

Aspects of this report have been edited to remove identifying information and extraneous material

Scholarship Technology Assessment Schedule 2011

The student has presented a reflective report with supporting evidence and:		
1	2	3
Demonstrated some synthesis and integration of technological experiences in bringing together knowledge skills, ideas and methods to allow their technological outcome(s) to be realised. (2 marks)	Explained how some of the complexities of the situation(s) have been identified and explored Explained why the outcome(s) address the problem(s). (2 marks)	Some reflection on information or understandings or practice(s) that were used to inform the development of their technological outcome. (1 marks)
Demonstrated synthesis and integration of technological experiences in bringing together knowledge skills, ideas and methods to allow their technological outcome(s) to be realised. (4 marks)	Explained how the complexities of the situation(s) have been identified and explored. Justified why the outcome(s) address the problem(s) or justified the technological practice undertaken. (4 marks)	Some reflection on information, understandings and practice(s) of others that were used to inform the development of their technological outcome. (2 marks)
Demonstrated synthesis and integration of technological experiences in bringing together knowledge skills, ideas and methods to allow their technological outcome(s) to be realised. Demonstrated: - elegance in terms of ingenuity, simplicity, optimisation and polish of their technological practice and its resulting outcome(s) or - originality in terms of inventiveness, innovation and elements of unconventionality in the technological practice they undertake and its resulting outcome(s) (6 marks)	Explained how the complexities of the situation(s) have been identified and explored Justified the technological practice undertaken and why the outcome(s) address the problem(s). (6 marks)	Reflected on information, understandings and practice(s) of others that were used to inform the development of their technological outcome. (4 marks)
Demonstrated synthesis and integration of technological experiences in bringing together knowledge skills, ideas and methods to allow their technological outcome(s) to be realised. Demonstrated: elegance in terms of ingenuity, simplicity, optimisation and polish of their technological practice and its resulting outcome(s) - originality in terms of inventiveness, innovation and elements of unconventionality in the technological practice they undertake and its resulting outcome(s). (8 marks)	Explained how the complexities of the situation(s) have been identified and explored. Justified comprehensively the technological practice undertaken and why the outcome(s) address the problem(s). (8 marks)	Critically reflected on information, understandings and practice(s) of others, across a range of contexts , that were used to inform the development of their technological outcome. (8 marks)
Sub Total 8	Sub Total 6	Sub Total 6

Overall Level of Performance

20

2011 Scholarship Report

Dinostones was created to help children in year 2 primary school class learn to read. Having experience in the use of Adobe Flash, website design and software programming, I initially approached with an idea for a maths animation that could be implemented on the school computers, but discovered that he was actually in need of a reading tool that would help low-level readers in his class learn to recognise simple and frequently used words.

I was able to have the children try several existing solutions and realised that they seemed to be reluctant to learn when placed in front of a computer. The children would constantly choose to use games and animations that really contained very little educational material and preferred to use solutions that were fun and entertaining. It became clear that the solution I created would have to contain a balance between education and entertainment so that the young students would have a desire to use it, yet would still successfully learn the required reading skills. To suit this specification and I decided that an engaging game would be the most successful solution to teach the children the necessary words.

Several ideas were developed for possible reading games with different themes, stories and learning methods. Eventually, and I decided to create a Dinosaur themed game after seeing the kids in his class constantly choose play a dinosaur themed game during my visit. The children also used a maths tool that incorporated dinosaurs.

A storyboard for Dinostones was created and then developed was using some of the latest and greatest computer software. Most of the game was developed using Adobe Flash, used across the web on millions of websites and considered the best software for web-based animations. The game included over 2,000 lines of ActionScript, the programming language within Flash. I also used PHP and MySQL databases so that the game could be played online from anywhere and save the players progress in the game. This same technology is used by Facebook, Wikipedia, Google and YouTube.

I also used the local radio station to record the voices for the game, recruiting the world renowned story- to voice three of the characters and one of the drama students at my school to do the rest of the voice work.

The final feedback I got from my stakeholders was very positive, and there were very few issues and alterations that I had to make.

Complexities

Designing and developing Dinostones required meeting several complex specifications and also working around complex issues which arose during this process.

After observing the kids as they used existing solutions I realised that they seemed reluctant to use anything that seemed too educational and much preferred solutions that were very fun. This was of course a problem as the main objective of the project was to teach and educate the children. A compromise had to be made between the educational value of the game and incentives for the children to use the game.

The game was made to look very fun and entertaining. I created carton graphics that I thought would appeal to the children, masking the education within the game so that that children would not be so reluctant to use it.

I implemented a system in which the children could collect magical stones by learning new words and playing through the game. The students could then compare their stones with those of their peers and be encouraged to collect more stones in order to show off to their friends.

I decided to implement the game on the internet. This would allow for players' progress to be saved in online databases, allowing them to continue their game and keep the stones they had collecting. This would also allow the students to play the game from home, collecting extra stones that they could then show to their friends and all the while learning more words. This introduced more complexity to the project however. To have the game online would mean the file size of the game would have to be rather small, to allow it to be quickly downloaded. To make sure that this happened I used entirely vector graphics for the game, which are generally very small because they are simply downloaded as equations for lines and shapes, unlike normal bitmap images (such as photographs) for which almost every individual pixel must be downloaded. I also compressed the sound files used in the game using Adobe Flash's compressor, which makes the sound files much smaller. The sound files for the words are also only downloaded when they are actually needed (when the player is at the level for those words).

Implementing the game on the internet also means that it can be viewed through a variety of different web-browsers and on many different computers. I had to make sure that the game would work for the majority of these cases, and to do this I tested the game on all of the most used browsers and on several computer systems including the computers at [REDACTED], the computers at [REDACTED] and several associates' computers who were sent links to the game via email. For the most part the game functioned fine on most of the systems, but adjustments had to be made to the way information was sent to the server to prevent an error on older versions of Mozilla Firefox.

2011 Outstanding: Score 20

As a teacher and IT manager at _____, _____ is a busy person, and not always available for feedback or input for the project, this lead to several complexities during the development of Dinostones. I had to make sure that consultations with _____ or his class were booked in advance so that _____ would be able to organise this and make sure that he would be available. I initially had planned to have children in _____ class do the voice recording for the game, however, _____ unfortunately managed to get ill during the week we had planned to do this and this left me without a voice crew. Fortunately, I had left the holiday period without delegation and this planning helped me organise to have a new voice for the game,

Technologists

I consulted with several technologists during the development of the solution in order to improve the design and implementation of the game.

Mrs _____ is a teacher at _____, however, she has also taught many young children basic reading skills during her time as a teacher. She advised me that I should teach “families” of similar words at a time, instead of individual words from the Essential Words list that _____ had given me. I tried to incorporate this advice into the end game. I still wanted to use the list of words that _____ had given me but instead of putting these words in the order on the list I tried to group them into “families” where this was possible. Part of the inspiration behind the stone collecting rewards system came from here advice for a “of levelling feature, so the players would have something to work towards.” She told me that her young son currently spent much of his time playing a game after school in which he played a character that could constantly level up and improve in ability.

_____ runs a weekly radio show on Waiheke Radio and is experienced in using the recording technology at the radio station which I used to record voices for Dinostones. Seth was very important in the development of Dinostones as without his expertise collecting the audio recordings would have proved difficult. He taught me how to use the software Audacity and also how to use the recording hardware. The first time I tried to use it resulted in the recording “clipping”, which is when the microphone is recording at a volume too high and the audio ends up going above or below the scale that it is capable of recording. However, Seth was quickly able to fix this and with his guidance I eventually felt confident using the equipment.



_____ is a free-lance programmer who has created games and applications for the iPhone, Windows, and websites. He was able to give me technical advice about programming and helped me to quickly solve problems by emailing him. He helped me refine the code in both the flash animation and also on the website. I wish I had met with John much earlier in the development process as his advice and technical knowledge was very helpful and would have saved a lot of time throughout the project if I could have contacted him instead of having to search the internet or use different and less efficient methods. I found it hard to abide by John’s rule of “Look at the game from the customer’s perspective” as often I thought that my much of the feedback I got from the class was incorrect, however,

2011 Outstanding: Score 20

I tried to put this feedback above my own, keeping in mind that they were the ones who would use the game in the end and I think that this led to a better solution for them.

Reflection

The most difficult part of this project was working around other people. It seemed to me that other people didn't seem to have the same commitment to the project that I did. got sick and then my replacement happens to be on the other side of the world. It is very easy to make things happen when I am the only person I have to rely on. I can stay up through the night and put in extra time to catch up on work if I need to. But if I needed something from someone else, such as their voice, there was nothing I could, no amount of caffeine and late nights can make up for a missing resource.

To avoid this problem in the future (or the past) I would make sure that I was completely prepared for the fact that people can simply vanish and that I relied on other people as little as possible. This would include planning to meet with people as early as I could in the project, so that if the meeting did not materialise, it could be shifted to a later date. Unfortunately, in this project I seemed to do the opposite and make people vital elements of the end of the project.

Of course, I also learned in this project that people are very useful. Without the other stakeholders in this project Dinostones would not be anything like what it is, if anything at all. Seth's recording expertise was vital for successful sound recordings, and Tanya's voice certainly adds another element to the game. John's knowledge has also been incredibly helpful.

Planning was very important and definitely helped me keep on track in the project. However, other people did not stick to my plan and often this would lead to terrible consequences. I would make my plan much more flexible to support things not going to plan. I think that I would also plan to finish far before I actually needed to finish. This was particularly difficult this year with a 4th term consisting of only one week, however, if I had spent more time on the project earlier in the year I certainly could have met a much earlier deadline.

Although I already knew much of the skills that were required for this project I have also learned a lot by completing it and I have most definitely improved these skills. I have never attempted a project of this size but now feel confident to try something bigger.

Much more has gone into Dinostones than is shown in the accompanying folder. Although the game was developed as a school project and for this submission, for me, this was not the sole purpose of its development. I wanted to create something that the kids in the class would actually enjoy and continue to play, hopefully for years ahead. A game that I could show people to demonstrate what I was capable of, and a game that would not only be confined to , but could also stretch to other schools.

Initial Brief

Animated Learning Tool

Increasingly, animation is being used to teach skills and communicate complex information. Animations are used in Industry as well as in educational institutions. Animation design requires a combination of complex skills such as analysis of existing solutions, understanding a client's needs, and translating information into a visually exciting and workable format. Having the skills to successfully design and build a user-friendly Animated Learning Tool is an important and valuable skill in today's society.

For this project I will design and produce an Animated Learning Tool for a specific client of my choice (subject to teacher approval).

Specifications:

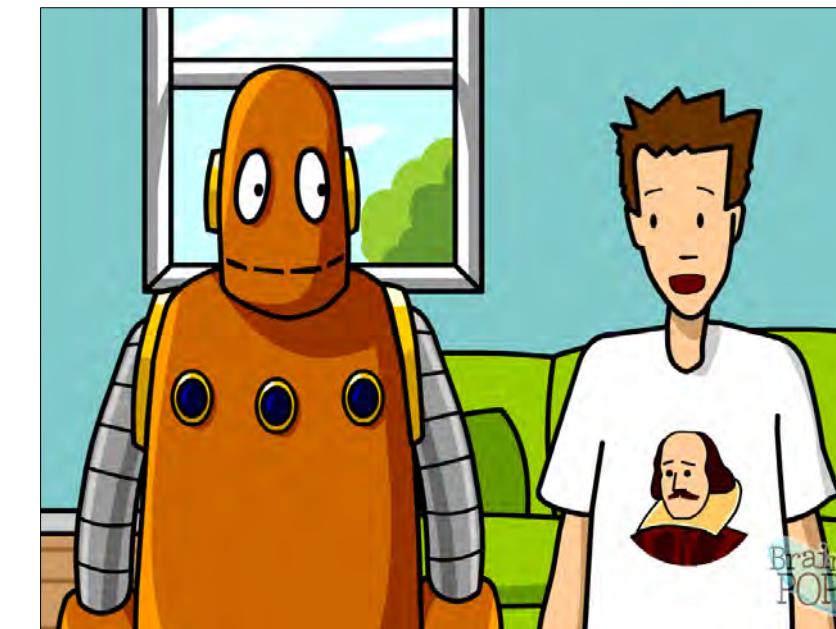
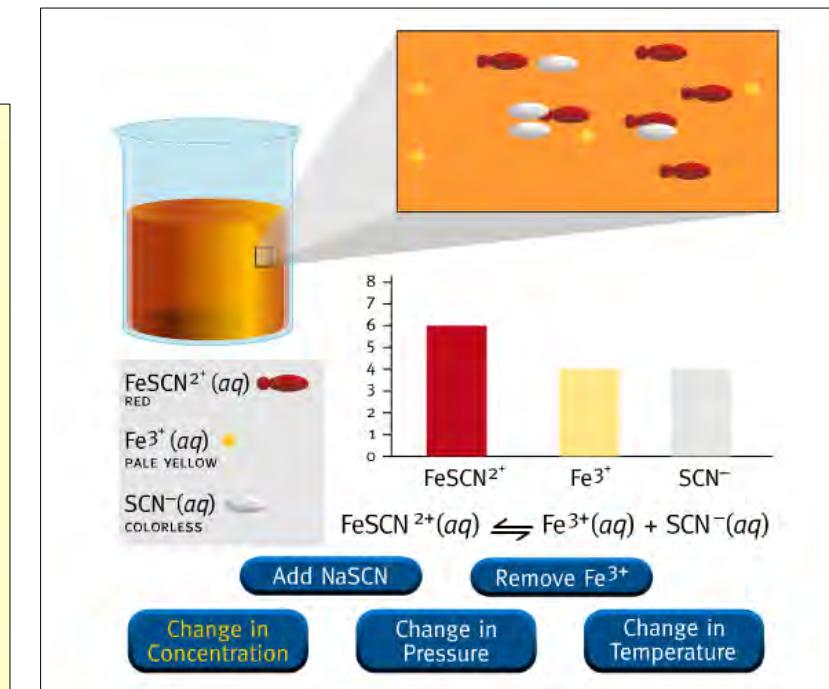
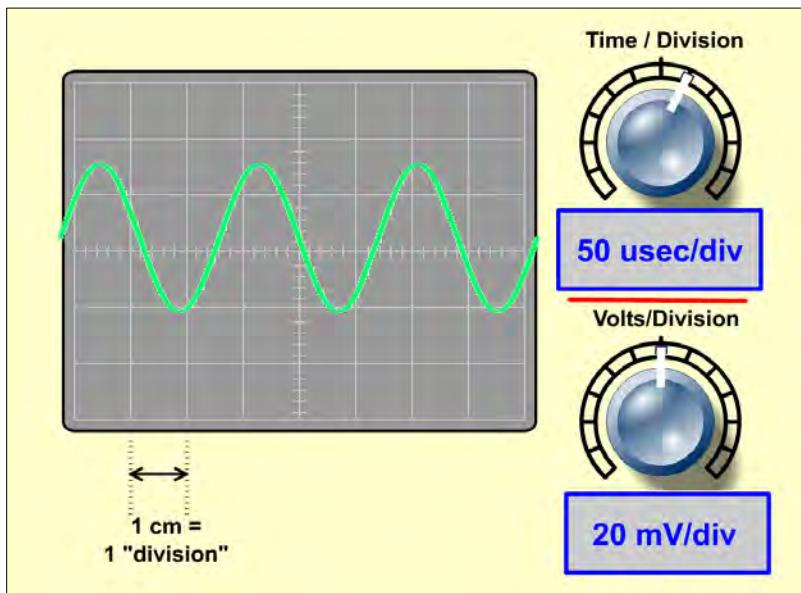
- I must have a client that has a need for an Animated Learning Tool.
- The animation must be used for educational purposes.
- The animation must effectively teach a specific topic or set of skills (specified by the client).
- The animation must be made (partly) using Adobe Flash.
- The animation must be user-friendly and appealing for its target audience.

Constraints:

- Limited Time – Project must be completed by the September 12th (Conceptual Design by 27th of May).
- Low budget (possibly no budget).
- Limited skills and experience

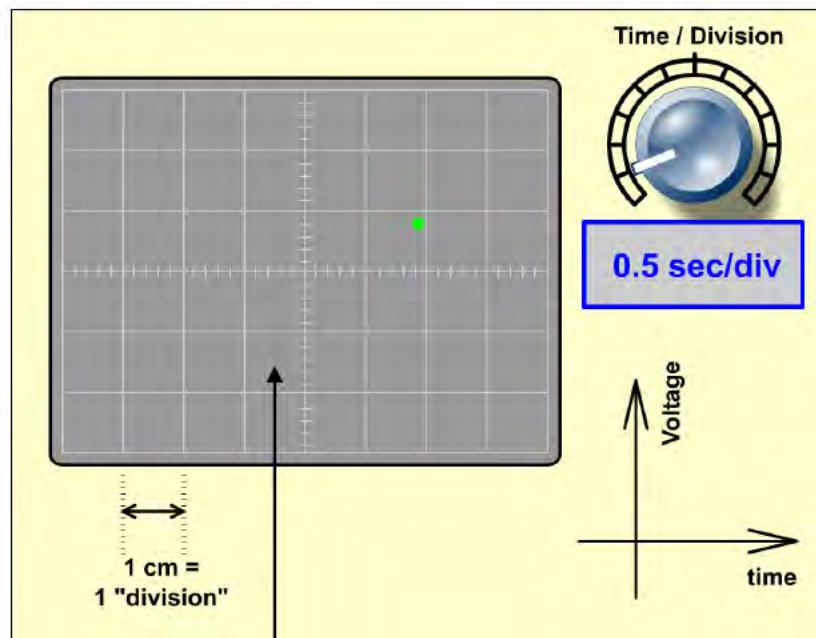
General Existing Solutions Analysis

To gain some idea of how I might create a solution to the specifications in my initial brief, without having a client yet, I am analysing existing solutions of other Animated Learning Tools that are free to use on the internet.



Upscale Physics Animations

<http://www.upscale.utoronto.ca/PVB/Harrison/Oscilloscope/Flash/>

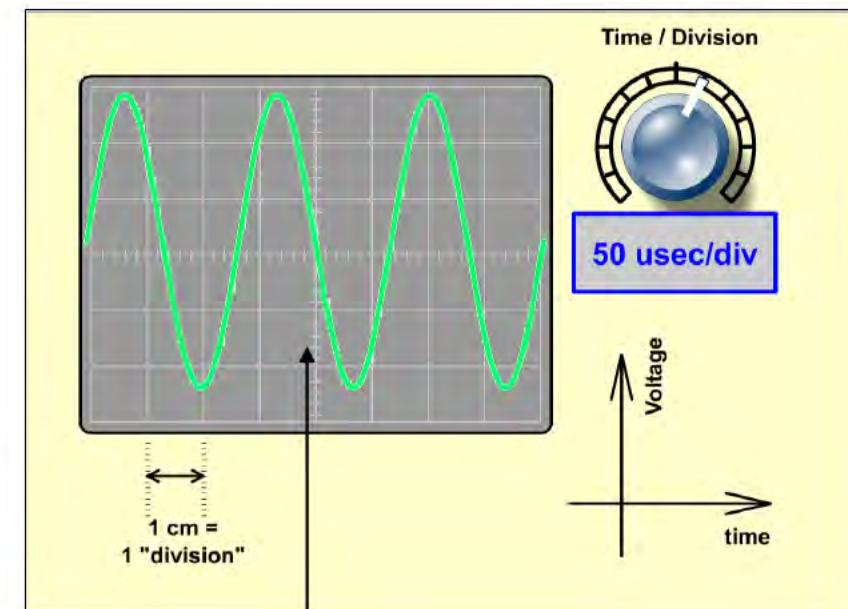


This screen shows a visual representation of the wave (that green dot is always moving).

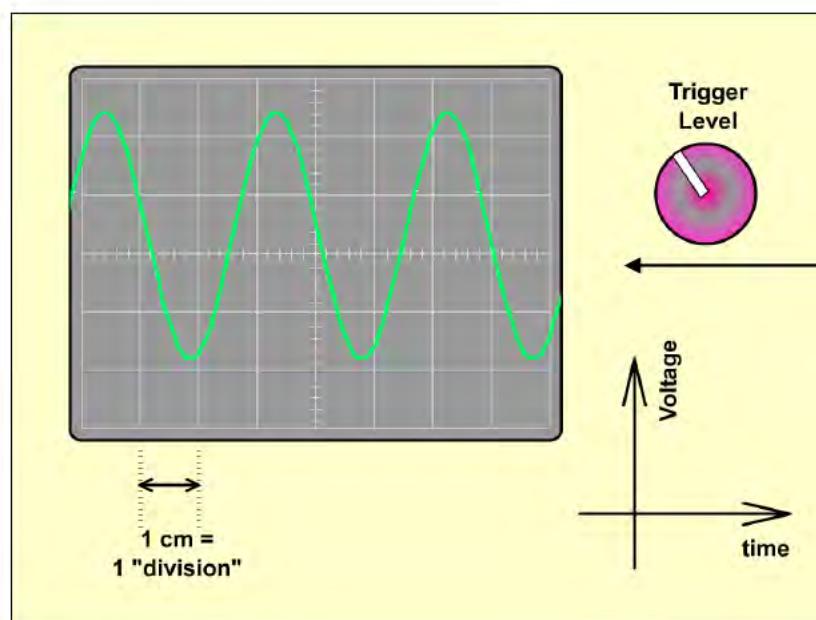
These animations demonstrate different properties of waves and allow the user to alter values to see the affect on the wave. These animations were made using Adobe Flash.

Although these animations may not be very easy to use for people who do not know much about physics or waves in the first place, I am sure that someone who knew what was being shown and what the values meant would have no trouble working them. The interface is very simple.

The visuals in these animations are not very colourful or creative. However, given the target audience of the animations (high school physics students) the main purpose of the animations is to display and demonstrate the properties of waves. Using this style of art has effectively done this.

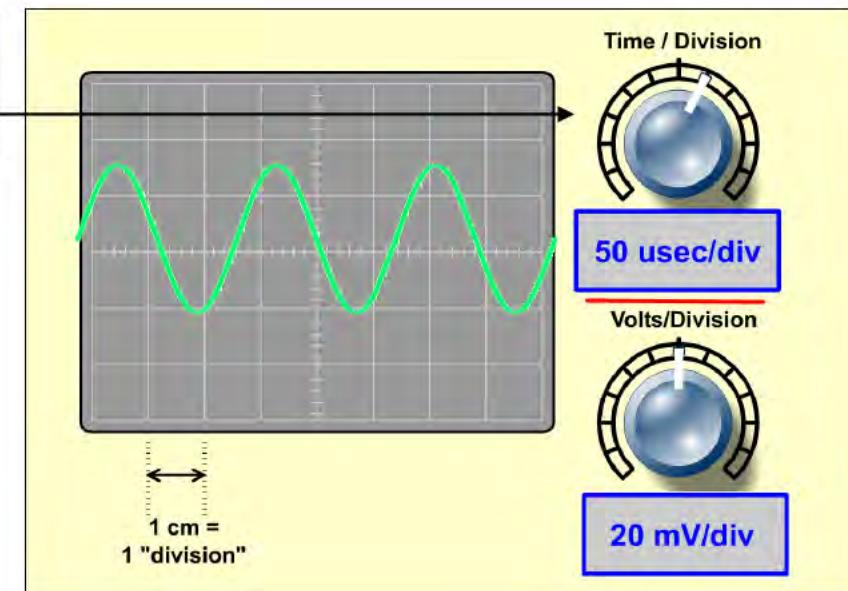


Very simple and clear visuals are used to show the data.



Different waves are shown in different ways.

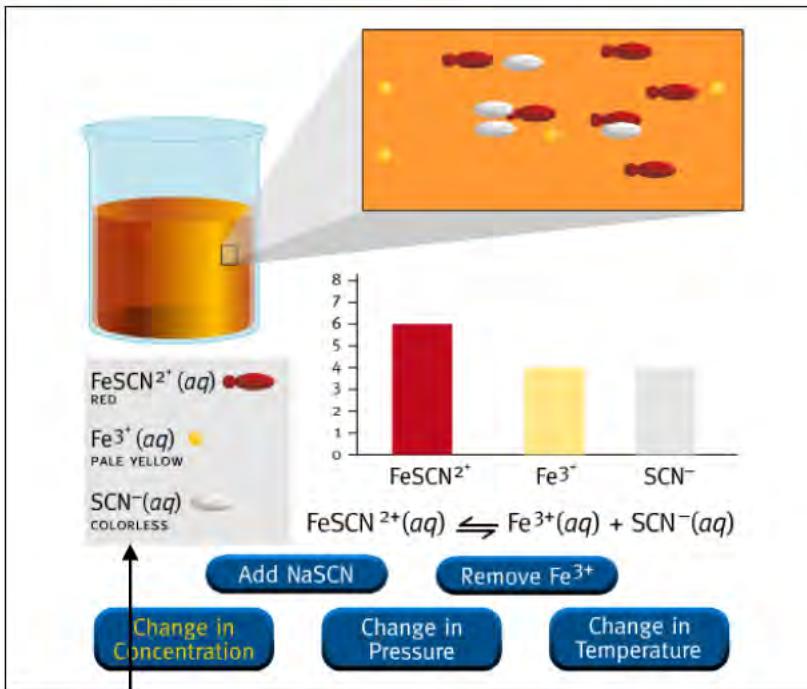
These knobs can be used to alter the properties of the waves.



Chemistry Animations



<http://www.learnerstv.com/animation/animationcategory.php?cat=Chemistry>



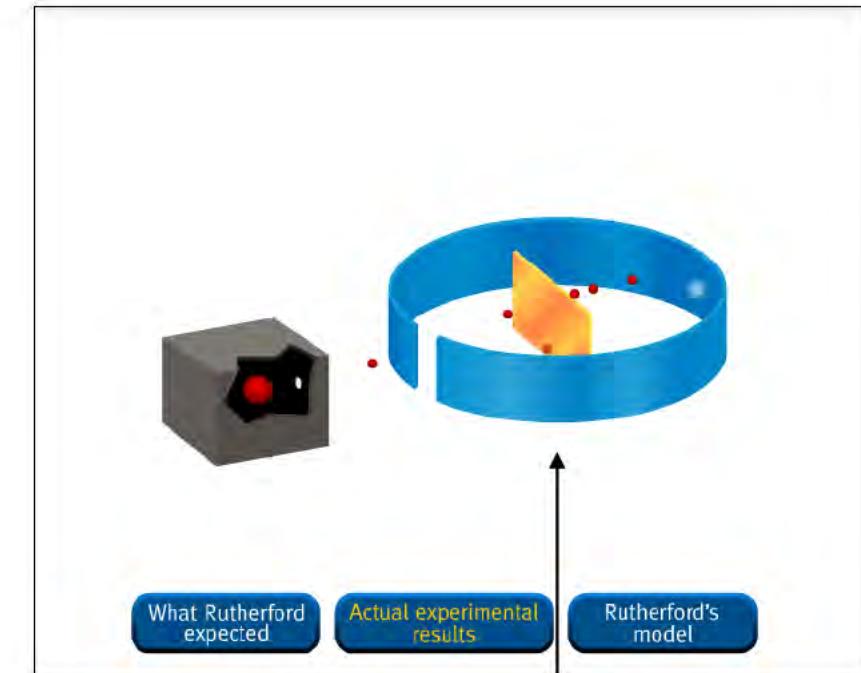
Very little text is used in the animation because audio explanations are heavily used.

This website provides many different animations which explain and demonstrate many aspects of different areas of chemistry. The animations were made using Adobe Flash.

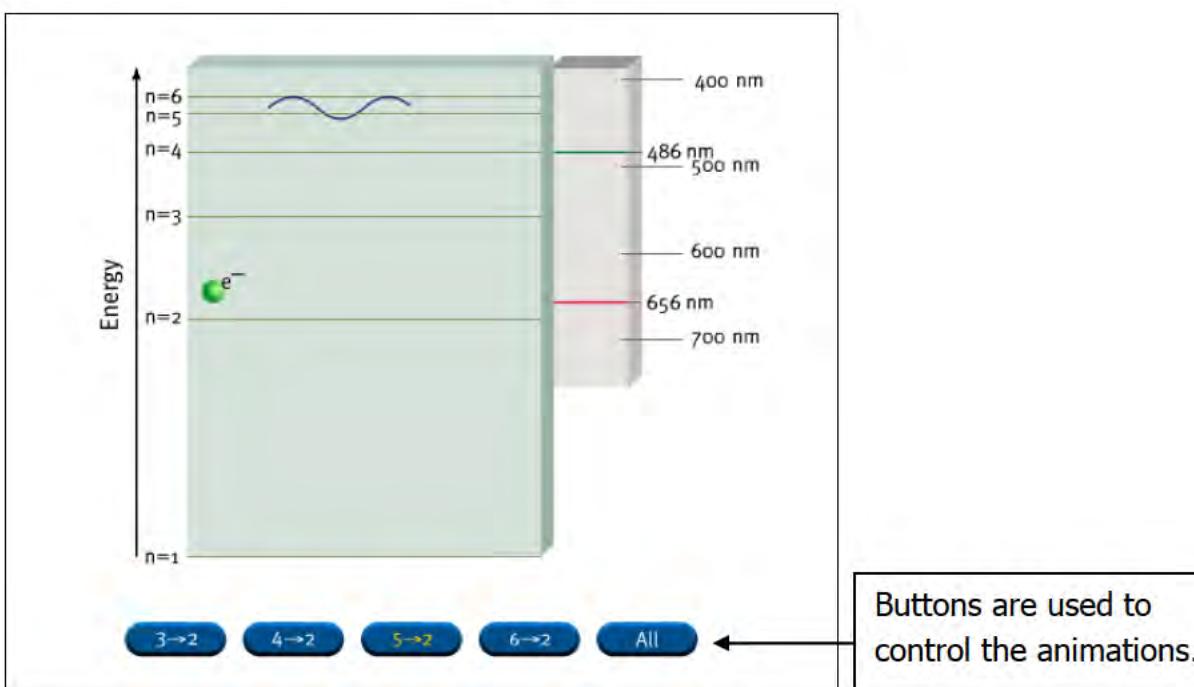
The animations are very clear and easy to use. All the user has to do is click buttons to control the animation.

