



in Schools
United Kingdom

ENTRY CLASS

GUIDEBOOK



UK Competition

2018/19



Welcome to the world FI in Schools™, you're in for an exciting ride!

The FI in Schools™ Entry Class is your first step on the way to becoming World Champions, starting off with the chance to be crowned Regional Champions in your first season...

This guidebook contains everything you need to know to design and make a car, ready to compete at your nearest FI in Schools Race Day. It's as easy as 1,2,3 – or in our case, **Design, Make, Race!**

Project action plan:

1. READ THE RULES!



- Read this guide very carefully one section at a time, so your design will be fit to race. Pay EXTRA SPECIAL attention to the **Critical Regulations, which are highlighted in yellow (see page 9)**.

2. Get your Entry Class starter kit from isupply3d.com

- The starter kit contains all the standard components required to design and make your FI in Schools Entry Class car. **Please note: all Entry Class cars must be manufactured using this kit.**

3. Design the FI® car of the future

- Have a go at our IsoSketch® tutorial, which shows you how to sketch the basic chassis of your FI in Schools Entry Class car. Then start designing a super cool aerodynamic body and some sleek wings onto the chassis. **Remember no idea is too crazy at this stage, so do loads of sketches to experiment...**

4. Download the Entry Class CAD files from flinschools.co.uk

- There are 4 Entry Class CAD models that can be downloaded to help you build your car. These are: **FI® model block, body 'no-go-zone', standard wheel and the standard axle.**

5. Turn your ideas into a CAD drawing

- Using the 3D parts listed above and any 3D CAD package that you have available, turn your freehand sketches into an accurate 3D CAD model.

6. Get making your car!

- **Make sure your design is fully legal before manufacturing your car.** Decide how best to produce your car, using either a CNC router, a 3D printer or manual workshop tools, then **get cracking!**

7. Create a 5-page Design & Engineering Portfolio

- The judges want to see a **5-page** Design & Engineering Portfolio on Race Day. This should show sketches, models, CAD work and testing to explain how you designed, developed and manufactured your car.

8. Create a 5-minute Verbal Presentation

- As a team, you must put together a verbal (spoken) presentation that lasts no longer than 5 minutes. You can use a powerpoint presentation to help you along, but it's all about speaking directly to the judges!

9. Create a table-top display for your Team Pit Area

- There will be an award for the best Team Pit Display on Race Day, so get creative to show off your team!

10. TURN UP ON RACE DAY!

- Attend your nearest FI in Schools Race Day to ready to compete! See flinschools.co.uk for full details

ENTRY CLASS

What is F1 in Schools™?	04
Car Design	05
Assessment	10
The Competition	15
Appendix	23





UK Entry Class Competition

2018/19

What is F1 in Schools™?

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

I 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 and prizes up for grabs to all teams who compete, with the regional Race Day champions becoming VIP guests at our UK Season Finale at Silverstone Circuit!

F1 in Schools is open to all UK based secondary schools, colleges and youth groups. The challenge is simply to design, make and race innovative F1 cars of the future, using a combination of design and make skills and CAD / CAM software. The competition has three classes: **Entry, Development and Professional.**

Entry Class is open to **11-14 year olds**, in teams of **3-6**. By choosing Entry class, you have given yourself the best possible chance of growing through the ranks to become one of the UK's top teams and ultimately fighting for a chance to reach our world finals, which is contested by over 40 countries!

Our rules committee have created this document to give you all the information needed to compete in the Entry Class competition, attend your nearest Race Day and compete for a chance to be crowned Regional Champions.

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

A blue ink handwritten signature, likely belonging to Andrew Denford.

Andrew Denford
Founder and Chairman
F1 in Schools™



CAR DESIGN

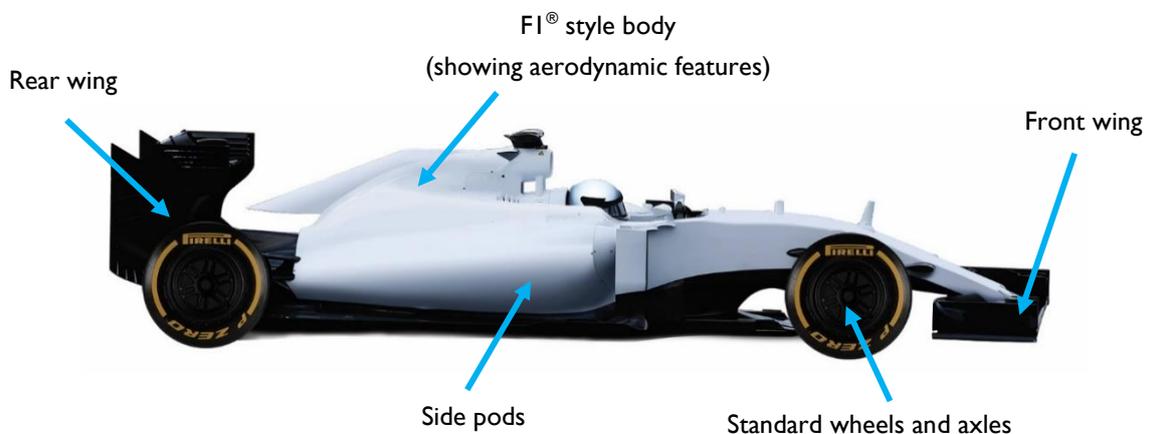
What is an Entry Class car?	06
What is the 'no-go-zone'?	07
Design Brief	08
Car Scrutineering	09



What is an Entry Class car?

