Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 2 Digital Technologies 2024

91899 Present a summary of developing a digital outcome

EXEMPLAR

Excellence

TOTAL 07

INSTRUCTIONS

The task in this assessment requires you to discuss a digital outcome you have developed within the past 12 months.

You must illustrate your answers with three images you have prepared in advance:

- a single image of the digital outcome (e.g. a website, a poster, an electronic device)
- a single image of a digital component of the outcome in the software used to create it
- a single image of the development process.

During this assessment, you may access only the three images you have prepared in advance. You may not access your digital outcome, any other online or paper resources, or the Internet.

If you developed your digital outcome as part of a group, you must write about your role and specific contributions to the project.

Read all parts of the task before you begin. Do not repeat your response in different parts of the task.

Candidates must complete their assessments individually under teacher supervision, in accordance with the NCEA Assessment and Examination Rules and Procedures. The material submitted for assessment must be the candidate's own work.

Candidates are not permitted to access any resources (either in hard copy or online) other than those supplied in the assessment itself.

Schools, teachers, and candidates are not permitted to share or discuss the assessment or their assessment responses with any other schools, teachers, or candidates until after the final date for submission (30 October 2024).

The use of chatbots, generative AI, paraphrasing tools, or other tools that can automatically generate content is not permitted and material generated by these tools should not be submitted as part of the candidate's work.

(Assessment Specifications, NZQA 2024)

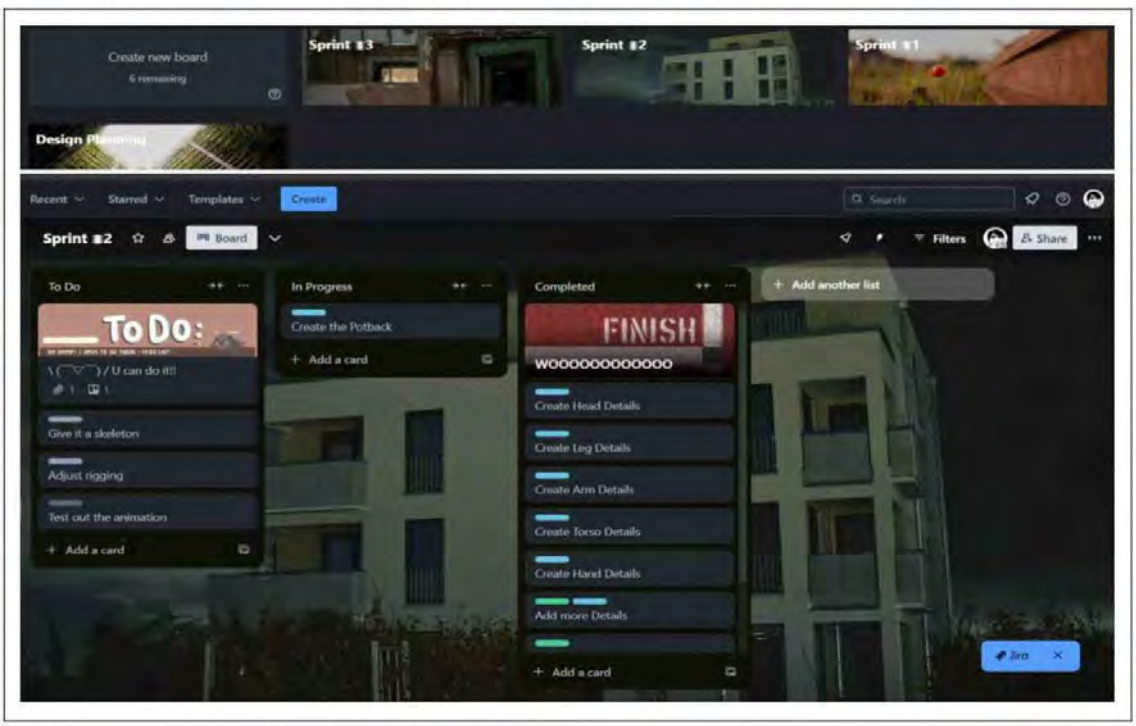
ASSESSMENT TASK

Name the type of digital outcome you created (i.e. website, app, magazine, animation, etc.)

