

PROJECT : CLOSE QUARTERS

ART DEVELOPMENT PROJECT

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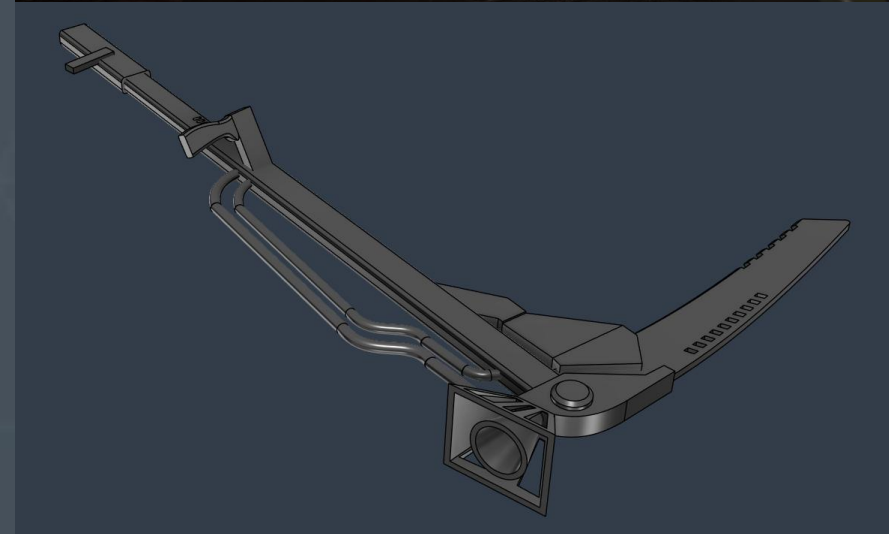
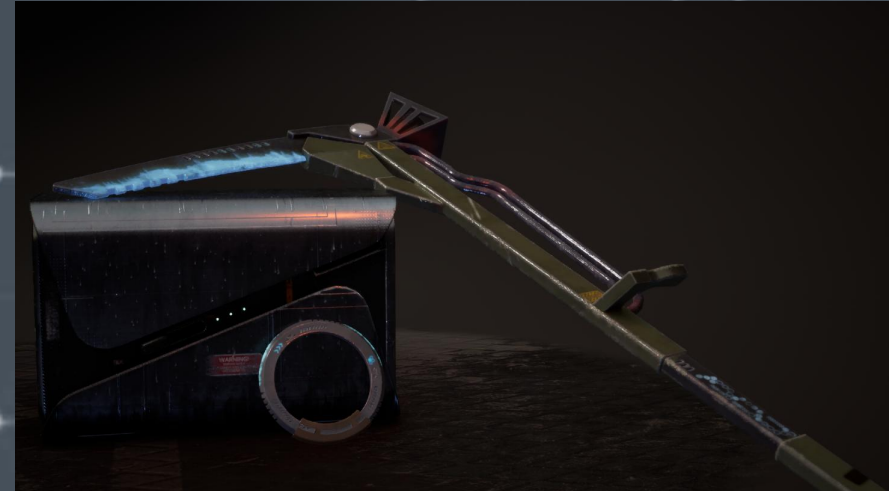
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Project Overview

This project will revolve around breaking down gun design language of a game franchise, then using said design language to create melee weapons for the franchise.

The end product will be two melee weapons - a scythe and a chakram, in the style of the game Titanfall 2.

The weapons will be fully optimised, unwrapped, textured for game engine implementation to a game-ready standard.



Idea Development

Idea Development

This project started as a project to implement melee weapons in a futuristic game like Apex Legends, due to their weapon lineup mostly being guns.

With some research to the market and gameplay standpoints, melee weapons while not being the most viable combat option, is still desired by the community for various reasons.

For pvp games, games like Counter Strike (before the market crash) have very expensive knife skins, which are some of the most sought over items in the game, one of them peaking at 1.5 million USD. Less extreme examples like Apex still have purely cosmetic melee weapons replacing the normal fist melee called heirlooms costing 160 USD per weapon while providing no real combat advantage.

For pve games, melee are way more sought after as a playstyle. For example, The First Descendant community asked for melee weapons ever since the game launch. And although the power level was rather weak in its initial release, people still built their characters around it to use them. For the Monster Hunter series, 11/14 weapons in said game is melee, and long range players have always received criticism for "not engaging with game mechanics" due to the range letting them ignore most melee attacks made by bosses.

Reverse engineering these market researches, it is apparent that melee weapons have their own edges like adding to the action, engagement and visual stimulation of gameplay.

However, the initial idea of "futuristic games" was a bit too broad, and not every game needs melee systems especially pvp games. Therefore, the project was changed to the current one.

Concepting and blackout

Visual Analysis

Only major melee weapon in titanfall 2- ronin sword



- Geometric decorations
 - Blue energy decoration
- Strong wear and tear



Game aesthetic - character



- High saturation
- Vibrant with slight greyish undertone
- Slightly glossy, stylised texture

Primarily mechanical aesthetic with blue energy cores as a wow point

Lots of wires and gears sticking out
Most functional parts are viewed from the outermost layer