Don't worry if you've never heard of 'side pods' or 'wing span' before, the next few pages explain everything you need to know about designing your mini FI[®] racing car to meet the UK Entry Class rules. *Read through the following pages very carefully as a team!*

Your FI in Schools[™] Entry Class car must have the following features:



What is the car body?

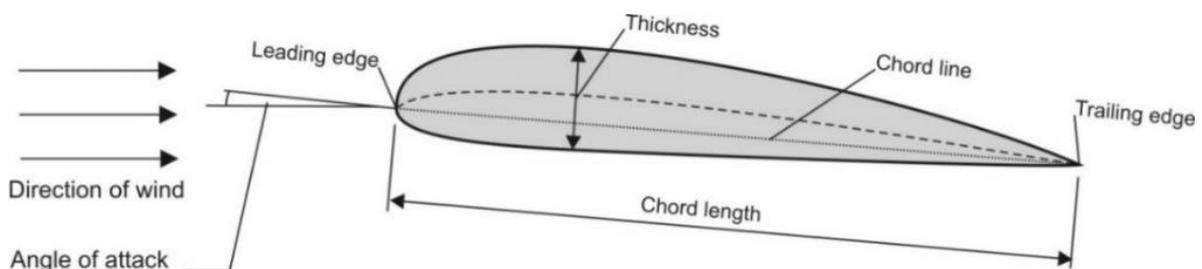
The car body is the main bulk of your Entry Class car. It is the middle section that the front and rear wings, axles and wheels are all attached to. Depending on how you make your car, this is manufactured from either the FI[®] model block or any 3D printing material and must be manufactured according to the 'no-go-zone' (*don't worry – this is explained on the next page!*).

Wing design explained:

- A **leading edge** is the edge of the wing that cuts through the air first.
- The **trailing edge** is the edge that the air touches last as it leaves the wing.
- Wing **span** is a bit like the arm span of a human, or the wing span of a bird or plane. It is the total width of the wings, including the nose cone or body of the car.
- Wing **chord** is the widest point of the wing's cross section, between the leading and trailing edges.
- Wing **thickness** is the deepest point of the wing across it's cross section.

These terms are all shown on the diagram below, make sure you understand what they all mean!

Wing cross-section diagram



What is the 'no-go-zone'?

Entry Class cars **must be safe to race** down our 20m elevated race track, powered by a CO₂ cartridge. To ensure this, the FI in Schools rules committee has created a 'no-go-zone' that **car designers MUST use as a minimum** for the body of their car. Think of this like starting with a basic shape that you add to, to create the shape of your car.

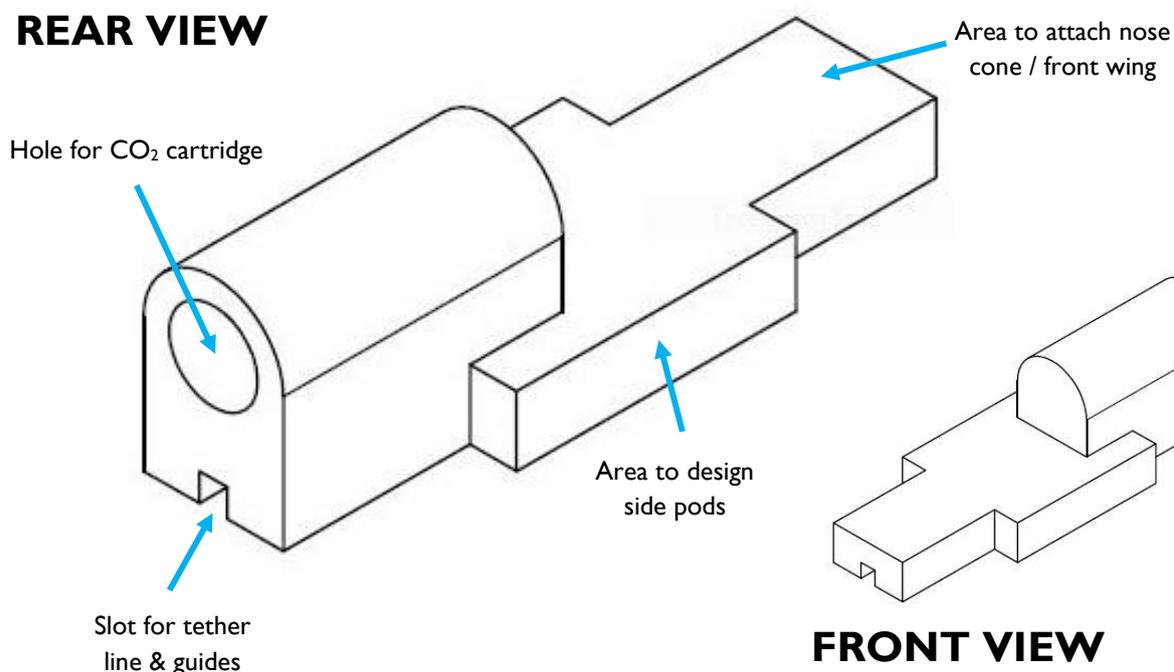
The 'no-go-zone' has been carefully designed so you can still make your Entry Class car look like a real FI[®] racing car, so use all your imagination and styling ideas to make sure your car doesn't just look like the no-go-zone with some wheels stuck to it!

