Science: Interdisciplinary Project

Proposal

Candidate name	
SCN	
Centre name	
Assessor name	
Project title	Are the public properly informed about benefits and risks of vaccinations?

Project outline *(what it is you want to do and how will you go about it)*

I want to find out if recipients of vaccinations are given all the adequate information they would need to make an informed decision about getting the vaccination themselves or allowing their child to have it, and in what form the information is given. After I have found out the type, detail and format of the information, I will see if any improvements could be made which would benefit the public, possibly by using modern technology and constructing a website to provide the necessary information. There are three main steps I intend to take in order to achieve this. Initially by constructing and giving out questionnaires to the public to find out where they currently get their information on vaccines, what form it is in, whether they use a variety of sources, and how easy they find it to gain and understand such information. The second thing I will do is interview some health professionals involved in vaccinations (both specialists and nurses who administer vaccines) to find out what information they are giving to the public, how this may vary between surgeries and if this comes through in the results of the questionnaire. The third thing I am going to do is look at what information is freely available to the public, such as on websites and in newspapers, and whether this information is accurate or biased towards a particular view which may alter the public's perception. This will show if the media affect the views of the public. All the data collected from these three approaches will be collated and analysed. The results will then be discussed with the surgeries involved to see if the route for information transfer to the public can be improved, either by updating and presenting current leaflets, developing a website or having specific printed information sheets which are available to the public. An additional part of the project is to conduct a small study with two S2 classes in school, as the girls will currently be undergoing the Human Papillomavirus vaccination scheme. I will issue a questionnaire to find out how much the pupils know about certain vaccines and where they got the information from. I will then allow the pupils to access information via a Glow web page I plan to develop, and then give them another questionnaire to find out if they learned any new information, or if the information given has altered their views. I will also ask them for feedback to see how easy it was to use and access information or if they have any suggestions for improvement.

Reasons for choosing this project *(eg personal interest, future plans, links to other subjects you are studying/ have studied)*

My ambition for pursuing a medical career makes me interested in researching and expanding my knowledge of vaccinations. This can be of use to me in the future and allow me to help patients to make informed decisions based on facts if I become a doctor. I am also interested in how information is passed from professionals to patients/the public and how this can influence the decision of the recipient on whether to undergo the vaccination. This interest is partially a result of personal experience. I noticed when I went to get vaccinations when going abroad the lack of information I received at my GP surgery about what I was about have injected into me - I knew nothing of the risks involved or side effects I may experience as a result of the vaccination. This realisation that patients in general do not often know very much about vaccination procedures they are about to get started my curiosity about how those administering the vaccination informed the patient about the treatment. My interest in the flow of information is also from growing up during the debate of the link between the MMR triple vaccination and autism in children, which has made me more aware of how the media present such scientific debates. After recent suggestions that the MMR vaccination can cause bowel disease as well as autism in children, I noticed that most of these articles appear to use 'scare tactics' and only tell the public theories instead of facts. The consequences of theories are shown through the recent outbreak of measles in Europe, where many people who were not immunised as babies are now contracting the disease. The fact that vaccinations are mentioned frequently in the news and are always a topic of debate increased my personal interest in the topic.

The broad contexts this project will cover are

Citizenship
A better informed public will be more knowledgeable on matters to do with vaccinations, so will be able to make more informed decisions

Enterprise
Plan to develop an interactive 'Glow' page for use in school when teaching vaccines topic to Science classes.

Employability
I hope to study medicine at university, so being more informed in this area will be of great benefit to me in the future

Learning environments I will access are
Abertay and Dundee university libraries
School – speak to the school nurse and pupils in school. Also speak to teachers who may have knowledge on the subject and S2 pupils who I will give questionnaire and teach, as the girls in the class will be undergoing their HPV vaccinations.
GP surgeries to speak to the nurse/doctor responsible for administering vaccinations.
Ninewells hospital to interview specialists.
Speak to a university specialist who has experience of lecturing in this field.
Internet – websites which contain information about vaccinations, and websites of newspapers which have reported public debate issues on the subject of vaccinations
Liaise with the computing department in school to get the author-rights needed to allow

me to develop materials on Glow

How I will use my knowledge of science/technology
From personal experience of vaccinations, I have come to realise most of the information given to patients comes in leaflet form and as leaflets may be an inefficient way of delivering information, the patients are likely to be less informed. The patients are also left on their own to search websites which can provide biased information. I will use my knowledge of Information Technology to create a website initially for doctors' surgeries which gives the patients unbiased and factual information, as well as providing links to revised sites where patients can gain accurate information about vaccinations.

The skills I will develop and/or improve in the course of this project are:
(carry out a short analysis of your current strengths and weaknesses in the skills areas below and how you think your project will allow you to develop and/or improve these skills)

- *application of subject knowledge and understanding*

I will have to use my knowledge from Higher Biology where there is a topic on viruses and immunity and about how vaccinations work and the reason for giving them. I will also have to use personal experience from when I have received vaccinations at school or GP surgery to evaluate how useful the information given to the patient has been. I must expand my understanding of the ways the NHS delivers information to recipients of vaccinations and parents of children who need to be/are about to be vaccinated. I will have to apply my knowledge of confidentiality and ethical issues when making questionnaires to hand out to members of the public. At the present I am comfortable with applying my scientific knowledge, but can improve these skills further

- *research skills – analysis and evaluation*

I will have to improve my research skills for selecting the information which is relevant to my project from articles and vast amounts of information on the internet. I must improve my evaluating skills by selecting what information will be relevant to analyse after I collect the data from questionnaires. I will also have to develop my critical analysis skills by effectively analysing data from questionnaires. I have used all of these skills on small projects such as school solo talks, but not on a project of this scale, so I am unsure of how strong I am in this area.

- *interpersonal skills – negotiation and collaboration*

I will have to develop my collaboration skills when arranging meetings at Abertay University with my supervisor, which I am already quite good at. I will also have to develop my collaboration skills when working with specialists and arranging meeting times with them. This means I will have to learn how to negotiate on a more professional level instead of the informal way that I currently arrange meetings and appointments.

