



in Schools

Ireland



COMPETITION REGULATIONS 2021-2022

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Hello and welcome to F1 in Schools™, The Formula 1® STEM Challenge!

We would like to give you a warm welcome to the challenge and hope you have fun working as a team to compete in this life changing experience. There are awards up for grabs to all teams who compete, recognising design flair, innovative thinking and much more.

F1 in Schools is open to all Irish and Northern Irish based secondary schools, colleges and youth groups. The challenge is to design, analyse, make, test and race innovative F1 cars of the future, using a combination of design and make skills, CAD/CAM software and marketing talent to promote and grow your team.

This year, the Irish competition will have a single category: the “Professional Class”. Professional Class is open to students aged **11-19**, in teams of **3-6**. The prize at stake here is not only the title of **National Champions**, but also the chance to represent Ireland at the **F1 in Schools World Finals**, which is contested by over 40 countries and runs alongside an international F1 Grand Prix...

We have created this document to give you all the information needed to compete in the competition, attend your nearest Regional Finals and compete for a chance to be crowned Regional, National and maybe even World Champions.

Best of luck, we look forward to seeing you on Race Day!

Best Regards,

Paul Flynn and Aaron Hannon

National Directors,

F1 in Schools Ireland.

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Please note: any changes in the Regulations from the 2021/22 competition will be indicated ~~using red strikethrough text.~~

New text will be indicated **using blue text.**

2021/22 COMPETITION REGULATIONS

The 2021/22 Competition Regulations have been rewritten and renumbered. While the basic regulations are the same, some scoring, interpretation and scrutineering methods have changed. Do not make any assumptions based upon previous Technical Regulations.

HOW TO USE THIS DOCUMENT



Use of 'NEW!' symbol denotes where dimensional limits have changed, or a new rule has been created. Please read all text carefully to fully understand the rules.

HELP TEXT *When you see green italic text, this is intended to help clarify a regulation or diagram.*

COVER PHOTO

Vortenova, St. Brigid's College, Loughrea. National Champions 2020/21.

YOUR F1 IN SCHOOLS™ JOURNEY – WHERE TO START:

1. Download and Read the Rules

- Download and carefully read through this season's Technical Regulations, alongside this document.
- Both Technical and Competition Regulation rule books are published on the F1 in Schools website (www.f1inschools.ie) at the beginning of every competition season.

2. Register Your Team

- Register your teams through the F1 in Schools Ireland website. **Schools can register multiple teams.**
- Registration fee is €20 per team member.

3. Design the F1 car of the Future

- Get in touch with us at teams@f1inschools.ie to find out what you need to start designing your car. Then, starting with a fresh piece of paper and a head full of ideas, start designing the basic aerodynamic shape of the body and wings of your car. **No idea is too crazy at this stage...**

4. Download Free CAD Software

- Download FREE CAD software from Autodesk via our website – f1inschools.ie/downloads
- Find stock CAD files on the website to help your card design. **We recommend the use of Autodesk Inventor or SolidWorks.**

5. Submit Your 5 Page Plan

- Draft a season plan which includes your design concepts, team roles, branding, social media and marketing plan and more.
- Submit your 5 Page Plan before the deadline on **December 17th, 2021.**

6. Manufacture Your Car

- **Make sure your car is legal before manufacturing.** Using the free F1 in Schools manufacturing service or otherwise, construct your car using CNC Machines and 3D Printing technology.

7. Create Your Portfolios

- **You must create one Design and Engineering Portfolio and one Enterprise Portfolio.**
- See guidance on what to include in the scorecards included below.

8. Prepare Your Verbal Presentation

- **You must prepare a 5-minute (Regional) or 10-minute (National) Verbal Presentation.**
- See guidance on what to include in the scorecards included below.

9. Turn Up on Competition Day!

- **Attend your F1 in Schools event!**

WHAT DO YOU NEED TO PRODUCE?

Qualifying Round (Deadline – December 17th 2021)

- 5 Page Proposal Plan

Regional Finals:

- 2 x 10 Page Portfolios
- A4 Engineering Drawings
- A4 Car Renderings
- 1 x 5 Minute Verbal Presentation
- 1 x Race Car
- 1 x Pit Display

Friday 4 March 2022	South Regional Finals
Thursday 10 March 2022	East Regional 1 (OPTIONAL: if 2-day event is required depending on number of teams)
Friday 11 March 2022	East Regional 2
Friday 18 March 2022	West Regional Finals

Venues TBC. This will be communicated to you well in advance of the Regional Finals

National Final:

- 2 x 10 Page Portfolios + Electronic Versions of Same
- A4 Engineering Drawings
- A4 Car Renderings
- A4 Marketing, Sponsorship and Digital Media Strategy Document
- 1 x 10 Minute Verbal Presentation
- 2 x Identical Race Cars (1 car is sufficient if your team uses the official F1 in Schools Ireland manufacturing partner)
- 1 x Pit Display

COMPETITION STAGES OVERVIEW

THE REGISTRATION PROCESS

Registration is simply the process of sending us your team details so we know you're actively competing in the competition, which is completed online at www.f1inschools.ie/register. Each team competing in the F1 in Schools STEM Challenge will be required to raise a one-off registration fee for their Regional Final, of **€20 per team member**. The key here is to try NOT to pay this yourself! Businesses will happily sponsor young, ambitious teams with the right approach; or if you know your way round a packet of cake mix, why not raise the money with an F1-inspired bake sale?! This is your first chance to practise raising money ahead of the bigger task of attracting team sponsorship later in the project! Get your thinking caps on and work out how to raise your portion of the team registration fee, which ensures your team can take part in your nearest Regional Final.

Note: There is a 50% discount for teams from DEIS schools. Please email us at teams@f1inschools.ie to find out how you can avail of this discount.

This registration fee is non-refundable and must be paid in full before your chosen Regional Final to F1 in Schools.

FIRST STOP – QUALIFYING ROUND

The F1 in Schools Ireland Qualifying Round will require all registered teams to submit a 5 Page Season Plan (see ARTICLE C4 for more). The 5 Page Plan will be evaluated by our team of judges and individual feedback will be provided to each team. Qualifying teams will be notified of their progression to the Regional Finals before the Christmas break in 2021.

It is intended that the vast majority of teams will progress from the Qualifying Round – this round acts as a tool for the organisers to understand teams' progress and assist with their development. Teams that do not progress from the Qualifying Round will be refunded half of their entry fee.

REGIONAL FINALS

Regional Finals will be held across Ireland, where student teams will compete against each other to win a place at the Irish National Final. The Irish National Final will determine who will be crowned the National Champions and invited to compete at the F1 in Schools World Finals.

F1 in Schools Regional Finals are 1-day events, beginning with an official welcome and culminating in our awards ceremony. Unless otherwise stated, timings for the day usually look like this:

09:00am	Teams arrive and set up pit displays
10:00 – 10:20am	Welcome
10:20 – 12:30pm	Judging Session 1
12:30 – 13:00pm	Lunch (catering will be provided)
13:00 – 15:00pm	Judging Session 2
15:00 – 15:30pm	Judges Debrief
15:30 – 16:00pm	Awards
16:00pm	Close of event

Please note that the timings provided above for the Awards and Close of Event may vary between each event, we will aim to provide a more accurate end time ahead of each Regional Final.

~~NEXT STEPS – FEEDBACK ROUND~~

~~As an alternative to the Regional Finals, a feedback round will be introduced for the 2020/21 season. This is an **optional** round where teams will be given the chance to submit their 10-page Enterprise Portfolio and their 10-page Design & Engineering Portfolio for marking by F1 in Schools alumni. This round will provide teams the chance to gain invaluable advice from some of Ireland's most successful F1 in Schools alumni. The score that teams get in this round will have no impact on the final marks at the VNF. This round exists purely to offer teams the chance to improve their portfolios before the VNF.~~

~~**Note:** Teams must submit their two portfolios to www.f1inschools.ie/submit before 5PM, Friday the 26th of February.~~

Note: The Feedback Round will only apply in the event that a Regional Finals can not take place.

IRISH NATIONAL FINALS AND WORLD FINALS

The Irish National Final will be held on **Friday the 6th of May 2021**. The very best teams from the Regional Finals will compete to be crowned Irish National Champions.

National Champions from over 40 countries around the world are invited to compete at the World Finals where they will go head to head to become the F1 in Schools World Champions and lift the F1 in Schools World Champions Trophy. This season, the following winning teams from the Irish National Finals will be invited to compete in the 2021/22 World Finals...

Who is invited to compete at the World Finals?

