

Get Ready for the 2025/26 **STEM Racing Season** – **ENTRY CLASS**



Start with the basics...

Who will take part? Team of **3 to 6 pupils** aged **11 to 14 years old**.

What will a team need to do?

- **Design and manufacture a car** that meets STEM Racing's race regulations.
- Produce a **5-page Design & Engineering portfolio** which documents how you designed, made and tested your STEM Racing car.
- Prepare a **5-minute verbal presentation**, to deliver to the judges on race day, that takes them your STEM Racing story so far.
- Create a team **Pit Display** to celebrate your team (Not included on the scorecard)

How does it work?

You are working towards a **Regional Race Day** (*usually in Feb/March*) at which you will **race your car**, hand-in your **Design & Engineering Portfolio** and **deliver your verbal presentation** to a team of judges.

Your car will be checked against the regulations, known as **scrutineering** (up to 175 point available), it will **race up to 4 times** (up to 100 points available linked to track time and reaction times), the judges will score your **portfolio** and **verbal presentations** against a scoring rubric (up to 140 points available for each) and the scores, plus any feedback from the judges, will be used to decide to the **award winners** and the **Regional Champion!**

When?

How teams organise their preparation time and how much time they spend preparing is up to them. There are key deadlines to look out for and plan around. **Race Day** is the key date but if you want EESW to manufacture your car body you will need to make sure your final car design is ready by the **submission deadline** (Usually in December for a February/March Race Day) so the basic car body can be machined and returned to you in time for you to finish it and paint it in line with your team's identity.

Cost?

There is a **registration fee** of **£50***. If you would like EESW to machine your car for you, this will cost **£75***. You will also need to organise travel to the Regional Race Day and there will be a cost for this. If your team want to 3D print any parts of the car, make models or print materials for the Pit Display there might also be a cost for these. Think about the total cost of taking part, there might be school funds available to cover these costs, but many teams will be tasked with finding team sponsors – try contacting local companies, tell them what you want to do and ask if they would like to sponsor your team. Or your team could plan some fundraising events such as cake sales or sponsored activities. Anything you undertake to help cover the financial costs of taking part can be referenced in your presentation as part of telling the story of your team.

* Funding support available in some Local Authority areas

STEM Racing Pre-Season Training



To design your car, you will ultimately need the full list of regulations for the season – these are not always available when registrations open but if you want to get started before the full regulations are released you can.

Think about some of the following:

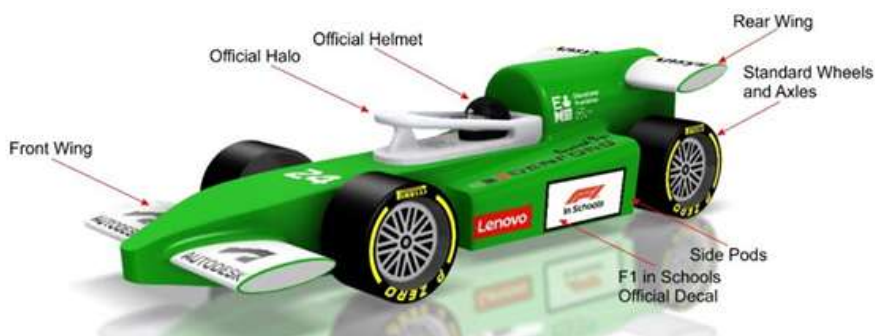
Preparing for a new season...

Activity Ideas

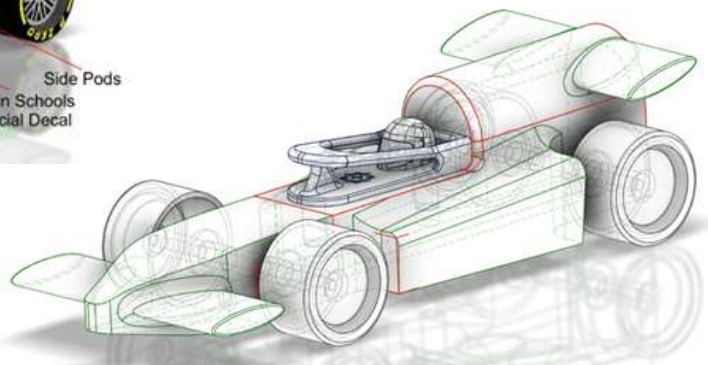
Sketch Car Design Ideas

Try sketching some design ideas by hand – a great chance to try out some 3D drawing and they'll look great in your Design & Engineering Portfolio.

