



THE FORMULA ONE™ TECHNOLOGY CHALLENGE

2013 WORLD FINALS Competition Regulations



Front Cover – World Champions: Cold Fusion with Bernie Ecclestone, President and CEO, FOM.

Amendments made on, [Insert date here], will be indicated **thus** (using red underlined text).

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PREFACE – SUMMARY OF REVISIONS FOLLOWING 2012 REVIEW

This section provides an overview of all articles that have been revised from the 2012 Competition Regulations.

C1.12 – Definition of Engineering Drawings now included.

C2.1.7 – New regulation regarding the wearing of the team's uniform by non team members.

C2.10 – Design specification sheet removed as a requirement

C2.10.3 – Requirement for 'online' submission of portfolios detailed

C2.10.7 – New mandatory project element – 'Pressure Challenge' added

C3.2 – Pressure Challenge judging category added

C3.5 – Point allocations updated to reflect additional 100 points for the Pressure Challenge

C3.7 – Best team website removed. Now part of 'Social Media Award'

C4.5 – Critical Regulation failure rectifications will now result in a half points penalty.

C7.6 – Verbal presentations to be video recorded for judging review and / or promotions

C8.9 – Points awarded for elimination in round 1 of the knock-out racing reduced from 10 points to 0 [zero] points.

C8.12.1 – New race track specification details

C9.1.3 – Extra detail explaining race related car damage type and when damage may have occurred

C10 – The new Pressure Challenge is detailed here

C12.1 – With the inclusion of the Pressure Challenge, there are now 7 teams of judges as opposed to 6 in 2012

C12.3.7 – Addition of Pressure Challenge judging team

C13.4 – Addition of FIA Women in Motorsport award

Appendix – Specification scorecard revised to reflect technical regulation changes and that most penalties being reduced by 50%. Team Specification sheet template deleted.

ARTICLE C1 – DEFINITIONS

C1.1 World Finals Event

The World Finals event is managed by F1 in Schools Ltd and usually held over several days to include various programmed social and competition activities. The event aims to provide all participants with an educational and personal development 'Experience of a Lifetime'. Specifically, the competition aims to determine the World Champions of F1 in Schools™ according to the 2013 F1 in Schools World Finals Technical and Competition Regulations.

C1.2 F1 in Schools In-Country Co-ordinator (ICC)

Person/s and/or an organisation approved by F1 in Schools Ltd. to manage and co-ordinate F1 in Schools™ The Formula One™ Technology Challenge within a specified country or region of the world.

C1.3 Parc fermé

A secure area where all primary and back-up 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').

C1.4 Competition Program

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

C1.5 World Finals terms and conditions for entry

This is a document issued by F1 in Schools Ltd which constitutes an agreement between F1 in Schools Ltd., ICC's and supervising teachers regarding participation by teams in the World Finals event.

C1.6 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 will be looking for in order to score the team appropriately.

C1.7 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.

C1.8 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. During time trial races where the automatic launch mode is used there is a zero reaction time value.

C1.9 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.

C1.10 Project elements

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

C1.11 Race event

The World Finals competition includes three separate race events. These are Time Trials, Reaction Racing and Knock-out Racing.

C1.12 Engineering Drawings

CAD produced drawings which should be such that, along with relevant 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.

ARTICLE C2 – GENERAL INFORMATION

C2.1 Competing teams

C2.1.1 F1 in Schools Ltd. will request that each In-Country Co-ordinator (ICC) nominates an agreed number of teams for entry to the World Finals event from their region. Once approved by F1 in Schools Ltd., these teams will then be invited to compete in the World Finals by the ICC. Normally the invited World Finals teams will be the overall winner of the in-country national final and an agreed number of runner-ups. Any special invitation teams must be approved by F1 in Schools Ltd.

C2.1.2 F1 in Schools Ltd. will provide help to establish international collaboration teams where needed by liaising between the relevant ICC's. Teams nominated to form international collaboration teams are usually runner-up or minor placed winning teams from respective National Finals.

C2.1.3 Each team must consist of a minimum of 3 students to a maximum of 6.

C2.1.4 **International** collaboration teams must consist of a minimum of 4 members up to a maximum of 6 with a minimum of 2 members from any one country i.e. 3 countries collaborating is the maximum.

C2.1.5 Student teams who have competed at a previous World Finals event are not eligible to participate. A single member of a team who has previously competed is eligible to enter, providing they are part of a new team, with no other previous participants, and this team has qualified for entry by progressing through the in-country competition. ARTICLE C2.1.1 applies.

C2.1.6 Regulation C2.1.5 does not apply to international collaboration teams who have previously participated provided the same international collaboration team is not entered.

C2.1.7 Only students who are members of the official competing team (maximum 6) are permitted to wear the team's uniform. Team affiliated students, supervising adults / teacher are not permitted to wear the team's uniform during competition days.

C2.2 Competition program and team number ballot

C2.2.1 F1 in Schools Ltd will issue the competition program before the team number ballot, showing all scheduled judging activities, with judging times listed against team competition numbers.

C2.2.2 A ballot will be held to determine the competition number each team will be allocated. These team numbers will correspond with those published in the competition program. The ballot will usually be either webcast live or filmed and made available for viewing by internet. This will usually occur a week or two prior to the event.

C2.2.3 Following the team number ballot, the competition program may be revised slightly to accommodate a team from the host country participating in the first race of the

event. The ballot may be conducted so that all collaboration teams are in the same judging stream.

C2.3 Team responsibilities

C2.3.1 Teams must read the World Finals **Technical Regulations** carefully to ensure their cars comply with those regulations.

C2.3.2 Teams must read the World Finals **Competition Regulations** 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.

C2.3.3 During competition it is the team's responsibility to ensure that team members are present at the correct time and location for all scheduled activities.

C2.3.4 Security of the pit display and its elements is the team's responsibility during competition.

C2.4 Role and responsibility of ICC and supervising teacher / adult.

C2.4.1 All ICC's and supervising teachers / adults should carefully read and understand the terms and conditions for entry to the F1 in Schools World Finals event, and must have explained all relevant information within this agreement to their team/s.

C2.4.2 It is the primary responsibility of any event accredited supervising teacher / adult and / or the ICC to ensure duty of care / well-being for all their student team members, as appropriate for their home country legislation. Any concerns arising during the event in relation to this should be brought to the attention of the F1 in Schools Ltd. Event Directors immediately.

C2.4.3 The event accredited supervising teacher / adult and / or ICC 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.