1st Place Professional Class (Irish National Champions)

2nd Place Professional Class

3rd Place Professional Class

4th Place Professional Class – Invited to form an international collaboration team

The Challenge

You are a Formula One Team commissioned to design, make and race the fastest F1[®] car of the future, driven by compact, compressed air power units.

In order to enter the championship, you must allocate job roles to the members of your group.

Ideally, one role should be allocated to each person. However, you may have to double up on your role and responsibilities, depending on the number of people you have available. The following job roles are examples of what could be covered by the members of your team:

- **Team Manager** (maximum 1 person)
This person is responsible for managing the team, project management of all key deliverables and ensuring that all 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 medias. 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.

IMPORTANT - Please register your teams online at www.f1inschools.ie to attend an Irish Regional Final as soon as you have allocated your job roles.

There are so many tasks that must be mastered, in order to design, manufacture, prepare and finally, enter a car for racing. Teamwork and project management 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.



PLEASE ENSURE YOU READ AND CHECK THE TECHNICAL REGULATIONS VERY THOROUGHLY BEFORE BEGINNING THE DESIGN AND CONSTRUCTION OF YOUR F1 IN SCHOOLS CAR.

DESIGN CONSIDERATIONS

Design Preparation

Before beginning to design your car, you will need:

- A 3D CAD solid modelling software package at your school/college. We strongly recommend the use of Autodesk Fusion 360, which can be obtained **free of charge**. Solidworks is also highly recommended.
- Our 3D CAD file of the official F1[®] Model Block. This can be downloaded from www.f1inschools.ie/downloads
- The dimensions of the F1[®] Model Block are also available in the appendix of the Technical Regulations
- Hopefully, an endless supply of ideas!

Training

CAD packages will help you draw and develop your ideas in 3D. Of course, as with most drawing packages, it takes time to learn how to use them. Your technology/DCG teacher should be able to show you how the software works, but members of your team will need to spend some time exploring the software, so you can see what it can do and how it can help you design your F1 car. Tutorial videos will be posted on our website.

Research

Investigate existing F1 car designs. Your teacher may be able to help you use the internet to find out the latest developments occurring in the world of F1 design. Concentrate your research on areas that could help your team, for example, aerodynamics and car body designs and then try to apply the principles to your own ideas.

Testing

Your team may want to consider testing a variety of car designs, or car parts, in a wind and/or smoke tunnel to evaluate their aerodynamic performance. 'Autodesk Flow Design' virtual wind tunnel software is available to download free of charge. Alternatively, Solidworks flow simulation is a very good option used by most teams.

Manufacturing Considerations

Please note that your car design template must be at least 10mm shorter at one end, compared to the actual F1[®] Model Block. You will not be able to machine to the extreme ends of the official F1[®] Model Block since they are sometimes used for attaching the CNC machine fixtures. Damage could occur if the cutting tool hits any of these fixtures.

The fixture is used to stop the official F1[®] Model Block moving whilst being machined. It also allows the block to be accurately repositioned. Please note however, that some machines will process with only one cut, others may require two or more cuts and therefore you will need to take this into account when you are designing your car.

Once machined, you can smooth down the official F1[®] Model Block design and finish with primer and paint. Note that only a limited amount of hand finishing to the body is allowed. You could also decorate the car body with any sponsorship stickers, decals, advertising or colour schemes.

Essential Equipment

You do not need to possess any equipment to get started in the competition. A CAD package license, CNC machine and 3D printer would make the competition a lot easier. F1 in schools will provide a manufacturing service for any team who needs it. This will include both CNC machining and 3d printing. Further details can be found on our website.

Some high-end 3D modelling software can be obtained for free also (e.g. Autodesk Fusion 360).

Consumables

Consumables for the challenge can be purchased from www.isupply3d.com

Enquiries and Questions

If in doubt, just ask. You can contact us on our website, or via our email teams@f1inschools.ie.

ARTICLE C1 – DEFINITIONS

C1.1 Article

Each section in all documentation will be referred to as an Article which brings F1 in Schools documents in line with the Fédération Internationale de l'Automobile (FIA) documentation.

C1.2 Parc Ferme

A secure area where all race cars are held to prevent unauthorised handling but to allow technical inspections to be conducted by the Judges. (Literal meaning in French of 'closed park').

C1.3 Competition Schedule

The competition program will detail the schedule of judging activities for all teams.

C1.4 Key Performance Indicators (KPI's)

These are portions of text that feature on the scorecards within a corresponding points range. The KPI's describe the type of evidence the Judges are looking for in order to score the team appropriately.

C1.5 Car Race Time Value

A 'car race time' value is the actual time taken for a F1 in Schools™ car to travel the track from start to finish, measured from the instant the launch pod fires to when the car breaks the finish line timing beam. In the case of reaction races, the 'car race time' value is calculated as the 'total race time' value displayed on the electronic start gate minus the 'reaction time' value displayed for that race.

C1.6 Total Race Time Value

The 'total race time' value is displayed in the total time field on the electronic start gate at the conclusion of every race. This time is the sum of the 'car race time' value and any 'reaction time' value displayed on the electronic start gate.

C1.7 Reaction Time Value

A 'reaction time' value is the time recorded from the instant the five (5) start lights extinguish to the instant the start trigger is activated by the driver. This value is displayed in the reaction time field on the electronic start gate.

C1.8 Project Elements

These are any materials and resources that the team presents as part of its entry for any judging activity.

C1.9 Engineering Drawings

Hand drawn or CAD produced drawings, which along with relevant machinery and/or CAM programs, could theoretically be used to manufacture the fully assembled car by a third party. Such drawings include all relevant dimensions, tolerances and material information. F1 in Schools engineering drawings include detail to specifically identify and prove compliance for the virtual cargo and wing surfaces.

C1.10 Renderings

Renderings are images intended to illustrate the three-dimensional form of an object. These can be hand drawn or CAD generated in isometric projection, oblique projection or perspective.

ARTICLE C2 – GENERAL INFORMATION

C2.1 Competing Teams

C2.1.1 Each team must consist of a minimum of 3 students to a maximum of 6, between the ages of 11-19. Team members competing at a Regional and/or Irish National Final must be those registered to compete with F1 in Schools on the official online registration form. If for any reason, a team member cannot travel to an event and is to be replaced by another individual, this must be brought to the attention of F1 in Schools prior to the event.

C2.1.2 Only the registered team members of any official competing team (maximum 6) are permitted to wear the team's uniform.

C2.1.3 During the competition, only the official core team members (maximum of 6) can represent the team at registration, Pit Display set up, Scrutineering review, Verbal Presentation, Design & Engineering judging and Enterprise judging, racing, on-stage presentations and any direct communication with the Chair of Judges or Event/Competition Directors.

C2.2 Team Responsibilities

C2.2.1 Teams must read the Irish **Technical Regulations** carefully to ensure their car(s) comply with those regulations.

C2.2.2 Teams must read the Irish **Competition Regulations (this document)** carefully to ensure that all project elements satisfy these regulations and that they understand the requirements and procedures for all aspects of the competition and judging.

C2.2.3 During the competition it is the team's responsibility to ensure that team members are present at the correct time and location for all scheduled activities.

C2.2.4 Security of the pit display and its elements is the team's responsibility during competition.

C2.3 Role and Responsibility of Supervising Teacher/Adult

C2.3.1 All supervising teachers/adults should explain all relevant information to their students.

C2.3.2 It is the primary responsibility of any supervising teacher/adult to ensure duty of care/wellbeing for all their student team members. Any concerns arising during the event in relation to this should be brought to the attention of F1 in Schools immediately.

C2.3.3 The supervising teacher/adult is permitted to be present during any judging activity with their team 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.

C2.4 Regulation Documents

C2.4.1 F1 in Schools issues the regulations, their revisions and any amendments made.

C2.4.2 Competition Regulations - (this document). The Competition Regulations document is mainly concerned with regulations and procedures directly related to judging and the competition event. Competition Regulation articles have a 'C' prefix.

C2.4.3 Technical Regulations – a separate document which is mainly concerned with regulations that are directly related to F1 in Schools™ car design and manufacture. Technical Regulation articles have a 'P' prefix for Professional Class.

C2.5 Interpretation of the Regulations

C2.5.1 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.

C2.5.2 Text clarification - any frequently asked questions that are deemed by F1 in Schools to be related to text needing clarification will be answered. The question and the clarification will be published to all teams at the same time.



C2.6 Supplementary Competition Regulations

Other documents may be issued by F1 in Schools that 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 manager has supplied F1 in Schools with a contact email address.

