

Science: Interdisciplinary Project

Proposal

Candidate name	Glen								
SCN									
Centre name									
Assessor name									
Project title	Waste to energy, Is it rubbish?								
Project outline (what it is I want to do and how will I go about it) <p>This is a joint project to investigate the economic viability of a landfill site using methane to produce electricity at a local level.</p> <p>While Christopher investigates the landfill site at Hill of Tramaud, I will focus on whether this is a sustainable energy source for the future. I will also investigate the range of renewables in use already and the contribution they make locally and compare this to national targets. I will also investigate why we need renewable energy and what Aberdeen City Council are doing and plan to do in the future.</p> <p>I will consult Aberdeen City Council, the landfill sites; Ness Farm and Tullos Hill, experts at Robert Gordon University and the local landfill site (Tullos Hill) designers, engineers and environmental groups.</p>									
Reasons for choosing this project (eg personal interest, future plans, links to other subjects I am studying/ have studied) <p>I have chosen this project as I am studying AH Chemistry and Physics. I am interested in how Chemistry and Physics are applied to real world issues such as the demand for renewable energy, and linking them to real life situations that will benefit me for my future career.</p> <p>This project includes questions of economic viability because I am interested in the business aspect of renewable energy having taken part in "Young Enterprise" last year and I'm interested in investigating the set up costs of different renewable energy sources, how much money is generated and whether or not a profit is involved.</p> <p>I am also interested due to the fact that I live relatively close to a landfill site in the process of upgrading the facilities to generate electricity from methane gas. Renewable energy sources are also very important in decreasing our reliability on fossil fuels and I am interested in developing my understanding of the issues involved.</p> <p>Through this project I also want to develop my research, and communication skills further to gain valuable experience in independent working before I go to University.</p>									

The broad contexts this project will cover are

- Citizenship Enterprise Employability
 Economic development Sustainable development

Learning environments I will access are:

Aberdeen City Council
Aberdeen University Facilities (environmental research department, library)
Landfill Sites (Tullos Hill, Ness Farm) - SITA
Robert Gordon University
Scottish Environment Protection Agency
Health and Safety Executive
Internet research [to attend Aberdeen University workshop]

The skills I will develop and/or improve in the course of this project are

- *Application of subject knowledge and understanding.*

Investigating the chemical processes involved with piping methane at landfill will allow me to apply my knowledge of Chemistry and Physics. I'll use my understanding of business and economics when investigating the economic viability of different renewables.

- *Research skills – analysis and evaluation.*

I will develop my analytical and evaluation skills by selecting appropriate materials to use and by drawing conclusions from the information I gather. I plan to do a Science based course at university so the research for my project will be a valuable experience.

- *Interpersonal skills – negotiation and collaboration.*

I will be working together with a fellow pupil and so will develop my team working skills. I will also need to negotiate, interact and work with a variety of people within school, the local council, private companies, government agencies and universities. Making contacts and getting in touch with people I do not know will improve my communication skills.

- *Planning: time, resource and information management.*

I will need to develop my planning and organisational skills as well as time management. I will make use of work jotters and computers to manage my data. Since I am working in a team, we will need to plan how our work is to be divided between us. To manage our times/deadlines I will possibly create a spreadsheet or gantt diagram in order to do this. This is another skill I wish to develop as I will be required to manage my own projects at university

- *Independent learning – autonomy and challenge in own learning.*

I shall be in charge of my learning and won't rely on my teachers to motivate me, this will be a valuable experience for when I go to university.

- *Problem solving – critical thinking: logical and creative approaches.*

I will be working with outside parties who may not always be as helpful as I expect. If I encounter difficulties, I will need to overcome these challenges by finding other solutions in order to successfully complete my project on time.

- *Presentation skills.*

My presentation skills will improve as I record my results and present my findings in a presentation at the end of the year. My presentation skills will also improve as I am talking to different people in the community and people who are experts in this field. Since I will be presenting what I am doing to them and to a group of Higher pupils, I will have to find a way that is appropriate to present to each person and situation.

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

development.

Before the project I will evaluate my skills above. Throughout the project I will continue to do so and I will conclude at the end by comparing the end result with that of my initial evaluation. Through doing this I will be able to evaluate my weaknesses and hopefully improve upon them.