C2.5 Regulations documents

C2.5.1 F1 in Schools Ltd. issues the regulations, their revisions and amendments made.

C2.5.2 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 'C' prefix.

C2.5.3 Technical Regulations - A document separate to this one which is mainly concerned with those regulations that are directly related to F1 in Schools™ car design and manufacture. Technical Regulation articles have a 'T' prefix.

C2.6 Interpretation of the regulations

C2.6.1 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.

C2.6.2 Text clarification - Any frequently asked questions that are deemed by F1 in Schools Ltd. 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.

C2.7 Supplementary competition regulations

Other documents may be issued by F1 in Schools Ltd. that provide teams with further logistic and other important event information. Any supplementary regulations will be issued to all ICC's and team managers, where the team manager has supplied F1 in Schools Ltd with a contact email address. Copies of all supplementary regulations issued will be displayed on a notice board at event registration and available online.

C2.8 Design ideas and regulation compliance queries.

Teams are not permitted to seek a ruling from F1 in Schools Ltd. or 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 World Finals 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.

C2.9 Team partnerships

C2.9.1 F1 in Schools teams' are encouraged to develop mentoring partnerships with businesses, industry or higher education organisations throughout their project.

C2.9.2 All teams will be required to complete a 'Team Partnerships' declaration using the template issued by F1 in Schools Ltd. This is submitted as per Article C2.12.

C2.9.3 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.

C2.9.4 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.

C2.9.5 '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.

C2.10 Mandatory project elements required for World Finals entry

Following is a summary of the mandatory elements to be submitted for judging:

- Three (3) F1 in Schools™ Cars
- A design portfolio
- An orthographic drawing and 3D render included in the design portfolio
- A pit display
- A 10 minute verbal presentation
- A Pressure Challenge project element produced and submitted as scheduled at the World Finals event
- An electronic copy of all specified project data
- A separate set of engineering drawings for specification judging
- A laptop containing all CAD data and relevant CAD software
- A 'Team Partnerships' declaration

The above list is detailed in the remainder of ARTICLE C2.

C2.10.1 Cars - Each team must produce three (3) identical F1 in Schools cars - a primary race car, an identical back-up and a third display car.

C2.10.2 Portfolio - Each team must produce a 'hard copy' 20 page maximum design portfolio, presented in an A3 (or similar) sized format for exhibition within the teams pit display. Refer to ARTICLE C6 of these regulations along with the portfolio and display judging scorecard for portfolio specification and content requirements.

C2.10.3 'Online' submission of portfolios for judging preview - teams must submit their 20 page design portfolio document in digitised format to F1 in Schools Ltd. before Monday, 4th November 2013, at 0:00 a.m. (GMT +0:00). Late submission will incur a 20 point penalty. Portfolio PDF files must be submitted by email to f1is.portfolios@gmail.com, or uploaded to <http://www.dropitto.me/f1inschools>. The upload password is: WorldFinals2013. The following file conventions must be adhered to:

- I. Document must be submitted in a single Portable Document Format (PDF) file.
- II. PDF file must be no greater than 20Mb in size for the email option and no greater than 75MB for the 'dropittome' upload option.
- III. The file must be named "your_team_name_here.pdf"

It is recommended that when creating the PDF file, teams consider embedding any unusual font types they may have used within their portfolio document to help ensure it displays correctly when opened by the judges.

C2.10.4 Orthographic drawing - A 3rd angle orthographic projection, including plan, side and end elevations of the fully assembled car must be included in the design portfolio. A 3D rendering of the final car design must also be included. These elements must be produced using CAD. The orthographic technical drawing should include dimensions and corresponding regulation numbers in order to illustrate regulation compliance.

C2.10.5 Pit display - Each team will be provided with a dedicated exhibition style space and table 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 C6 for further pit display specifications and content requirements.

C2.10.6 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 10 minutes. If teams are unable to deliver the presentation in English, then an interpreter can be present and a time of 20 minutes will be allocated. Teams should bring their own laptop with any slide show or other multimedia files that need to be shown as part of their verbal presentation. Any team who needs a laptop for verbal presentation judging and is unable to bring one to the World Finals must contact F1 in Schools Ltd, (world@f1inschools.com), at least one month prior to the event. Refer to ARTICLE C7 of these regulations for detail regarding presentation content and other requirements.

C2.10.7 Pressure Challenge - Each team will be required to produce and submit a project element within a specified time limit as scheduled during the actual World Finals competition. The exact nature of the challenge will be announced during the World Finals event. Refer to ARTICLE C10 of these regulations for more detail regarding the requirements of the Pressure Challenge project element.

C2.10.8 Electronic data - Teams must submit all engineering and other data specified below on a storage device compatible with the windows operating system. E.g. USB memory stick.

Data submitted must include:

- all CAD parts and assembly files
- hi-res realistic renders
- full design portfolio
- all additional engineering drawings submitted for judging
- any pit display multimedia files

This data may be referred to for judging purposes and possible marketing and promotion following the event. Note that the storage device will not be returned to the team.

C2.10.9 Engineering drawings [refer ARTICLE C1.12] for specification judging - Teams must submit a hard copy of any engineering drawings of their car assembly and parts they wish to be referenced by the engineering and specification Judges. As a guide, the minimum requirement is a separate duplicate copy of the orthographic drawing included in the design portfolio. These drawings must be on pages no larger than A3 in size.

C2.10.10 Laptop for engineering judging - A laptop with the CAD software used by the team and with all CAD part and assembly data must be brought to the World Finals event. This will be needed during the engineering judging session so that the team can demonstrate their CAD work and better explain how they engineered their car design. Any team unable to bring a laptop to the World Finals with CAD files installed must contact F1 in Schools Ltd (world@f1inschools.com), at least one month prior to the event.

C2.10.11 'Team Partnerships' declaration - Every team must complete the declaration template as issued by F1 in Schools Ltd. All partnerships and any outside assistance must be included. This document will be referenced by Judges so they can better understand team partnerships, ask questions, and therefore must be a full and accurate declaration.

C2.11 Team registration at the event

C2.11.1 Teams will be required to register with F1 in Schools Ltd. once arriving for the event. At this registration teams will be issued with World Finals accreditation, event programs and detailed welcome pack. The student team manager, supervising teacher and ICC for each team should attend. The time and location of registration will be published in further event supplementary regulations.

2.11.2 The World Finals 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 of the three cars by the team following registration and prior to the submission of their project elements.

