



MINI

Guide



When + Where

WED 27TH NOVEMBER 9AM - 3PM | TIGHES HILL TAFE

The Hunter Valley Electric Vehicle Festival 2024 Mini EV Challenge is open to all Hunter Valley Primary and Secondary Schools and will be held Wednesday the 27th November 2024 from 9am - 3pm at Tighes Hill TAFE

The goal of the Mini EV Challenge is to stimulate careers, innovation, team work, skills and development and entrepreneurialism in Solar Vehicle design and construction. By assisting students to learn the skills of engineering and photovoltaics, this event will provide students with an insight into STEM learning.



Team CHECKLIST

- ☐ Completed team member declaration and media release form for each person on the team. If no photography permission provided a wristband will be given to the Team Leader and that student will be removed from photos.
- ☐ Solar powered constructed car and or boat that complies with race rules.
- ☐ The Design and Innovation Award and Team Spirit Award will be judged during races. If your car or boat has a special design component please point it out to our race caller so we can note your team number.
- ☐ Two team members nominated as the race starter and race catcher for each team.
- ☐ Complete student survey at the end of the day
- ☐ Complete teacher survey at the end of the day
- ☐ Ruler for measuring
- ☐ Cardboard paddle to cover solar panels on the car at race start time
- ☐ Six 'new' A A batteries as a wet weather provision
- ☐ Tools, spares and similar (at discretion of team)
- ☐ Sunscreen and hat
- ☐ Food and drinks or money for the canteen.

Mini EV CHALLENGE

On the Mini EV Challenge event day, your team will compete in a number of races on the straight and oval track, so your car must be durable and well-engineered. While designing your car. It is important to consider weight and size, the alignment of the wheels and motor, the tracks, friction and the gear ratio. If you are participating in the boat races you should also consider shape and form in order to develop a boat that will most effectively travel along the surface of the water. It is also important to do some testing prior to the event.

On the day, prior to racing, all cars and boats need to be checked (scrutineered) to established if they comply with the rules outlined in the general information booklet. This booklet also includes hints and tips on construction and design including recommended materials. Teams are encouraged to bring 6 'new' AA batteries in case of bad weather.

The event will be a series of heats where the winning teams 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 knockout series of heats. Winners move forward and losers cheer on the winners until we get an overall winner

AWARDS

The Design & innovation Prize will be awarded to the team that has best designed and implemented a component or device that is part of the solar powered vehicle. This may be either an electrical or mechanical component.

Teams entering the Team Spirit Prize must demonstrate positive interaction between innovators, supporters, and teachers. Feel free to dress up to support your team!

SOLAR SPRINT RACE (STRAIGHT TRACK)



Primary Division
First Prize to the value of \$150



Second Division
First Prize to the value of \$200

DESIGN, INNOVATION, AWARD/PRIZE



All Divisions
First Prize to the value of \$150

BOAT RACE (AQUA TRACK)



Primary Division
First Prize to the value of \$150



Second Division
First Prize to the value of \$200

SOLAR SPRINT RACE (OVAL TRACK)



Primary Division
First Prize to the value of \$150



Second Division
First Prize to the value of \$200

TEAM SPIRIT AWARD/ PRIZE



All Divisions
First Prize to the value of \$150

CO2 RACE (DRAGSTER TRACK)