The visuals in these animations are also coupled with extensive and clear dialogue, which is used to explain the information rather than using large amounts of text. This makes the animations much easier and enjoyable to use.

Though the artistic style in these animations is very simple, it makes the demonstrations much easier to follow. The visuals are suitable for its target audience which must be high school students. It is vector artwork, probably created in Flash itself.

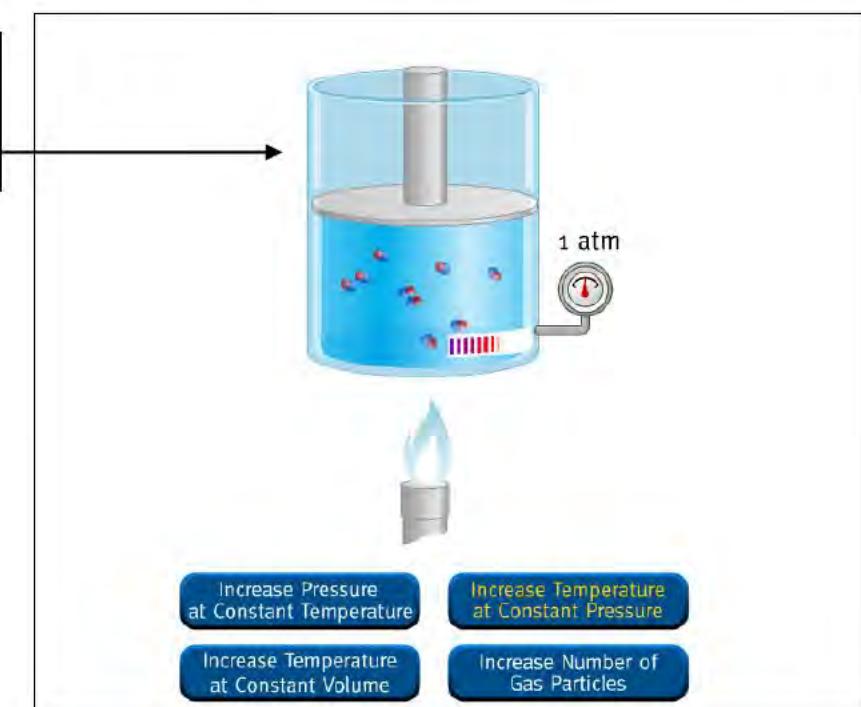


Live animated features help show ideas. This is showing how the particles move through the gold.



Buttons are used to control the animations.

Simple, clear visuals are used to explain and demonstrate complex ideas.



Starfall Learn to Read

<http://www.starfall.com/n/level-a/learn-to-read/load.htm?f>



The artwork is made to appeal to the target audience of young children.

Clicking this button will turn to the next page.

These animations are all stories that teach young children reading skills. These animations are also made in Adobe Flash.

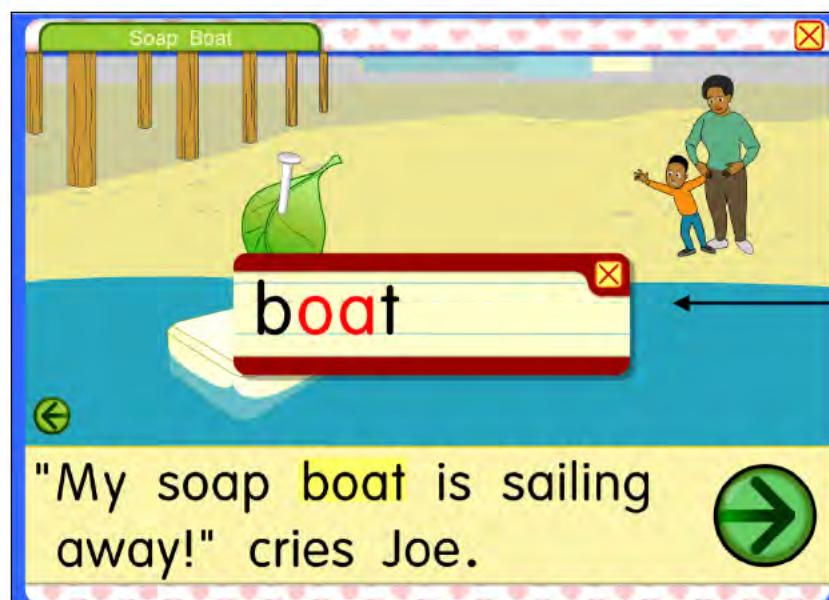
Each story is effectively animated to make reading more entertaining and fun. Each story focuses on a different part of words and reading. If the users are having trouble with specific words they can just click on them to have them sounded out.

The animations are very easy to use. The reader can click the big arrow to go to the next page, or they can click on parts of the pictures which will then animate.

Child-like primary colours are used to appeal to the target audience which is probably 6 or 7 year olds. The artistic style is also very aimed at young children with simple, colourful pictures, similar to those seen in children's picture books.



Parts of the picture will become animated when they are clicked.



Clicking on any word will make the animation sound it out.

Each story focuses on a different part of reading.



BrainPOP - William Shakespeare Animation

<http://www.brainpop.com/english/freemovies/williamshakespeare/>

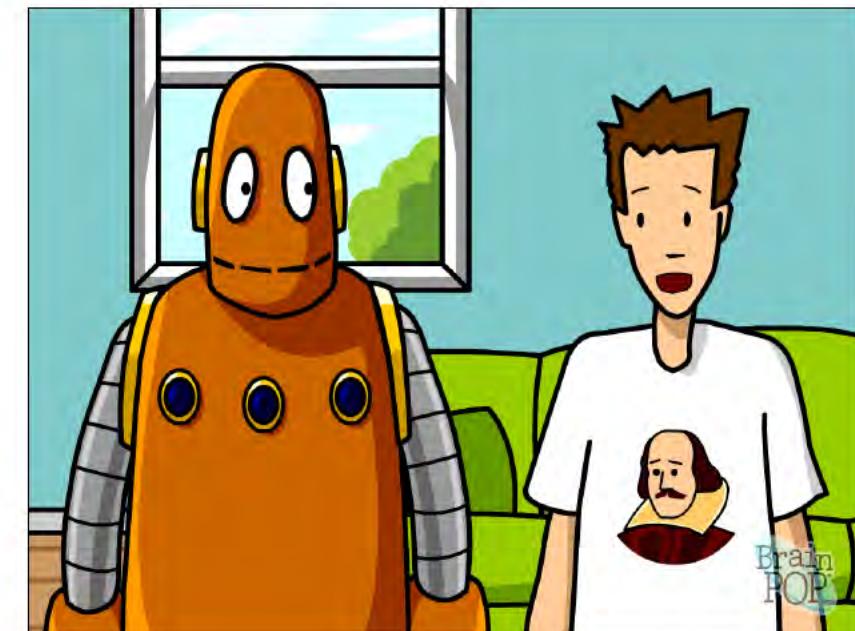


BrainPop contains dozens of educational animations on many different subjects. This animation focuses on William Shakespeare. All of the animations are made in Adobe Flash.

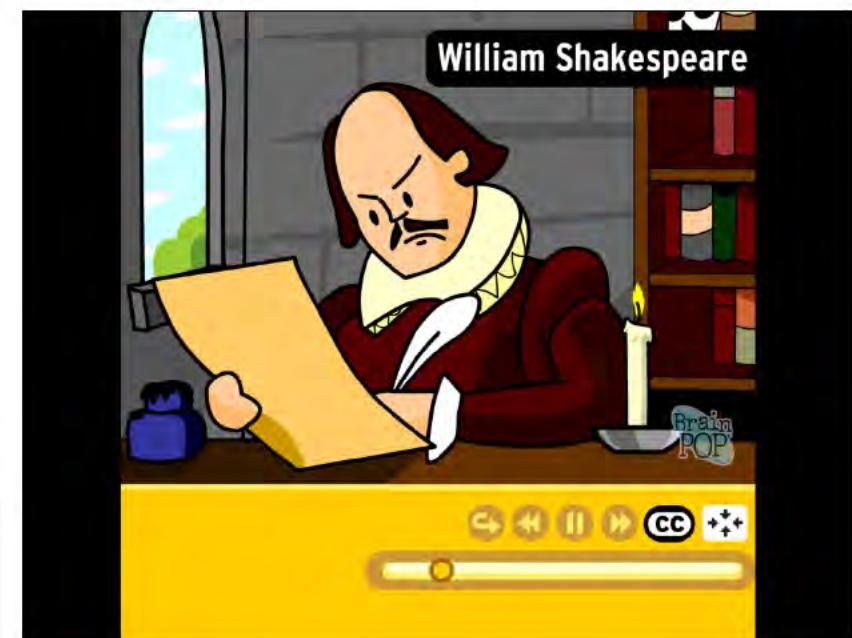
Each animation is presented by two animated characters and contains animated diagrams and processes, animated historical scenes and a lot of sound/dialogue. The narrators, along with the unique and creative animation make the information presented very interesting and entertaining.

Although there is no interaction with the animations themselves, the user is able to control their position in the animation through a simple interface below the animation. The animation is also surrounded by useful buttons that go to other animations and other features.

The colourful visuals are all created in Flash and are drawn in a cartoon style, though they become much more accurate and precise for completed diagrams. They make the animations entertaining without detracted from their educational value.



The animations can also be viewed in full screen mode.



Refined Brief

Situation

Increasingly, animation is being used to teach skills and communicate complex information. Animations are used in Industry as well as in educational institutions. Animation design requires a combination of complex skills such as analysis of existing solutions, understanding a client's needs, and translating information into a visually exciting and workable format. Having the skills to successfully design and build a user-friendly Animated Learning Tool is an important and valuable skill in today's society.

I have been asked by _____, a Year 2 teacher at _____ Primary School to design and develop an Animated Learning Tool to help teach reading and writing skills to the children in his class and perhaps even other classes in the school. I have been asked to teach a list of the 290 most frequently used words to the children. _____ has asked for this because there are few other resources he can use to teach these skills and he usually has several low level reader-writers in his class.

Brief

For this project, I will design and produce an animated game that will teach reading and writing skills to _____ class of 6 and 7 year olds in a fun and entertaining way. The game will focus on teaching the list of 290 essential words that _____ has given and will be constructed using Adobe Flash.

I will first create the conceptual design for the project which will consist of a full story board and basic visuals/start of the game. I will then continue to develop the conceptual design into a fully working game that will be accessible and fun for the students.

Specifications

These are features that the game must have or objectives that I must complete during the development of the project.

- The game must be made using Adobe Flash. This is the industry standard software used by most professionals. I have access to it at school and also at home.
- The game must teach reading/writing skills to _____ class; this is perhaps the most important objective of the project.
- The game must include list of 290 essential words supplied by _____. These words are what make up about 75% of all writing, so they are very important to learn and recognise.
- The game must be appealing visually to 6 and 7 year olds (target audience). If the game is not appealing then the students won't use it, and therefore will not learn from it.
- The game content and themes must be appealing to target audience. They also cannot be inappropriate (such as violence) or the students may not be allowed to use it.
- The game must be user-friendly (easy to use) for the target audience. Most of the users have very little experience using a computer or playing other game, therefore user-friendliness is very important.
- The game must be easily accessible by _____ to be used for the target. If it is not easily accessible then the students will not be able to use it as much as they could, and therefore are not learning as much as they could from it.



Key Factors

These are the factors that are critical to the success of my animation. They are ordered by importance.

1. Find a suitable client for my project. This is the most important key factor because without a client I cannot begin (or finish) my project.
2. Consult with my client and client's target audience to make sure my end product meets the needs of the client. This is a very important key factor as it will largely determine the success of the outcome.
3. Use the knowledge and skills that I already have. This is also very important as it will reduce the need to learn new skills (another key factor) that may be required to complete the project.
4. Make sure that I have the resources necessary to complete the project (see Resources). Without the required resources completing the project would be impossible, making this an important key factor.
5. Effectively use planning during the development of my project. This is important because it will allow me to meet due dates and manage my time to successfully complete my project.
6. Research and analyse existing solutions of other successful animations. This is important because it will greatly influence the development of my animation.
7. Make sure that the target audience of my client uses and is aware of the final product. This is important because without people using the animation it cannot be a success.
8. Make sure that my animation is appropriate for the target audience. Because the animation is a learning tool, it may be viewed by young people. It is important that it is appropriate or it may not be used.
9. Learn how to effectively use the computer applications that I need to complete my project. This is not as important as many of the other key factors because I already know how to use many of the applications that are required.
10. Make sure that I do not break any laws while I am developing the project. This is not as important as the other key factors because it is very unlikely and even if I did break a law it could likely be corrected and the process could continue.

Resources

These are the resources that I need in order to complete my project.

- **Time** – I will need enough time to complete my project, with a finished animation. Through the use of planning I can manage my time better.
- **Access and use of a computer** – I have a computer at home as well as access to computers at school. This is important because the majority of development will be done on computers.
- **Access to required programmes** – I have Adobe CS4 at home as well as access to use it at school.
- **Internet access for research** – I usually have internet access at school as well as at home.
- **Access to target audience and client for consultation and feedback** – When I determine my client I will make sure that they are regularly accessible for consultation, as well as having access to their target audience.
- **Printer and paper** – I have an A4 printer at home, and an A3 colour printer is available to me at school.

Stakeholders

These are the people who have an impact on the development of my project or are affected by the end result.

- **Client** – will have the most influence on the development of the project.
- **Target Audience** – class will also have a large impact on the development of the project through consultation and feedback from them.
 - Not only will class this year use the game, but also his class next year and perhaps other classes throughout the school as well.
- **Teacher** – My teacher) is also a stakeholder as she will help me in the development process.
- **Myself** – As the developer, I will be a major stakeholder, inputting the most time and resources into the development of the project.

Client Profile



is a teacher at . He teaches a class of year 2 students aged between 6 and 7 years of age. He has been teaching at the school for 7 years and is currently the computer systems administrator for the school. also lectures at Auckland University about using software such as Google SketchUp.

Because plays a major role in the school and is constantly doing work for his own class (even when not teaching he must do hours of planning), is very busy a lot of the time and so I will have to schedule my consultation time carefully so it is convenient for him.

would like me to create a game that teaches reading/writing skills to his class. He has supplied a list of 290 frequently used words that he would specifically like his class to learn. Though there are a number of different possible solutions to teach these skills, he believes an interactive game would be most successful because the students in his class will want to use it. There are 22 students in the class and most of them are able to

read simple picture books and write a limited number of words. However, also has several low-level readers in his class, who have trouble reading and writing even the simplest of words. has asked that these be the students the game is mainly aimed and therefore the games content be very simple, and possibly the classes below will be able to

use the game as well. Most of class have used computers before, having played a few other games that are available online. The class has access to computers in the library which

can book to use at any time. The large majority of the children in his class also have access to a computer and internet at home.



is a primary school of 212 students located on Waiheke Island, a small island of 8000 people in the Hauraki Gulf. It was established in 2005. I have chosen to create this project for the school because my younger sister is a student there and it is very close to where I live so I will have easy access to and his class.



Initial Client Interview

I sent these questions to via email, I believe that these are the most important questions I need to ask him before I can create a proposal for a solution to present to him.

1. What school subject do you think requires a new Animated Learning Tool for your class?

Reading and writing is definitely the subject that would need this resource the most.

2. Why do you think this is the subject that needs an Animated Learning?

I have a number of children who are low level readers and writers so some kind of word recognition programme would be marvellous! There are plenty of physical maths games and equipment and online material and games currently for most other subjects.

3. Who will be the target audience for the Animated Learning Tool?

Year 2 and 3 students, 6 and 7 year olds. The game could be used throughout the school though if it was found useful for other classes.

4. What knowledge does the target audience know about the subject already?

Some recognition of the high frequency words and some knowledge of grammar. E.g knows full stops capital letters but often forget them.

5. What does the target audience need to learn about the subject?

Repetition of high frequency words, any spelling and grammar rules, e.g full stop capital letters, conjunctions, nouns verbs adjectives etc. I have attached some words from a dictionary that we have in our class that are listed from level 1 on, this might give you a good starting point and it would be great if you could focus on teaching these words.

6. What learning tools do you currently use to teach this subject?

Some websites but mostly teacher knowledge demonstrated by whiteboard.

7. What Animated Learning Tools do you currently use to teach this subject (if any)?

Not many just a few websites! This is why there is a need for this.

8. Do you find the tools effective? What are the issues with these tools?

We do use the school journal resources! They now make for some books a Flash based programme that has the journal stories narrated and the words are highlighted as the narrator reads which is quite successful and children really enjoy.

Analysis and Revision of Planning

Initial Conceptual Design Plan

My initial plan worked very well until Week 3. I had completed everything required up until then with no major time problems. However, although I was able to contact and organise my client on Monday, I was unable to consult with him and gain specifications like I had planned as (event though I had organised it earlier) it was inconvenient for him at that time. Therefore, I could not do the brainstorming or specific research that week like I had planned. I revised my planning due to this issue.

Week 4 Revised Plan

My plan for Week 4 worked quite well and I was able to effectively use it to complete all of the tasks I had planned except creating a mind map of the project, I have moved this task to Monday Week 5 because I think it will be more beneficial after my specific research. I will have to revise my plan for Week 5 because I have learned that Athletics Day has been moved to Wednesday, my planning will help me avoid this day for any important tasks.

Week 5 Revised Plan

This week I finished my relevant research and mind map and then focused solely on researching how I could create visual graphics in Flash. My planning allowed me to solely focus on these tasks and get them done fairly quickly.

Week 6 Plan Analysis

The planning for this week worked well, which was expected because it only relied on me finishing my Flash visuals research and researching programming in Flash. However, I think that I allocated too much time for these tasks, not realising how much of the programming I already knew, I could have perhaps finished them earlier if I had planned to. I have decided to revise my plan as of Week 7 as I realise now that I should consult with [redacted] class before I finalise and present the game concepts to [redacted] (I have organised for this to happen).

Week 7 Revised Plan

I was able to complete all tasks this week. Because I had planned to consult with [redacted] earlier on in the project, he was able to make sure he was free on that day. Also, while

consulting with him, I organised to meet with his class next Friday when they have access to the computers. I will revise my plan for Week 8 to include this.

Week 9 Plan Analysis

My planning in Week 9 did not work very well. It took longer than expected to complete the concepts based on the children's feedback, which meant that I did not get [redacted] opinions until a day later than planned. Also, I have decided to consult with one of the English teachers at my school, Mrs [redacted], about the game and puzzle concepts I have created. I will revise my plan for Week 10 to include this, and I found out that the hand in is on Wednesday, not Friday as I thought. I was unable to fully finalise my concepts that I will use because I would like to do this after I talk to Mrs [redacted]. I will also create a plan for the holidays as more of my planned tasks have been pushed into this time.

Week 4 Term 2 Revised Plan

I have realised that it will take much longer than planned to develop a complete story board and conceptual design. As a result I will have to use time that I allocated for one-off solution development. Thankfully, because of effective planning I had planned to meet the first deadline instead of aiming for the second available deadline, so I have time to develop the story board further. Also, work created during this time will make creating the one-off solution much easier so I don't think that I have lost too much time.

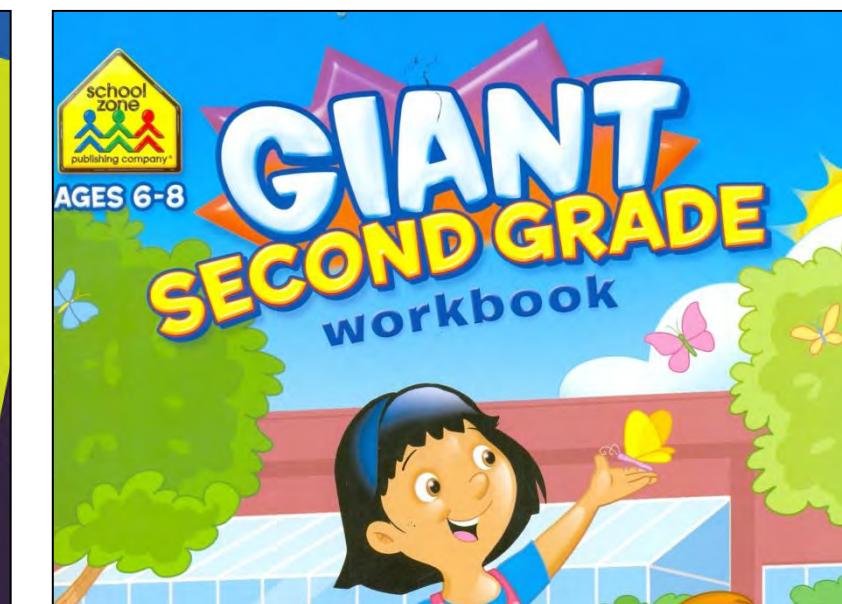
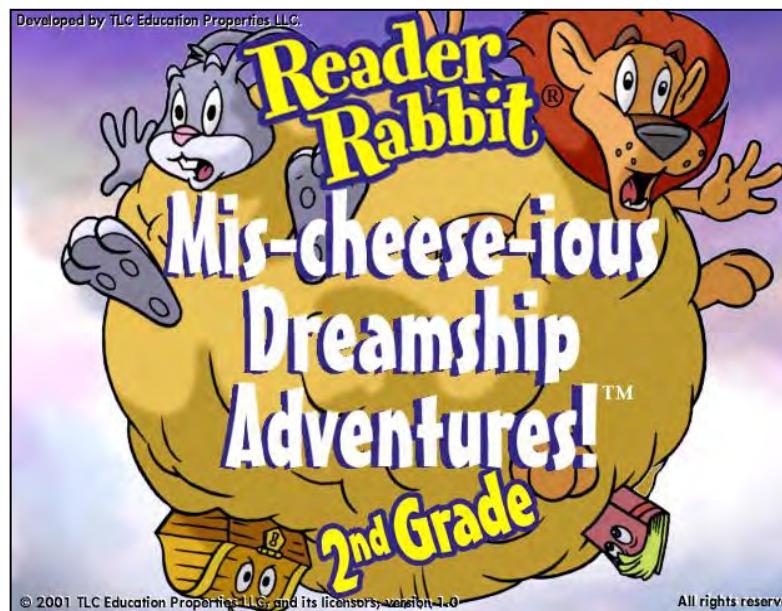
Final Analysis

Overall, I have found my planning very helpful. It has allowed me to organise tasks and make sure that I would complete the project before the deadlines. Unfortunately I misjudged how long some tasks would take; however, using my plan I left time available to finish these lengthy tasks. When planning in the future I will make sure that my plan is more flexible around the requirements of the client and make sure that I book appointments with them well in advance.

The Gantt chart was an effective way of planning as I could easily see what I was supposed to be doing on each day and see what I would be doing in the future on other days.

Analysis of Existing Related Solutions

has asked for an Animated Learning Tool that will help young kids in his class to learn to read and write. After discussing further with my client we believe that an interactive and fun game would be the best solution to teach these skills. The existing solutions analysed here also focus on teaching reading and writing skills to young children. Although many of them are not made in Flash, I believe that they are just as valid as most of them could be easily recreated using Flash and still provide relevant solutions to teaching young children reading and writing skills.



Reader Rabbit's 2nd Grade Adventures



All of the characters in the game are anthropomorphic animals. These characters are very friendly and interesting for young children.

All of the aspects of the game are explained verbally by the characters (which makes sense seeing as the majority of the users are learning to read) and the voices in the game are all unique and entertaining which makes watching the game very fun and keeps the users engaged.

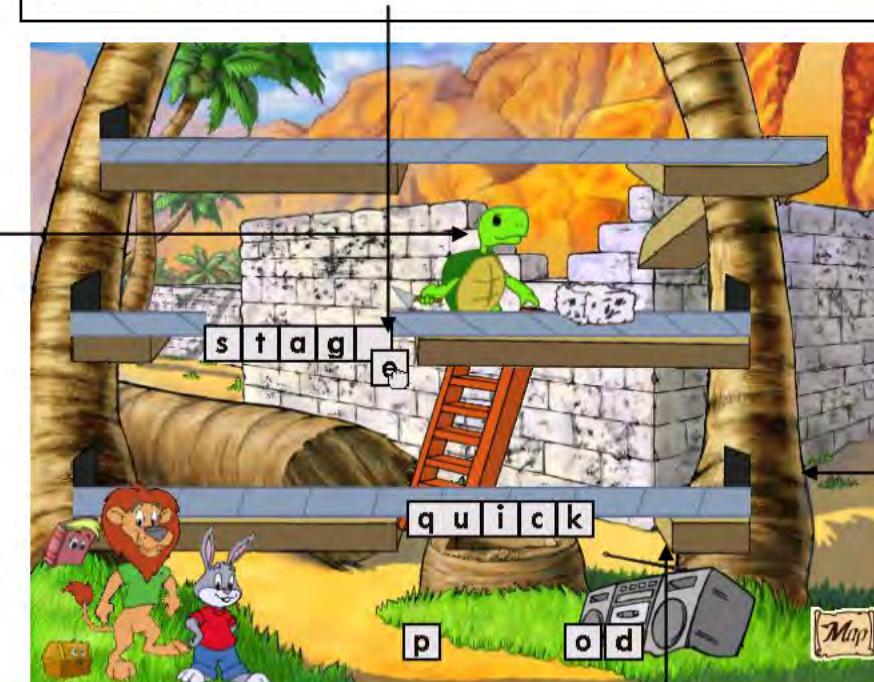
Bright colourful cartoon-like bitmap graphics and animation are used throughout the game. At times this makes the game feel like a cartoon that would be on TV, which I am sure would appeal to school children.



Story

Reader Rabbit and his friends get trapped on an island by the mean "Pirats" and have to solve puzzles including spelling, sentence structure, antonyms and maths to fix their boat to get off the island. I can see how this story would be appealing for young children, containing colourful characters and an entertaining plot with the ultimate goal of defeating the Pirats to get off the island. A fun story like this makes the game much more entertaining to play.

The game uses a very simple interface, controlled entirely by the mouse, with no keyboard input it only requires the players to click and drag.



This game features constant cut scenes that continue the story as you move around the island to make the game more interesting and less repetitive.



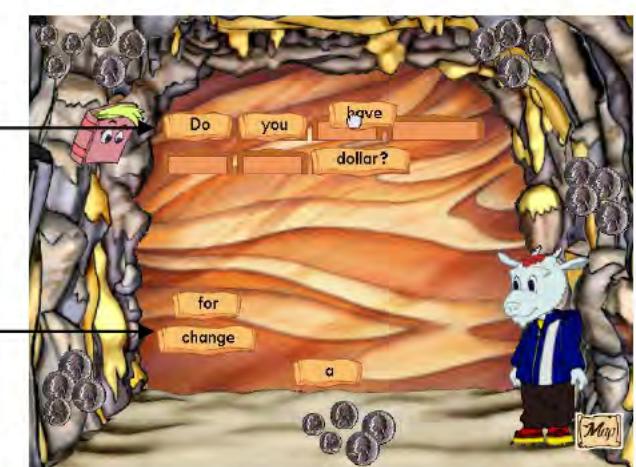
Players must make their way to different locations on the island and solve puzzles to gain the nonsensical ingredients necessary to fix their boat. Once they finish this task the game ends and can be played again, but with the same words only.

This simple interface is important for young school students as most of them will not be very familiar or experienced with using a computer.

Although these games make not make much logical sense, they will still be entertaining for their target audience and accomplish their goal of teaching reading skills to children.



Users can create their own login to save their data and continue their game from where they left off.



Reading games include spelling words which are spoken by a turtle in order to fix his conveyer belt and ordering word into a logical sentence to open the doors in a cave.

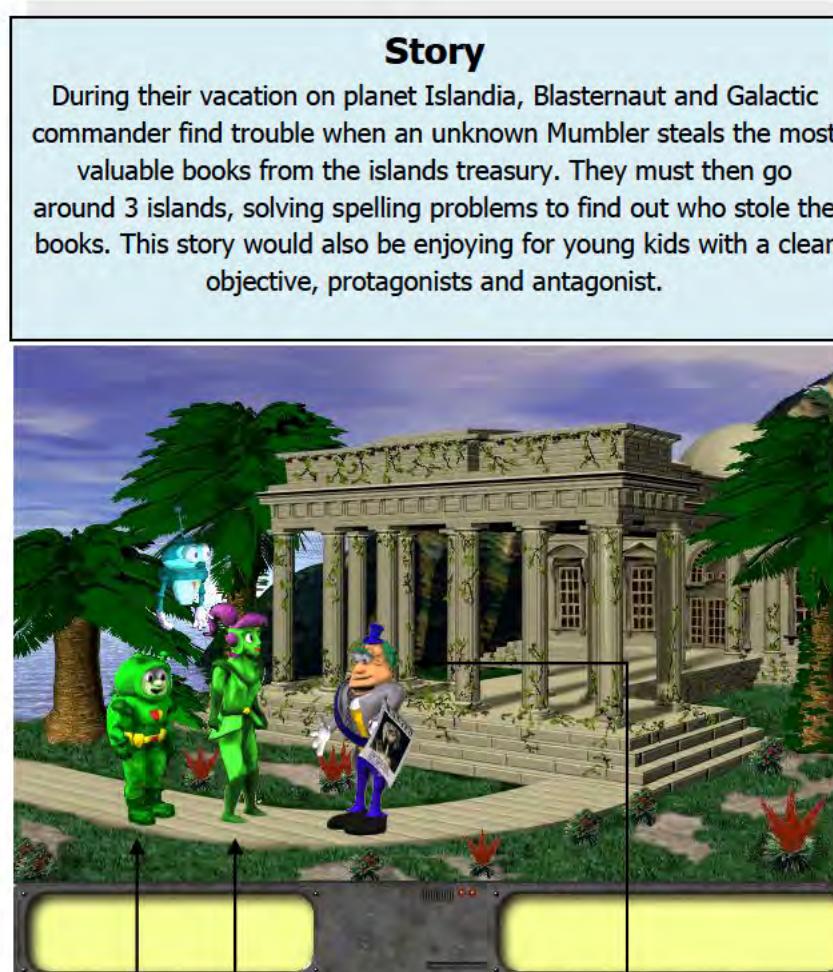


The players are able to move around the island to different areas and puzzles by clicking on the path they wish to follow. The map can also be used for navigation.