Assessor comments

This is a good choice of project with clear links to your prior learning, career aspirations and local interest. It fits well into the contexts of economic development & sustainability and you have indicated in discussion that you see this as an important as well as topical area for research. You have stated your intention to complete a SWOT analysis of your skills as a baseline assessment. This will help you to later evaluate your progress in this area.

The outside agencies you intend to contact will enable you to employ a range of research techniques, liaise with a mix of professionals and gain experience out with school in various contrasting environments. This should generate sufficient material for you to analyse and evaluate as you prepare your final presentation.

The project is sufficiently wide ranging to allow independent working for yourself & Chris as well as later needing to work together to draw conclusions and present your findings. It will be challenging to complete the project in the time available but your careful planning and detailed timeline will help you achieve this.

Proposal approved	YES	Further work required	
Candidate signature		Date	
Assessors signatures		Date	

Science: Interdisciplinary Project

Plan

Candidate name	Glen								
SCN									
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Project title	Waste to energy, Is it rubbish?								
<p>Is this a group project? yes <input checked="" type="checkbox"/> no <input type="checkbox"/></p> <p>If a group project, what will your role or responsibilities be?</p> <p>As this is a group project, we are splitting the responsibilities we have. I will be focusing on landfill sites currently piping methane producing electricity and the contribution they are making at a local level. Also I will see if landfill is an appropriate energy source for the future. I also intend to research Aberdeen City Council's targets and plans for renewable energy within the city.</p> <p>Some of the points I want to research are:</p> <ul style="list-style-type: none">• Landfill Technology• Costs of production• Contribution to local economy• Environmental awareness• Sustainability• Safety <p>At the end of this joint project we will combine our findings and put together a presentation to deliver our conclusions to a Higher Chemistry class.</p>									
<p>Timescales (start, finish and milestones)</p> <p>First stages: as soon as approval is given</p> <ul style="list-style-type: none">• Arrange meetings with ACC, RGU, SITA (September) <p>Research</p> <ul style="list-style-type: none">• Internet Research (September-October)• Interviews/Visits including preparation of questions (November-December)• Lab experiment (December)									

Presentation

- Gather findings and prepare presentation (January)
- Deliver Presentation (early February)

Final Stages

- Evaluation (February)
- Finish and submit work (by end of February)

Planning – state how you are going to meet the agreed objectives of your project

In order to meet the agreed objectives of my project I will have to contact several people in a variety of organisations so that I can ask appropriate questions and receive accurate information. I will contact Aberdeen City Council to find out their current targets and plans. I will talk to the people there in order to find out the required information. I will also contact RGU to find out from experts in the School of Energy & Environmental Engineering about other renewable available and the current level of use as well as projected use. I will also need to contact SITA in order to find information about each landfill site.

Resources (people, materials, places)

Aberdeen City Council
Aberdeen University Facilities (environmental research department, library)
RGU the School of Energy & Environmental Engineering
Scottish Environment Protection Agency
Health and Safety Executive
Internet research
SITA

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

Contacting people by phone, arranging a suitable time to meet for interview [RGU , Aberdeen City Council, SITA UK]
Preparing questions for each contact to make sure they are appropriate.
Experiment with combustion of methane in lab.

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

Different groups will be interested in the findings: people who are interested in renewable energy sources, people interested in the future of landfill sites and people interested in the local environmental issues about landfill sites.
Also pupils studying Chemistry who want to understand the issues relating to alternative fuels and costs.

What methods are appropriate to the audience (for example demonstration, presentation software, websites, oral, report, piece of theatre, dvd, wiki/blog or any combination)

We will use oral presentation with presentation software in order to share our findings with the audience, this way the two parts of our project can easily be presented together.

Dependencies (what is required for your project to go ahead ie reliance on other people or resources, steps in plan that must be completed before starting the next step)

Both the plan and proposal must be approved. Our project is dependant on the co-operation of the companies and organisations that will be contacting. If they are not able to help us we may not be able to complete some parts of our research.

My proposed stages also rely on other people as I plan to hold meetings and carry out practical experiments.

Contingencies

Any anticipated problems?

Gaining the co-operation of SITA UK and the landfill sites

Gaining co-operation of ACC

My plans for overcoming the anticipated problems.

Be persuasive and state our points clearly as to not give the wrong impression. Present a positive outcome with possibility of publicity.

Be persistent.

Method for recording own skills development and future areas for improvement

Preparation of timeline with clear checkpoints.

