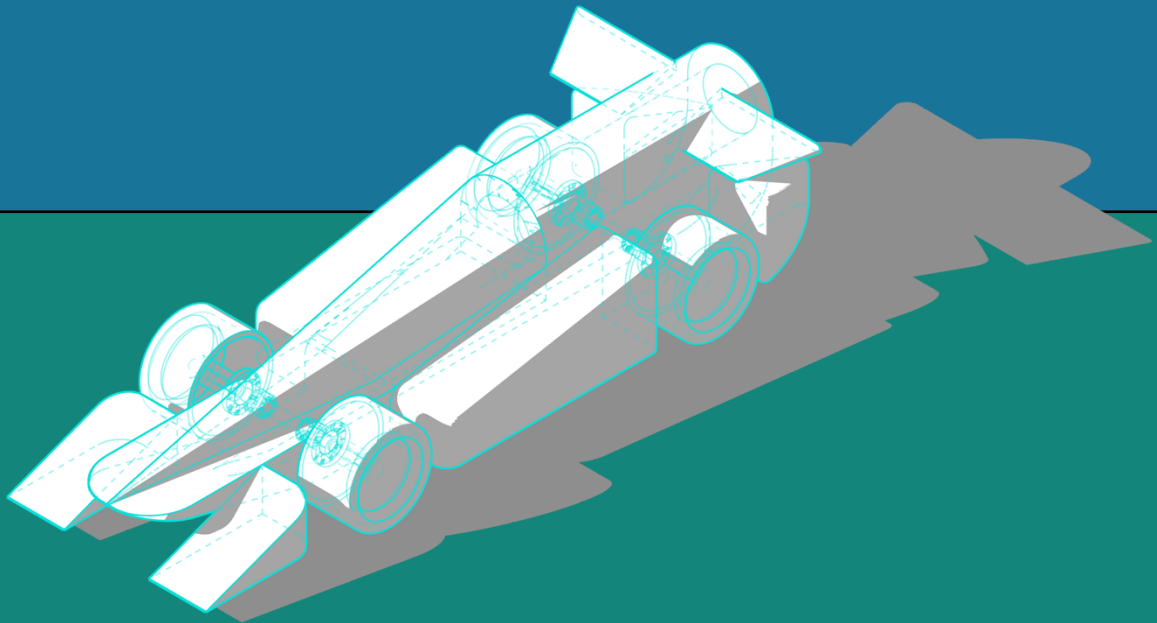




T3 'Car only' Guidebook

2025/26 Vs1

This is the original guide and rule book for the 'Car only' competition to be held May 2026. Teams brand new to the STEM Racing (formally F1 in Schools) concept might find this as a way into the competition. Teams with more experience should consider T2 or T1.



Welcome

Welcome to the world of STEM Racing – Supported by Formula 1. You're in for an exciting ride!

In May 2026 STEM Racing™ Luxembourg will host a National Finals for all teams participating in the STEM Racing competition. This competition will be either your introduction to the competition format or your next step on your STEM Racing™ journey. For most of you this will be the exciting start to a multiple year journey

This guidebook contains everything you need to know to get ready to compete at the STEM Racing™ competition in May 2026 at Tier 3 level. It is intended as a stand alone document and to show everything you need to get started and compete. Be sure to read this guidance carefully.

Project action plan:

1, Confirm your Team, Register and read the rules!

Depending on the experience in the team and the team's plans for the future you may want different things. Make sure everyone has the same goal, register your team with Mr Duxbury, read all the rules!

2, Design your car of the future

Competing in the 'Cars Only' competition is for teams just starting out. Other teams can take part if they wish. Deliberately designing, testing and refining your design to create your fastest car is the objective.

3, Turn your ideas into a CAD drawing

Make sure that your idea meets all the rules before final manufacture. Use CAD drawing tools like industry leading Fusion 360 (available for free to all participants) to create your idea.

4, Team Branding

Remember there is a lot of help online.

Creating a single identity, a team message and a logo to represent the team is very important for branding and marketing. This branding should appear on your cars and an A4 paper colour submission together with your team message. The branding sheet will then be presented with the other T3 teams in a dedicated pit booth. Aim to stand out. You might also want team t-shirts or uniforms but this is not a requirement.

5, Make your cars

Your cars can either be printed on a 3D printer using a filament of your choice or made by hand

6, Prepare to answer some questions about your car

from an official STEM Racing block.

Creating your team, choosing a name and look, deciding on roles, and working together to build your best possible car is all part of a deliberate design process. Along the way, the decisions you make, the reasons behind them, and the results you achieve matter. To help you practice sharing

your process and justifying your choices, you will be asked to answer three simple questions on the start line: **What made you decide on this design? How did you go about solving the problems you faced? What evidence do you have that this is the best car you could build?** As long as you can explain your thinking, give reasons, and show some evidence, you're doing exactly what's expected. This is a first step in presenting your ideas—simple, clear, and not too demanding.

Contents

1. STEM Racing tm	Page 4
2. General information	Page 5
3. Your team	Page 8
4. Judging information	Page 9
5. Car Design	Page 11
6. Assessment	Page 15
7. The competition	Page 19
8. Scoring	Page 24
9. Appendix	Page 22
10. Registration	Page 29

What is STEM Racing™?

STEM Racing™ Luxembourg is a competition for school children (aged 11–18), hosted by ISL in Luxembourg, in which groups of 3–6 students design and manufacture a miniature car to be fired down a track by compact, compressed air 8g power units.

The challenge offers a way to learn and apply Science, Technology, Engineering and Maths (STEM) related subjects in an exciting way.

Teams learn to use CAD/CAM software to collaborate, design, analyse, manufacture, and test their car.

Students, over the course of their participation at increasing levels will learn about physics, aerodynamics, design, manufacture, branding, graphics, sponsorship, marketing, leadership/teamwork, media skills and financial strategy, and apply them in a practical, imaginative, competitive and exciting way.

