

Science: Interdisciplinary Project

Proposal

Candidate name	Christopher								
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 project will investigate the economic viability of a landfill site using methane to produce electricity for use at a local level. My part of the project is to look into the background operations of a local landfill site to understand the context that the methane-to-electricity production system is in.</p> <p>The project will also question whether electricity from methane is a sustainable energy source for the future and to what extent it could meet energy demands. I will consult Aberdeen City Council, the local landfill sites (Hill of Tramaud, Ness farm and Tullos Hill) designers and engineers of technology plus environmental groups to ascertain the costs, projected output both long and short term and the environmental concerns associated with the implementation of the electricity-to-methane production system.</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 currently taking AH Chemistry and am planning to study Chemistry at University next year. I am interested in applying Chemistry to a real world issue and up to now I've not had much experience with Chemistry outside of the classroom. I hope that by doing this project I will gain experience in talking with professionals involved in practical applications of Chemistry and further improve my communication and independent research skills. I take AH Biology which includes a section concerning the environment and alternative energies, this project will allow me to build upon that theoretical knowledge with a more practical understanding of alternative energy technologies.</p> <p>I am also particularly interested as I live very close to a landfill site that is in the process of upgrading its facilities to stop flaring methane and instead generate electricity from it.</p> <p>This is a very important topic globally as we enter an age of renewable energy sources and decrease our dependency on fossil fuels. I want to develop my understanding of alternative fuels and how they may be realistically used in the world.</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)
 SITA UK owned Landfill Sites (Hill of Tramaud, Tullos Hill)
 G&E Oil and Gas
 Scottish Environmental Protection Agency
 Health and Safety Executive
 Internet

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

- *Application of subject knowledge and understanding.*

I will be applying my knowledge of chemistry when dealing with chemical processes and my business and economics knowledge will help me to investigate economic viability.

- *Research skills – analysis and evaluation.*

I will develop these skills by selecting appropriate materials to use and by drawing conclusions from the information I gather.

- *Interpersonal skills – negotiation and collaboration.*

I will be working together with a partner in this project and so will develop my team working skills. I will also need to work with a variety of people within school and from other entities.

- *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 an e-portfolio to manage my data. Since I work as part of a team we will need to plan how the work is to be divided between us.

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

I shall be in charge of my learning and will not be relying on my teachers as much as normal.

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

In the event of a complication, I will need to overcome the challenges posed in order to succeed.

- *Presentation skills.*

I hope that my presentation skills will improve as I will be presenting my findings at the end of the year to an audience. They will also improve as when I am talking to different

people since I will need to present what I am doing to them in a way appropriate to each person and situation.

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

Throughout the project I will need to evaluate my learning and performance in the above sections.

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 there is a clear link with your planned future studies. In discussion you have explained that you will complete a SWOT analysis of your skills as a baseline assessment and understand that this will help you later when you evaluate your progress.

The outside agencies you intend to contact should enable you to be involved in a range of research techniques as well as needing to communicate with a mixture of technicians, managers and researchers. This will give you valuable experience out of school in various different locations and should generate sufficient material for you to analyse and evaluate as you prepare your final presentation.

This joint project is sufficiently wide ranging to allow independent working for yourself and the other candidate as well as later needing to cooperate to evaluate materials, draw conclusions and present your findings.

It will be challenging for you both to complete the project in the time available but careful planning and a detailed timeline will help you to achieve this.

Proposal approved	YES	Further work required	
Candidate signature		Date	
Assessor signature		Date	

