

Measuring the success of my solution.

	Feature	Aim (how it should work)	How successfully did it meet its aims? What effect could does this have?
Mechanics	Playable character mechanics.	The playable character should be able to freely navigate (in eight two-dimensional direction) the world and interact with certain objects and platforms.	The playable character can navigate the level using the arrow keys to move left and right and the space key to jump. The controls are very responsive and the last key is registered, meaning you can't break the movement of the robot. Jumping and horizontal movement is independent, meaning you can jump left and right. This allows it to move freely across the level as intended, unless the level itself restricts it. With the controls as solid as they are, it really gives the player a feeling of control. This makes it easier to accept that you are playing the game. The change of jumping to space also means that a player is more likely to use both hands when playing the game- this lack of a free hand gives them less chances to be distracted. As a core mechanic of the game, it is important that the movement is simple and effective, as it becomes less of a burden and requires less brain power, allowing the user to spend for attention to the environmental aspects of the game.
	Object mechanics.	Objects should be intractable with the character, some should block the character's ability to freely navigate the map until certain conditions are met, such as interacting with another object.	The objects themselves will stop the player from progressing past them, but it does so by stopping the player's movements past them. This leads to some loss of emersion as there are no animations of trying to push up against a block. On the other hand, this could be seen as a good thing, as the bounding box for objects are usually bigger than the object themselves, leading to the robot pushing against nothing. Because some objects will talk, if you interact with an object, you'll have to press enter twice, this has been spoken negatively quite a few times by players, but is only a very minor inconvenience. The main issue about objects is that you can attempt to interact with them again. This will lead to the player being stuck in place again until they press enter. Players complained that there was a lack of information provided about this event and they had no idea what was going on, really ruining the experience. To combat this I provided an instruction set because while the kiosks in the introduction of the levels do provide an interactive tutorial, I received a concerning number of responses complaining about not knowing to press enter, it would seem like the symbol may not be clear enough to be interpreted by others.
	Platform mechanics.	Platforms should always interact with the character by being solid and preventing the character from passing through them at any time. This can be disadvantageous like a wall, or a key benefit like a floating platform to add jumping over a wall.	Vertically, all interactions with platforms (or the tiles that the platforms consist of) work perfectly as intended, this allows the game to actually be plated, as you stand on platforms. Horizontally, the tiles act a littles different. The displacements get weird if you start jumping into walls that are made of tiles. There was one event where some players managed to crash the game by escaping the final level. This is shocking as that meant they had to get past a solid wall of tiles. This is interesting, as while they act as platforms to stop vertically movement they work without flaw, but in this case of acting as a wall for horizontal movement, they failed. Ideally, the platform mechanics would be perfect without these abnormalities, but overall behave enough to allow level progression to the end of the game.