- *planning: time, resource and information management*

I will have to develop my planning skills in order to complete the different parts of the project on time. Although I believe planning is one of my strengths, following through the plan I have made is currently one of my weaknesses. I will also have to plan alternatives to replace things in my project which may not work or produce inconclusive results, and this is a new skill for me to develop and discover how strong I am in this area. I will have to expand on the resources I normally use and gain information from various sources instead of relying on one source for information. I will also have to

develop my information management skills to ensure all relevant information is kept together and organised appropriately, which I am already good at from organising school work from different subjects.

- *independent learning – autonomy and challenge in own learning*

I will have to improve my skills of working alone and motivating myself, as it is up to me to move the project forward and ensuring targets are met. At present I am not good at doing this, as I can lack the self-motivation to work consistently over a long period of time without being told to do things. I will also have to take responsibility for my own learning in order to gain the necessary knowledge to continue with my project through the year. I am currently quite good at this, as a natural curiosity makes me eager to learn new things.

- *problem solving – critical thinking: logical and creative approaches*

In this project, one of the problems is to work out the best way to condense relevant information in order to present it. I am currently not very good at condensing data to extract the most important facts, and can sometimes include unnecessary information. Finding creative approaches to solving problems is also one of my weaknesses - I find it difficult to 'think outside the box' when it comes to problem solving.

- *presentation skills*

I currently struggle with giving presentations and talking to large groups of people I do not know, as I get nervous and am not confident. I will try to develop my presentation skills by teaching a few classes of second year pupils in school about vaccinations. I will also present my findings to my tutors at the end of the project.

- *self-evaluation – recognition of own skills development and future areas for development*

I found it quite difficult to complete the skills analysis section, as the only previous experience I have had of this was briefly in Personal and Social Education class at school, so I am weak in self-evaluation. I will constantly reflect and review my progress in skills development in each area throughout the project by keeping a progress log.

Assessor feedback to candidate

The thing that stands out having read your Project Proposal is how thoroughly you have examined your strengths and weaknesses in all of the skills areas, and how honest you have been in your reflection of these. This should give you an excellent baseline to work from so that you can reflect throughout the project on how you are progressing in each of the areas. From our weekly meetings it is clear that you have set yourself some challenging goals in some of the skills areas e.g. presenting/teaching pupils on vaccines, which you have purposely done in order to try to develop this area. You have been very critical of yourself in some areas e.g. 'problem-solving – critical thinking' where you think you may struggle to find creative approaches to problems - from some of the suggestions you have raised thus far e.g. using Glow as an interactive vehicle for helping the Science classes learn about vaccines it would appear that you are already rising to the challenge here with some innovative and creative suggestions and pushing yourself outside your 'comfort zone'

It comes through clearly that you obviously have a personal interest in your project area not only due to your intention to pursue a medical career but also from your own personal experiences and you have shown how there are substantial links across 3 broad context areas. As discussed with you previously, the Citizenship and

Employability areas come well within the context of your project area and the fact that you intend to try to make the 'product' an interactive teaching tool for use in the school also supports you covering the Enterprise context.

From the project outline it is clear that that you have already put quite a bit of thought into the various parts of the project and there is a clear logical progression through the tasks. When you progress to the detailed planning of this you will be able to put in time allocations for each and see how some parts are dependent on others. A concern is whether you will have time to produce a revised product for the surgeries i.e. either redrafting of their current information or development of a website within the time constraints of the baccalaureate project. This may become obvious when you do your detailed planning, don't be afraid of revising this aspect at a later date if needed, it is important that you appreciate the need to be flexible and adapt as projects progress.

You may also wish to give greater thought to which specific elements of your Advanced Higher syllabuses link into the project and highlight these in your documentation.

Otherwise you have made exceptionally good progress at this stage of the project and clearly it provides an excellent vehicle for you to develop a very worthwhile project.

Proposal approved		Further work required	
Candidate signature		Date	
Assessor signature		Date	

Science: Interdisciplinary Project

Plan

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Is this a group project?   yes   ☐   no   ☑

If a group project my individual role or responsibilities will be:

Timescales *(this should be a detailed timeline and any separate spread sheets or charts should be included as evidence)*

See Gantt Chart included

Planning *(how you are going to meet the agreed objectives of your project)*
I will meet the agreed objectives of my proposal by following the timescale and meeting the deadlines of each part of my project to ensure my project as a whole will be completed on time.
- Complete my proposal and plan to ensure I am clear about the objectives of my project and what I need to do to effectively complete the project.
- Research the different formats in which information is given to the public about vaccination, and evaluate the usefulness of each type of information.
- Construct a questionnaire to be distributed to the public, possibly at GP surgeries or Dundee Science Centre to find out what information parents/patients are given and the sources they use for information.
- Contact doctors and nurses who administer vaccinations. Construct a set of standard questions to ask them. Interview a few specialists to find out what information they give, or think they are giving, to the recipients of these vaccines. I will interview professionals from different surgeries to investigate if they provide patients with different information.
- Analyse and compare the results of the two investigations to find out if there is a link between the information given by the professional and what the patient understands.
- Research newspapers, news articles and websites to find out what information they make available to the public. I will also compare this information with published research findings to see if it is biased or inaccurate in any way, and if this would affect the public's perception of the topic.
- Results of the research will be collated and analysed. After this, discussion of the results with the specialists and GP surgeries involved to investigate if there

is a more efficient and effective way to provide information in a way the public would find more useful. This may be done by updating or redrafting leaflets, creating a website which would provide information in an easy-to-use fashion or producing information sheets which are freely available to the public.
- Construct another questionnaire to hand out to two S2 classes. Issue the revised format of information to the class and then give them another questionnaire to find out if they learned anything from the presentation. Also find out if the information has changed any views they previously had on vaccinations. I will also ask them for feedback to see which aspects they found helpful and if they have suggestions for improvement.

