflectors, supports, Velcro and power leads may be added to these components as needed. One solar panel and one motor allowed per car. The remainder of the vehicle can be made from any other materials.
2. The vehicle, including any attachments, may not be larger than 30 cm. (12 in.) wide by 60 cm. (24 in.) long by 30 cm. (12 in.) high.
3. The vehicle, including the panel support system, must be structurally sound without the solar panel or payload. The payload may not support the solar panel or function as any other component of the vehicle's structure. The panel must be able to be easily disconnected from the motor and removed from the vehicle.
4. Two 2 cm. x 2-cm. surfaces must be available for the car number, which should be easily visible from either side when the vehicle is in the ready to race position.
5. The payload: The vehicle must carry a payload of one empty 12 oz. conventional aluminum soda or seltzer can, to be supplied by the Northeast Sustainable Energy Association during vehicle inspection. The can must not be altered in any way, and application of adhesives or other materials is not allowed. It must be returned to the judges following the race if requested. Think of the payload as a person or cargo. It must remain with the vehicle at all times, and must be easily and rapidly removed or reinserted.
6. The compartment: The vehicle must be designed with a compartment that secures the payload even in the case of a roll-over "accident." The compartment, including all components required to secure the payload, must retain its shape with or without the payload.
7. The vehicle with its solar panel, must be powered solely by the sun's energy. No energy storage devices (e.g. flywheel, battery, etc.) may be used in conjunction with the solar panel.
8. If the sun's energy is judged insufficient, a battery pack and elastic bands will be furnished for each race to be attached on top of the vehicle's solar panel. Motor power leads should be readily accessible for easy attachment.
9. The vehicle will be attached to a guide wire in the center of the lane that runs the length of the track, with no free end. The attachment device must not be potentially damaging to the line. The wire will be a small diameter line such as a 60# fishing line. The wire will be no higher than 1.5 cm above the track surface.
10. The vehicle must be of students' own design and manufacture from current school year. No car or major component thereof from a previous year shall be allowed to compete. Solar panels, motors and other individual parts may be reused in a new design. Each team from a given school must have a unique car design. An

engineer's journal or work record portfolio demonstrating progress and originality is optional. Team members present their vehicle to judges without adult assistance and make their own car repairs and adjustments. Adult work on a vehicle at the event may subject it to disqualification.

### **The Race Track:**

11. The race lane is 60 cm. wide and 20 meters long. The track is a hard flat surface such as an asphalt tennis court or running track. The track may be oriented in any direction (e.g. North-South, East-West, etc.)

### **Conduct of the Race:**

12. The races will be run in a double elimination format. Thus you will have a minimum of two opportunities to race before you are eliminated from competition.

13. Only two members of the race team will be allowed on the track during the race: one at the starting line and one at the finish line. A non-team member may act as a catcher if necessary. Student non-team members will be chosen over adult non-team members if possible.

14. Each vehicle must have an assigned student team captain. No student shall be assigned team captain to more than one vehicle. No team shall consist of more than four students.

15. The vehicle will start from behind the starting line with all wheels touching the track. The solar panel will be completely shaded by a supplied opaque material cover held *above* the panel by a member of the team. At this time, the vehicle should not be touched by the cover or by any member of the team. When the line judge signals the start of the race, the team member will remove the cover so the panel will be exposed to the sunlight.

16. There will be a 5-minute time limit to prepare your vehicle to race in your lane. This should be sufficient time to attach the vehicle to the guide wire. The race will start at the end of this time limit regardless of whether your vehicle is ready to compete.

17. Once the race heat has begun, team members may only touch their vehicle if it has crossed the finish line, and may not be on the race lanes until the judges have determined the heat is completed. Pushing the vehicle after the race has begun may result in disqualification or a re-run of the race.

18. Any car that leaves its lane will be disqualified from the heat in question, but may compete in its second trial if it has not done so already. If the car leaving its lane interferes with any other cars, those cars will be allowed an additional opportunity to run.

19. Loss of payload during a race will result in disqualification from the heat in question. However, the offending vehicle may compete in its second trial if it has not done so already. If the loss of payload interferes with any other cars, those cars will be allowed an additional opportunity to run.

20. The winner of a heat will be the first vehicle to cross the finish line or the vehicle to travel the furthest down the track. Generally speaking, the top two finishers will advance to the next heat. In the event of a tie, the judges may determine multiple winners, and admit additional cars to advance to the next round of competition.

21. Awards will be given for speed, design (i.e. technical merit, craftsmanship, and innovation, etc.), and other categories as seen fit.

### **Advancement from Area to Regional Competition:**

22. Participation at an area event, grade 8 or under, and receipt of a team invitation from an area coordinator is required for advancement to the Northeast Regional Championship.

23. Each area will be provided a given number of invitations determined by the Northeast Sustainable Energy Association. It is up to area event coordinators to determine additional eligibility requirements for filling that quota, and they determine which teams will be invited to advance to the Northeast Regional Championship.

24. Area events may determine their own variations of rules for Junior Solar Sprint and these may differ from Northeast Championship rules. Teams that advance to the Championship must ensure that their vehicles and conduct meet the rules and Spirit of the Sprint herein.