THE FORMULA ONE™ TECHNOLOGY CHALLENGE
IN SCHOOLS

This document details the points allocation, specification sheets, score cards and race scoring method used at 2010-2011 F1 in Schools Regional and National Finals.

Points Summary

Judging Area	Points Available	% of Overall Points
Engineering Judging		
Specification	120	13.33%
Use of CAD/CAM	60	6.66%
Quality of Manufacture	60	6.66%
Portfolio & Pit Display		
Portfolio	90	10.00%
Pit Display and Marketing	60	6.66%
F1 Car Design Process	60	6.66%
Verbal Presentation		
Technique	60	6.66%
Composition	60	6.66%
Subject Matter	60	6.66%
Racing		
Time Trials	225	25.00%
Reaction Racing	45	5.00%
Penalty Points		
Grand Total	900	

Specification – 120 Points

F1 Class:

Regional Final - Only the nominated race car will be scrutineered. 5 points deducted for each rule infringement.

National Final - Two cars are required, both will be scrutineered. 2.5 points deducted for each rule infringement on each car.

Bloodhound SSC Class:

Regional Final - Only the nominated race car will be scrutineered. 10 points deducted for each rule infringement.

National Final - Two cars are required, both will be scrutineered. 5 points deducted for each rule infringement on each car.

Wind Tunnel Testing (Bloodhound SSC Class only)

40 points out of the 120 are allocated for wind tunnel testing. The calculation will be included on your post event results summary.

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Bloodhound SSC Class Specification Sheet

Team Name:	Team No:
School:	
Age Group:	
Designed Using (CAD):	
Manufactured Using (CNC):	

This sheet should be completed before attending your regional final and submitted along with your nominated race car on arrival

All measurements are in millimetres
Tolerances: Dimensions ±0.1mm

Rule	Detail	Measurement/Value
	Body Dimensions	
2a	Full Body Length	
2b	Minimum cross sectional area	
	Wheels	
3a	Minimum of 4 wheels (two at the front, two at the rear)	Yes/No
3b	All 4 wheels should touch the racing surface at all times	Yes/No
	Power Plant	
4a	CO_2 Cartridge Chamber Diameter	
4b	Lowest Point of Chamber to track surface	
4c	Depth of chamber	
4d	Wall thickness around chamber	
	Screw Eyes/ Tether Line Attachment	
5c	Inside diameter of screw eyes	
5d	Distance Apart	
	Total Deductions	
	Points Available	
	Grand Total	

For clarification on individual rules please refer to the published rules & regulations.

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Formula One™ Class Specification Sheet

For clarification on individual rules please refer to the published rules & regulations. All measurements are in millimetres or grams.
Tolerances: Dimensions ±0.1mm Weight ±0.1g

Rule	Detail	Measurement /Value
Body and Side Pod Regulations		
1a	Car design using CAD/CAM, Manufactured using CNC	Yes/No
1b	Limited Hand Finishing	Yes/No
2a	Full Body Length	
2b	Body to Track Clearance	
2c	Width at Side Pods	
2d	Total Car Width inc. Wheels	
2e	Body Weight	g
2f	No part of the body or sidepods less than 3.5mm thick	Yes/No
2g	Max Body Height	
2h	Car body inc sidepods machined from single piece of balsa	
2i	No implants/hidden voids	Yes/No
2k	View from top a projected rectangular shape of 30mm x 50mm x 10mm minimum must exist within the sidepod extremities	Yes/No
Wheel Regulations		
3a	All F1 must have 4 wheels	Yes/No
3b	Front Wheel Diameter	
3c	Front Wheel Width	
3b	Rear Wheel Diameter	
3c	Rear Wheel Width	
3d	All 4 wheels must touch the racing surface at the same time across the full width of the wheel	Yes/No
3e	Wheel dimensions consistent	Yes/No
3g	Front Wheel Visible (Side & Plan View)	Yes/No
3g	Rear Wheel Visible (Side & Plan View)	Yes/No

Team Name:	Team No:
School:	
Designed Using (CAD):	
Manufactured Using (CNC):	

Power Plant Regulations		
4a	CO_2 Cartridge chamber Diameter	
4b	Lowest point of chamber to track	
4c	Depth of hole	
4d	Wall thickness around cartridge	
4e	No paint inside chamber	Yes/No
Tether Line Guide Regulations		
5a	2 screw eyes/tether line guides	Yes/No
5b	Tether Line Guide must be clear of racing surface	
5c	Inside diameter of tether line guide	
5d	Distance apart at furthest point	
Aerofoil Regulations		
6a	Car design resembles F1 Car	Yes/No
6b	Front aerofoil non-metal	Yes/No
6c	Front Aerofoil Span	
6c	Rear Aerofoil Span	
6d	Front Aerofoil Chord	
6d	Rear Aerofoil Chord	
6e	Front Aerofoil Thickness	
6f	Rear Aerofoil Thickness	
6g	Front Aerofoil in front of centre line of front axle	Yes/No
6h	Rear Aerofoil behind centre line of rear axle	Yes/No
6i	Rear Aerofoil higher than highest point of rear wheel	Yes/No
	Total Deductions	
	Points available	120
	Grand Total	

THE FORMULA ONE™ TECHNOLOGY CHALLENGE
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ENGINEERING SCORE CARD

Team Number:
Team Name:
School:

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	
Analysis	Minimal analysis shown	Good analysis. Results applied to development	Variety of advanced and relevant analysis techniques	
	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	
	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	
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15	