Resources *(eg people, materials, places)*

Some of the resources I plan to use are:
- Abertay and Dundee university libraries to carry out research
- Doctors and nurses who give vaccinations to find out what information they are giving to patients
- Specialist in the field at Abertay University
- Computing department at school to find out information and get help with the website
- S2 classes to carry out the questionnaire
- Research journals from Abertay library to find out accurate information
- Newspapers and news websites to research the information which is available to the public through media
- Various sites on the internet to find out what information they contain on vaccinations

Research methods *(eg contacting companies, surveys, focus groups, experimentation)*

- I will interview specialists who administer vaccinations to find out what information they give to patients
- I have constructed a questionnaire to hand out to members of the public in doctors surgeries to find out what information they know about vaccinations and if they think they are well informed on the subject.
- Libraries at the university will be important for carrying out my research on vaccinations to access research results as well as media information.
- I will construct a questionnaire to give to school pupils to find out their opinion and knowledge of vaccinations
- Developing lecture presentations to deliver to S2 classes

Presentation

- **Who do I think will benefit from listening/reading/looking at my presentation of my project findings/product?**

I think the GP practices I will work with will benefit from my findings. Doctors and nurses will be able to ensure their patients gain a better understand the facts of what vaccination they are about to have. The public will have more knowledge on the topic of vaccinations, and so will be able to make well informed decisions. This may also benefit the wider society as it would help ensure the public reject any invalid claims and theories about vaccinations which may prevent them going ahead with the treatment.

- **What methods are appropriate to my audience(s)** *(eg demonstration, presentation software, websites, oral, report, piece of theatre, dvd, wiki/blog or any combination)*
  - I will present my findings to my tutors and some peers in a powerpoint presentation
  - I also plan to provide detailed feedback to the GP practices involved regarding my findings from both research and questionnaires so that they could evaluate their process of informing patients and improve patient understanding. Initially I will look at preparing a website, but at this stage I am not 100% sure how suitable this would be, and so the product of my research may be a leaflet or a report to the surgeries that they could use within their practices.
  - Finally I will teach an S2 class in school with information gained as a result of my research and the website I will construct to do this will be used within the school when pupils are in their Personal and Social Development classes giving them information to make an informed choice when they are getting their vaccinations.

Dependencies *(what is required for your project to go ahead i.e. reliance on other people or resources, steps in plan that must be completed before starting the next step)*
The dependencies of my project are:
- Specialist and GP surgeries being willing for me to carry out interviews and hand out questionnaires
- Analysing the data of the questionnaires and producing valuable information to allow me to carry out the additional study
- Teachers of S2 class allowing me to carry out my additional study during the time they have with their class
- The S2 class pupils participating in the study
- The internet

Contingencies	
Any anticipated problems	**My plans for overcoming the anticipated problems.**
1. Specialists and nurses not responding	1. Contact more than one specialist and nurse in that field so as to increase the chances of a response

2. Teachers of S2 classes being unwilling to give up class time 3. GP surgeries not allowing me to hand out questionnaires	2. Ask more than one teacher if I could carry out my study with their class 3. Contact Dundee Science Centre to see if they would be willing for me to hand out questionnaires

Method for recording my skills development and future areas for improvement

I will use my progress log to track the progress of my project and my skills development. In my log I will include any meetings or correspondence, problems and the steps I took to overcome these problems. This will help me to evaluate how well I have used different skills throughout various parts of the project and track which skills I have developed and which areas I am still weak in.