Science: Interdisciplinary Project

Plan

Candidate name	Christopher								
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Project title	Waste to Energy, Is it Rubbish?								
Is this a group project? yes <input checked="" type="checkbox"/> no <input type="checkbox"/>									
If a group project, what will your role or responsibilities be?									
<p>I will be focusing my attention on the Hill of Tramaud landfill site which is to stop its flaring and begin piping its methane early in 2010. I will be finding out what the initial costs are, how much methane they expect to produce, for how long they expect to be able to produce it, how much electricity they expect to be able to produce from methane and how much income this will provide.</p> <p>I will also be looking into the technology they are going to use to pipe and produce electricity from methane. I will attempt to discover how efficient their industrial process of producing electricity from methane will be.</p> <p>In addition to investigating the operations at the Hill of Tramaud I will be finding out how the plans affect the local community and the environment.</p> <p>I will also be considering the context of the technology by investigating the operations of the landfill site itself.</p>									
Timescales (start, finish and milestones) Start: As soon as approval is given. (September) Stages: Research/Practical (October-December) Prepare final presentation (January) Give presentation (early February) Complete Evaluation (February) Finish: by end of February									
Planning – state how you are going to meet the agreed objectives of your project I will contact SITA UK to discuss the operations at the Hill of Tramaud. I will enquire into what technology they use and learn as much as possible about it from them and G&E Oil and Gas. To investigate the efficiency I will perform a small scale experiment into the energy released by combustion of methane in the lab and from these results I can observe									

how efficient the industrial process of energy conversion is.

I will conduct a survey of people local to the Hill of Tramaud to discover how the plans affect them. I will contact the Scottish Environmental Protection Agency (SEPA) to investigate how the plans effect the environment. To consider safety I will be contacting the Health and Safety Executive.

Resources (people, materials, places)

Aberdeen City Council

Aberdeen University Facilities (environmental research department, library)

Tulloch Hill (SITA UK)

G&E Oil and Gas

Scottish Environment Protection Agency

Health and Safety Executive

Focus group and people in the local community

Internet

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

Discussion with University Staff

Internet Research

Contact G&E Oil and Gas, Aberdeen City Council, SITA UK,

Contact focus groups, Health and Safety Executive

Experiment with combustion of methane in the lab.

Presentation

- **Who do I think will benefit from listening/reading/looking at my presentation of my project findings/product?**
- People interested in the prospects of renewable energy sources, how local landfill sites can contribute to people locally and people with environmental worries about landfill sites. We will make our presentation accessible to pupils to help clarify to them the issues and complications with this type of renewable energy.
- **What methods are appropriate to the audience (for example demonstration, presentation software, websites, oral, report, piece of theatre, dvd, wiki/blog or any combination)**
- I will present my findings to an audience using presentation software.

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. We are relying on the co-operation of the companies and organisations that we require for our project.

We will need to conduct research before we can collate data and evaluate our findings. We need to evaluate our findings before presenting them.

Contingencies

Any anticipated problems?

Gaining the co-operation of SITA UK and the Hill of Tramaud staff.

My plans for overcoming the anticipated problems.

Be polite but persistent. Explain the backgrounds of the project. Make sure they understand we are looking for benefits. Attempt to make contact through several people.

Method for recording own skills development and future areas for improvement

Audio Log and Written Log

Assessor comments

Your written plan and the discussions we have had show that you have put a lot of thought into the project and have put together a clear framework and timescale. Your milestones are challenging but realistic.

It is important that you have regular meetings with Glen to go over the work completed as well as completing a detailed log, This will be useful to you both when developing your presentation. We will look at the progress you have made at your interim review in January and consider any modifications you may need to make.

It is a good idea to attend the University research workshop, this will help you to use your time effectively & efficiently and also assist with later analysis of materials. We have discussed the possibility of completing lab work in the Chemistry Department. This is particularly relevant to your part of the project and should be explored further.

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

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).

Having gathered all the information we could from various sources; The Hill of Tramaud, Dr Alan Owen and the Internet, Glen and myself put together a combined presentation of both my side and his side of the project.

The target audience was a Higher Chemistry class. We chose them because we thought that they would be advanced enough to understand the content of our presentation and would be sufficiently interested in learning of our discoveries.

The presentation itself was 30 minutes long. Glen and I have both given presentations before but this was far longer and much more factual so it presented us with a challenge.

We split the presentation between us as we had the entire project but included overlapping areas to provide a natural flow. For instance after I described landfill sites using methane to produce electricity Glen would then move on to compare this with other sources of renewable energy.

