May 7, 2015
We were given our booklets for this project today and it was explained to us in class. I went home and thought about it. So far, I’ve listed down solving waste problems (rubbish, energy, water), natural elements (water, sun, wind etc.) and light and sound. I’m thinking to look further into these areas. But, I’ve also come up with a few different ideas in completely different areas.

May 23, 2015
I’ve narrowed my ideas down to 3. Firstly, a scientific investigation that would involve finding out which sense (sight, smell, sound etc.) triggers the most or best memories and what the reasons for this are (e.g. does gender decide the result?). Secondly, an engine that converts sound energy into electricity (like a microphone does) to power something, like a vehicle. Another idea along these lines are shoes that turn the energy that would otherwise go into the ground into electrical energy to power things. Finally, a scientific investigation on whether IQ tests are reliable and how to make them more accurate.
Strengths
This experiment explores new areas (the way your brain interacts with senses) that are not discussed during school, making it an interesting and unique area to investigate within. Also, this investigation is very affordable since I am not using equipment that is hard to access or expensive. My investigation also allows a lot of room for further questions and complex results. Instead of having a few definite result possibilities there are quite a few that can be a combination of different things. For example, the result could be that scent triggers the best memories but only for women. This in itself is a more complex and interesting result. I could investigate even further into and ask why? Is at all women or just of a certain age group? What makes scent more effective for women? This scientific investigation allows room for further thought and questioning. Since the results can be so abstract this investigation becomes overall more interesting and unique. Also, this investigation requires the use of background information, such as how the senses work in the brain, and my own research and experimenting. I would be able to learn things from past research then add new information to this, from the investigation that I conduct. This creates balance in two important areas of a scientific investigation, which, once again, makes this investigation interesting and unique.

Challenges
I would need a lot of people since I would be testing one sense on each of them. To make this investigation accurate I would have to carry out experiments for each sense on many different people. Also, it would be difficult to make this a fair test. For example, after giving them material to memorise I would have to ensure that they do the same thing before I continue the experiment (checking how much they remember). It would also be difficult to compare my results to a control. If I wanted to compare how well sound triggered memory in a person compared to taste I would have to give them two different materials to memorise. One of these materials may be naturally harder to memorise compared to the other. It would be difficult to compare how well senses trigger memories when using multiple different people since there could be different factors in each person that determine different results. For example, if I tested one person’s taste and another person’s visuals and found that visuals triggered better memories it could be because the person that I tested visuals with was naturally a visually learner and better when given visuals. Overall, my scientific investigation would be difficult to make reliable and accurate due to the amount and range of people that I would have to test with and the different factors that affect the results that I may be unaware of.

Resources
- multiple different people, including groups in the same family, race, different age groups and those of the same gender, to apply my experiment on
- material to memorise such as text, images etc.
- a scent, like perfume, to test how effective smell is in triggering memories
- a taste, such as food, to test how effective taste is in triggering memories
- fabric to feel to test how effective feel is in triggering memories
- music to test how effective sound is in triggering memories
- a visual, such as image or text, to test how effective sight is in triggering memories
- a type of documentation, like paper and pen, to keep record of the results I get
- books and internet for background information
Strengths
This scientific investigation will require me to research and find new knowledge as well as require me to do a lot of my own logical and scientific thinking. For example, to create a new test I would have to logically utilise the information I have gathered to create a better test. It is also a unique investigation that isn’t looked into very often. The efficiency of IQ tests is not often, or known to be, investigated. Since the actual idea is quite simple and the time frame I am given is quite large compared, I may have a lot of time to create multiple ideas and extend myself further with the information I collect and utilise. This means I will be able to think more deeply about making a test with the most efficiency and therefore find the best result to this scientific investigation.