C2.12 Submission of project elements

C2.12.1 A time and location will be published in the event program for when each team must submit their project elements. This will occur well before judging commences. Following is a list of the elements which must be submitted by each team at this time;

- 1 x nominated primary race car
- 1 x nominated back-up race car
- 1 x printed 20 page design portfolio
- Electronic copy of all specified project data
- Scrutineering engineering drawings
- Design specification document
- 'Team Partnerships' declaration template

All elements must be submitted complete and ready for judging. Refer to ARTICLE C2.10

C2.12.2 During project submission, each team will be given the opportunity to check the weight of their cars on the official World Finals scales. If either car being submitted is under legal weight, the team will be permitted to fix any issue in order that both cars can be submitted at a legal weight.

C2.12.3 The team will be required to nominate which car is the primary race car and which is the back-up race car. Small coloured 'dot' stickers (approximately 5mm in diameter) and supplied by F1 in Schools Ltd, will be adhered to the underside of each car. The stickers will feature the team's competition number and be colour coded for identification between the primary and back-up cars.

C2.12.4 Once cars have been submitted, they are considered as being in parc fermé.

C2.13 Project elements to be retained by F1 in Schools Ltd.

It is a condition of World Finals entry that each team permits F1 in Schools Ltd to retain 1 x race car, usually the nominated back-up car, the 20 page design portfolio and the electronic copy of all specified project data submitted. Teams also permit F1 in Schools Ltd. to use any of these project elements for marketing purposes and / or publication as exemplar projects for reference by others.

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 Ltd 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 40 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 five (6) main judging categories, each with its own team of judges and specified judging activities as detailed in further articles.

- Specification Judging
- Engineering Judging
- Portfolio and Display Judging
- Verbal Presentation Judging
- Pressure Challenge Judging
- Racing

C3.3 Judging score cards

The F1 in Schools™ World Finals judging score cards 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 2013 World Finals judging score cards can be found in the appendix of this document. **READING THE SCORE CARDS CAREFULLY IS IMPORTANT. THEY PROVIDE CRITICAL INFORMATION FOR TEAMS AS TO WHAT NEEDS TO BE PRESENTED FOR EACH JUDGING CATEGORY.**

C3.4 World Champions

The Bernie Ecclestone F1 in Schools™ World Champions perpetual 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 time trial 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 five (5) categories with maximum possible scores as detailed in the following table;

World Finals Judging Categories and Point Allocations	
Specification Judging	
Specifications	120 points
Engineering Judging	
CAD CAM and Analysis	60 points
Quality of Manufacture	60 points
Portfolio and Pit Display Judging	
Portfolio	90 points
Pit Display and Marketing	60 points
F1 Car Design Process	60 points
Pressure Challenge	
Team's challenge submission	100 points
Verbal Presentation Judging	
Technique	60 points
Composition	60 points
Subject Matter	60 points
Racing	
Time Trials	170 points
Reaction Racing	60 points
Knock-Out Racing	40 points
TOTAL	1000 points

C3.6 Critical regulations

C3.6.1 Some of the Technical Regulations have been identified as being critical regulations. If following scrutineering and time given to rectify any infringement (Refer C4.5), a team's primary race car is judged as being NON-COMPLIANT with any critical technical regulation, they will be INELIGIBLE for the following awards:

- World Champions
- Fastest Car
- Best Engineered Car

C3.6.2 If the back-up race car is used for any races, it must also comply with all critical Technical Regulations for the team to be eligible for these awards.

C3.6.3 The critical Technical Regulation articles are:

T3.1/T3.2/T3.3/T3.4/T3.5/T3.6/T4.1/T4.2/T4.3/T4.5/T7.1/T8.1/T8.2/T8.3/T8.4/T8.5/T8.10/T10.1/T10.2/T10.4/T10.5/T10.6.

Note well: Article numbers are from the 2013 World Finals Technical Regulations.

ARTICLE C4 – SPECIFICATIONS JUDGING (120 points)

C4.1 What will be judged?

Specification judging is a detailed inspection process where BOTH the primary and back-up race cars are assessed for compliance with the F1 in Schools™ World Finals Technical Regulations. Refer to the specification judging scorecard for scoring details.

C4.2 Team preparation

Teams must ensure that their primary and back-up race cars are complete and ready for specification judging before they are submitted. Notice is also drawn to the critical technical regulations, refer ARTICLE C3.6. Teams must have also submitted an electronic copy of all specified project data, scrutineering engineering drawings, and design specification document, which may all be referenced. Refer ARTICLE C2.10

C4.3 Who needs to attend?

Specification scrutineering is a closed activity that no team member or supervising teacher may attend. There will be a specification review session scheduled that must be attended by the team manager, team design and manufacturing engineers as a minimum.

C4.4 Judging process / procedure

Teams begin specification judging with a full allocation of 120 points. Any infringements of the Technical Regulation articles, on either car, will result in point's being deducted as detailed in the Technical Regulations.

There are two parts to the specification judging process.

- A. **Scrutineering** – this is conducted within the confines of parc fermé, where the specification Judges will scrutinise both cars 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 as cars are submitted.
- B. **Scrutineering Review Interview** – each team will be scheduled a period of time for a review of any specification infringements ruled. The Judges will highlight to the team any regulation infringements and provide necessary explanations. The team is then given opportunity to explain to the Judges why they feel any identified infringements should be considered as permissible. Following the teams explanation, the judges may choose to reverse their original decision or uphold it. No further discussion will then be permitted.

C4.5 Rectifying critical regulation failure

Teams that have been judged during initial scrutineering to have incurred a critical regulation failure will be provided with a special 20 minute car service time, prior to the commencement of racing. If during this service time the car can be modified so as to comply with the failed regulation/s, the team will then only incur HALF the point's penalty for that infringement, without being classified as having a critical regulation infringement.

C4.6 Specification judging decision appeals

Teams may appeal the specification Judges decision if they still believe their justification for regulation compliance should be accepted. An appeal must be submitted in writing directly to the Chair of Judges within two (2) hours of the team completing their scrutineering review session. Refer ARTICLE C11. The Chair of Judges will discuss the appeal with the scrutineering judges and may seek additional advice from F1 in Schools Ltd. regulation

authorities. The Chair of Judges will then meet with the team, to discuss the appeal and explain the final decision.

ARTICLE C5 – ENGINEERING JUDGING (120 points)

C5.1 What will be judged?

The engineering Judges will assess the team's use of CAD/CAM technologies along with the quality of manufacture of both the primary and back-up race cars submitted. The specific areas to be assessed are:

- Application of CAD CAM
- Analysis
- Organisation of CAD data
- Orthographic drawing and 3D rendering
- Quality of manufacture and assembly of the two submitted cars
- Manufacturing process discussed in the portfolio
- Use of CNC machining

Refer to the engineering judging scorecard for key performance indicator information.