Players can use a map to quickly move around the island.

Spelling Blaster Ages 6-9



Players can choose from these two characters each time they play the game with a new word list.



The words and instructions in the game are all explained verbally, however, the voices in this game are often robotic and similar words can easily be miss-heard.

Although the game mainly uses the mouse for most game and navigating the player, the interface also requires input from the keyboard when spelling words. This bar at the bottom of the screen serves as a large part of the interface.



Users can type the spelling of words in this bar here using the keyboard.

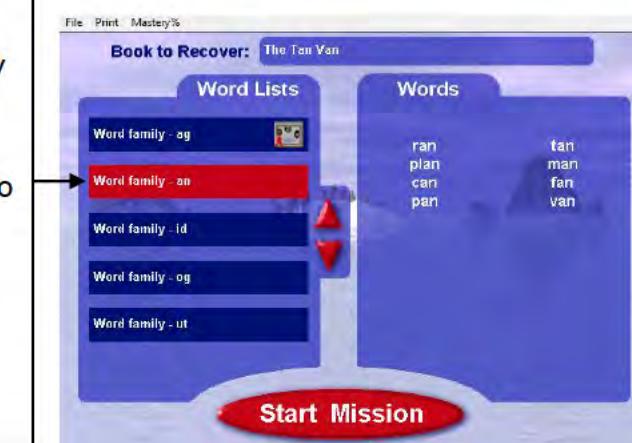
These buttons can be used to submit the word or hear it again.

The player can see the clues that they have gathered so far here. Once they have gathered all 4 clues they can then determine who the real thief is.



The player can choose a new word family (words with the same end sound) for each mission. These words are then used throughout the mission in the puzzles, so at the end of the mission the player is very familiar with the particular word family they chose for that mission. Once the player completes one mission, they then do another mission with a new word family. James has given me a list of words he would like me to include in the game; I could use a similar method to teach a set of the words he has given me on each "mission".

Specific puzzles within the game include having to help a yeti with her spelling homework, climbing a cliff by only using ledges with correctly spelled words, shooting the correct letters into words to block geysers and passing a sea monster's spelling test to cross a bridge. These games are also very unrealistic but are still suitable for imaginative young children who won't analyse the logical probability of these challenges actually presenting themselves to the protagonists.



Users can also create their own login to save their data and continue their game from where they left off.



Players must travel to 3 different islands to collect all the clues to find the thief. Each island has different puzzles.



Sunburst Key Skills

This game does not have any story line like the other games thus far; instead, it consists of many small separate games that focus on different area of reading and writing. Overall, I think that this makes the game less fun and think it would have been better to incorporate the games into some sort of story.

The game consists of many smaller games that the players can choose from each time they play. Each game focuses on different "Key Skills" including rhyming, word matching, syllables and contractions.

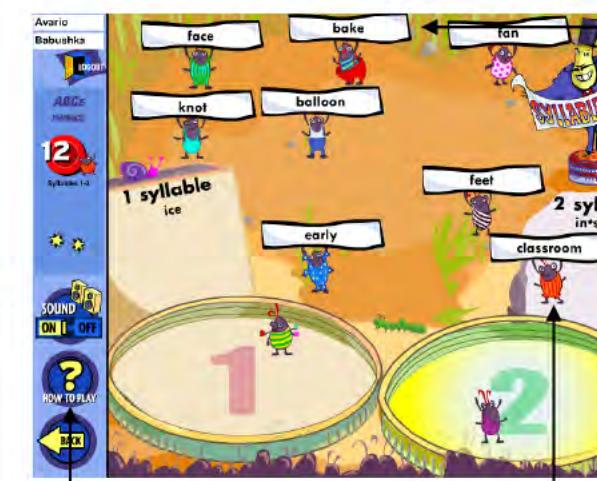
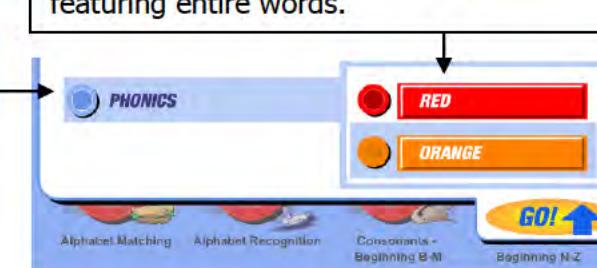


Each game has a unique picture and number to make them recognisable and memorable to young children.



Players collect stickers when they do well in games. I think this is a good reward system as it makes the player feel like they are getting something for their work and makes them want to play again to collect more stickers.

Players can choose between 2 difficulty levels: Red games are quite easy, many only featuring problems with single letters; Orange games are harder, with problems featuring entire words.



All of the games feature a "How to Play" section that verbally explains and visually shows the instructions on how to play the game. This makes the games very easy to learn and removes a lot of confusion young children may have.

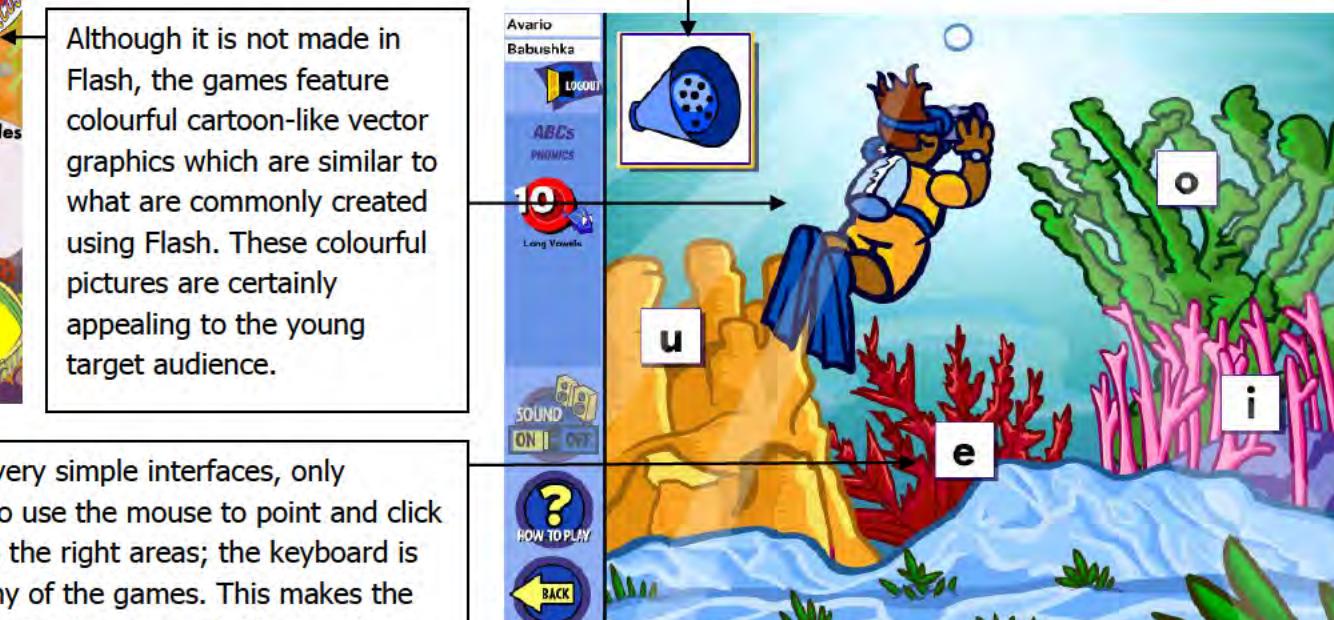
The games all use very simple interfaces, only requiring the user to use the mouse to point and click or drag objects into the right areas; the keyboard is not used at all in any of the games. This makes the games very easy to play for young children and means that it does not require any computer-using skills but is solely testing the reading/writing skills of the player.



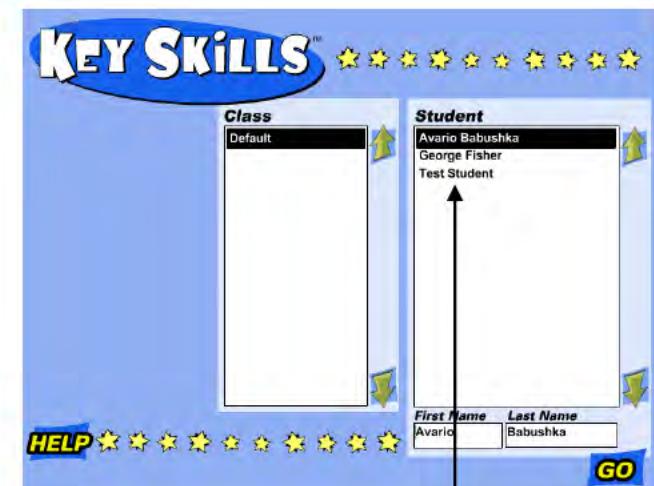
Players can print off their sticker sheet to their parents. I think it is also possible to print using Adobe Flash.

Most of the game is explained verbally, clicking on a word or letter will have the game speak it out loud, however, sometimes the start of word are skipped so words like "bake" are often pronounced "ache", which can be very confusing and makes the games harder to play.

Although it is not made in Flash, the games feature colourful cartoon-like vector graphics which are similar to what are commonly created using Flash. These colourful pictures are certainly appealing to the young target audience.



This bar can be used to access many of the features of the interface such as logging out, viewing the game's instructions and returning to the main list of games. It also shows the name and icon of the game currently being played.

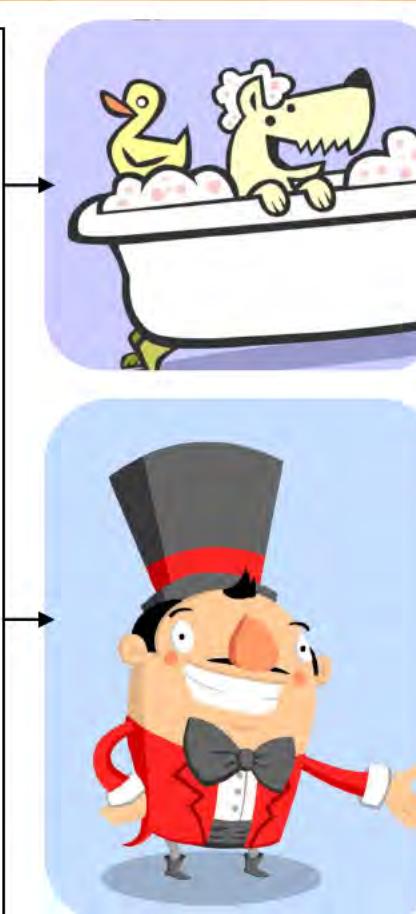


Between the Lions

Between the lines is an award-winning interactive website that features games, videos and stories that help teach young children to read. The games on the website are not linked by a story of any kind but are instead separate from each other, similar to the Sunburst Key Skills game.



The games on this website were made using Adobe Flash. They use colourful vector artwork, much of which is similar to what might be found in a story book or a cartoon. The advantage of vector artwork compared to bitmap is that the vector artwork is infinitely scalable; it can be viewed very large without any loss of quality. The file size of vector artwork is also generally smaller than bitmap because it only saves mathematical equations to represent the picture, rather than storing data for every single pixel.



The website's homepage which allows users to select which section of the site they would like to visit.

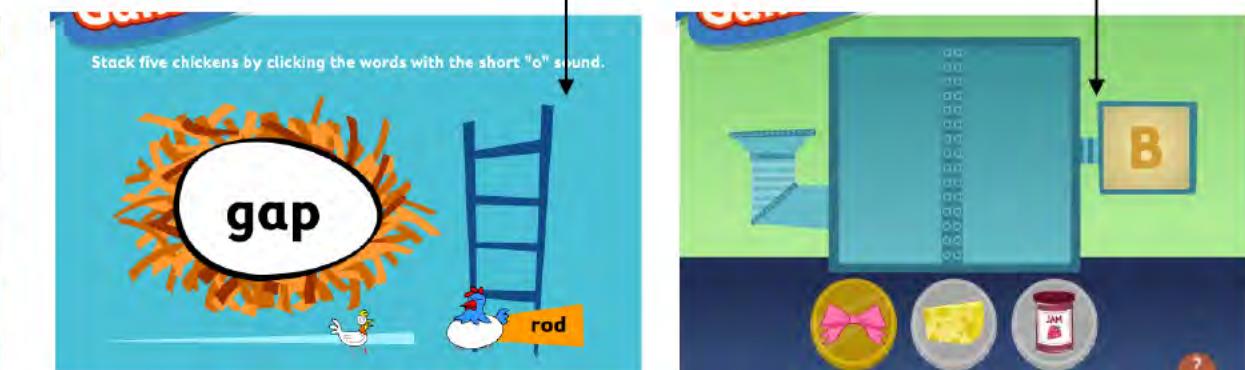
Moving the mouse over a letter will make the game sound it out. Clicking on word or pictures based on a word will also make the game say the word.

All of these games also use very simple interfaces. None of the games make use of the keyboard and only require the player to use the mouse to click and sometimes drag words or letters. In the game below the player must navigate a hot air balloon by moving the mouse around the screen, the balloon then moves to the position of the mouse. These controls are very easy for the target audience to use.



This side bar shows all of the games you can play on the site. The icons can be clicked to play the game. This simple method allows for the user to browse for different games without going to a different page or quitting their current game and is very easy for young children to use.

The website has many different games which each teach specific skills in different ways. Most of the games have different artistic style and interfaces, creating a lot of variety for the player and making each game unique and entertaining.



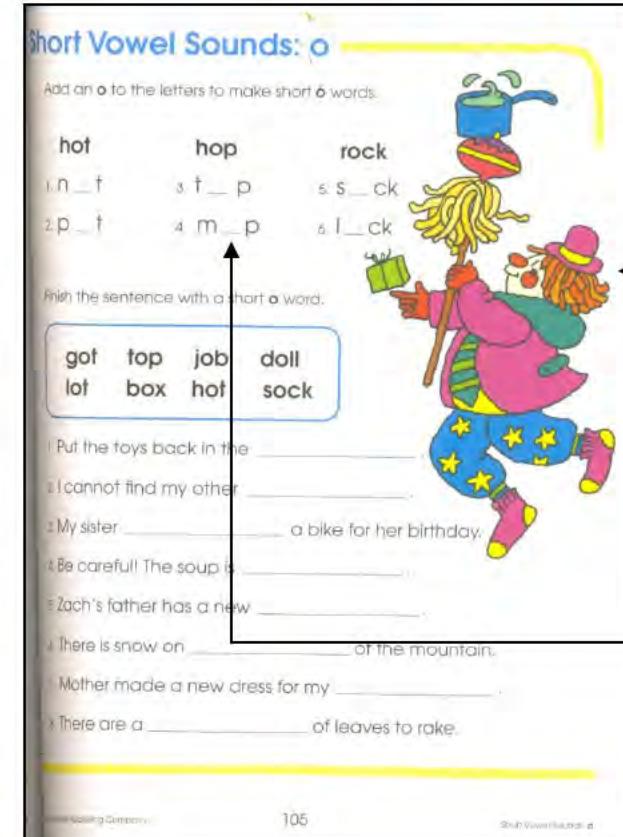
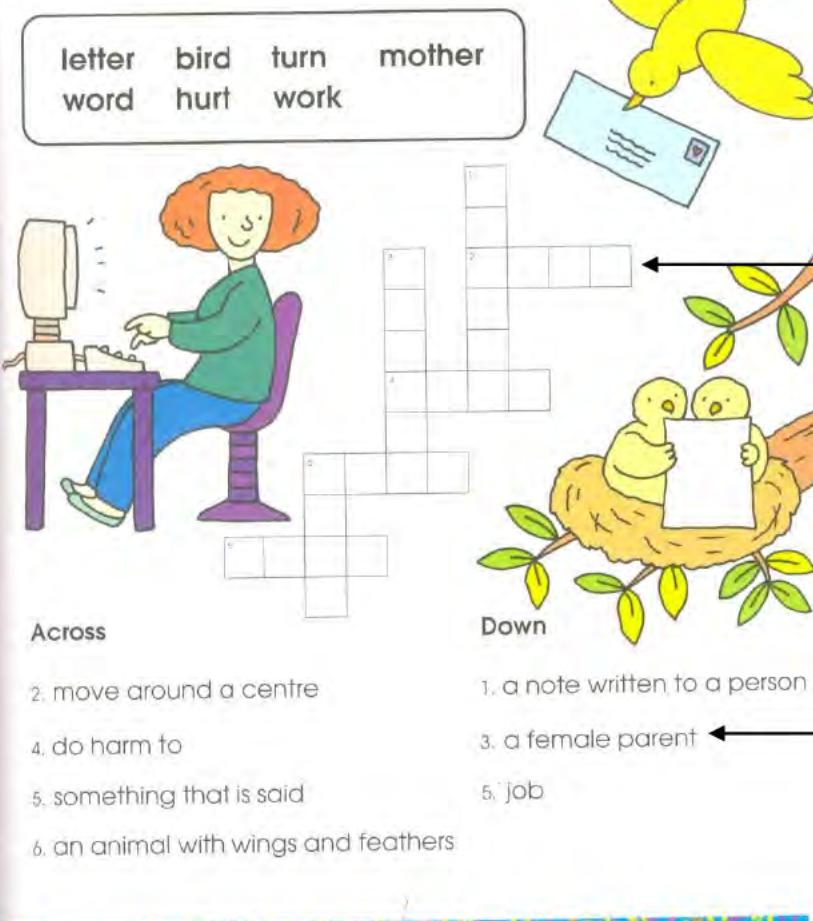
Giant Second Grade Workbook

This is a large workbook that contains many different reading and writing activities for children in the second grade. I decided to analyse this book because James has said that the children often use and enjoy activity books in class. I also believe that many of the activities in books like this one could be implemented in an animated game. I used the school scanners to scan in these pages.

Each page contains a game or activity that focuses on a different letter, word group, or area of reading/writing. This is similar to the separate activities that games such as Key Skills and Between the Lions used. The activities are not linked by any sort of story.

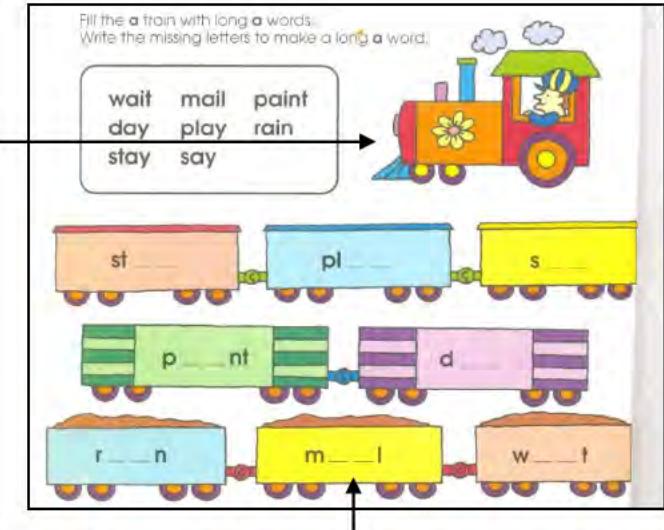
Words with er, or, ir, ur

Read the clues to finish the puzzle.



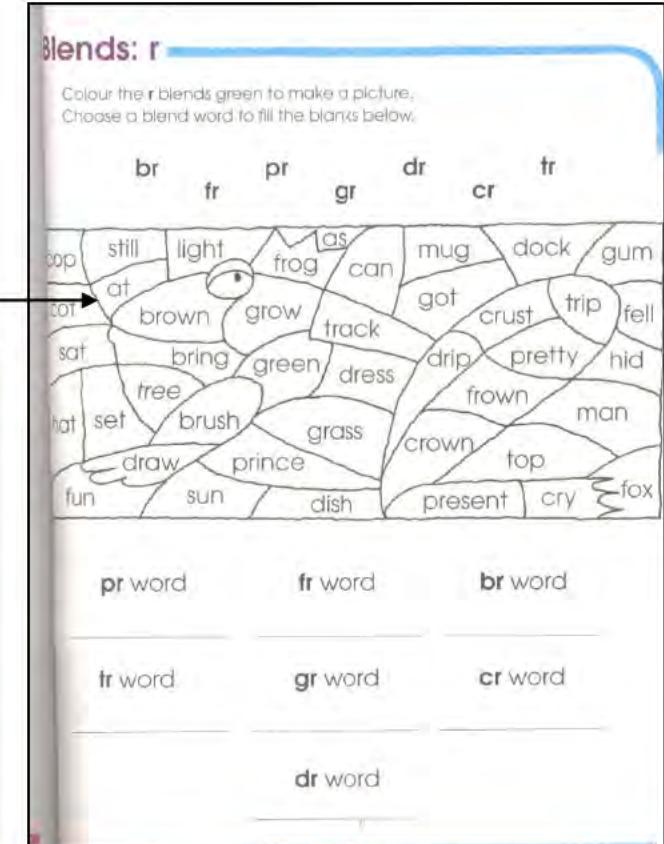
The pages all feature colourful illustrations which make the book much more interesting than just text for young children. Most of the pictures relate to the activities or give them some sort of context. These look like vector graphics to me, which are commonly used in print to maintain the image quality when they are printed and can easily be created in Flash.

With over 200 pages, many of the books activities are effectively the things (such as filling in the missing letters of words), however, they are often put into different contexts, such as a train or this clowns belongings which prevents the book from becoming repetitive without having to present hundreds of completely different activities.



This is one of the activities that I thought could easily be implemented in an animated game. You must colour in all the sections that meet a specific word criteria and eventually reveal the image.

The book also has answer pages in the back for all of the activities. This helps kids if they get stuck or would like to their answers. I think that in my game, although I may not have answer pages, I might think about some sort of hint system of helping guide to implement in the game to help the players, especially when they are first starting to play the game.





Comparison and Conclusions

Through the analysis of these solutions I can see several important similarities and differences between the different solutions. There are also features of the solutions that I believe are note-worthy.

The first two solutions were played around creative stories that linked the activities to a context with the overall goal of accomplishing a final goal. The other three solutions did not contain a story of any kind and instead each activity was presented completely separately. I found (although I am not part of the solutions' target audience) that the game that had a story were much more enjoyable to play as it seemed that the problem solving was always working towards something and not just for "pointless" education.

All of the solutions used very simple interfaces and were therefore very easy to use. Most of the computer driven solutions only required the user to use the mouse to point-and-click and sometimes drag elements on the screen, except for one which also required input from the keyboard at times. Even the activity book was very easy to use, containing very simple activities and instructions. As stated, I believe that these simple interfaces are especially important for the target audience of young children who are probably not very experienced with using a computer and are perhaps unable or unwilling to take the time to learn how to effectively use complex interfaces. Also these interfaces allow for the games to test only the users reading/writing ability, not their skill at using a computer or playing computer games.

To make the game easier to play for kids learning to read, all of the solutions (except the workbook), verbally, using the computers speakers, read out the words and instructions in the games. I think this is a very important feature and allows for the students to play the games by themselves, without assistance from someone who can read and think it is a large advantage animated learning tools have over other resources.

The first three solutions allowed for each user to create their own account on the game. This allows for users to save their game and continue playing their existing games. I thought this was particularly effective with the use of Key Skills sticker reward system, allowing kids to save their stickers and perhaps show them off to other players. This type of system may create (healthy) competition between the players and persuade them to play the game more, all the while improving their reading/writing skills.

Each solution contained many different activities for its users. Most of the activities (especially in the computer solutions) were flexible and could be applied to any words or areas of reading. The different activities prevent the solutions from becoming boring and repetitive as they are used and allows the solutions to build different skills of reading and writing. Often these activities did not make much sense in the context they were given (Why would a Yeti just happen to need endless help with spelling homework, coincidence?), but I think that these are okay for the target audience who will not think too much into the probability of these activities actually presenting themselves in these ways.

The story-driven solutions linked the activities in the story, requiring the user to complete them to get to the next stage in the game. The solutions that did not have any story simply allowed the users to select and play whichever activities they wanted to. Both methods are effective, however, I think the latter may be better suited for a teacher who can then assign which activities they would like the students to do depending on what they are doing in class.

All of the solutions used very colourful, creative visuals, often in the style of cartoons. I think that these types of graphics are very suitable for the target audience who would find them interesting and exciting, compared to realistic, dull images that would be more suitable for an adult audience. Most of these games used vector graphics (or graphics that could be easily reproduced in a vector format) which is common for illustrated, cartoon graphics and can successfully be made in Flash.

Having completed this analysis, I feel much more prepared to propose a solution for my client and plan to give him options for each different aspect of the game such as the type of story, visuals and activities based on these solutions.

Resources

In order of appearance:

Reader Rabbit Mis-cheese-ious Dreamship Adventures! 2nd Grade

The Learning Company, 2001
Retrieved from Waiheke Public Library 22/02/11

Spelling Blaster Ages 6 – 9

Vivendi Universal Games, Inc.
Published by Knowledge Adventure School, 1998
Retrieved from Waiheke Public Library 22/02/11

Key Skills

Sunburst Technology Corporation, 2006
Retrieved from Waiheke Public Library 22/02/11

Between the Lions

WGBH/Sirius Thinking, 2011
Free to use at www.pbskids.org/lions/

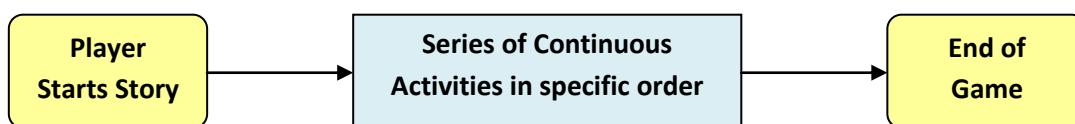
Giant Second Grade Workbook

Lorie DeYoung, et al.
Published by School Zone Publishing Company, 2008
Retrieved from Waiheke Primary School 24/02/11

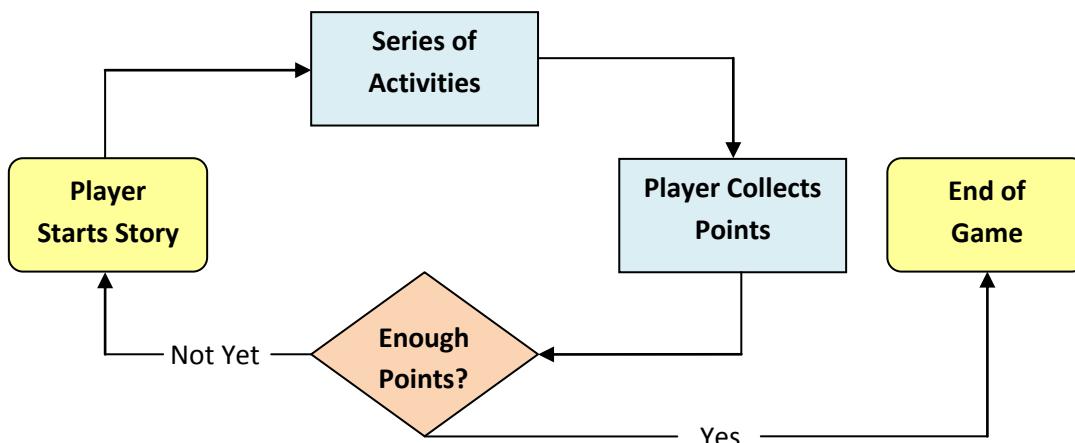
Story

There are different story types that could be implemented in the game. The aim of the story is to make the activities in the game more fun by giving them a rewarding and interesting context. These story lines would be put into a context depending on a chosen theme.

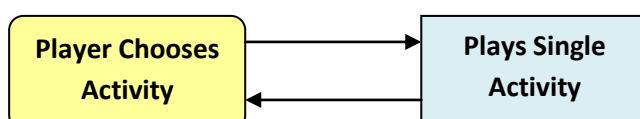
1. **Linear Story Line:** Much like a film, players embark on a quest and go from start to finish once, completing reading activities on the way. The activities get more difficult (use harder words or offer less clues/help) as the player moves through the story. This is the type of story in the Reader Rabbit game.



2. **Cyclic Story Line:** Player continuously completes a miniature story (or series of activities), each time they complete a circuit of the story they are given a point (or perhaps an item) and then begin another circuit of the story, each time with different words in the puzzles (although the puzzles are effectively the same). They continue to do this until they have collected enough points to eventually win the game. This is similar to the story structure of Spelling Blaster.



3. **No Story Line:** The activities in the game would be completely separate from each other, not linked by any story line. This would allow the games to be played in any order (unless players were forced to play one activity before being granted access to other). There is no "End of Game" in this format. This is the type of story used in Key Skills and Between the Lions.



Artistic Style

These are the artistic styles that I think would work best for an animated game for a target audience of young children - they are all colourful and creative.

1. **Cartoon:** Similar to what would be found in cartoons on television, these vector illustrations contain black outlines filled with solid colour (no gradients) and they may contain solid shading. Characters and objects drawn in this style often have exaggerated and unrealistic feature features.



2. **3D Style Bitmap:** This art style is much more realistic than cartoon. It uses bitmap images which have been shaded with gradients to make them look more 3D. These graphics would be difficult to replicate in Flash, which is made for creating vector graphics; however, they could be imported from another programme.



