

regret this however as I feel that structuring my life around a chart is not how I wanted to plan my project.

Presentation skills

(Think about how you presented your findings. Evaluate your presentation method(s), choice of audience(s), layout, structure, degree of formality and choice of content. Did your presentation include information/ideas/reflections with supporting detail in a logical order and reach a reasoned conclusion?)

I chose to use Prezi for my presentation as it is easily accessed from anywhere due to its accessibility through the internet. As well as the fact that it contained templates that I could use that were modern, colourful and contained animations. All of which helped to attract my audience's attention when presenting. I feel that my selection of audience was appropriate for my presentation as they were all interested in either Physics, Maths, Formula One or just the idea of my project as a whole. I started off my presentation by explaining some of the results from my survey and asking questions about them to engage my audience. I then lead on to explain the fundamentals of my project. I started off with aerodynamics which I then used to lead on to Bernoulli's principle and how it relates to drag. I then began to introduce the changes that had been made to the Formula One cars and explained the impact and effect of these changes on the cars. I introduced the idea of vortices and then went on to explain how they arose by using an analogy and props. I used a ball to represent a particle and then began to give examples of how it would gain rotational velocity allowing it to gain circular motion. I then introduced more particles and described how these vortices arose. I found that this worked as it helped my audience to visualise the process and I confirmed this through the nodding of my audiences heads and a discussion after the presentation. After explaining the basis of my research, I then began to lead on to conclusions that would link into my aim. I then finished off with any extra information I wished to include such as information about the Formula One industry adapting and developing wind tunnels from the aeronautical industry to improve their understanding of aerodynamics as well as allowing the opportunity for any questions to be asked in which I was asked multiple questions which tested my knowledge however I answered them confidently.

Self evaluation – recognition of own skills development and future areas for development

(Think about how you have developed throughout your project. How did you deal with feedback, praise, setbacks and criticism and their impact on your own development of knowledge, skills and understanding? To what extent did you ask for feedback, learn from experiences and how will you use these to inform future progress?)

Over the duration of my project, I have developed both my skills as well as my character. This is due to the independent nature of the project which has helped to increase my confidence as well as my interpersonal skills as I had to contact and speak to professionals in my area of study solo. I learned that most of these professionals are more than willing to share and spread their knowledge which has filled me with confidence to approach situations such as these with a calmer

mindset as I know that I now have the ability to contact and speak to these professionals on my own. This confidence will most definitely assist me later in life especially in university where I will have to work with lecturers and PHD students who will most likely assist out with classes. I have developed the ability to deal with setbacks with a more positive mindset as I use these setbacks to develop myself further and push forward. Such as when I initially did not receive any replies from my contacts, I began to feel anxious and worried however as I received my first reply, I began to feel assured and more confident about getting replies as I began to receive more and more messages. This helped me to develop my problem-solving skills as I had to search for a solution which was to use my secondary contacts that I had set up as a contingency plan. I had planned to use my Gantt chart efficiently throughout my project however I quickly realised how lacking my time management skills were as I began to fall behind. However, my weekly meetings and phone calendar reminders were enough to keep my track during this project. I would have felt more confident throughout my whole project if I had stuck to my Gantt chart and my initial planning. I even feel this added pressure now as I evaluate myself in the last few days of my project under a strict time limit.

As a whole, my science baccalaureate experience has been one of the most enjoyable experiences of my senior year as it helps me to develop my physics, maths and graphical communication skills and core skills even further. Which will be a major asset to me in future including university and when I am working.