C5.2 Team preparation

A laptop needs to be ready and taken to engineering judging along with the design portfolio. (Refer ARTICLE C2.10). Other items may also be taken to help the team explain any engineering or manufacturing concepts. The engineering judges will not have access to the team pit display for judging purposes. Teams must not take their display (3rd) car to engineering judging. Preparation should include careful reading of the scorecard. The key performance indicators for the application of CAD / CAM, analysis and associated data organisation, describe what the judges will be looking for.

C5.3 Who needs to attend?

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

C5.4 Judging process / procedure

Teams will be awarded points as per the key performance indicators shown on the engineering scorecard. The scheduled engineering judging interview session will focus on the application of CAD / CAM, analysis, CAD data organisation, orthographic drawing, 3D render and use of CNC machining. 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.

ARTICLE C6 – PORTFOLIO AND DISPLAY JUDGING (210 points)

C6.1 What will be judged?

The portfolio and display judges will examine each teams 20 page design portfolio and pit display so that they can assess the following specific areas.

- Project management
- Team work
- Portfolio for clarity and quality
- Team identity
- Marketing
- Pit display for clarity and quality
- F1 car design process
 - Ideas
 - Development and testing
 - Evaluation

Refer to the portfolio and display judging scorecard for detailed point scoring and key performance indicator information.

C6.2 Team preparation

Each team must prepare a design portfolio and pit display as per ARTICLE 2.10. Most importantly, teams need to read the portfolio and display judging score card carefully to ensure that all areas to be assessed are included within the context of their design portfolio and pit display. It is each team's decision how and where each area is presented. Teams should be mindful of the time constraints of judging when making these decisions.

C6.3 Who needs to attend?

All team members must be present during the portfolio and display judging session.

C6.4 Judging process / procedure

Portfolio and display 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. Team members may be asked questions by Judges to help them find certain content and or seek further explanation. In addition to the scheduled judging session, the Judges will also be given time to conduct pre-judging and review of each teams pit display and design portfolio. This will be a 'closed to teams' session programmed before the commencement of scheduled judging sessions. Design portfolios will be returned to teams so that these can be integrated into each teams display.

C6.5 Design Portfolio requirements

The design portfolio must be in a printed 'hard copy' format of A3 or similar size. The portfolio is limited to 20 pages which include the front and back covers. This can be 20 single sided or 10 double sided sheets. If a portfolio comprises more than 20 pages, the Judges will only review the first 20 PRINTED pages for assessment purposes. 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 project management, the team, design ideas, design development, research, testing and evaluation are commonly presented within the portfolio.

C6.6 Pit display setup and parameters

C6.6.1 F1 in Schools Ltd will provide each team with a self contained exhibition style display space including integrated lighting and 1 x power supply with pins and rating configured to the host country format. Teams need to supply any power adaptors they may require. A trestle style table will also be supplied, use of this is optional. The precise space description and dimensions will be announced closer to the event. Display spaces are normally of approximate dimensions 3m wide x 1m deep x 2.4m high.

C6.6.2 A time period will be scheduled for when all teams will set-up their pit displays, usually during the day prior to judging commencing. A time limit will be enforced. The time limit is usually two hours; this will be confirmed in supplementary regulations.

C6.6.3 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.

C6.6.4 **ONLY** student team members are permitted to set-up their pit displays. There must be no supervising teacher / adult or other outside assistance, unless deemed by F1 in Schools Ltd to be a health and safety issue.

C6.6.5 F1 in Schools Ltd 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 Ltd. will instruct teams to remove or alter any display inclusions considered to be a safety hazard.

C6.6.6 Any electrical appliance connected to the power supply must be safe and compatible with the host country power rating.

ARTICLE C7 - VERBAL PRESENTATION JUDGING (180 points)

C7.1 What will be judged?

The verbal presentation Judges will assess each teams 10 minute verbal presentation across the areas of technique, composition and subject matter:

- Presentation technique
 - use of visual aids – effective use of multimedia and / or other ‘props’.
 - team contribution – effective participation by all team members
 - dynamic – levels of enthusiasm and energy.
 - engagement – audience interest and excitement.
- Presentation composition
 - concepts clarification – clear and concise explanations where required.
 - use of time – how effectively was the 10 minutes used.
 - Presentation structure – overview explained and connection between topics.
- Subject Matter (the topics which need to be talked about)
 - innovation – detail key innovations related to car design, project management, marketing or any other aspect of the team’s project.
 - collaboration – detail any partnerships or mentoring from outside the team and justify in terms of improving project outcomes.
 - learning experiences – explain how the F1 in Schools™ project has benefited team members.

Refer to the verbal presentation judging scorecard for detailed point scoring and key performance indicator information.

C7.2 Team preparation

Each team is required to prepare a verbal presentation as per the requirements at ARTICLE C2.10. Any multimedia content, slides etc must be saved on, and shown, using the teams own laptop. Teams need to 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 verbal presentation judges will be looking for.

C7.3 Who needs to attend?

All team members must be present during the verbal presentation judging session.

C7.4 Judging process / procedure

Verbal presentation judging is scheduled for the same duration of other judging sessions, usually 40 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 10 minute duration (20 minutes if not speaking English and using an interpreter), 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. Verbal presentations may be filmed for Judges review or promotional and future resource purposes.

C7.5 Verbal presentation judging provisions

F1 in Schools Ltd. 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.

C7.6 Verbal presentation video recordings

The verbal presentations of all teams may be video recorded by the F1 in Schools™ for the purpose of judging review and / or post event publicity and promotion purposes by F1 in Schools™

ARTICLE C8 – RACING (270 points)

C8.1 What races will be conducted?

The F1 in Schools™ World Finals racing points will be awarded through the staging of three types of race events.

- A. Time Trials – automatic launch mode, two races in each lane.
- B. Reaction Racing – manual / driver launch mode, two races in each lane.
- C. Knock-out Competition Races – manual / driver launch mode, one race in each lane per round of competition.

Time trial races will be conducted first, followed by reaction racing. **The single fastest 'car race time' value from all time trial and reaction races will determine the Fastest Car Award.** The knock-out competition is the last of the scheduled races. Refer to ARTICLE 3.5 and further information following for details on how points are calculated and awarded.

C8.2 Team preparation

C8.2.1 Teams should be familiar with the operation of the F1 in Schools™ Race System. There will normally be a demonstration track within the venue where teams can practice race starts during free time prior to their scheduled races.