3. **Hand Drawn:** These vector drawings are similar to what are often shown in children's picture books. They look like they are drawn by hand because the lines used are not perfectly straight or smooth. They consist of solid outlines, solid fill and shading is rarely used.



4. **No Outlines:** These types of graphics are often used in animations created in Flash. They are vector artwork, made up of solid filled shapes with no outlines, solid shading can be applied to make the drawings look less 2 dimensional. Characters and objects are often drawn with exaggerated features and are often very simplified with little detail.



Word Puzzles

Ideas for reading puzzles within the game that should be applicable to any group of the 300 fundamental words. All games will be put in some sort of context when played in the game. Not all of these puzzles have to be included in the game.

1. **Word Matching:** Select the boxes (or other containers) that are labelled with a specific word from a set of boxes all labelled with 4 different words. The contents of the boxes are then used for a useful purpose (though not necessarily for the player).
2. **Word Spelling:** Given some of the letters (perhaps none) the player must then fill in the remaining spaces of the word to spell a word that is said verbally.
3. **Path Finding:** The player must find their way across an area by stepping on platforms labelled with a specific word only. Crossing the area may not be a requirement to get somewhere, but rather completed a task for a non-player character (NPC) in the game.
4. **Word Sorting:** Sort different words into different boxes. The boxes and words would have to be identified verbally, and words would be supplied one-by-one.
5. **Colouring In:** Colour in a line picture by clicking on the sections of the picture labelled with a specific word. Unlike the other games thus far, these puzzles could not be randomly generated but pictures could be randomly chosen from a selection of pre-created drawings.



Client Consultation

Wednesday, 16 March 3:15pm

I met with James in person for the first time on Wednesday the 2nd of March after he had finished teaching his primary school class for the day, until then we had only communicated through email. The main purpose of the consultation was to decide on many of the specifics of my solution. To aid the consultation, I first created a meeting agenda and separate pages about options for different aspects of the game that James could choose from. I have attached these pages. The following is what I learned from the consultation that will help me in designing the solution.

James' Class

The information that I learned about James' class during the consultation has been documented in my **Client Profile**.

I chose to let James make decisions about what the game should include rather than surveying his class. Even though they will be the end users, I believe that the data gathered from such a survey would not be very accurate or helpful, given that young children are likely to make decisions based on what their friends choose or what is suggested by the people around them, rather than truly thinking about what would really be best for them. However, I do plan to gain feedback from the class later in the development process, when I have something tangible for them to test and critique.

Game Design

I discussed many aspects of the games design with James and we decided on options for many of the aspects of the game.

James decides that a cyclic story line would be best suited for his class. His decision is based on the fact that it allows for a lot of repetition, so the children are more likely to remember the words if they are confronted with them several times. He also thinks that having a story line will be more fun for the children (as opposed to no story line) and that a linear story line may be too difficult for some of the children.

James likes all of the puzzle ideas that I presented to him, saying that they would all be suitable for teaching the class. He specifically liked the Word Sorting and Colouring In puzzles.

We both decided to have a magic theme throughout the game (wizards, sorceresses, potions, etc). This was decided because James thought it would be appealing to his class and also because the other themes were oriented more towards boys and the game will be played by both boys and girls.

Although James thought any of the artistic styles would work well for the game, we decided to use the no outline art style. This style is easy to produce in Flash and we believe that it is most suitable for James' class's age group.

James also liked the idea of each student having their own account in the game and we discussed that perhaps each student could have a unique word to access their account, no passwords would be necessary. He liked the idea of printable games, thinking that they could be used for the kid's "Daily Activity" and could then put them in their books to reinforce learning. He also suggested printable certificates for the games. James was in support of putting the game online too, allowing his class to play it at home. He said that they could put it on the school website (<http://www.waiheke.school.nz/>), or he as other servers that he could use to host the game on a separate site.

I suggested that the game should have voice work in it to read out words to the students. James said he has a TV recording studio with a phonics mixing desk in the school that I could use for this purpose and he knows several students that would be happy to volunteer their voices.

Signed: _____

Having now completed my first face to face meeting with James and having decided on many aspects of the game I could conclude that:

I will make a wizard themed game for James' class that will use a cyclic story line, featuring many different activities to teach reading/writing skills to his class. The game will use vector style artwork with no outlines and will be put online for students to use. Each student will have their own account and parts of the game will be printable.

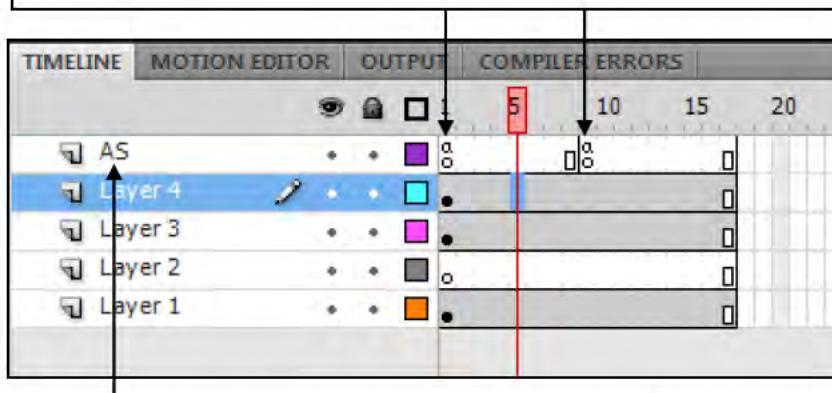
However, this is likely to change during the rest of the development process.

ActionScript in Flash

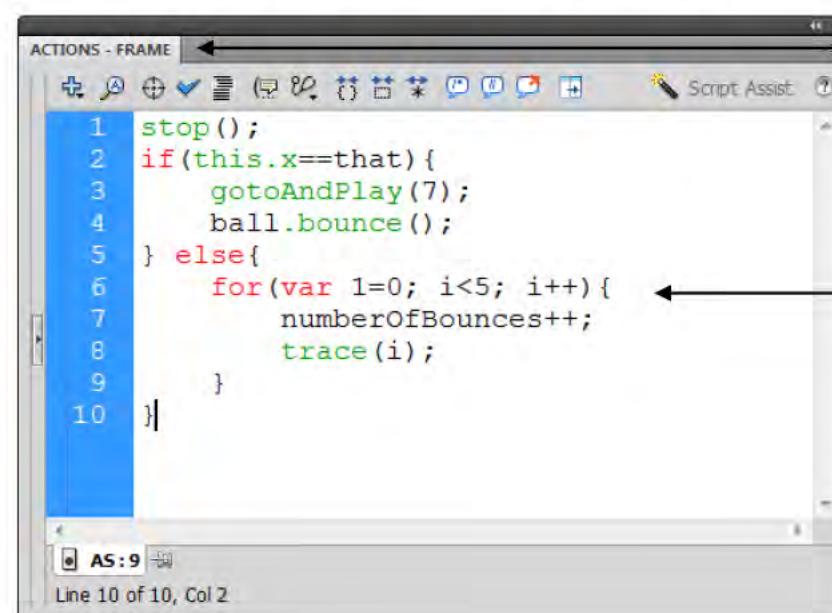
Parts of ActionScript Syntax

Because my game will be very interactive, I will need to add the functionality it requires using Adobe Flash's programming language – ActionScript. I have decided to do some research into ActionScript 3.0, the latest version of ActionScript, to find out how it works and what it is capable of.

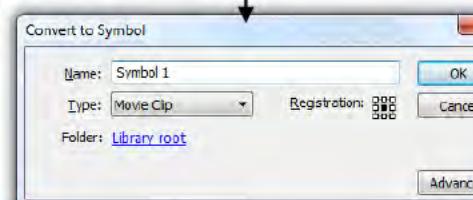
ActionScript 3.0 is applied to frames. When a frame has ActionScript applied to it (which is invisible, not a visible thing but a set of instructions) a small layer case **a** is shown in the frame.



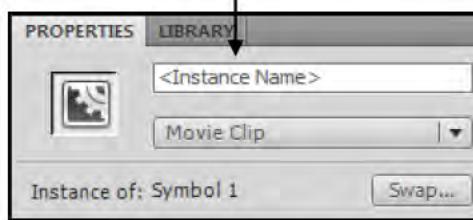
It is recommended that all of the ActionScript is kept in a separate layer, this way it is easier to manage. You can place the ActionScript on any layer, even on different layers in the same frame; you cannot apply ActionScript to actually objects or symbols on the stage though, unlike ActionScript 2.0.



To refer to objects you have drawn on the stage in ActionScript you must first convert them to symbols by pressing the **F8** key.



This will add the symbol to your library and will allow you to give it an Instance Name. You use this instance name to refer to the object in ActionScript. It is called an instance name because the object is an instance of the symbol. You can have several instances of a symbol, each with a unique instance name.



You can view the ActionScript on a frame by selecting the frame and pressing the **F9** key. It will bring up the Actions window.

These are the instructions that will be executed each time the frame is entered. They are colored according to what they do. Preset functions such as `stop()`, which stops the animation playing, are colored green. Other key words, such as `if` are colored red. The code here will execute from top to bottom.

The `import` keyword is used to import ActionScript that is stored in a separate external file.

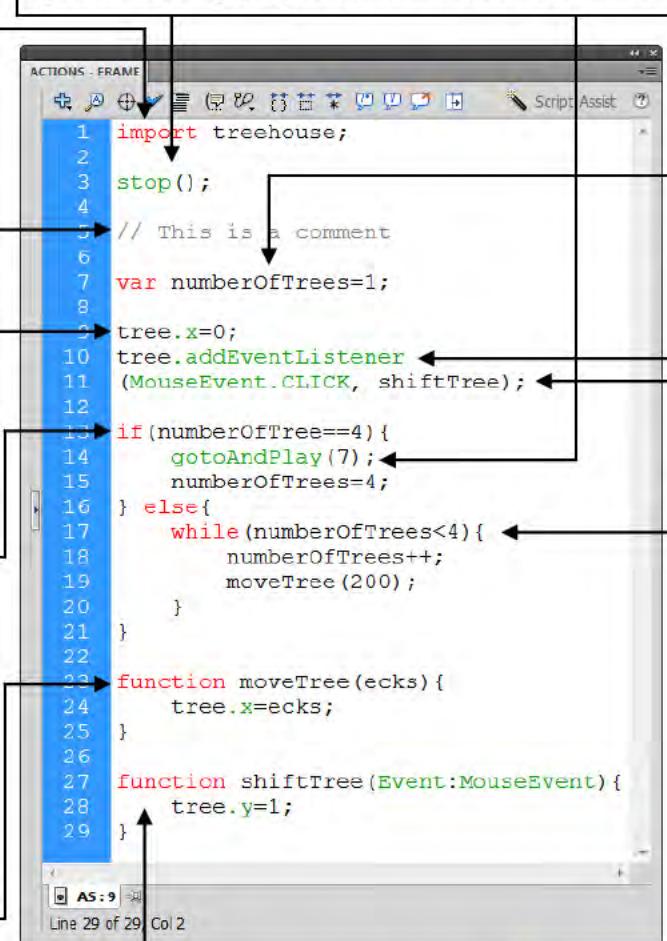
Comments start with a double forward slash and do not affect the execution of the code.

This will set the x coordinate of the object with an instance name of `tree` to 0.

An `if` statement will execute the code between the following parentheses only if the condition in the brackets are met, i.e. if the variable `numberOfTrees` has a value of 4.

This is a custom function, the code between the parentheses will be executed every time the function `moveTree()` is called. They are used in the same way you would call a preset function. The value in the brackets is passed to the code (as `ecks`).

`Stop()` is a preset function, these are functions that have been predefined to do things by Adobe. All function calls end with brackets which can contain data to be passed to the function. Such as `gotoAndPlay(7)`, which will move the animation to frame 7.



Variables store data (numbers or letters) that can then be used or changed later.

Calls the function `shiftTree()` every time tree is clicked.

A while statement will continuously execute the code between the following parentheses, {}, and while the condition in the brackets is true. It is known as a loop.

This custom function is executed every time `tree` is clicked. The mouse event that caused the function call is passed to the function so it can use details about the event in its code (such as where it took place). You can also add event listeners for many other events such as a mouse movement, key press or for when the animation enters a new frame.

I am very familiar with the syntax and use of several other programming languages such as C++, PHP, Java and Perl, which all share many similarities with ActionScript. Therefore, I believe that I have the capability to produce and programme the functionality required for the game.



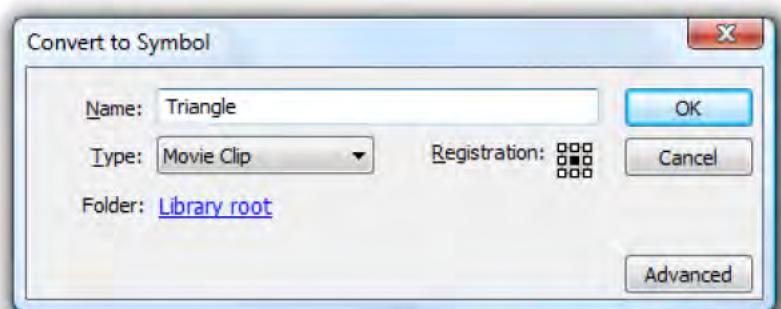
ActionScript Practice in Flash

Having researched using ActionScript in Flash, I will now use what I have learned to make a simple programme. The programme will feature a triangle that will constantly move towards the mouse. It will also rotate so that it is always facing in the direction of the mouse. The code here is entirely my own work and ideas, though I am sure others have done it.

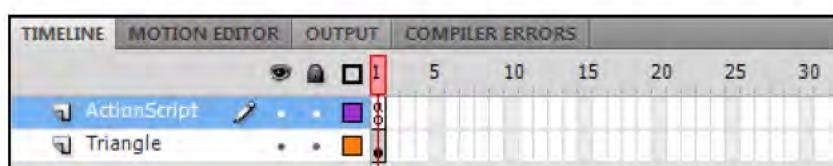
The first thing I need to do is create the triangle. I use the Polygon Tool set to 3 sides.



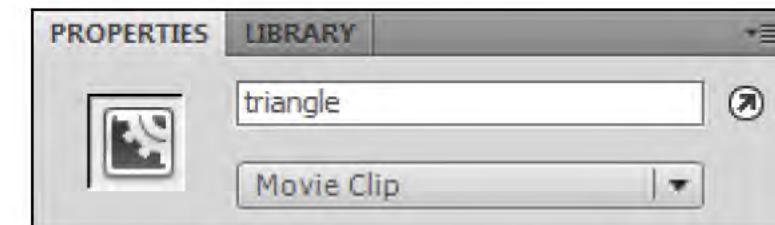
That is the extent of the visuals in this programme. I will now need to convert the shape to a symbol so that I can control it using ActionScript. When creating the symbol, I make sure that its point of Registration is the centre spot because this is where I want it to rotate around and where I want to take the x and y values of the triangle from.



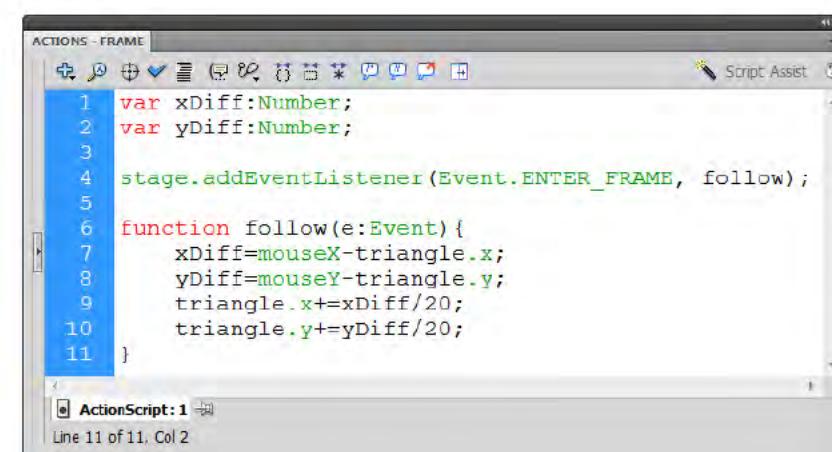
I then create a separate layer to start writing the ActionScript on.



I have to then give the triangle an instance name before I can communicate with it through ActionScript. I gave it the name triangle.

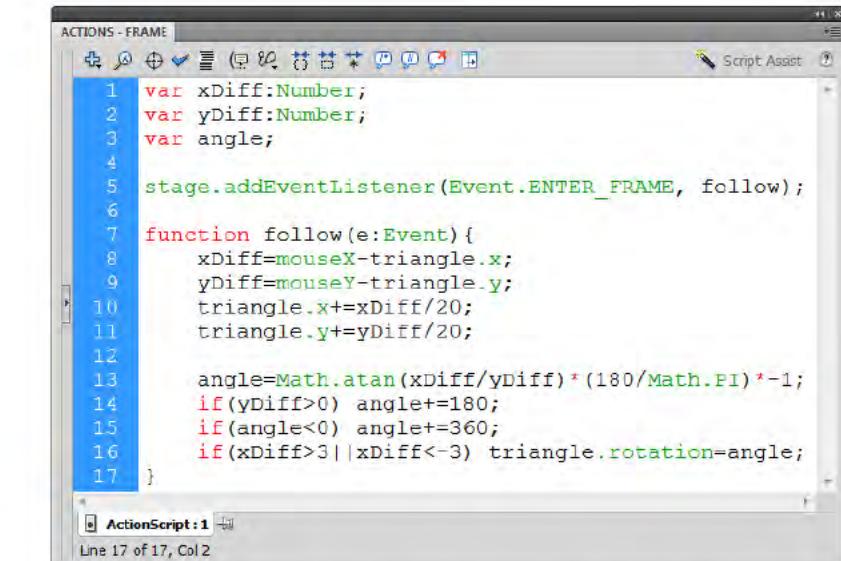


First I will try to make the triangle move towards the position of the mouse, without turning towards it. To do this I use the following code:

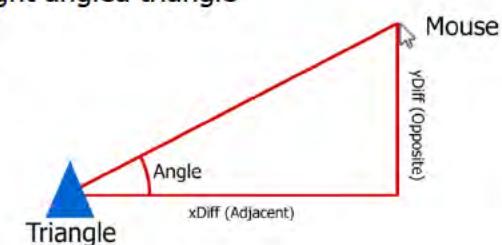


This first sets up variable to store the difference between the x values of the triangle and the mouse and the y values of the triangle and the mouse. An event listener to execute the function follow() every time a frame is entered (24 times per second). Each time follow() is called, the x and y value differences are calculated and the triangle moves one twentieth of the horizontal and vertical distance towards the mouse. Because the is a percentage, the distance the triangle travels will decrease as it gets closer to the mouse, making it come to a smooth stop at the mouse.

Next, I can add the functionality to make the triangle steer towards the mouse. I add the following code to the script to accomplish this:



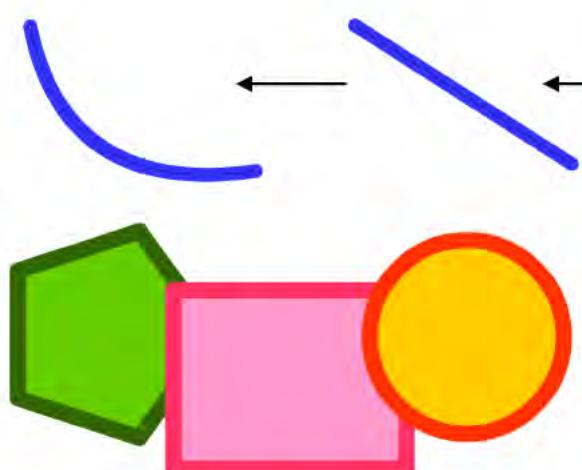
I add another variable called angle to hold the angle between the triangle and the mouse. The angle can then be calculated using the yDiff and xDiff values and a little bit of trigonometry. It is calculated by taking the tan (Math.atan in Flash) of the adjacent and opposite sides of the right angled triangle produced by the triangle and the mouse. This angle is then applied to the .rotation property of the triangle to make it point towards the mouse.



This example shows how ActionScript can be used to add functionality to Flash animations. It shows how you just have to think about things logical and decide what you really want the programme to do, and then write it in code. It also has shown me how much maths can be involved in some code. I think that using what I have learned and through completing this example, I am confident that I can programmed all of the functionality for the game from scratch, and will not need to take prewritten code from other people.

Drawing in Flash

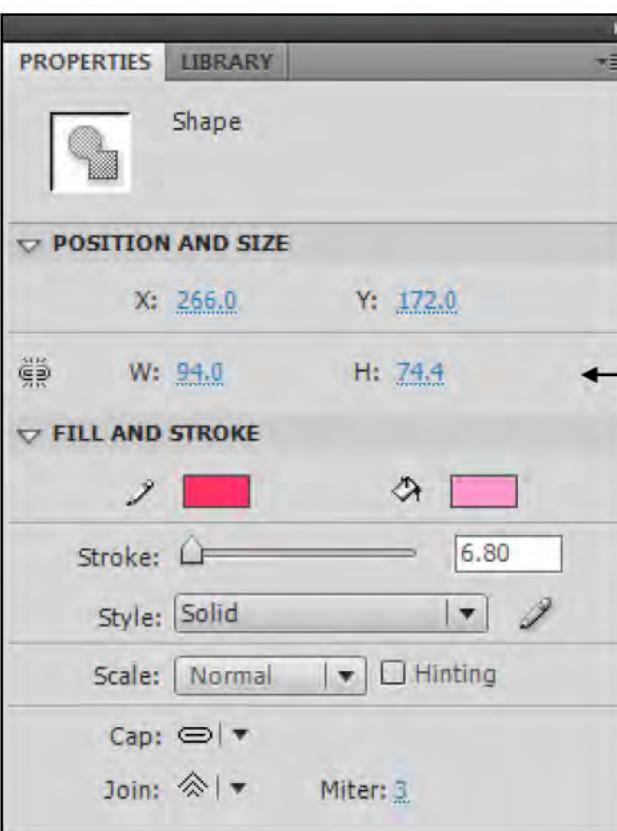
I have decided to do some research about drawing techniques in Adobe Flash CS4 in order to determine what sort of graphics are possible to create using Flash, how I could make them, and what type of visual I can present to James when deciding on a solution. Flash uses many different tools in its toolbar to create different artistic effects; each of them has a different function.



The **Selection Tool** can be used to select objects on the stage by dragging out a rectangle of where you want to select. You can then change the properties of what has been selected (such as the colour), move the selection, or delete it.

The **Line Tool** is used to make straight lines by dragging the mouse from the point where you want the line to begin to where you want it to end. These lines can then be curved, however, using the Selection Tool.

The **Shape Tools** are used to create many different shapes including circles and rectangles. The number of sides on the polygon can be changed when you are drawing it by using the up and down arrows. Holding down the **Shift** key while dragging out the shape will also keep it regular.



The **Eraser Tool** is able to remove parts of an object in the same way an actual eraser would work, by rubbing over the parts you want to remove. You can also set it to remove just lines or just fill.

The **Properties** menu allows you to edit properties of objects (such as shapes) that have been selected after you have created them on the stage. It lets you apply precise values for the width and height of the object that you would not be able to get by manipulating the object by hand. The panel also allows you to edit the properties of tools when you are using them.



If two shapes have the same fill and are placed overlapping on the same layer, they will automatically merge into one shape.



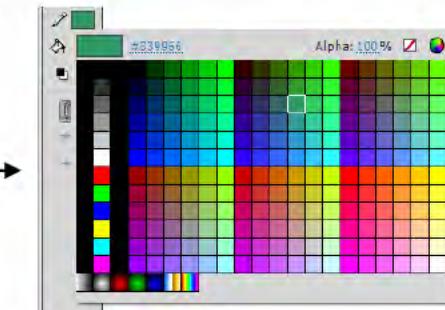
The **Transform Tool** can be used to change the size of objects and rotate them using handles placed on a frame around the object.

The **Pen Tool** can pen used to draw curved and straight line. It connects points with handles, the distance the handles are pulled from the points determines how much curved is placed on the connecting line.

The **Pencil Tool** and **Brush Tool** are very similar. They are both used to create free-hand drawings. The Pencil Tool creates lines and then gives them a stroke, this allows for the lines to be edited later. The Brush tool creates a filled in area where ever the user paints, which is not as editable but allows for creations the Pencil Tool cannot produce.

The **Paint Bucket Tool** is used to fill in enclosed spaces with the specified Fill colour

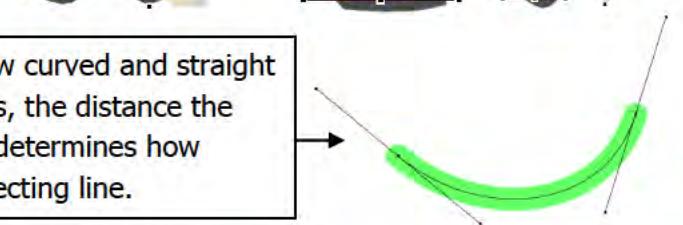
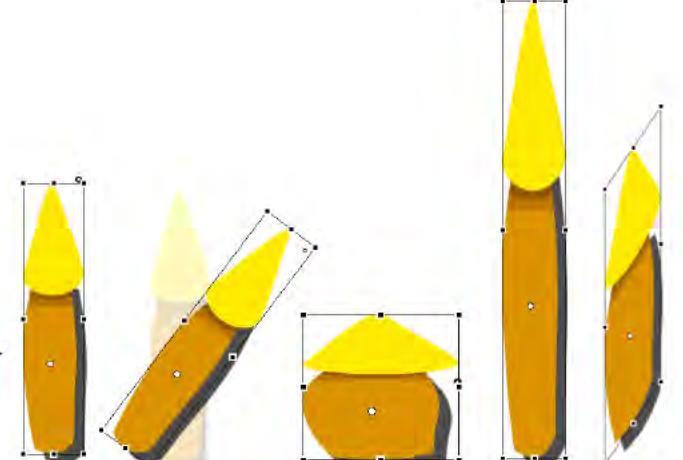
These are the **Stroke** and **Fill** colours that are currently being used with the tool or object you currently have selected. By clicking on them you can then change them by selecting a colour from the chart or creating a custom colour (top right icon).



With **Snap to Objects** on, lines and points will automatically snap to other objects close to them, very helpful when you want two objects to be perfectly adjacent or two points in the same place.

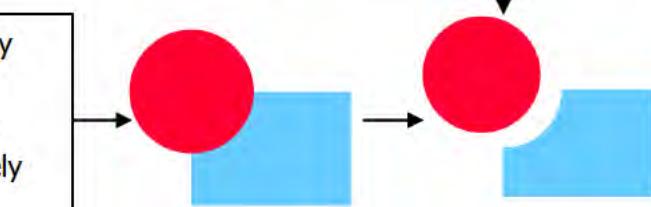
To prevent this from happening, shapes can be created on different layers.

If the two shapes do not have the same fill, they are not merged. Instead, the object on top will delete anything on the layer behind it. The two objects can then be moved separately, effectively cutting a section from the behind shape.



Pencil Tool
(Showing Lines)

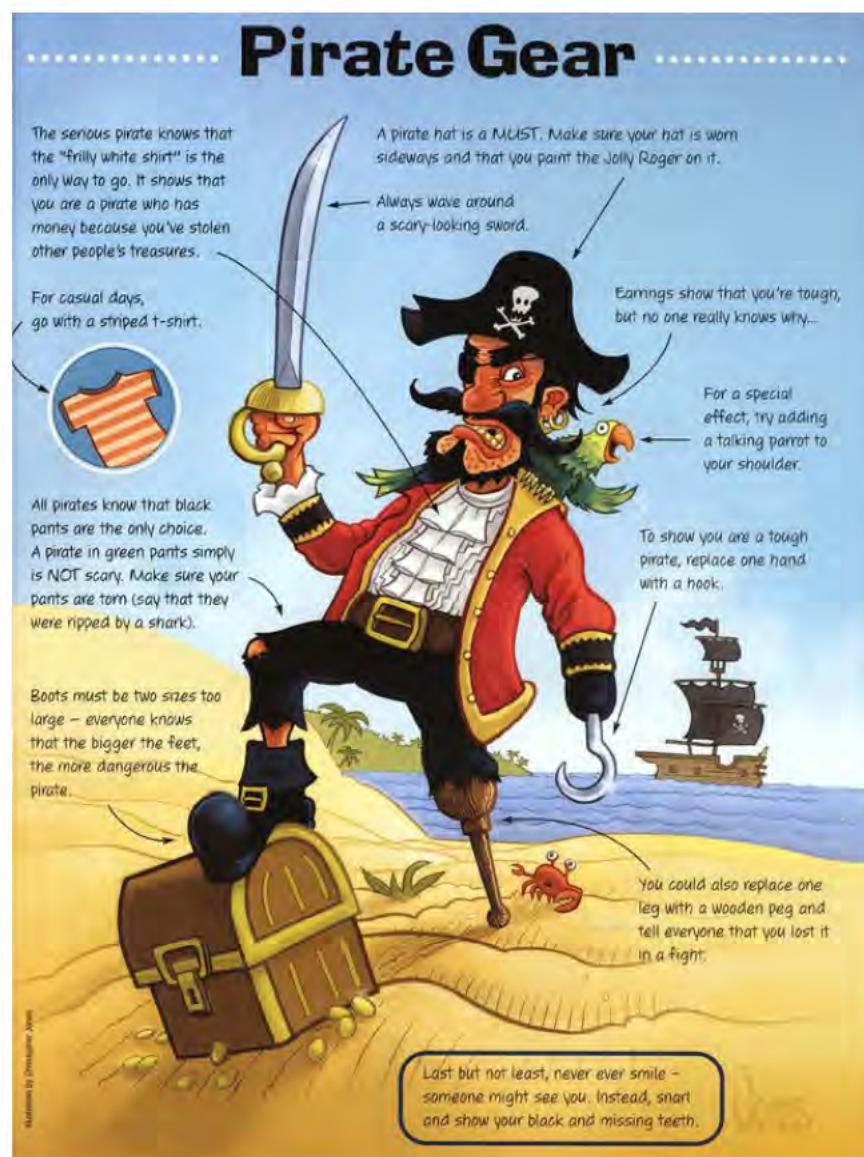
Brush Tool
(Just Fill)



Drawing Practice in Flash

Having researched drawing techniques in Flash I will now attempt to use these techniques to draw a Pirate in the style chosen by James – no outline artwork. I do not plan to use this pirate in my animation, I am purely creating him for the purpose of practice and to see if I can use the techniques to produce artwork of this style.