The presentation was generally well received, the feedback being that the content was interesting but the presentation style required more work. Glen and I both agreed with this assessment and I felt that if we'd had time to polish the presentation and to rehearse it a few times more then it would have been much better than it was.

Assessor Comments

(Please include detailed comments against the following criteria)

Grade C Criteria	Assessor comments
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.	Detailed planning and clear timeline. Wide range of resources accessed. Regular discussion with partner , joint decisions reached. Clear self monitoring with review of progress.
Application of specialist and interdisciplinary subject knowledge to establish meaningful connections within the broad theme(s).	Excellent handling of the complex technical data. Clear understanding of the interdisciplinary aspect of the project. Effective exploration of both economic development & sustainability.
Clear presentation of main findings/product.	Excellent presentation, information presented in a clear and interesting way. 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 used to present findings of the project. Conclusions clearly stated and linked to topical issues.
Skilful and creative use of resources, including people, information and learning contexts to progress the project.	A variety of research techniques was used. Interviews, 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 was clearly understood using prior knowledge and current research. Project content explained well in the presentation and linked to local situation.

Candidate Signature	Date	
Assessors Signatures	Date	

Science: Interdisciplinary Project

Evaluation of project

Candidate name	Christopher								
SCN									
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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 the investigate the economic viability of a landfill site using methane to produce electricity for use at a local level and to determine whether electricity from methane is a sustainable energy source for the future and to what extent it could meet energy demands. To give the electricity-from-methane context Glen was to investigate other renewable energy sources and I was to look into the operations of a landfill site both long-term and short-term.</p> <p>In terms of information and learning I think this project has been very successful. I have learnt a lot about landfill sites such as the amount of engineering that goes into setting up a landfill site initially, the day-to-day operations during the course of a site's life and then the procedure for ceasing operations and shutting the site down. I also learnt a lot about the way that the site produces energy from methane. Material decomposes producing gas that accumulates in pockets called gas wells under the compact earth. The gas is then drawn up and through pipes that span the site, then dried and purified before being send to either the electricity generator or the flare.</p> <p>From Dr Alan Owen I learnt a lot about alternative energy sources, although that was more relevant to Glen's side of the project it was still interesting and helpful when it came to preparing the joint presentation. Dr Alan Owen was helpful to my side of the project because he was able to explain the concept of R.O.C.s to me. R.O.C.s are renewable obligation certificates, I'd heard about them from the staff of the landfill site and Dr Alan Owen was able to give me further information. The R.O.C.s are a government incentive to encourage investment in renewable energy sources. The basic idea is that companies receive money if they invest in renewables and are fined if they do not invest enough. In this way the cost gap between a technology's physical feasibility and economic desirability can be bridged.</p> <p>Glen and myself pooled our information to create a joint presentation which was</p>									

given to a Higher Chemistry class because we felt that they would be advanced enough to understand the content of our presentation. We've both given presentations to our peers before but this presentation was very different as it was 30 minutes long and was full of factual information. Although it was generally well received and the evaluations completed by the audience were largely positive I still felt that the presentation could be improved. We gave the presentation a second time to a second Higher Chemistry class. The second presentation was better although I felt that with a bit more time to prepare and rehearse it could have been even better still. I did however enjoy the challenge of making a 30 minute presentation.

An important stage of the project's development was changing it after discovering that with one landfill site closed we didn't have enough to produce two distinct projects. Having changed the project to have Glen look at other renewables to compare to the landfill site I was investigating we found that the division helped things to run more smoothly.

How effective were my communication methods?

Over the course of this project I have had to communicate with a variety of different people in different ways.

When attempting to arrange a visit to the Hill of Tramaud I had to communicate over phone several times. I phoned the SITA UK Aberdeen office to find out how I could meet someone who could give me some information about the landfill site. I was told I'd have to phone the site directly but they did give me the name of the site supervisor, David Regalski. I phoned Hill of Tramaud several times and asked to speak to the site supervisor but I was never successful in getting through to him and he didn't return any messages I left for him. I think that it was due to his being busy rather than poor communication skills on my part.