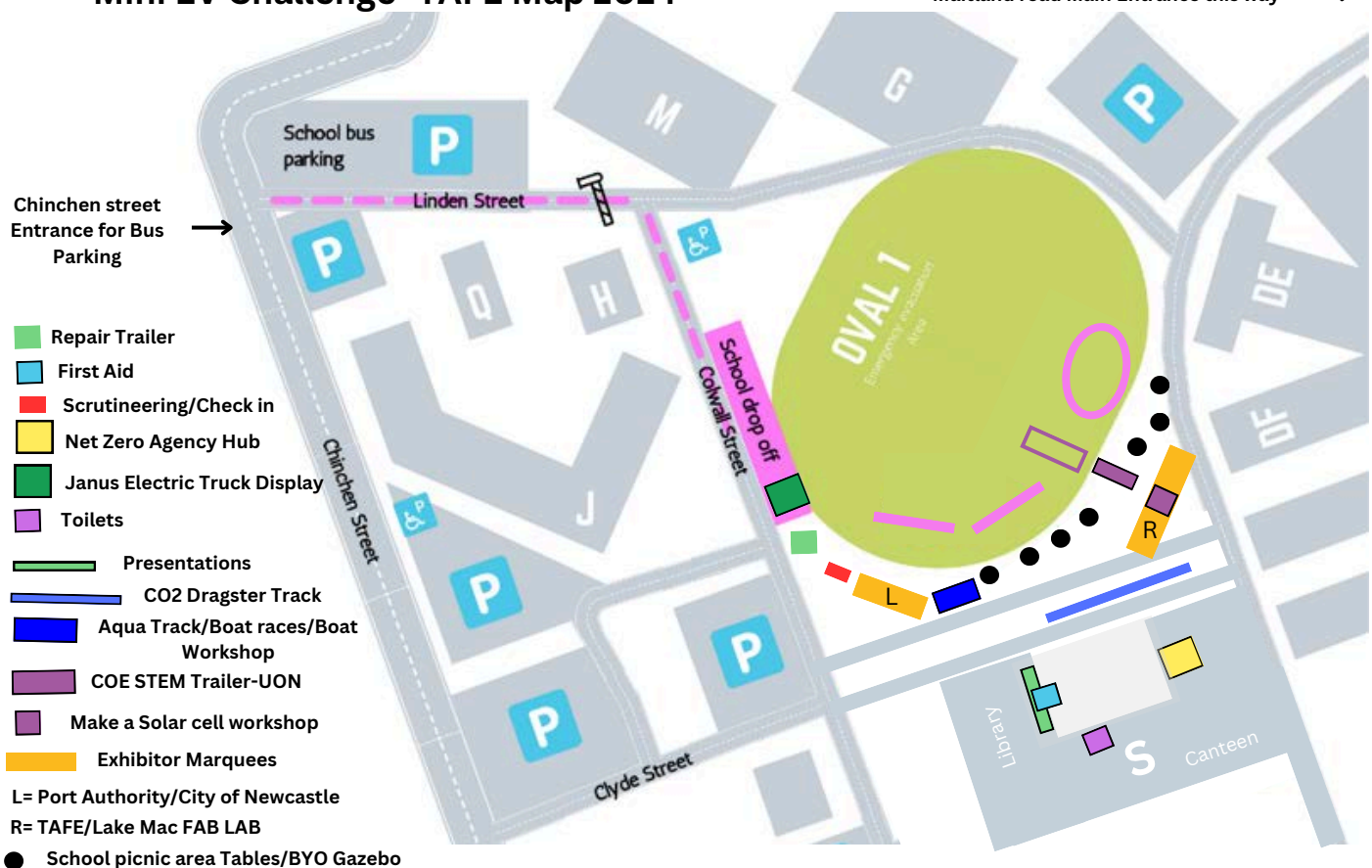
All Divisions
First Prize to the value of \$150