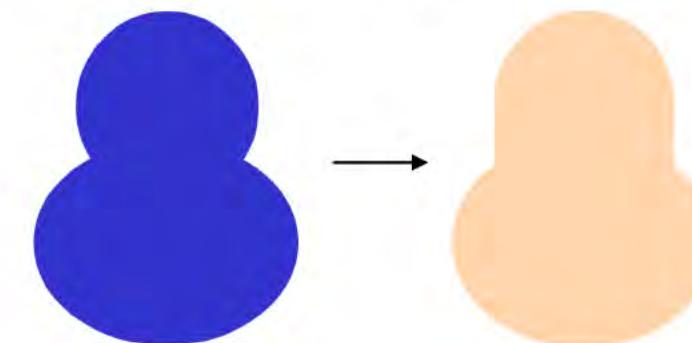
The first thing I did was look online for source material that I can use as inspiration for my pirate. This is what I found:



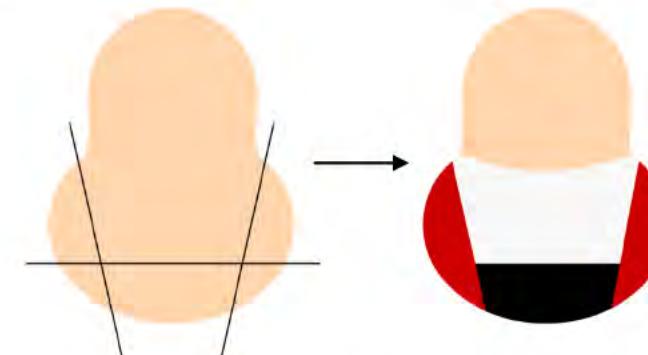
By Chris Jones, <http://www.jonesid.com/2008/pirate-gear/>

Of course, my pirate will look very different because it will be drawn in a completely different style and aimed at a different audience; however, they will share many elements. All of the artwork following this is completely my own creation.

I start by creating the basic shape of the body by drawing two ovals; they are the same colour with no outline so they merge into one shape. I then delete the two points where the intersect using the Pen Tool to make the neck rounded. This body shape is greatly exaggerated to go with the art style. I then changed the shape to a skin colour using the Paint Bucket Tool.

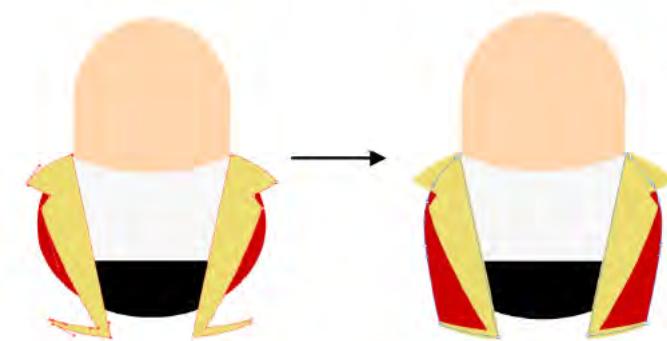


I then coloured in sections of the body to match the clothing of the pirate by drawing a line (Line Tool) to create a separate section, then with the Paint Bucket Tool I filled it with the appropriate colour, then deleted the line (Delete Key).

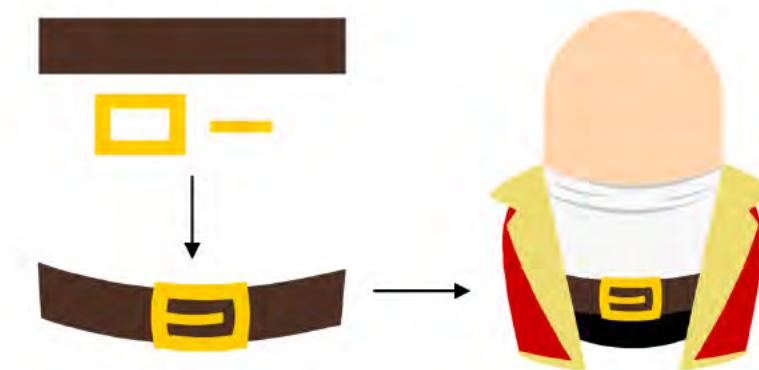


To make his jacket with the gold edges, I first make the shape of the gold edge alone the edge of the red shape. This is created on a different layer so it can be edited and moved without affecting the body shape. Once I have created the shape on one side, I can duplicate it (Ctrl + D) and reflect it (Transform Tool) to place it on

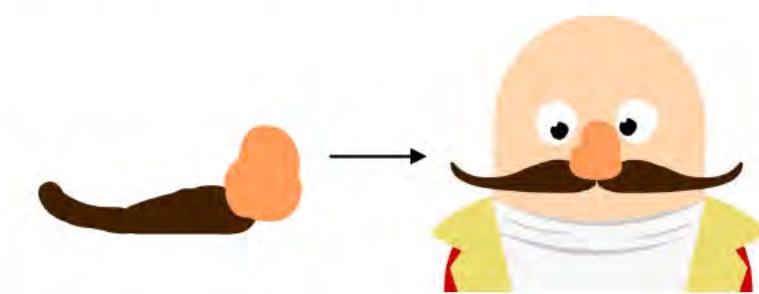
the opposite side. Then on the layer below the rims, I created a red shape (using the pen tool again) to fill in the rest of the coat. You can edit the handles and points on a shape by using the Subselection Tool (the white mouse beneath the Selection Tool).



Next I created some ruffles on his shirt by making several light-grey shapes with the Pen Tool. His belt is made entirely of rectangle, I curved the edges using the Selection Tool (in the same way you can bend lines).



To make the facial features I simply used the Brush Tool paint the general shapes of the features. Then I used the Smooth button (S) which simplifies the shapes and smooths out any irregular bumps. I also edited the moustache with the Subselection Tool.



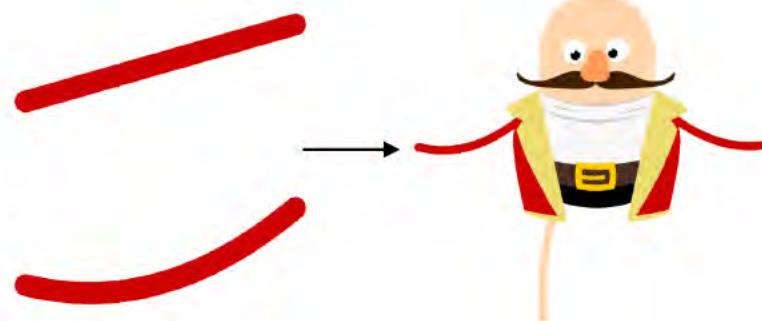
Unsmoothed or and unedited

Smoothed or and edited

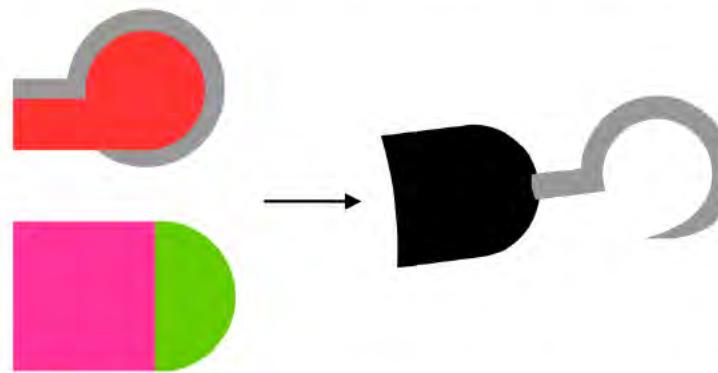
Click Yellow boxes

to read comment

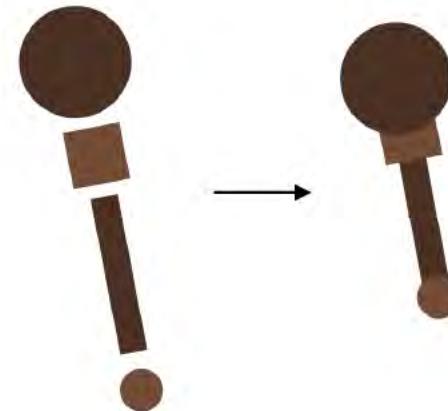
I added the arms and leg (one leg will be a wooden peg) using the line tool. I first draw straight lines line curved them using the Selection Tool.



A circle and a rectangle were cut out of another circle to create the hook shape. A rectangle and a circle were then combined to make the shape of the base. I then curved some of the lines because the objects are round in shape (makes then look less flat).



The Peg leg was made by combining several circles and rectangles. I made them different shaded so the different parts could be differentiated.



2011 Outstanding: Score 20

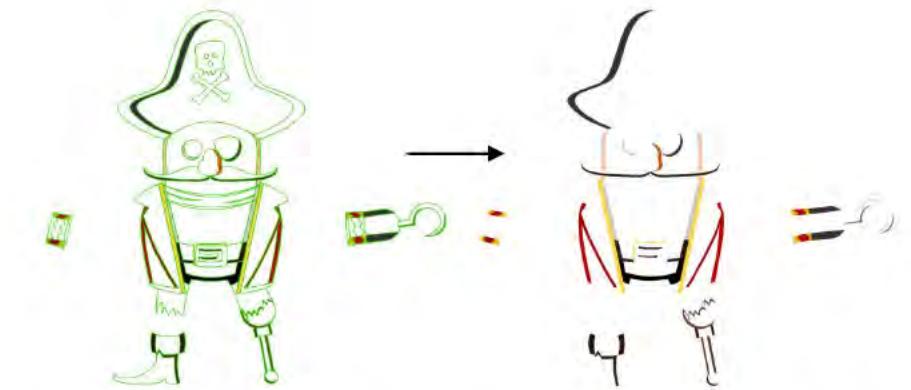
I the finished the drawing by adding the rest of the features using very similar methods:



This would work as a final graphic, except it looks very 2 dimensional. To make it look more 3D I will add some shading. The first thing I will need is the outline of all of the shapes in the image. To get this, I copy all of the separate layers onto one layer. Then I use the Ink Bottle Tool to add outlines to all of the pieces. I then erase all of the fill (using the Eraser) to just leave the outlines on that layer.



I can then make copies of these lines, move them away from the original ones a little bit, and then fill in between the lines a slightly darker colour, this creates a shading effect. I then erase all of the outlines by changing the properties of the eraser to just leave the shadows.



When these shadows are then overlaid on top of the pirate that is not shaded, it makes the image look more 3 dimensional and hot as flat:



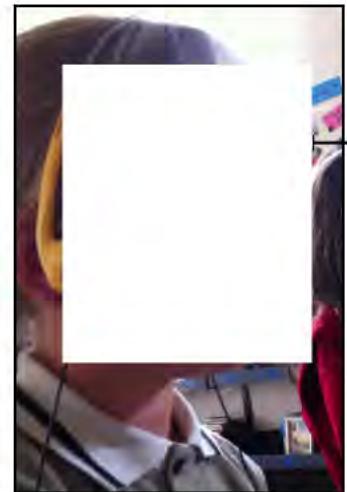
This process could easily be repeated in order to produce other characters, objects and all other graphics that the game may require. It is quite time consuming though, and so perhaps I will simplify the artwork more and not shade the images so much in order to produce the artwork more quickly.



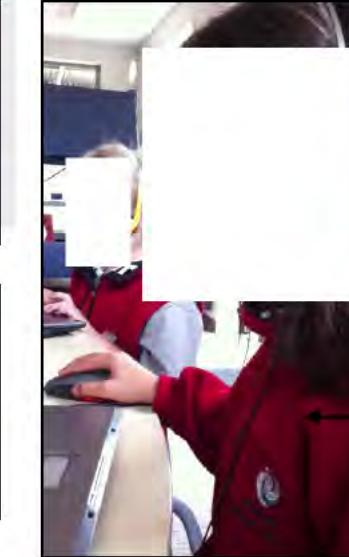
Stakeholder Research

Friday, 25 March 1:00pm

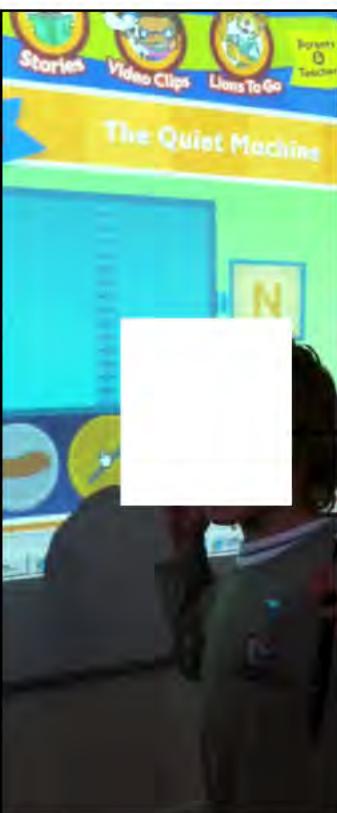
I was able to consult with James' class after their lunchtime. James' was able to set them up on the school library computers and I got them to play some of the existing games I had been analysis. I then videoed them while asking them questions about the games they were playing so I could find out what they liked and what they didn't. I have included the video in AVI format on this CD.



This girl did not play any of the interactive games during the library session, instead, she found the educational videos and animations on the same website and decided to just watched these videos instead of the playing the games. I should keep this in mind when I create my animation, perhaps including large animated sequences.



Much of the feedback gathered from the class was more or less not very insightful though, for example this young girl liked it "when it gets to the grass and it stops and it eats" but did not like it when "it stops and eats." I think many of the kids were saying things without truly thinking about what they thought of the game. Perhaps the more useful information gained from the experience was gained through just being able to watch the kids, not so much what they said. I could see that the kids were actually quite competitive, wanting to show each other the prizes they had won in their games. Also, I noticed that once one child starting playing a dinosaur game, another kid would see it and want to play the same game, eventually about half the class was playing the same dinosaur game. Because of this phenomenon, I have added a short analysis of this game below.



These boys decided to stop playing the games that I had offered them and began to play a painting game. This was apparently because the games were too hard to get working, they "couldn't do the sound" and the game "took not 5 minutes but 40 minutes" to load. I will need to make sure that my game is easy to use and loads quickly so the kids do not get bored or frustrated.



The game uses very attractive, vibrant colours in the graphics, this may have been one of the features the kids found appealing. The game also contains quite fast paced live-action game play, which many of the children would have found exciting and more fun than the typical slow educational game.

The dinosaur game that the children were so attracted to was not actually a reading game, or even educational for that matter. Perhaps this is why the so many children wanted to play it, because it looked more like a game for fun than for education. I will have to make sure that my game does not appear to be too educational, or the kids may not want to play it. However, the main purpose of the game is to teach reading skills to the children, so I have to find a balance between the two, perhaps by using colourful visuals and an interesting story, or jokes and action scenes.

This boy was playing the games on a large projected touch screen available at the school. He most enjoyed the part of the game "when it goes to the last part and it goes 'Quiet!'" He enjoyed this part because he thought it was funny, I could see him laugh every time it happened. The children have a very simple sense of humour, perhaps I could include jokes and gags within the game to increase the amount of entertainment; it is obvious it would not take much to make the kids laugh.



Client Proposal – Specific Solutions

After consulting with James and his class, I have come up with several different proposals for a solution. I have created concepts for the different aspects of the game – Story, Puzzles, Visuals and Functionality – from which I will let James decide which idea from each would be best for his class.

Story Proposals

1. **Island** - The player plays the game as an apprentice wizard who must defeat an evil sorcerer who has taken over a magic volcano island.



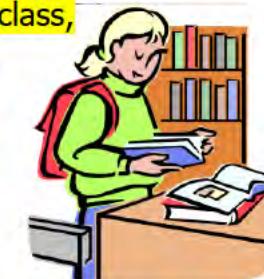
The player must walk around the island and complete tasks for its inhabitants (word puzzles) in order to gather materials to construct a bridge to the centre of the volcano. Once they cross the bridge they collect a treasure, the evil sorcerer realises they are their and the player is just able to escape before he destroys the bridge. The player must then go around the island again to rebuild the bridge and collect another treasure. Once they have collected all of the treasures they can defeat the sorcerer. Each time the go around the island they are given 4 new words which are used in the puzzles. The player is able to see the treasures they have collected at anytime by returning to their home on the island.

2. **Castle** – Set around a large castle with multiple levels. The noble king and queen have been force from the castle and it has been taken over by an evil wizard. The player is a normal citizen of the castle who decides to become a wizard in order to defeat the evil captor, however, in order to level enough magic, they must collect all of the pages of the *Book of Magic*. The player must scale the castle, on each level completing

a word puzzle in order to get the next level. When they reach the top they enter the throne room of the evil wizard and are able to collect a page of the *Book of Magic*, they then jump down a slide to the bottom of the castle. Once they collect all of the pages they are able to defeat the wizard and return the castle to normal. Each time the player scales the castle the puzzles use four new words.



3. **School** – While watching James' class, many of the students really liked the library. James told them that "you have to be really quiet, because the books are very tired and are sleeping." This story is set at where someone has stolen the books from the library. The player must move around the school and solve word puzzles to collect clues and find out who has stolen the books to retrieve them. Once they solve the mystery, they are given a new case (somebody different has stolen the books) that they must solve with new words. Perhaps I could give the books, personality and lives, as James suggests.



4. **Prehistoric** – While consulting with James' class, a lot of the kids wanted to play a dinosaur game. I have decided to create a prehistoric themed story concept. In this story the player plays as a young Neanderthal (similar to Fred Flintstone). It would also take place on a volcanic island on which an evil Neanderthal (Og) is trying to make the volcano erupt, which would destroy the village. The player must go around the island, solving reading puzzles to eventually find a dinosaur egg. Once the player has found all of the eggs, they can stop Og from destroying the island.



Puzzle Proposals

I have included my concepts for word puzzles on separate A4 pages. I drew them by hand so I could show how they might work. Some of the games may only work for some of the stories, but most of them could be altered to work with any of the storylines.

Functionality Proposals

Control Bar

I have created several different bars that I think the kids will find attractive. While watching the kids, they did not like boring solid shapes, instead they preferred themed interfaces where the buttons were objects or animals. Also I have tried to make these very simple as a lot of the children found many of the games I showed them too complicated to play.

1. **Paper** – This bar is a paper themed bar that is always on the bottom of the screen:



2. **Stone** – This bar is a stone themed bar that would always be on the bottom of the screen:



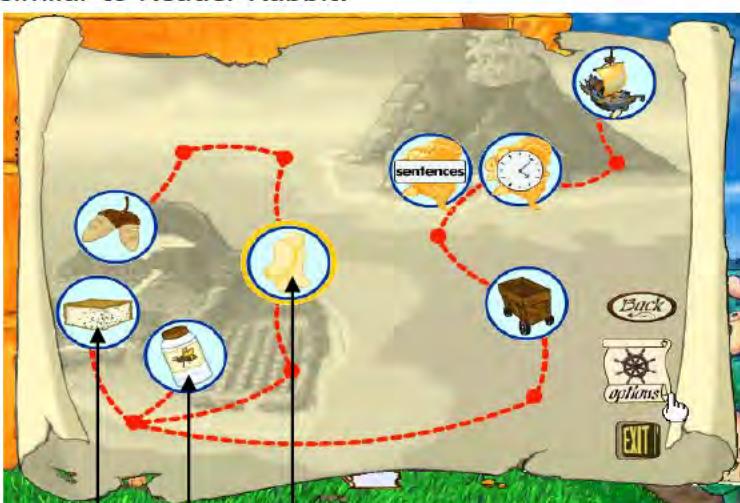
3. **No Background** – This bar does not have a background (you will just see the actual game behind the contents). It has a menu button that will expand a menu of options when you click it.



Navigation

All of the stories involve the player navigating an area. These are ideas of how the player could move around the area. All navigation and interfaces are simple because I noticed the kids have very limited computer skills during our consultation.

1. **Map** – The player uses a map to move to anywhere in the area. They could open the map by clicking a button and then click on the area they wanted to visit, which would contain a word puzzle or task. This could be used in combination with another method and is similar to Reader Rabbit:



These areas can be clicked to visit them.

2.

2011 Outstanding: Score 20

Path Clicking – The player clicks on the path that leads to where they would like to go, giving them the ability to move from one area, to their desired area, via a number of other areas. Similar to Spelling Blaster:



The player can decide which path to follow by clicking on it.

3. **Loop Area** – The areas would be continuous loops, so the play can only move left or right and will walk in a complete, they can then complete tasks when they reach certain areas in the cycle. The best example I have found of this is Treasure Mountain:



The player can move left or right by clicking to the corresponding side of the character, the background moves behind them.

You can enter areas and activities by clicking on the entrances when you reach them.

Visuals Proposals

James likes the “no outline” style of art work I showed him during our consultation, the children in his class also liked this style of art so I have created three variations of this style to show James. I used the pirate I created to demonstrate the solutions. The children seemed to like all art styles that were cartoon and child-like, most could not tell the difference between visuals of different games.

1. **Not shaded** – this art style does not include any shading on the shapes:



2. **Shaded** – this art style includes the shading of the shapes to give them more depth:



3. **Outlined** – Although the defining feature of this style is no outlines, I decided to show James the style with outline to give him more options:



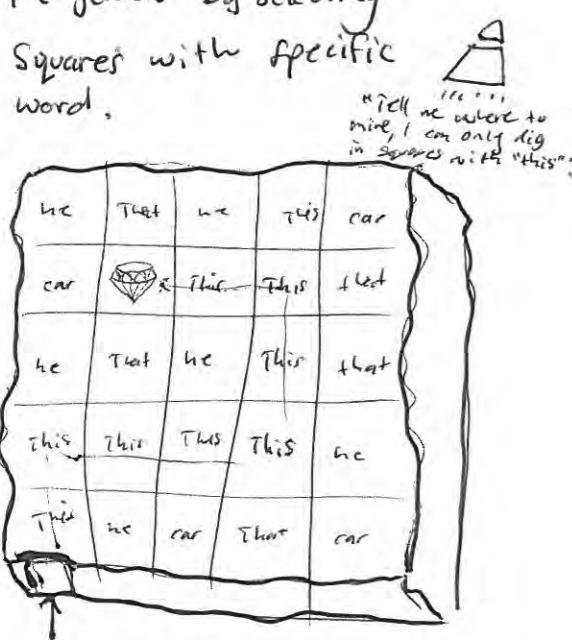
Exemplar 1 Page 3
Click Yellow boxes
to read comment

Word Puzzles

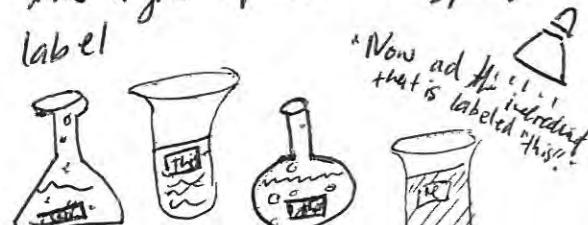
Book Sorting - At library, sort books int correct box



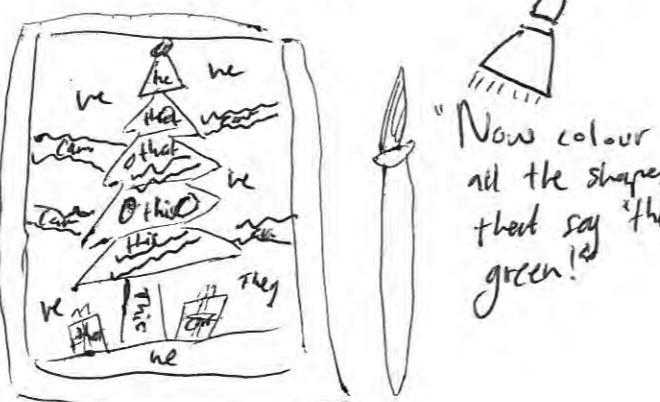
Mining-Guide a miner to
the jewels by selecting
Squares with specific
word.



Potion Mixing - mix ingredients
to make a potion by selecting
the ingredient with a specific
label Now add <1>



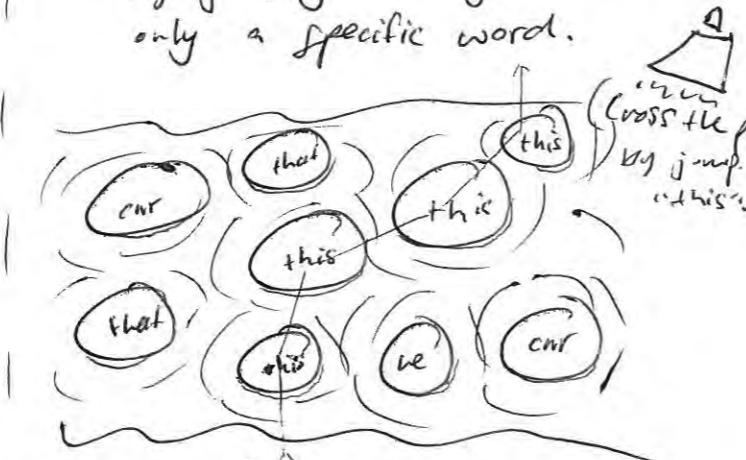
Art Gallery - Colouring paintings
by adding colours to ~~several~~
with a word.



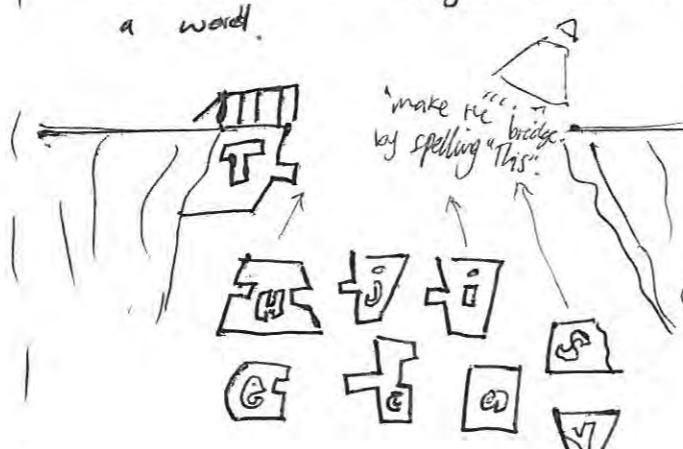
Wizard Duel - duel with an

ng: Score 20
evil wizard by "spell"ing a word to cast a "spell"; if it is spelt correctly, you win, else, you lose.

Pond Crossing - Cross a pond by jumping on lily pads with only a specific word.



Bridge Building - Build a bridge to cross a dark gap by placing letters in the right order to spell a word.



Bone Sorting - Sort bones

with the same words to assemble a dinosaur.



Client Consultation

Wednesday, 31 March 3:15pm

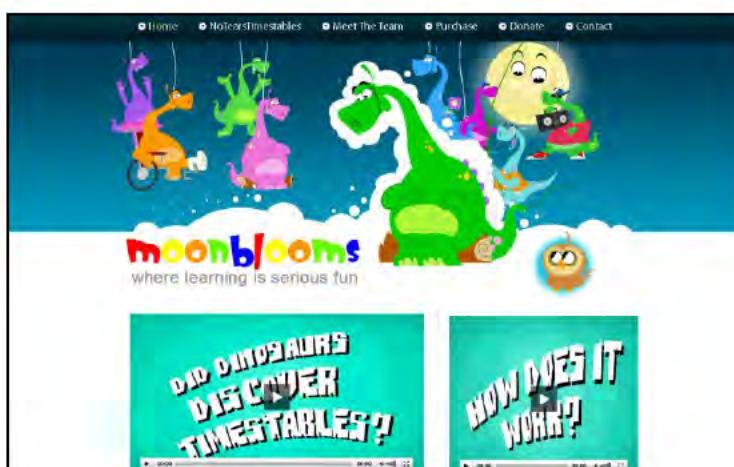
I consulted with James again to show him the concepts that I have come up with. During the consultation he gave me valuable feedback about the concepts and I allowed him to choose which aspects he thought would be best for his class.

Story Concept

James liked all of the story ideas that I presented to him and thought that the kids in his class would enjoy playing through any of them. However, overall he thought that the **prehistoric** storyline would be best for his class. His class has recently been studying dinosaur and have a skeleton bone model in there class that the kids can use. Also, the children used a dinosaur-themed learning tool for mathematics called



Moonblooms which would tie in nicely with a dinosaur themed reading game. Moonblooms are a counting tool with a series of 100 flowers thread along a stick, which can then be separated by dinosaur shaped inserts to teach children maths. They are created by one of the teachers at the school.



suggested that perhaps the students should have to collect some sort of magical dinosaur eggs to save the island; they could then show these eggs to their peers. When I tried to rationalise this, he said that the story does not have to make perfect sense.

Moonblooms also has an animated website (www.moonblooms.co.nz) which has a creative animated video that introduces fictional dinosaur characters that are related to Moonblooms. Apparently the children really like this website and animation, so I may use it for inspiration when I create my game.

James also made some suggestions to improve the story of the game. He

Puzzle Concepts

James chose to use three of the puzzles in created; the **mining** puzzle, the **painting** puzzle, and the **dinosaur bone sorting** puzzle. He chose these puzzles because he thought that they provided variety and taught the necessary reading skills effectively. However, he suggested that each puzzle have to be repeated several times, even with the same words, this repetition is meant to enforce learning. He would also like to see each puzzle have a character that goes with it and helps the player through it, such as a miner for the mining puzzle.