The 'no-go-zone':

Below is an illustration of the Entry Class no-go-zone, showing the minimum shape of your car body. With the exception of your two (2) axle holes, it is a **Critical Regulation** that you don't cut or machine inside the no-go-zone, so make sure you measure and make your body carefully to avoid losing out on lots of points!

Critical Regulations are explained on Page 9.

REAR VIEW



FRONT VIEW

Note: The best way to start designing your Entry Class car is to watch our IsoSketch[®] tutorial on YouTube, for a step-by-step guide to sketching the no-go-zone. After that, you can get really creative with the body, add some crazy wings and unique styling features to your car! Full dimensions can be also found at the back of this guidebook in Appendix ii.

The Design Brief:

Your task is to design, make and race a miniature FI[®] racing car, which will race down the FI in Schools 20m elevated race track, powered by a compressed CO₂ cartridge. You must use a range of techniques to show design work, including freehand 3D sketches **and** 3D CAD development drawings.

The car:

Your car must include the following features:

- FI[®] style body including side pods
- Front wing
- Rear wing
- Standard FI in Schools wheels, axles and axle guide tubes

Note: See 'Car Scrutineering' (next page) for all body and wing dimensions

Body manufacturing:

In Entry Class, there are **three** manufacturing options for your car body:

- **Option 1:** The car body can be manufactured using a 3D CAM router (such as the Denford MRC40) from the official FI[®] Model Block
- **Option 2:** The car body can be manufactured using traditional workshop tools (such as fret saws, rotational multi-tools, band saws, pillar drills, milling machines) from the official FI[®] Model Block
- **Option 3:** The car body can be manufactured entirely using a 3D printer (such as the Up Plus 2) using any 3D printing material, in one piece or as multiple parts.

Wing manufacturing:

You can manufacture the front and rear wings of your car using any manufacturing method and material combination. Be creative, but remember that the wings are usually the most fragile parts of the car!

Now turn over for a checklist of how to design your FI in Schools Entry Class car...

Car Scrutineering:



E1.1 Car body material - [Critical regulation | 20pts]

E1.1.1 Make option 1: The car body **MUST** be manufactured using the official FI[®] Model Block

E1.1.2 Make option 2: The car body **MUST** be manufactured using the official FI[®] Model Block

E1.1.3 Make option 3: The car body can be manufactured from any 3D printing material



E1.2 Car body size - [Critical regulation | 20pts]

The car body must have a minimum size no less than the official Entry Class no-go-zone with two (2) axle holes, but no bigger than the official FI[®] Model Block. Please refer to **Appendices i & ii** for more details.

Min size: no-go-zone / Max size: model block

E1.3 Front wing - [5pts]

The front wing must be securely fixed to the body of the car, either as a single piece or as part of a nose cone assembly. The front wing can be manufactured using any suitable material.

E1.3.1 Front wing thickness: Min: 3mm / Max: 15mm

E1.3.2 Front wing span: Min: 60mm / Max: 80mm

E1.4 Rear wing - [5pts]

Rear wings must be securely fixed to the body of the car, either as a single piece or as separate elements that make up the total wing span when measured as part of the finished car.

E1.4.1 Rear wing thickness: Min: 3mm / Max: 15mm

E1.4.2 Rear wing span: Min: 60mm / Max: 80mm

E1.5 Wheels - [5pts]

Entry Class cars **MUST** use the standard wheels, unmodified in any way. Please refer to **Appendix iii** for more details. (Included in the FI[®] Entry Class starter kit)

E1.6 Axles - [5pts]

Entry Class cars **MUST** use the standard axles and axle guide tubes, modified only in length to the dimensions below. Please refer to **Appendix iv** for more details. (Included in the FI[®] Entry Class starter kit)

Min: 50mm / Max: 66mm



E1.7 Tether line - [Critical regulation | 10pts]

Entry Class cars **MUST** use the standard tether line guide screw eyes, unmodified in any way. (Included in the FI[®] Entry Class starter kit)



E1.8 Total car weight - [Critical regulation | 20pts]

The completed car, including wheels, axles, paint and any decals must be at least the minimum weight to race.

Min: 65g

E1.9 Surface finish - [20pts]

Surface finishing can include using abrasive paper, polish, paints, lacquers and / or stickers.

E1.9.1 Make option 1: The car body should have a surface finish added to the model block

E1.9.2 Make option 2: The car body should have a surface finish added to the model block

E1.9.3 Make option 3: The car body should have a smooth, attractive surface finish



IMPORTANT: Critical Regulations are worth the most points, so it is very important not to break them. Breaking a Critical Regulation also means your team CANNOT win the 'Fastest Car' award, so make sure your car is fully legal before attending Race Day!



ASSESSMENT

Research Mission:	11
Design & Engineering Portfolio:	12
Verbal Presentation:	13
Pit Display (not-assessed, award only):	14





Research Mission:

On Race Day, your first task in the Entry Class will be your Research Mission. This is your chance to visit all the competing teams from Development and Professional Class, ask questions and look at their work to find out more about FI in Schools. The judges will ask you to answer questions about your Research Mission later in the day after your verbal presentation, so make sure you cover all the key questions!

Key questions

Think of the 'Key questions' as essential knowledge of the FI in Schools STEM Challenge. These are questions that the judges will expect you to be able to answer, from asking Development and Professional Class teams and using your investigative powers in the pit display area! Make sure the whole team understands the answers, as sometimes the judges like to ask more difficult questions that build on your understanding of the topics...

