

# Junior Solar Sprints Race Rules

[Updated 2020]

## **Spirit of the Sprint**

*Junior Solar Sprints offers students an opportunity to design, construct, and race a model solar powered 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:**

### **Provided Materials:**

- The Ray Catcher Solar Panel sold by PITSCO, and provided by goHunterdon, is the only panel that may be used in the races. Panels cannot be physically altered in any way. All panels should be returned to goHunterdon staff following the races.
- The motors supplied with the panels are the ONLY motors that can be used in the competition.
- All parts mentioned above must be used without modification to their functionality, though reflectors, supports, Velcro, and power leads may be added to the component as needed. One solar panel and one motor are allowed per car. The remainder of the materials used for the car can be made of anything.

### **Vehicle Size:**

- The vehicle, including any attachments, may not be larger than 12 in. wide by 24 in. long and 12 in tall.

### **Passenger:**

- The vehicle, including the panel support system must be structurally sound without the panel or the passenger on/in the vehicle. The passenger may not support the solar panel or function as any other component of the vehicle's structure. Removal of the passenger from the car should not alter any part of the structure of the vehicle as the vehicle should retain its original shape. The panel must be able to be easily disconnected and removed from your vehicle.

- The compartment for the passenger, including all components associated with such, must retain their shape with or without the passenger.
- The vehicle must carry a passenger [one empty 12 oz. conventional aluminum soda can. Juice or other types of cans are not permitted]. The can must not be structurally altered in any way, and application of adhesives to keep the passenger in the vehicle is not allowed. The can must be able to be removed for judging verification should it be requested. Do not do anything with the passenger that you would not do with a person in your car [i.e., holding up the roof, not secured, etc.] The passenger must remain with the vehicle at all times during the race, and must be easily and rapidly removed or reinserted.

### **Design/Construction:**

- 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.
- If the sun's energy is judged insufficient we will switch to a battery panel that utilizes a single AA battery. \*NOTE: batteries are not provided.
- The vehicle will be attached to a guide wire in the center of the specified lane that runs the length of the track. There is no free end of the line and it cannot be unattached. The attachment device cannot be potentially damaging to the line. The wire will be a small diameter 60# fishing line. The wire will be no higher than 1.5 cm above the track surface.
- The vehicle must be of the students' own design and built during the 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.

### **Judging:**

- A student documentation portfolio demonstrating progress and originality is optional, but will be a judged category. Without completion of this category it is not possible for a team to win the overall highest scoring team award.
- Team members will present their vehicle without adult assistance to the judges to be scored in Engineering, Craftsmanship, and Upcycled Materials. Students will make their own adjustments and car repairs [with

limited assistance provided at the Fix it Table]. Adult work on a vehicle at the event may subject it to disqualification.

### **The Race Track:**

- The race lane is 24-36 in wide and runs 66 feet in length. The track is a hard flat surface and the track can be oriented in any direction (e.g., North-South, East-West)

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

- The races are run in a double elimination format. Therefore you will have a minimum of two opportunities to race before you are eliminated from the competition.
- Only two members of the race team will be allowed on the track during the race: one at the start line and one at the finish line. A non-team member may act as the catcher if necessary. Adults will not be allowed at the start or finish lines, line judges can help any students needing assistance.
- No team shall consist of more than 4 students and have no less than 2 students.
- The vehicle will start behind the starting line with all wheels touching the track. [Drop starts will lead to a loss for the vehicle in question] The solar panel will be completely shaded by a supplied cover that is held above the panel by a team member. Once initial setup and attachment is complete the vehicle should not be touched by the cover or by any member of the team. When the judge signals the start of the race, the team member will remove the cover so the panel will be exposed to the sunlight. Once the race has been started you cannot touch your vehicle, guide wire, or anything else associated with the vehicle until the race is finalized. Doing so will count as a loss in this race.
- There will be a **maximum** of 3-minutes to prepare your vehicle to race in your lane. This should be sufficient time to prepare and attach your vehicle to the guide wire. The race will start at the end of this time regardless of whether you are prepared to compete.
- Once the race has begun, team members may only touch their vehicle if it has crossed the finish line, and may not retrieve their vehicle on the race lines until the judges have determined that the heat is finished. Pushing or touching the vehicle after the race has started will result in a loss for that race.

- Any car that leaves its lane will receive a loss for the heat. If the car leaving its lane interferes with any other cars, those cars that have been disrupted will be allowed the opportunity to rerun their race.
- Loss of a passenger during the race will result in a loss for the heat. If the passenger is lost from this vehicle interferes with any other vehicle, those vehicles that have been disrupted will be allowed the opportunity to rerun their race.
- The winners of a heat is determined by the first 3 cars to cross the finish line OR the three cars that traveled the farthest down the track. Races with 4 or 5 cars will be restricted to the top 2 cars, and a 3 car race will be restricted to 1 car.
- Awards will be given for Speed, Craftsmanship, Engineering, Documentation Portfolio, and Upcycled Materials. An overall winner will be given as well with the scores from each category being combined for the highest score. [Points for speed will be given out as 10 points for first place, 9 points for second, 8 points for third, and so on until reaching 0.