	Level and environmental mechanics.	The character should be able to change level after meeting certain conditions (e.g. reaching the end of the screen, pressing up on a door or collecting a flag). Everything should be able to be placed in the environment and communicate to avoid any placement issues.	When touching the right side of the frame, the game will load the next level and spawn the character and all the objects into it. This works fine and makes the game enjoyably simple, but somewhat linear. All objects are placed using coordinates, resulting in some loss of placement freedom, but this can be overcome by modifying the image. On the other hand, the biggest flaw in the whole program exists in the level transition code. If the player tries to jump into the next level (this is the jumping state of the jump, falling is fine), the code will bug out, causing the player to be stuck to the edge of the screen, unable to move- effectively crashing the game. An exit tile has been placed at the end of teach level to attempt to stop this from occurring. While the tile has definitely reduced the chances of this happening, the error is still part of the game.
Solution/ Game	The main character.	The main character should be science themed and child friendly. While navigating the game, the character should be animated and respond well to the users inputs.	The character was designed to be a robot. I have received very little feedback on the robot. I take this to be confirmation that the robot has a user friendly design. The animations themselves are nothing special but hold the weight of animation to keep the game looking nice in that aspect. Upon viewing players use the robot, there were some that attempted move the robot with a series of rapid tapping. This was weird to me, but I overlooked the situation where someone has had never little experience with games. Unless you press and hold the arrow keys to move, you will experience quite a bit of difficulty completing some levels. At no point in my game did I explain that you would need to press and hold the keys to move left and right, nor did I state that you'd only need to tap the space and enter key to perform their assigned actions.
	The levels.	Each level should have objects creating puzzles to retard the progression of the player, followed by a smooth and clearly defined transition for progression to the next level.	Each level is now different from the design. This is a good thing, as each design level was confined to a single screen and was very cramped in effect. Now that what was one designed level has been spread across multiple screens, the game is not only longer, but each puzzle now has more space to play out. This has also allowed me to stray away from the repetitive nature of the designed levels (they were designed as such to allow the greatest concentration of objects in a single screen). With tiles, the character and objects all painted on different layer, they can only clash with themselves mechanically, but this did make some of the level design very hard. This is evidenced with the massive design change with the DNA puzzle, as going from background design to objects was too difficult. Of course, due to the limitations of my abilities, I have received a lot of feedback stating that the game becomes very repetitive and is rather simple. Suggestions like include puzzles and have levels where you need to move objects has been included. These are all valid tactics that would have included (and some are included in my plan but just couldn't be implemented in the end).
	The themes used.	Each level and puzzles in the game should have the theme of GCSE triple science. On the other hand, things like the character and any possible tutorial levels should be science themed, but should avoid directly symbolising one of the three core sciences.	With objects only implemented after being designed from themes right out of the GCSE science books that the school uses, there were little chances for the puzzles to be out of place. The backgrounds are a bit hard to interpret; as the same background design is used for each subject, I had to design them to avoid encompassing too much of a single topic in each one.
	The game aesthetics.	The visual designs of the game should be consistent, giving the game a feeling of completion. While the art itself should be clear enough so that the user can determine what it is that they are looking at.	As I personally drew all the graphical assets from scratch, there is a consistency in terms of aesthetics. This consistency allows the visuals to be subpar, as it becomes possible to interpret this design as stylistic. While the game will never receive any complements about its breath taking visuals, I am yet to receive a complaint. Only issue with the aesthetics is that some of the objects are not clear or easy to interpret, I have tried my best to amend these objects when they are brought up.

User interactions/ Themes	The users experience during the game.	The user should be engaged during their time playing the game. Ideally, they should be reading text and not skipping object interactions to finish the game in haste.	<p>The game lasts longer than I expected. While I haven't gone around timing each play through, it lasts long enough to take a portion of a break time (the shorter break being fifteen minutes), without putting the student dangerously close to the end of break time.</p> <p>User engagement during playtime is surprisingly high. No user has skipped any text yet. This was surprising, as research shows that action games are very popular- I assumed this would have led to impatience with the slow pacing and event light gameplay that the solution offers. Although, I did briefly talk about the raw desperation for a student to play a video game in school. I believe that this is part of the reason so my undivided attention goes into playing the game. I also feel that by knowing that the game was created on school software leads to a type of interest in the game. This curiosity of having no idea on what to expect of a product is exciting and will draw in users, as the solution has shown. This has the issue of only working for the first play though, although I didn't design the game to have high replay value, as that'll get it targeted by teachers.</p>
	User interactions and views after the game.	The whole purpose of this game is to promote GCSE science and build up an interest in science in general.	<p>I did see some talking about the game within groups (usually 2-3 students). I asked them to try and guess the themes before they started the game. This worked very well as I did see some discussions about the themes amongst tester. On the other hand, as there was some debate about some themes and puzzles, there may be some issues with how easy the themes are to interpret. This isn't too much of an issue, seeing that there are themes present that they have never seen before.</p> <p>In terms of interest in science, it seems that science is one of the more popular subjects in school. It seemed to break down into two groups - those who liked science and were very interested in it and those who didn't really understand science and this caused them to attempt to avoid it. Hopefully my solution could reach out to the latter group, showing them that there are many ways to learn science past heavy reading.</p> <p>This increase of science popularity has seemed to stem from the romanticism of science from media, with television and online videos depicting grand displays of science. This is a little worrying, as science isn't all practicals and involves a massive technical side full of paperwork. However, seeing that no student turned down the chance to try and play the game, and that some students have found me while walking in-between classes to ask for a chance to play. Even if it just serves as a distraction, this shows that it is somewhat popular, allowing the themes that in heavily embodies get maximum exposure.</p>