C2.7 Design Ideas and Regulation Compliance Queries

Teams are not permitted to seek a ruling from F1 in Schools, 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 an event. Design compliance to the regulations forms part of the competition. As in Formula 1, innovation is encouraged and F1 in Schools teams may also find, sometimes controversial ways, of creating design features by pushing the boundaries in order to get an extra competitive edge.

C2.8 Team Partnerships

C2.8.1 F1 in Schools teams are encouraged to develop mentoring partnerships with businesses, industry or higher education organisations throughout their project.

C2.8.2 All design work, text and scripting for all project elements presented for assessment must be wholly undertaken and created by the team. This includes all CAD and CAM data, electronic portfolio and graphic content.

C2.8.3 All aspects of any partnerships should also be represented in the team's portfolio. For project elements produced utilising some outside assistance, teams should be able to demonstrate to the judges a high level of understanding of, and justification for, any of the processes used.

C2.8.4 'Common sense' will prevail for project elements or components that a team has purchased from a supplier. E.g. bearings, screw eye, display hardware. Teams should be able to explain and justify why a specific component was selected/purchased over other similar available components.

C2.9 Mandatory Project Elements for Regional/National Final Entry

C2.9.1 Regional Final:

- One (1) F1 in Schools car including all optional replacement components
- One (1) A3 or similar Design & Engineering Portfolio
- One (1) A3 or similar Enterprise Portfolio
- A 5-minute Verbal Presentation with laptop and USB memory stick.
- A Pit Display

C2.9.2 National Final:

- Two (2) identical F1 in Schools cars and replacement components ([1 car is sufficient if your team uses the official F1 in Schools Ireland manufacturing partner](#))
- Two (2) identical A3 or similar Design & Engineering Portfolios
- Two (2) identical A3 or similar Enterprise Portfolios
- Electronic version of both portfolios submitted to F1 in Schools
- A Pit Display
- A 10-Minute Verbal Presentation with laptop and USB memory stick
- A4 Engineering Drawings of the completed race car
- A4 Renderings of your finished race car
- A digitally submitted Marketing, Sponsorship & Digital Media (MSDM) Strategy Document (2000 word/4 page max)
- A Project Elements Submission Checklist which must include the official F1® Model Block holographic sticker, if applicable. [Teams availing of the free F1 in Schools manufacturing service will not have to include the holographic sticker as part of their submission.](#)

C2.9.3 Pit Display - each team will be provided with a dedicated exhibition style space for set-up of their pit display elements. The specific style and size of this space will be announced in supplementary event competition regulations. Refer to ARTICLE C7 for further pit display specifications and content requirements.

C2.9.4 Verbal Presentation - teams will be required to deliver a Verbal Presentation in relation to their project to the Judges. The presentation must not last longer than **5 minutes (10 minutes at the Irish Nationals)**. Teams must bring their own laptop with any slide show or other multimedia files that need to be shown as part of their Verbal Presentation. The presentation must also be submitted on a USB memory stick. [Verbal presentations can be judged over Zoom. This option will be assessed on a case-by-case basis.](#)

C2.9.5 Project Element Submission Checklist – teams must complete the checklist (please refer to Appendix iii) and attach their official F1 Model Block holographic sticker (if applicable) for submission at the event.

C2.9.6 Marketing, Sponsorship & Digital Media (MSDM) Strategy Document (**Irish National Final Only**) – teams must submit their MSDM Document electronically, in advance of the Irish National Final. Further information about how to submit the document will be given to teams after qualifying for the Irish National Final.

C2.10 Team Registration at the Event

C2.10.1 Teams will be required to register with F1 in Schools once arriving for the event. At this registration, teams will be issued with a detailed event welcome pack. The student team manager and supervising teacher/adult for each team should attend.

C2.10.2 The Regional or National accreditation material issued will include the official F1 in Schools™ 30x15mm car decals, for teams that have not manufactured their own. These decals must be fitted to each car by the team following registration and prior to the submission of their project elements. [Every team is responsible for applying the correct decals to their car\(s\). Teams risk being docked marks as a result of not having the correct decals or placing these in the incorrect locations on the car\(s\). Please refer to the Technical Regulations for clarification on decal rules.](#)

C2.11 Submission of F1 in Schools™ car(s)

Once the race-ready car(s) have been submitted, they are considered as being in Parc Ferme.

C2.12 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 from 2017 onwards.

The F1 IN SCHOOLS 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.

C2.14 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.

C2.15 Spirit of the Competition

Teams are expected to act in the spirit of the competition, both before and during any F1 in Schools events. 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 exploit the technical regulations to their advantage may, at the discretion of the chair of judges, be removed from racing and receive no points for this activity.

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 F1 in Schools. Make friends, create positive relationships, network professionally and enjoy yourselves.

ARTICLE C3 – COMPETITION AND JUDGING FORMAT

C3.1 Competition Program

C3.1.1 Each team will be judged as per the competition program. The competition program will be formulated by F1 in Schools to best and fairly accommodate all judging and other competition activities. Teams will rotate around judging activities as per this program, with each rotation usually of 15 minutes in duration.

C3.1.2 Judging Streams – the competition program will normally be divided into two parallel judging streams (Stream A and Stream B), to help ensure quality judging time intervals within the event time constraints. A number of strategies are implemented within the judging process, including judge briefings and judge reviews for cross-moderation to ensure there is consistency across the judging streams.

C3.2 Judging Categories

There are six (6) main judging categories, each with its own team of judges and specified judging activities as detailed in further articles.

- Specification and Scrutineering Judging
- Design and Engineering Judging
- Enterprise Judging
- Marketing Judging
- Verbal Presentation Judging
- Racing

C3.3 Judging Scorecards

The F1 in Schools judging scorecards provide detailed information in relation to what the Judges will be looking for. They include key performance indicators which are referred to by the judges in awarding points during judging activities. The judging scorecards can be found from p19 of this document, alongside guidance for the corresponding judging category. Reading the scorecards carefully is important. They provide critical information for teams as to what needs to be presented for each judging category.

The judging scorecards are not to be viewed as assessment criteria but are for the purpose of ranking teams at F1 in Schools events. Marks given may differ between events, so scores should not be used exclusively to determine the strengths and weaknesses of a team.

C3.4 Irish National Champions

The CJJ Motorsports National Champions trophy will be awarded to the team with the highest total score, sum of all judging categories (ARTICLE C3.5). In the case of a tied points score, the team with the highest racing score will be determined the winner.

THE CHAIR OF JUDGE'S DECISION IS FINAL!

C3.5 Point Allocations

Points will be awarded to teams across six (6) categories in Professional Class, with maximum possible scores as detailed in the following table:

Qualifying Round:

5-Page Proposal Plan	
Research and Design	20 points
Team Structure	10 points
Sponsorship, Budgeting and Project Management	10 points
Marketing and Brand	10 points
TOTAL	50 points

Regional and National Finals:

Specification and Scrutineering Judging	
Specifications	110 points
Engineering Drawings	20 points
Rendering	20 points
Quality of Finish and Assembly	20 points
Design and Engineering Judging	
Design & Engineering Portfolio	180 points
Enterprise Judging	
Enterprise Portfolio Only Assessment	100 points
Team Identity	20 points
Pit Display	60 points
Marketing Judging (Irish National Final Only)	
Marketing & Sponsorship Strategy	20 points
Digital Media Strategy	20 points

Verbal Presentation Judging	
Technique	80 points
Composition	40 points
Subject Matter	60 points
Racing	
Time Trials	110 points
Reaction Racing	110 points
TOTAL	970 points

C3.6 Classification of Regulations

The technical regulations are classified as either: **GENERAL**, **SAFETY**, **PERFORMANCE**.

GENERAL	SAFETY	PERFORMANCE
Regulations that shape the way the car fundamentally looks and works, vital to the style of an F1 in Schools car.	Mandatory rules that govern the safe running of the car. Cars must meet these rules to be considered 'safe to race'.	Rules that have a direct impact on the performance of the vehicle, these typically carry the heaviest penalties.

P2.4.2 If a race car is judged as being NON-COMPLIANT with any Performance regulation, they will be INELIGIBLE for the awards of: 'Fastest Car' and 'Best Engineered Car'. All Performance regulations are highlighted in yellow throughout this document.

ARTICLE C4 – 5-Page Proposal Plan (50 points)

C4.1 What will be judged?

The 5 Page Proposal Plan is a document prepared by teams which is used by F1 in Schools Ireland to assess teams' progress and determine which teams qualify for the Regional Finals.