Having discovered the phone number of Colin Forshaw I was able to phone him and ask for a visit which went to plan; Colin arranged a tour of the site for us.

The tour of the site was conducted by David Regalski, the site supervisor. After his not returning my calls I was apprehensive about meeting him but as it turned out he was very friendly and enthusiastic about teaching Glen and myself about how the site worked. Communicating with David Regalski involved listening to what he told us about the landfill and asking appropriate questions. Given that he was a professional and not any kind of teacher I think I communicated very well with him. I asked enough questions to get a lot of good information back from him.

Communicating with Dr Alan Owen involved similar communication as with David Regalski. I was initially concerned that with him being a University lecturer I may not be able to follow what he was saying but he was very good at explaining things to me and Glen. We responded by asking him questions appropriate to our project that he may have been able to answer as an expert on tidal energy and a well-informed person on alternative energy in Aberdeen.

The final method of communication employed during this project was the final presentation where I had to communicate the information I had learnt to an audience. Preparation was an important part of this; writing the script and putting together the PowerPoint presentation involved selecting the most appropriate information and finding the best ways to explain it to the audience. After preparing the presentation it all came down to the actual delivery in front of the audience. To communicate to the audience the important things were to keep talking to maintain the flow but not to ramble. Projection also was important, I needed to talk loudly enough for the audience to be able to hear me. These things I don't think I did badly although I do think I could have been better too.

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

I would have liked to look into the operations of other landfill sites to compare them with the Hill of Tramaud.
I would also have liked to conduct a survey to find out the local people's feeling towards the landfill site and how much it affected them.

Candidate signature	Date	
Assessors signatures		

Self evaluation of generic and cognitive skills development

Candidate name	Christopher							
SCN								
Centre name								
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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
Application of subject knowledge and understanding	
<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>I've learnt a lot about the day-to-day operations of a landfill site and about the decomposition of the waste deposited there. It has been very interesting to learn about how the landfill site deals with the waste it receives, particularly how engineered and thought-through the process is. I've seen how electricity is generated from methane and how it can help to meet energy demands. In addition I've learnt about the sustainable nature of this process compared with burning fossil fuels for example and I've learnt about how through the Renewable Obligations, companies find it desirable to invest in technology such as electricity-from-methane generators.</p> <p>This has been a great opportunity to see science outside, applied in real world situations.</p>

Research skills – plan, research, analyse and evaluate	
<p>Plan</p> <ul style="list-style-type: none"> • Define your research subject by identifying its scope and key concepts. • 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>I was taking part in a group project, working with Glen. The project was examining landfill sites using methane to generate electricity compared with other forms of renewable energy. The project was split between us and my half was to investigate the landfill site generating electricity, how sustainable an energy source this is, investigate the context of the landfill site itself and the reason that companies are obliged to invest in renewables.</p> <p>Initially a lot of internet research was involved. After I established the background information I needed I moved on to contacting people over the phone to find out more and then to going out and meeting people. Meeting Nathan Skillen, RGU, was a big help as he put us in touch with other people at the University who helped us with our project.</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>Initially I had to do a lot of internet research to give myself a good grounding in my area of interest.</p> <p>After that my research expanded to talking to people over the phone and then to speaking with people face-to-face such as David Regalski and Dr Alan Owen.</p> <p>All the information I received was recorded in my log book or typed up. When visiting the Hill of Tramaud I couldn't write down everything David Regalski told me because we were engaged in a more casual discussion so I took brief notes and then expanded them after the visit.</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>The information I received from David Regalski I deemed to be sound as he is a professional working every day at a landfill site. The information about R.O.C.s I got from Dr Alan Owen I was more wary of so backed it up by checking R.O.C.s on the government's website.</p> <p>Some of the internet research I remained sceptical about and rightly so as an Internet news article claimed that the Tullos Hill landfill</p>

	site was generating electricity when in fact it was not.
<p>Evaluate</p> <ul style="list-style-type: none"> Evaluate the research process. 	<p>Apart from a few mistakes courtesy of the internet's uncertain nature the research stage went well and gave me a good foundation in the topic of landfill sites.</p>