3D Model

Development process

(a) Insert the image of your development process that you have prepared.



Research and design

(b) Based on your research and/or design(s), identify and explain a key decision you made about the direction of your digital outcome and its development.

At the beginning of my project, I used sprints to make my directions towards my digital outcome, helping me navigate on what to do. As diving in straight into the project will get me lost and confuse, so this "to-do" list made it easier to make big chunks of content into small ones that are easy to perform. Adding one gear and another until it's a completed clockwork.

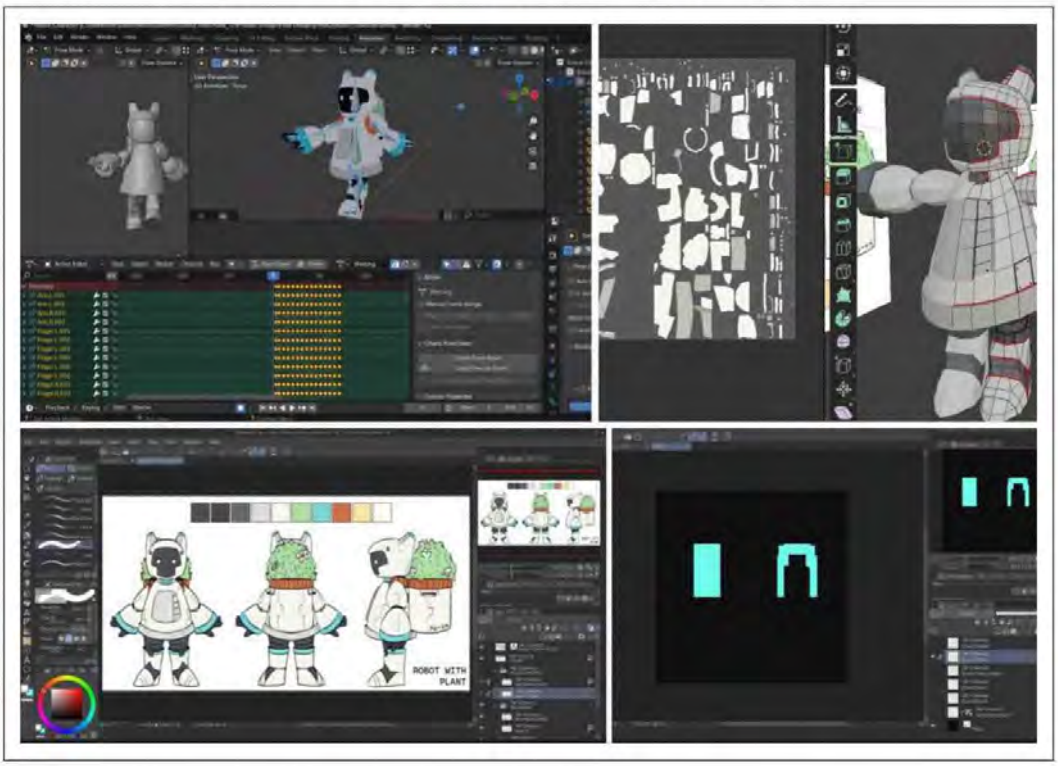
In my research, I've aimed for two things: The design of a robot and how to make a model of one with blender. These two factors are what I identify as important for my digital outcome, which made the first half of my sprint designing and watch tutorials to fill the gap in the learning curve.

After that, I've split the process into key three parts. Modelling the mesh, this is what gives the model a body. Texturing it, which is about giving colour to the model. And then rigging the model, which allows the model to move around.

Of course, they're specified even more in the sprints, with each key getting a feedback stage in order to make my outcome more appealing and better.

Development

(c) (i) Insert the image of your software's digital component that you have prepared.



(ii) Name the primary software that you used to develop your outcome.

Blender 4.2

(iii) Based on the primary software named in (ii) above, identify one of the software tools you used, and explain the techniques you used to create an aspect of your digital outcome.