C4.2 Team Preparation

Teams must prepare a 5-page document (front and rear cover not included) which outlines their plan for the F1 in Schools season. This plan should consider the design and development of the car, team and financial management, and the team brand and marketing strategy. Teams must submit the 5 Page Proposal Plan electronically, in PDF format, by 5PM on the 17th of December 2021.

C4.3 Who needs to attend?

5 Page Proposal judging is completed remotely. There is no need for attendance.

C4.4 Judging Process

5 Page Proposal plans will be evaluated remotely by an experienced team of F1 in Schools Judges, according to the KPI's outlined below. Feedback will be communicated to each team on their adherence to the KPIs.

5 Page Plan																				
	Low band				Middle band							High band								
Research and Design	Limited detail on research undertaken to date.				Basic research concepts outlined. Some evidence of sketching and CAD design development.							Several research concepts outlined with clear understanding and detailed explanations. Clear evidence of numerous design concepts being explored through both sketching and CAD.								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Team Structure	Limited detail on team structure.				Some evidence of roles and team planning (meeting agendas, charts)							Clearly defined and justified team roles linked to skills/interests. Strong evidence of teamwork and planning. Evidence of collaboration across tasks.								
	1	2	3	4	5	6	7	8	9	10										
Sponsorship, Budgeting and Project Management	Limited detail on sponsors and finance.				Sponsors and sponsor packages presented. Basic budget and spending plan. Spending not justified appropriately.							Excellent project plan with contingency and risk analysis, documented through Gantt Chart or similar. Sponsorships presented with clear return on investment. Detailed budget and spending plan with justified spending impact.								
	1	2	3	4	5	6	7	8	9	10										
Marketing and Brand	Some explanation of team name and brand colours. Social media handles.				Basic social media strategy presented. Justified explanation of team name and brand identity.							Clearly defined target audience. Advanced use of social media and online marketing to reach audience. Clear brand identity consistently shown throughout document, website (if applicable) and social media. Justified brand identity with compelling "story".								
	1	2	3	4	5	6	7	8	9	10										
5 Page Plan Total =																			/50	

ARTICLE C5 – SPECIFICATION & SCRUTINEERING JUDGING (170 points)

C5.1 What will be judged?

Scrutineering judging is a detailed inspection process where all race cars plus any optional replacement components are assessed for compliance with the F1 in Schools Technical Regulations. The A4 Engineering Drawings, A4 Renderings and quality of finish & assembly will also be assessed. **Refer to the scrutineering and specification judging scorecards for scoring details.**

C5.1.1 Optional replacement components must be identical to those fitted to all race cars and must be submitted with the car. Only the following replacement components are permitted:

- Rear wing/support structure – maximum of three (3)
- Front wing/support structure and / or nose cone – maximum of three (3)
- Wheel/wheel support system – maximum of three (3) car sets

Submitted replacement components that are determined by the judges to not be identical to that which is fitted to the car will not be allowed to be used. Submitted components will remain in Parc Fermé and only be handed back to the team if needed during racing and / or car servicing.

C5.2 Team Preparation

Teams must ensure that their car(s) and any optional replacement components are complete and ready for specification judging and racing before they are submitted. At the Irish National Finals, teams must also submit an electronic copy of all specified project data such as scrutineering engineering drawings, which may all be referenced.

HELP *For more information, refer to ARTICLE C2.9 and C3.6.*

C5.3 Who needs to attend?

Specification & Scrutineering judging is a closed activity that no team member or supervising teacher may attend. At Irish National Finals, for selected teams there will be a specification review session scheduled that must be attended by the team manager, team design and manufacturing engineers as a minimum.

C5.4 Judging Process

Teams begin specification judging with a full allocation of 110 points. Any infringements of the Technical Regulation articles, on either car, will result in points being deducted as detailed in the Technical Regulations. There are two (2) parts to the specification judging process.

- **Specifications** – this is conducted within the confines of Parc Fermé, where the specification Judges will scrutineer all cars submitted and optional replacement components for compliance to the Technical Regulations. A series of specially manufactured gauges will be used to broadly check compliance. Accurate measuring tools, such as Vernier callipers will then be used to closely inspect any dimensions found to be near to dimensional limits per the initial gauge inspection. Scrutineering commences immediately, as soon as cars and optional replacement components are submitted.
- **A4 Engineering Drawings & Renderings** – these documents are used along with the car(s) to assess Engineering Drawings, Rendering and Quality of Finish & Assembly as on the Scrutineering Judging scorecard - this is conducted within the confines of Parc Fermé, where the specification Judges will assess both cars as per the Scrutineering scorecard.

HELP *The specific areas to be assessed are described on the scorecard and specifications sheets on the following pages.*

C5.5 Safe/Fit to Race Fix

At Irish National Finals, a special 20-minute car service time will commence prior to the start of racing, for any teams judged during initial scrutineering to have incurred a regulation failure from the list below. Cars must meet these rules to be considered 'Safe/Fit to race. If during this service time the car can be modified to comply with the failed regulation(s), the team will then only incur half the penalty points for that infringement, without being classified as having incurred a **SAFETY** infringement.

Safe/Fit to race regulations: **T3.2.1, T3.7, T5.1, T5.5, T5.6, T7.1, T7.2, T7.3** and **T8.11**

Scrutineering Judging

Team Number:

Team Name:

Scorecard


School:

Scrutineering				
	Low band	Middle band	High band	
Engineering Drawings	Limited detail, Little or no annotation	Third angle orthographic projection. Excessive or insufficient detail	Third angle orthographic projection and un-rendered isometric view or similar. Additional views to show sufficient detail. Parts list / bill of materials and regulation compliance shown	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Rendering	Basic use of colour and 3D to show finished car	Well-proportioned full colour 3D renders showing more than 1 view. Detail close to final car.	Many different views. Very close match to final car including branding. Fitting environment and lighting. High end drawing / rendering technique	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Quality of Finish and Assembly	Reasonable finish with some inconsistencies	Good overall finish quality and assembly with attention to details	Excellent finish quality on all components. Very high attention to detail across all assembly and finishing. Two cars are identical	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Scrutineering Total =				/60

Notes:

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Car A	Car B	Team Number:			Remarks
						Judge 1	Judge 2	Judge 3	
P SPECIFICATIONS SCORECARD – Professional Class (1 of 3) (Car B applies to Irish National Final only) (CO ₂) – measured with full 8g CO ₂ cartridge						Team Name:			
ARTICLE P3 – Fully Assembled Car									
P3.1.1	Designed and engineered using CAD / CAM	Check Portfolio	-5						
P3.1.2	Body manufactured using CNC only	Check Portfolio	-5						
P3.1.3	Holographic sticker	Must be supplied	-5						
P3.1.4	Both cars designed with identical geometry	Visual / Eng. drawing Check	-5						
P3.2.1	Safe construction	Check P3.2.1	-10						
P3.3	Undefined features	Check PI.1	-20						
P3.4	Total length	Min:170mm Max:210mm	-5	PP+	PP+				
P3.5	Total width	Max: 85mm	-5	PP+	PP+				
P3.6	Total height	Max: 65mm	-5	PP+	PP+				
P3.7	Total weight	Min: 50.0g	-10	PP+	PP+				
P3.8	Track clearance (CO ₂)	Min: 1.5mm	-10	PP+	PP+				
P3.9	Status during racing	Nothing removed	-5						
P3.10	Replacement Components	Identical to fitted	-5						
ARTICLE P4 - Body									
P4.1	Body construction	FI Model Block	-20						
P4.2	Virtual cargo – See T4.3 for dims	Between Axles	-25						
P4.3	Virtual cargo identification	Check Eng. Drawing	-2						
P4.4	FI in Schools logo decal location	Check PI.12	-5						
P4.5	Decal thickness	Max: 0.5mm	-5						