Reflective questions:

These questions give you the opportunity to speak for longer, to explain your thoughts and reflections having completed the Entry Class project. They might encourage you to talk about:

- How the competition has gone this year
- What you would do differently if you had the chance
- How you will prepare to return as a Development Class team

The judges will ask you both Key and Reflective questions at the end of your verbal presentation, so make sure you are feeling ready and prepared to tell the judges all about your day and how much you've learned along the way!

Note: Your Research Mission will be given to you on Race Day, so there's no need to worry about this before you turn up to the event. Just focus on getting your Design & Engineering Portfolio and Verbal Presentation finished to a standard that you are proud to show.



Design & Engineering Portfolio:

You must produce a printed (or 'hard-copy') **5-page** Design & Engineering Portfolio to show to the judges on Race Day, explaining how you designed, tested and made your FI in Schools racing car. Below is a checklist of suggestions for what to include in your Design & Engineering Portfolio.

Content:

Your Design & Engineering Portfolio should contain evidence of the following:

- **Initial ideas** – including 3D freehand sketches
- **Design development** – including images of any models, CAD work and testing
- **Team Graphic Identity** – Including team name, logo and car livery (colour scheme and patterns)
- **CAD** – including 3rd angle orthographic (top, front and side) and 3D views of your final design
- **Project Evaluation** – including anything you didn't manage to do this time

Format:

The format of your Design & Engineering Portfolio is up to you, choose between either:

- **A4** – landscape or portrait
- **A3** – landscape or portrait

Note: Please make sure your Design & Engineering Portfolio is printed in full colour and stapled or bound.

Additional information:

You may choose to include the following sections, which do NOT count towards your 5-page limit:

- Decorative front cover
- Contents page

Note: You **MUST** clearly display your team name on the front page of your Design & Engineering Portfolio. Your Portfolio must be clearly displayed at your Pit Area on the morning of Race Day.



Verbal Presentation:

You must prepare a **5-minute** verbal presentation to deliver to the judges on Race Day, explaining how you designed, tested and made your FI in Schools racing car. You may also produce an electronic presentation to accompany your verbal presentation if you wish.

Content:

Your verbal presentation is your chance to tell the judges your story! It is completely up to you how you structure your presentation, but here are some suggestions to help make you stand out!

- Tell the judges why you got involved in FI in Schools
- Describe what you found the most difficult – the judges appreciate honesty!
- Tell them which bits you have enjoyed the most
- Describe how you came up with the final design of your Entry Class car
- Explain how you went about manufacturing your car

Content:

There are **NO** rules about how to deliver your verbal presentation; do it stood on your head, sing the judges a song, act it out like a school play. Just do what feels most comfortable to you. All we ask is that:

- **Everyone takes part!** – make sure every member of the team has a speaking part
- **You don't go over 5 minutes** – the judges need to ask you questions so no waffling!

Research Mission:

The judges will be asking you some questions to see what you have learned during your day at the Entry Class Regional Final. These questions will be given to you on Race Day so be prepared to get investigating!

Note: Any electronic presentations **MUST** be saved to a memory stick. Please also bring a laptop to run these presentations on, as we cannot provide one for you!

Team Pit Display:

Each team is given a 'Pit Area' including a table on Race Day. This will become your base for the day and is the perfect space to create a team display. This is not assessed as part of the competition, but the judges are keeping their eyes peeled to give an award to the best display on the day. Make sure you stand out!

Content:

The Team Pit Display is your opportunity to share all your design work, models and prototypes, creating an attractive area that teams and judges will want to come and look at. The Pit Display can be made up of several elements, so here are some suggestions to help make you stand out!

- Show a range of 'behind the scenes' design work, not just your Design & Engineering Portfolio
- Make sure it's clear whose Pit Display it is – add your team logo and colours to make it obvious
- Judges love cupcakes. In fact, most people love a freebie, so why not bring something to give away?
- Give it height! To make it visually appealing, having raised items helps create a better look

Remember there is **no scorecard** for the Team Pit Display, just an award for the Best Team Pit Display, so have some fun with it! The judges will be looking for interesting and engaging displays, so have a think about what you could bring along with you. When you compete in the Development and Professional classes, the Pit Display is assessed as part of the competition, so get some ideas and make sure you find out what makes a really strong Pit Display for next year.



THE COMPETITION

How it works – Race Day	16
How it works – Judging	17
Judging Score cards	18
Next Steps – Development Class	21



Race Day – what to expect

Race Day happens at your nearest UK Regional Final, which brings together all three classes of the FI in Schools family. You'll be sharing the track and pit area with Development and Professional Class teams, but don't worry – you'll only be competing against other Entry Class teams from your area! This is your chance to check out the competition and ask the Development and Professional Class teams about the next stages of the competition.

Welcome presentation

- After a short set-up period to get your display table set up, we will hold the official welcome and explain the format of the day.

Research Mission

- Using your Research Mission checklists, go around the pit displays and speak to teams, finding out answers to all the questions. The judges will be asking you about these later on in the day!

Judging: Design & Engineering Portfolio

- Our team of expert judges will visit your team pit and look through your portfolio with you. This is a great chance to speak to the judges informally and explain everything you've done and what you've learned!

Judging: Verbal Presentation

- Your team will deliver a 5 minute verbal presentation to our judges, explaining what you have done to get here. The judges will then ask a series of questions related to your research mission, crucially the judges will want to know what you'll do differently when you come back as a Development Class team next year...

RACE!

- You will go head-to-head with another Entry Class team to compete for top spot on our leaderboard. Racing will consist of 2 timed runs in each lane of the 20m FI in Schools elevated race track.