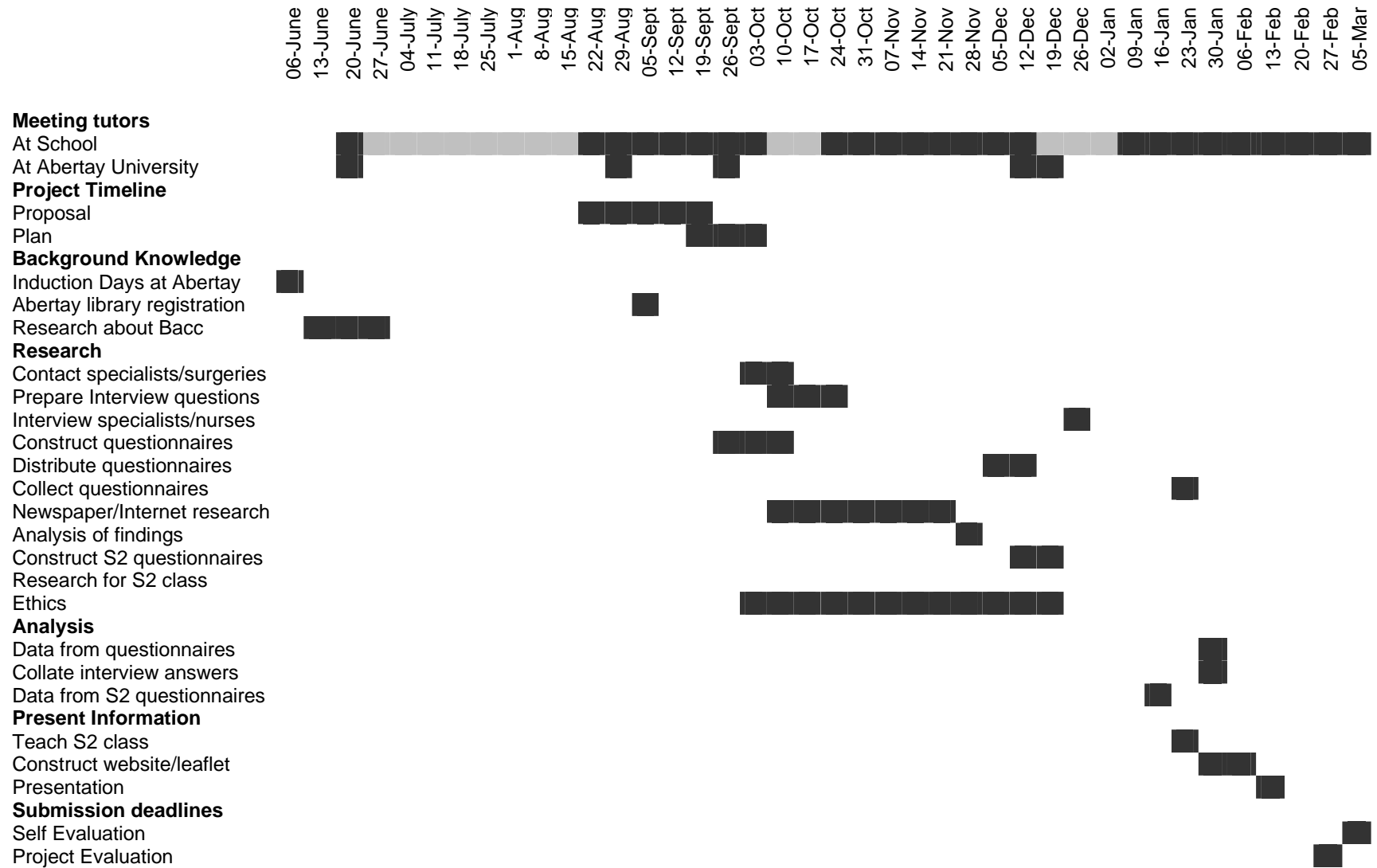**Assessor feedback to candidate**

It is evident from your narrative that you have developed clear objectives and a logical route through your project, with the main stages clearly identified. It is good to see that you have included a number of strands/routes to obtaining the background information you need so that you can get as balanced an overview as possible of the current situation regarding vaccines and information availability and transfer.

Your Gantt Chart is very detailed and covers all possible areas that we can anticipate at this time. Remember that this is a working tool and can (and should) be adjusted if circumstances demand as the project develops. We can include this in our weekly meetings if you want.*[1]

From the efforts and attention to detail you have thus far put into both your Proposal and Plan this is an excellent start to your project and we look forward to seeing how it develops.

*[1]*Note: During Interim Review Meeting held in December we reviewed how effective you found the Gantt planning tool and from the evidence of our weekly meetings where you presented updates to this it (which were needed as a result of having to gain ethics approval by NHS), this was obviously being used as a working tool by yourself and you had found it of benefit in helping you focus on how problems could impinge on the final deadline you had set yourself. You may find this tool of use in the future and it has been good to see you use it in the way it is intended and not just as a paperwork exercise. Well done!*

Plan approved		**Further work required**	
Candidate signature		**Date**	
Assessor signature		**Date**	

Date columns: 06-June, 13-June, 20-June, 27-June, 04-July, 11-July, 18-July, 25-July, 1-Aug, 8-Aug, 15-Aug, 22-Aug, 29-Aug, 05-Sept, 12-Sept, 19-Sept, 26-Sept, 03-Oct, 10-Oct, 17-Oct, 24-Oct, 31-Oct, 07-Nov, 14-Nov, 21-Nov, 28-Nov, 05-Dec, 12-Dec, 19-Dec, 26-Dec, 02-Jan, 09-Jan, 16-Jan, 23-Jan, 30-Jan, 06-Feb, 13-Feb, 20-Feb, 27-Feb, 05-Mar

Meeting tutors
At School
At Abertay University
Project Timeline
Proposal
Plan
Background Knowledge
Induction Days at Abertay
Abertay library registration
Research about Bacc
Research
Contact specialists/surgeries
Prepare Interview questions
Interview specialists/nurses
Construct questionnaires
Distribute questionnaires
Collect questionnaires
Newspaper/Internet research
Analysis of findings
Construct S2 questionnaires
Research for S2 class
Ethics
Analysis
Data from questionnaires
Collate interview answers
Data from S2 questionnaires
Present Information
Teach S2 class
Construct website/leaflet
Presentation
Submission deadlines
Self Evaluation
Project Evaluation

Science: Interdisciplinary Project

Presentation of Project Findings/Product

Candidate name	
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How I presented my project findings *(describe in detail how you presented your project findings and explain the choices you have made with regard to your presentation method(s) and audience(s))*

I presented my findings in two main ways. Both ways included a PowerPoint presentation, though these were individually suited to the target audiences. I chose to give presentations as they ensure all the members of the audience can clearly see the information. They can also be easily saved into various places, such as computers and USB flash drives, where people who are interested can have access to the information, so this saves paper as it prevents leaflets, information sheets etc being printed and thrown away.

The first presentation was given to my assessors and a small group of fellow pupils who are in advance higher or higher biology classes. The PowerPoint started with a short introduction which provided the audience with some background information so that as the aims and purpose of the project were clear. I then discussed each strand of my project separately – the public study first followed by the second year study HPV Vaccination study. Each strand had the same format. The results of the questionnaires were collated and analysed and the results put into graph form. This made it easy for the audience to identify trends in the data. I then discussed the results to encourage the audience to reflect upon the results and form their own opinions. I then included a slide detailing the outcome of the part of the project in order to inform the audience what actions I carried out to try and ensure the results could be improved. Each section was concluded with a piece on my skills development to give the audience an insight into the purpose and benefits of the interdisciplinary project. The presentation was concluded with a summary and the audience were given an opportunity to ask any questions so that I could clarify anything which they were unsure of or did not understand.

The second presentation was given to the girls of a second year science class in a lesson where I taught them about the HPV vaccination. I decided to do this as all the girls in the audience were undergoing the HPV vaccination scheme, so would benefit from the findings. The presentation consisted of the collated results of the questionnaire second year girls had completed, followed by information about the vaccine. The results were also in graph form and the information was in bullet point form so that it was easy for the pupils to understand the relevant information without including lots of irrelevant points. I then added links to useful websites and a short video advertisement about the HPV vaccination scheme. The links provided

the pupils with an easy way to search for more information and the short clip helped to ensure they did not become bored listening to the presentation while at the same time providing them with information. The presentation finished with true/false questions where the pupils could test what they had learned with the answers included on the following slide. This not only benefits the pupils, as they can test their knowledge, but can also benefit teachers in future, as they will be able to see how much the girls understand the information and what areas require more consolidation. This presentation has been uploaded to the school computer network so that it is available as an information source to all girls who will undergo the vaccination scheme in future and possibly as an aid for teachers to use in lessons.

Assessor feedback to candidate

You gave an excellent presentation. You seemed very relaxed throughout, your slides were well-laid out and legible and you explained each competently and clearly; what particularly impressed us was the fact you managed to do the entire presentation without the use of any support notes. This shows that you had thoroughly prepared for, and were very familiar with, the subject matter. From your answers to our questions at the end it is evident that you have an excellent understanding of the project area and the implications of your findings.

