



## SISP Secondary Solar Car Challenge Pursuit Solar Car Rules and Regulations

### Introduction

This solar car race is for primary students who want to have fun and learn the skills of engineering and photovoltaics. While the cars are simple in design, they need to be accurate and fast plus you might find it more of a challenge than you think.

### Spirit of the Competition

We ask students to enter the “Spirit of the Competition”. We hope students will put new skills they learn along the way to be involved in fair and fun racing. Sharing your knowledge will benefit all students in your class.

### The Car

In order to keep the race in line with the spirit of the competition there are some standards and some suggestions.

### Standards

The car will be powered by one 2 volt 700mA solar panel.

The car can have one F13s motor

The car will be constructed wholly by your team

Will be no wider than 260mm

### Must Have

An on off switch clearly indicated

Minimum of 16mm clearance under the car

A plate measuring 10cm x 2cm with your car name on it as part of the car design and clearly visible.

### Must Not have

Batteries or any electronic charge devices

High tech/ large dollar construction technique

### Construction

You can use any materials for the construction of the chassis, however you will need to use the axels and gears provided plus there are two choices of wheel size. The kit uses 5mm corflute for the chassis but you may wish to consider balsa wood, Perspex, and craft board. It is important to consider weight and size. The diameter of the wheel has an impact on torque and the 16mm clearance.

There are a number of races you will need to complete to get to the final, so your car has to last. It needs to be durable and well-engineered.

### Your Challenge

Your challenge apart from being first across the line is the accuracy of construction and strength. Alignment of wheels and motor are most important. The track is a straight line, so you need the car to track as straight as possible. Attention to detail and engineering are most important. Friction will be your biggest problem.

The gear ratio will have a large impact on the speed and acceleration of the car. You will need to do some testing for different ratios and wheel size. You may even need to consider the ability to change the gear ratio on the day due to the weather conditions.

It is a good idea to do some testing in different sunlight with different gear ratios.

### STEM Industry School Partnerships

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## Scrutineering

Prior to racing all cars need to be checked to establish if they comply with these rules. It is important that you read these rules carefully and take special note of the Standards, "Must have" and "Must not have" on page one.

Cars will be checked and then given a race number. This number will then be used to call cars to the start line for racing. You will need to be alert so when your number is called, we can get races started.

## Track

The oval track is made of corflute which is a smooth board. The guide is solid wood and approximately 14mm wide and 14mm high. The track is made up of 6 curve sections at each end. These 6 curves make a half circle and join the straight. Refer to the picture below. The straight section on each side is 2.4m long. The total length of the track is 19.3m

We have done our best to make the joins as clean as possible however there will be some bumps and bulges. You will need to consider this and design your guides to cope with this.

## The Track

There is a U channel stuck to a flat smooth board (Corflute). The length of the track is 20m. The car will need some form of guides to ensure it will run smoothly along the track, these guides will be on the outside of the U Channel as we use an internal joiner at each section of the track. We will race two cars at a time. The track is joined every 2.4m and this creates small bumps. Your guides will need to take this into account.



## The Start

Students will be asked to place the car on the track and align the guide system. You will need a cardboard "paddle" to cover the solar panel and then turn the switch to the ON position for your car.

When the cars are ready the starter will call, Ready, Set, GO. The student will lift the cardboard paddle to expose the solar panel to the sun and the race will start. The race is to the other end of the 20m track. One of your team members will be the catcher at the finish line.

## Points to consider.

1. The car needs enough power to start from a standing start.
2. The "paddle" needs to fully block the sun so the car will not move at the start line until the "paddle is removed.
3. You need to get the car on and off the track as easily as possible.

## The Race

The race will be a series of heats. The winners move forward to round two, the losers may have another series of heats and the winners of these heats move into round two as well. This can change due to the number of cars.

Round two will be a knockout series of heats. Winners move forward and losers cheer on the winners until we get an overall winner.

If there is not enough solar power on the day, we will provide batteries and the last four winners will be best of three races with changing over batteries.

Have fun and good luck.