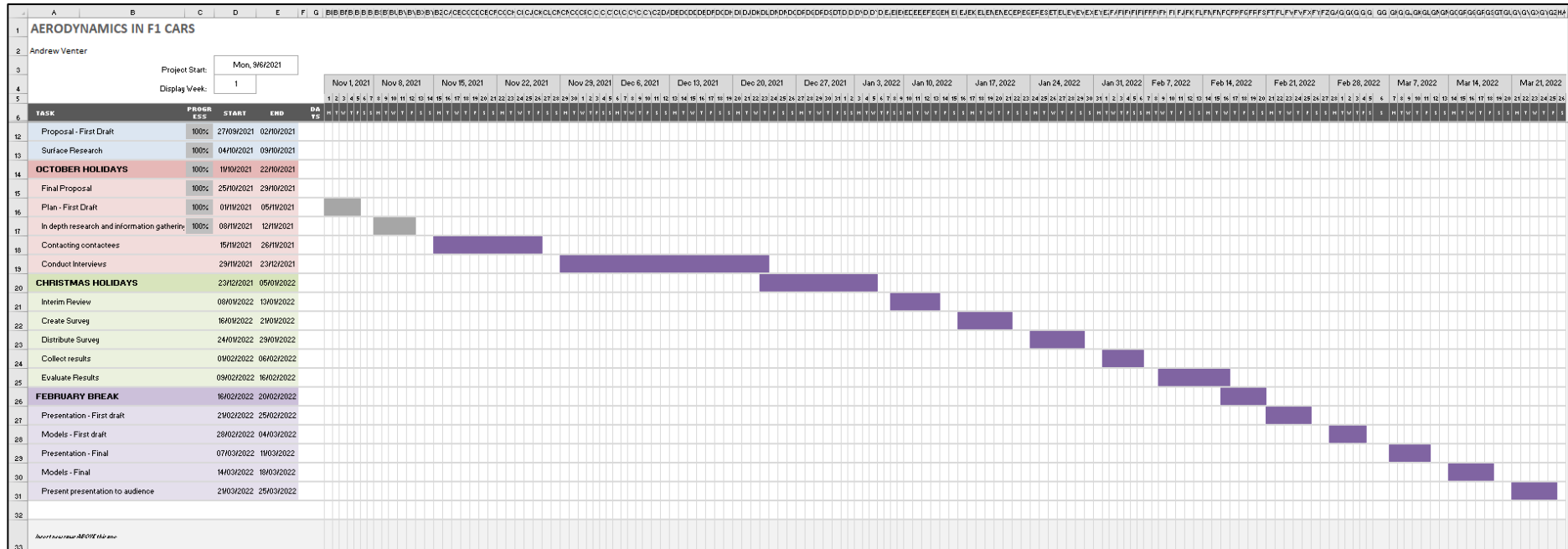
This section is not mandatory. It has been included to allow you the opportunity to undertake an overall reflection of your project.

Reflection on my experiences throughout this project (eg things you feel you have achieved, things you have done that you feel particularly proud of, anything you would do differently were you to do something similar in future)

After completing this project, I am very glad to say that I am filled with a sense of accomplishment. At the start of this project, I didn't know what direction it would take me in. But I am very glad that I chose to do this project as it has helped me to build skills and knowledge, both of which will be of vital importance later in my life. My presentation is probably the part I am most proud of as I had never really presented anything of this scale. However, from the feedback I received it seems that I did a wonderful job which I am very happy with. If I were to do something similar in future I would most definitely include an experiment.

Skills that I have used in this project that I would like to develop further (eg using skills in even more challenging situations, more working on your own, more team working)

The skills that I would most like to develop are my interpersonal skills so that I would be able to work even better with others which is always helpful as well as my research and analytical skills and all of these will be able to help me later in life when working independently or in a team.



Science: Interdisciplinary Project

Assessor report

Candidate name _____

Candidate number _____

Centre _____

Project proposal	Tick as appropriate
Grade C criteria	
The title and aims of the project.	✓
Clear aims and reasoned arguments to support the relevance and practicability of the project.	✓
Identification of opportunities for: own skills development collaborative working accessing less familiar learning environments application of science subject knowledge in a broad context use of knowledge and skills across different disciplines making connections between subject knowledge and the wider world	✓
	✓
	✓
	✓
	✓
	✓
Evidence of the ability to communicate clearly and concisely in advocating the proposal.	✓
Grade A criteria, includes all of above plus	
Well conceived proposal which sets creative and challenging goals which are at the same time realistic, achievable and practicable.	✓
Robust and carefully argued justification of the proposal.	✓
Substantial links and understanding of possible connections across disciplines contributing to the project.	✓
Comments	
<p>The candidate has written a good proposal in terms of a challenging yet achievable project. They explained why they have chosen this topic due to their strengths in AH Physics and Maths. This candidate is intending in studying Engineering at University and this project has strong links to this. The candidate also links their Graphical Communication knowledge however this was not strongly used/applied during the project.</p> <p>The project will allow the candidate to gain a deeper understanding of Physics in terms of how increased tyre grip is achieved through aerodynamics creating more downforce and the candidate will apply Maths to understand the equations behind this.</p>	

The outline of the project creates challenging goals in terms of researching and presenting information on a topic which the candidate is not knowledgeable on although it does relate to the candidates' academic strengths.

The candidate has made clear links to economic development, enterprise and sustainability in terms of improving the efficiency of F1 cars and thus reducing tyre wear and fuel consumption which results in the cars being more eco-friendly.