During our discussions afterwards we raised a few minor points as follows:

- It would have been good to have a few slides at the start of the presentation giving an overview on vaccinations i.e. what they are and why we get them, giving specific examples to set the scene for the rest of your talk.

- When explaining the practical methods used during your project you could have used your Gantt chart overview on a slide so that you could have talked us through the main milestones and issues that arose.

On the whole the professionalism of your talk shone through and although the above points would have improved the presentation slightly your answers to questions clearly illustrated that you have a clear understanding of both the scientific and social elements of this project.

Your second presentation to S2 girls in school was equally impressive. You successfully communicated in a clear and relaxed way and in a form they could easily understand. Your lesson was set at a suitable pace and you interspersed your talk with discussions and activities that kept their attention for the duration. The feedback they gave you at the end in response to your questions clearly showed they had gained a better understanding of the background to the HPV vaccine and issues they had been concerned about that had affected their decision on whether to have the vaccine. The materials you used and links to the appropriate websites will be put onto the school server (possibly into a glow page once some software issues have settled down) and are to be used in Personal and Social Education classes in future years to help advise the girls on HPV vaccinations. Well done!

Candidate signature		**Date**	
Assessor signature		**Date**	

Science: Interdisciplinary Project

Evaluation of project

Candidate name	
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How successful has my project been overall? *(consider the strengths, weaknesses and learning points of your planning, implementation and findings/outcomes giving examples to support your comments)*

I think my project has been quite successful overall, although it did not go to plan with regard to the final product.

The purpose of the project was to find out if the public were properly informed about vaccinations. The answer I found through questionnaires was generally yes, but I found that schools were not informing pupils enough. The planned final product of the project was to be a website for use by the public or glow webpage pupils could access in school, but this did not go ahead for many reasons. After research into what websites were available to the public, I found that the NHS already has an effective and useful website which provided enough reliable information. There are also various other websites which provide reliable information and are user-friendly, such as Immunisation Scotland, which has links both to the Scottish Government and NHS Scotland. These websites are freely available to the public, so I decided against creating a website as there are already adequate ones for the public to use, and I didn't think creating another would be an effective use of the information I gained through the project. The idea of a Glow webpage was also not carried out because pupils in school often find it difficult to access glow, and it sometimes does not work as effectively as is required . Glow is also regularly updated, so it would be difficult to maintain the page outside school. Instead I decided to create a learning tool which is saved onto the schools internal network. This means teachers can use it annually for teaching girls who are about to undergo the HPV vaccination scheme in PSE (Personal and Social Education) classes. This also solves the problem of pupils being unable to access the information, and pupils and teachers can also save the information onto flash drives and disks, which they would not be able to do with a Glow webpage.

The main weakness of the project was the long delays due to ethical issues. Even with ethical approval form Abertay University, one of the GP surgeries required approval form the NHS ethical board before they would let me hand out questionnaires in the practice. This took a great deal of time, and even with a letter from Ninewells Hospital stating there didn't seem to be any ethical concerns, the surgery was persistent that a more formal NHS ethical approval was required. This meant my project had to be moved back slightly, even though a few weeks were

built in to allow time for delays.

One of the greatest strengths of the project was the result of the class study. Through the research I carried out I was able to identify that the pupils were not being given enough information, and the product is able to help with this. This accomplishes the aim of having a better informed public on the subject of vaccinations. Another major benefit was working with GP surgeries. This helped to improve my collaboration skills through contact with the practice manager. Constructing the questionnaires for the surgeries also taught me how to best construct questionnaires and what language is best to use, which is a new skill I have gained, as I have not had to design a questionnaire before. It also helped the surgeries as it confirmed to them that they are providing the service they think they are providing, so is a great form of positive feedback.

For planning the project I used a Gantt chart. I started at the last date at which everything had to be completed and worked back, building in some weeks to allow time for any delays which may occur. I found this a very useful planning tool as it showed which parts of the project had to be completed before other parts could begin, for example, the questionnaires had to be fully discussed and agreed with Practice Manager and supervisors before being refined for use and distributed to patients. I could also add in other things which would affect the project, such as school prelims and this helped me to plan the work around these things. Although it had positive points, there were a couple of drawbacks to using a Gantt chart. I found the dates were quite difficult to read from the computer screen because I had to scroll along to find the box and up to find the date so it was easy to misread the chart. The writing was also made quite small when the chart was printed on one page, although this was necessary as it was more confusing with the chart printed over more than one page.
I also used a progress log to track my progress which also assisted in the planning. The log also helped me to remember key events and meetings throughout the project and how these things reflected my skills for example how I dealt with the mix up with the surgery and how this needed my collaboration skills.

How effective were my communication methods throughout the project?

Through part of the project my communication methods were quite effective, although I could have greatly improved other aspects. Communication with my supervisor at Abertay University was maintained via e-mail and occasional meetings, which was effective as e-mail was a quick and easy way to stay in contact and the meetings were an effective way to discuss progress. Contact with my supervisor in school was maintained through face-to-face contact, which was effective as this allowed discussion about the progress of the project. With one GP surgery communication methods were generally good and I had no problems working with the Practice Manager to arrange meetings in the surgery and times when I would carry out particular parts of the project, e.g. dropping off questionnaires. Although communication through e-mail and the occasional face-to-face meeting was effective, there was a slight misunderstanding with the distribution of the questionnaires, but this was quickly resolved by a phone call. Communication with another surgery I hoped would also be involved in my project but chose not to take part could have been greatly improved. Making initial contact

with the Practice Manager went well at first, but ethical concerns they had about the project discouraged them from taking part. I could have improved my communication by first providing them with the questionnaire and a full outline of the project to show them there were no great ethical issues involved and this could have satisfied their concerns. This has improved my negotiation skills as I have a greater understanding of how to approach and sufficiently inform the person I am in contact with. I also learned this through my communication with staff at school, which I could have improved by ensuring I kept them up to date with the progress of the project and by going back to see them to confirm dates.