Challenges
If after doing my research I find that the IQ test currently is adequate and in no need of improvement my scientific investigation reaches a dead end and consequently becomes less interesting. Also, if the IQ test does need improvements and I create a new test that tests IQ more adequately, it may not be useful or significant work. This investigation doesn’t give me room to ask further and more complex questions to achieve more complicated results. This investigation only allows a few assigned paths. For example, after finding out whether the IQ test is effective or not I would then go on to research the brain and what tests each area best then construct a test based on that. There aren’t any further paths or questions that I could follow to achieve interesting or more complicated results.

Resources
- books and internet to find background information
- logbook to document process
**Strengths**
This invention would require me to do a lot of research and learn a lot of new and complex skills to be able to make it, meaning the process of making the invention would be very educational and interesting. This invention could be applicable and useful in many real life situations, such as a hiker charging a phone with the shoes in case it’s needed during emergency. Also, the process of finishing this invention would require me to build on previous, basic knowledge. For example, the knowledge that energy is never destroyed or added but changed is basic knowledge that I already have but through the process of making this invention I would need to build on this with new information and scientifically thinking based on what I already know. This would mean my project would be one that would require almost all aspects of scientific thinking and analysis. Another strength of this invention is that it gives me the opportunity to extend myself through problem solving. While making the invention I will encounter problems. I will need to think logically and scientifically to solve these problems. The process of finishing this invention gives me a lot of room to experiment and trial things, therefore expanding myself and making this project more interesting.

**Challenges**
Since the idea is a rather complex one it would mean that the process of completing the invention would be quite difficult and even costly. It would require a lot of research into complex areas and my own scientific thinking and ability on top of that. Also, the shoes could be quite heavy and thick if I add all the needed equipment to make it work. Obtaining the resources needed to complete this invention - such as the material needed to change the energy and store it - would be quite difficult and costly. If such materials have not been invented yet, the process of making this invention would be more difficult and costly. I will need to trial and re-trial my invention and I would require a lot of equipment that could be costly. Making this invention comes with quite a few safety hazards, when I am trialling it and making it. If my invention was to be faulty and I was to trial it on a person, that person may be in risk. Also, while completing the invention I am also prone to accidents or hazards, such as electrocution if/when I need to put circuits and electrical objects together. With the time frame given I may not be able to finish this invention or extend it to its full potential. The process of making an invention requires time to trial, re-think, re-trail and so forth. This project does not give me a limitless time to finish my invention meaning I may not have time to completely extend on my invention (after trialing and finding potential points of improvement) or finish my invention.

**Resources**
- books and internet for information and help with creating the invention
- any type of materials or equipment required to make this (e.g. shoes)
- logbook to document process
June 8, 2015
After completing the strengths, challenges and resources for three of my ideas, I think I will be doing an investigation on memory and it’s relation to senses as it is practical while still quite interesting. I discussed this with my science teacher previously and she told me that investigating the effects of one sense could be more practical. I think I will do some research of the different senses to help me choose the best option.

June 9, 2015
I carried out some research on each sense and their relation to memory. From this I have decided to do taste. Not much research has been done on the effects of taste on memory but what I have found implies that it does have an effect on a subject’s ability to recall memory. Also, taste is closely related to smell and much research has been done to show smell has an impact on a subject’s memory. This could mean that investigating whether taste impacts memory could be interesting.

June 13, 2015
I did some background research on the effects of taste on memory. The research I did was on past experiments and on things related to memory, taste and the brain. Most of the studies conducted have used tastes related to negative emotions, like sickness, and these have been shown to have an impact. Whether tastes related to negative emotions will help humans is not known as all experiments have been done on animals. This means that taste and its impact on human memory is not looked into much so my experiment would provide quite a bit of new information. Also, after conducting this research I want to further investigate the impacts of taste related to negative emotions, based on previous investigations, then look into the relatively un-investigated area of taste related to positive emotion.

June 14, 2015
I worked more on my investigation by doing more background information based on my finalised aim: to investigate whether tastes (both liked or disliked) have an effect on memory. Today I also started on my method and typed up my hypothesis, which is that tastes linked to a negative feeling (the disliked drinks) will improve memory.