C8.2.2 Manual / driver starts - One or more team members (driver/s) must be appointed for launching of the teams' car using the manual launch method.

C8.2.3 Finish line management - At least one member of the team must be appointed as responsible for managing the finish line deceleration system. I.e. standard deceleration towels or teams own system (refer C8.13), and return of car along the track to the start.

C8.2.4 Start line car staging - one team member may be appointed as being responsible for 'staging' the car. This team member is permitted to set the alignment of the car with respect to the launch pod and track under close supervision from the race track Judges. Appointment of this team member is optional. The race Judges can assist or perform this task for the team.

C8.3 Who needs to attend?

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

C8.4 Time trial race procedure

Cars are launched in automatic mode with four (4) races total per team, two (2) races in each lane. The total time displayed on the start gate for each race is recorded for scoring purposes. The time trial race events will be conducted using the following procedure:

- i. Teams race in order as shown in the competition program. To begin, Judging stream A in track lane 1 and stream B in lane 2.
- ii. One team member to track finish for deceleration system control.
- iii. Race 1 - Judge sets cars on track / tether line and inserts CO2 canister.
- iv. Judge arms launch pod - SAFETY ON - makes initial launch pod adjustments.
- v. A team member is then allowed to 'fine tune' the staging of their car.
- vi. Judge switches launch pod - SAFETY OFF - checks track is clear for racing.
- vii. Judge presses the start system reset button - car is launched.
- viii. Judge records TOTAL RACE TIME displayed on start gate.
- ix. Team member at finish control returns car and canister along track to the start.
- x. Race 2 conducted in same lane using same process as above.
- xi. Judges remove cars from tether line and change lanes.
- xii. Race 3 and Race 4.
- xiii. Cars removed from track and returned to Parc Ferme.

C8.5 Time trial race scoring

The eight (8) 'car race times' recorded during the time trials and reaction races will be considered. Of these eight (8) races, the team's 2nd, 3rd, 4th and 5th 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 = 170 pts
- Second fastest avg. time = 165 pts
- Third fastest avg. time = 160 pts.
- 'Base Time' = 120% 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 = 28 + (132/(Base Time - 3rd fastest avg.)) x (Base Time - teams avg.)

- Any team that has an average slower than the base time will score 28 points. To further discriminate between these teams, a deduction will be made of 7 points for any did not finish (DNF) time trial result.
- If after discarding a team's fastest time there remains less than 4 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 times to average.

C8.6 Reaction race procedure

Cars are launched in manual / driver reaction 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:

- i. Teams race in order as shown in the competition program. To begin, Judging stream A in track lane 1 and stream B in lane 2.
- ii. Driver and team stands trackside with corresponding lane start trigger.
- iii. One team member to track finish for deceleration system control.
- iv. Race 1 - Judge sets cars on track / tether line and inserts CO2 canister.
- v. Judge arms launch pod - SAFETY ON - makes initial launch pod adjustments.
- vi. A team member is then allowed to 'fine tune' the staging of their car.
- vii. Judge switches launch pod - SAFETY OFF - checks track is clear for racing.
- viii. Judge presses the start system reset button - car is launched.
- ix. Judge records TOTAL RACE TIME and REACTION TIME displayed on start gate.
- x. Team member at finish control returns car and canister along track to the start.
- xi. Race 2 conducted in same lane as above, driver can be inter-changed.
- xii. Judges remove cars from tether line and change lanes.
- xiii. Race 3 and Race 4, driver can be inter-changed.
- xiv. Cars removed from track and returned to Parc Ferme.

C8.7 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' = 60 pts
- 2nd fastest 'total race time' = 58 pts
- Slowest 'total race time' = 5 pts
- Base Time = 125% of 2nd fastest 'total race time'
- 3rd fastest and all other teams score points using the following formula:

Points = 5 + (53 / (Base Time - fastest 'total race time')) x (Base Time - teams fastest 'total race time')

- Any team with a best 'total race time' that is slower than the base time will score 5 points. To further discriminate between any teams scoring 5 points, a deduction of 1 point will be made for any did not finish (DNF) reaction race result.

C8.8 Knock-out competition procedure

Teams will be issued the knock-out racing draw prior to this racing commencing. The racing order for the first knock-out round is determined through ranking all teams using the fastest 'total race time' they achieved from the reaction racing event. Some teams may draw a 'bye' in round 1. Cars are launched in manual / driver reaction mode, with two (2) races total, one (1) race in each lane, for each round of the knock-out. The team with the fastest 'total race time', as displayed on the start gate, from the two races conducted, is the winner of that knock-out round. In case of a tied result, a further 'sudden death' race will be conducted. The knock-out competition will be conducted as follows:

- Teams race in order of the competition draw. Top of draw in lane 1.
- Driver stands trackside with corresponding lane start trigger.
- One team member to track finish for deceleration system control.
- Race 1 - Judge sets cars on track / tether line and inserts CO2 canister.
- Judge arms launch pod - SAFETY ON - makes initial launch pod adjustments.
- A team member is then allowed to 'fine tune' the staging of their car.
- Judge switches launch pod - SAFETY OFF - checks track is clear for racing.
- Judge presses the start system reset button - car is launched.
- Judge records TOTAL RACE TIME displayed on start gate.
- Team member at finish control returns car and canister along track to the start.
- Judges remove cars from tether line and change lanes.
- Race 2, driver can be inter-changed.
- Cars removed from track and returned to Parc Ferme.

C8.8.1 Cars judged to have critical regulation failures will only be permitted to race in round one of the knock-out competition and will be automatically knocked out during round one regardless of the race result.

C8.9 Knock-out competition scoring

Points are awarded based on the round of competition a team is eliminated as follows:

- Eliminated in Round 1 = 0 pts
- Eliminated in Round 2 = 18 pts
- Eliminated in Quarter Final = 25 pts
- Eliminated in Semi Final = 32 pts

- Eliminated in Final = 36 pts
- Knock-out Winner = 40 pts

C8.10 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.

C8.11 False starts

C8.11.1 A false start (jump start) occurs when the driver depresses the trigger button before the 5 start gate lights have extinguished. This will be signalled with the outer red light above a lane illuminating.

C8.11.2 All false starts will incur a 5 point penalty and by default forfeit that race. This penalty does not apply to knock-out racing.

C8.11.3 During knock-out racing – If one team false starts (jump starts), the other team should continue to race as normal. The team who false started forfeits that race, scoring a DNF, and the other team's time is recorded. If both teams false start, the race is re-run.