Blender 4.2 is a free software that anyone can use for 3D modelling, from cartoony to realism. In the outcome I created, the style I have is called "Low Poly", which as the name implies, uses the smallest amount of vertices (those square plates you see) possible, it's a mix-match of performance boost and stylistic charm.

In order to get this effect, I used the flat plane method, extruding and connecting one plane to another until I get my desired body part. In order to make things easier, there were references used on the side and back to get the desired look of my robot.

Another thing that made the process quicker is the use of mirroring, a modifier that allows anything I do on one side be flipped over and copied on the other. This saves time and the hassle to redo things, along with aligning them.

(iv) Name one of the most important requirements of your digital outcome.

It should have a riggable skeleton.

(v) Based on the requirement named in (iv) above, discuss what you had to undertake to meet this requirement, giving specific details about how you implemented this in your digital outcome.

Much like in real life, a skeleton is a group of bones that allows the user move the model around, the more bones, the more specified things to control and the more flexible it gets through the joints. Without it, the mesh will stay stagnant, and while you can just edit it around with use of your editor tools for that desired animation — it is harder to revert back to the default pose, messing up the model in the process.

Having a riggable skeleton on the other hand, it separates both the model and the bones through pose mode, giving us the desired poses and able to go back to the default with one shortcut, free of consequences.

Because my model is a robot, I had to make all of the outer bones parented towards the main body (the torso). This is to give a desired effect called "rigid rigging". This makes it so that all 32 bones are separated from one another, giving them that lego-esque effect that they can be twisted and do 360s without it bending the body as some sort of body horror.

(vi) Name a different requirement to question (iv) that was heavily influenced by feedback.

The robot's design has to be appealing and match the sci-fi theme

(vii) Based on the requirement named in (vi) above, answer the following:

- What was a digital component that related to this requirement?
- Who did you receive feedback from?
- Discuss changes you made to this digital component, based on feedback received; give specific examples, including details of who you received feedback from.

A 'component' is a smaller part of the outcome.

The design is mainly drawn in Clip Studio Paint, but has been edited throughout the blender stage. Each time I would finish a sprint, I would give it to two batches for feedback.

My school, which involves my peers and teachers. Then my demographic, which are friends and siblings who are into fun characters and sci-fi robots.

I made numerous designs, half of which aren't even full robots but people with a punk-esque theme and cyborgs. The outcome's design is just so happened to be the most favoured option, for its detailed simplicity and appealing looks. Not only that, but it had the most recongisable silhouette as well.

The next feedbacks were about improving said design. To name a few, there's the colour pallettes, where the white and blue was chosen due to it being common in the sci-fi genre and overall fits the demographic's appeal for the robot. Another thing is when a few friends and peers of mine pointed out how the robot was lacking in the robotic aspects, making it feel more like a toy, to which was solve by adding more panel-esque designs and bolts. My brothers wanted to give it a tag, as all manufactured robots do, giving me the idea to implement the 404 number as an easter egg for the errors I had making the little guy and internet culture as a whole. My teacher pointed out the inconsistenties of my robot's expressions, which gave me the motivation to fix them.

These feedbacks helped me make a better, more appealing design, improving my outcome as a whole.