Functionality Concepts

For navigation, James thought the **map navigation** would be best for his class. He has suggested though that I create an interface that is as simple as possible, so kids can just click on where they need to go, ect. He wants there to be as few buttons as possible.

Visual Concepts

The **shaded art style** gained the most positive feedback from James. I will try to create graphics in this style, however, I might create them without shading first and then add shading if I have time.

Signed: _____

Having now consulted with James about my initial concepts I believe that I am now ready to start developing my conceptual design for the game. Based on this consultation the conceptual design is likely to meet the following criteria:

The game will have a prehistoric theme and storyline in which the player will have to save their island from an erupting volcano. It will feature puzzles including mining, painting and dinosaur bone sorting. Navigating through the game will consist of a map and simple interface. Shaded graphics with no outlines will be used for all visual aspects of the game.

This is likely to change during development of the conceptual design.

Stakeholder Consultation

Tuesday, 5 April 2:15pm

New Stakeholder:

[REDACTED] is an English teacher at [REDACTED]. She is very experienced at teaching reading skills to children of all ages and is easily accessible by me.



Feedback about Games



loved all of the game concepts I had created and believed that the kids would really enjoy playing them. However, she did not think that teaching kids the 300 essential words was the best way to develop reading skills, that words taught in isolation have little affect.

She suggested that instead of focussing on 4 different essential words each time they go through the game I could focus a "family" of words, words that share similar characteristics. For example I could focus on words that end in "ight", such as flight, light, might and fight.

She liked all of the games, though she specifically liked the mining, dinosaur, painting and duelling games.

However, she suggested that for the wizard game, instead of doing separate letters for each word I could just do the different parts. For example, for the word "blimp", I could use the pieces "bl" and "imp". I think this is a good idea, because it reinforces that the kids should sound the words out.

She also said that the game should have some opportunity for the kids to apply what they have learned, perhaps by being able to use the words they have learned to create sentences. She gave me a learning process to follow:

Recognition ▶ Understanding ▶ Practice ▶ Apply ▶ Create

She also suggested having some sort of levelling feature, so the players would have something to work towards.

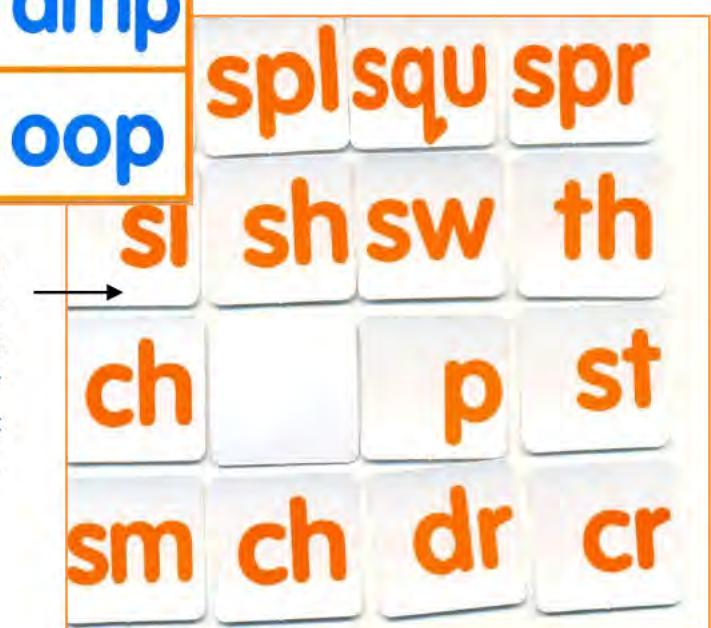
Recommended Existing Solution

showed me some of the games that she uses to teach young children. I have done a short analysis of one of the games she uses below.

The game is used to teach children the different components that words are made up of. For example the word "push" start with "p" and ends with "ush", it emphasises how other words may contain the parts (such as "crush").

irt	ush
ash	ift
ock	ick
ing	amp
eed	oop

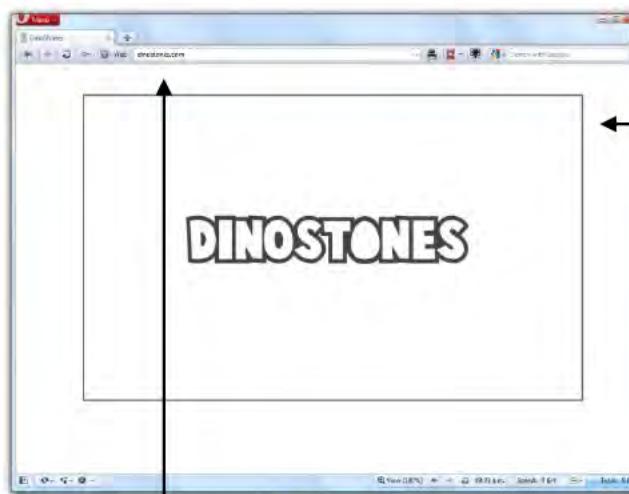
Kids are given a table with the ends of words. There are several different tables and some become more complex.



They can then place the beginning parts of words in front of these by placing these cards. They can do this by themselves (experimenting) or could be instructed to make specific words.

Storyboard

This storyboard contains the specific details of the content that will be developed in the one-off solution. Graphics shown in this storyboard are not complete and may not be used in the final solution.



The game will be accessible online at the website www.dinostones.com.

If the player has not heard the story yet, it is played for them.

Story is written on the stone tablet as it is told aurally

This button is click to go to the next part of the story.

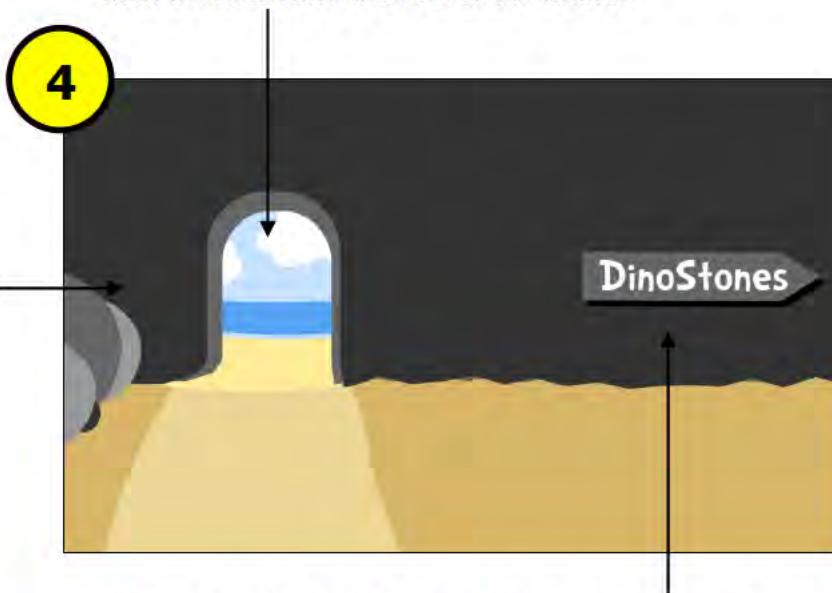
The visuals behind the tablet will show the story visually.

The Story: A bunch of magical eggs used to prevent the volcano from erupting, however, Og has removed these eggs and they flew into the ocean. The volcano is now slowly beginning to erupt. The player must collect all of the magic eggs before the volcano erupts and destroys the island.

To collect the Dinostones the player must build a fishing rod from three main parts: a pole, string, and magnet (Dinostones are conveniently magnetic). The player can collect these materials from different games and can then fish out a Dinostone from the ocean. This process is then repeated to collect another stone.

Once the players login and have listened to the story they will start in the home cave. A summary of their stats (the stones they have collects and the materials they have) will be loaded and they can continue from their last play.

The player can click on the door to exit the cave and then move around the rest of the island.



Walking to the right will move the player into a hall of shelves that displays all of the eggs they have collected so far; they will therefore be able to compare eggs with their friends.

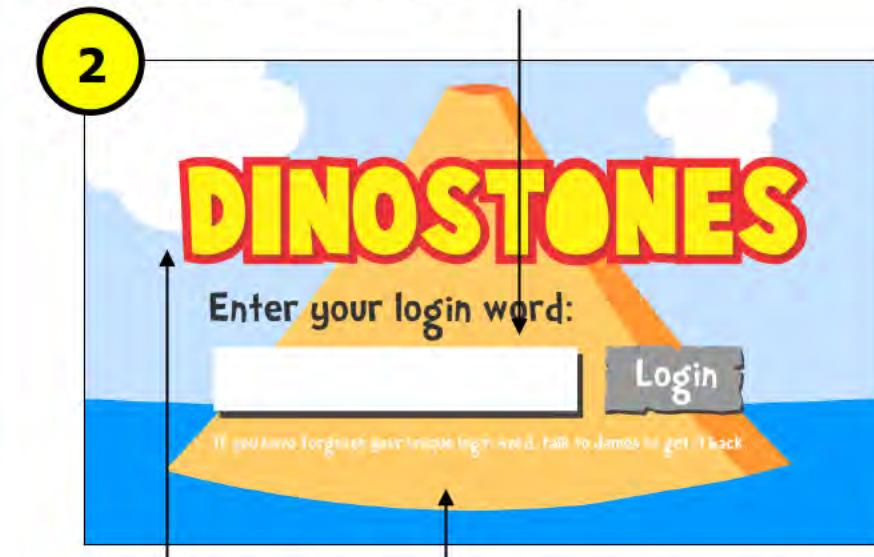
This storyboard contains the specific details of the content that will be developed in the one-off solution. Graphics shown in this storyboard are not complete and may not be used in the final solution.

The game will measure 900px width and 550px in height.

Information about the game will also be available on the site.

The loading screen displays the game logo along with a series of bones which indicate the percentage loaded as well as the written percentage. Some movement will be added to show the programme is active.

This is the login screen. Users enter their unique word given to them to continue their game.



Long view of the island is shown in the background and the clouds would float across the sky.

Millions of years ago, on a far away island, all of the villagers lived happily...

The Story: A bunch of magical eggs used to prevent the volcano from erupting, however, Og has removed these eggs and they flew into the ocean. The volcano is now slowly beginning to erupt. The player must collect all of the magic eggs before the volcano erupts and destroys the island.

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2011 Outstanding: Score 20

Once the player leaves the cave they will be able to move around the island to the different games, collecting parts of the fishing rod as they complete the games.

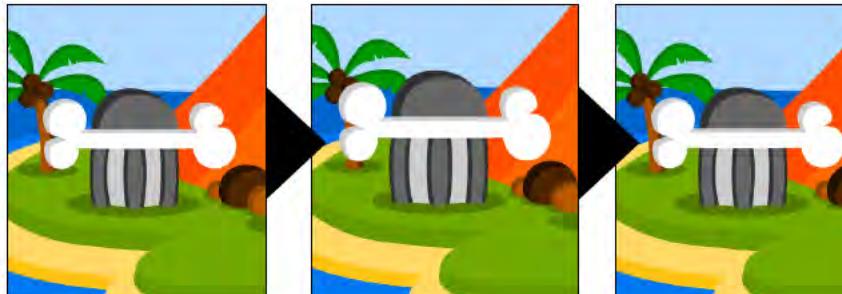
When they exit their house they will appear outside as their character representation (either male or female). They can then click on the different locations on the island to walk to them and complete the activities at each location.



Museum – The dinosaur bone sorting game. The player collects the pole for the rod from this location.

Magnet Mine – This is where the player plays the mining game. The magnet for the rod is collected here.

Each location will enlarge when the mouse is hovered over it. When the mouse moves away from the location it will shrink back to its original size. This makes the interface more intuitive and responsive:



Clicking on any of the location will have the player walk to that place on the map and enter the location.



This is the initial sketch of the island, this was scanned into the computer and then I traced over it using Adobe Flash.



This is the male character that will be the player in the game. He will walk around the island to selected locations.

House – This is where the player starts the game and where they can return to see the Dinostones they have collected.

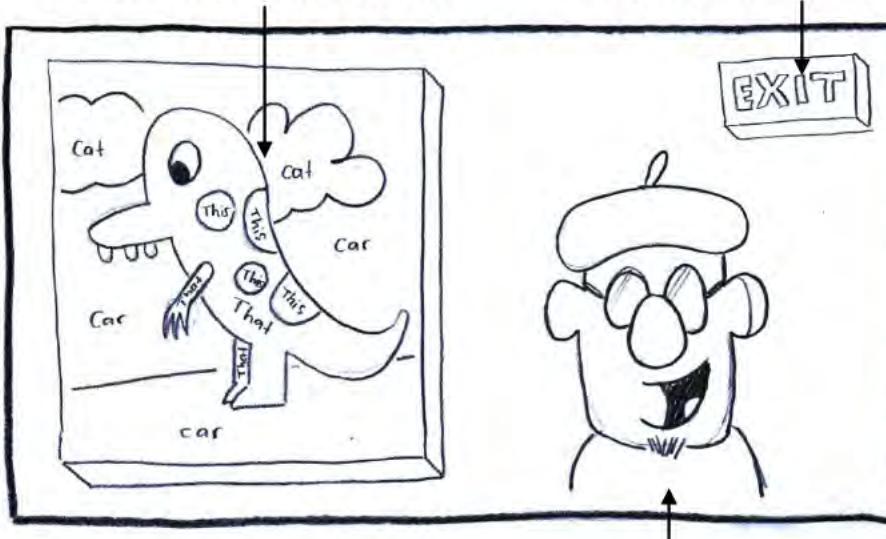
Wharf – This is where the player must go to fish Dinostones from the ocean once they have collected all materials required to make the fishing rod.

Art Gallery – The painting game is played here. This is where the player collects the string for the rod.

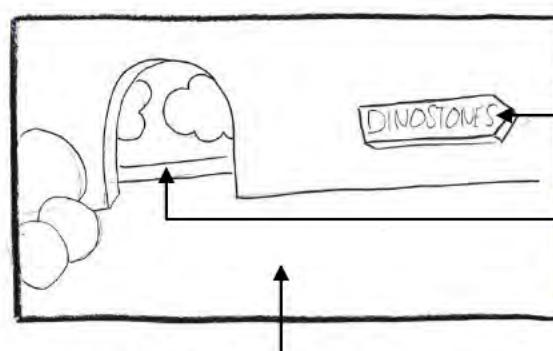
Many parts of the island are animated such as the clouds moving, the volcano rumbling, the coconuts falling randomly, and the waves moving in and out:

When Og removed the Dinostones from the volcano all of the colour vanished from the paintings in the art gallery. In the **painting game** the player must re-colour all of the paintings by clicking on the parts of the painting that are marked with a specified word. Once they have coloured a painting they will receive a piece of string to use to build their fishing rod.

Players click on the parts of the pictures that contain the correct words to colour them the right colour.



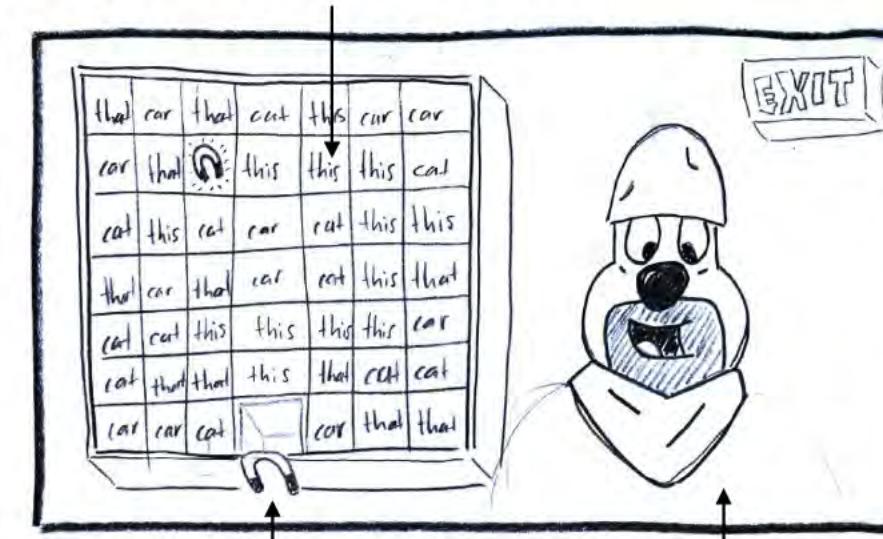
The artist character will give the player instructions aurally to help them play through the puzzle. For example, he may say "Now colour in all of the pieces that say "that" blue." And he will also give the player encouragement such as "Good job" and "well done".



This is the players home, where they start the game and where the return after collecting a Dinostone.

The exit button can be clicked at any time to go back to the main island.

Players click on the grid squares labelled with a specified word to guide the miner to the magnet. Here it would be the word "this".

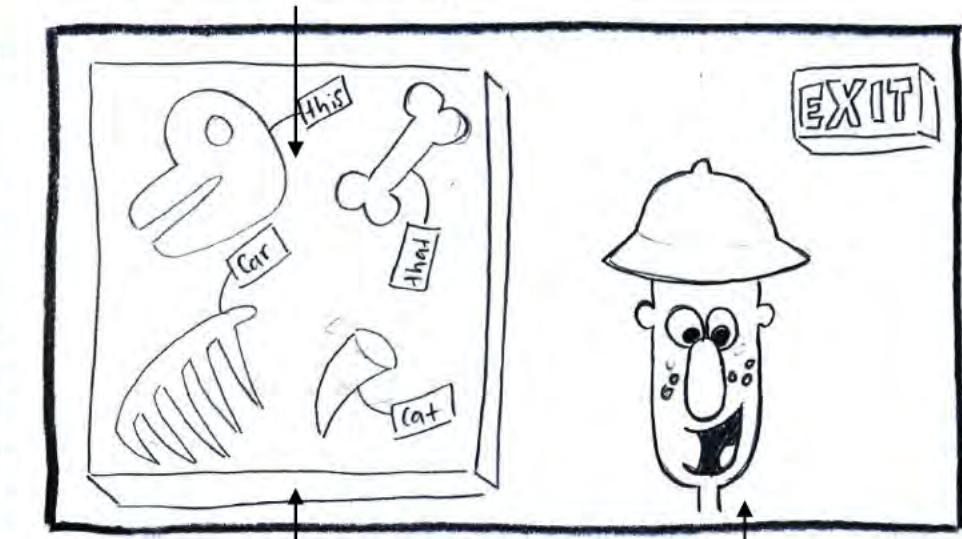


The miner starts at this entrance.

The miner character will give instructions to the player to help them complete the puzzle and will also offer encouragement.

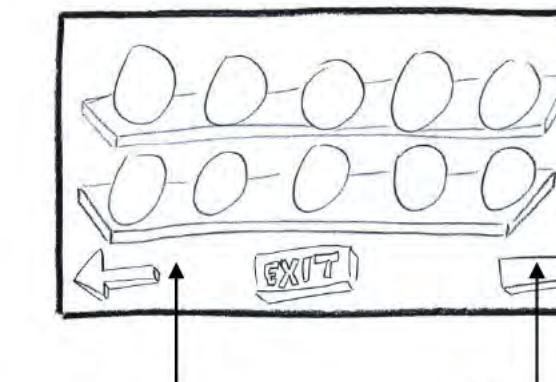
The removal of the Dinostones from the volcano has caused all of the dinosaur bone exhibits to fall apart at the museum. In the dinosaur bone sorting game the player must reassemble the exhibits by clicking on bones labelled with a specific word. Once they have assembled an exhibit they will be given a wooden pole that they can use for the fishing rod.

Players click on the dinosaur bone here that matches the word they have been given, such as "this". A new set of bones appear and a new word is given.



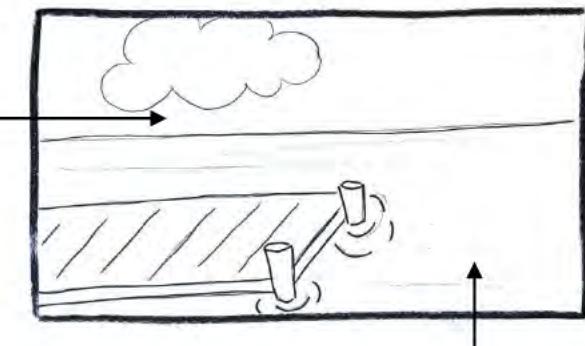
After the player correctly identifies four correct bones they have completed the puzzle and are shown the full skeleton structure of the dinosaur.

The archaeologist gives instructions and feedback for this puzzle.



This is the Dinostone storage area. All of the Dinostones that the player has collected are displayed here. Players can therefore show their stones to all of their peers. There will be many different Dinostones with different patterns and colours on them.

The wharf is where the player must go once they have collected all the parts for their fishing rod.



Clicking on the ocean will use the rod to fish out a new Dinostone from the sea. The rod is then lost and the player returns to their home and repeats the process.

Characters



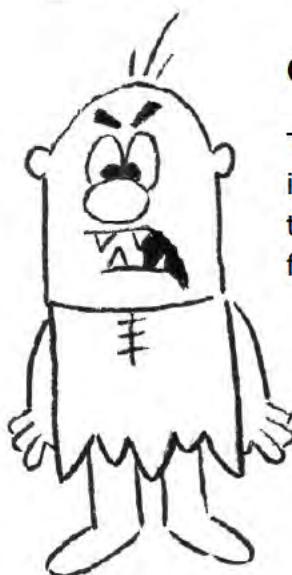
Boy Player

This is the character that the player controls if they are a boy. He is happy and cheerful but never actually speaks.



Girl Player

This is the character that the player controls if they are a girl. She is equal in happiness and optimism and also does not talk (arms will be added when developed).



Og

This is the bad guy in the story who initially removes the Dinostones from the volcano. He does not talk except for a little bit of grunting.



Og's Minion

This was a character concept of one of Og's Minions who would eventually test the player of their new spelling skills before they could enter the wharf. He was removed from the design due to time constraints.



Colouring and Development

Eventually all of the characters will be fully coloured and animated in the style that was chosen by James. Such as these guys here.



User Interface

The user interface has been simplified a lot after gaining feedback from James who suggested a very simple interface for the children.



Conceptual Design Feedback

Friday, 17 June 1:00pm Feedback

Have created an initial conceptual design I now wanted to gain feedback from James and his class. I visited them during school hours to show them the design.

James was very impressed with the design and overall thought that it would be very effective in teaching the kids the list of words he had given me. He liked the simple interface that I had implemented saying that "[He is] sure every one of them should be able to use this." He also liked the visuals that I had created and thought that they were of "professional quality." The students also liked the visuals and could immediately distinguish between the protagonist and antagonist. The story and gameplay was also received very positively and James said that he would be able to help create dialogue using the recording studio at the school.

Suggestions

James and his class also gave several suggestions of features they thought should be added to the game to improve it (I am not sure which ones I will implement):

1. There should be a helper character that helps the player to play the game (providing hints and telling them where to go).
2. There should be system to show which parts of the rod the player has collected.
3. Different difficulties may be added for students in higher reading levels.
4. There should be sharks in the water around the island.
5. There should be dolphins in the water around the island.
6. Lollipops should grow on the trees (not coconuts).
7. There should be a rainbow over the island.
8. The bad guy should fall into the volcano.
9. There should be a roller coaster on the island.

Newsletter

James added a write-up to the school newsletter about my visit. I have attached this to the page (on the right there).

Final Evaluation

Animated Learning Tool

I have now completed my final conceptual design with feedback from my client and stakeholders and believe that it meets the specifications of my brief. This design, when developed, will be able to teach reading skills to the children in class and perhaps even kids outside of it.

The game is to be made using Adobe Flash. It will then be accessible to all of the children on a dedicated website which all of the students will have access to at school and those of have internet access at home will also be able to use it there. This also makes the game very accessible to to use anyway in the school with his class.

The game is designed to include all of the 290 essential words supplied by by going through a looped storyline, repeating the same game play with different words. However, the game is not restricted to these words and has the potential to add other words, perhaps more difficult words for more advanced children. The game will be able to effectively teach these words through three different games within the game, and by doing this in a fun way the children are more likely to enjoy learning and remember the words.

I have put a lot of effort into making the design visually appealing to its target audience of 6 year olds. The game contains colourful and cartoonlike pictures, designed specifically for young children. This means the game will be more fun for the children and it almost disguises the fact that it is a learning game. This is important because when I was observing the children they liked the games that were less educational (I cannot remove the educational value from the game as this is the main purpose of creating it). I gained very positive feedback from and his class when I presented the visuals I had prepared so far.

The game content and story is also appealing to its target audience. The game uses themes (such as dinosaurs) that the children in class are familiar with and also draws on aspects of games that are used to inspire the children's imaginations (such as the magical Dinostones and playing on a prehistoric island). This content will help give the children a desire to play the game, and continuously play it. By adding Dinostones as a reward system in the game it gives the children an incentive to play the game many times to collect new stones which they can

then show off to their friends. I also gained positive feedback from stakeholders and about the story and game content.

Ease of use has been made a high priority in the game. The interface is very simple and intuitive, requiring only the mouse to operate in a click-to-go style. Having seen the children play other games, and I am very confident that they will have little trouble using the game.

If the design is developed into a one-off solution there are several changes I would make to the design and features I would incorporate into the design:

1. I would add a helper in the form of a wise dinosaur on the island to help the player and guide them through the game.
2. A basket would be added to the wharf area that when clicked would show the pieces of the fishing rod that the player has collected.
3. Shark fins will be animated in the ocean around the island. A shark will also jump out of the ocean and take the players fishing rod after the collect another dinostone (requiring them to go through the games again).
4. A rainbow will be shown over the island once the player wins the game (has learned all of the words in the list).

DINOSTONES

Animation One-off Solution

Introduction

I have created a conceptual design for a reading game named Dinostones and will now develop this into a working solution. The game was designed for

Year 2 class at It will be developed to teach a list of 290 frequently used words that the students should learn to recognise quickly and easily.

Initially I wanted to make an animation teaching kids maths such as something that would run through the multiplication table. I thought an animation for young children would be appropriate as Flash is often used for colourful and child-like animation.

I approached James with this idea because he is the teacher of my younger sister's class. Although he rejected the idea of a maths animation he thought that something to help the kids learn to read could be very helpful. He insisted that an entertaining game of some sort would be the most successful solution because it is hard to get the kids to engage with and learn from something that they do not enjoy.

Although I researched other possible solutions such as animated story books and non-interactive animations I also came to this conclusion, considering that small children would be much more likely to use something that they interacted with and influenced.

The feedback from the last consultation with James' and his class was very positive and James believes that the conceptual design, when developed, will make a successful and useful learning tool.

Given the feedback however, there are several things that I have changed from the original design including:

- The player will be able to interact with parts of the island such as the clouds and the sun.
- There will be a helper character that will guide the player through the game.
- An interface must be added (such as a basket) to show which parts of the fishing rod the player has collected.

DINOSTONES

Initial Brief

Situation

Increasingly, animation is being used to teach skills and communicate complex information. Animations are used in Industry as well as in educational institutions. Animation design requires a combination of complex skills such as analysis of existing solutions, understanding a client's needs, and translating information into a visually exciting and workable format. Having the skills to successfully design and build a user-friendly Animated Learning Tool is an important and valuable skill in today's society.

I have been asked by [REDACTED], a Year 2 teacher at [REDACTED] to design and develop an Animated Learning Tool to help teach reading skills to the children in his class and perhaps even other classes in the school. I have been asked to teach a list of the 290 most frequently used words to the children. [REDACTED] has asked for this because there are few other resources he can use to teach these skills and he usually has several low level reader-writers in his class.

Brief

For this project, I will develop an animated game that will teach reading skills to class of 6 and 7 year olds in a fun and entertaining way. The game will focus on teaching the list of 290 essential words that [REDACTED] has given and will be constructed using Adobe Flash.

The development of this solution will closely follow the conceptual design I have created, however, parts of it may change, adding, or excluded during development.

Specifications

These are features that the game must have or objectives that I must complete during the development of the project.

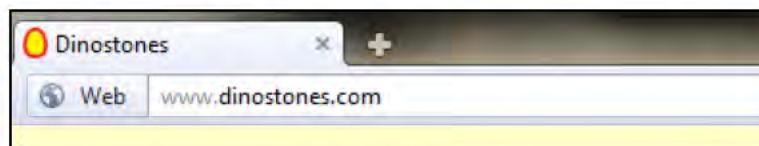
- The game must be made using Adobe Flash. This is the industry standard software used by most professionals. I have access to it at school and also at home.
- The game must teach reading skills to [REDACTED] class; this is perhaps the most important objective of the project.
- The game must include list of 290 essential words supplied by [REDACTED]. These words are what make up about 75% of all writing and reading, so they are very important to learn and recognise.
- The game must be appealing visually to 6 and 7 year olds (target audience). If the game is not appealing then the students won't use it, and therefore will not learn from it.
- The game content and themes must be appealing to target audience. They also cannot be inappropriate (such as violence) or the students may not be allowed to use it.
- The game must be user-friendly (easy to use) for the target audience. Most of the users have very little experience using a computer or playing other games, therefore user-friendliness is very important.
- The game must be easily accessible by [REDACTED] to be used for the target audience. If it is not easily accessible then the students will not be able to use it as much as they could, and therefore are not learning as much as they could from it.