Judges Debrief

- After all the judging has been completed, the team of judges will gather to discuss their scores and work out who will go home from Race Day with our various awards.
- **Entry Class awards: Fastest Car**
- **FI in Schools Judges Tip: Future Stars Award**
- **Entry Class top prize: Entry Class Regional Champions**

Awards ceremony

- Awards will be handed out to teams in all three classes, including the prestigious **Entry Class Regional Champions** award. Fingers crossed!

The judges - what they're looking for:

The judges will have a **total of 480 points** to give you throughout the day and will score your work in four areas: **Car Scrutineering, Design & Engineering Portfolio, Verbal Presentation** and **Racing**.

Below is a quick guide explaining how the judges score your work, on the next pages are the official Entry Class score cards so you can see exactly what the judges are looking for!

Car Scrutineering

- Your car will be assessed and hopefully declared safe to race by our judges, who will use the Scrutineering criteria on Page 9. Car Scrutineering will be scored using the score card on page 18.

- **Total points available for Car Scrutineering: 140**

Design & Engineering Portfolio

- Your Design & Engineering Portfolio will be assessed by the judges and given a score based on a number of criteria, as described on page 12. Portfolios will be scored using the score card on page 19.

- **Total points available for Design & Engineering Portfolio: 100**

Verbal Presentation / Research Mission

- The judges will listen to your 5 minute presentation, then ask questions related to your Research Mission based on the criteria on page 13. Verbal presentations will be scored using the score card on page 20.

- **Total points available for Verbal Presentation: 140**

Racing

- You will be awarded racing points depending on how you perform on track. Points will be awarded for your reaction time, the time your car takes to complete the track and the combined 'total race time'.

- **Total points available for Racing: 100**

Now have a look at the judging scorecards to see exactly what the judges will be awarding points for when they meet you on Race Day...

Car Scrutineering Score Card

Team Number:
Team Name:
School:

Specifications					
Regulation	Summary	Criteria	Points available	Pass/Fail	Score
EI.1	Body material (award points for one ONLY)	EI.1.1: CNC Model block	20		/20
		EI.1.2: Handmade Model block	20		
		EI.1.3: 3D printed body	20		
EI.2	Body size	Min: No go zone Max: Model block	20		/20
EI.3.1	Front wing thickness	Min: 3mm Max: 15mm	5		/5
EI.3.2	Front wing span	Min: 60mm Max: 80mm	5		/5
EI.4.1	Rear wing thickness	Min: 3mm Max: 15mm	5		/5
EI.4.2	Rear wing span	Min: 60mm Max: 80mm	5		/5
EI.5	Wheels	Standard wheels	5		/5
EI.6	Axles	Standard axles and axle guide tubes	5		/5
EI.7	Tether line guides	Standard guides	10		/10
EI.8	Weight	Min: 65g	20		/20

Specifications Total /100

Aesthetics

FI® style body	Few recognisable FI® design features	Attempt to create FI® style body with most features present	Highly recognisable FI® style body design, including side pods, front and rear wing and nose cone
	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 (including EI.9)	Reasonable finish with some inconsistencies	Good overall finish quality and assembly with attention to details	High level of accuracy shown on all manufactured components. High attention to detail across all assembly and finishing
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20

Aesthetics Total /40

Specifications Total + Aesthetics Total = Scrutineering Total = /140

Notes:

Design & Engineering Portfolio Score Card

Team Number:
Team Name:
School:

Design & Engineering Portfolio Only Assessment				
Initial Ideas	Few rough ideas of value, most design work conducted on CAD	Good range of initial ideas to show different possible solutions. Clear annotation of ideas justifying design decisions	Comprehensive range of ideas, including freehand 3D sketches and test modelling to show possible solutions. All designs clearly annotated with design justifications	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Design Development	Little progress made from initial ideas	Evidence of design decisions made between initial idea and final design, clear justification	Clear and logical design development, showing stages of development from initial idea selection to final design. All decisions justified	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
CAD drawings	Basic CAD drawings with little detail	Good use of CAD to produce multiple views, final design shown with dimensions	Impressive CAD skills demonstrated to develop and present final design. Full dimensions provided along with orthographic and 3D views	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Project Evaluation	Little evidence of reflection	Evaluation limited to short sentences with some justification, some ideas for improvements	Well justified evaluation, clearly describing strengths and difficulties experienced. Justified suggestions for improvement	
	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				/80

Team Identity				
Graphic Identity	Inconsistent, limited or obscure identity	Effective team identity consistent through all project components e.g. car matches team logo	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

Design & Engineering Portfolio Only Assessment + Team Identity Total = Enterprise Total = /100

Notes:

Verbal Presentation Score Card

Team Number:
Team Name:
School:

Technique				
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 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	
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	
Technique Total				/60
Content				
Design process	Basic descriptions of tasks undertaken	Clear and appropriate explanations of the design concept	Full description of how design ideas led to final design. Development journey clearly explained	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Manufacturing process	Lack of understanding of methods used	Clear and appropriate explanations of relevant processes	High level of understanding, manufacturing processes and methods explained and justified	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Content Total				/40
Research Mission				
Key Questions	Lack of knowledge of Key Questions	Some Key Questions understood and answered cohesively	Most Key Questions answered with confidence, able to expand on questions when prompted	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Reflective Questions	Lack of discussion around Reflective Questions	Some Reflective Questions discussed thoughtfully	Most Reflective Questions discussed with confidence. Key skills recognised and identified demonstrating strong evaluative skills	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Research Mission Total				/40
Technique Total + Content Total + Research Mission Total = Verbal Presentation Total =				/140

Notes:

Next steps...