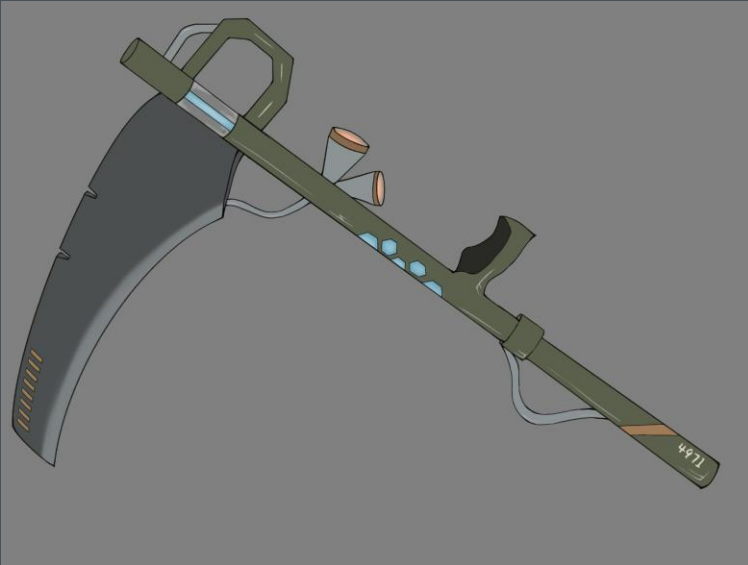
Geometric patterns as decoration

Rustic yet high tech

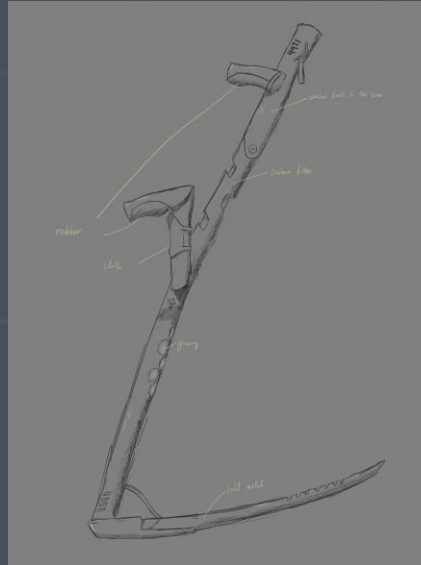


Concepting and blackout

Scythe concepting and blackout development



Concept 1 – deciding on shape language



Concept 2 – fleshing out functionality and realism



Real life reference for how scythes are used

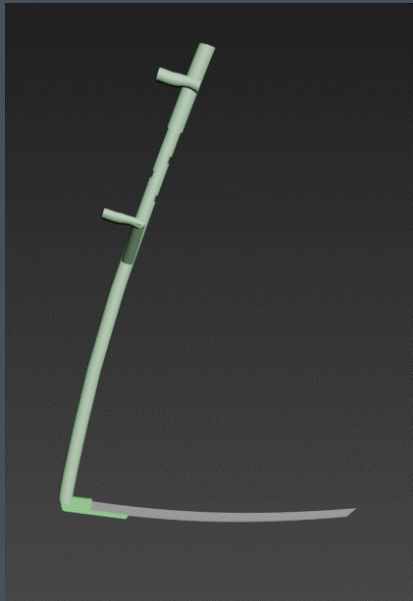
The first 2 concepts were done by hand painting in procreate – an ipad app with very close functionality to clip studio paint and photoshop.

The first concept was mostly focused on design and shape language, with the idea for some form of fuel powered pushing device, connecting wires or pipes and general design direction decided.

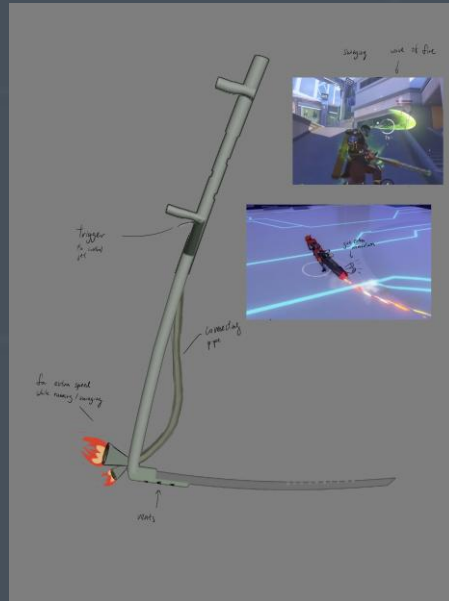
The second concept added some realism into the design, with references to the real world scythe reference while still keeping the general functionality and design direction the same.

Concepting and blackout

Scythe concepting and blackout development



Blockout 1 –
checking scale and
shape



Drawover –
functionality and
adding features

Moving onto the first 3d blackout – The initial blackout was created in 3ds max for scale checking purposes. A preset human model with height of 173cm was imported to the file, then referencing real life references, the scythe was built referencing the ratio of length of human and scythe handle. Some initial curvature was created with FFD 3x3x3 modifier, and the organic shapes were made with edit poly.

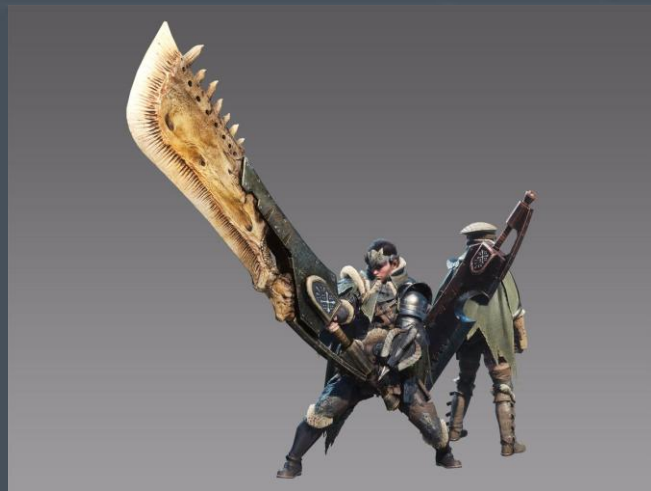
With an initial look at what the model would have looked like, some drawovers were carried out to further flesh out the weapon concept. With references to different games and how they used weapons with long blades to implement unique systems – for example Genji from Overwatch in stadium mode being able to fire energy projectiles from swings from his blade or multiple games having characters having jets to help the character propel the heavy weapons.