You could use the front and rear-view No-Go Zone images provided or why not follow the *IsoSketch Design Tutorial* and draw the whole thing yourself. Don't worry too much about the regulations at this point but think about the style of the car and where you might want to include team logos and other imagery. Why not look at real life race cars and other things we associate with speed, as design inspiration. You can use these images in your Design & Engineering Portfolio or in your Pit Display



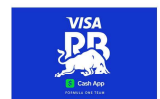
IsoSketch Design Tutorial



Create a Team Identity

Think about a team name, brand identity and a team ethos. Come up with ideas, share and discuss ideas as a team and develop these ideas to agree a team name, logo, design theme and maybe even a team tagline – anything that will help people recognise your team and what it represents.

- What makes good logo?
- What colours will you use?
- What does your logo/team name say about your team?
- Will your logo work well in different sizes?
- Will there be different versions of your logo?
- How about a team uniform?
- What font will you use in any digital work?

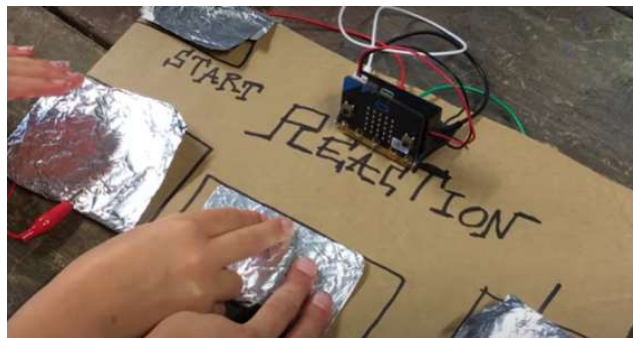


Fastest Reactions (Driver Selection)

On Race Day you will need to choose a driver – you can have a different driver for each race if you'd prefer but as reaction times are part of the scoring it can be a good strategy to identify the team member with the fastest reaction speed. To start a race a series of lights will come on in turn, after a few seconds delay they will turn off. When the lights go off the driver must press a trigger to send their car down the track but if they press too soon, the car won't launch.



There are lots of reaction time games/tests available online or you could carry out a practical experiment such as seeing who can grab an object from the middle of a table first, trying to catch a dropped ruler and recording how far it has fallen or if you want to try something a bit different there is great online tutorial to build and code a reaction tester using a micro:bit



Start Getting to Grips with CAD

Start building or developing your CAD skills.

Your final car design will need to be produced in CAD – usually Fusion360, but you can use other programmes too.

Check that your team have access to a device with a suitable programme and have a go at some tutorials to help you get to know how to use the programme, knowing how to use a variety of commands, how to create different shapes and some of the shortcuts you can use along the way, will help you create the design you envisage. Have a go at drawing a whole variety of things

STEM Racing (Formally F1 in Schools) themed tutorials can be found in the **Learn** section of **Offthetrack.net**