25/26 STEM Racing™ Luxembourg Event

This event, held in May and described as the STEM Racing Luxembourg National finals will be a fun opportunity for everyone who has signed up to showcase what they have learned and made, to see what others have done and to test their latest car against others.

During the day there will be three tiers present: Tier 1: Advanced, the teams who are testing and preparing their cars, portfolios, presentations and pit displays in line with world finals expectations; Tier 2: Intermediate, the teams who are testing all their hard work to see where they are currently at and building their experience ready for future competitions. Tier 3: Beginners, those just getting started out on their journey who are coming to their first final, you. If you are competing in Tier 1 or tier 2 this document is not relevant to you and you should get the relevant competition guidebook.

Each team may only compete at one level in the competition and must have a unique and individual identity.

At the end of the event all participants will have had similar experiences, will have seen what everyone else is doing and should be able to reflect for themselves about what they now want to do. It might be different to what they thought before starting the competition!

By registering to take part in this competition, you agree to follow and be bound by the rules of the competition, the site hosting the event and any announcements that may be made during the day by either the organisers or the chair of judges.

For the event, T3 teams will need to produce:

- 3x STEM Racing Luxembourg cars
- 1x A4 colour sheet with team logo and team message displayed on it
- Answers to the three starter line questions

Competing teams

- Each team must consist of a minimum of 3 students to a maximum of 6, between the ages of 11-18 (at the time of the event).
- All team members must be registered before the event and only team members may represent the team at the competition
- The team must be registered for Tier 1, 2 or 3 (as described on page 4)

Team responsibilities

- All teams' members must read these rules and play a role in checking the cars, logo sheet and any other elements the team wishes to present
- During the competition it's the team's responsibility to ensure that team members are present at the correct time and location for all scheduled activities..

Role and responsibility of supervising teacher / adult.

- All supervising adults should explain all relevant information to their students.
- It is the primary responsibility of any supervising adult to ensure duty of care/well-being for all their student team members. Any concerns arising during the event in relation to this should be brought to the attention of the event chair immediately.
- The supervising adult is expected to be present and available to the team at any point during the competition day but must not interact in any way with the student team, judges or judging process. Any incident considered inappropriate will be brought to the attention of the Chair of Judges and penalty points may be applied. Supervising adults may not form part of a team.

Interpretation of the regulations

- The final text of these regulations is in English. Should any dispute arise over their interpretation, the regulation text, diagrams and any related definitions should be considered together for the purpose of interpretation.
- Updates may be required to this document and the latest version at the time of the competition will be considered binding
- Teams are not permitted to seek a ruling from the competition organisers, any competition official or judge before the event as to whether a design idea complies with the regulations.
- Rulings will only be made by the Judges at the event.
- Design compliance to the regulations forms part of the competition. As in Formula 1, innovation is encouraged and STEM Racing teams may find ways of creating design features by pushing the boundaries in order to get an extra competitive edge.

Supplementary competition regulations

- Other documents may be issued to provide teams with further logistic and important event information. Any supplementary regulations will be issued to all lead teachers and team managers, where the team has supplied this contact information. The website www.STEMRacing.lu will also be updated.

Team partnerships

- STEM Racing teams are encouraged to develop mentoring partnerships with businesses, industry or higher education organisations throughout their project.
- All design work, text and scripting for all project elements presented (Cars, Logo, question answers) must be wholly undertaken and created by the team.
- All aspects of any partnerships must also be declared with teams able to demonstrate an understanding of the process and product used..

General info'

Mandatory project elements for 25/26 STEM Racing Luxembourg T3 entry

The following is a summary of the elements you must bring to the competition:

- Two (2) identical STEM Racing cars to race and any replacement parts you may wish
- One (1) Model of your Racing car to go in the pit with your logo
- One (1) A4 hard copy logo with team message
- One (1) Digital copy of logo

Cars - each team must produce

- Two (2) identical race cars
- When you arrive and before racing, both cars must be submitted with optional spare parts to the race managers. They will then check that they meet the safety and performance rules before you are allowed to race them.
- The third car is intended as a model for display, it does not need to work but should represent the team and your racing car

Pit Display

- A dedicated Pit display will be provided for all T3 teams. In this space you will display your A4 sheet with your logo and team message as well as your model car.
- There may be opportunities for you to leave other things at the pit display like calling cards or advertising for your team or team collaborations, but this will depend on space and the decision of the head of judges on the day.

Suggestions:

- You may wish to bring with you some notes cards in preparation for the questions so that you can refer to them
- Uniforms are not required but you may wish to bring them or at least to make sure that everyone in the team is wearing the same combination of colours and clothing types

General info'

At the event

- Everyone is required to present themselves at the entrance to sign in and receive any last-minute details.
- Hand in your cars to the race manager, all cars for the race must be submitted before the racing for scrutineering (checking the car meets the requirements)
- Place your model car and logo sheet in the T3 pit
- Digital copy of the logo will have been submitted
- Entry to 25/26 STEM Racing Luxembourg final permits the organisers to keep one race car

Team names

- No teams participating in the challenge are permitted to use any of the Formula One Word Marks (shown below) in their team name, logo, domain name, and/or any social media handle.
 - For example, “Infinity F1” is not allowed and should be changed to something similar such as “Infinity” or “Team Infinity”.
- No team will be permitted to use any of the prohibited word marks within their team name when participating in F1 in Schools/STEM Racing from 2017 onwards.
- The F1 logo, F1, FORMULA 1, FIA FORMULA ONE WORLD CHAMPIONSHIP, GRAND PRIX and related marks are trademarks of Formula One Licensing BV, a Formula 1 company. All rights reserved

Benefit of doubt

- The chair of judges will, where appropriate, seek to use ‘benefit of doubt’ when the assessment of compliance is marginal or unclear. In this situation, teams will be given the benefit of doubt rather than a firm penalty if a penalty cannot be clearly measured or identified.