Concepting and blackout

Scythe concepting and blackout development



Re-blockout and drawover – adding weight and stylisation



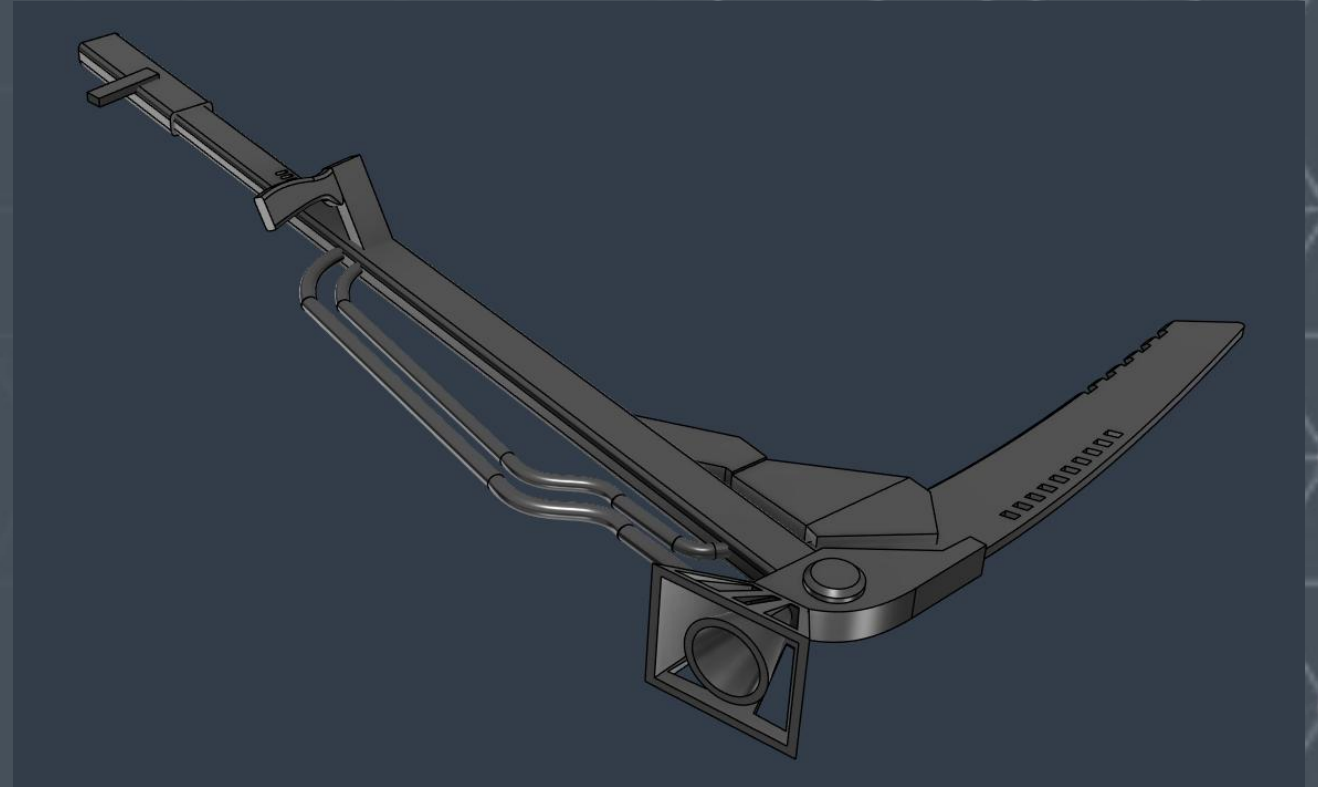
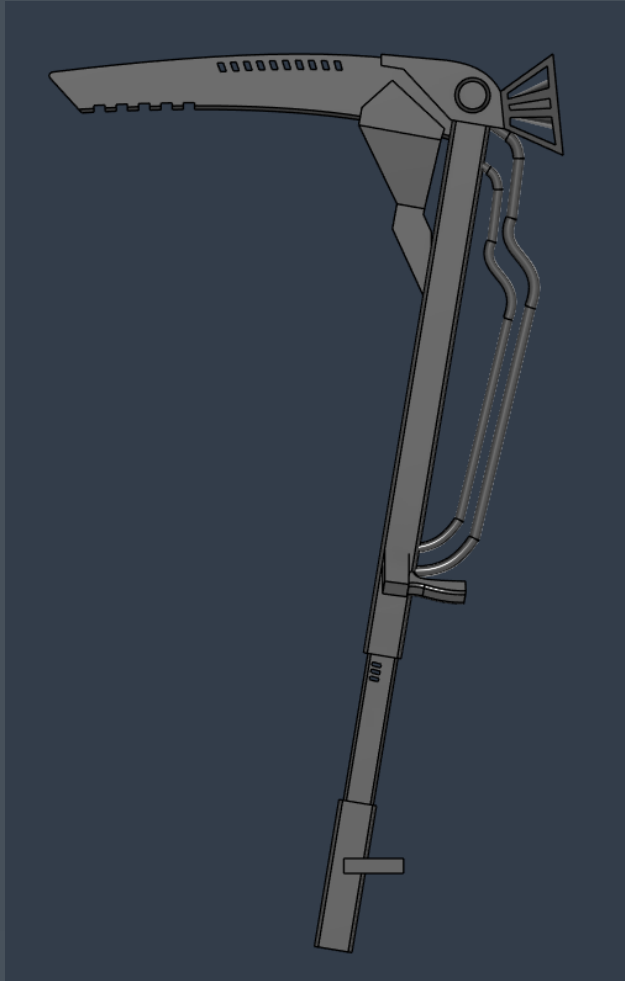
However, with the first blackout, the weight of the weapon wasn't fully implied in the design – with it looking more like a nimble weapon than a heavy one. Thus, some changes were made to the design – with the blade being completely remade in Fusion 360, using the array to path tool to create the holes that were present in the first concept (see page 6). Heavier connecting parts to blades and jets were also added, referencing the greatswords from different franchises especially Monster Hunter, as well as some connecting pipes to solidify functionality.

Some drawovers were also added for an initial idea on the direction on the texturing.

However, the design language still lacked uniformness to it. Thus, a completely new model was made in Fusion 360, The Jet was also fully redesigned as well as the whole handle part to make the weight look more balanced.

Concepting and blackout

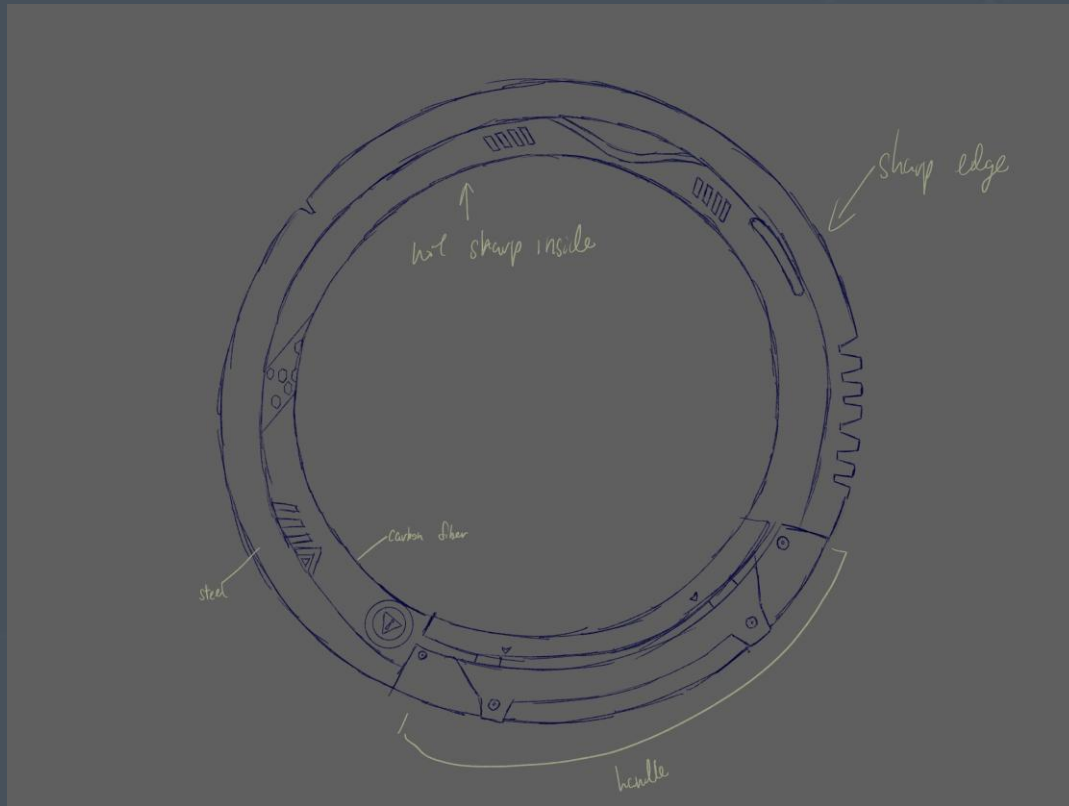
Scythe concepting and blackout development