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Car A	Car B	Team Number:			Remarks
						Judge 1	Judge 2	Judge 3	
P SPECIFICATIONS SCORECARD – Professional Class (2 of 3) (Car B applies to Irish National Final only) (CO ₂) – measured with full 8g CO ₂ cartridge						Team Name:			
ARTICLE P5 – CO₂ Cartridge Chamber									
P5.1	Diameter	Min: 17.8mm Max: 19.5mm	-10						
P5.2	Distance from track surface (CO ₂)	Min: 30mm Max: 40mm	-5	PP+	PP+				
P5.3	Depth	Min: 45mm Max: 58mm	-5	PP+	PP+				
P5.4	Max. angle of chamber	Min: -3° Max: 3°	-5						
P5.5	Chamber safety zone	Min: 3mm	-10						
P5.6	CO ₂ cartridge visibility (top view) (CO ₂)	Min: 5mm	-10	PP+	PP+				
ARTICLE P6 – Tether Line Guides									
P6.1	Location	2 guides, 15mm fore/aft CL's	-10						
P6.2	Internal dimension	Min: 3.5mm Max: 6mm	-5						
P6.3	Tether line guide safety	200g test, safe to Race	-10						
ARTICLE P7 – Wheels / Wheel Support									
P7.1	Number and location	4, 2 x 2	-25						
P7.2	Distance between opposing wheels	Min: 30mm	-2.5 PW	PP+	PP+				
P7.5	Diameter	Min: 28mm Max: 34mm	-2.5 PW	PP+	PP+				
P7.4	Width (excluding chamfers / fillets)	Min: 15mm	-2.5 PW	PP+	PP+				
P7.9	Visibility (top and bottom views)	See diagram	-25						
P7.10	Visibility (side view – exc. wheel support)	Not obscured	-15						
P7.11	Visibility in the front view	Only obscured below 15mm	-10	PP+	PP+				
P7.6	Racetrack contact (CO ₂)	Tolerance +/- 0.5mm	-2.5 PW						
P7.7	Rolling surface	Consistent, No Tread	-2.5 PW						
P7.12.1	Wheel support systems	Cylindrical Volume	-5						
P7.12.2	Wheel support systems identification	Check Engineering Drawings	-5						
P7.8	Rotation (tested on minimum 2° incline)	Reasonably minimal effort (2°)	-5						
P7.3	Wheelbase	Min: 100mm	-5	PP+	PP+				

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Car A	Car B	Team Number:			Remarks
						Judge 1	Judge 2	Judge 3	
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 10%; text-align: center;">  </div> <div style="width: 60%;"> <p>SPECIFICATIONS SCORECARD – Professional Class (3 of 3) (Car B applies to Irish National Final only) (CO₂) – measured with full 8g CO₂ cartridge</p> </div> <div style="width: 30%;"> <p>Team Name:</p> </div> </div>									
ARTICLE P8 – Nose Cone									
P8.2	Nose Cone Identification	Check Engineering Drawings	-5						
ARTICLE P9, 10 – WING AND WING SUPPORT STRUCTURE									
P9.2, 10.2	Description and placement	F & R & Height	-25						
P9.1, 10.1	Wing identification	Check Eng Drawing	-5						
P9.4	Front wing / support structure location	In front of FW CL, up to 30mm	-10						
P10.4	Rear wing / support structure location	Behind RW CL	-10						
P9.7, 10.7	Visibility of wings	Not obscured in front view	-25						
P9.5.1	Front wing span	Min: 50mm	-5	PP+	PP+				
P10.5.1	Rear wing span	Min: 50mm	-5	PP+	PP+				
P9.5.2	Front wing chord	Min: 15mm Max: 25mm	-5						
P10.5.2	Rear wing chord	Min: 15mm Max: 25mm	-5						
P9.5.3	Front wing thickness	Min: 2mm Max: 6mm	-5						
P10.5.3	Rear wing thickness	Min: 2mm Max: 6mm	-5						
P9.6, 10.6	Clear airflow	5mm clear 'air' space	-10						
P9.3, 10.3	Construction and Rigidity	Span constant during racing + rigid	-5						

Total Deductions (Car A + Car B):										
Points Available:						110				
Score = Points Available – Total Deductions										

Article C6 - DESIGN & ENGINEERING JUDGING (180 points)

C6.1 What will be judged?

The Design & Engineering judges will mark your 10-page Design & Engineering Portfolio so that they can assess the team's car design and use of CAD/CAM technologies along with the quality of manufacture of all race cars submitted. *The purpose of this interview is to assess the team's Design & Engineering knowledge. Judges will score your portfolio prior to the interview. Judges can choose to increase your score after the Engineering Interview if they believe the team show a greater Design and Engineering understanding than your portfolio provides. Your score can not be decreased as a result of the Interview.*

C6.2 Team preparation

A laptop needs to be ready and taken to Design & Engineering judging along with any other items which may help the team explain any Engineering or manufacturing concepts. The Design & Engineering judges will have access to the car(s) submitted for racing. Preparation should include careful reading of the scorecard. The key performance indicators for the design process, application of CAD / CAM, analysis and associated data organisation, describe what the judges will be looking for.

C6.3 Who needs to attend?

This judging session must be attended by the team manager and team design and manufacturing engineers as a minimum.

C6.4 Judging Process

Teams will be awarded points as per the key performance indicators shown on the Design & Engineering scorecard. Judges will review the Design & Engineering portfolio in a 'closed to teams' session programmed before the commencement of scheduled judging sessions. The scheduled Design & Engineering judging interview session will focus on the overall Engineering and Design of the car. This is an informal interview where Judges will ask the team to demonstrate their CAD/CAM work and query teams on what they have done. The quality of car manufacture and car assembly will be judged during a separate 'closed to teams' session.

HELP *Please note: The Best Engineered Car award takes into account any penalties occurred through damage during racing (please refer to C11.1.3 for more details).*

C6.5 Design & Engineering Portfolio requirements

The portfolio is limited to **10 pages** of content, which **does not** include the front and back covers. This can be 10 single sided or 5 double sided sheets. If a portfolio comprises more than 10 pages, the Judges will only assess the first 10 PRINTED pages after the front cover. The Design & Engineering portfolio must be in a printed 'hard copy' format of A3 or similar size.

Irish National Final: teams must also provide an electronic copy of their Enterprise and Design and Engineering portfolios to F1 in Schools. Submission details will be provided to teams prior to the event.

There **MUST** be content related to the use of CAM and CNC manufacturing included in the portfolio and this will be referenced by the Engineering Judges. An orthographic drawing and 3D render must also be included in the portfolio, refer ARTICLE C2.10. Content related to the car, design ideas, design development, research, testing and evaluation are commonly presented within the portfolio.

Please note: Front and back covers do not contribute towards the portfolio assessment in any way, these are purely presentation items.

HELP *The specific areas to be assessed are described on the scorecard on the following page.*

Design & Engineering Scorecard

Design & Engineering Portfolio Only Assessment

	Low band	Middle band	High band	
Design Concepts	Single or basic hand sketched concepts	Multiple hand sketched concepts with links to research. Some evidence of physical 3D modelling	Several clearly annotated, hand sketched ideas for different car components. Experimentation of ideas using physical and CAD 3D modelling	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
3D Modelling	Basic application. Only final design 3D modelled	Appropriate 3D modelling in development stages. Dimensional constraints of F1® model block considered	Advanced use of physical and CAD 3D modelling techniques to develop final concept through iterative approach. Designed for manufacture considerations (i.e. fillets)	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Application of Computer Aided Analysis	Limited CFD/FEA analysis shown	Appropriate analysis shown. Results applied to development	Advanced and relevant. Virtual analysis integrated throughout design development	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Use of CAM/CNC	Limited evidence of CAM/CNC understanding	Effective use and understanding of CAM/CNC processes used	Evidence of excellent understanding of CAM/CNC technologies. Appropriate techniques and processes used to achieve manufacturing goals	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Other Manufacturing & Assembly	Limited manufacturing presented. Outsourcing with minimal understanding or justification	Manufacturing process and stages described. Appropriate use of manufacturing resources documented (i.e. tools, finishes, jigs, fixtures)	Details all manufacturing stages and processes. Quality assurance and workplace safety considerations evident. Appropriate outsourcing justified	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Research & Development	Limited evidence of R&D	Some scientific & mathematical theories and principles considered. Logical research-based design developments explained	Relevant R&D throughout the entire product design & development cycle, demonstrating high level CAD skills where appropriate. Design developments justified from research findings	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Testing	Limited evidence of testing	Limited testing. Some evidence of method and outcomes	Purposeful testing with method and outcomes documented. Evidence of virtual and physical testing on the fully assembled car and individual components	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Design Process Evaluation	Limited design process evaluation	Ideas or process evaluations at different stages	Excellent ongoing idea evaluations linked to improvement actions	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Document Presentation	Difficult to follow with basic presentation	Document clearly structured and well organised	Document has high impact and professional throughout. Consistent and clear organisation	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Design & Engineering Portfolio Only Assessment Total =				/180

Notes:

Note: For “Other Manufacturing & Assembly”, you are being marked on appropriate outsourcing. If you choose to take advantage of F1 in Schools Ireland manufacturing services, this can be considered outsourcing.

ARTICLE C7 – ENTERPRISE JUDGING (180 Points)

C7.1 What will be judged?