Car Design and production (Tier 3)

- You are encouraged to use a Computer Aided Design (CAD) package. SketchUp and Fusion 360 are two examples of such programs. You may use any which you are familiar with or wish to learn. Checking the compatibility with any manufacturing you intend to do like 3D printing is important (the export function on most CAD packages will produce a universally accepted file)
- Fusion 360 is recommended as Autodesk are sponsors for STEM Racing and the package is available free through your teacher.
- Learning to use a CAD package will take time so allow the time to find tutorials and practice
- Please be sure to look at the score card for measurement requirements
- Also investigate existing designs on the internet. Pay particular attention to the differences between cars that did well and those that did not, an essential part of design is to see if you can form a reasoned opinion as to why one would do better than the other and then build on it.
- Testing virtually saves on materials and manufacturing time so it might also be worth looking in to Computational Fluid Design (CFD), also available from Autodesk but this is not essential at this level.
- Testing real prototypes in buckets of water or on ‘friction slopes’ is also another example of ways that teams can look at their ideas
- Getting started early with CAD and CFD will allow you to start building your experience and expertise ready for higher levels of the competition (these are also industry standard packages) so it is likely to be time well spent.

Your team

As the team builds in confidence and experience and wishes to proceed to higher levels there will be more tasks needing to be mastered. Initially you might like to have just engineering, design and manufacture but you should think about your team, how it is represented and your 'outward facing' image. Teamwork and project management throughout the team will be vital to your success. A real F1 team succeeds because all the people learn to work together and support each other. Remember, no one person is more important than other members in the team.

- Together
- Everyone
- Achieves
- More

At T3 level you should consider these roles and who might do better in them, grow more. You don't need them all right now but you will need to think about them if you intend to grow to the next level so starting now might be a good idea.

Ideally, one role should be allocated to each person. Whilst 3 is the minimum, 6 will be the ideal number of people in a team later on to juggle this commitment with school work. All members representing the team must be between 11 and 18 on competition day. Only official members of the team can represent the team at any event on competition day.

Consider your Team

The following job roles are examples of what could be covered by the members of your team:

- **Project Manager (maximum 1 person)**

This person is responsible for managing the team, project management of all key deliverables and ensuring that race cars are ready for the competition. The team manager works closely with all members of the team, offering assistance where necessary.

- **Finance Manager**

This person organises budgets and resources needed for designing and making the car(s) and team project work. They might keep track of all expenses and income generated, allocating certain funds to certain areas of the project, for example Car, Pit Display, Portfolio, team uniforms.

- **Manufacturing Engineer**

This person is responsible for advising team members on the manufacture of the car and the constraints of the machining process. Manufacturing engineers will need to liaise with the design engineers to report and help solve any problems with the construction of the car.

- **Design Engineer**

This role is responsible for the styling and aerodynamic performance of the car design. Design engineers will need to liaise with the manufacturing engineers to ensure their ideas can be realised.

- **Graphic Designer**

This person could be responsible for producing the colour schemes applied to the vehicle, including any special sponsorship decals, together with the final graphic renderings and any additional team marketing materials. The graphic designer will need to liaise with the design engineer to ensure any schemes will fit the shape of the vehicle and the resources manager for additional marketing development.

- **Sponsorship & Marketing Manager**

This person could be responsible for generating sponsorship proposals for potential sponsors, contacting firms and marketing the team through different media. They may be tasked with creating and managing the team's social media accounts as well as thinking up ways to generate interest and income for the team through marketing events.

25/26 STEM Racing Luxembourg Judging

Times and orders of events

All teams will be provided with a timed sheet at the beginning of the event to detail where and when they need to be. T3 teams should take particular note of when they are racing and then maximise their opportunities to see what the other teams are doing by meeting with them, talking to them about what they have done and any tips they might have for teams following along behind them. Sorts of things you might ask them about:

- Specification and Scrutineering Judging
- Design and Engineering of their car (how did they come up with their design)
- Team Enterprise, how they went about funding and raising the profile of the team
- Verbal Presentation, preparation and the actual experience if they have done it
- Brand Identity
- Pit display
- Racing

Judges

Judges will be around on the day looking at the work and achievements of T1 and T2 teams in particular but if you see them with a few moments to spare you might like to approach them to find out about how they judge or the things that particularly interest them.

Scoring

T3 teams are in it for the experience, to see what the event is about and to meet other teams. You also have the chance to race your cars and get a taste for the competition. Cars will be scrutineered to check that they are safe and fair to race but the only 'score' for T3 teams will be who got an intact car over the finish line the fastest!

Trophies

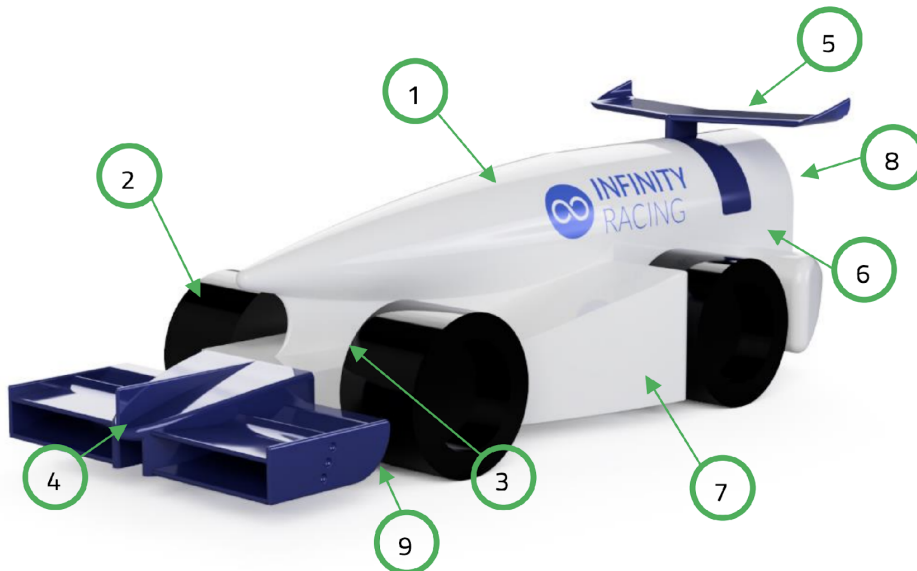
- Tier 1 Champions: The team in Tier 1 who have earned the most points across all events
- Tier 2 Champions: The team in Tier 2 who have earned the most points across all events
- Tier 3: Team to watch out for
- Fastest Cars: Presented to the team with the best average track times across all time trial events (not the KnockOut) and both cars.
- KnockOut Champions: At the end of the day a simple 'first past the post' competition will be used between the 8 fastest qualifying teams using both of the team's cars.