Interpersonal skills – negotiate and collaborate	
<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. Have positive self belief. Be confident enough to offer and ask for support. 	<p>Working with a partner on this project has been challenging because it requires compromise and collaboration however it does mean that there is someone else to give you support.</p> <p>Taking on board the criticism of others after the presentations wasn't easy but I understand it was for the good as I learn my own weaknesses from such criticisms.</p> <p>When talking with David Regalski at the Hill of Tramaud I had to adjust my mannerisms to communicate with him as a non-teaching professional outside of school.</p>
Planning – time, resource and information management	
<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>Given that we started the project late we seriously needed to make good time with things. Then after being set back by the lack of response from the landfill site we had to push things back even more whilst still working to a deadline.</p> <p>The written and audio logs we (me and Glen) kept were a very helpful technique to keeping track of our efforts in attempting to contact people at the beginning of the project and then later for keeping track of our meetings with people.</p> <p>I recognised that getting in touch with the landfill site directly was becoming problematic so I had to phone Colin Forshaw directly.</p>
Independent learning – autonomy and challenge in own learning	
<ul style="list-style-type: none"> Use my skills responsibly to 	<p>At the beginning of this project there was a lot</p>

<p>make things happen.</p> <ul style="list-style-type: none"> • Take initiative to establish links with other learning environments/opportunities. • Look for challenges and don't necessarily take the easy option. 	<p>of internet research required to give me an informed background from the outset. This required independent work.</p> <p>I had to take initiative to arrange the visit to the landfill site by phoning Colin Forshaw directly.</p>
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<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 improve the situation. • 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>I came up with a lot of ideas to use in this project and while I did not have the opportunity to follow through with them all I think that most were still sound. These ideas included visiting more than one landfill site to make comparisons between the two and talking to people local to the landfill site to gauge their opinions and the level of effect the site had on them.</p> <p>Every stage of the project was subject to critical thinking as that is my natural thinking process. This helped when talking to David Regalski and Dr Alan Owen in analysing what they were saying. Critical thinking was also useful when conducting internet research as sources from the internet can be unreliable.</p>
<p>Presentation skills</p>	
<ul style="list-style-type: none"> • Choose appropriate formats and apply effectively e.g. written, oral, video, 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 	<p>When preparing the final presentation I needed to evaluate and select the appropriate information for the presentation to be given to a Higher Chemistry class. I used a PowerPoint presentation which I believe was an effective media. The style chosen was formal to reflect the factual nature of the presentation but not so formal as to bore the audience.</p> <p>The presentation was structured logically to have a particular flow and to allow Glen and myself to speak for equal lengths of time</p>

detail in a logical order, reaching a reasoned conclusion.	alternately but with each section not so short as to have Glen and myself continually swapping positions. We reached our conclusion after presenting the supporting body of evidence.
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Self evaluation – recognition of own skills development and future areas for development	
<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>I think my communication skills (particularly with new people) have improved through meeting with the likes of David Regalski and Dr Alan Owen.</p> <p>My presentation skills have improved both by giving the long and factual presentation but also by asking the audience to evaluate and criticise.</p> <p>My self evaluation skills have improved. Never before has it been required of me to criticise myself so thoroughly.</p>

Science: Interdisciplinary Project

Assessment checklist

Candidate name Christopher

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.	√

- Could have been more varied – reluctant to try survey/different techniques.

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.	

*Good written evaluation, less clear orally. Not keen on SWOT analysis.

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	B
Assessor comments Christopher is a mature, capable pupil. He worked well independently and he evaluated/analysed/selected appropriate materials effectively. Christopher struggled at times to meet deadlines, a more detailed timeline would perhaps have helped him with this. Christopher arranged a mixture of contacts and conducted a range of interviews. He found the lack of results at times frustrating but could have addressed this by using a variety of different research techniques. Very good presentation, clearly thought out with regard to content, level etc. Christopher gave a detailed summary of conclusions and made a good evaluation of the project. His self-evaluation was less thorough, his initial SWOT analysis was weak and didn't help him when it came time to complete his self-evaluation.	