Setting up the Website

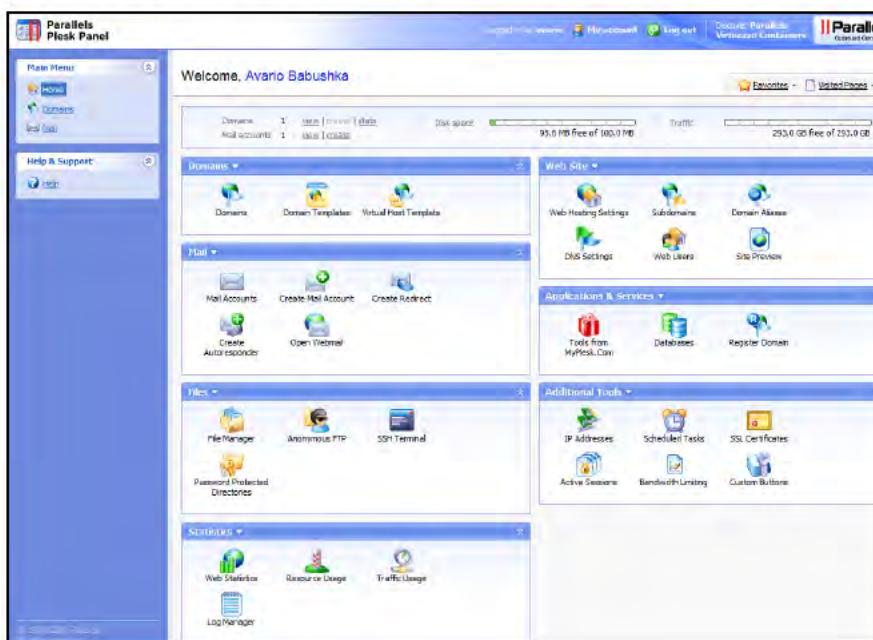
The Dinostones game will be played over the internet, accessed through a web browser. I have chosen to distribute the game this way for several reasons. This means the children will be able to easily access the game from home as well as at school. It will also allow me to give each student their own account in the game and store the accounts online in databases.

James registered the domain www.dinostones.com for my use. This is the address that will be used to access the game online.

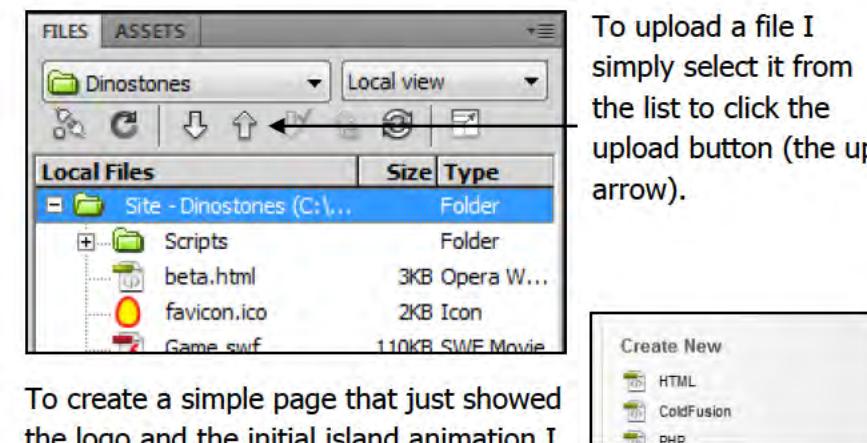


James also has access to a web host that he uses for other websites that he runs. He has allowed me to use this host to publicly store the files necessary to run the Dinostones website. As a result of James' contributions it will not cost me any money to have the game online.

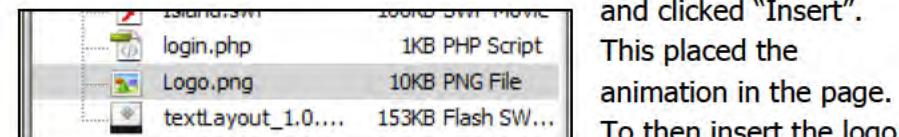
I can edit the website through the control panel of James' host:



The control panel will allow me to upload and edit the website files, as well as create databases and run PHP scripts. To more easily edit the website I have set up FTP using Adobe Dreamweaver. This allows me to edit and create content in Dreamweaver and then upload it only using Dreamweaver.



To create a simple page that just showed the logo and the initial island animation I first created a blank HTML page. To insert the SWF animation in then selected Insert > Media > SWF, located the island animation and clicked "Insert".



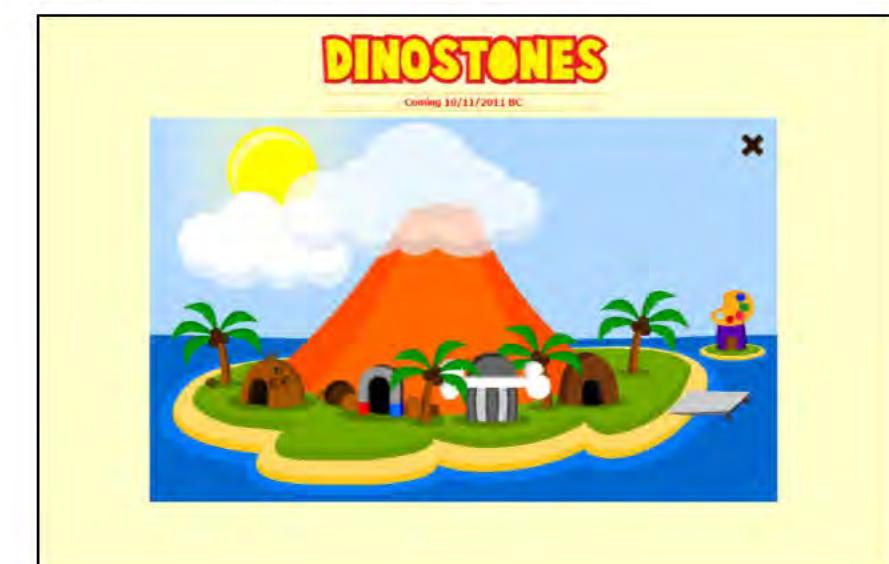
This placed the animation in the page. To then insert the logo image I just dragged it into the page from the list of files shown on the left. The line of text was then added beneath the image and I added header tags (`<h1>`) to this so that it could then be formatted.

I used CSS code to format the page to make it look just how I wanted. This code is placed between the `<style>` tags of the HTML page:

```
8 <style type="text/css">
9 body {
10   background-color: #FFFFCB;
11 }
12 h1 {
13   margin: -10px 0px 10px 0px;
14   padding: 3px;
15   font-family: Tahoma, Geneva, sans-serif;
16   font-size: 14px;
17   border-bottom: 1px solid orange;
18   border-top: 1px solid orange;
19   color: red;
20   width: 400px;
21 }
22 </style>
```

CSS code allows you to format specific parts of your page by setting values for specific properties. For example, to set the background colour to a light yellow, I first target the `body` section of the page; this is the main content, and then set the `background-color` property to the value of `#FFFFCB`, the hex code for the light yellow colour I wanted.

The finished page:



Now that the initial website has been set up I will now be able to use it test content and show it to James and his class. Ultimately this website will also host the final game once other aspects have been created.

New Specification

The game must work on a variety of computer systems and web browsers.

To allow the students to play the game from home, it is important that Dinostones is able to run on many different types of computers and web browsers. As such I am adding this to my specifications.

Path-finding ActionScript

This will be the first part of real programming that I do for the game. This part of ActionScript will be used in the Magnet Mining game and it specifically will create a random path from the entrance of the cave to the magnet that the player must dig to. It must produce paths that are interesting and not too simple; also the length of the path should be able to be specified to suit specific word lengths.

Initially, I will just create the programme to create a maze of coloured squares, each colour representing a word in the end game. Also, a rectangle will represent the entrance and a star will represent the magnet. These are some of the shapes I draw in Flash then converted to symbols so that they could be manipulated using ActionScript:



The first part of code was placed in the first frame so it executes when the animation first starts.

```
1 const ROWS:Number=6;
2 const COLUMNS:Number=6;
3 const DIMENSION:Number=70;

4 var squares=new Array();

5 for(var r=0; r<ROWS; r++){
6     for(var c=0; c<COLUMNS; c++){
7         var squareID=r*COLUMNS+c;

8         squares[squareID]=new Square;
9         addChild(squares[squareID]);

10        squares[squareID].x=30+(DIMENSION+5)*c;
11        squares[squareID].y=30+(DIMENSION+5)*r;
12    }
13 }

14 
```

The first 3 lines are variables that set how many rows and columns I want the grid to have and how large I want each square to be. Next, a `for` loop is executed that will create a grid of squares to fit these parameters by setting their x and y coordinates on the stage. This is the result:

Each square here represents a section of the mine that can be dug out.

The next part of code must be placed in the next frame to allow these squares to initialise and be manipulated further.

A random number between 5 and 20 to be used as the path length:

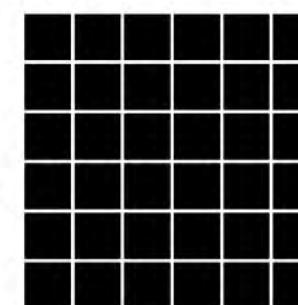
```
5 var pathLength:Number=5+Math.floor(Math.random()*15);
```

A loop is then executed that will continually add parts to the path until this path length is met, this is the main part of the code:

```
20 pathFinding: while(path.length<pathLength) {
21     for(var n=0; n<4; n++){
22         nextSquare=squares[path[path.length-1]].neighbours[n];
23         if(touches(path[path.length-1],nextSquare)
24             && squares[path[path.length-1]].trialed[n]==false
25             && crowded(nextSquare)==false){
26             squares[path[path.length-1]].trialed[n]=true;
27             path.push(nextSquare);
28             continue pathFinding;
29         } else{
30             squares[path[path.length-1]].trialed[n]=true;
31         }
32     }
33     squares[path.pop()].trialed=[false,false,false,false];
34 }
```

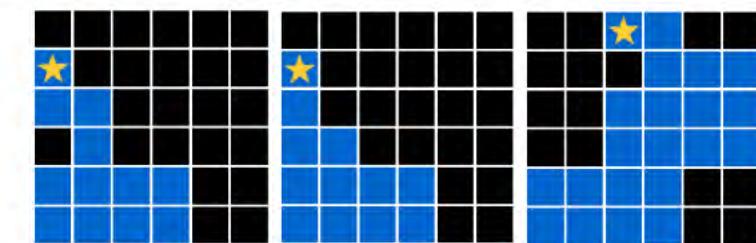
How It Works

The path finding loop is fairly simple. An array (a series of values) is created that will store the squares that are added to the path. The first square is always that next to the entrance. The code will then randomly chose one of the squares next to this one (a "neighbour") and see if it is suitable to add to the path, checking whether it is already in the path, whether it is next to any other squares in the path (whether it is "crowded") and whether it has already been checked. If this neighbour is suitable to add to the path then it is added to the array, otherwise it is marked as having been checked and another neighbour is checked. If none of the

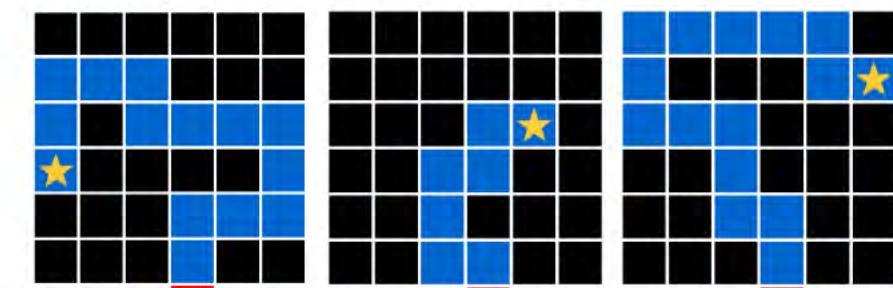


neighbours are acceptable, then the square itself is removed from the path and another neighbour of the previous square is checked, preventing the loop from becoming stuck. The squares in the path will then be changed to blue and a star will be placed on the last square in the path.

Initially I did not check whether squares were "crowded" before adding them to the path. This gave results like these:



These types of paths would not work well because the give crowded parts of the maze the have only one word and allow the player to take short-cuts. However, adding the crowded test produced much better results:



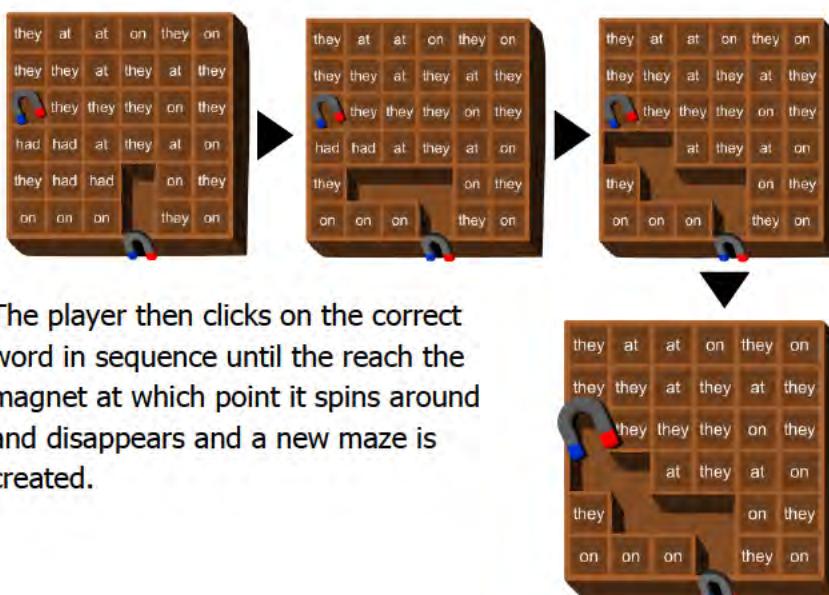
With this main code structure created, it will be easy to transform it into the mining game simply by changing the way the squares look and adding the ability to click on the path to dig the way to the magnet.

Magnet Mining Game

The magnet mining game is the first of three mini-games that I will create for Dinostones. It was designed to teach word recognition by requiring the player to mine their way to a magnet by clicking on the right word (which will be spoken by the miner character).



This is the game that the kids were presented with. At this point the character does not say the word that must be mined, instead I had to tell the kids by looking at the maze and finding the path. In this case the word is "had".



The player then clicks on the correct word in sequence until they reach the magnet at which point it spins around and disappears and a new maze is created.

Feedback from James and Class

I wanted to gain feedback from James and his class for this game before I created the other games, as they all contain similar features. I visited the class on Friday the 15th of July.



Each child in the class got to try the game and give feedback. Overall I think that the feedback was very positive, every child enjoyed playing the game and said that it was fun to play and that they would enjoy playing it as part of their school work. Some specific feedback given by several students included:

- The words are too easy. Many of the students are now above the reading level that the game is aimed at. However, I believe that this level will be suitable for children starting the year and who have not been given lessons yet. Also, the words will become more difficult as the game progresses.
- The white background is too boring.
- The game should make sounds when you click on things.
- The mining character should move.
- The mining character should have a magnet on his hat.

New Specification

The game must include sound.

The students and James have both commented on the game lacking sound and I believe that sound is a very important feature of most games. To make my game for entertaining I have decided to add this to my specifications.

I also gained some feedback from James. He believed that the game was great and that it would be successful in teaching the kids to recognise the simple words. He also mentioned a few things that he would like changed however:

- He thought the font used for the words was too simple and boring and that a more childish font should be used, like the ones found in picture books.
- To make the game harder and to fit longer words into the maze, the player should have to click on individual letters of the word, spelling it in sequence, instead of the entire word.
- He also believed that the plain white background was too boring and recommended that it be replaced with perhaps a cave background.

With James' feedback about the font in mind I searched for more fonts that I could use that were not as simple and let James choose which one to use:

Kristen
AR CENA
Doctor Soos

James chose "Doctor Soos", based on the font created by Dr. Seuss for use in his famous picture books. The font was created by Sean Trowbridge and is free to use and is what I used in the original conceptual design but did not use because I thought it may be too hard to read, but James insisted that it was perfect.

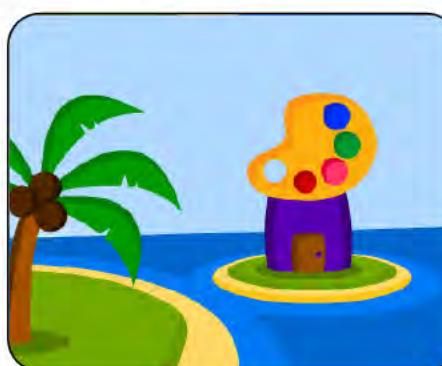
Having completed and gained feedback on the first of the three mini-games, I can now refine the mining game and continue to create the other two mini-games.

Completion of the Mini-Games

After completing the Mining mini-game I will now create the other 2 mini-games that must be played to collect essential parts of the fishing rod. These games are the Archaeology game and the Painting game.

The Painting Game

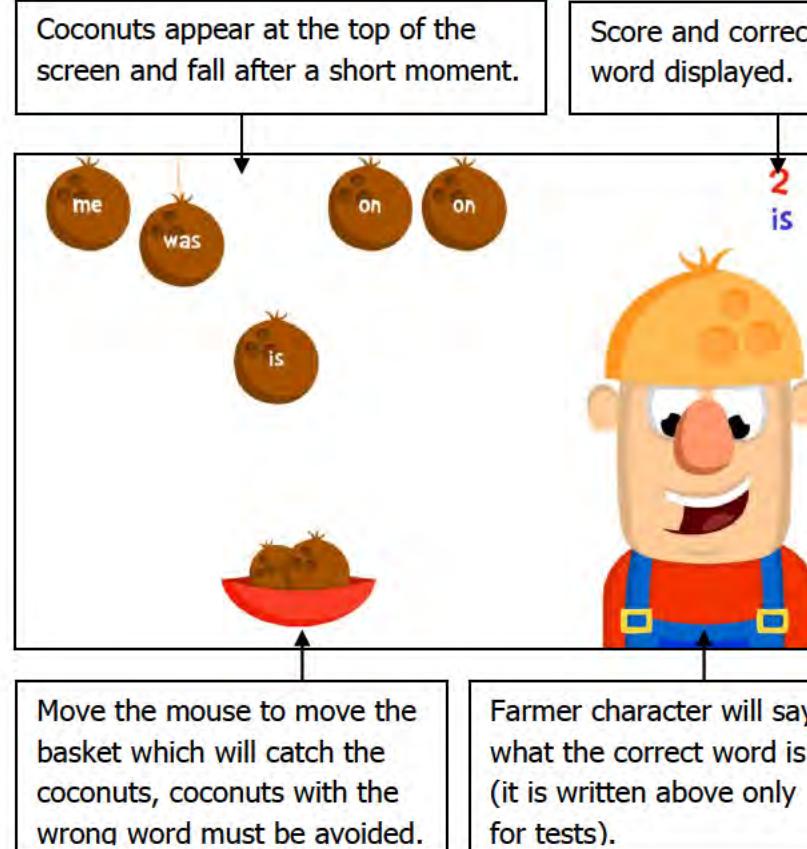
The painting game was going to enforce word recognition by having the player paint sections of a picture with a specified word written on them. However, after finding a few pictures that might have been usable for this purchase I soon decided not to develop this game as it would be too time consuming to create and colour all of the different images. Also, many words would not fit in some sections of the image and overall the concept just wouldn't work for all words. I have therefore discarded the painting game as one of the mini-games and instead (knowing how much the kids in the class liked a different painting game during one of my consultations) will include a painting activity that can be unlocked after completing a certain part of the game. This activity will be placed on a separate island as shown. I will develop this activity at a later date as it is not of high priority.



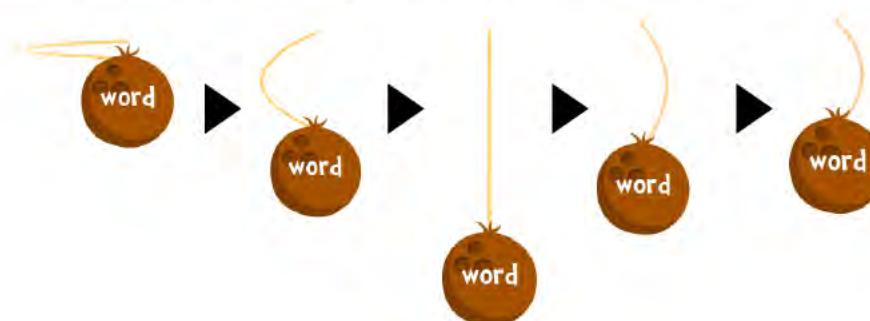
The Coconut Game

To replace the painting game I quickly came up with a concept for a coconut themed game in which coconuts will constantly fall from the top of the screen and the player will have to catch the coconuts with the right word written on them. This is where the player will collect the string to make their fishing rod.

I wanted to gain feedback from James and his class for this game before I created the other games, as they all contain similar features.



To create a realistic animation of when the coconuts drop into the screen I used a Shape Tween on the string so that it would bend as if it was connected to the coconut.

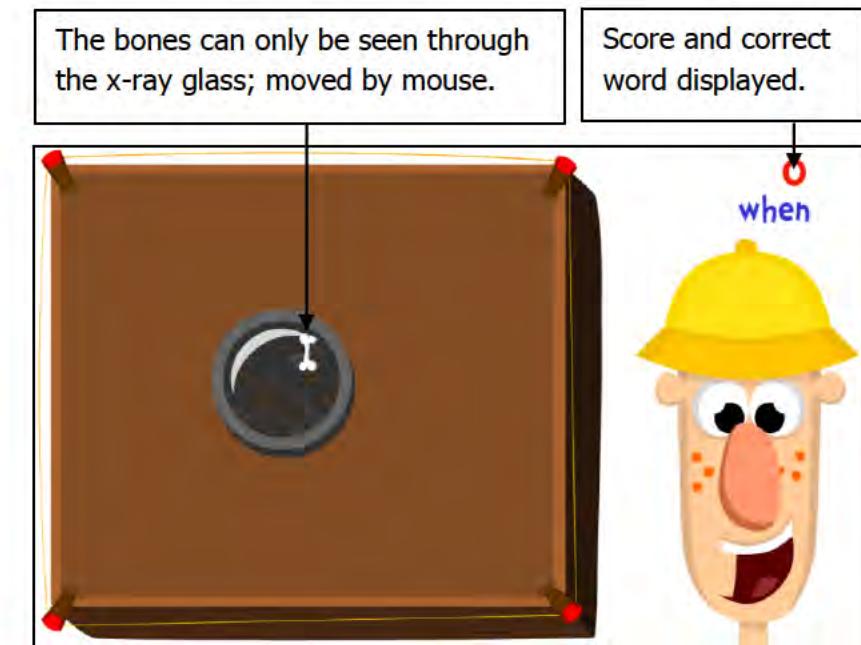


The Shape Tween will create a smooth morph between two shapes (such as the bent string and the straight string), filling in the frames in between the two shapes.

To create a Shape Tween I create two key frames with the two shapes on one each, then right click between these frames and select Create Shape Tween.

The Archaeology Game

The Archaeology game was initially going to involve the player selecting dinosaur bones that had the correct word written on them, eventually constructing a dinosaur skeleton from these bones. However, like the painting game I decided that this would take too long to make as I would have to draw all of the different bones. Instead, I created a similar game in which you have to search for bones beneath the ground using an x-ray machine.



When the mouse is hovered over a bone a word will appear. If the word is the correct word then the player can click it to collect it.



The ActionScript to make this game work involves a mask. This will only show parts of a symbol if another specified symbol is on top of it. In this case the glass masks the bones and stones beneath the dirt.

```
15 ground.mask=xray.glass;
```

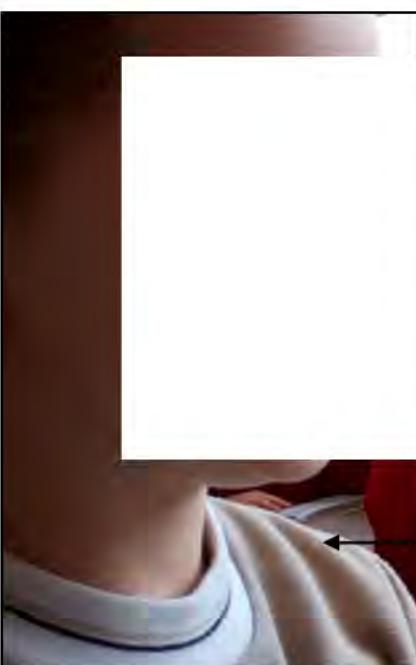
The x-ray and ground before the mask has been applied.



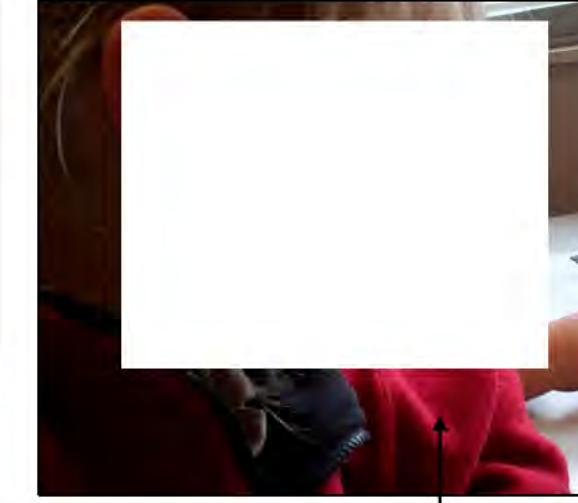


Mini-Games Feedback

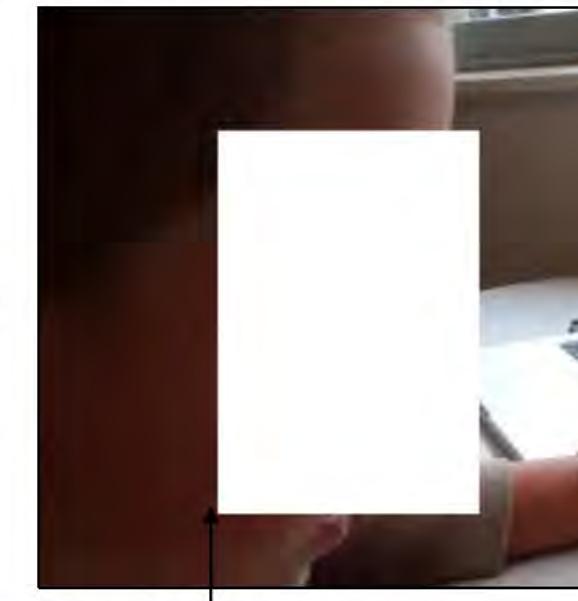
I once again visited James' class to gain feedback on the three mini-games that I have created and added to the main game. One of the main purposes of this consultation was to find out how difficult the games were for the children to play. To aid in this I added a score counter to the games to show how many words they got right and how many they got wrong. I filmed the children as they played the game and gathered feedback from them.



This girl thought that the mining game was too easy was able to work through the mines very quickly. The mining game should become more difficult however if the words are spoken instead of written on the screen, so the students can't just visually match the words. Also, if I implement James' idea to split longer words up into their individual letters this will also make the game more difficult.



This girl said the coconut game was "a little tricky." She suggested that to make the game easier I could "make the coconuts maybe come down a bit slower" to make them easier to catch.



Many of the students, like this boy, were so involved they were oblivious to the fact that I was trying to them questions. I think this is encouraging as it shows that the game is truly engaging the students and that they really do enjoy playing the games, while finding them challenging.



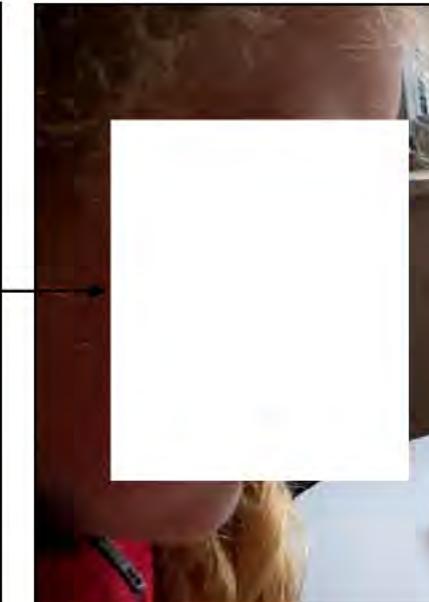
Several of the children, such as this boy, could not figure out how to player the games. I thought that they concepts may be simple enough to grasp without full instructions, however, this proved to be incorrect. When audio is added to the game I may add aural instructions to teach the children how to play the games, perhaps delivered by the characters in the game.



While with James, I also got him to choose from several visual variations I had created for the games. For example, James chose:

- A plain texture for the dirt instead of rocky.
- The original miner over a larger one.
- An elastic string for the coconuts, instead of the original one that bent.
- The magnifying glass moves towards the mouse position, instead of instantly being there.

This student "kind of" liked the coconut game, she thought that the it was too difficult. She suggested that I should leave the coconuts at the top of the screen for longer before they fall, given the player more time to read the words. The main purpose of the coconut is to encourage quick recognition however, so I will have to find a fine balance between difficulty and skill building.



The feedback gathered from this consultation was overall very positive. All of the students liked the games and none of them got bored of any of the three mini-games. The favourite game was the mining game, apparently because it was the easiest to play. The game found most difficult was the coconut game, which I will have to adjust to fit the skills of the class. James however, thinks that it is necessary for the game to be challenging and does not want it made too easy. Next step is to allow the players to collect Dinostones as rewards.

Communicating with the Server

One of the features of the game is its ability to store user details online. This will allow a player to continue their game (keep their Dinostones, level, and any items collected) from school, home, and anywhere with internet access.

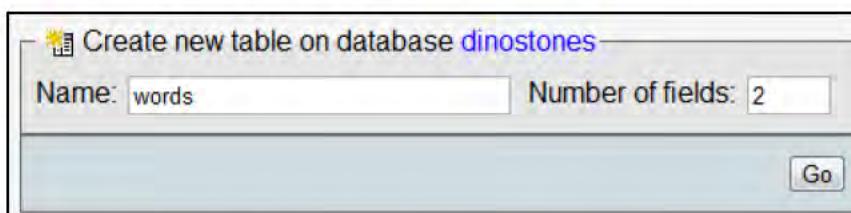
In order to make this happen, the Flash game must communicate with a server, a computer open to the internet which will store the information.