Development Class



Next steps: Development Class

Entry Class is your first step on what could be the journey of a lifetime. With FI in Schools, you could travel the world as one of our World Finalist teams, meeting the real team members and drivers from FI®. This really could be your chance to land the job of your dreams!

All our Entry Class Regional Champions will win a special VIP invitation to attend and spectate at our UK National Finals at Silverstone, the home of the British Grand Prix.

Looking ahead and learning what comes next will be the most important thing if you want to be in with a chance of being one of the world's top teams. In Development Class, some things will be familiar, where others will be slightly more complicated. Start looking at the rules and regulations for Development Class and aim to come back next year challenging for a place at our FI in Schools National Finals at Silverstone!



Soaking up Silverstone: Accelaron, Development Class UK National Finalists 2018

#RoadToSilverstone starts here... To download and start reading the rules and regulations for Development Class, visit FIinschools.co.uk

APPENDIX

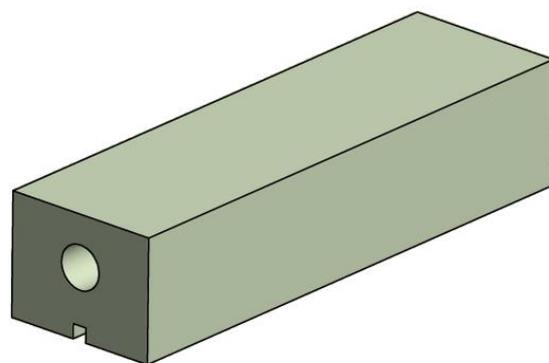
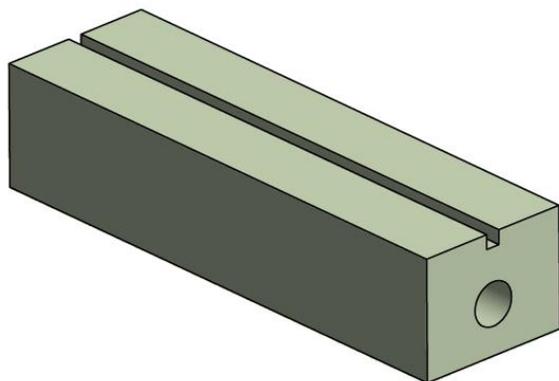
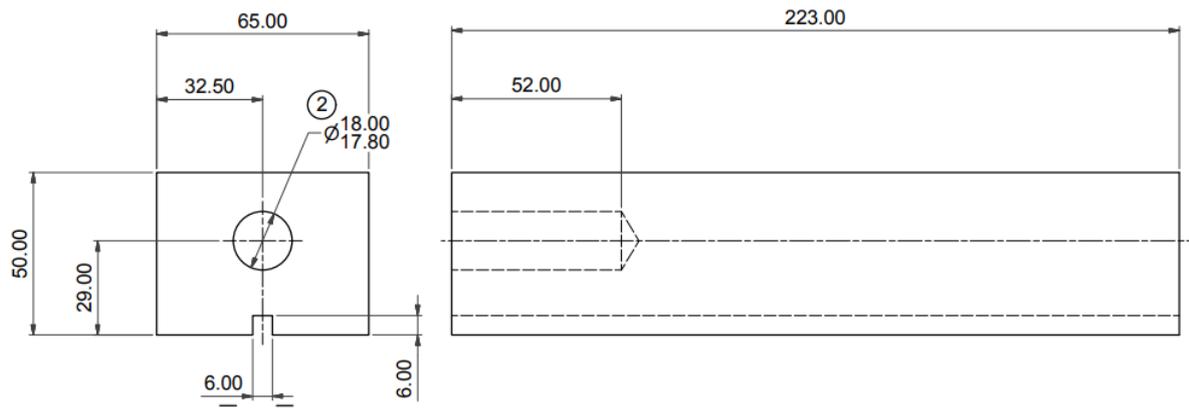
Appendix i:	Official F1 [®] model block	24
Appendix ii:	No-go-zone	25
Appendix iv:	Standard wheels	26
Appendix v:	Standard axles	27
Appendix vi:	Essentials checklist	28



Appendix i. Official FI® Model Block



This component is available to download a FREE 3D part from the FI in Schools website. For this part and more, please visit <http://www.fiinschools.co.uk/downloads-and-resources/>