Is there any aspect of my project that could be taken further? What might my next steps be?

There are various ways in which I could further expand my project:

- Carry out more in-depth research into the public's perception of vaccinations by issuing questionnaires to a larger number of GP surgeries to find out if there are differences in the information different surgeries are giving patients.
- Specifically target people of different age ranges to investigate if there are significant differences of opinions.
- Research if information is better for some vaccines compared to others, for example if patients receiving the flu vaccination are given more information than patients receiving a tuberculosis vaccination.
- Investigate if schools provide pupils with enough information with regard to all vaccinations they receive at school, for example booster vaccinations.
- Research if information given to pupils about vaccinations varies between different schools and age groups.
- Research if there are guidelines on how much information GP surgeries have to give to patients before they receive a vaccination.
- Investigate if there are any specific guidelines the media have to follow when doing a story on health related issues, for example if a medical claim needs to be supported by several independent studies from accredited sources before they can report on it

Candidate signature		**Date**	
Assessor signature		**Date**	

Science: Interdisciplinary Project

Self evaluation of generic and cognitive skills development

Candidate name	
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In evaluating your skills consider the skills analysis which you carried out at the Proposal stage and how you said you would develop and improve these skills. Now refer to your reflective diary/log/blog and feedback you have received and evaluate how you have developed and/or improved these skills through the work on your Interdisciplinary Project.

Application of subject knowledge and understanding

(Think about practical uses for the science you have learned. How did you use your knowledge of science/technology effectively to help you carry out various aspects of your project and how it related to your chosen broad context(s)?)

I had to use my scientific knowledge of vaccinations and how they work which I gained thorough Higher Biology in order to create some questions on the questionnaires to test the public's general knowledge of the subject. I also expanded this knowledge through research for the project and this can be applied in future as I hope to have a medical-related career. I also had to use my mathematical understanding of statistics in order to effectively analyse the data obtained through the questionnaires, for example collating the data and producing graphs of the results. Through these activities I have confirmed that I am comfortable applying my scientific knowledge as the required results were obtained. Personal experience from receiving vaccinations came in useful throughout the project, especially for the second year study with the HPV vaccination as I had the same experience when I had these vaccinations. This meant I was able to construct the questionnaire and plan a lesson in a more effective way as I was able to relate with the pupils on what their experience was like and directly compare it with my own and provide them with information I also thought would have made me more comfortable with the vaccinations. I applied my knowledge of confidentiality for constructing the questionnaires, although this is an area I have identified I can expand my understanding as there were problems due to ethical and confidentiality issues with one of the surgeries involved. For creating the teaching tool I had to use my knowledge of technology for creating graphs and transferring them to the presentation. As I have not done this before I have learned a completely new skill which I can apply to other parts of my academic life, such as for use in my Advanced Higher Biology investigation report.

The broad contexts of my project which I was going to cover were citizenship, enterprise and employability, and I think I have successfully covered all three. For citizenship, I hoped to inform the public about vaccinations. I have been able to do this by testing the knowledge of the S2 class and then teaching them using the learning tool. After the lesson, I tested their knowledge again and the results showed that they understood the topic much better – on a question about basic knowledge of why they were getting the vaccination, 100% of the pupils answered correctly compared to 65% before the lesson. For the enterprise section, the product is a teaching tool which can be used by teachers in lessons or by pupils for general information. The final broad context was employability. If I successfully follow a medical-related career, I will be able to not only use my knowledge of vaccinations and immunisation against diseases in future but also the knowledge and first hand experience of ethics in the modern medical world which I have gained through carrying out this project.

Research skills – analysis and evaluation

(Think about the research process. How did you plan, carry out, analyse and evaluate your research? You should evaluate your research methodologies, tools, resources and contacts, data recording and referencing, reliability and usefulness of data.)

I planned my research by initially using a Gantt chart to allocate certain dates to research of the subject. The topics I was going to research were then all noted down, such as vaccinations in general, the HPV vaccination etc. and each was researched in turn. I also used my progress log to ensure I was on track with the research and this prevented any delays in future due to too much time spent on one subject. I distributed questionnaires to a GP surgery for patients to fill out and refined the questions with the help of a specialist at the university. I also altered the questions in response to feedback from the GP surgery, for example, if the doctors thought a specific question was too advanced or may be difficult for the patient to understand.

I used various sources for research, such as books, scientific journals and internet sources. At first I found it was difficult to select relevant information but I was more confident and found it easier to do this as the project progressed. Comparing the research from these sources helped to ensure the information was reliable. I also attended a morning at the university library where one of the sessions was about use of the internet for research and how to ensure the information is accurate and reliable. I found this very helpful as I gained knowledge of how to find and use scientific evidence based information and this is a new skill which will assist me greatly in future, especially for university projects. I also used my progress log to note any sources I used, such as book titles and website addresses which I could refer back to in the future if necessary.

To analyse how useful and reliable the information I obtained was, I used my skills of evaluating information as mentioned previously. I also collated data from questionnaires and picked out the relevant parts for my project. I managed this fairly easily, so identified it as one of my strengths since I was initially unsure of how good my skills were in this area.

I used my progress log and Gantt chart together to evaluate the progress of the project as the Gantt chart gave an overview of the project as a whole and this could be compared with the detailed progress log.

Interpersonal skills – negotiate and collaborate

(Think about how you considered other peoples' views/feedback, discussed issues of concern, reached a solution where needed, adjusted your approach in response to a situation/environment, showed positive self belief and had the confidence to offer and ask for support.)

Throughout the project, I was given feedback mostly from my tutors at school and Abertay University. I took their feedback of my progress and things I could improve into consideration and made changes if necessary to develop my skills, for example, taking detailed notes of things discussed during meetings at the time. I frequently met with my tutors and this helped to ensure my project was on track and also helped my collaboration skills and self belief as I grew in confidence about asking questions as the project proceeded. My confidence in seeking help also grew as I felt more comfortable discussing any problems which arose during the project, such as one surgery deciding against taking part. Working with the GP surgeries also assisted in improving my communication and collaboration skills as I had to adopt a more formal and professional manner when working with staff, such as during interviews and this is something which I have not done before. Although I have developed my interpersonal skills in a different setting and with tutors, I have identified this as a skill which I need to develop further. When working with other teachers in school I was not ensuring they had enough information about the progress of the project by contacting them in some way to let them know what was underway. I also did not take into account all the information they are given on a daily basis so assumed they would remember dates and times etc. instead of going back to confirm and remind them of the proceedings. The project has shown me the importance of ensuring people I am in contact with are up to date and even though it did not affect the outcome of my project, this will prevent any possible confusion in future.