Final blackout

Concepting and blackout

Chakram concepting and blackout development

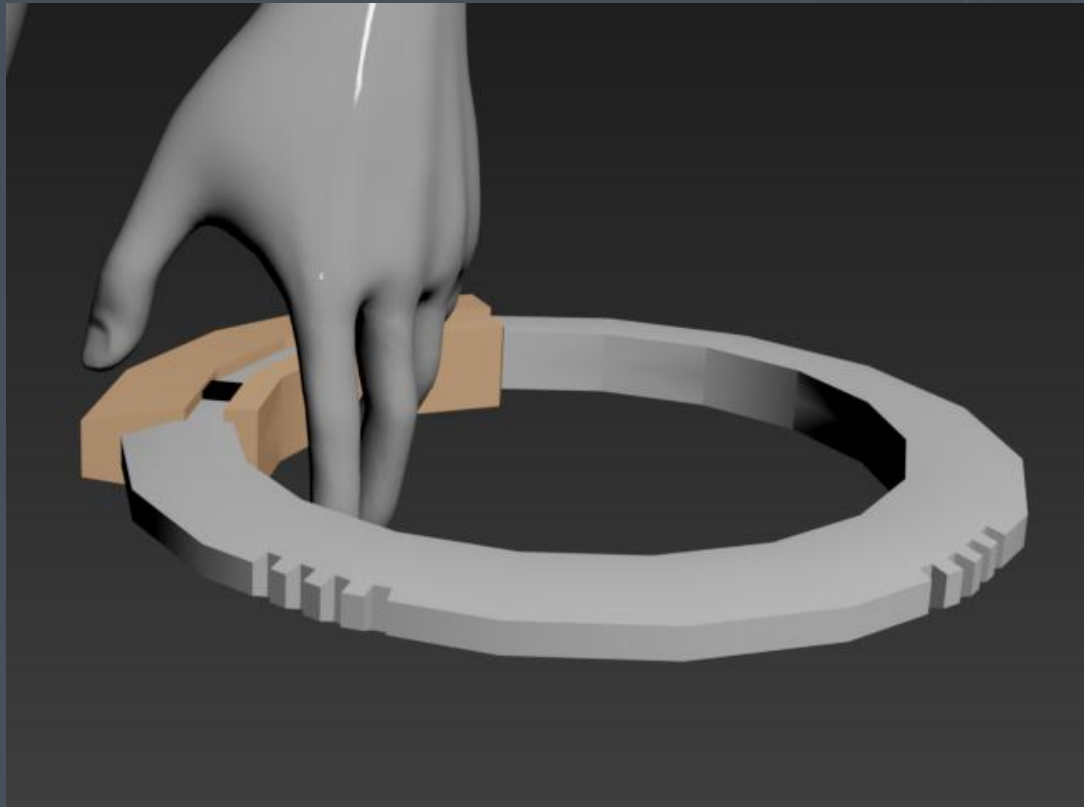


Initial concepting

With the chakram, production was always one step behind the scythe – so that lessons could be learnt from the scythe and less trial and error would be needed. With this design, it was initially going to be a completely melee focused weapon with the ability to fling it out like a projectile – similar to the functionality to a real life chakram. However, to fit into the futuristic theme of the scythe and the game in general. Some modernisation was made in the process. The idea that was landed on was to make it look more like a handheld chainsaw type weapon, with the blade part able to spin by itself.

Concepting and blackout

Chakram concepting and blackout development



Blockout and scale check

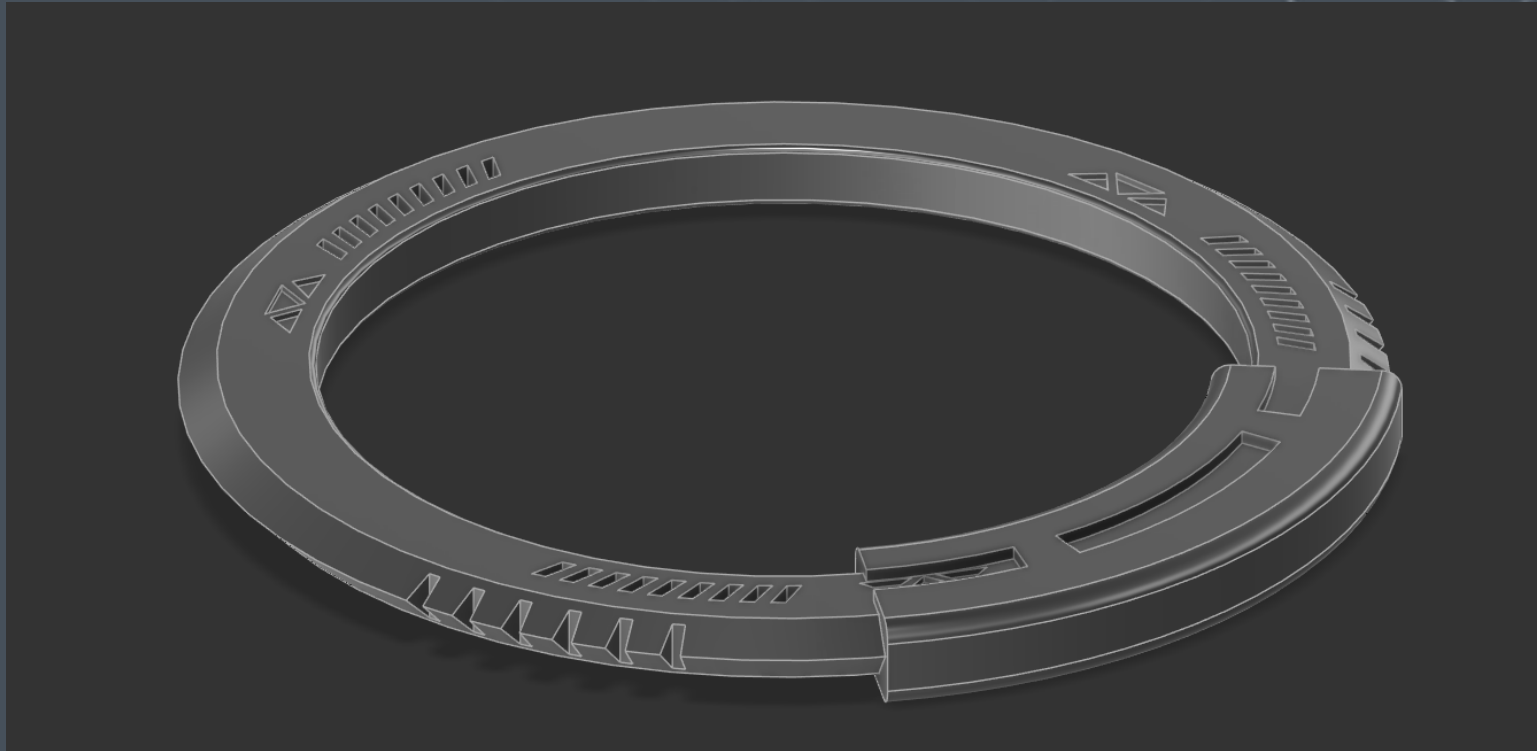
Similar to the scythe, this blackout was made using the same human reference, and in 3ds max. However, 3ds max struggled a lot with circular Boolean details – such as the jagged edges on the blade. The array tool didn't work as well as expected and the model in general looked very low quality. After checking the scale, everything was remade in fusion 360 – with the array to path tool and the sketch workflow in general being way better for this type of modelling. With references to the Beyblade franchise and how they add patterns to circular props, lots of revamping was made to the design and the final blackout and low poly model was produced.