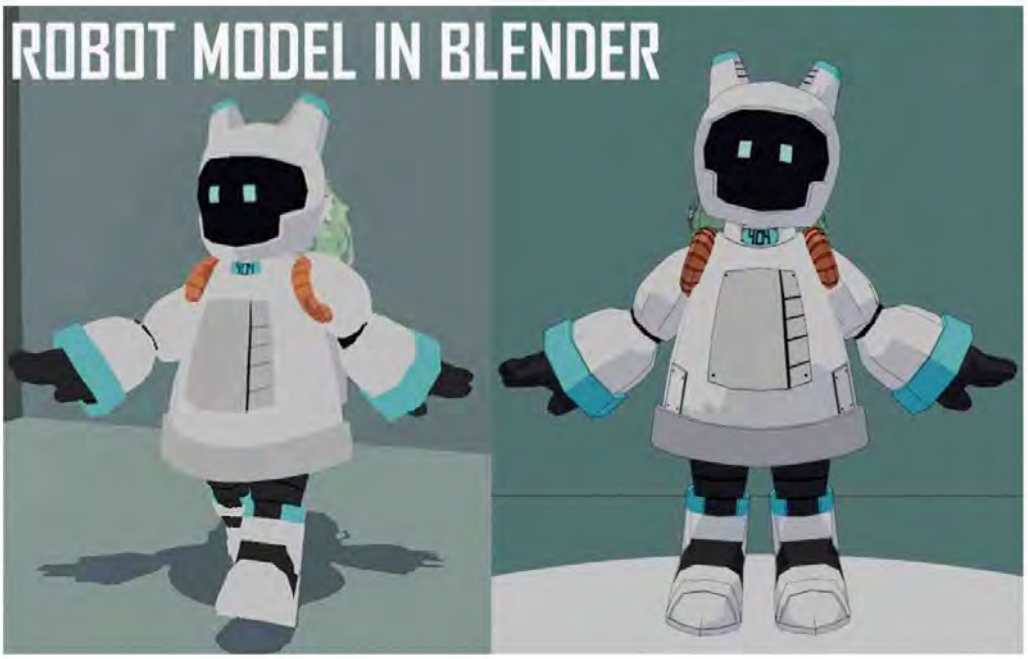
(viii) Discuss the cultural and/or ethical implications you considered during the development, and how you addressed this in your digital outcome.

In my model, it was easy to avoid offense on other cultures, as it was a robot. A safe option that poses no sorts of representation or attacks on such. The culturual implications carried over more to the internet side of things, of how despite being robots, we can't help but personify them, giving the model a childlike look.

Another thing was the overall mood of the robot, carrying ethical implications about morality. Due to its lighthearted nature and the cartoonish design, I stray hard from the genre's usual dystopian future to give it a more hopeful one instead, sending out a message that they're there to co-exist and help, not to be against each other. This can be seen in how approachable the robot is, along with the potted plant behind it's back, carrying greenery as opposed to removing it.

Testing and evaluation of final outcome

(d) (i) Insert the image you prepared of your finished outcome (what the end user sees).



(ii) Explain your final digital outcome – the purpose of it, how it looks, how it works, where it is used, and who uses it.

My robot is a model created in blender, its main purpose is to be someone's character for a game or animation, or maybe like, a model created to be a person's little guy to figure the ins and outs of blender.

The aimed demographic are fans of the sci-fi, or someone who just likes stylistic characters. But as to who uses it, it would be animators.

It met the appeal of my demographic with its adorable looks, simplistic colour palette, matching the sci-fi theme, and having a recognisable silhouette that emphasises its bubbly, friendly nature.

It works as expected, allowing the users to move the body using the rigs for animations. Due to the separated parts of both the mesh and bones, it's able to give off a rigid effect. Not only that, but the face has a function of its own, it can be changed by using another a bone with the title "face", then move it up and down on the z-index section. They don't have to stay with one expression but many that's according to the emotion they want the robot to display.

It can be used either in the blender file or be imported to another software with the OBJ. file, which retains most of its design, but sometimes the textures can be lost. This is why in the folder with the files to be shared, there's a texture folder that the user can get and fix with.

(iii) Identify one of the key digital components that required testing. Explain the process you undertook for testing this, and evaluate the impact the testing had on the digital outcome.

If there's anything that required the most testing, it was the face expressions. I knew for a fact I wanted it to be a screen, so while it did had no overlay indiciating it, it now has a node that uses emission light to brighten up even in the dark.

To make the expressions be changed, there were nodes and drives to connect to each other and form a system that allows the user to make the bone go up and down for the desired expression. The maths were done by the nodes themselves, but I had to set up exact number location of the faces in the texture file and which direction it goes.

There were a few mishaps along the way, such as some faces weren't shown during the testing, trial and error had to made before coming to the evaluation that some connected lines were on the wrong parts or didn't even connect at all. Which I struggle to see due to the fact there's already too many nodes to keep track of.