Planning – time, resource and information management

(Think about your time management. How did you set targets, monitor/record progress, consider any probable barriers to achievement and take steps to minimise them?)

I constructed a Gantt chart to plan out the project, starting at the week the project had to be completed by and working back to the present week. It was by this method I set targets and deadlines for parts of my projects. I built in extra weeks in some parts of the project in case of any delays. This especially came in useful when there was a great delay due to ethical concerns by one GP surgery I was working with. Trying to gain ethical approval from the board at the Tayside NHS Ethics Committee in Ninewells Hospital took longer than expected and even after they gave approval the surgery chose not to take part in the study. The weeks which were built in ensured the whole project did not fall a great deal behind as it allowed time to recover from any delays. This skill of anticipating problems and finding alternative ways of carrying on with the project was new to me and I have found it a very valuable skill which I can apply in many situations and use in the future. I also managed my time by including holidays and exams in the Gantt chart so I could fit in time to still work on my project and adjust the workload according to time available. I monitored my progress by keeping a detailed record of the progress of the project. I identified an inability to follow through on plans as one of

my weaknesses but I think I have improved this skill, as despite delays I was still able to keep to most of the deadlines set – such as the planned date of carrying out research etc.

Independent learning – autonomy and challenge in own learning

(Think about how you used your skills to make things happen, took the initiative to establish links with other learning environments/opportunities and looked for challenges rather than taking the easy option.)

At the beginning of the project I identified working alone and self-motivation as weaknesses. I think I have improved these skills greatly as I was mostly able to carry out the project according to plan without prompting, such as organising the interviews at the GP surgery. This is a skill which I could further develop, as there were some tasks my tutor drew my attention to which needed to be completed quickly.

To explore other learning environments I attended various information sessions at the university and university library. This gave me the confidence to explore different environments which I would normally consider out of my comfort zone, for example, after the information morning at the university library, I went back at a later date to borrow books and often used the library for research. I also used the classroom in school for learning, but from the perspective of a teacher while giving the S2 class a science lesson instead of from the view of a pupil. Working with the GP surgeries was another unfamiliar environment which I accessed over the course of the project, as I was working with the staff instead of being the patient.

One of the main ways I challenged myself was by teaching the S2 class in school. I am not used to or very comfortable giving presentations, especially to people who I do not know, so teaching a class was a great challenge for me. I also chose to gather public data using a questionnaire rather than a survey, and I found it a challenge to ensure I used the correct language as I had never had to construct a questionnaire before.

Problem solving – creative approaches; critical thinking; logical approaches

(Think about your problem solving skills. How did you generate and explore ideas, use logical and creative approaches, analyse source materials in order to support findings, reflect on problems and possible contributory factors and think critically about possible actions/changes?)

The teaching tool was my idea as I thought it would be the best and most effective product for the project. I used creative approaches by making the teaching tool for the second year class, as I had to ensure it would be both interesting and informative for them, for example, I added video clips on the topic that they could watch. I had to use logical approaches when it came to creating the questionnaires as I had to think about what questions to ask that I could generate meaningful results from. The main problem which occurred in the project, as previously mentioned, was the delays due to the ethical concerns. A solution to this problem would be to initially send the questionnaire to the surgery and give them a detailed outline of the plan of the study so as they could be confident that it was not necessary to seek further ethical approval. This would have saved a lot of time and would have widened my sample size. From this experience I have learned how important ethics is in the modern world and the importance of proving to people

who you wish to work alongside with very detailed information to prevent any misunderstanding.

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 had two different presentations for the separate strands of my project. One was a power point presentation to my tutors and a small group of fellow pupils discussing the whole project. The other was part of the lesson to the class. The first presentation was very formal as it was informative and contained quite a lot of information. To help the audience understand this information I added graphs of collated data so that results could be easily seen and trends identified. The presentation included a small amount of background information into the project and reasons why I chose the topic. My findings from one study were presented and the results discussed and then the same format was used when presenting the findings from the second part of the project with an overall summary at the end. This made the presentation easy to follow as there was a consistent format throughout.

The second year presentation was based on the HPV vaccination scheme. It included some of the results from the S2 study but included more graphs and relevant factual information which pupils could easily understand. I also added links to websites and video clips which helped to maintain their attention. I concluded the presentation with ten true or false questions where the pupils could test their knowledge with the answers on the following slide.

Presentation skills was one of the main areas in which I identified I was weak at at the start of the project and I feel I have developed these skills greatly. Although I was very nervous at first about presenting my findings to tutors and fellow pupils, I grew in confidence as the presentation progressed. Positive feedback from the audience about how confident I seemed also gave me a confidence boost so I was able to teach the second year pupils with only a small hint of nervousness.

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?)

Any feedback I got throughout the project was noted down in my progress log, and I used any praise to slightly boost my confidence as I was very apprehensive at the start about doing the Baccalaureate project. I took into account any criticism I was given from tutors or others involved in the project as I saw it not as an offence or completely negative point but as an opportunity to positively develop my skills. I have greatly developed my presentation, independent learning and research skills through carrying out this project and these are life skills which will be of use to me in the future, whatever path I take. I have also learned a lot from mistakes about

myself and how to collaborate with others. They have shown me the importance of anticipating problems and how to effectively deal with them. This project has taught me what skills I need to develop in order to grow as a person, and I would not have found these things out without carrying out this project.

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)*

I am particularly proud that I was able to complete the project and consider it an achievement that I have managed through it considering how apprehensive and even reluctant at points of going ahead with the Baccalaureate. The things I would do differently in the future would be the way in which I communicated with people – provide them with more information. I would also try to be more confident through the whole project, as I think I would enjoy it more.