Voice Log and Written Log

SWOT analysis

Assessor comments

Your written plan and subsequent discussions show you have put a lot of thought into the skills you will need to complete your project as well as having put together a clear framework and timescale. Your milestones are challenging but realistic. The planned regular meetings with Chris to review progress are essential as well as keeping a detailed log. We will look at the progress made at the interim review in January to see whether you need to modify your plans in any way. It is a good idea to attend the University research workshop, this will help you use your time efficiently & effectively and also assist with later analysis of materials. We have discussed the possibility of completing lab work in the Chemistry Dept, this needs to be explored further.

Plan approved	YES	Further work required	
Candidate signature		Date	
Assessors signatures		Date	

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Science: Interdisciplinary Project

Presentation of project findings/product

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Candidate Instructions

Please describe the way(s) you have presented your project findings and the target audience(s).

Initially in carrying out the project, our target audience was a higher chemistry class; this was because I was familiar with the class and knew that they would be interested in what we had to say.

Once this was established it was easy to create a presentation that was appealing to them. We used a power point presentation, using both humour and the element of surprise grabbing the audience's attention. We then carried on in a formal manner allowing the audience to think about renewables and learn about them.

We then gave the presentation to a different class with members of the senior management team including our head teacher. The presentation was filmed, evaluated and well received.

Assessor Comments

(Please include detailed comments against the following criteria)

Grade C Criteria	Assessor comments
Evidence of effective and critical use	Wide range of sources used, good time

of: Resources, research methodologies, information and time management, prioritisation, problem solving approach to reach objectives, feedback, collaborative approaches, self-monitoring.	management, clear prioritisation of tasks ensuring a successful outcome. Effective cooperative working throughout. Regular discussion, reflection, review of progress.
Application of specialist and interdisciplinary subject knowledge to establish meaningful connections within the broad theme(s).	Understanding of the complex technical data was excellent and effective cross-curricular working has established clear links with economic development & sustainability.
Clear presentation of main findings/product.	Excellent presentation, information presented in an interesting and understandable way with evident depth of understanding.
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.	Range of materials analysed and evaluated before selection for findings and presentation. Conclusions clearly stated with accompanying argument and evidence referenced.
Skilful and creative use of resources, including people, information and learning contexts to progress the project.	Variety of research techniques used. Range of interviews in different environments, workshop on research skills, site visit and lab work.
Accurate and deepening of understanding through application of subject knowledge in the chosen context, with meaningful connections well established	Complex technical information assimilated and used to support and explain conclusions. Prior Chemistry & Physics knowledge applied, enabling effective questioning and assessment of responses. Broad overview of subject clearly explained.

Candidate Signature	Date	
Assessor Signature	Date	

Science: Interdisciplinary Project

Evaluation of project

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Project title	Waste to Energy, Is it Rubbish?								
<p>How successful has my project been overall (planning, implementation, and findings/outcomes in terms of strengths, weaknesses and learning points)? Justify your response using supporting evidence</p> <p>The aim of the project was to investigate current and future uses of renewable energy, particularly from landfill, and the contribution they make to local energy needs. Also to investigate why we need to increase their use and what ACC are doing and plan to do in the future.</p> <p>My part of this joint project was to focus on the range of renewables in use already, the contribution they make locally and compare this to national targets.</p> <p>As a result of my research I now know that:</p> <p>At the moment under the Decentralised Energy Programme of 2008, Aberdeen City Council is committed to the installation of a decentralised energy system to all new buildings, replacement of heating and hot water systems in existing Council owned buildings as well as adopting an annual target of a 2.5% reduction in fuel purchased over the next 10 years. As a result of this policy the Council has developed 3 Combined Heat and Power schemes within the City. These systems currently run on natural gas however as part of the Carbon Management Plan there are plans to convert the Seaton CHP to gasification of biomass.</p> <p>Also the Council recently approved the Carbon Management Plan which details 26 projects which will reduce the Council's carbon emissions by 23% over the next 5 years. Some of these projects include the use of renewable energy sources, for example installing air source heat pumps, solar heating and biomass boilers to Council buildings. A biomass heating system is currently being installed in the new Council Headquarters (Marischal College) as well as in the Winter Gardens at Duthie Park.</p> <p>From Dr Alan Owen I learnt of other renewables currently in use; Tidal power, Wave power, Hydro power and Wind Power. These are in use in the country however Aberdeen at the moment is currently not using them. Also from Dr Alan Owen I learnt of an upcoming energy crisis as we are running out of fossil fuels. This showed me that there is in fact a real need for renewables, and we need more soon if we are to keep our current way of life.</p> <p>The technical information I had to read and analyse was a big challenge but I found the University staff very approachable and was able to select the information needed for the presentation. The research workshop I went to [by Aberdeen University] gave</p>									

a lot of useful information about internet research and evaluating sources.