Event MAP

TIGHES HILL TAFE

Mini EV Challenge- TAFE Map 2024

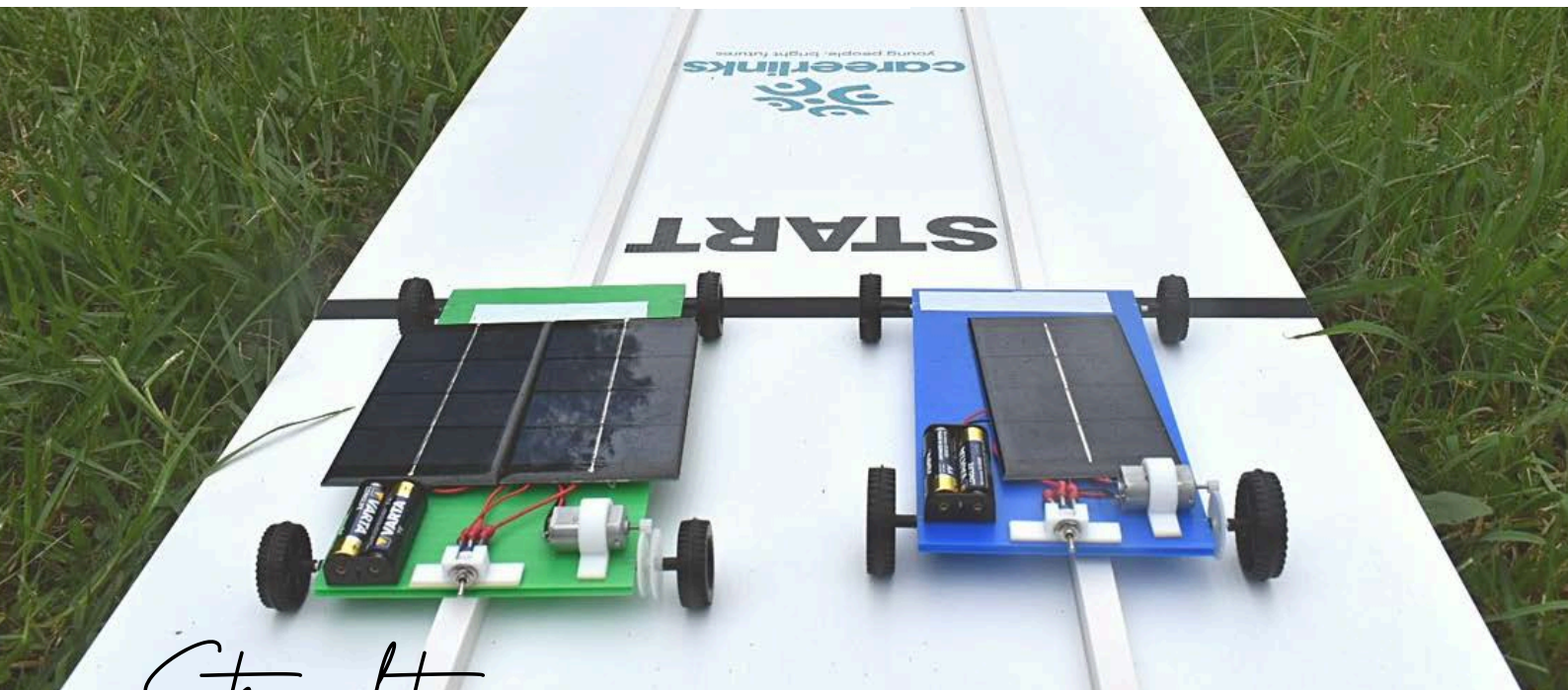
Maitland road Main Entrance this way →



Please note: Students travelling by bus will be dropped off on Colwall street and will be required to follow the direction of their teacher to the event. All day parking is available at the main car park at 266 Maitland road.

There will be a canteen available for you to purchase food and drinks. A presentation of awards will be held at the close of the event. Please see the event agenda for the race, lunch and presentation times. The following will have an exhibition stand on the day: Net Zero Economy Agency, Janus Electric, TAFE NSW, University of Newcastle STEM Trailer, Port Authority NSW, City of Newcastle, Lake Mac FAB LAB.

Exposure to the weather is inevitable, therefore, teams should ensure that they have adequate shelter available for their team and spectators as well as protection from sun and rain. Feel free to set up Gazebo's where indicated on map.



Straight TRACK

This race will be testing your car for **SPEED**. 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 TRACK

The straight track is 20m in length and is a straight line made out of conflute and a solid wood guide. The track is joined every 2.4m which creates small bumps in the track. The car should be constructed with guides to ensure that it will run smoothly along the track. During this race, it is important that you ensure that your car is able to track as straight as possible. We will race two cars at a time, one on each track.

THE RACE

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 you 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. Your challenge apart from being first across the line is the accuracy of construction and strength. It is important that you and your team read the guidelines to ensure you are complying with the rules as well as building a car that is durable and well - engineered.



Oval TRACK

This race will test your cars **ENDURANCE**, the fastest car with the most staying power will win. The car guidance will be most important, but the gear ratio will also 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.