C8.12 Track, tether line and timing system information

C8.12.1 The F1 in Schools™ Elevated Race Track, as manufactured by Pitsco Inc., will be used. The official length of the track, from start line to finish, is 20 metres. Pitsco Inc. has recently redesigned the Elevated Race Track used by F1 in Schools™. This new design will be used at the 2013 World Finals. Please see the manufacturer's description below. A monofilament tether line of diameter 0.6mm, fixed at the start end, passes down the centre of each lane. At the finish end the line passes through 90 degrees over a single pulley then attached to a 1.0kg mass suspended above the floor.

Elevated overlapping rail system with track keys that secure tightly with thumbscrews ensuring flush joints between each track section and a level and smooth track.



Race track sections

C8.12.2 Launch / Timing System – The F1 in Schools™ F1 Race System will be used for launching cars and timing races and driver reaction times to 1/1000th of a second.



Launch / Timing System Components

C8.13 Deceleration system

C8.13.1 The deceleration system acts to bring cars to rest once crossing the finish line. F1 in Schools Ltd. will provide a standard race car deceleration system, consisting of two towels positioned behind the finish line of each lane.

C8.13.2 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 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.

C8.13.2 Deceleration systems must be located a minimum of 25mm after the finish line.

C8.14 CO2 Race cylinders

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

C8.15 Car weight checks

Cars will have their weight checked at the race track 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.

C8.16 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 C9 – CAR REPAIRS AND CAR SERVICING

C9.1 Car repairs

C9.1.1 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.

C9.1.2 No items can be removed or added to a car during racing, other than CO2 cylinders, except in the case of a repair.

C9.1.3 If the primary race car sustains damage during racing and this damage is ruled to be related to engineering deficiencies, the back-up race car will be reverted to immediately. This will incur a 5 pt penalty, against the teams score for this race event. This may include but not limited to car body, wings & wheels being damaged as part of racing including damage occurring within the deceleration area.

C9.1.4 Team members will be allowed to make 'trackside' repairs to the damaged car as racing continues.

C9.1.5 If the back-up car is damaged the repaired primary car will be reverted to and another 5 pt penalty will be applied.

C9.1.6 The Judges may choose to suspend racing in order that repairs can be made.

C9.1.7 If the Judges rule that damaged sustained was not due to engineering deficiencies, immediate repairs or revert to back-up car will be permitted without penalty.

C9.1.8 No penalty is applied for damage incurred during knock-out racing or a team's final race of any race event.

C9.2 Car servicing

C9.2.1 Teams will be scheduled time to carry out penalty free maintenance on their race cars in the designated car service area. The length of time will be the same as other judging sessions, normally 40 minutes. The service time will occur between the team's time trial and reaction racing as per the competition program. No other car service time will be permitted.

C9.2.2 Teams will also be provided with a 15 minute car service interval prior to the commencement of each knock-out racing round.

C9.2.3 Only team members and Judges are allowed to enter the car service area.

C9.2.4 Tool kits are allowed to be taken into car service. 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.

C9.2.5 Maintenance and alterations can only be made to the front and rear wings, nose cone, tether line guides, wheels and wheel support systems. The car body **MUST NOT** be modified or substituted.

C9.2.6 Each team will be required to complete a car service log form, declaring any maintenance or repair work completed. This will be validated by the Judges.

C9.2.7 Teams must hand their race cars and completed car service log to the service area Judges **BEFORE** the conclusion of their scheduled service interval. A penalty will apply for exceeding the scheduled service time limit of 5 pts for every minute late.

ARTICLE C10 - PRESSURE CHALLENGE (100 points)

Formula 1 teams often have to think on their feet. Presented with problems or tasks at very short notice, they have to draw upon the collective expertise of their individual team members, to analyse the task at hand and coherently deliver a solution; be that to a technical problem, an unexpected change in regulations or a PR and media opportunity.

At the 2013 World Finals, you will be presented with such a challenge. A challenge that you must deal with under the pressure of the World Finals event. Can your team pull together and deal with it? Is your bond strong enough and your breadth of expertise wide enough? Let's find out.

Your team should come to the World Finals prepared to face that challenge. Armed with your CAD, multimedia and video tools, along with, of course, your imagination and creativity, you will be asked to deliver a solution to a challenge that will be announced at some point during the World Finals event.

Has your team got what it takes?

The Pressure Challenge will be marked out of a total of 100 points and will count towards the each team's overall World Finals score. The exact nature of the Pressure Challenge task will be unknown until announced by the Chair of Judges or his/her delegate during the World Finals event. More detail regarding the resources you will require to complete the challenge will be released in further pre-event information.

ARTICLE C11 – PROTESTS

C11.1 Scrutineering decision appeals

These must be submitted within two hours of the team completing their specification review judging. Other rules for submitting these will be the same as for protests.

C11.2 Submitting a protest

Any protest issues must be submitted by the team manager to an Event Director, who will register this and immediately lodge it with the Chair of Judges. This must occur by the date and time stated in the event supplementary regulations. All protests must be lodged in writing via the official protest form available from the Event Directors. The Chair of Judges decision related to any protest is final.

C11.3 Unsuccessful protests

Teams should carefully consider their grounds for submitting a protest or appeal. Any protest or appeal that is unsuccessful, with the Judges initial decision remaining unchanged, will result in the team having a 15 point penalty applied against their total score.

ARTICLE C12 – JUDGES

C12.1 Overview

There will be seven (7) teams of Judges that form the entire Judging panel. Each judging team will have one Judge appointed as the Lead Judge. Judges are nominees from ICC's and other education and industry experts invited by F1 in Schools Ltd. 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

An independent authority appointed by F1 in Schools Ltd. to 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.

C12.3 The judging teams

C12.3.1 Specification Judges - will scrutinise each primary and back-up race car with respect to the World Finals Technical Regulations.

C12.3.2 Engineering Judges - The Engineering Judges will be assessing each team's use of CAD/CAM, CNC technologies and quality of manufacture. They will be nominating team's deserving the Best Engineered Car Award.

C12.3.3 Verbal presentation Judges – will assess each team as per the verbal presentation scorecard. They will also be nominating team's deserving of the Verbal Presentation Award and the Innovative Thinking Award.

C12.3.4 Portfolio and display Judges – will assess each team as per the portfolio and display scorecard. They will also be nominating team's deserving of the Pit Display Award and Team Sponsorship and Marketing Award.