The candidate has identified the various opportunities for skills development and conducted a skills audit to reflect on where those skills are at the start of the project

Project plan	Tick as appropriate
Grade C criteria	
Development of clear project objectives in line with the project proposal.	✓
Relevant and detailed planning strands to enable the project to be implemented, monitored, presented and evaluated.	✓
Realistic timescales and achievable milestones for each stage of the project.	✓
Clear identification of resources needed, research methodologies to be used, opportunities for support and feedback.	✓
Grade A criteria, includes all of above plus	
Careful selection and effective use of research/investigation techniques.	✓
Anticipation of probable and possible factors which may impact on the project with realistic and well considered contingencies.	✓
Clear identification of dependencies or reliance on the success of other strands of work and of necessary adjustments to the plan.	✓
Outline the process for achieving own identified development needs.	✓
Comments	
<p>The candidate has broken down their project proposal into more specific tasks (page 4) and assigned realistic timescales within their GANTT chart which has been created with excellent detail. They have considered the holidays and their prelims in their GANTT chart which shows a good planning skills.</p> <p>The candidate has considered some potential issues and planned contingencies accordingly. They have also considered the impact Covid-19 may have for their planned visit to the University of Glasgow and how to overcome this.</p>	

The candidate has given a list of dependencies (page 5 - 6) and this is also reflected in their GANTT chart. They show an awareness of which tasks rely on others i.e. creating their survey after completing their research and then evaluating the results before creating their presentation so it is at the correct level for the intended audience.

The candidate has outlined a good process for monitoring their development and areas for improvement by using their logbook, GANTT chart, weekly meetings and completing 3 skills audits at various times of the year.

While the candidate has not discussed in detail their research/investigation techniques they did complete this effectively by persevering and following up suggestions from one of the initial contacts and then interviewing several PhD students which proved vital to the project. The candidate does employ a good strategy of creating their survey to be distributed to the target audience and then use the feedback from this as part of their presentation.

Presentation of project findings/product

Tick as appropriate

Grade C criteria

Evidence of effective and critical use of — resources, research methodologies, information and time management, prioritisation, problem solving approach to reach objectives, feedback, collaborative approaches, self-monitoring.

✓

Application of specialist and interdisciplinary subject knowledge to establish meaningful connections within the broad context.

✓

Clear presentation of main findings/outcomes.

✓

Grade A criteria, includes all of above plus

Critical thinking, analysis and reflection used at key stages in the project to construct rigorous arguments, draw convincing, well supported conclusions, identify and resolve issues.

✓

Skilful and creative use of resources, including people, information and learning context to progress the project.

✓

Accurate and deepening of understanding through application of subject knowledge in the chosen context, with meaningful connections well established.

✓

Comments

The candidate delivered a highly successful presentation in terms of clearly explaining the aim and findings of their project. They discussed the findings of the survey within their presentation and gave background information relating to the project to fill in the gaps of the audiences' knowledge which was evident from analysis of the survey. The candidate took time and effort to select their audience and analysed feedback from questionnaires to ensure the presentation was at the correct level to be relevant and meaningful.

The Prezi presentation was skilfully created and was clearly effective in terms of engaging the audience and explaining the findings of their project. It was well structured, and the candidate did not use a script or notes as they had conducted the research effectively and prepared well for the presentation. The candidate's language was clear and at the appropriate level and their body language was confident yet friendly which showed good presentation skills. The candidate also made use of humour at times when asking for forgiveness if he mispronounced and of the names of Italian professionals that related to their research.

There was clear evidence of deepened subject knowledge when explaining vortices using a ball as a prop, and also when explaining how aerodynamics can lead to increased downforce due to the airflow being forced. The candidate also used analogies when explaining vortices and this proved effective as the audience responded positively to this. They displayed and explained some of the equations linked to this which was clearly beyond Advanced Higher Physics and Maths. There was some brief links to Design Technology and Graphical Communication when discussing the designs of rear wings, front wings and diffusers.

The candidate spoke with confidence and flowed as they were knowledgeable in the subject due to the amount of research completed.

Evaluation of project	Tick as appropriate
Grade C criteria	
A critical and justified evaluation of all stages of the project process — planning, implementation and findings/outcomes in terms of strengths, weaknesses and learning points.	✓
Effective use of chosen communication method(s).	✓
Grade A criteria, includes all of above plus	
Incisive, well balanced evaluation of the project outcome against project aims, supported convincingly by well selected evidence.	✓
Careful choice and skilful use of communication and presentation methods(s).	✓
<p>Comments</p> <p>The candidate learned to use the Prezi software and developed their ICT skills by doing so. They delivered their presentation well and communicated clearly throughout using their presentation as a guide i.e. they presented without using notes or a script. They also detail (page 19) their reasoning of why they used Prezi in terms of the animations and templates available to help engage and focus their audience.</p> <p>The candidate discusses the successes of their project in terms of meeting the aims in terms of the various developments in F1 that have improved the aerodynamics and the Physics and Maths behind this. The explanation of the development of various designs</p>	

added to the car i.e. bargeboards, diffusers etc. and how this reduces turbulent air containing vortices is clear evidence of deepening subject knowledge via the research completed. They then explain the economic and environmental impact this has in terms of improving fuel efficiency, reducing tyre wear and being more eco-friendly (page 10).