THE TRACK

The oval track is made out of corflute and a solid wood guide and is a continuous loop in the shape of an oval. This means your car will be requested to follow the half circle loops at each end of the track. The track is 19.3m in length with curve sections on each end and 2.4m straight sections on each side which creates small bumps in the track. Guides and steering are the most important element of your solar car as it is an oval track. We will race 2 cars at a time, one on each side of the track as seen in the image.

THE RACE

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 one of endurance and will continue until one car catches the other. Your challenge is not to be fastest over a short distance but to ensure your car is built to last. First across the line will demonstrate a balance of strength and speed.



Aqua TRACK

This race will test your boats **BUOYANCY** and balance as well as speed, the winner will be determined by fastest across the finish line. The objective is to develop a boat that will most effectively travel along the water guided by a thin line suspended above the water to cover the distance of 10 meters in the shortest possible time.

THE TRACK

The Aqua track is 10m in length and is filled to a depth of 10cms. Your boat will be guided by a thin line suspended above the water at a height of 300mm. Your boat should be designed to skim across the surface, smoothly as well as swiftly on the guide line. Your boat must stay on the guideline, If it comes loose and collides with another boat you will be disqualified. We will race two boats at a time, and the first one to reach the other side wins.

THE RACE

You will have the opportunity to test your boat behind the start gate and then cover the panel to stop the motor. The starter will then ask you to uncover the solar panel and your boat should then push against the start gate.

The starter will call out "ready" "set" "GO" on the go the start gate will be dropped. First boat to touch the end of the pond or the boat which travels the longest distance along the guideline will win the race. Your boat will need to withstand the impact of crashing into the end of the pond.



CO₂ Dragster TRACK

This race is all about speed- blink and you'll miss it! Our first year running this category is all in the spirit of fun. There is no kit-you may use any material you like ie Balsa wood, plastic, recycled materials or even 3D printed. Your car must be fitted at the back with a recess to fit a CO₂ cannister (for propulsion) and two loops (one at the front and one at the back) to keep it on the guideline. Design your car to be both light and aerodynamic for best results.

THE TRACK

The Dragster track is a roll out track 20m in length and is designed to race CO₂ powered cars. These can be made of Balsa wood, 3D printed or even paper (we will have some of these available on the day for students to build). Your car will be guided by a thin line down the centre of each side of the track. We will race two cars at a time, and the first one to reach the other side wins.

THE RACE

There will be an electronic starting gate which will count down from 3, 2, 1. When the countdown finishes and the display lights up, hit your button. This will burst the CO₂ cannister and your car will take off down the track at top speed. Whoever has the quickest reflexes, coupled with the fastest car will win!

All activities in the race area are under the control of the race coordinator. Failure to comply with the directions of the race coordinator will result in exclusion from the race

Event AGENDA

All times are approximates and maybe subject to change depending on the time needed to complete all races. All teams must listen very carefully when called to their race. Some teams may need to split in two if still competing on Oval Track when boat racing commences. Primary students are welcome to join TAFE tours if finished on Sprint track and space allows.

PRIMARY

9:00AM - 10:00AM	CHECK IN AND CAR SCRUTINEERING
10:00AM - 11:40AM	STRAIGHT TRACK (sprint)
11:40AM - 12:20PM	LUNCH
12:25PM - 1:40PM	OVAL TRACK (pursuit)
12:20PM - 1:00PM	CO2 DRAGSTER RACE AND WORKSHOP-ALL LEVELS
1:00PM - 1:50PM	AQUA BOAT RACE-ALL LEVELS
2:00PM - 2:30PM	PRESENTATION

SECONDARY

9:00AM - 10:00AM	CHECK IN AND CAR SCRUTINEERING
10:00AM - 10:30AM	OVAL TRACK (pursuit)
10:30AM - 11:00AM	STRAIGHT TRACK (sprint)
11:00AM - 11:40AM	FACULTY TOUR (Aviation and Renewable departments)
11:40AM - 12:20PM	LUNCH
12:20PM - 1:00PM	CO2 DRAGSTER RACE AND WORKSHOP-ALL LEVELS
1:00PM - 1:50PM	AQUA BOAT RACE
2:00PM - 2:30PM	PRESENTATION

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