Car Design

What is a T3 'CAR Only' Competition car?

Essentially, nobody knows until you have designed it! There are some important rules that must be followed to make sure that everyone is safe, that the competition is fair and to get you started on your way to future levels of the competition.

Your 25/26 STEM Racing™ Car Only car must have these features:



Body
4x Standard wheels
Standard Axels & bushes
Front wing
Rear wing
Surface finishing
STEM Racing decal
CO₂ Cartridge chamber
Tether line guides

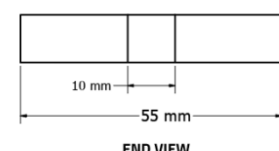
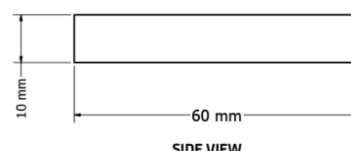
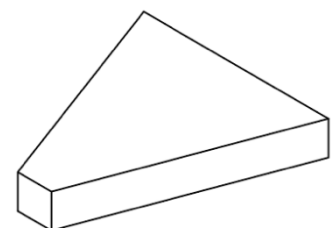
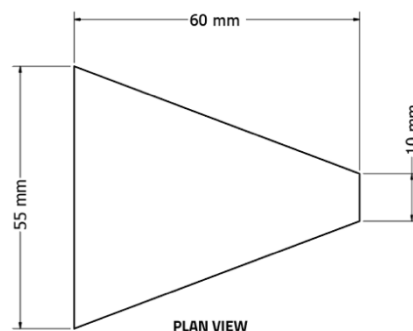
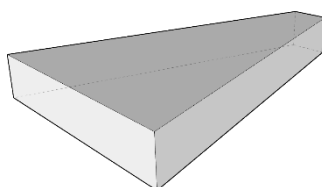
This diagram is from the F1 in Schools UK Technical Regulations 2019 DEVELOPMENT document

What is the car?

Your car must have the components listed above. The main part of your car, the body must be 3D printed. The body is the part which goes from the front axle to the back of the car and includes: the no-go-zone, side pods, and CO₂ cartridge chamber. You might choose to make the cars in one piece in which case the body will also include the wings. When the size of the car is being checked the whole thing will be placed inside a measuring box so be sure to check your outside measurements.

No-go-zone

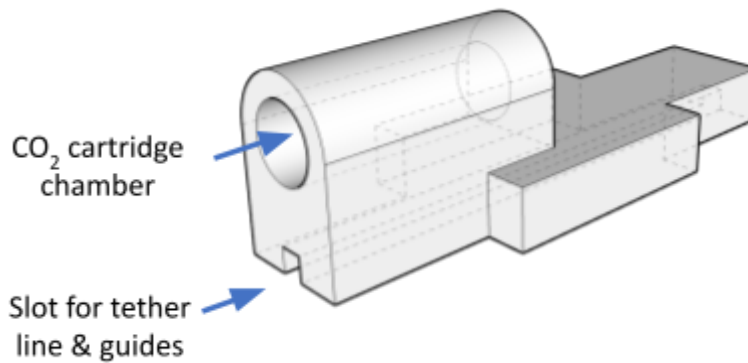
To ensure the safety, it must be visibly possible for your cars to hold the no-go-zone as described here. Fitting the no-go-zone is a **SAFETY** requirement and therefore required to be allowed to race. If it is not clear where the no-go-zone might fit the race manager will ask you to show them.