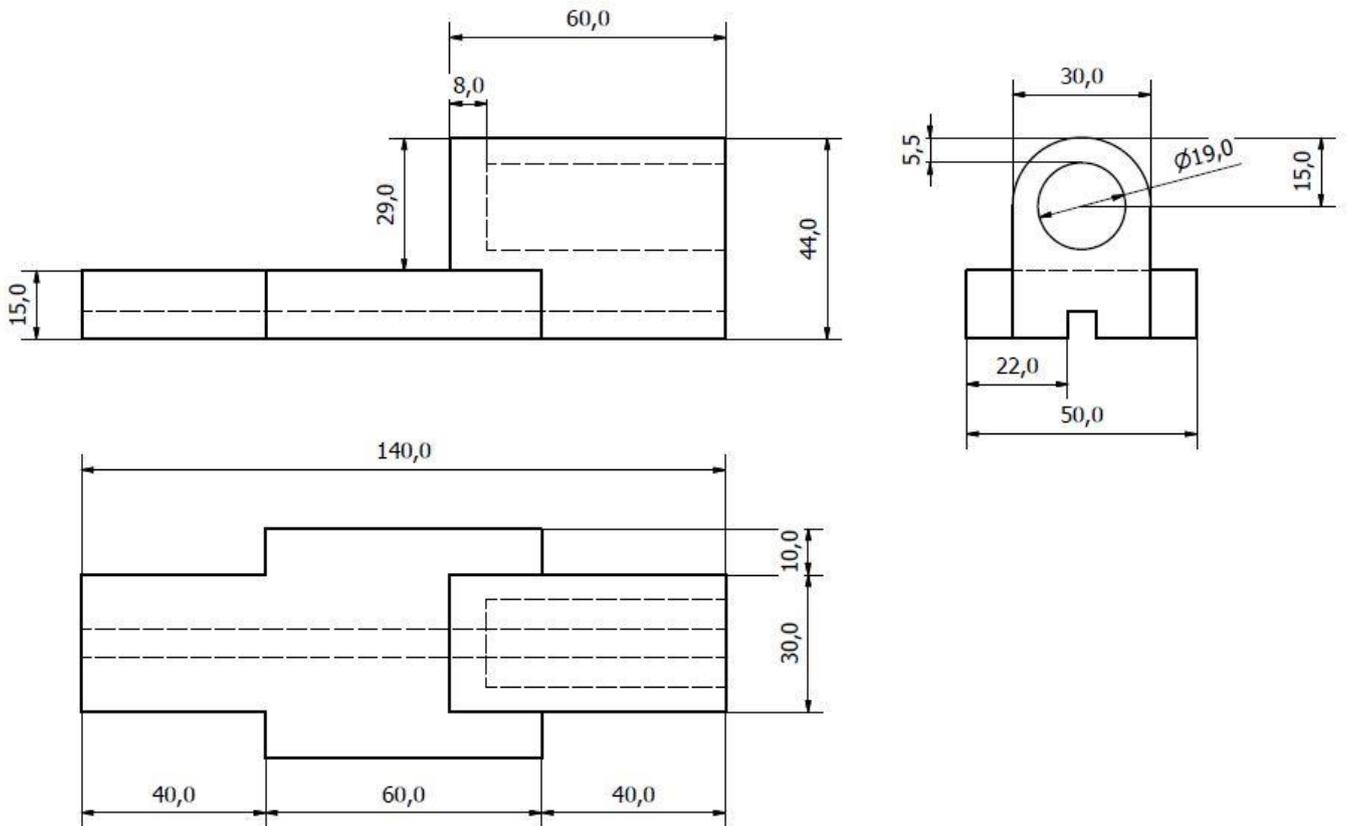


Appendix ii. Entry Class ‘no-go-zone’



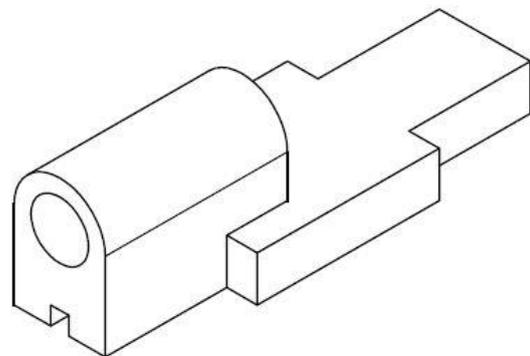
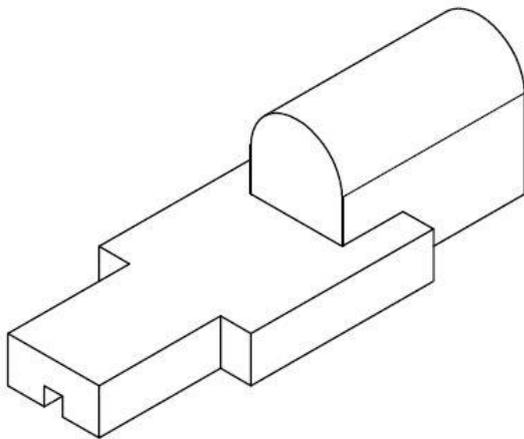
This component is available to download as a FREE 3D part from the FI in Schools website. For this part and more, please visit <http://www.fiinschools.co.uk/downloads-and-resources/>

Orthographic projection:



Front view

Rear view



Note: See how to sketch the no-go-zone and quickly start designing, by watching our tutorial on the FI in Schools website. Just visit our [Downloads and Resources](#) section to see how!

Appendix iii. Entry Class standard wheel

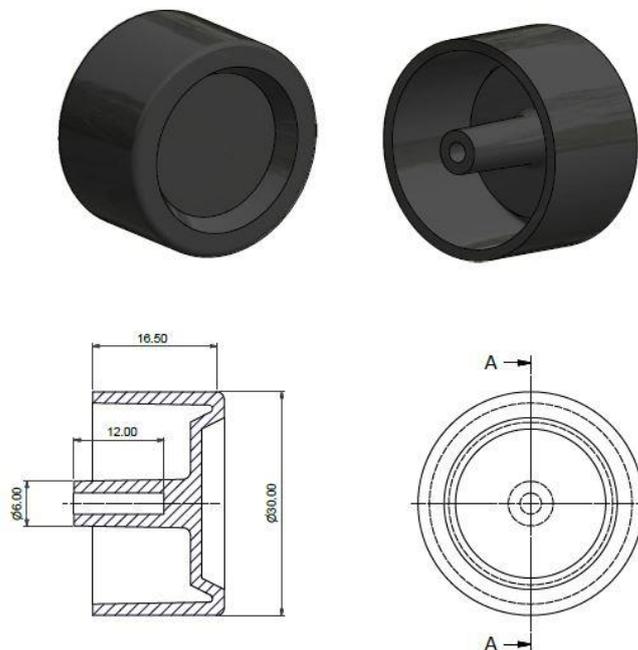


This component is available to download as a FREE 3D part from the FI in Schools website. For this part and more, please visit <http://www.fiinschools.co.uk/downloads-and-resources/>