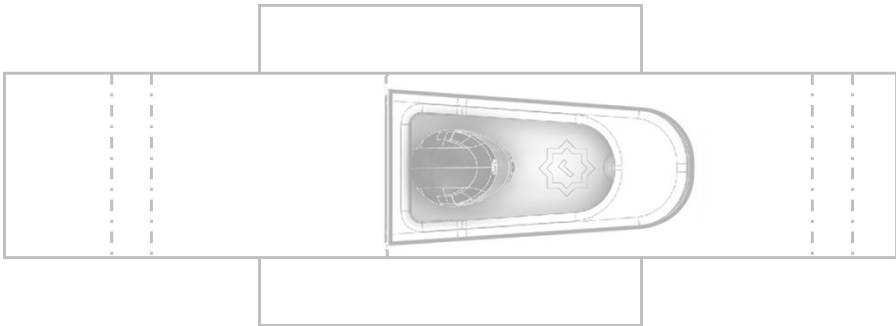
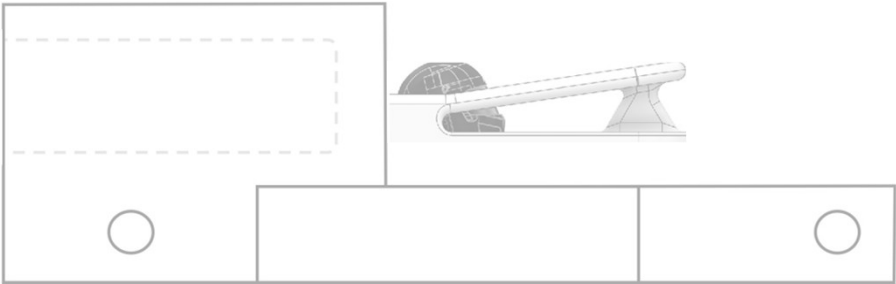


Design Sketches

Your car will need a **front wing**, **rear wing** and **side pods** – *don't worry too much about the regulations in these early sketches, you can work within those more easily when you create your CAD design*

Rear

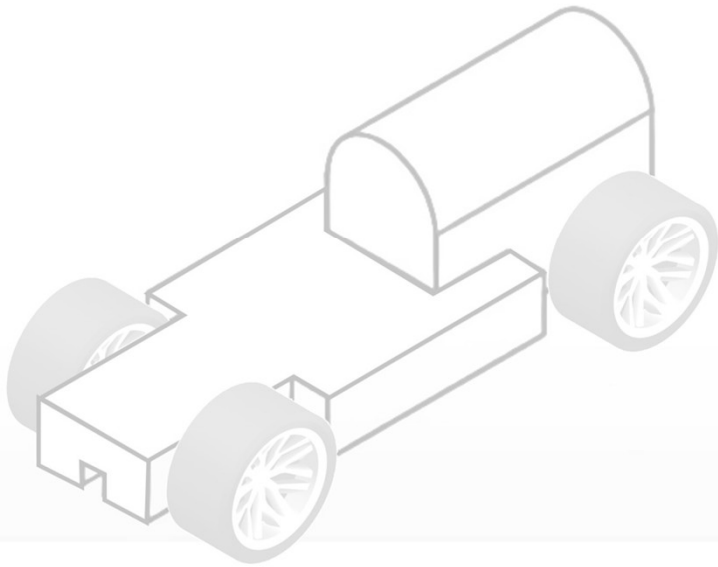
Front



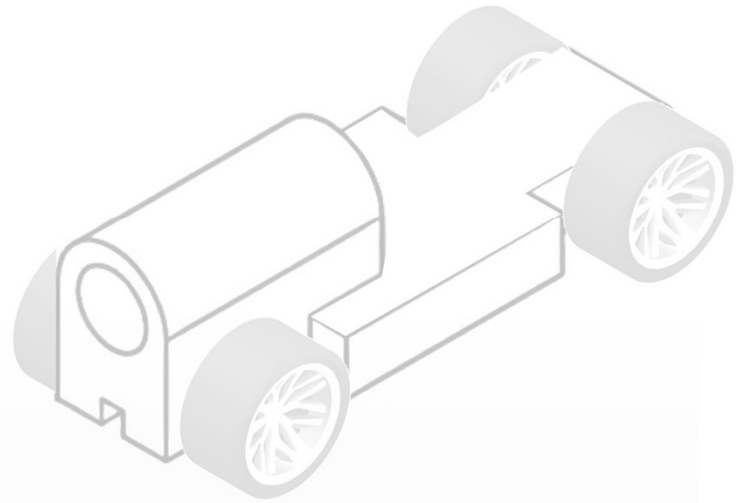
Design Sketches

Your car will need a **front wing**, **rear wing** and **side pods** – *don't worry too much about the regulations in these early sketches, you can work within those more easily when you create your CAD design*

