

## SOLAR VEHICLE (DRAFT 01/17)

1. **DESCRIPTION:** Teams must design, build, and test one vehicle that uses solar energy as its sole means of propulsion to travel a required distance as quickly as possible.  
**A TEAM OF UP TO:** 2      **EYE PROTECTION:** None      **IMPOUND:** Yes      **TIME:** 10 minutes
2. **CONSTRUCTION PARAMETERS:**
  - a. The solar powered vehicle (SPV) must be designed to travel a distance between 5.0 - 10.0 meters. The exact distance will be chosen by the Event Supervisor (ES).
  - b. The sun or other light source determined by the ES is the only energy that can be used to power the vehicle. No energy storage devices are permitted. The vehicle must **not** be remotely controlled or tethered.
  - c. Components and kits may be purchased or made by the team members. Electronic components are allowed.
  - d. Entire vehicle including solar panel(s) (in the ready-to-run configuration) must fit in a 30.0 cm x 60.0 cm space of any height. Panels may be adjustable for optimal angle to the sun.
  - e. Competitors must start the vehicle by pushing a button or switch down (vertically) towards the floor using an unsharpened number 2 pencil.
  - f. The only vehicle parts allowed to contact the floor during the run are wheels/treads. Piece(s) falling from the vehicle is a construction violation.
3. **THE TRACK:**
  - a. At the ES's discretion, more than 1 track may be used. All tracks must be on a smooth, level and hard surface.
  - b. The ES must clearly mark the Start Line, Finish Line and a one meter line beyond the finish line. There is no lane width requirement. It is recommended that three timers be used with the middle time being official.
4. **TECHNICAL DOCUMENTATION:** Written Practice Log: Record time and distance (and any other observations made by students) for a minimum of 10 runs.
5. **THE COMPETITION:**
  - a. Teams have 10 minutes to set up their vehicle and complete 2 runs. Vehicles in the ready-to-run configuration that start a run before the end of the time limit will be allowed to complete that run.
  - b. In the ready-to-run configuration, the vehicle must be behind the start line without being touched.
  - c. Teams may adjust their vehicle before each run (e.g., change its speed, panel angle, directional control,) within their 10 minutes providing the vehicle continues to meet specifications.
  - d. Teams must not roll the vehicle on the floor of the event venue.
  - e. Substances applied to the wheels must not damage the floor or leave residue on the track and/or event area and be approved by the ES prior to use. During their 10-minute time, competitors may clean the track but it must remain dry at all times.
  - f. If the vehicle does not move upon actuation, it does not count as a run and the team may request to set up for another run within the 10-minute limit. Students may not push the vehicle when activating the switch. If a push start occurs the ES will stop the run and will allow teams to restart the vehicle until time runs out.
  - g. Run time starts when ES says "GO" and ends when the leading edge of the vehicle crosses the finish line. The Run Time must be recorded in seconds to the precision of the timing device used.
  - h. One student starts the car at the starting line and their partner stops the car one meter after the finish line.
  - i. A Failed Run occurs if a second run does not occur in the 10 minutes, or if the vehicle stops before crossing the finish line.
  - j. Students must be able to answer questions regarding the design, construction, and operation of the vehicle per the Building Policy and Technical Documentation. See [www.soinc.org](http://www.soinc.org)
6. **SCORING:**
  - a. Fastest time (of the two runs) wins. If two teams are tied the fastest time of the teams' other run breaks the tie.
  - b. The third tie breaker is the vehicle with the smallest surface area of solar panels.
  - c. Teams with incomplete practice logs must have 10% of their running time added to each run.
  - d. Teams without practice logs must have 30% of their running time added to each run.
  - e. Vehicles that violate construction parameters will be ranked below all other vehicles meeting construction parameters.
  - f. Teams not completing any runs within the 10 mins. or have two Failed Runs receive participation points.
  - g. If no vehicles cross the designated finish line, the ES will measure the perpendicular distance traveled from the start line to the front of the vehicle to determine place.
  - h. Teams filing an appeal must leave all impounded material with the Supervisor.

**RECOMMENDED RESOURCES:** Malaysia Indoor Solar Car Competition. Solar Car Challenge — STELR: [www.stelr.org.au/solar-car-challenge/](http://www.stelr.org.au/solar-car-challenge/) NREL Model Car Competitions: [www.nrel.gov/education/jss\\_hfc.html](http://www.nrel.gov/education/jss_hfc.html)