Please note: Teams may use the new style wheel (as supplied) or the older 'Fusion' style wheels for the 2018/2019 season. Please see below orthographic drawings for both the Fusion and new style wheels:

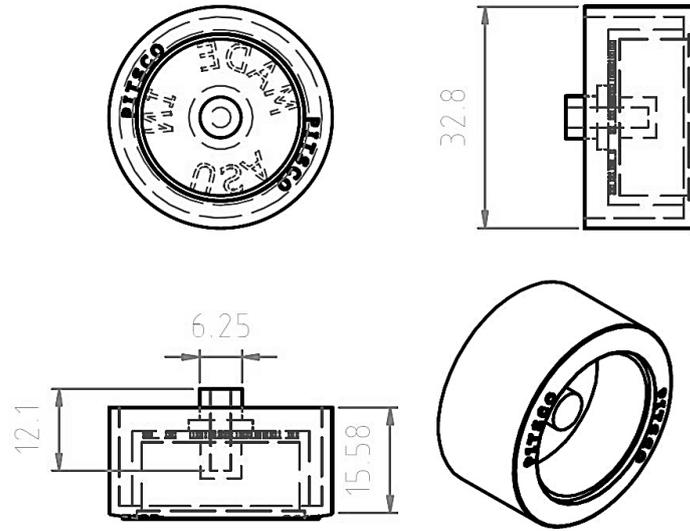
New style wheel:

Individual wheel weight: 3.5-3.8g



Pitsco 'Fusion' wheel:

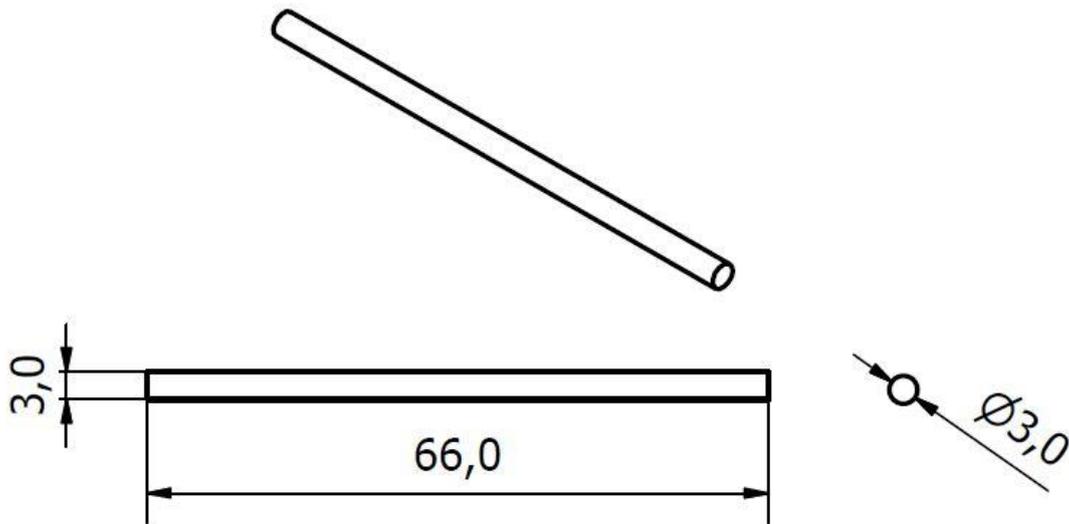
Individual wheel weight: 5.5g



Appendix iv. Entry Class standard axle



This component is available to download as a FREE 3D part from the FI in Schools website. For this part and more, please visit <http://www.fiinschools.co.uk/downloads-and-resources/>



Individual axle weight: 4g

Appendix v. Essentials Checklist

Below is a helpful checklist, showing some of the essential items you'll need for designing, making and competing in the FI in Schools Entry Class:

Essential workshop kit:	(TICK)
Tools / equipment:	
CNC router, laser cutter OR 3D printer	
Band saw	
Coping saws	
Sanding disk	
Modelling files	
Pillar drill	
Rotary multi-tool	
Glass paper	
Materials:	
Modelling foam / spare FI® Model Blocks for practice / testing	
PLA / ABS reels for 3D printing	
Acrylic (3mm minimum, suitable for laser cutting)	
Paint & lacquer (suitable for school use)	
Standard parts:	
Standard wheels	
Standard axles and washers	
Standard tether line guides	
Model Block (E1.1.1 / E1.1.2 only)	
Race Day essentials:	
Assessment items:	
1 x Entry Class FI in Schools™ Car	
1 x 5-page Design & Engineering Portfolio	
1 x Computer to run Verbal presentation (optional)	
1 x Table top display for your team's pit area	
Tools / equipment:	
Superglue	
Gaffer tape	
Blu-tack	
Consumables:	
Food / drink	
Basic first aid kit	

**Good luck,
see you on
Race Day!**

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

FI in Schools™ STEM Challenge
Engineering in Motion

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