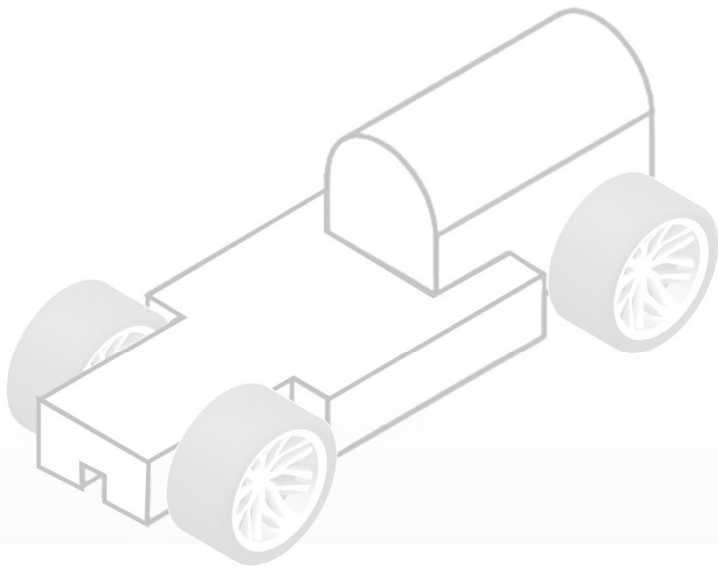
Front view



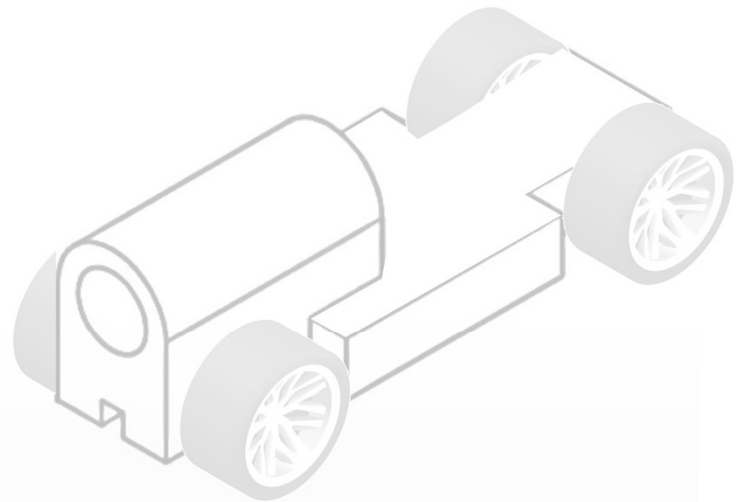
Rear view



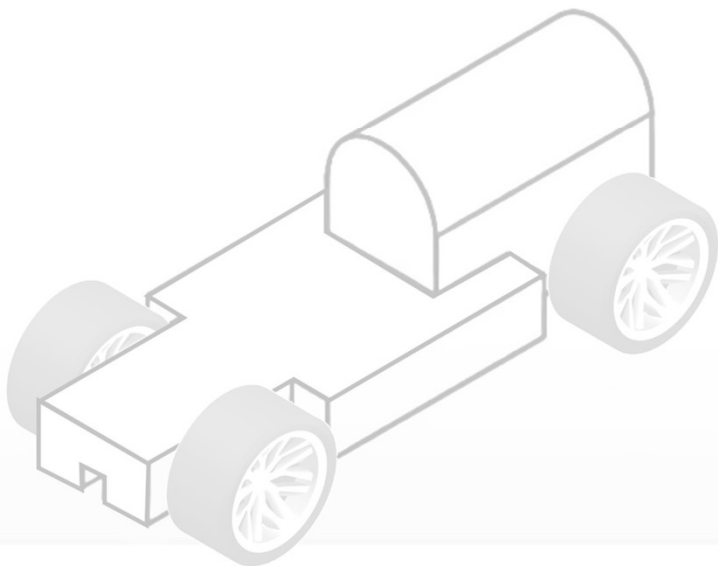
Front view