The candidate also explains how the research and interviews they conducted were a success (page 11). They desired information was gathered, interviews ran smoothly and even remained in contact beyond the interviews.

There are some weaknesses discussed such as the lack of replies from the College, F1 companies or the issue of the Motorsport Industry Association not able to disclose details. They therefore targeted the backup contacts, as detailed within their contingencies (page 6), which proved more successful. They also detail how the impact of COVID-19 prevented them from visiting the University to access the library, interview professionals face to face or conduct experiments in their wind tunnel.

The candidate also reflects on the time and effort sent on selecting and organising the audience (pages 7 and 14) for their presentation and that using social media would have reduced this.

The candidate does not explain the lack of their report being produced however it had been discussed during several meetings that the presentation would be their product and the report would not be produced as all the summarised information was within their presentation and feedback from the surveys indicated this had been understood. In addition to this, the lack of time remaining once they had completed their presentation to produce the report and evaluations meant they had to prioritise. This should have been commented on as a weakness of the project however the candidate does evaluate in sufficient detail to meet the A criteria.

The candidate also reflects on their time management as a weakness as they did not manage to stick to their plan or GANTT chart. They did not anticipate the impact their extra-curricular commitment (the candidate swims competitively and trains/competes 5 days a week in addition to playing for a rugby team) would have on their project. They did adapt and made use of their phone calendar to help ensure they completed their project.

Self-evaluation of generic/cognitive skills development	Tick as appropriate
Grade C criteria	
A critical evaluation of own skills development against the list of specified generic/cognitive skills.	✓
A reasoned evaluation of own strengths and key goals for development in the specified list of generic/cognitive skills, which takes account of feedback sought and evidenced from others throughout the project.	✓
Grade A criteria, includes all of above plus	
Insightful, balanced, and well-structured self-evaluation of own development.	✓

Assertive and justified use of feedback from others in evaluation and identification of development areas.	✓
Comments	
<p>The candidate reflects on the various feedback they took on board at various stages of their project. The research seminar conducted by the school librarian allowed the candidate to employ various research methods effectively (page 14). This is evident by the cross-referencing of information and evaluating the reliability before finalising what was going to be in their presentation.</p> <p>They also arranged to practise their presentation to a small number of staff so they could gather feedback which they used to then improve their presentation. This led to the candidate making use of some props to help visualise how particles act in vortices so the audience could understand. The candidate also altered some of the text within their presentation to ensure it could be easily read from the back of the classroom as suggested by a member of staff.</p> <p>They discuss their deepened subject knowledge of Maths and Physics which was evident during the candidate's presentation in addition to their folio (pages 10, 13 – 14). This was possible due to the research and interview skills of the candidate developing during the project.</p> <p>It is clear the candidate has developed their interview skills during this project as they had not experienced this before. Preparing and sending questions in advance to ensure they gather the required information was a good strategy. This also allowed the interview to flow smoothly and the candidate built a working relationship with one of the PhD students who remained in contact to check the content of the candidate's simplified research/presentation (page 16).</p> <p>The self-evaluation is somewhat balanced in terms of strengths and weaknesses of skills. They do mention their indecisiveness as a weakness as this cost them valuable time to get started and when they did finalise a project they had to make an effort to catch up. Fortunately, their research skills and interviews allowed them to make up most of this time.</p> <p>The candidate also identifies not sticking to their original plan and GANTT chart as a weakness and found themselves completing the majority of their work the day before the weekly meetings which proved stressful. The candidate does adapt and started to create reminders on their phone calendar to help improve their organisational skills. They show an excellent awareness of how not having weekly meetings with a mentor would result in the need for a more in depth approach to time management/planning (page 15).</p>	

The overall grade will be:

- A indicative of a highly competent performance which meets the additional Grade A criteria and consistently demonstrates a high degree of autonomy, initiative and effective information management across the five pieces
- B indicative of a competent Grade C performance across the five pieces, but with some aspects of work meeting the criteria for highly competent performance (as outlined by the Grade A criteria)
- C indicative of a competent performance across the five pieces, with all aspects of the work meeting the criteria identified for Grade C performance

Overall grade awarded	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> Unsuccessful
Additional comments/overview	
<p>A good project with very strong evaluations. The candidate has developed a range of skills during the completion of their project and has applied their Physics and Maths well to gain a deeper understanding of how this applies to aerodynamics.</p>	

Assessor signature _____ **Date** _____

Co-assessor signature _____ **Date** _____

External verifier signature _____ **Date** 22/3/22