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)*

I would like to further develop my interpersonal skills, as even though working with different people has helped to develop these skills, I still feel like it would be of benefit to me to develop them further.

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	
The candidate is interested in pursuing a medical career and in the context of the Baccalaureate Project wished to expand on, and develop, her knowledge with respect to vaccinations and information flow to patients, in particular concentrating on the HPV vaccination process currently going on in the school with the S2 cohort of girls. Her project outline, and reasons behind choosing her subject area have been very clearly expressed, showing that at this stage she has put a lot of time, effort and planning into not just the overall general subject area, but also setting specific and challenging goals she wishes to achieve by the end of the project. From the details contained in the proposal there is no doubt that there are strong connections with 3 broad context areas: Citizenship (aiming to improve information for the public on matters affecting their health); Employability (helping her become more knowledgeable in the area of vaccinations and patient information which will help her when pursuing her medical career); Enterprise (she is trying to use the information developed in the project to improve the information flow for S2 girls getting the HPV vaccination via producing materials in a 'Glow page' that can be used by teachers and pupils in future years).	

Initially when the candidate was asked to complete the project proposal form the one area she was very unsure about, and needed a bit of guidance on, was the Skills Development area. Her statements in the final version of the Proposal clearly demonstrate that she has closely examined her strengths and weaknesses and been very honest in her self-appraisal. This helped greatly when she came to do her final skills development evaluation. The proposal provides clear evidence of a carefully considered and planned 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.	✓
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	
The candidate's planning was clear and comprehensive and built on the outline of items she had highlighted in her proposal and she used a Gantt Chart to plan the various milestones throughout the project. In weekly meetings this chart was reviewed and adjusted when necessary, for example when NHS ethics approval to allow her to issue questionnaires to patients in surgeries was delayed and this impacted on future events. Similarly a few omissions were noted and subsequently added in. The Gantt chart was very much used as a 'live' document and she took ownership of this and actively brought it to our weekly meetings with adjustments in place based on the issues she had encountered during the previous week. A good selection of research methods were identified ranging from interviewing specialist doctors and nurses involved in administering vaccinations; specialists in research at Abertay; literature research at the university library to questioning patients and pupils via prepared questionnaires. A number of dependencies were identified and contingencies detailed for the main ones. Progress through the project detailing any adjustments needed due to problems encountered was recorded via the use of a log book which was reviewed at the weekly tutor meetings. Overall the candidate has planned the project well using the necessary tools and considering a range of dependencies and contingency measures.	

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	

During the candidate's final presentation of her project findings an assessment form was completed independently by both assessors at the time, we then discussed and agreed our classification of each area as Excellent/Satisfactory/Unsatisfactory at the end and our final joint format was verbally relayed to her straight away. The areas covered in the assessment were: Presentation; Methods and Resources; Knowledge and Understanding.
Out of 29 areas assessed we identified 22 as 'excellent' and 7 as 'satisfactory'

Generally she showed great enthusiasm for the topic, her knowledge gained from research and interviews came over clearly, and her presentation style was relaxed and engaging. Her power point had good visual aids to help display the data she had analysed and she went through these at a suitable pace, explaining as she went. What was particularly remarkable was that she presented throughout in a thoroughly professional manner without referring to any support notes whatsoever. She had obviously prepared thoroughly. Questions at the end were handled with ease and she had excellent recall of specific facts.

A minor criticism of an otherwise excellent presentation was that the scientific principles of vaccination could have been developed a bit more as part of the introduction.

The candidate did not fully exploit the output from her project in the manner originally planned, although this has been in part due to factors out with her control.

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).	✓
Comments	
The candidate's analysis of the success of the project covers all the main issues that arose and she has correctly identified the main strengths and weaknesses of the process. It would have been good if she had detailed a few more pieces of evidence to back up her evaluation and conclusions, as during the weekly meetings we had, the evidence was contained within the progress log she kept throughout. One of the main areas she still has to develop somewhat are her communication methods. She has highlighted this in her narrative, and is fully aware of the issues that arose and the need to ensure all necessary people are kept informed when changes occur. The evaluation report as a document charts the progression and development work that went on throughout the project and shows that although the output from the project changed significantly from the planning stage the rationale for this change is clearly explained and entirely justified.	

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	
The candidate has tackled her skills evaluation with the same honesty that she applied throughout the project. At the start of the year she thoroughly examined her strengths and development areas, and during the project at various points in our weekly meetings we reviewed how she was progressing in each area. Her narrative in this section may not be the most coherent and logical, and in some cases does not do full justice to the critical self-evaluation she has undertaken throughout the project, but it is evident that she has considered and reviewed her performance and development in all areas and is very self-aware of her aptitude in the main skills areas. The candidate has 'grown' a lot during the process of the Baccalaureate project. Dealing with a range of unfamiliar activities she has grown in confidence when she successfully completed tasks, and this helped her to enjoy the experience of the Baccalaureate, rather than worry if everything was going alright. She has taken feedback/criticism extremely well, looking at the positive aspects of it and adapting her approach appropriately. By her own admission she was worried about the presentations to both her supervisors and the S2 group of students but the total professionalism with which she carried out these tasks is testament to the development of her confidence and presentational and planning skills.	

The overall grade will be:

A   indicative of a highly competent performance which meets the additional Grade A criteria and consistently demonstrated 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	A (B) C Unsuccessful
Additional Comments/Overview The candidate has risen admirably to the challenges the Baccalaureate project has set her. She was initially unsure if she could balance its demands with those of her Advanced Highers and Duke of Edinburgh commitments, but her hardworking, tenacious approach and her obvious interest in the subject matter meant she threw herself wholeheartedly into the task. It has been good to see her develop from not being confident of her skills in some areas e.g. presentations (mostly due to not being given the opportunity to try them out) to being able to critically reflect on her skills base from a position of experience having used and reflected on these skills throughout the project. While the assessors see this project as a strong B Grade, further analysis of the results, and their implications could have highlighted the significance of the project output for the practice of vaccine delivery.	

Assessor signature _____ **Date** _____

Internal verifier signature _____ **Date** _____