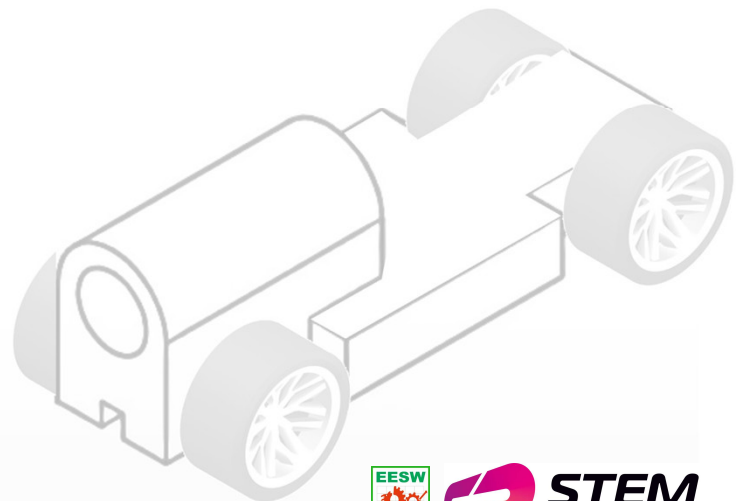
Rear view



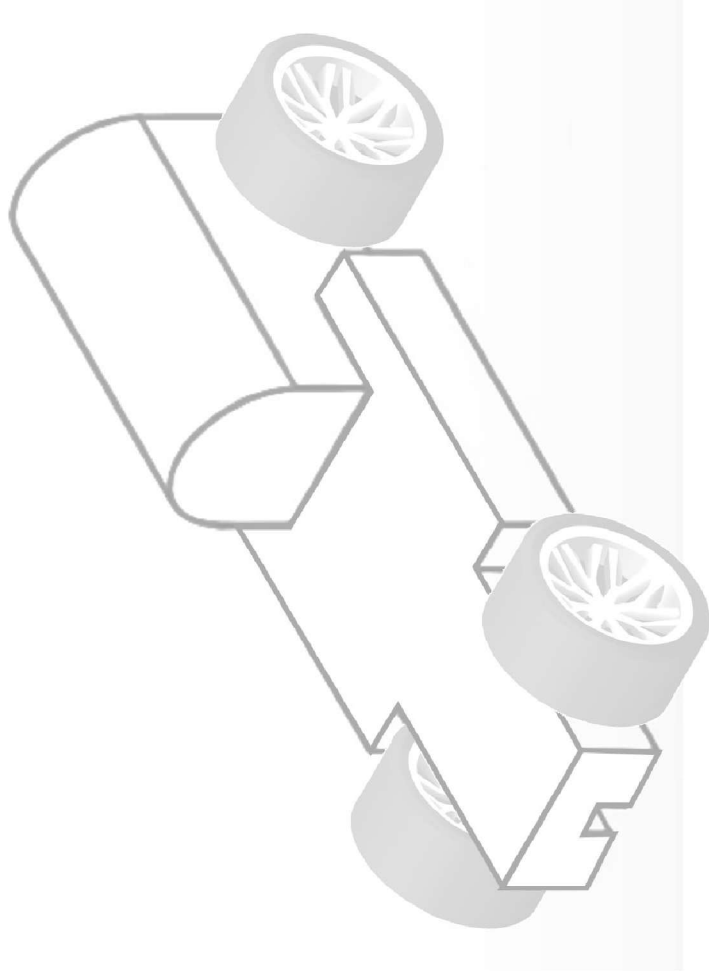
Front view



Rear view



Front view



Rear view



Pit Crew Uniform Designs

