

# Pursuit Track

## Pursuit Rules and regulations -2019

### **INTRO**

This solar car pursuit race is aimed at students who may have entered the 20m straight track event and would like to test their skills of engineering and photovoltaics a little further. While the cars may look 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.

### **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. The car you enter will need to be made by you. Teachers along with parents can offer suggestions but the work needs to be completed by the students.

### **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)  
Installed a 2 x AA battery pack without batteries  
Minimum of 15mm clearance under the car  
A plate measuring 10cm x 2cm with your school name on it as part of the car design and clearly visible.

#### **Must Not have**

Batteries or any electronic charge devices. The provision for batteries is only for days when the weather has very low solar strength.  
High tech/ large dollar construction technique.

### **CONSTRUCTION**

You can use any materials for the construction of the chassis, axels and wheels. Materials you may wish to consider are corflute, 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 15mm clearance. In this event the guides and steering are important as it is an oval track.

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.

Please have a read of the suggested text. It might help point you in the right direction.

# **MiniSprint Solar Challenge**

## **Pursuit Rules and regulations -2019 cont'd**

### **YOUR CHALLENGE**

In this event the track is a continuous loop in the shape of an oval. This means your car will be required to follow the half circle loop at each end of the track. The guidance will be most important. Please take a good look at the picture below.

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.

Using two solar panels will provide a good source of power but you will need to consider how to wire them up. It is a good idea to do some testing in different sunlight with different gear ratios. Remember to record your results.

### **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.

### **TRACK**

The oval track is made of corfulte 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

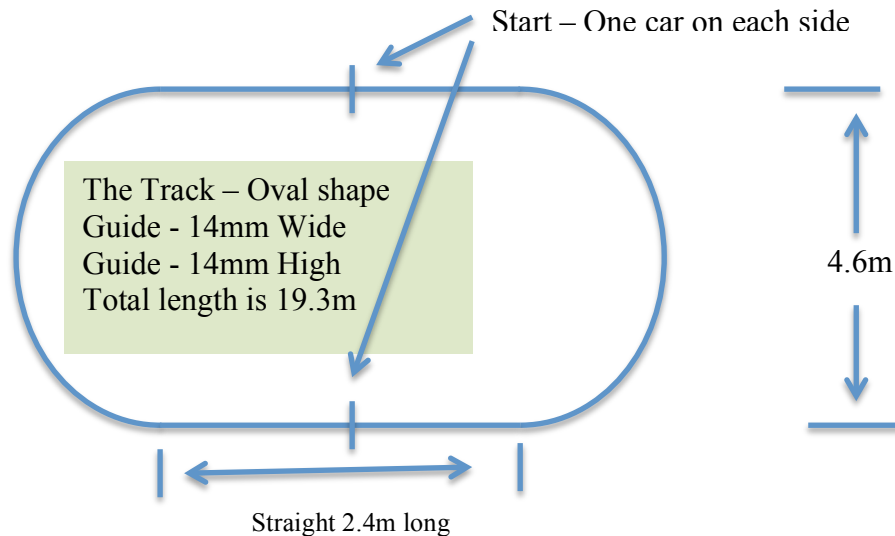
We have done our best to make the joins as clean as possible however there will be some bumps and bulges. You will need to consider this and design your guides to cope with this.

If you are unsure about any aspects of the track please contact me.

# MiniSprint Solar Challenge

## Pursuit Rules and regulations -2019 cont'd

### The Track



### **THE START**

Students will be asked to place the car on the track, one on either side. It is important to make sure your guides are correctly lined up with the track. Students will need a cardboard “paddle” to cover the solar panels and then turn the switch to the ON position with the panels covered.

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. As there is a car on each side of the track facing the same direction, the winner is the first car to catch the other. If both cars are the same speed and they look unlikely to catch each other, both will be declared the winner of that race.

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.
4. As this is an oval track the guide system will be important.

### **THE RACE**

The race is finished when one car catches the other or both are declared winners. In low light it might be the car which travels the greater distance.

The overall event will be a series of heats. The winners move forward to round two, the losers have another series of heats and the winners of these heats move into round two as well.

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.

# **MiniSprint Solar Challenge**

## **Pursuit Rules and regulations -2019 cont'd**

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 battery packs and the last four winners will be best of three races with changing over battery packs.

Have fun and good luck.

Please register for this event on the web site. [www.sunsprint.com.au](http://www.sunsprint.com.au)

### **Suggested Reading**

- Model Solar Car Racing by Peter Harley - Available from Kite Magic Coogee
- Model Solar Cars: Optimising Their Performance by Stan Woithe - Available – Give Kite Magic a call
- [http://ca.geocities.com/thibaultd2001@rogers.com/model\\_solar\\_car/Model\\_Solar\\_Car\\_for\\_Newbies.pdf](http://ca.geocities.com/thibaultd2001@rogers.com/model_solar_car/Model_Solar_Car_for_Newbies.pdf)

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.

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