The Enterprise Judges will mark your 10-page Enterprise Portfolio, and your Pit Display. [The purpose of this interview is to access the team’s Enterprise knowledge. Judges will score your portfolio prior to the interview. Judges can choose to increase your score after the Enterprise Interview if they believe the team show a greater enterprise understanding than your portfolio provides. Your score can not be decreased as a result of the Interview.](#)

C7.2 Team Preparation

Each team must prepare an Enterprise Portfolio and Pit Display as per ARTICLE C2.9. Most importantly, teams need to read the Enterprise judging scorecard carefully to ensure they have met all the areas to be assessed. It is each team’s decision how and where these areas are presented. Teams should be mindful of the time constraints of judging when making these decisions.

C7.3 Who needs to attend?

All team members must be present for their Enterprise Judging session.

C7.4 Judging Process

The Enterprise Judging will take place at each teams Pit Display. The Judges will usually introduce themselves then ask the team to stand clear of their display so the Judges can conduct assessments, while asking further questions about the work. Outside judging slots, the Judges will also be given some time to conduct pre-judging and review of each team’s Pit Display and Enterprise Portfolio.

C7.5 Enterprise Portfolio Requirements

The portfolio is limited to **10 pages** of content, which **does not** include front and/or back covers. This can be 10 single sided or 5 double sided sheets. If a portfolio comprises more than 10 pages, the Judges will only assess the first 10 PRINTED pages excluding the front cover. Portfolios are usually presented on A3 paper. No larger format paper will be accepted.

C7.6 Pit Display Setup and Parameters

C7.6.1 At Regional Finals, teams will be given a table to present their pit display. At Irish National Finals, F1 in Schools will provide each team with an exhibition style display booth. Exact layouts and dimensions of the space provided are unique to each venue and will be communicated to teams in advance of each event.

C7.6.2 At Irish National Finals, no part of the teams completed Pit Display is allowed to protrude beyond the physical dimensions of their allocated pit space. This includes anything that might protrude above the pit space highest point e.g. flags.

C7.6.3 ONLY student team members are permitted to set-up their pit displays. There must be no supervising adult or other outside assistance, unless deemed by F1 in Schools to be a health and safety issue.

IMPORTANT HEALTH & SAFETY: Please ensure that Health and Safety measures are considered when working on all aspects of your Pit Display. F1 in Schools reserves the right to apply a penalty of **up to 50 points** at the discretion of the Chair of Judges for unsafe activity.

C7.6.4 F1 in Schools and/or the Chair of Judges may instruct a team to take action to reduce noise or remove display inclusions deemed to be inappropriate. F1 in Schools will instruct teams to remove or alter any display inclusions considered to be a safety hazard.

C7.6.5 Please note, at Regional Finals there may be no availability of power for teams, so it is advisable not to rely on this assumption for your display. F1 in Schools will inform teams prior to events about the availability of power.

~~**C7.6.6** Teams will be asked to submit 1 A0 PDF poster for the Pit Display. The scorecard for the Pit Display will remain the same.~~

~~**C7.6.7** Teams can choose to submit a 2-minute video in order to integrate technology and multimedia into the Pit Display. This video should give an insight into why the Pit Display is laid out as shown. **Top tip:** Consider this video as if you are at an in-person event and the judges are just after arriving to your Pit Display for the Pit Display Interview.~~

HELP *The specific areas to be assessed are described on the scorecard on the following page.*

Enterprise Scorecard

Enterprise Portfolio Only Assessment				
	Low band	Middle band	High band	
Project Management	Little evidence of project management	Simple management and planning used to guide progress. A range of project resources identified. Basic team budget	Comprehensive project management. A range of factors considered; e.g. scope, time, resources and project risks. Plan changes discussed. Comprehensive financial management	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Teamwork	Limited team work evident	Evidence of effective team work with roles defined	Highly structured team with clear roles. All team members had effective and critical contributions. Role interactions recognised	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Sponsorship & Marketing Summary	Little evidence of attempt to collect sponsorship	Sponsor/partner hierarchy and roles described. Some attempt to clarify Return On Investment	Range of relevant sponsors/partners. Creative activities linked to Return On Investment. Evidence of FI in Schools program marketing	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
FI in Schools Project Evaluation	Limited project evaluation	Good evaluation of some project areas e.g. team work	Excellent ongoing project enterprise evaluation linked to improvement actions	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Document Presentation	Difficult to follow with basic presentation	Document clearly structured and well organised	Document has high impact and professional throughout. Consistent and clear organisation	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Enterprise Portfolio Only Assessment Total				/100
Team Identity				
Overall Team Identity	Inconsistent, limited or obscure identity	Effective team identity consistent through various project components e.g. car matches team uniform	Excellent and highly effective team identity. Team 'brand' consistently applied through all project elements	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Team Identity Total				/20
Pit Display				
Marketing	Little or no evidence of marketing	Good attempt – some marketing material on display	An excellent understanding of marketing with marketing material on display linked to sponsorship & sponsor 'return on investment' (ROI)	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Graphic Design	Poor pit display, little or no graphics or table display	Good pit display with a reasonable amount of graphics and a good table display with display items	Excellent pit display with professional looking graphics and a very structured table display with display items	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Pit Display Content	Limited detail shown, build quality shows basic construction methods	Clear and effective presentation and messaging. Multimedia used to enhance display	Clean, well-organised with high impact. Highly professional with attention to detail. Excellent integration of technology and multimedia	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Pit Display Total				/60
Enterprise Portfolio Only Assessment + Team Identity Total + Pit Display Total = Enterprise Total =				/180

Notes:

Article C8 - VERBAL PRESENTATION JUDGING (180 points)

C8.1 What will be judged?

- Presentation technique (how your team comes across during the presentation)
- Presentation composition (how well you structure your presentation)
- Subject Matter (the topics which need to be talked about)

C8.2 Team Preparation

Each team is required to prepare a **5-minute (Regional)** and **10-minute (Irish National Final)** Verbal Presentation as per the requirements at ARTICLE C2.9.4. Any multimedia content, slides etc. must be saved on and shown, using the team's own laptop. Teams must have all presentation resources tested and ready with them for Verbal Presentation judging. Most importantly, teams should read the Verbal Presentation judging scorecard carefully to ensure their verbal presentation features all elements and content that the judges will be looking for.

C8.3 Who needs to attend?

All team members must be present during the Verbal Presentation judging session.

C8.4 Judging Process

Verbal Presentation judging is scheduled for the same duration of other judging sessions, usually 15 minutes. Teams will be given an opportunity at the start of their time to set-up and test their laptop and any other presentation technologies and resources. The team will inform the judges when they are ready to begin. The judges start timing the 5-minute/10-minute duration and will provide a discreet time warning signal when one minute of presentation time remains. The team will be asked to cease presenting when the time limit has been reached. At the conclusion of the team's presentation time, the judges may choose to provide some feedback and/or ask any clarifying questions they feel necessary.

C8.5 Verbal Presentation Judging Provisions

F1 in Schools will provide a dedicated private space, such as a small meeting room, where each team will deliver their presentation to the judges. This space will include a data projector, screen and multimedia sound system. These will be in fixed positions but usually with sufficient cable length to allow teams some freedom for choosing where they wish to locate their laptop. A single table will also be made available with its use and location in the presentation space being optional.

C8.6 Video Recordings

The Verbal Presentations of all teams may be video recorded by F1 in Schools for the purpose of judging review and/or post event publicity and promotional purposes by F1 in Schools™.

HELP *The specific areas to be assessed are described on the scorecard on the following page*

Verbal Presentation Scorecard

Technique				
	Low band	Middle band	High band	
Visuals	Little use of aids	Some aids used effectively	Highly professional aids effectively improve communication	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Team Contribution	Minimal team participation	Good contributions from most team members	Excellent teamwork with all members participating effectively	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Dynamic/Energy	Artificial and/or low energy	Speakers generally enthusiastic with lively delivery	Passionate with effective and appropriate levels of liveliness	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Engagement	Minimal engagement	Some audience connection at times	Audience fully engaged and excited throughout presentation	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Technique Total				/80
Composition				
Concept Clarification	Several concepts lacked clarification	Clear and appropriate concept explanations	Everything presented was understood through excellent explanations	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Time / Presentation	Too fast or ran out of time. No structure presented	Good timing. Balanced topic depth and pace. A basic structure / outline provided and could be followed by audience	Ran on time or under. Excellent balance of depth for each topic. Clear presentation outline / overview. Excellent connections between topics and easy for audience to follow	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Composition Total				/40
Subject				
Innovation	Little project innovation presented	Project innovations described and justified	Originality. Clever innovations with high positive project impact	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Collaboration	Little collaboration discussed	Links with industry or higher education described	Collaborations justified with links to learning and project outcomes	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
F1 in Schools Learning Experiences	No real reflections discussed	Good explanation of some learning outcomes with reference to career aims	Compelling accounts of how the competition has impacted on life skills and career aspirations for a range of team members	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Subject Total				/60
Technique Total + Composition Total + Subject Total = Verbal Presentation Total =				/180

Notes: _____

ARTICLE C9 - MARKETING, SPONSORSHIP & DIGITAL MEDIA JUDGING (40 points – Irish NATIONAL FINAL ONLY)

C9.1 What will be judged?