Keeping a log was a big help in meeting targets and deadlines and having one period a week timetabled for the project also helped with this.

Realising that just landfill sites was not enough for a joint project was a challenge but I was able to extend my plan to include other renewables and this gave a more complete idea of what is happening locally.

Selecting the information for the presentation from the huge amount collected was difficult. I have done presentations before but not using complicated technical information like this and I wanted to make sure it was both interesting and easy to understand. Our target audience was a Higher Chemistry class who we felt had enough background in Chemistry to understand the technical details and would hopefully find the talk interesting and relevant.

An evaluation questionnaire given to those who watched the presentation showed that the content was interesting, easy to understand and that they had learnt a lot from it. The feedback also said that our presentation style was good though could be improved, hesitant and quiet spoken at times.

How effective were my communication methods?

I have had to develop my communication methods as I have worked through the project! The first meeting was with a supervisor from a local oil company who discussed our proposal and plan with us and some possible aspects to consider, people to contact. It was difficult to actually speak to many of these people who could help, often a message had to be left asking them to contact me but if this didn't work I had to be more persistent but polite – this seemed to be very effective.

In contacting SITA through phone calls I managed to find the appropriate information regarding the landfill site I wanted to investigate. It turned out the initial landfill site I wanted to investigate wasn't piping methane at all and therefore I did not need to visit.

We arranged a visit to the landfill site my partner was to investigate. We both met the site manager and talked to him about different aspects of site management. By carefully preparing questions before the visit we gained the information we wanted not just about this particular landfill site, but also others in the U.K. This was a very good visit and interview, producing a lot of information. One of the reasons it was so successful was the discussions we had before we went and this has improved my ability to work closely with someone else.

At Aberdeen City Council I contacted Amy Smith, Sustainable Development Officer for the Council. Her department looks at reduction of use of fossil fuels to reduce climate change and the switch needed to renewable to allow this to happen. Unfortunately I could not meet with her as the deadline for our presentation was quickly approaching so arranged an e-interview which gave me all the information I needed about ACC's targets and plans.

To research renewables other than landfill gas I set up a meeting at RGU with Dr Alan Owen, an expert on tidal energy. He also had a lot of information on many other

kinds of renewable energy sources and gave his opinion on ACC's involvement/plans for the future which was very useful. At first I was nervous in this meeting with a very senior lecturer in the University; but he was very approachable and took a lot of time answer my questions. This has made me more confident in my ability to discuss technical data with lecturers and other experts.

Putting together a successful presentation has improved my communication skills in a different way. After all of the information was gathered, I had to evaluate it and decide the items that were relevant and useful. There was a lot of information to consider and some of the technical explanations needed time and research to understand them and then decide if they were suitable. I spent a lot of time selecting the best technical information and deciding how to make it clear and interesting for the audience which included staff and our RGU mentor as well as Higher Chemistry pupils. We gave the presentation to one Higher class as a rehearsal. This was very useful before the final presentation to another Higher Chemistry class, our assessors, the Head teacher and Depute Head teacher..

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

The renewable energy sources that I focused on were generally well established in the world today. To expand the project I would like to include some of the more experimental renewable methods that could have been more thought provoking.

With that in mind the presentation could be shown to younger pupils at my school to perhaps inspire them into taking science and in turn research into renewable energy.

Candidate signature	Date	
Assessors signatures	Date	

Science: Interdisciplinary Project

Self evaluation of generic and cognitive skills development

Candidate name	Glen								
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Project title	Waste to Energy, Is it Rubbish?								

When evaluating your generic and cognitive skills use the information in the left hand column to help you consider your skills development.