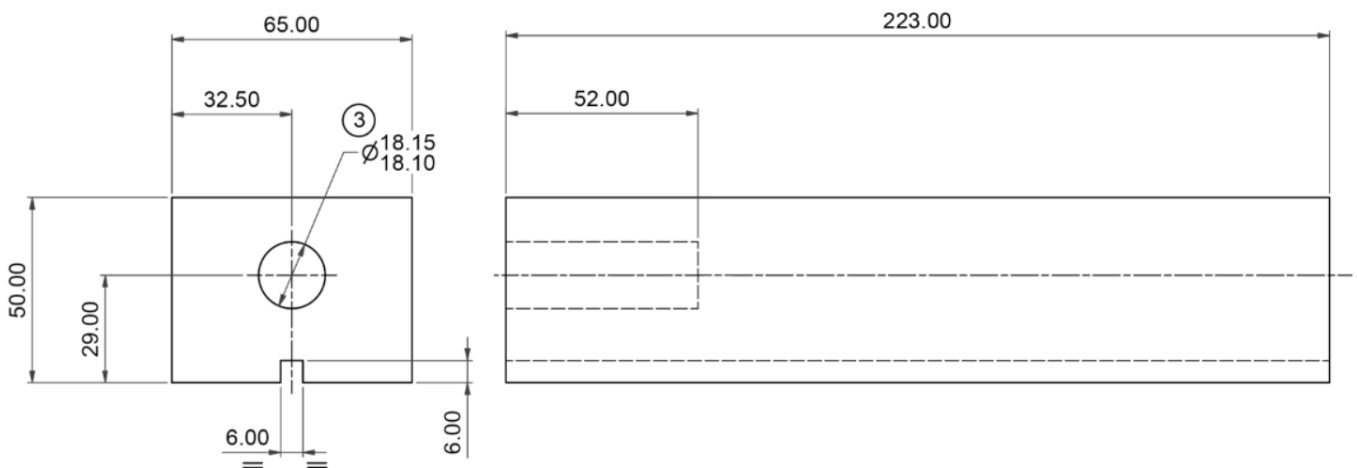
Car design

CO₂ Cartridge Chamber

This is where 8g compressed gas cartridge will go. The dimensions are shown here. It is a **SAFETY** requirement that your chamber is large enough to hold the cartridge and that there is a 3mm thick zone of material around it. If the hole is not at least 18mm diameter the cartridge will

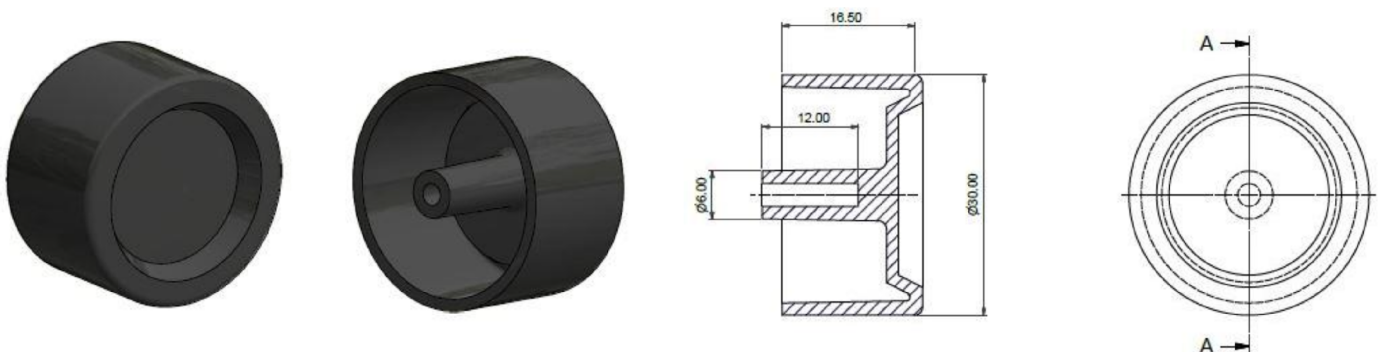


not fit and it will not be possible to race.



Wheels

All 25/26 STEM Racing Luxembourg cars must have 4 standard wheels. The car must run with all four in contact with the track at all times across the 16mm width of each wheel. All Tier 3 teams must race using the standard wheel shown below, either bought from the kit or printed yourself from the file available here: www.stemracing.co.uk/downloads.html



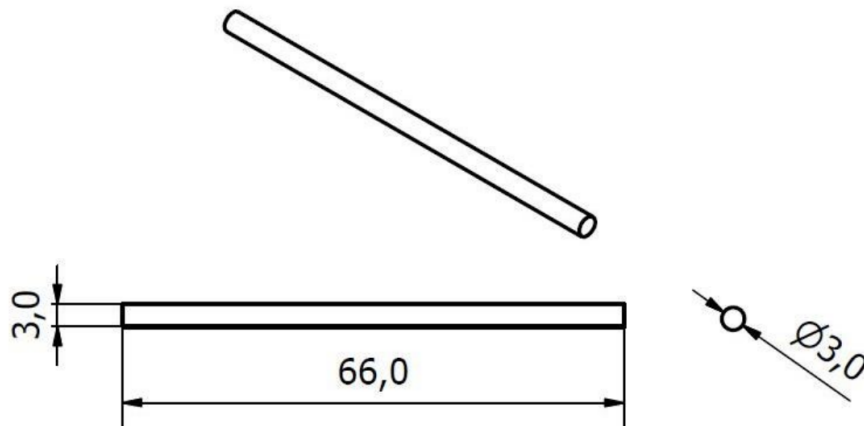
Axles & Bushes

Your cars must have 2 standard axles and 4 standard bushes. These are available in kits to buy and bushes can be printed from the site mentioned above

Car design

Standard Axle

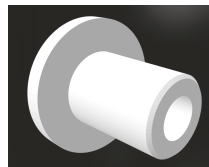
For the competition your wheels must run attached to standard axles (2 per car). Standard axles can be bought as part of the standard kit or bought independently so long as they meet the diameter requirements and are made from steel.



Individual axle weight: 4.0g

Standard axle bush

For the competition your cars must use four standard axle bushes, one per wheel for the axle to run in. These are available for download at <https://www.stemracing.co.uk/downloads.html>



Tether line guides

For the competition your cars must have an interrupted slot as shown on page 11 of at least 6x6mm along the length of the car (so it must not, for example, go through the front wing) for the tether to run along. Screwed into this slot just in front or just behind each of the front and back wheel axle lines must be a tether line guide. These two tether guides must be the standard screw eyes firmly attached to the underside of your car. Tether line guides are a **SAFETY** requirement and must meet the requirements given here and in the specifications.