Beyblade reference example

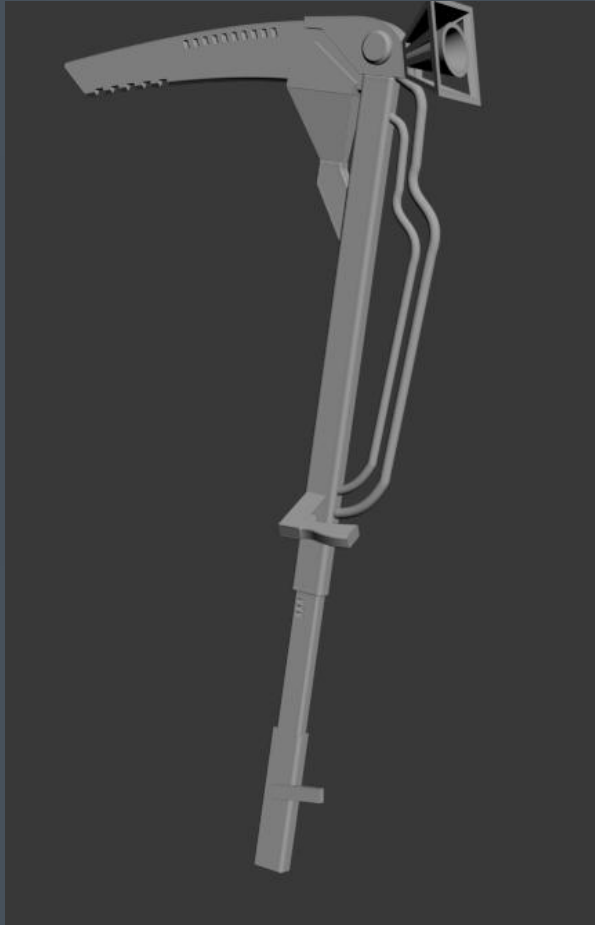
Concepting and blackout

Chakram concepting and blackout development



Final blackout

Highpoly and baking



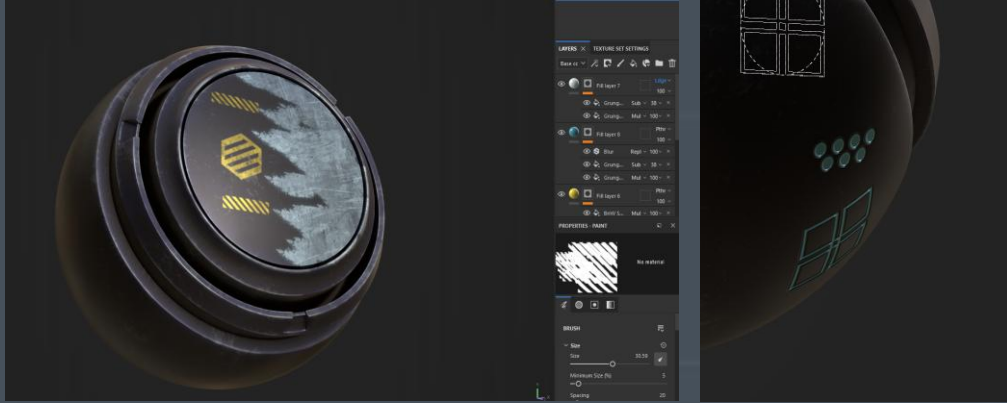
Highpoly polishing was done in Zbrush. Using the split to groups feature to separate geometry, using Dynamesh to get a high density mesh to then use the polish modifier allowed for a good enough high poly model since there weren't many organic parts nor weld marks in the design, allowing for a lot of sculpting to be skipped even for hard surface standards.

The weapons were originally exported as obj files as that is the default for Zbrush. However, doing that caused the dimensions and measurements for high poly models to not be able to align with the low poly models since the models shrink a lot in size while exported as obj then re-imported to 3ds max. Re-exporting with the FBX import/export plugin solved the issue – the scale was kept well so quick alignment could be done. With the assist of naming conventions, baking was done relatively easy as well in substance 3d painter.

Side note : while importing into engine, both the scythe and chakram had "handle_lp" as a part of the model – causing the need to change one of their names. Not much interruption was caused due to baking already being done. However, considerations will be made in the future while making asset packs / diorama assets.

Texturing

Initial material breakdown and testing



Material tests on substance sphere



Titanfall model reference

Before the unwrap was done, some texture tests and breakdowns were done to test out using alphas, getting the look of the dark metals and also the glowing parts right.

The first conclusion reached was that height maps were necessary for any engravings or signs that were glowy, since they would be embedded in the body and carved out to have it exposed.

The second conclusion was that to achieve the glowy part of the blade, it was nearly impossible to get the look with just one layer. The best attempt is shown in the screenshots, which still looks flat and doesn't have the effect where it starts out light, turns darker and especially high saturation before fading down.

A non destructive masked workflow was also developed in the process since it wouldn't be efficient to hand paint most of the details. Adding any noise or paint chip by hand painting was inefficient at best. Therefore, the workflow developed involved using a multiply layer to add on noise maps such as clouds 3 or bnw dots 1 (depending on case) as a fill layer in the black mask. Other details were also added in a similar fashion.

Texturing

Scythe textures



Primitive textures and initial details

First attempt at the textures – focused on getting the primary colours on and some secondary details.

The basic workflow for every layer was to add a fill layer with black mask and work from there. Then using a paint layer, the primary details were filled in pretty easily.

The energy particles on the blade was hand painted, then using some modifiers, noise was added to them as well as some height difference. The layer was then duplicated, put behind the initial layer, adjusted to a darker and more saturated colour, then blurred. This created the high saturation needed for the boundary line.

The burn marks and colour on the jet was created by direction blurring a colour, then using a similar technique to the blade, duplicating, turning the colour to a darker red colour then blurring it even further. It did bleed over to some nearby textures so another paint layer was added to turn the mask black on the parts getting bled onto.

Texturing

Scythe textures



Second refinement of the texture

With some feedback, the glow on the blade was changed to a more vibrant colour as well as a higher value of emission.

Some of the red burn marks was added to the pipes as well for continuity's sake. As the colour used there was only the red colour – which ended up looking better than the orange colour on the jet, the glow on the jet was later changed to the colour of the pipes.

Some warning signs were added to the green parts of the model to break up the geometry a bit.

An identification code was added to the metal part of the handle, as an identification code was originally planned to be in the design, but hand painted numbers didn't look that good. The serial code was inspired by morse code and the year peasants used scythes to revolutionise - 1794. Flipped the numbers so that it is 4971 and turned it into morse code (...- ----. --... .----) and then used the hollow hexagon to represent a dot and solid to represent a line, stylised it a bit so that it wouldn't be in a straight line as well.



Texturing

Textures



Final scythe texture

With some feedback, the texture looked too stylised and prop-like.

A lot of noise, dents and paint chips were added to break the blank space of the textures, using the multiply noise technique with different maps like dirt and edge wear, as well as some hand painted parts.

Some altering to the texture colours were also made, notably the ID code, the jet colour, glow on the scythe. A lot more colour noise were also added to the model by using b/w spots as a mask with different high saturation colours on low transparency.

Further adjustments were made in Unreal since Unreal viewport works differently to substance, notably increasing the roughness, darkening the colours and adjusting the emission colours.