June 17, 2015
After having a science lesson today and being able to discuss my method and overall investigation with my teacher I decided to do more work at home. I changed my method a bit to make the comparisons between each group more accurate. Previously I just gave subjects a drink before trying to memorise the material given but I have now decided to give it to them again before they’re asked to answer questions about it. This way the drink can be used as a valid retrieval cue for memory. My friend suggested having each person do the test once without a drink and once with a drink as this could be more accurate. This is true however after thinking about this I found that doing this brings in other variables that could make the experiment inaccurate. For instance, if I do this I will need to change the material, as subjects would be able to remember more after viewing something twice. This could mean that the material my be harder in the first trial compared to the second therefore meaning the results would not be from what drinks were given but instead the difficulty of the material.
June 19, 2015
School finished today and I’ve made plans to meet up with my friend to work on our SRPs over the holidays. I’m also planning to do some trial experiments on myself and some of my family or friends. This was suggested by my science teacher and will hopefully help me to improve on my method to make it as effective as possible.

June 27, 2015
I returned from vacation a few days ago and have started working on getting materials together to do some trial experiments. The materials I have prepared so far is an image of several random objects, taken with my phone, to ask people to remember. I also have 4 questions on this image. I think I will be able to trial this tomorrow on two people from my family.

June 28, 2015
I trialled my method today and found that it was quite helpful. From my trials I found that four questions might not be enough to properly outline how well people can remember information, as the answers from the participants didn’t follow any particular trends within the questions. Also, the image of the objects taken with my phone was not very good as the lighting was poor and both participants struggled a bit with identifying the actual objects. They also called things out which could make my experiments a little unreliable if it happens in my actual experiments. Finally, I need to adjust the amounts of time I set for the participants to be with and without the material based on my trial experiments.

July 1, 2015
I worked a bit on new material for my participants to memorise today by collected high quality images from stock photo libraries. All these photos are professionally taken of common objects or symbols have a white background and I am making a collage of these on my computer. Apart from this, I’ve adjusted the times in my methods by shortening the amount of time participants have without the image and shortening the amount of time they have to view it. Also, I have adjusted the size of the drink to make it a little larger as the portions I gave participants in my trial experiments were smaller than I had thought.

July 14, 2015
I have not left very many entries in my logbook recently as I have forgotten. However, today was the first day back at school and I have started finding people who would be willing to participate in my experiments. By finding people from school, the age and gender of my participants would be controlled. I am asking people what their least favourite and favourite drinks are and keeping a record of it on a piece of paper. From the list I gather, I will try to choose people so that the range of drinks is as small as possible to further control this element of my experiment.

July 19, 2015
At the moment I do not have very many people’s names done so tomorrow, on Monday, at school I will make sure to ask more people. The list I have has a very large variety of drinks put down for both liked and disliked so this makes my plan, described in my last entry, of controlling the effects of the type of drink in my experiment by lessening the variety of drinks, a little more difficult.
July 24, 2015
I think I have gathered a sufficient amount of people. The list of people I have asked is quite long now as I have asked most of my grade what their favourite and least favourite drinks are. I have organised these into lists and am further organising these to limit the variety of drinks as best possible. Fortunately, it looks like I will have the 30 participants I need.

July 27, 2015
Today I asked my mum to help me buy the supplies I need as over the weekend I managed to organise the lists so that the drinks used were only two, Fanta and Coke. I have more than 10 people for each group in case someone is unavailable. I have also asked my science teacher to use the science classrooms at lunch to carry out my experiments. I have prepared a powerpoint to display with instructions, the image and the 20 minute video (2 ‘Adventure Time’ episodes), printed out the questions sheets and printed out my consent forms.

July 28, 2015
I did the first of my experiments at lunch today and it was a little chaotic as many people showed up. However, apart from having difficulty managing my time to ensure it didn’t run over lunch and having to talk to so many girls and tell them what to do, my experiment went smoothly. I have typed up my data so far into a table but I haven’t looked at trends yet.