Picture of a standard screw eye
Minimum internal dimension 3.5mm

Car design

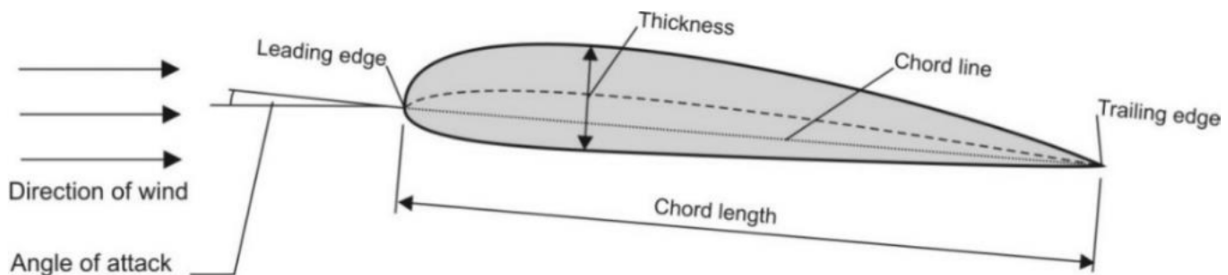
Front and rear wing design explained:

Wings are mounted on the front and rear of your car to control airflow around all surfaces of the car.

- A **leading edge** is the edge of the wing that cuts through the air first.
- The **trailing edge** is the edge that the air touches last as it leaves the wing.
- **Wing span** Is the total width of the wings only and does not include support structures or other parts of the car.
- **Wing chord** is the widest point of the wing's cross section, between the leading and trailing edges. This will be checked across the whole wing span.
- **Wing thickness** is the deepest point of the wing across it's cross section, this will be checked across the whole wing span.

These terms are all shown on the diagram below.

Wing cross-section diagram:



Surface finish and decals (stickers)

A surface finish on a STEM Racing car is any applied surface covering, over the car. A decal is anything stuck to the surface. To be defined as a decal, 100% of the area must be stuck to a surface. Surface finishes and decals are included when measuring.

Hand finishing

Hand finishing is defined as use of any device powered by your hand (e.g. files, sand paper, lacquer) for removing any irregularities on the surface of the car body. You should aim to need to do as little hand finishing as possible through a high manufacturing standard.

Labelling your cars

Each car should have the STEM Racing logo stuck on them as well as a A on one car and a B on the other. You may also like to put your team logo on the car and any sponsorship or school associations on.

Car scrutineering:

Scrutineering judging is a detailed inspection process where all race cars plus any optional replacement components are assessed to see if they meet the T3 STEM Racing Luxembourg rules.

Your two identical cars are submitted to the Race Managers for checking when you arrive

Once cars are submitted no person outside of the competition judges and race marshals may touch or interfere with the car, this includes before, during and after the race (except where specifically authorised). Doing so may result in the car being disqualified.

Cars:

The purpose of submitting two cars is to demonstrate the standards of your manufacturing and finishing. To see how you controlled quality and checked it. Cars will be measured carefully to closely inspect dimensions. Where there is any doubt the scrutineers will talk to you about it.

You may also submit replacement parts identical to those fitted to the race cars. If the race managers determine that the replacement parts are not identical they will not be allowed.

You are invited to watch as the race managers carry out their tests to see that you have met the rules but you may not get involved, interfere or argue. Politely phrased inquiries to understand the rulings made are fine so long as you are intending to use the learning to do better next time.

Quality of finish and assembly includes attention to detail, smoothness of finishing and how identical the cars are.

Special service time:

Cars judged unsafe or unfit to race will receive a 15-minute car service time during the pit set up time. These are the red rules and your car must be modified in this service time to be allowed to race. If the car can be fixed within the service time the team will be penalised with a 0.2s time addition for each penalty each time it races. If it can't be fixed it will not be allowed to race. Be sure to arrive with a car you are sure meets the requirements.

Outside of this time, only judges may touch the cars on the event day except in specific post race service circumstances.

Ready to race

Questions & Answers Presentation:

On the start line and in front of the other teams and anyone else present you will be asked to give answers with as much detail as you like to the three questions. No need for visuals, just give verbal answers to show your experience and understanding.

Questions:

1. What made you decide on this design?
2. How did you go about solving the problems you faced?
3. What evidence do you have that this is the best car you could build?

Try to answer with reasoned explanations and justifications rather than just data.

There are NO rules about how you answer the questions; you could try to do it stood on your head, singing or acted out in mime just do what feels most comfortable to you. All we ask is that:

- **Everyone takes part!** – it is better if each member of the team contributes something to the answer to show that the whole team was involved and knows what is going on
- **Don't talk for too long** – To the point explanations are better. There is a skill to being informative and concise and it is worth practicing before you arrive.

The Competition

1. How it works: Race day	page 22
2. How it works: What they are looking for	page 24
3. How it works: Pit Display	page 25
4. How it works: Verbal Presentation	page 25
5. The KnockOut Competition	page 26

By signing up to this competition you agree to be bound by all the competition rules and the decisions made by any member of the judging team.

Teams are expected to act in the spirit of the competition, both before and during the STEM Racing event. Any team deemed by the chair of judges to be acting outside of the spirit of the competition, can be removed from certain or all aspects of the competition. For example, a team attempting to abuse the specifications to their advantage may, at the discretion of the chair of judges, be removed from racing and receive no points for this activity. A team deemed to be acting in an unsportsmanlike, negative or non inclusive manner towards another team or other persons may be removed from some or all judging areas.

The spirit of the competition is simple; embrace and respect the rules and regulations, do your very best to compete legally and fairly, while contributing positively to the STEM Racing event. Make friends, create positive relationships, network professionally and enjoy yourselves.

Language of the competition and competition entries will be English

The Competition

How it works

Race day – What to expect:

Race Day happens at ISL and will bring together everyone in Luxembourg registered for the competition. You'll be sharing the track and pit area with all teams so this is your chance to check out the competition and ask the other teams about their experiences.

1, Registration

When you arrive, you'll sign in with us, where you'll be given some important information including your timetable. Then go straight to placing your items in the T3 pit area.

2, Welcome Presentation

We will hold the official welcome and explain the format of the day. Bring lots of energy, you'll need it! Then there will be a period of time for all teams to set up their pit displays. This will be a great opportunity to start looking at the innovations they may have come up with and how they are presenting a unified brand image.