CAD & Analysis	/60

MANUFACTURING				
Quality of Finish	Reasonable finish with inconsistencies	Good overall finish quality with attention to detail	Showcase' finish quality on all components. Exceptional attention to detail. Two cars are identical.	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Assembly	Poorly assembled	Generally well assembled and engineered	Professional assembly, highly engineered. Sound	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	
Use of CNC Machining	Minimal evidence of CNC understanding	Effective use and understanding of CNC machining	High level of CNC machining competence. Appropriately complex techniques and processes used to achieve	
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	

Manufacturing	/60

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

THE FORMULA ONE™ TECHNOLOGY CHALLENGE IN SCHOOLS

PORTFOLIO & PIT DISPLAY SCORE CARD

Team Number:
Team Name:
School:

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

PORTFOLIO

Project Management	Little evidence of project management presented.	Simple management and planning used to guide progress. A range of resources considered.	Comprehensive project management. A wide range of factors considered; e.g.. scope, time, resources and project risks.	
	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 and 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

PIT DISPLAY & MARKETING

Team Identity	Inconsistent, limited or obscure identity	Effective team identity consistent through various project components.	Excellent and highly effective team identity. 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 & 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. Some project development displayed.	Clean, well organised and has high impact. Highly professional with attention to detail. Well presented project developments.	
	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

CAR DESIGN PROCESS

Ideas	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas. Form linked to function.	
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15	
Development and Testing	Limited development shown	Logical design developments based on testing	Clear and justified developments linked to tests and research	
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15	
Manufacture	Little manufacturing detail	Manufacturing processes and issues presented	Detailed assessment of manufacture, stages, materials & issues	
	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 project aspect evaluation linked to improvement action	
	1 2 3	4 5 6 7 8	9 10 11 12 13 14 15	
			F1 Car Design Process	/60

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

THE FORMULA ONE™ TECHNOLOGY CHALLENGE
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VERBAL PRESENTATION SCORE CARD

Team Number:
Team Name:
School:

5 MINUTE TIME LIMIT FOR VERBAL PRESENTATION

TECHNIQUE				
Visual Aids	Little use of aids. 1 2 3	Some aids used effectively 4 5 6 7 8	Highly professional aids effectively improve communication 9 10 11 12 13 14 15	
Team Contribution	Minimal team participation 1 2 3	Good contributions from most team members 4 5 6 7 8	Excellent team work with all members participating effectively 9 10 11 12 13 14 15	
Dynamic	Artificial and/or low energy 1 2 3	Generally enthusiastic and lively delivery 4 5 6 7 8	Passionate with consistent and appropriate levels of animation 9 10 11 12 13 14 15	
Engagement	Minimal engagement 1 2 3	Some audience connection at times 4 5 6 7 8	Audience fully engaged and excited throughout presentation 9 10 11 12 13 14 15	
			Technique Total	/60

COMPOSITION				
Concept Clarification	Several concepts lacked clarification 1 2 3 4	Clear and appropriate explanations 5 6 7 8 9 10 11	Concise and creative clarification of ideas requiring explanation 12 13 14 15 16 17 18 19 20	
Use of Time	Too fast or ran out of time 1 2 3 4	Good timing. Balanced topic depth and pace 5 6 7 8 9 10 11	Ran on time or under. Excellent balance of depth for each topic 12 13 14 15 16 17 18 19 20	
Presentation Agenda	No agenda presented 1 2 3 4	A basic agenda presented and could be followed by audience 5 6 7 8 9 10 11	Clear presentation outline. Excellent connections between topics and easy for audience to follow 12 13 14 15 16 17 18 19 20	
			Composition Total	/60

SUBJECT MATTER				
Innovation	Little innovation presented 1 2 3 4	Innovations described and justified 5 6 7 8 9 10 11	Originality. Clever innovations with high positive project affect 12 13 14 15 16 17 18 19 20	
Collaboration	Little collaboration 1 2 3 4	Links with industry or higher education described 5 6 7 8 9 10 11	Collaborations justified with learning and project outcomes 12 13 14 15 16 17 18 19 20	
Learning Experiences	No real reflections discussed 1 2 3 4	Good explanation of some learning outcomes 5 6 7 8 9 10 11	A range of personal, life long learning and career skills acquired identified as project outcomes for a range of team members 12 13 14 15 16 17 18 19 20	
			Subject Matter Total	/60

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

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Race Scoring

Racing will comprise of 4 races, 2 races per lane. The reaction time will be subtracted from the total race time and used to calculate the time trials score. A false start counts as a race. The car must cross the line intact; any failures before crossing the line will result in that teams race being regarded as a Did Not Finish (DNF).

Time Trials – Maximum of 225 points.

- Fastest Time = 225 Points
- Second Fastest Time = 210 Points
- Base Time value = 120% of Second Fastest Time (140% for Bloodhound SSC Class)
- Third to slowest time score points using the following formula:

Points = 30 + (180 points / (Base Time – 2nd Fastest Time)) x (Base Time – My Best Time)

- Teams slower than Base Time are deducted 7.5 points for any DNF race result.

Reaction Racing – Maximum of 45 points.

- Fastest TOTAL (Reaction + Race Time) = 45 points
- Slowest Total = 3 points
- Base Time value = slowest time.
- All teams score points using the following formula:

Points = 3 + (42 points / (Base Time – Fastest Total Time)) x (Base Time – My Best Total Time)

Penalty Points

- A one off 15 point penalty may be applied to cars that fail before crossing the finish line which require repair, this is likely to include but not limited to objects falling off the car. This may also be applied should you have to use your back-up car.