Chakram textures – same workflow as scythe texture, not much to annotate

Texturing

Texture sheets



Chakram base colour texture sheet



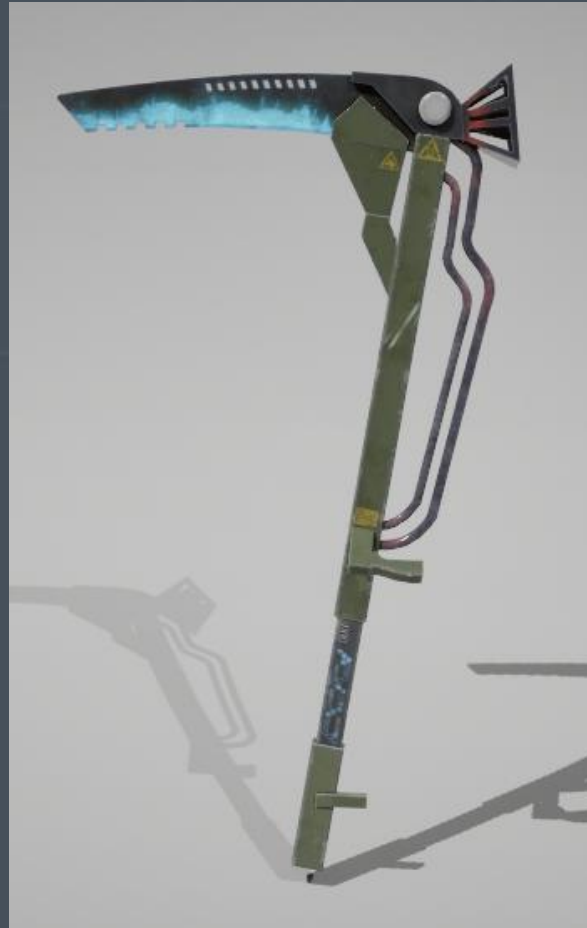
Scythe base colour texture sheet

Engine Implementation

Scythe implementing and rendering



Initial renders



The initial renders were done with the scythe stood up fully and the camera being horizontal, causing the actual scythe to have not much space to be seen.

Therefore, the shot was changed to the below:



Engine Implementation

FX implementing



Closeup shot of scythe functioning

For the render shot, Fab assets for fire were used since producing particles from scratch takes too much time. After importing the pack, multiple fires were tested, and after a few tests this looked the most natural with the scythe.

The flame was tilted to align with the scythe, but it was not convincing enough. Therefore, a low emissive point light with a deep red colour was added into the fuel exhaust to mimic the looks of a real world jet better.



Engine Implementation

Rendering shots



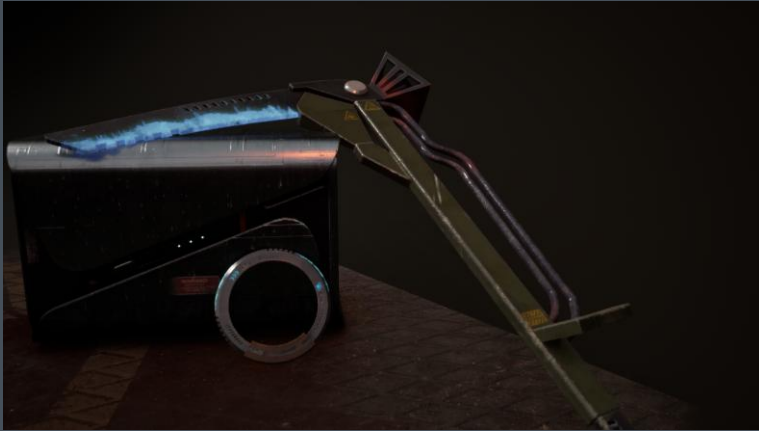
Studio shots didn't have much to setup, since a studio setup from previous projects was used. Flat shots and side shots were set up with different camera focal lengths, and most adjusting was done in the lighting. The biggest change was to turn off cast shadows on all the lighting for a cleaner, more polished image.

The product shots went through a lot of iterations, with an initial idea of the scythe leaning on a wall sideways with the chakram in the middle empty part – see left image for quick idea.

However, setting up a good wall asset wasn't easy, as most baked in textures didn't look quite right with a very closeup shot. Therefore, a crate from fab was used to set up the scene. (see next page)

Engine Implementation

Rendering shots



Initial setup was done very quickly with hdri and a fab asset crate, but there were a few problems with the shot:

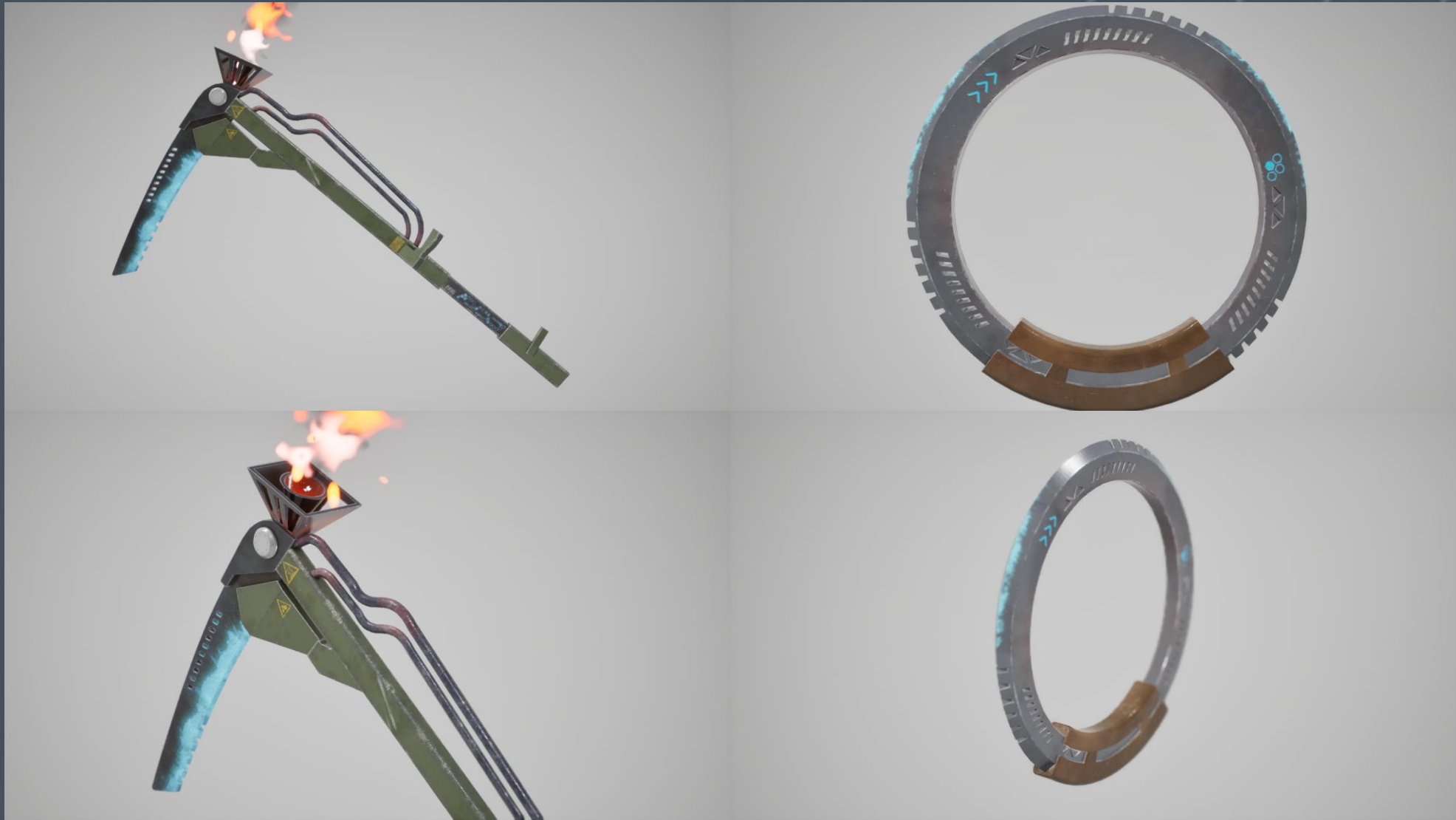
- focal length caused the scythe to not be able to be seen fully.
- the infinity wall used in the shot was clipping into the ground of the crate
- the face of the crate and chakram were too dark