3, Car testing with race manager

Pit set up time is the time to approach the Race managers with your cars and to see them test them against the requirements. You might be asked to fix some details at this point if your cars are not safe to race.

4, Question time

We want to hear about your journey, talk to people and practice describing how the team came together, what got you involved, why you hope to continue. Also take some time to make sure the whole team knows what they are going to be saying at race time. You will answer the three questions at your first race

5, Racing

Racing takes place throughout the day for cars that have met the specification. We will attempt to make sure your races are somewhat bunched together but you will always be on the track with another team and it will be a great opportunity to learn from them as well as to practice your driving.. Time trial races are against the clock and will be used to decide who goes through to the KnockOut rounds.

For each race you are to decide which one member of the team will be driving and only the teams' designated drivers will be allowed next to the track. No racing occurs until everyone else is seated or outside the race area, this includes any supporting adults.

6, Judges Debrief & Awards Ceremony

After all the racing has happened and the teams have spent the day with the judges and you have learned everything you can, there will be an awards ceremony. In T3 the judges will be keeping their eyes open for the team that really stood out as 'the one to beat' next year

The Competition

How it works

The KnockOut competition:

Who Participates

The top 8 fastest teams (including, as a minimum, one from T2 and one from T3) will be invited to participate in the KnockOut competition. Teams will be given a total of 3 minutes to look their cars over and make any small repairs they may wish to make. This may include replacing broken pieces only if the pieces have been submitted with the cars and scrutineered. At the end of 3 minutes any car not returned will not compete.

The race order (seeding) will be calculated from the fastest total race time achieved by the team (reaction + track time). Teams who have failed any performance specification will only be allowed in the KnockOut if insufficient teams qualify and with a time penalty of 0.1s per infringement

Race Preparation

applied.

- Each team will nominate two 'drivers'. They will be in charge of racing the cars.
- The slower team in the race will decide which car they will race first and in what lane
- The first ranked team will then decide which car they wish to race first.
- The other two cars will be loaded into the tracks behind the first cars but on the opposite track

Example:

The team ranked second of the two teams decides to have car B in lane 2. The first ranked team decides to use their car A. This will be placed in lane 1. Then 2nd team car A goes in lane 1 and 1st team car B goes in lane 2

The Race

As in the time trials, only the drivers are allowed next to the track. Racing will not start until all others are seated.

The first cars will be loaded into the start gates. Drivers will be given their starting orders and the first race begins.

Winning the race

The first intact car over the line wins. In the event of an absolute tie the cars will be raced again.

Winning the heat

If a team outright wins both races in the heat then that team will automatically go through to the next round. If both teams win one race each, then the team with the fastest combined total times from both races will go through.

The final round

With complete silence and everyone focused and seated. The final 4 drivers come forwards. Two at a time they will take their positions and fire their cars following the same format as each race. If one team doesn't win both races then the cars are reset and 2 new drivers from each team

race (if there are insufficient team members then one may race a second time). In the event of a second tie total times (with any relevant penalties added) will be used to calculate the winner.

Scoring

1. Car: Safe to race page 23
2. Car: Performance page 24
3. Car: General page 25
4. Racing page 26

Car scrutineering summary

All measurements will be rounded down to the nearest whole mm and 0.1g and considered either a 'pass' or a 'fail'

Rule type	Penalty
Safety	If your car can not be corrected before racing starts, you will not be allowed to race.
Performance	Car can not win fastest car award and may not be allowed to participate in the KnockOut competition.

Scrutineering

Team Name:

T3 Car Scrutineering Scorecards

			Car A		Car B	
Regulation	Summary	Criteria	Pass/ Fail	Comment	Pass/ Fail	Comment
T3.1	Body Material	3D printed body				
T3.2	Safe construction	Race Manager rule unsafe				
T3.3	Tether line slot	Uninterrupted from front to back of car				
T3.4	2 secure tether line guides	One at the front				
		One at the back				
T3.5	Wing construction	Rigid and secure				
T3.6	Cartridge safety	Min 3mm thickness protection				
Safety comment						

Scrutineering

Team Name:

T3 Car Scrutineering Scorecards

Specifications: Performance

Regulation	Summary	Criteria	Car A		Car B	
			Pass/ Fail	Comment	Pass/ Fail	Comment
T3.7	The Car	Must consist of 9 listed features				
T3.8	CO ₂ Cartridge visibility	No obstructions in rear view				
T3.9	Total car weight	Min: 55g (without CO ₂ Cartridge)				
T3.10	Total Car width	Max: 90.0mm				
T3.11	Car length	Min: 170.0mm Max: 210.0mm				
T3.12	No-go-zone	Visibly possible to fit				
T3.13	Wheel contact	All four wheels contact the track together				
T3.14	Rear wing	Location behind rear wheel				
T3.15	Front wing	Location in front of front axel				
	Performance comments:					

Scrutineering

Team Name:

T3 Car Scrutineering Scorecards

Specifications: General

Regulation	Summary	Criteria	Car A		Car B	
			Pass/ Fail	Comment	Pass/ Fail	Comment
T3.16	Both cars	Identical				
T3.17	Components	Nothing removed				
T3.18	Decals	Both cars identified				
T3.19	CO ₂ Chamber centre line height	Min: 30mm Max: 40mm				
T3.20	Wheel rotation	Rotation with minimal effort				
T3.21	4 Wheels	Standard wheels				
T3.22	Axels and bushes	Standard parts				
	General comments:					

Racing

DNF (Did not Finish) race results

Damage or part separation occurring during a race, before the car crosses the finish line, (e.g. wheel or any other part of the car separating), or car not crossing the finish line at all, effects in a DNF race result. The Judges' decision of a DNF result is final. For calculations DNF cars are assigned the slowest car time.