July 30, 2015
I did the second of my experiments after school today and it was easier than the first as there were less people. The experiment went smoothly and I controlled all the variables I listed. I have written down my data in a table again but I have changed the way I mark the 10 questions with a marking guideline to ensure the data is as accurate as possible so I have re written all of my date from these two experiments.

August 1, 2015
I have created graphs and charts from my data. Also, I have analysed it a bit and written about a few trends in the discussion. This is as much as I have done today as I was busy. Tomorrow I am planning on finishing this discussion and finalising my report.

August 3, 2015
I forgot to make an entry yesterday but today I completely finalised my report. The results from my experiment were actually quite surprising and were almost completely opposite to my hypothesis. I discussed this quite thoroughly in my discussion as well as the other elements of my investigation outlined in the booklet given to us at the beginning of the SRP. I will hand in my project on Wednesday and I’m quite excited since the experience of doing a SRP has been quite interesting.
Un-Signed Consent Forms

INFORMED CONSENT FORM
FOR YOUNG SCIENTIST RESEARCH PARTICIPANTS

Purpose of my research:
I am conducting a scientific investigation as part of the STANSW Young Scientist Awards. For my project, I am investigating whether taste can better your memory and whether a taste that is liked or disliked can provide better memory stimulus.

If you participate, you will be asked to:
Drink a liquid that you have previously identified that you like/dislike
View material that you will be asked information on after a period of 20 minutes
Watch a 20-minute video
Answer 10 questions about the material given

Time required for participation:
Approximately 25 minutes.

Risks involved:
Eye strain and/or back pain from looking at the material/video/questions (participants will be in a dark room with computer screens)
Allergic reaction to drink (participants will be asked for allergies)
Reactions to drinks that may be expired or contain bacteria unknown of (drinks will be checked at purpose to ensure they're not expired)

How confidentiality will be maintained:
Your name will not be used in the finished research paper and project and you will instead be assigned a number. Only the interviewer and/or supervisors will be aware of your answers to the research papers. Any identifying information will be eliminated after the data is collected. Records of your answers to the questions will also be destroyed after the data is collected. The information collected from you will be combined with information from other participants to assist in finding an accurate result to my research purpose.

Statement from School Scientific Investigation Coordinator:
The Ethics Committee of has reviewed the risks involved in this activity and has deemed them as minimal / low / medium / high.

Permission has / has not been granted to conduct this particular activity as part of the student's STANSW Young Scientist project.

School Research Coordinator:  Signed  Date

Voluntary Participation:
Participation in this study is completely voluntary. If you decide not to participate there will not be any negative consequences. Please be aware that if you decide to participate, you may stop participating at any time and you may decide not to answer any specific question.

Consent:
By signing this form I am attesting that I have read and understand the information above and I freely give my consent to participate or permission for my child to participate in this activity.

Participant:  Signed  Date

Parent / Guardian:  Signed  Date
(if participant is under 18)
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Watch a 20-minute video
Answer 10 questions about the material given

Time required for participation:
Approximately 25 minutes.

Risks involved:
Eye strain and/or back pain from looking at the material/video/questions
Participants will be in a well-lit classroom with materials that are clear, have large text/images

How confidentiality will be maintained:
Your name will not be used in the finished research paper and project and you will instead be assigned a number. Only the interviewer and/or supervisors will be aware of your answers to the research papers. Any identifying information will be eliminated after the data is collected. Records of your answers to the questions will also be destroyed after the data is collected. The information collected from you will be combined with information from other participants to assist in finding an accurate result to my research purpose.

Statement from School Scientific Investigation Coordinator:
The Ethics Committee of ___________________________________________ has reviewed the risks involved in this activity and has deemed them as [minimal / low / medium / high].
Permission has [has not been granted to conduct this particular activity as part of the student's STANSW Young Scientist project.

School Research Coordinator: Signed: ___________________________ Date: ___________________________

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Participant: Signed: ___________________________ Date: ___________________________

Parent/Guardian: Signed: ___________________________ Date: ___________________________
(If participant is under 18)