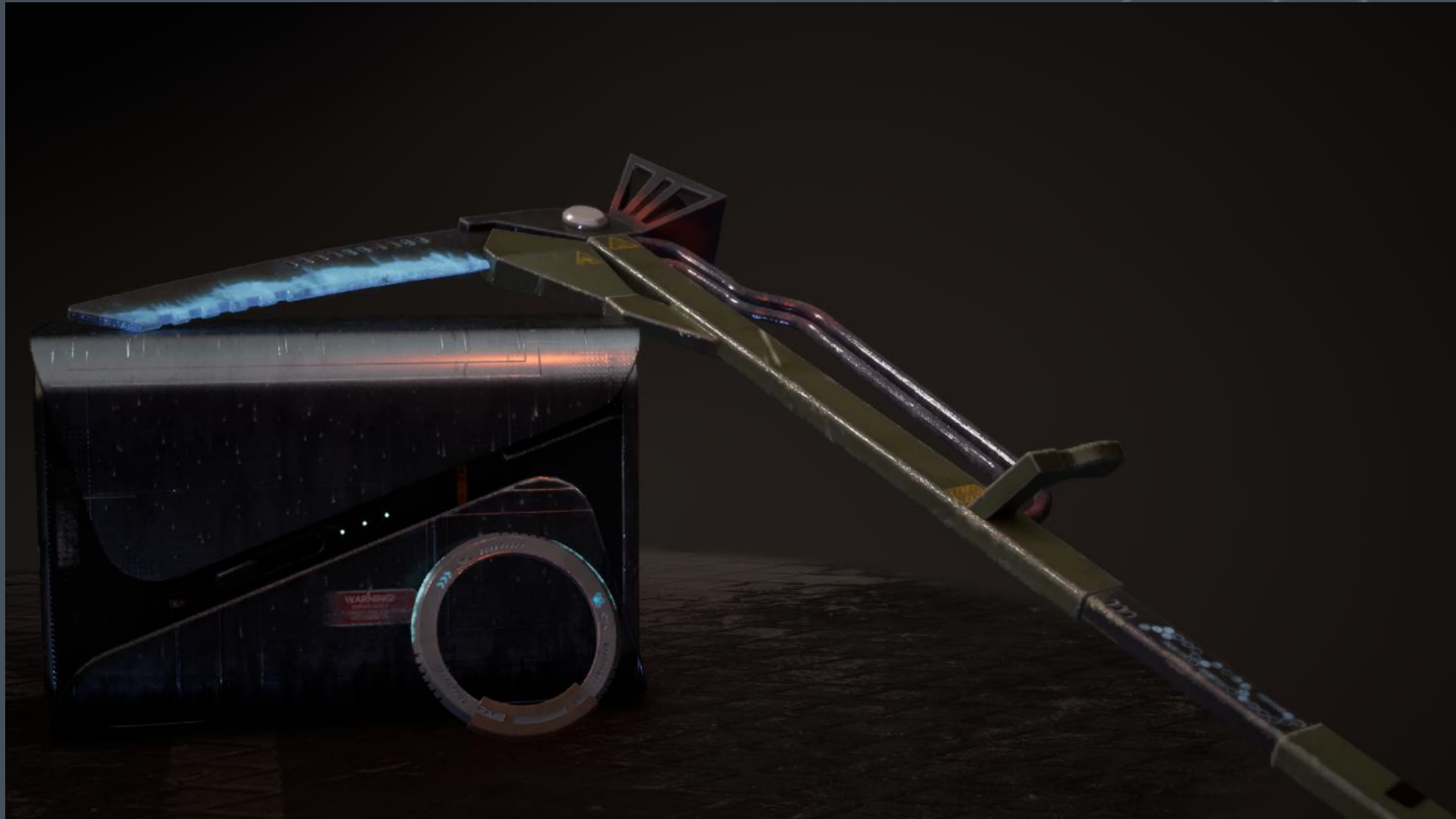
After fixing all the issues by moving around assets and adding lighting, a new shot was set up with the rule of thirds in mind.

With the render shot, the fire was turned off since the FX did not look good in the shot. This was turned back on in the video render.

Render shots



Render shots



Render video



Reflection

Concepting and Blockout

Since the project involved creating new concepts instead of using existing concepts, a good part of the project was a concept art piece done by a non-concept student. Most time spent on 2d concepting was wasted as the workflow could have been more efficient with a workflow involving constantly editing blockouts in 3d softwares.

Lots of time was also spent going between different ideas, different degrees of stylisation vs realism and different functionalities. Spending more time fleshing out the design language and establishing a solid vision before modelling would have also been way more efficient.

Ultimately, a decent attempt at a weapon concept, with the final blockout/concepts being decent but a heavily unoptimized workflow. Compared to industry work, the concepts could have been done with a measurement/grid lines signifying measurements, and with textures, colours and features pre-determined in this step. In this project, these were all done in their respective steps (modelling, texturing) which took a lot of time due to repeated trial and error.

Learnes Studios –
Cyberpunk
melee weapon set
concept art



Reflection

Modelling

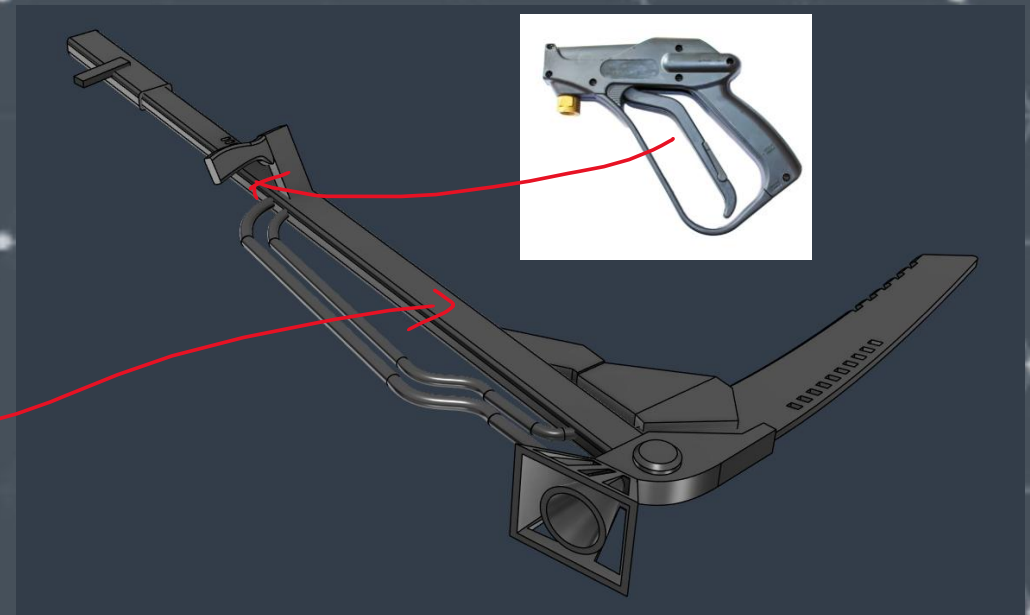
The low poly model – as mentioned in page 25, was made while the concept and vision of the project was constantly changing. Thus, a lot of details were missed out in the process – for example, a fuel can on the handle part of the scythe or triggers for both weapons to trigger their jets/spinning respectively.