Management	Solution testing.	My solution needs to go through rigorous testing and quality control to ensure my client gets the best possible solution to their problem.	<p>Due to the time taken to get objects to work, there hasn't been any formal alpha or beta-testing. The word formal is very important, as a large number of students from different year groups and a few members of staff have completed a play through of my game during stages of version 5, changing the end result into a much more user friendly experience (an example of this is the instructions added to the background of the first level, this background edit was given by a fellow year 13 student playing a very early version).</p> <p>In terms of testing the solution myself, this was done by module. In the five versions of the game, four of them introduce each module. At the end of a developed version, I would then test and review the implemented modules. Post development, there were also times where this testing would lead to changes. Version 5 received extensive formal testing, being placed against my original plan. This was quite eye-opening, as all the changes in testing not only showed the modifications made due to hurdles met in the development process (like the collisions with objects), but test that were removed because after review from both myself at a later date and players, certain parts of the game were decided as redundant (like the electroplating station object).</p>
	Client meetings and interactions.	As this is the solution to my client's problem. I need to maintain regular contact with my client to ensure that they are well informed of everything that is going into the solution and that every aspect of the solution has their approval.	Not really much to review here. As stated before, my client is very busy, therefore my contact with him was limited, but each one was very important. This often led to my client reviewing massive amounts of content in one section. This was possible not only due to a strong trust and good communications between use, but the clever use of diagrams and examples to ensure that my client was comfortable in understanding the concepts I was explaining to him.
	Planning, deadlines and documentation.	To ensure the project is done on time, plans will be made for sections of the work. Deadlines will result from these plans, as well as deadlines to show my client prototypes and get feedback.	<p>A project log and Gantt chart was used to manage and allocate time to tasks. Due to balancing this project and the constant invasion of school work and exams, the allocated time is vastly spread across the year. This is model in the Gantt chart, as the focus is in the actual time taken on each task and the total allocated to each section, rather than dates to get them done by.</p> <p>On the other hand the project log concerns itself with the dates that I started each task, but not the time spent on each one. By using both the project log and the Gantt chart, it become possible to get a clear picture. Considerations such as time allocated to familiarising myself with Java really paid off; but there are sections such as object development, where I didn't account of loss of productivity via mock exams and illnesses.</p>
Client	The product needs to be science based	All assets and themes in the games will be science based, from level to object and obstacle design.	Everything has a science theme, although some items (like the create object) are directly science related but are used in other science related puzzles.
	It should promote all of GCSE science	The game will be split into three parts, each part will represent one of these aspects of science.	There are three different sections, biology, physics and chemistry (appearing in that order). Each section has three levels. Each science gets equal coverage.
	The product needs to be fun	By using a game format and avoiding quizzes it should feel more like an enjoyable experience than revision. By ensuring that the game and controls work, immersion should also help to increase enjoyment when playing the product.	There are varying degrees of feedback on how fun the game is. Some found it fun, while others stated that either its lack of complexity or repetitive nature really dulled the experience.

	It has to be online or available across the school's shared network area	Either I export the final version of the product as a web service or as an executable file on the school's server.	It's currently hosted on the school's public server with a shortcut available for any student connected in school to access. It also has the icon of the battery in the game.
	It has to be suitable for year 7s and year 8s	Stylised graphics and simple themes and controls will make the game appeal to a younger target audience.	All the feedback stated that the controls were basic. With only four inputs and no ability to enter wrong inputs, the game is very easy to pick up.
	All students should be able to complete it- therefore it should be easy to use	Simple controls and a reduced overall complexity will make the game accessible to people of all abilities. Removing the ability to die will also ensure that anyone can finish the game without having their progress lost.	While crashing acts as a death system and forces the user to start from the beginning of the game, there have been no cases of a user not seeing the final stage (that being stage 21).
	Between the fun aspect and target audience, there should be no questions present	As pre-GCSE students would not be able to complete GCSE questions, none would be present in the game.	In all twenty one levels, there is no instance of a question being asked that will impede the progress of a user.
	It needs to be in a game or simulation format	Liberal use of a graphics user interface with sharp input/output feedback will immerse the user as either a game (i.e. has a set win condition and means of getting to them) or a simulation (i.e. the ability to interact with an environment with set rules)	While there have been some complaints about the lack of content, people are generally accepting that they played a game. When in development and testing, bystanders instantly recognised that a game was being played in school.