The Marketing, Sponsorship and Digital Media (MSDM) judges will assess each teams' MSDM document which is limited to a maximum of 4 pages and 2,000 words. Please note, any pages only containing images will also count towards the 4-page maximum. A front cover page with the team name and/or team logo only can be submitted in addition to the 4 pages/2000 words.

Marketing and Sponsorship

For the marketing element, teams are asked to summarise their approach and reasoning to gaining awareness, engagement, sponsorship and any other marketing activities.

Digital Media

For this element, teams are asked to outline their approach and reasoning for social media platforms, electronic mailings, website, and other online communications. The Digital Media element within the document will be assessed in conjunction with a review of the team's Digital Media campaign executed.

C9.2 Team Preparation

Each team must prepare an MSDM document as per ARTICLE C2.11. Most importantly, teams need to read the Marketing, Sponsorship and Digital Media judging scorecard carefully to ensure that all areas to be assessed are included within the context of their document.

C9.3 Who needs to attend?

No team members are required to be present for judging, as the MSDM Strategy Document is submitted electronically and assessed prior to the event.

C9.4 Judging Process

MSDM judging will be assessed by the Enterprise Judges.

C9.5 Document Requirements

The MSDM strategy document must be formatted in A4 or similar size. The document is limited to a maximum of 4 pages and 2,000 words which **does not** include front and/or back covers and must be submitted digitally as per the instructions under article C2.9.6. The judges will only review the first 4 pages and 2,000 words for assessment purposes. There **MUST** be content relating to the marketing, sponsorship & social media strategies included in the document.

HELP *The specific areas to be assessed are described on the scorecard on the following page.*

Marketing, Sponsorship & Digital Media Scorecard

Marketing & Social Media Strategy				
	Low band	Middle band	High band	
Marketing & Sponsorship Strategy	Limited or irrelevant	Some planned marketing activity. Some development of sponsorship strategy explained	Creative and effective activities linked to marketing, sponsorship & sponsor 'return on investment' (ROI)	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Social Media Strategy	Limited or irrelevant	Some development, some impact, some consideration of audience and platforms	Clear, developed, high impact social media strategy. Careful consideration of target audience and suitable platforms	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Marketing & Social Media Strategy Total =				/40

Notes:

ARTICLE C10 – RACING (220 points)

C10.1 What Races will be Conducted?

At Regional and Irish National Finals, the F1 in Schools racing points will be awarded through the staging of two (2) types of race events:

- **Reaction Racing** – manual/driver launch mode, two races in each lane.
- **Knockout Cup Racing**

Reaction racing will be split over one (1) session of four races. The average 'car race time' value from all reaction races will determine the Fastest Car Award (refer to C10.6). Refer to ARTICLE C3.5 and further information following for details on how points are calculated and awarded.

C10.2 Team Preparation

C10.2.1 Teams should be familiar with the operation of the F1 in Schools Race System. There will be a practice run before the races to allow a nominated student the chance to familiarise themselves with the Race System operation.

C10.2.2 Manual/driver starts - one or more team members (drivers) must be appointed for launching of the team's car using the manual launch method. The driver must stand within the dedicated starting area.

C10.2.3 Finish line management - at least one member of the team must be appointed as responsible for managing the finish line deceleration system or teams' own system (refer C11.10.2) and return of car along the track to the start.

C10.2.4 Start line car staging – one team member may be appointed as being responsible for 'aligning' the car. This team member is only permitted to set the alignment of the car behind the start line, with respect to the launch pod and track under close supervision from the racetrack Judges. Team members are NOT permitted to interfere in any way with the CO₂ cartridge or vertical alignment of the launch pod. This process must be completed within a time limit of 30 seconds. Appointment of this team member is optional. All four wheels must be in contact with the track surface after completion of the car staging time. The race Judges can assist or perform this task for the team.

C10.2.5 Teams must ensure that both cars are race ready, a car service session will be provided before the next race event (refer C10.2). If a team's car is damaged beyond achievable repair, then teams will forfeit any races that the car would have been used for.

All team members must be present during their scheduled racing sessions and should assemble at the track start for briefing by the racetrack judges at their scheduled time.

C10.3 Race Procedure

Cars are launched in manual (driver launched) mode with four (4) races total per team, two (2) races in each lane. The TOTAL RACE TIME displayed, and the REACTION TIME displayed for each race is recorded. The reaction races will be conducted as follows:

1. Teams race in order as shown in the competition program. To begin racing, the lowest team number will start in lane 1. Both cars will be loaded onto the track.
2. One team member to track finish for deceleration system control.
3. Judge arms launch pod - SAFETY ON – makes initial launch pod adjustments.
4. Race 1 (Car A) - Judge sets cars on track / tether line and inserts CO₂ cartridge
5. A team member is then allowed 30 seconds to 'fine tune' the alignment of their car, please see C10.2.4 for more detail
6. Driver and team stand trackside with corresponding lane start trigger
7. Judge checks deceleration system is ready, track is clear for racing, switches launch pod - SAFETY OFF
8. Judge presses the start system reset button – cars are launched by driver pressing start trigger
9. Judge records TOTAL RACE TIME and REACTION TIME displayed on start gate

10. Team member at finish brings car back to the start line, race is repeated.
11. Judges swap the cars between lanes and the races are repeated.
12. Cars returned to Parc Ferme.

C10.4 Reaction Race Scoring

All four (4) 'total race times' recorded from the reaction races are considered. The fastest of these four (4) times is used in the following formulae to calculate the points awarded:

Fastest 'total race time' = 110 pts

2nd fastest 'total race time' = 105 pts

3rd fastest 'total race time' = 100 pts

Slowest 'total race time' = 30 pts

Base Time = 120% of 3rd fastest 'total race time'

4th fastest and all other teams score points using the following formula:

Team Points = $30 + (95 / (\text{Base Time} - \text{fastest 'total race time'})) \times (\text{Base Time} - \text{team's fastest 'total race time'})$

Any team with a best 'total race time' that is slower than the base time will score 30 points. To further discriminate between any teams scoring 30 points, a deduction of 5 points will be made for any did not finish (DNF) reaction race result.

C10.5 Time Trial Race Scoring

The four (4) 'car race times' recorded during the reaction races will be considered. From these four (4) races, the team's 2nd and 3rd best 'car race times' will be averaged. This average time is used in the following formulae to calculate the points awarded:

- Fastest average (avg.) time = 110 pts
- Second fastest avg. time = 105 pts
- Third fastest avg. time = 100 pts.
- 'Base Time' = 115% of the third fastest avg. time of all teams avg. times.
- Fourth (4th) to slowest avg. time score points using the following formula:

Team Points = $20 + (80 / (\text{Base Time} - \text{3rd fastest avg.})) \times (\text{Base Time} - \text{teams avg.})$

Any team that has an average slower than the base time will score 20 points. To further discriminate between these teams, a deduction will be made of 5 points for any did not finish (DNF) time trial result.

If after discarding a team's fastest time there remains less than two (2) times from races finished, due to DNF's, the slowest time recorded is again input to the average equation until there are a total of four (4) times to average.

C10.6 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 may refer to video evidence to verify a DNF result.

C10.7 False Starts

C10.7.1 A false start (jump 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.

C10.7.2 All reaction false starts will incur a 2.5-point penalty and by default, forfeit that race. This penalty does not apply to knockout racing.

C10.7.3 During knockout racing – if one team false starts (jump starts), the other team should continue to race as normal. The team which false starts forfeits that race, scoring a DNF and the other team's time is recorded. If both teams false start, the race counts as one of the two (2) runs.

C10.7.4 During any manual/driver starts, if a driver false starts and distracts the other driver the race will be re-run and the driver who caused the distraction will forfeit their race.

C10.7.5 Distractions outside of the race start area will be assessed by the lead track judge and track officials to determine if the race should be re-run. Spectators must keep noise down to a minimum and not use flash photography.