C12.3.5 Race Judges – will oversee and rule on all race events and any incidents. This will determine the Fastest Car Award and Knock-out Champions Award.

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

C12.3.7 Pressure Challenge Judges – will assess each teams Pressure Challenge project element.

C12.4 Judging Decisions

THE DECISION OF THE JUDGES IS FINAL.

ARTICLE C13 - AWARDS

C13.1 Awards Celebration

The World Finals awards will be presented at a gala Awards Celebration. Details of this event will be released closer to the event.

C13.2 Participation recognition

All students, supervising teachers / adults, ICC's and Judges will receive an official participation certificate.

C13.3 Prizes and Trophies

C13.3.1 Team mementos – Teams that win an award will be presented with a minimum of a SINGLE main trophy or similar memento. This is normally a F1™ team sponsored trophy. The team members and / or supervising teacher will need to decide how this memento is to be shared and displayed amongst the team stakeholders.

C13.3.2 Student mementos – students winning an award may be presented with their own individual medallion or certificate.

C13.3.3 Formula One™ Team Trophies – In past years F1 in Schools Ltd. has been extremely fortunate to have a number of F1™ Teams generously supply purpose built 'one off' trophies for various awards. These trophies are normally constructed from F1™ car components.

C13.3.4 Bernie Ecclestone World Champions Trophy – This is a perpetual trophy presented to the World Champions, and as such, must be returned to F1 in Schools Ltd. before the following years World Finals event.

C13.4 List of awards to be presented

[This list may be amended at the discretion of F1 in Schools Ltd.]

- **World Champions**
(Team must comply with all critical regulations. Refer to Article C3.6)
The team which achieves the highest total score out of 1000 points.
- **2nd Place**
The team which achieves the 2nd highest total score out of 1000 points.
- **3rd Place**
The team which achieves the 3rd highest total score out of 1000 points.
- **Fastest Car Award**
(Team must comply with all critical regulations. Refer to Article C3.6)
This will be awarded to the team that achieves the fastest 'car race time' recorded during the time trial and reaction racing events.
- **Best Engineered Car Award**
(Team must comply with all critical regulations. Refer to Article C3.6)
This will be awarded to the team that scores the highest score from
 - Specification Judging

- Quality of manufacture
- Use of CAD
- F1 Car Design Process
- **FIA Women in Motorsport Award**

Teams with 2 or more female members will be informally interviewed throughout the competition by a representative of the Federation Internationale de l'Automobile who will determine the winner based on outstanding performance by young women in their F1 in Schools endeavours.
- **Team Sponsorship and Marketing Award**

At the Judge's discretion, this will be awarded to a team with outstanding marketing and sponsorship related project content.
- **Innovative Thinking Award**

At the Judge's discretion, this award will be presented to the team that displays the most unique / clever feature or idea that impresses the judges.
- **Team Identity Award**

At the Judge's discretion, awarded to the team with outstanding overall identity.
- **The Best International Collaboration Team Award**

This will be awarded to the collaboration team with the highest overall score.
- **Outstanding Sportsmanship Award**

At the Judge's discretion, this will be awarded to a team that exhibits outstanding support/friendship and encouragement to other teams.
- **Chair of Judges Special Achievement Award**

Awarded at the Chair of Judges discretion.
- **Best Newcomer Award**

This is awarded to the team with the highest total points score from all teams representing any country competing at the World Finals for the first time.
- **Pit Display Award**

At the Judge's discretion, awarded to team with most impressive pit display.
- **Verbal Presentation Award**

At the Judge's discretion, this is awarded to the team who delivers the most engaging verbal presentation.
- **Portfolio Award**

At the Judge's discretion, awarded to team with the most impressive portfolio.
- **Research and Development Award**

Awarded to the team demonstrating excellence in the application of R&D to the final design
- **Social Media Award**

Awarded at the Judge's discretion, this will be presented to a team that has achieved outstanding social media outcomes in relation to their F1 in Schools endeavours

APPENDIX

PORTFOLIO & PIT DISPLAY SCORE CARD

Team Number:

Team Name:

20 PAGE FOLIO LIMIT - mark only the first 20 PRINTED pages including cover page.

PORTFOLIO ONLY ASSESSMENT ITEMS			
Project Management	Little evidence of project management presented.	Simple management and planning used to guide progress. A range of project resources identified.	Comprehensive project management. A range of factors considered; e.g. scope, time, resources and project risks. Plan changes discussed
	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18	19 20 21 22 23 24 25 26 27 28 29 30
Team Work	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 21 22 23 24 25 26 27 28 29 30
Portfolio Clarity & Quality	Difficult to follow with basic presentation standard.	Clear structure, well organised. Good use of ICT's enhancing presentation and impact.	High impact and professional throughout. Consistent and clear organisation. Excellent use of ICT's to enhance presentation
	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18	19 20 21 22 23 24 25 26 27 28 29 30

Portfolio Total /90

MARKETING & PIT DISPLAY ASSESSMENT			
Team Identity	Inconsistent, limited or obscure identity	Effective team identity consistent through various project components.	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
Marketing	Limited or irrelevant	Some marketing activity / sponsorship explained	Creative and effective activities 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
Pit Display	Repetition of folio elements	Clear and effective presentation and messaging. ICT's used to enhance presentation	Clean, well organised with high impact. Highly professional with attention to detail. Excellent integration of technology and ICT's
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20

Pit Display & Marketing Total /60

F1 CAR DESIGN PROCESS - PRESENTED IN PORTFOLIO AND / OR IN DISPLAY			
Ideas	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas for different car components
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15
Development	Limited development shown	Logical design developments explained	Clearly justified developments based around research and testing
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15
Testing	Little evidence of testing	Tests which are relevant and results documented	Quality test method. Accurate results data linked to design revisions
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15
Evaluation	No or limited evaluation	Ideas or process evaluations at different stages	Excellent ongoing project evaluations linked to improvement actions
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15

F1 Car Design Process /60

Portfolio + Pit Display & Marketing + F1 Car Design Process = Portfolio and Display Total = /210

VERBAL PRESENTATION SCORE CARD

Team Number:

Team Name:

10 MINUTE TIME LIMIT FOR VERBAL PRESENTATION

PRESENTATION TECHNIQUE

Visual Aids	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
Team Contribution	Minimal team participation	Good contributions from most team members	Excellent team work with all members participating effectively
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15
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
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

Technique Total /60

COMPOSITION OF THE PRESENTATION

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
Use of Time	Too fast or ran out of time	Good timing. Balanced topic depth and pace	Ran on time or under. Excellent balance of depth for each topic
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
Presentation Structure	No structure presented	A basic structure / outline provided and could be followed by audience	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 /60