In the end, the hassle for the testing prove worthy, now that all the promised expressions were there.

(iv) When considering your final outcome, provide an evaluation of the overall performance and discuss specific examples of what this conclusion is based on.

To start with, the skeleton. The bones are located within the separate parts of the body and are correctly parented to the nearest joint, with those nearest joints being connected to the main body. This allows the user to create a rigid effect of a robot moving around. However, the legs were a bit hard to rig as its design wasn't really that well implemented for the mesh and bones to exist as separate parts like the rest of the body was. This was simply glued by adding an extra bone to give a more bendy foot for that cartoonish look.

The design is not only pleasing, but the method use to create the model makes it use only the vertices I truly need to create the model, no extra subdivides or anything. This makes it so that the model won't just crash due to the heavy memory and such, without sacrificing the looks. Creating a balance between functionality and aesthetics.

All in all, I believe that the my final outcome has reached the requirements. Sure, there are parts where I absolutely believe needs tweaking, but it is functional and works as intended.

(v) Look now at the entire development process of your digital outcome and consider what you could have done differently.

- Identify which stage of your development process you would change next time (can be from one named in this paper, or another).
- Discuss what you did and what you would now change.
- Discuss how making those changes would impact your final digital outcome.

To provide context, there were 3 sprints, each of which was supposed to represent core requirements and the unfinished extras I continued from the last sprint. My main regret here is waiting til the last sprint, the part where you're supposed to have effects, is now the part I scrapped all of the progress to make the current one.

I didn't regret doing it. The outcome we have now is WAY better than the initial model I made. However, I regret not doing it *sooner*, as this event is a result of getting help from my brother. Who's way more in touch with the world of blender. All I wanted was advice on how to make the initial model, but he somehow convinced me to restart the whole thing.

I had to watch tutorials, do those tutorials, unlearn bad habits and memorise quick shortcuts to make my thing easier. I was watched, timed, and criticised in order to create the model as better version and fast before the deadline. It was torture, especially when the methods were something I was unfamiliar with, but worth it in the end.

Another thing was the initial design, I wished I could've made the design with the knowledge of how the bones are going to affect it. The legs were proof of this, making it a bit clunky to work with. I would've changed it to

have individual parts instead of having the mesh as one big boot. I couldn't separate it midway because the design did not allow for such.

Now as for how it impacted my final digital outcome...

For the redone robot model, the changes I made there were ones I would've done for the initial design. Which made a huge impact for how my digital outcome look, it was more polished, and actually looks like how I wanted it to be. If that didn't happen, we would be stuck with a plastic looking doll, barely any details, and a hole in the pot.

While the legs being changed would be more of an improvement than a drastic glow up, people would be saved from the hassle of the legs being stretched out far and wide just to get the required pose. Which is what they have now.

In short, I wished I did things more effectively at the start, but I had zero clue on how blender worked; this is what the project was for, overcoming hurdles in order to learn a new skill.

Excellence

Subject: Digital Technologies

Standard: 91899

Total score: 07

Task	Grade score	Marker commentary
One	E7	The candidate has undertaken some research and/or design to shape the direction of their outcome. The software chosen (Blender) was appropriate for the outcome (and Level 7 of the curriculum), and explained, with detail, the technique used to create a part of the digital outcome. The purpose of the digital outcome (3D model) was clearly explained, including how it looks, works, how it will be used, and by who. The candidate then identified an important requirement for the digital outcome and explained how it was implemented. They have addressed how feedback influenced a second requirement, including who provided the feedback, what was suggested, and the specific changes made as a result. Clear and relevant examples were given, demonstrating that these were authentic. Cultural and ethical considerations were applied effectively, with concrete examples of how these considerations were respected in the outcome. The candidate identified a key component of the digital outcome that underwent the process of testing, and provided an evaluation of how testing impacted the final outcome. The candidate assessed the overall performance of their outcome with examples to support their conclusion. Additionally, they reflected on areas of the development process that could have been improved, discussing what changes would have been beneficial, providing examples of how those adjustments would have enhanced the final outcome.