The Database

A database is a group of tables of information that can be read, altered, and added to. In the case of my game, I am using a MySQL database which can communicate with PHP.

I will set up a `users` table which will store all of the information for all of the players and a `words` table which will store the list of essential words used in the game.

To set up the tables I first log in to the host that James has set up for me and navigate to the Dinostones database. I then specify the name of the table and how many fields it will have:



Create new table on database `dinostones`

Name: `words` Number of fields: 2

Go

Next I specify the name and type of each field, along with its attributes. All tables should have a primary key so that every entry has some way of uniquely identifying it:

Field	Type	Length/Values	Collation
<code>id</code>	INT	255	
<code>word</code>	VARCHAR	16	utf8_general_ci

Finally I just hit save and I have a brand new table that I can add values to and read values from. I will manually add the 290 frequent words to this table.

The ActionScript

ActionScript must now be added to the game to make it communicate with a PHP page, the PHP page can then fetch information from the database and return it to the game. Here is the ActionScript for getting the words that should currently be used in the mini-games:

```
50 var wordsVariables:URLVariables=new URLVariables();
51 var wordsRequest:URLRequest=new URLRequest("words.php");
52 var wordsLoader:URLLoader=new URLLoader;
53 wordsRequest.method=URLRequestMethod.POST;
54 wordsRequest.data=wordsVariables;
55 wordsLoader.addEventListener(Event.COMPLETE, setWords);
56 wordsLoader.dataFormat=URLLoaderDataFormat.VARIABLES;
57 function getWords(){
58     wordsVariables.level=level;
59     wordsLoader.load(wordsRequest);
60 }
61 function setWords(e:Event){
62     words=wordsLoader.data.words.split("_");
63 }
```

First this script sets up a `URLVariable` that will store any information to be sent to the PHP page (in this case we want to send the player's level). Next, a `URLRequest` is used to specify the PHP page we will request (`words.php`). Then, a `URLLoader` is created which is what will actually download the information from the page. Simple enough, right?

When the `getWords()` function is called the player's current level is sent to the `words.php` page. When this request is returned (with the words we want) the `setWords()` function is called, splitting the returned text into an array and setting this as the words to be used in the mini-games.

New Specification

Players must be able to save their game.

To ensure that the students will continue to play the game, I think it is important that their progress in the game is saved and can then be continued at another time. This idea was envisioned a while ago but I now believe that it is an important part of the solution and should be added to the specifications.

The PHP

ActionScript will call a PHP page just as a normal user browsing the internet does. A large portion of webpages run off PHP as it allows for dynamic pages to be generated depending on information received from the user and information received from the server.

Here is the PHP code for the `words.php` page:

```
1 <?
2 $connection=mysql_pconnect('localhost','avario','*****')
3     or die('Could not connect to server.');
4 mysql_select_db('dinostones',$connection)
5     or die('Could not locate database');
6
7 $start=$_POST[level]*4+1;
8 $end=$start+3;
9
10 $wordsquery=mysql_query("SELECT word FROM words WHERE
11     id BETWEEN $start AND $end");
12
13 for($i=0; $row=mysql_fetch_row($wordsQuery); $i++) {
14     $words[$i]=$row[0];
15 }
16 echo "words=".implode("_",$words);
17 ?>
```

The first 6 lines connect to the `dinostones` database. The ID of the first word we want to select from the table (`$start`) is then calculated considering that the player moves up the table four words for every level and the first word has the ID of 1. The last word is then specified (`$end`) as 3 words after the first word.

A `mysql_query` then selects all of the words from the table that are between the first and last word (including those words) and these words are added to an array (`$words`). The words are then written out as a single line separated by underscores. This line is what is returned to the ActionScript of the game, which then splits the line up into the individual words.

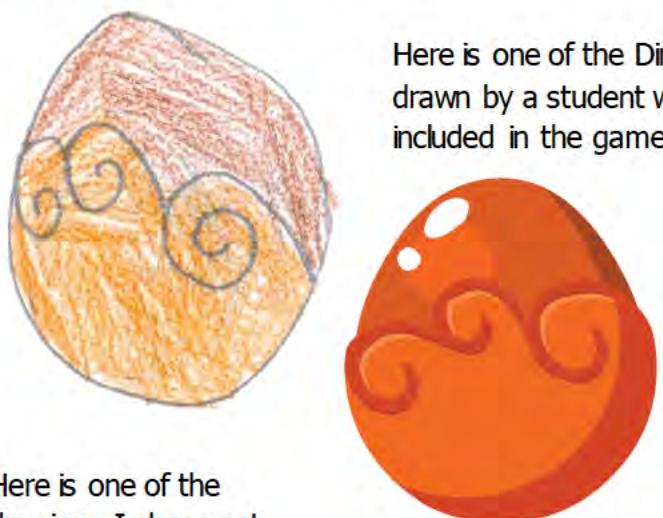
Similar methods will also be used to communicate with the database to keep track of the player's scores in the mini-games, their level, and the Dinostones that they have collected.

Dinostones

The main incentive to play the game is to collect the magic stones called Dinostones. Not only will these magical stones prevent the island's volcano from erupting but these collectable eggs can also be compared with the player's friend's stones.

When I last visited James' class I asked James if he would get the kids to draw some Dinostones as an art project. I could then trace these stones in Flash and the kids could collect the very stones they had drawn in the game. Not only does this personalise the game for the class, but adds more value to the stones that they collect and makes the kids feel like part of the development process. How could you not want to play something you helped build?

The kids drew a variety of stones ranging from the strange and questionable, to true artistic masterpieces. Unfortunately not all of the stones were suitable for the use as a Dinostone, but I was able to trace a fair few into the game.



Here is one of the drawings I chose not to include in the game:



Here is one of the Dinostones drawn by a student which I included in the game.

More of the stones the kids drew shown next to their corresponding stone drawn in Flash:



I drew the remaining stones myself and also traced them in Flash. Some are shown here:

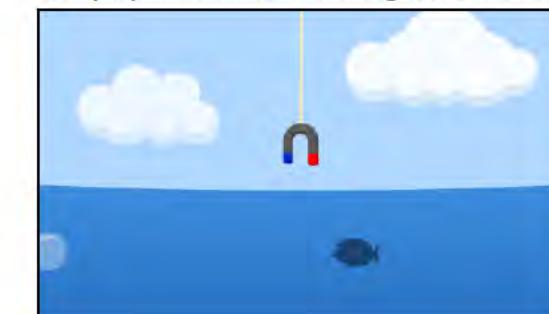


That Dinostones serve as a good reason for the children to play the game. I think that this reward will even result in kids playing the game from home to collect Dinostones to show to their friends at school. 97 of the 100 Dinostones are shown on the next page.

Fishing

The fishing animation is run when the player has collected all the parts of the fishing rod and then clicks on the wharf. It is used as a suspense builder and allows time for the game to download the sound files for the new words the player will have to learn to get the next Dinostone.

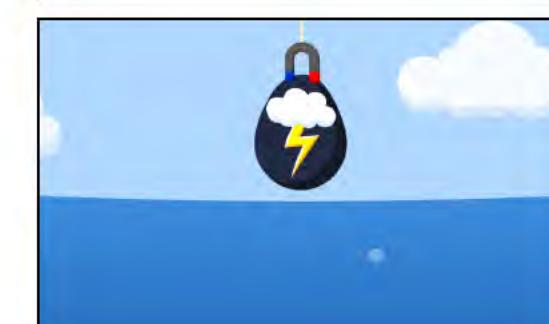
The player controls the magnet hook with their mouse, pulling it into the water and to the bottom of the ocean.



The sea is animated with fish and bubbles to give a point of reference as the hook moves down.



When the player reaches the bottom their hook will attach to the stone and they can begin to move up to the surface.



When they reach the surface they can clearly view their stone and it will be added to their collection.

To draw the line from the top of the screen to the magnet hook a simple piece of ActionScript is used, the `curveTo()` function:

```
68 line.graphics.curveTo(450, (magnet.y)/1.6, magnet.x, magnet.y);
```

This function will draw a curved line to the coordinates of the magnet and curve it a certain amount given the depth of the magnet in the water (the line should curve less as the string gets longer).

2011 Outstanding: Score 20



Incentives to Play

Hidden Dinostones

When I visited James' class and had the kids play various "educational" games. I realised that the children were very reluctant to play games that they knew were very educational and were not very fun. I have put in place several features that will make the game more entertaining and provide incentives for the children to play the game.

Day and Night

I added the ability for the player to control the time of day by dragging the sun. When they drag the sun below the island it will go dark, the moon appears, a symphony of night-dwellers begins to sing, and it changes to night.

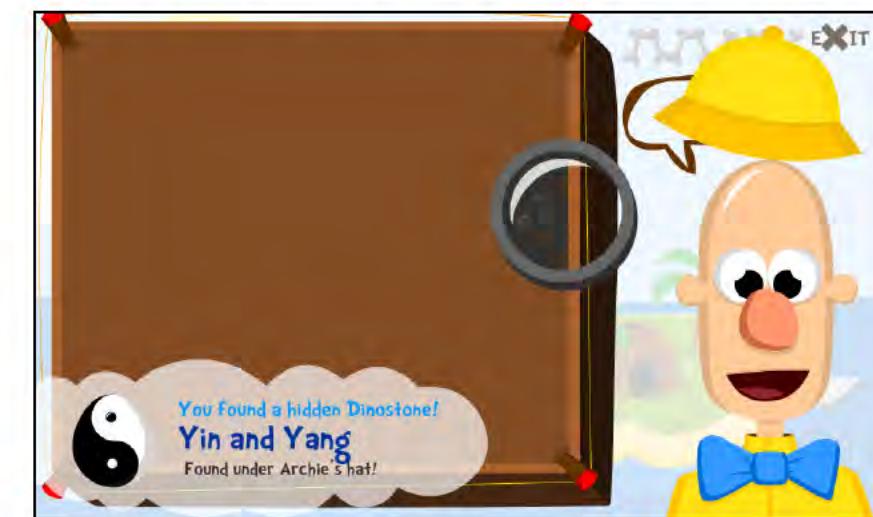


Dragging the sun back up or dragging the moon down will change it back to day-time.

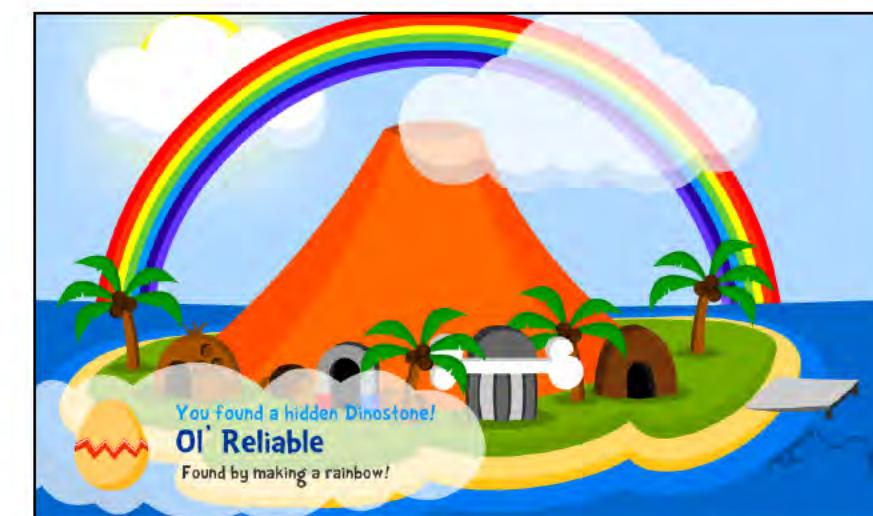
I have also allowed the players to drag the crowds in the sky and click on the coconuts the fall from the tree (which causes them to mysteriously fly into the air).

I think that small additions such as these will make the game more fun to play and it shows the players that the game is not entirely educational.

If the player clicks on the archaeologist's hat during the game, it will fly into the air and they will find a Dinostone hidden under it (the Dinostone found is randomly chosen). Dinostones can also be found under the miner's scarf, in the farmer's pocket, under a rock outside the magnet mine and under a coconut.



The kids asked to have a rainbow in the game, so by holding a cloud in front of the sun for 3 seconds, a rainbow will appear and a Dinostone will be found.



The stones the players collect can be viewed by clicking on the volcano in the centre of the island. They are displayed in a table and the ones that they have not collected are shown as grey silhouettes.



This gives the players something to work towards, as Mrs _____ suggested. I also made some stones "ultra-rare", which are actually just as rare has the other stones but appear in the ultra-rare box. Clicking on a collected stone will show a larger view of it and a short story or description to go with the stone. These descriptions add more value to the stones and give the players the opportunity to test their reading skills.



Voice Recording



Initially, I had hoped to have the kids in James' classroom do the voices for the characters in the game. However, James managed to get ill in the week that we had planned to do this and so unfortunately the children were never able to do the recording.



is a professional story teller that lives on Island. She has travelled the world many times telling story and giving aural presentations at many events across the globe. She also runs the local "Story Centre".

I contacted Tanya to ask if she could do the voices for the game. She replied saying she would be happy to; however, she was in South America until the second week of the holidays.

This resulted in the voice recording happening much later than I had hoped.



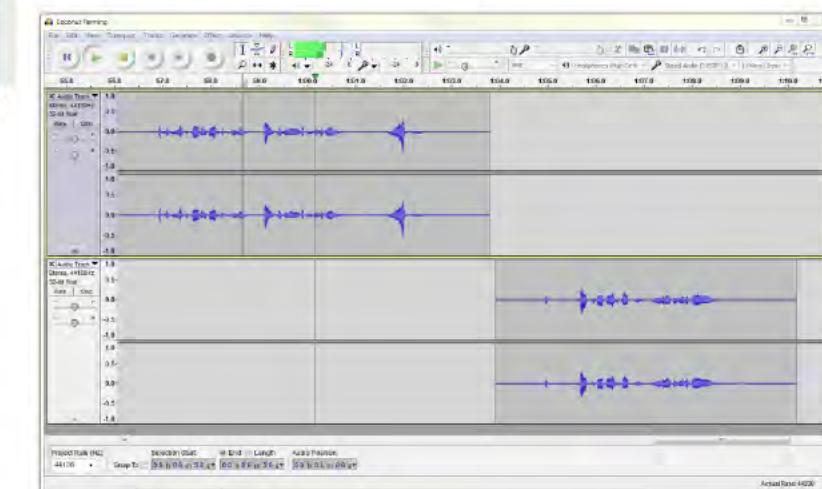
is a year 13 Drama student at my school. He has been involved in many drama productions and also runs a weekly radio show at Waiheke Radio.

I also recruited Seth to do the voice for the in-game help voice. He also reads out all of the 290 essential words for the game.

Because Seth has access to the Waiheke Radio recording room, I was able to use this for the voice recording. Seth's expertise was essential for this process, allowing us to gain professional quality recordings.

[New Stakeholders](#)

Editing



Once we had acquired a recording, Seth and I used a free piece of software call Audacity. This allowed us to edit the recording. We used this to split the large recording into its smaller parts. In Seth's case, we had recorded the 290 words all in one recording. I then went through a split this recording into each individual word.

I also used Audacity to change the pitch of Tanya's voice for each character. For the coconut farmer I increased the pitch slightly to make her voice sound younger. For the magnet miner I decreased the pitch, making the voice sound more masculine.

Implementation



When the audio files were imported into Flash, they were compressed to allow them to be downloaded quickly. I had initially thought that I would animate the mouths of each character to match what they were saying. However, after creating the mouths, and trying this method on a piece of audio, it was so time consuming that it was not viable. Instead, I used speech bubbles which have what the character says written in them.

These are the mouths I created; each mouth is shown for a different sound such as "oh", "ee", "s", and "f".

Stakeholder Feedback

John

John is a friend of my uncle's. When I visited my uncle during the holidays I was able to meet with John and discuss the game I am making and also learn more about his technical process.

He was very impressed by the game. He especially liked the graphics and said that being more of a programmer, he could not produce very effective graphics. He said that he usually outsources graphic work to friends he knows.

He gave me some general advice for game development:

- When you come up with an idea, you have to consider whether it is really worth making it, or if it will just be a waste of time. Game development is very time consuming, and the best way to reduce the amount of time you will spend on it is just to remove unnecessary aspects of the game.
- Always consider how the game is played from your customer's perspective, it doesn't matter what you think of your own game because you are not the one who will be buying it.

He also looked at the ActionScript in my game. He has never programmed anything in ActionScript but it is similar to many other languages so he was able to point out a few ways I could improve my code.

One thing he recommended was to use arrays instead of separate variables where the variables are similar. For example, to store the current state of the parts of the fishing rod I made three separate variables. However, John recommended that I instead store all three variables in a single array. This will simplify the code and make it easier to use.

```
13 var pole:Boolean;  
14 var line:Boolean;  
15 var hook:Boolean;
```



```
13 var rod:Array=[false,false,false];  
14  
15
```



New Stakeholder

has had an important impact on the development of the game, specifically on the ActionScript and functionality of the project. I will continue to contact John about other parts of code that I need guidance for and for this he is a new stakeholder in the project.

Mrs

I consulted with Mrs again in the first week of term 4, I had planned to talk with her last term but she got too busy so we had to re-schedule.

Mrs loved the game and gave very positive feedback. She thought that the Dinostone reward system would be very effective and thought that the stones were like collectables that kids traded at school. She thought that a more clear levelling system could be used however, perhaps with a "Reader Level" displayed somewhere.

She was disappointed that there was no game that focused on the sounds of words however. She had recommended that the students should have to combine sounds to make words such as combining "bl" and "imp" to make the word "blimp". I was unable to do this due to technical difficulty however.

She thought that the game would be effective in teaching kids to recognise the words that were included and although she thought that there may be better ways to teach than rote learning, she believed that it would be effective in enabling the kids to quickly recognise the frequently used words because of the repetitive nature of the game.

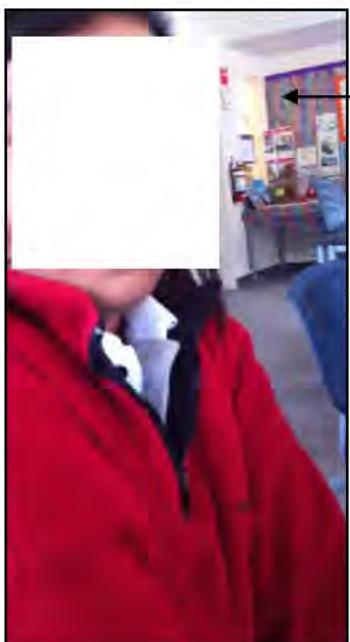
It was recommended by her that I implement the game at Te Huruhi Primary school as well. I may do this in the future; however, I don't have enough time left to do this before the project is due to be handed in.



Final Stakeholder Consultation

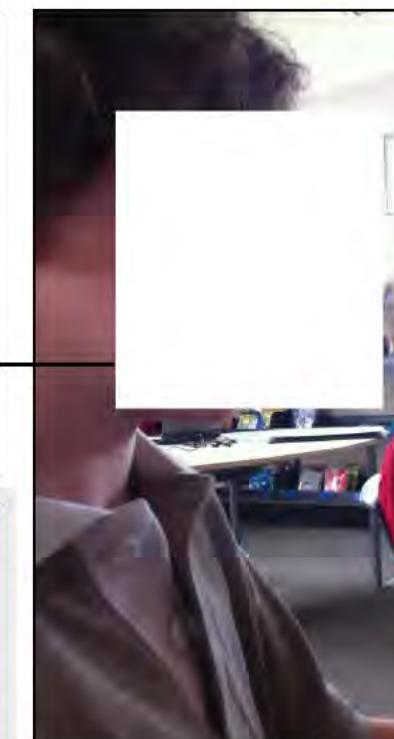
Friday, 28 October 1:00pm

Once again, the students of James' class were assembled in the library and were, for the first time, able to try out the completed game. This feedback will be used to gage how successful the game really is and get an idea of any alterations that should be made.



This girl was the first player to collect a Dinostone in the game. There was an obvious sense of pride in what she had done, and she soon had many of the other player come over to see the stone she had found.

This student found out that you could move the sun to change it from day to night very quickly this spread throughout the library and within minutes everyone knew how to do it. None of the hidden Dinostones were found by any of the students. I think that this is good because it means that these things will be found slowly, keeping the game interesting for a longer period of time.



Overall I think the children really loved the game and I believe that they will continue to use it, hopefully at school and at home. The Dinostone reward system work very well, the kids spent probably just as much time playing the games as they did looking at their own stones and running around to see the stones their friends had collected. The ultra-rare stones worked especially well, the children were very pleased when they found these stones, and the students who did not find ultra-rare stones were very motivated to keep on playing to find one.

The kids were much better at the game than I expected, most of them did not need to learn the words as they already knew them. This is probably because the game was aimed at the students at the start of the year; they seem to have learned most of the words in the game throughout the year. It took most students around 10 minutes to collect each Dinostone.

The kids also really liked the voices in the game. Often mimicking what the characters were saying.

Stakeholder's Take

was very pleased with the game and thought that it worked much better than he ever expected that it would .He could see that the kids were really enjoying the game and thought that he may create a time each week that the kids would be able to use the computers to play the game. He had several suggestions that may improve the game:

- One of the major problems with the game is that it requires the players to listen to the words that are spoken and then try to recognise them. This means that the players must either have speakers or wear headphones. It is difficult for everyone to use speakers in the library as it would get quite loud, and James did not have enough headphones for everyone in the class. James acknowledged that there was really no way around this, he may try to get some more headphones, however, he recommended that I add some sort of reminder to the game that would remind the player to have either headphones or speakers.
- Many of the students said that the coconut game was still too hard, even after I had adjusted the speed and number of coconuts in the game. However, James thinks that it is important to have challenge in the game. He suggested that perhaps the difficulty of the game could increase as the player levels up.
- James also thought that some sort of welcome message would be nice when the player first starts the game to make it more personal to them. This could include the player's name.

Some other alterations suggested by the kids:

- There needs to be a repeat button to hear which word you are looking for again. Often the kids did not hear the word correctly by listening to it just once.
- The locations need to have labels so they know what each location is. For example, the game says, "You can click on your house to learn any new words," but many kids couldn't figure out where your house is.

The feedback from James and his class was very positive and there are very few alterations that I will need to make to the game. Perhaps this is dues to the large amount of polishing I did during the holidays.

Final Evaluation

Dinostones is now complete, and having had James' class test the game I believe that it successfully meets the specifications of the brief and is an effective solution for James to use.

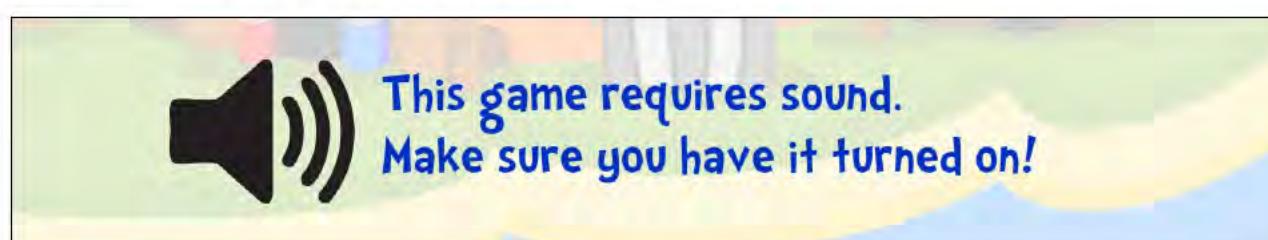
Final Alterations

In response to the feedback I gathered from James and his class, I made several alterations to the game to ensure that it would be as successful as it could be.

As James suggested, I add a welcome message to the game. When the player logs in, a short message appears to welcome them back to the game. For example, if the player's name was Chuck, the message could say "Have fun, Chuck", "Welcome back, Chuck" or "Keep collecting Dinostones, Chuck."



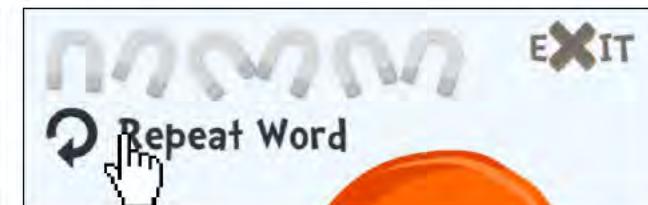
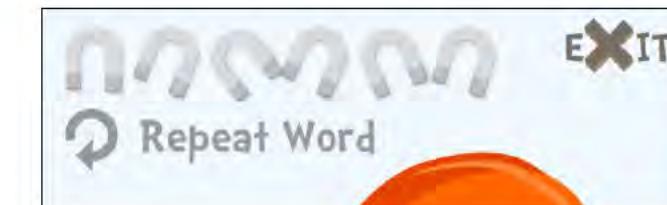
Also taking James' advice, I included a message beneath the login input advising players to make sure they are the sound on:



The difficulty of the coconut game now increases as the player plays the game more. This is done by shortening the time the coconuts are shown before they fall, and how fast they fall, making these inversely proportional to the fourth root of the player's level:

```
Timer(Math.floor(Math.random()*4000/Math.pow(MovieClip(root).playerLevel, 1/4))
```

The students recommended that I add a button to the games that would allow them to hear the word they were looking for again. This was due to the fact that they often did not hear words correctly or had simply forgotten. Here it is:



I noticed while watching the kids that many of them could not figure out where some of the locations were. To help remedy this I added pop-up labels to the locations that reveal themselves when they are referenced. For example, when Seth says "Go to the wharf to fish up a Dinostone", the wharf label will pop-up to show where the wharf is:



Evaluation of the Specifications

The game is able to teach reading skills to the class. This is difficult to test with James' current class as most of them have already learned most of the words taught during the year; however, I believe that next year's student will be able to learn using this game.

Players are repeatedly required to recognise simple words. This repetition will help them remember these words easily and recognise them quickly when they see them again.

Dinostones includes 287 of the 290 words that were mentioned in the initial specifications. Three words were not included in the game – I'll, I'm and it's. These were excluded because it was hard to make the apostrophes work in the mining game and I think that excluding these words has very little effect on the overall game.



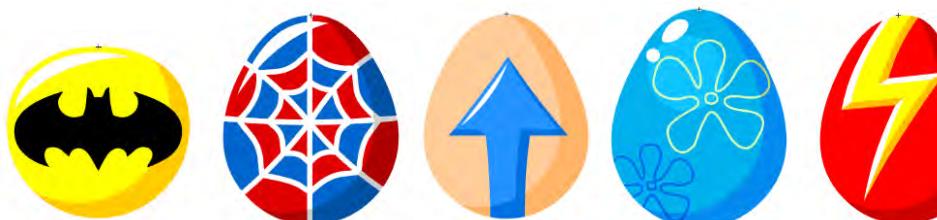
The game is visually appealing to the young children in class. It contains cartoon graphics that the children really seemed to like. I think these graphics make the game seem more fun and help to make the kids think that it is not a purely educational game.

The game also orally appeals to young children as comical sound effects have been used and and have supplied voices which are both interesting and friendly.

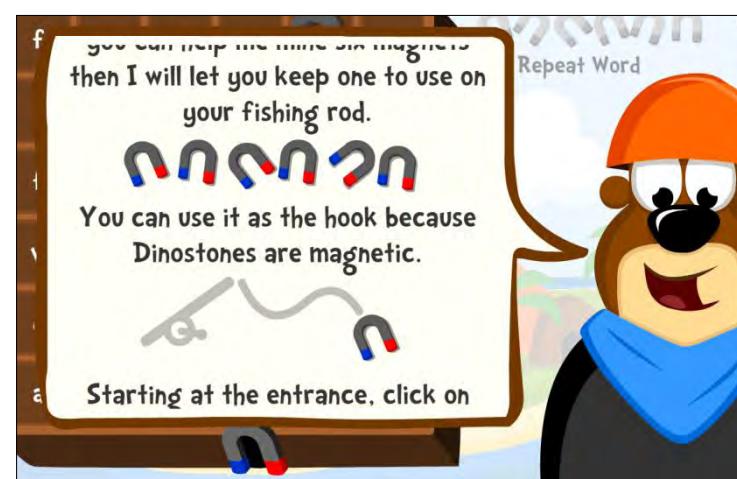


This appeal helps motivate the children to play the game. If they did not have any desire to play it, they probably wouldn't, and therefore they would not learn from it.

Content and Themes in the game are all appropriate for six and seven year old children. No violence or inappropriate language is used. However, I think that it is important that the players are not treated too childishly, for they have to feel that they are doing something important when they are playing the game. To make sure this is the case, I have included several features in the game that specifically aim it at this age group. For example, several super heroes are alluded to in the game as at this age children often idealise these characters. The difficulty of the game also reflects this age group as it is challenging for most of the students, yet not too difficult that they ever want to give up.



The game is very easy to use. It only requires the use of the mouse (apart from typing in the login word). None of the children had any problem using the game and most of them were able to use it very well without even listening to the instructions. Despite this, simple instructions are given aurally and visually to the player which makes it clear how to play the game.



2011 Outstanding: Score 20



The game is very accessible by Dinostones is available online, so it can be used on any computer that has internet access. This means that it can be used on all of the school computers and also on the students' home computers.

Evaluation of Feedback

During my final consultation with and his class the game received very positive feedback. The students really enjoyed playing the game and from watching them I believe that they were also learning to quickly recognise the words. gave very positive feedback and thought the game was a successful solution.

Further Development

If I was to continue the development of Dinostones further, I may have included a feature that would allow different reading levels to use it. This would really only be a matter of adding another database of new words. I may have also expanded the project to include Te Huruhi Primary School, the other primary school on Waiheke Island.

Conclusion

Dinostones is online and the students of class are now able to use it to learn to recognise essential words. I think that this game can hopefully be used for many years to come and that the students of it and learn essential literary skills.