

# Cars - 20m Track

## Rules and regulations -2020

### INTRO

This solar car race is aimed at first time players and students who just 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. This race will provide students with an insight to the main SunSprint race plus plenty of room for fun and learning. This can be an ideal STEM project.

### SPIRIT OF THE COMPETITION

We ask students to enter the “Spirit of the Competition”. We hope students will learn new skills and be prepared to be involved in fair and fun racing. This is the reason we are providing a kit. We are encouraging ideas but not dollars.

### 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 or two of the KM 2 volt 700mA panels.  
The car can have one or two KM – F18 motors  
The car will have a majority of student input in construction  
Will be no wider than 260mm

#### Must Have

An on off switch – 3 positions( Solar, Off, Battery)  
2xAA Battery holder installed without batteries.  
16mm clearance under the car  
**A plate measuring 10cm x 2cm with your school name on it incorporated into the design.**

#### Must Not have

Batteries installed or any electronic charge devices  
High tech/ large dollar construction technique.

### CONSTRUCTION

You can use any materials for the construction of the chassis, axels and wheels. The kit uses 5mm corflute for the chassis and 3mm rod for the axels with plastic wheels. Other materials you may wish to consider are balsa wood, Perspex, and craft board. It is important to consider weight and size. Wheels can be made from all types of material. 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.

# MiniSprint Solar Challenge

## Rules and regulations 2020 cont'd

### 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 mostly 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 aim of this race is learning and innovation however if you make the project too complicated there will more chance of failure due to breakdown. It is important to have a go at innovative ideas, but this is about speed over a set track.

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.

Using two solar panels will provide a good source of power. They can be wired in different ways to produce different outputs. It is a good idea to do some testing in different sunlight with different gear ratios.

### 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. You may need to fill out a registration form but this will be handed out on the day or emailed prior to the event.

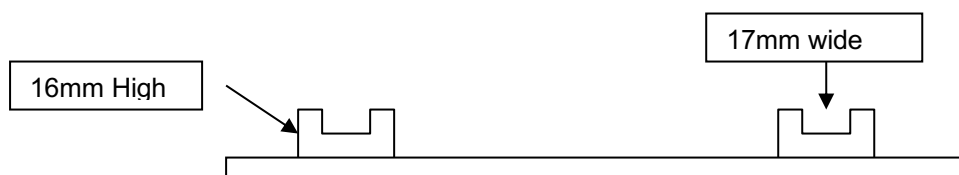
Cars will be checked and then given a race number. This number will then be used to call cars to the start line for racing. You will need to be alert so when your number is called we can get races started.

### THE TRACK

#### High School Track

In addition to the notes below for the straight 20m track which the Primary students will use, your track will have a chicane section at the end of the track. See the picture at the end of the rules. This will add 3.62m to the length of your 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. 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. Please call me if you are unsure.



# **MiniSprint Solar Challenge**

## **Rules and regulations 2020 cont'd**

### **THE START**

Students will be asked to place the car on the track and the guide mechanism on the car will need to be secure. Students will need a cardboard “paddle” to cover the solar panels and then turn the switch to the ON Solar 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 panels to the sun and the race will start. The race is to the other end of the 20m track. You may need a catcher at the finish line or else the car will run into the sand bags.

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 numbers.

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

The last two winners will get to do a demo on the SunSprint 100m track just for fun.

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.

We also have the boat race and this year and a car pursuit race. These races might interest you or something to try next year.

If you have any questions or are unsure of any aspect please contact me before the day so we do not have troubles on the day.

Thanks. Have fun and good luck.

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