SUBJECT MATTER / PRESENTATION CONTENT / TOPICS

Innovation	Little innovation presented	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	A range of personal, life-long learning and career skills acquired and identified as project outcomes 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 Matter Total /60

Technique + Composition + Subject Matter = Verbal Presentation Total = /180

ENGINEERING SCORE CARD

Team Number:

Team Name:

COMPUTER AIDED DESIGN AND ANALYSIS															
Application of CAD-CAM	Basic application. Final design in CAD only			Appropriate use of CAD in product development stages. Good understanding of CAM evident					Advanced use of CAD and CAM technologies throughout. Final CAD identical to the physical model car produced						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Computer Aided Analysis	Minimal analysis shown			Good analysis. Results applied to development					Variety of advanced and relevant analysis techniques conducted						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Organisation	Generally unorganised			Satisfactory organisation of data and models					Data & parts highly ordered & linked. Full CAD product assembly						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Orthographic & Rendering	Basic drawing & rendering			Good technical drawing and realistic rendering					High detail & includes spec dimensions. Photorealistic render						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Only the orthographic and 3D rendering presented in the 20 page portfolio are to be assessed.

CAD & Analysis Total

/60

MANUFACTURING																			
Quality of Finish and Assembly	Reasonable finish with some inconsistencies				Good overall finish quality and assembly with attention to detail						Showcase' finish quality on all components. Exceptional 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
Manufacturing discussed in portfolio	Little manufacturing details				Manufacturing processes and some issues						Detailed assessment of all manufacturing, stages, materials & issues								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Use of CNC Machining	Minimal evidence of CNC understanding				Effective use and understanding of CNC machining processes used						High level of CNC machining competence. Appropriately complex techniques and processes used to achieve manufacturing goal								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Manufacturing Total

/60

CAD & Analysis + Manufacturing = Engineering Judging Total = /120

SPECIFICATIONS SCORE CARD

Team Number: _____ Team Name: _____

For clarification on individual regulations, refer to the World Finals Technical Regulations.

Car 1 = Primary race car & Car 2 = Back-up race car.

Regulation	Critical	Regulation Overview	Penalty per Car	Pass or Fail		Score
				Car 1	Car 2	
ARTICLE T2 - GENERAL PRINCIPLES						
T2.4.1	N	Safe construction of both cars	-5			
ARTICLE T3 - FULLY ASSEMBLED CAR						
T3.1.1	Y	Designed and engineered using CAD / CAM	NA			0
T3.1.2	Y	Body manufactured using CNC only.	NA			0
T3.1.3	Y	Hand finishing as per definition.	NA			0
T3.1.5	Y	Both cars designed the same.	NA			0
T3.2	Y	Undefined features	-6			
T3.3	Y	Overall length	-6			
T3.4	Y	Width	-6			
T3.5	Y	Total weight	-6			
T3.6	Y	Track distance	-6			
T3.7	N	Status during racing	-6			
T3.8.1	N	Engineering drawings submitted	-6			
T3.8.2	N	Drawing accurate representation of car	-6			
ARTICLE T4 - BODY						
T4.1	Y	Body construction	-6			
T4.2	Y	Implants	-6			
T4.3	Y	Virtual cargo	-6			
T4.4	N	Virtual cargo identification	-3			
T4.5	Y	Exclusion zones	-6			
T4.6	N	Body thickness	-3			
T4.7	N	F1 in Schools logo decal location	-6			
ARTICLE T5 - CO2 CYLINDER CHAMBER						
T5.1	N	Diameter	-3			
T5.2	N	Distance from track surface	-2			
T5.3	N	Depth	-2			
T5.4	N	Thickness of chamber surrounds	-3			
T5.5	N	Finishing of chamber surrounds	-2			

Regulation	Critical	Regulation Overview	Penalty per Car	Pass or Fail		Score
				Car 1	Car 2	
ARTICLE T7 - TETHER LINE GUIDES						
T7.1	Y	Location	-6			
T7.2	N	Diameter	-2			
T7.3	N	Guide separation	-2			
T7.4	N	Tether line guide safety	-3			
ARTICLE T8 - WHEELS						
T8.1	Y	Number and location	-6			
T8.2	Y	Distance between opposing wheels	-6			
T8.3	Y	Diameter	-6			
T8.4	Y	Width	-6			
T8.5	Y	Visibility	-6			
T8.6	N	Visibility in the front view	-6			
T8.7	N	Race track contact	-2			
T8.8	N	Rolling surface	-3			
T8.9	N	Wheel support systems	-3			
T8.10	Y	Rotation	-6			
ARTICLE T9 - NOSE CONE						
T9.1	N	Construction	-6			
ARTICLE T10 - WING AND WING SUPPORT STRUCTURE						
T10.1	Y	Description and placement	-6			
T10.2	Y	Construction	-6			
T10.3	N	Clear airflow	-6			
T10.4	Y	Rear wing location	-6			
T10.5	Y	Rear wing height	-6			
T10.6	Y	Front wing location	-6			
T10.7	N	Visibility of front wing	-3			
T10.8	N	Wing identification	-3			
T10.9.1	N	Front wing span	-3			
T10.9.2	N	Rear wing span	-3			
T10.10	N	Span segments	-3			
T10.11.1	N	Front wing chord	-2			
T10.11.2	N	Rear wing chord	-2			
T10.12.1	N	Front wing thickness	-2			
T10.12.2	N	Rear wing thickness	-2			
TOTAL DEDUCTIONS						

TEAM PARTNERSHIPS DECLARATION

TEAM NUMBER: _____ **TEAM NAME:** _____



Please complete the fields below in type, no hand writing. Use one section for each project element a team partner assisted you with.

PARTNERS / SPONSORS WHO HAVE ONLY ASSISTED WITH FINANCIAL CONTRIBUTIONS DO NOT NEED TO BE INCLUDED.

Project Element What you got help with. I.e. Front wing RP, Pit display poster printing.	Name of Partner Organisation I.e. ABC Bearings Co.	Contact Name I.e. The main person you worked with	Email Address
Describe the Partnership Work I.e. What did the partner do for you?		Reason for Partnership I.e. Why did you need to get this help?	

Project Element What you got help with. I.e. Front wing RP, Pit display poster printing.	Name of Partner Organisation I.e. ABC Bearings Co.	Contact Name I.e. The main person you worked with	Email Address
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Include more pages as necessary to list ALL of your teams Partnership activities