C10.9 Track, Tether Line and Timing System Information

C10.9.1 The F1 in Schools Elevated Racetrack, supplied by Denford Ltd will be used. The official length of the track, from start line to finish is 20 metres. A monofilament tether line of diameter 0.6mm, fixed at the finish end, passes down the centre of each lane. At the start end the line passes through 90 degrees over a single pulley then attached to a 1.0kg mass suspended above the floor.

IMPORTANT: Teams are not permitted to add anything to the racetrack until 250mm after the finish line/gate.

C10.9.2 Launch/Timing - The F1 in Schools Launch/Timing System will be used for launching cars and timing races and driver reaction times to 1/1000th of a second.

C10.10 Car Deceleration system

C10.10.1 The Car Deceleration System acts to bring cars to rest once crossing the finish line. Teams will need to provide their own Deceleration System for events. Typically, teams will use a towel that can crumple up to absorb the impact of the car and ensure no damage is done to the car on impact. An official F1 in Schools Car Deceleration System can be purchased here:

http://website.denford.ltd.uk/wp-content/uploads/2019/03/DenfordUKWEBCatalogue-04_19.pdf



C10.10.2 Teams may supply their own deceleration system and the team will be responsible for its management. Any system supplied by a team must be simple to setup within 1 minute and must not impede the opposing track lane, race car or the race schedule in any way. The judges, at their discretion, can rule any system supplied by a team to be inappropriate and revert to use of the standard deceleration system.

C10.10.3 Deceleration systems must be located a minimum of 250mm after the finish line.

C10.11 CO₂ Race Cartridges

CO₂ cartridges to be used for all competition races will be supplied by F1 in Schools. Each CO₂ cartridge will be separately weighed before competition to ensure that all CO₂ cartridges used for races are within a weight range of 0.5 grams. All race cartridges will be kept in a temperature-controlled environment of 21 degrees Celsius.

C10.12 Car Weight Checks

Cars will have their weight checked at the racetrack prior to commencing a race event. This is done to ensure each car remains at a legal weight during all races. If a car is judged to have gone under weight whilst stored in Parc Fermé, the judges will add ballast to return the car weight to what it was when first submitted to Parc Fermé, without penalty.

C10.13 Judges Handling Cars

The Race Judges will not be required to comply with any special car handling requests made of them by teams. This includes use of any special gloves or tools.

Article C11 – CAR REPAIRS AND CAR SERVICING

C11.1 Car repairs

C11.1.1 All damage issues and related repair work during racing is at the Judge's discretion and may be referred to the scrutineering Judges and/or Chair of Judges for a final decision.

C11.1.2 No items can be removed or added to a car during racing, other than CO₂ cartridges, except in the case of a repair.

C11.1.3 If any race car sustains damage during racing and this damage is ruled to be related to engineering deficiencies, the damage can be repaired using any of the defined replacement components. Any repairs using replacement components that can be safely performed in under 30 seconds will not incur any race penalty points. A timer will start when the race official places the damaged car on the official repair table. If the repair takes longer than 30 seconds, does not use the defined replacement components or the car is not race ready, then a 5-point penalty will be applied. A repair time limit of 120 seconds (2 minutes) will be applied, if the car is not race ready at the end of this time then any further repairs must take place in the next service session. This may include but not be limited to car body, wings & wheels being damaged as part of racing including damage occurring within the deceleration area.

HELP *Please note: The Best Engineered Car award is calculated using several scores from the competition, including penalty points incurred through damage during racing. Please see the Awards Matrix in the appendix of this document for more information.*

C11.1.4 Engineering deficiencies may include, but are not limited to, damage to car body, wings & wheels as part of racing including damage occurring within the deceleration area.

C11.1.5 Curing time for adhesives must be included in 30 second repairs.

C11.1.6 Tool kits are allowed to be taken to the racing. Teams must supply all of their own tools and other necessary resources. Judges will not be able to assist teams with any additional resource requirements.

C11.1.7 If the Judges rule that damaged sustained was not due to engineering deficiencies, immediate repairs will be permitted without penalty.

C11.1.8 No penalty is applied for damage incurred during knock-out racing or a car's final race of any race event.

ARTICLE C12 – JUDGES

C12.1 Overview

There will be a minimum of five (5) teams of judges plus officials that form the entire judging panel. Each judging team will have one (1) judge appointed as the Stream Lead Judge. Judges are competition alumni, education and industry experts invited by F1 in Schools. All judges sign a 'declaration' to ensure there are no conflicts of interest with respect to judges and the teams they are judging.

C12.2 Chair of Judges (Irish National Final only)

This is an independent authority appointed by F1 in Schools who oversees all judging procedures. The Chair of Judges will determine the final judging decision where a protest has been submitted or other judging issue needs resolution. The Chair of Judges will also preside over a meeting of all Lead Judges to ratify the final results along with nominations and winners for relevant awards. At Regional Finals, F1 in Schools will nominate one lead official to act as Chair of Judges for any resolutions.

C12.3 The Judging Teams

C12.3.1 Specification and Scrutineering Judges - will assess all race cars as per the Specification and Scrutineering scorecards.

C12.3.2 Design and Engineering Judges - will assess each team as per the Design & Engineering scorecard.

C12.3.3 Verbal Presentation Judges – will assess each team as per the Verbal Presentation scorecard.

C12.3.4 Enterprise Judges – will assess each team as per the Enterprise scorecard.

C12.3.5 Race Judges – will oversee and rule on all race events and any incidents.

C12.3.6 Car servicing officials – will oversee all car service activities and rule on any infringements that may occur.

C12.3.7 Marketing Judges (Irish National Final only) – will assess each team's use of marketing and social media.

C12.4 Judging Decisions

THE DECISION OF THE JUDGES AND OFFICIALS IS FINAL.

Article C13 – AWARDS

C13.1 Awards Celebration

The Regional and Irish National Final awards will be presented at the Awards Ceremony at the end of the competition.

C13.2 Participation Recognition

All students will receive an official participation certificate from F1 in Schools.

C13.3 List of awards to be presented

A full list of awards to be presented will be announced before the Regional or Irish National Final event. All awards will be presented to the team that achieves the highest score in each category taken from the scorecards unless otherwise stated below.

Achievement Awards:

1st Place Overall (winners presented with the CJJ Motorsport Perpetual Cup)
2nd Place Overall
3rd Place Overall
4th Place Overall / Collaboration Award
Best Engineered Car
Fastest Car

Star Quality Awards (one or more to be presented)

Best Team Identity
Best Social Media
Best Enterprise
Best Verbal Presentation
Best Pit Display
Best Innovation
Best Newcomer
Judge's Choice
Women in Motorsport Award
[Best Communicator](#)
[Fair Play Award \(if applicable\)](#)

APPENDIX: PROJECT ELEMENT SUBMISSION CHECKLIST



Key: Grey fill and **(NF)** denotes item only mandatory for Irish National Final

Team Number:	
Team Name:	
School:	

Project Element	PRE-EVENT: (Team members)	AT EVENT: (F1 in Schools Staff)	COMMENTS: (AT EVENT: Completed by F1 in Schools Officials only)
1 x 10 Page Design & Engineering Portfolio	TICK	TICK	
1 x 10 Page Enterprise Portfolio	TICK	TICK	
A4 Engineering drawings	TICK	TICK	
A4 Car renderings	TICK	TICK	
1 x 4 Page MSDM Strategy Document (NF)	TICK	TICK	
1 x Car A (Green Dot)	TICK	TICK	Weight: g
1 x Car B (Red Dot) (NF)	TICK	TICK	Weight: g
Rear Wing / Support Structure (Optional)	TICK	TICK	Max: 3 sets Number Submitted:
Front Wing / Support Structure (Optional)	TICK	TICK	Max: 3 sets Number Submitted:
Wheel / Wheel Support System (Optional)	TICK	TICK	Max: 3 car sets Number Submitted:
2 x Official F1 Model Block Holographic Stickers (if applicable)	TICK	TICK	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid red; border-radius: 50%; padding: 10px; text-align: center;">Car A sticker here</div> <div style="border: 1px solid red; border-radius: 50%; padding: 10px; text-align: center;">Car B sticker here</div> </div>

Sign-off by	Name	Signature
Team Manager:		
F1 in Schools Official:		



Please make sure you have also read the
F1 in Schools 2020-2021 Irish Technical Regulations

Work hard, see you on the track!

If you need any help at all, just get in touch with us:

F1 in Schools™ STEM Challenge
Student Innovation Ireland CLG

Website: www.flinschools.ie

Email: teams@flinschools.ie

Adapted by the F1 in Schools Ireland Team