False starts

- A false start occurs when the driver presses the trigger button before the five (5) start gate lights have extinguished. This will be signalled with the outer red light above the lanes illuminating
- All reaction false starts will incur a 5-point penalty and by default, forfeit that race.
- In KnockOut racing a false start will automatically forfeit the race unless it is beyond the control of the driver.
- If a false start is the result of a distraction from the other driver the race will run again with the driver who caused the distraction forfeiting the race

Handling cars

Only judges may handle the cars during the competition day except for a brief window to repair for the KnockOut competition.

Appendix

- I. Choosing the right Tier
- II. Registration

i) Choosing the right Tier

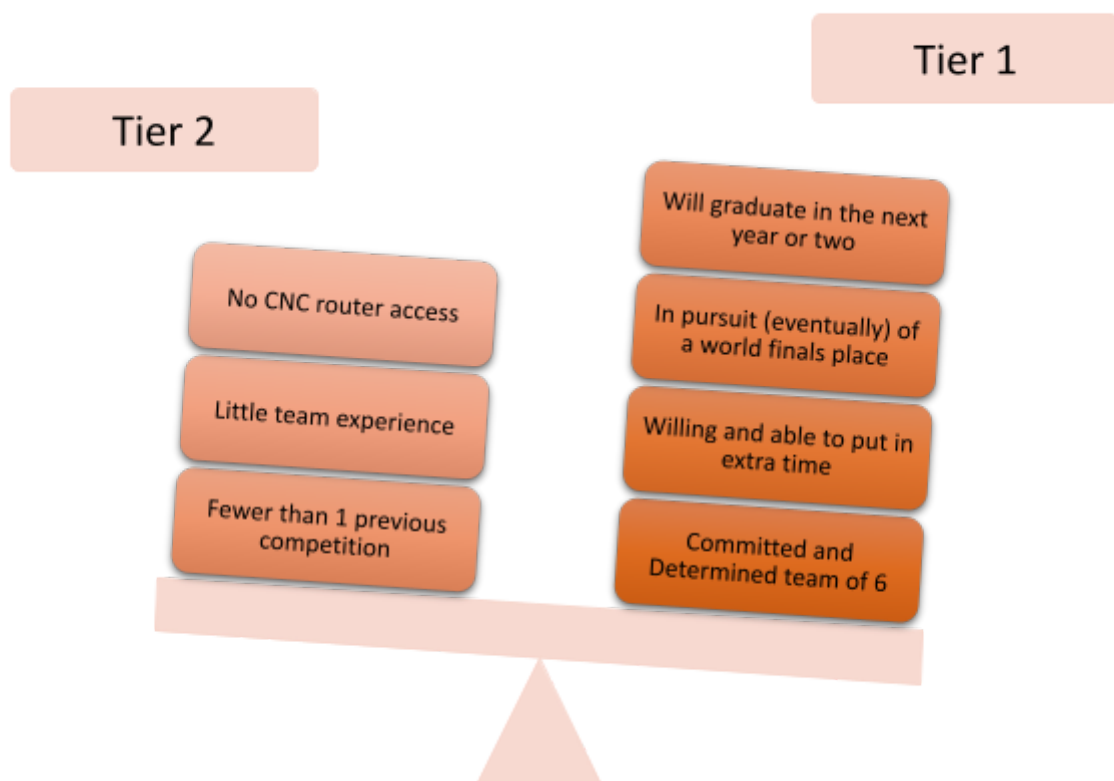
Tier 3 is intended for beginners, teams just getting started. Most likely in their first year of STEM Racing. The rules are a simplified version of the higher tiers and intended as an easier introduction to the challenge. Teams with a bit of experience should select a higher tier, 1 or 2.

The aim is that teams will be able to choose the appropriate Tier in order to compete against teams with similar aspirations and a similar level. The essential difference between the next two Tiers up is that Tier 1 requires you to CNC machine your cars, just like at the Championships whereas Tier 2 does not. Tier 1 participants must also add the Halo and driver to their cars. CNC routing is not available at all schools in Luxembourg so if you talk to Mr Duxbury at ISL we should be able to work something out. There are also, if you are willing, some cheap CNC mills available through online shops

Otherwise, you will consider which Tier is appropriate for you based on your amount of experience and the whole team's determination to progress this year.

Tier 1 asks for a lot of the same deliverables as the world final and will mark you out as candidate as well as letting you see just how much more work you have left to do. Tier 2, similarly, is an opportunity to try out your ideas and get feedback on where you are now.

Please note: The overall Winner at Tier 1 is considered with other important considerations as set out in the 'Selecting the team to represent Luxembourg procedure' document to determine who will represent Luxembourg at the World Finals. Below the chart is just another way of thinking about the two top Tiers:



Registration

Registration for the competition

Register your team (all 3-6 members at the same time) by filling in the form at:

<https://bit.ly/25-26SRLuxReg>

Please note: The number of teams who can participate is limited. Wait for a confirmation of the team entry before proceeding.



If you do not have a team

If you do not have a team, please contact Mr Duxbury (F1inSchools@islux.lu), there may be others who you can team up with or teams with spaces in them.

The STEM Racing[™] starter kit

Once your team have received a confirmation you may send an email to Mr Duxbury and we can arrange delivery of the starter kit. This kit can be bought directly from Denford if you like or you can find alternative suppliers. At Tier 3 you could 3D print all the parts except the tether guides and axels which can be bought in most handwear shops.

The kit includes:

- 1x STEM Racing official model block
- 4x STEM Racing official wheels
- 2x STEM Racing official axels
- 4x STEM Racing official Bushes
- 2x Screw eyes

Total Price €20 (plus postage and packaging)

We ensure that everyone
in our community becomes
inspired, resilient and *passionate*
about achieving what matters,
anywhere in the world.

