

Junior Solar Sprint Competition Regulations



OVERVIEW

Junior Solar Sprint (JSS), an Army Educational Outreach Program (AEOP), provides a hands-on opportunity for students to apply science, technology, engineering, and mathematics (STEM) concepts, creativity, teamwork, and problem-solving skills as they design, construct, and race a solar-powered car.

A Junior Solar Sprint team may consist of two to four students.

JSS REQUIREMENTS

PORTFOLIO DOCUMENTATION

A report cover must include the following single-sided, 8½" x 11" pages, in this order. Sections of the portfolio may be organized by dividers.

1. Title page with the event title, your name and any other necessary information deemed required by the host site.
2. Table of contents
3. **Project Log** that indicates preparation for the competition, as noted by date, task, time involved, obstacles/issues encountered, modifications made, team member responsible, and any comments.
4. Design drawings must show the model with a minimum of two views; the drawings must be developed using standard engineering practices and procedures (including measurements/dimensions); the drawings may be produced using traditional drafting methods or CAD; any handwritten documentation and/or rough sketches are acceptable and should be included.
5. Design details of the model, including model size, wheel size, gear ratio, specifications of the motor and solar collector used.
6. **Components list.**
7. Design process description, including pre-testing notes of various configurations of the model and revision notes about the model design throughout the process.

DISPLAY

1. A decorated shoebox must be used as a display stand during judging of the model car.
2. The portfolio must be placed with the model car.
3. The display may only include the model, shoebox, and portfolio.
4. The display must fit in an area 15" deep x 3' wide.

MODEL CAR

1. The model car, with the solar panel attached, should not exceed the following dimensions:
 - 60 cm (23½ inches) length
 - 30 cm (11¾ inches) width
 - 30 cm (11¾ inches) height (as measured from the surface the car is resting upon to the highest point of the car, with all its components attached)
2. Reflectors, supports and power leads can be added to the car as needed, but they must fit within the required dimensions.
3. Energy-enhancing devices, such as mirrors, must be firmly attached to the vehicle.
4. The vehicle can be innovative in design and materials.
5. The vehicle must be structurally sound without the solar panel attached.

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6. A student-designed attachment device, such as an eyelet or a purchased screw eye must be attached to the car to accommodate the easy attachment and removal of a guide wire for steering. A guide wire, such as fishing line, will be no more than 1.5 cm from the surface of the track. It will go through the attachment device (such as an eyelet) attached to the car and serve as a steering mechanism to keep the car in its lane. This must be done without disconnecting the guide wire. Both ends of the guide wire will be fixed to the track. This is the only allowable method of steering the car.

SOLAR PANELS

1. Solar panels cannot be shaved, drilled, or delaminated.
2. Only the motor supplied in the kit can be used.
3. Motors cannot be re-wound or disassembled.
4. One (1) solar panel (limited to a maximum output of 3.2 W), and one (1) motor (limited to a maximum 3.0 VDC) are allowed per car.
5. All models meeting safety and performance criteria will be given up to two chances to race.

RACING

1. All models meeting safety and performance criteria after static judging has occurred will be given up to two chances to race.
2. If it is determined that the vehicles will be raced using solar power, the sun's light is the only energy source that can be used to power the vehicle. Batteries, capacitors, flywheels, or any other energy storage devices are prohibited.
3. If the sun's energy is judged insufficient, a battery pack and two AA 1.5 V batteries will be furnished for each team. Only the provided batteries are permitted to power the model.
4. The model's motor power leads must be readily accessible for easy attachment to a battery pack.
5. If a car is deemed unsafe, it will not be permitted to race.

6. At race time, each car will be placed with the most forward part of the vehicle set even with the starting line and all of its wheels in contact with the ground.

7. Each car will be covered completely by an opaque sheet covering that does not touch the solar panel. The opaque sheet will be removed at the start of the race, allowing the vehicle to collect solar power and start driving.

NOTES

1. Junior Solar Sprint (JSS) is an Army Educational Outreach Program (AEOP) competition. Information about AEOP opportunities can be found at www.usaeop.com.
2. All students, teachers and volunteers participating in Junior Solar Sprint are asked to register thru the online Army Education Online Program (AEOP) registration tool. The AEOP requires that TSA collect information on students participating in JSS to provide registration and evaluation data. Register online via the free AEOP online registration tool, www.cvent.com/d/jgqb13/4W.
3. An array of support materials, such as correlations to STEM standards, a glossary of terms, course outlines, and lesson plans can be found at tsaweb.org/competitions-programs/jss-chicago-public-schools

STEM INTEGRATION

TSA Jumpstart competitions are correlated to the National Science Education Standards, the Technology Standards, and the National Council of Teachers of Mathematics Principles and Standards for School Mathematics.

CAREERS RELATED TO THIS EVENT

This competition connects to one or more of the careers below:

- Energy efficiency technician
- Mechanical engineer
- Solar engineer
- Solar panel installer
- Solar sales consultant