Generic and Cognitive Skills	Self evaluation
<p>Application of subject knowledge and understanding</p> <ul style="list-style-type: none"> • Candidates should think about practical uses for the science(s) they have learned. • Build these ideas into meaningful and realistic contexts, chosen from one or more of the Broad Contexts (citizenship, economic development, employability, enterprise and sustainable development). • Plan how they can use their knowledge of sciences effectively as part of a successful project. • Use their sciences to help them carry out various aspects of the project. 	<p>My research showed the importance of renewables already as a contribution to local energy needs as well as nationally. It also showed the importance of developing these sources further.</p> <p>I have developed my own understanding of renewables and the energy crisis, I can evaluate materials and select relevant information to help me describe and explain this to others.</p> <p>My knowledge of Chemistry and Physics helped me to choose the subject and plan the project, do background research and decide who to approach.</p> <p>It also helped me to understand and evaluate the info I collected and to discuss renewables with experts, asking them questions and understanding their answers.</p>
<p>Research skills – plan, research, analyse and evaluate</p> <p>Plan</p> <ul style="list-style-type: none"> • Define your research subject 	<p>We listed all the possible areas linked to the project. We then discussed them and agreed</p>

<p>by identifying its scope and key concepts.</p> <ul style="list-style-type: none"> • Define your research process by identifying tasks and creating a schedule. • Show initiative in choosing methods of research eg contacting companies, surveys, focus groups, experimentation. • Identify and use relevant tools, resources and contacts for your research process. 	<p>which were key areas. We divided these between us, making sure that we each had separate topics to research. We worked out our timescale – very short as the school had only decided to offer the course after the start of term – and used it to arrange meetings etc. I used a mixture of internet research, phone calls, interviews and questionnaires to get info from a local company, the landfill site, RGU University and ACC. This gave me a wide range of information to evaluate and analyse to draw my conclusions. I was flexible when meetings were difficult to arrange, using phone calls and e-interview instead.</p>
<p>Research</p> <ul style="list-style-type: none"> • Carry out research from a variety of sources. • Keep records and notes on strategies, sources, tools and resources used. • Adopt a referencing methodology (where appropriate). 	<p>Keeping a log was very similar to keeping the AH project logbook. Having weekly meetings to discuss progress was also important to make sure we were both on track and to discuss adapting things as we went along. Technical information/articles were kept in an e-portfolio which was used later when putting together findings for the presentation.</p>
<p>Analyse</p> <ul style="list-style-type: none"> • Analyse the usefulness and reliability of materials gathered and resources consulted. • Return to research stage as necessary 	<p>All information collected was recorded in the e-portfolio, it then had to be analysed, evaluated and assessed for including in the presentation. The research workshop helped me to compare and evaluate sources of information and select articles that were reliable and appropriate. In some cases information needed to be reviewed against new sources.</p>
<p>Evaluate</p> <ul style="list-style-type: none"> • Evaluate the research process. 	<p>Keeping an accurate record of all the sources of information that I collected and then evaluated meant that I was able to go back to the original articles and select the best sources of information to use in my conclusions and the presentation. The log made it a lot easier to do this towards the end of the project.</p>
<p>Interpersonal skills – negotiate and collaborate</p>	
<ul style="list-style-type: none"> • Consider other peoples' views/feedback. • Discuss issues of concern, seeking resolution where needed. • Adjust approach in response to a situation/environment. 	<p>It took a long time to get started but because it was a joint project and we had to have a detailed plan and clear division of the work, who to contact etc. We also had to plan how we would later put together our results for the presentation. Working with someone else was a skill that I developed throughout the project. I had to be able to compromise at times and</p>

<ul style="list-style-type: none"> • Have positive self belief. • Be confident enough to offer and ask for support. 	<p>argue my opinion at others.</p> <p>Once the initial plan was completed and approved, implementing what we each had to do was quite straightforward. When the original plan had to be extended I was able to make suggestions how we could proceed, adapt to this and contact new sources of information at short notice.</p>
<p>Planning – time, resource and information management</p>	
<ul style="list-style-type: none"> • Estimate time needed and set milestones (targets). • Monitor/record progress using tools such as schedules, diaries, logs and calendars to help completion of activities. • Consider any probable barriers to achievement and take steps to minimise them. 	<p>I had a detailed time line and used it to keep to the main targets but needed to be flexible if situations changed. Contacting people and arranging meetings took longer than expected as people were very busy but noting dates of contact in the log made it easier to regularly follow up enquiries.</p> <p>Jointly going over our progress each week helped keep us on track. The main barrier to success was difficulty contacting some of the people we had thought of but in each case I was able to find an alternative.</p>
<p>Independent learning – autonomy and challenge in own learning</p>	
<ul style="list-style-type: none"> • Use my skills responsibly to make things happen. • Take initiative to establish links with other learning environments/opportunities. • Look for challenges and don't necessarily take the easy option. 	<p>I have been able to follow the project plan to a successful conclusion. I have increased my self-confidence by approaching new people e.g. at RGU and ACC, setting up meetings, explaining the aims of the project and asking appropriate questions.</p> <p>When things have had to be adapted I have been able to find an alternative solution.</p>
<p>Problem solving – creative approaches; critical thinking; logical approaches</p>	
<ul style="list-style-type: none"> • Generate and explore ideas to support my project. • Use creative approaches such as lateral thinking. • Use logical, step by step thinking approaches. • Consider how a situation may have arisen and possible contributory factors. • Think critically about possible actions/changes that would 	<p>We used the early discussions to consider all aspects of the topic and narrow it down to the finalised plan. I have used new techniques during the research including; SWOT analysis to evaluate my skills, complex time charts and e-interviews.</p> <p>Expanding the original plan when information was limited to cover other renewables than landfill might have been avoided with more detailed research at the start about local landfill sites but I was able to adapt my part of the</p>