More detail could have been done in the high poly, with details like weld marks on the pipes and grooves/patterns on the grip missing, and some details done with height maps (e.g. markings on the dial, damage dents on handle) being more ideally being done with baking down the highpoly.



Flamethrower from Aliens

High pressure Jet washer trigger gun – equip2clean



Reflection

Texturing

More grunges could have been used to break up big areas of same colours.

The metal textures could have been less shiny.

More edge wear could have been added in general, and the “generator look” should have been broken up more with hand painting.

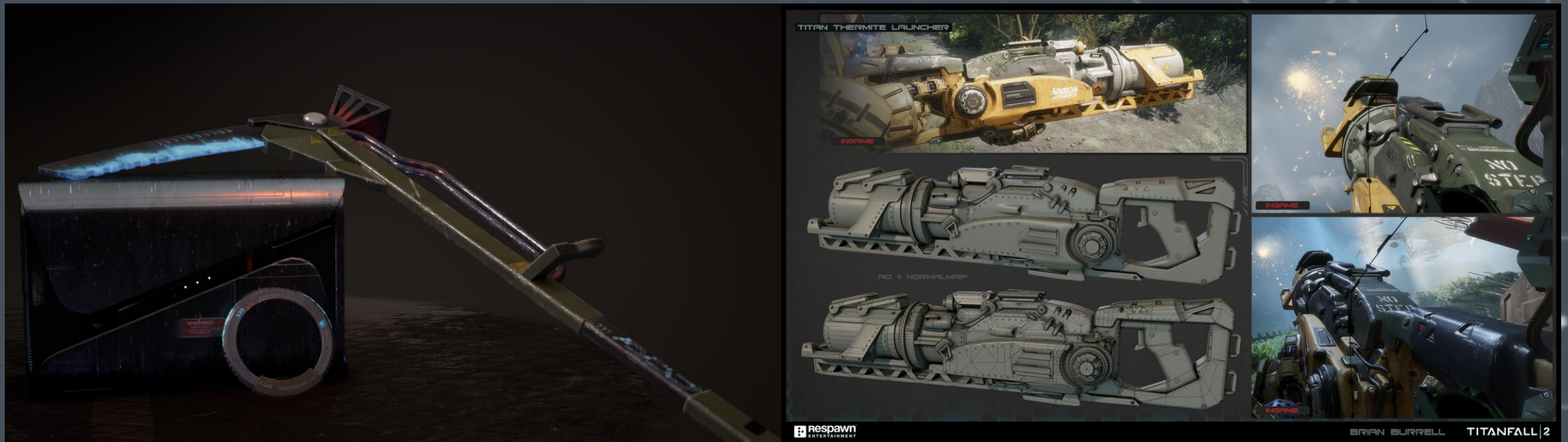
In conclusion, texturing had a good workflow, but due to the lack of pre-planning it wasn't as ideal as it could have been. It was still a good attempt and the texture could pass fine at a first person scenario like Titanfall 2 where models wouldn't be viewed as a whole object a lot of the time.



Thermite Launcher
(Titanfall 2 fanart),
Brian Burrell

Reflection

Rendering

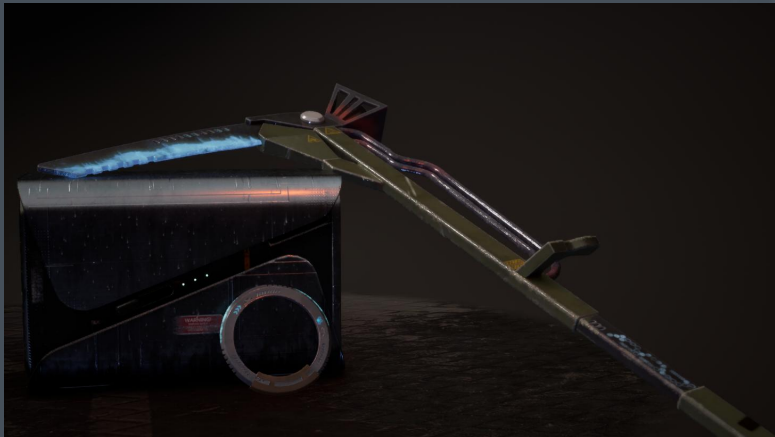


Thermite Launcher (Titanfall 2 fanart) , Brian Burrell

Would have been more ideal if assets in the scene could have been self produced instead of fab assets, and could have used some shots with first person pov. However, in general, the shot was set up with decent framing and composition, and the lighting was enough to accentuate details in the scene.

Reflection

Overview



Project deliverables in the initial pitch – “Visual delivery of 2 melee weapons in the style of titanfall 2, including concept art, drawovers, colour palette breakdowns, low, high poly and wireframe renders, uvs and texture maps, renders in studio background and game environment”

Deliverables were mostly met, except for wireframe renders and game environment renders. The game environment render was replaced by a beauty scene render – shown on the left.

Skillset development in the initial pitch – “Develop a strong understanding of the game art pipeline, and develop an eye for art direction and sticking to a fixed aesthetic”

Deliverables were met, despite more trial and error than initially planned. Previous pages of reflection demonstrate a higher understanding of the game art pipeline as the project goes on, and the general art direction stayed in line with the aesthetic initially decided on. An increase of efficiency was documented in the progress of the project and while the workflow was behind the planning in the initial documentation, said time lost was made up in time at the end of the project.

Bibliography

Ronin game model – Titanfall 2

<https://titanfall2.fandom.com/wiki/Ronin>

Pilot game model – Titanfall 2

https://www.vhv.rs/viewpic/hbwJbhw_titanfall-2-pilot-png-sonar-pilot-titanfall-transparent/

Real life scythe reference

<https://www.amazon.com/Lehmans-Scythe-Kit-Over-Users/dp/B087D7DG2R>

Dark souls greatsword reference

<https://www.dualshockers.com/dark-souls-3-best-strength-weapons/>

Monster hunter greatsword reference

<https://steemit.com/gaming/@gamehouse/monster-hunter-world-beta-testing>

Beyblade reference

<https://mfbeyblade.fandom.com/wiki/Hades>

<https://beyhaven.com/products/fusion-wheel-storm-takara-tomy>

Industry reference

<https://www.artstation.com/artwork/kDX3WA>

<https://www.artstation.com/artwork/1l6W8>