<p>improve the situation.</p> <ul style="list-style-type: none"> Analyse points of view in source materials in order to support findings from research e.g. flaws in the reasoning; relevance; reliability; supporting evidence; credibility of sources of evidence. 	<p>project and actually improve the project findings overall. Careful use of search engines to find information helped me to select appropriate and reliable sources.</p>
<p>Presentation skills</p>	
<ul style="list-style-type: none"> Choose appropriate formats and apply effectively e.g. written, oral, video and multimedia. Consider my target audience, the layout, structure, degree of formality of my presentation. Gather, select and include relevant information or ideas, emphasising the main points. Present information/ideas/reflections with supporting detail in a logical order, reaching a reasoned conclusion. 	<p>The target audience was decided early so that the style and format of the presentation were suitable for that audience. A power point presentation allowed us each to present information visually and orally in an interesting way as well as combine our research.</p> <p>We decided to use surprise and humour at the start of the presentation to get the attention of the audience but kept the main delivery of the technical information formal. At the end of the presentation the audience was asked to think about their role in reducing the amount of energy we use in the future as we have to rely more and more on renewables.</p>
<p>Self evaluation – recognition of own skills development and future areas for development</p>	
<ul style="list-style-type: none"> Ask for feedback and deal positively with praise, setbacks and criticism. Reflect on my experiences and feedback from others to assess the development of my knowledge, skills and understanding. Learn from my experiences and use to inform future progress. 	<p>The feedback received from the Higher class was very positive and encouraging. I was pleased with the feedback about content and was told that the presentation was easy to understand. I feel I have improved all my skills during the project and this will help me study independently at University, organise my time more efficiently and has let me understand the importance of forward planning and meeting deadlines. Feedback from the class will help me improve my style of presentation.</p>
<p><i>This section is not mandatory. It has been included to allow the candidate the opportunity to undertake an overall reflection of their project.</i></p> <p>Reflection on my experiences throughout this project (for example things I feel I have achieved, things I have done that I feel particularly proud of, anything I would do differently were I to do something similar in future).</p> <p>I am pleased to have completed the project in such a short time and it has shown I</p>	

can adapt to challenges to reach a successful conclusion in a team or independently.

Are there any skills that you have used in this project that you would like to develop further? (For example, using skills in even more challenging situations, more working on own, more team working).

I know that I will need to use all these skills at University and I am more confident now about being able to do that and study independently.

Science: Interdisciplinary Project

Assessment checklist

Candidate name Glen

Project proposal	Tick as appropriate
Grade C criteria	
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.	√
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.	√

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.	√

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 theme.	√
Clear presentation of main findings/product.	√
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 contexts to progress the project.	√
Accurate and deepening of understanding through application of subject knowledge in the chosen context, with meaningful connections well established.	√

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/product 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).	√

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.	√

The overall grade will be:

- A indicative of a highly competent performance which meets all 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
Assessor comments Glen is a very capable, mature & highly motivated pupil and he worked well independently from the start of the project. The subject that was chosen is of great personal interest to Glen and his interest and enthusiasm were evident from oral discussions and the detailed log book. His thorough planning and analysis of the accumulated materials provided an interesting and informative presentation, with honest and well considered evaluation and self-evaluation. His effective critical thinking led to well supported conclusions that were evident in the final product. Glen consistently met deadlines throughout the project and used a range of research techniques both efficiently and effectively Throughout the project he has also been aware of developing skills that will be ideally suited to his University studies.	