PATTY PAN
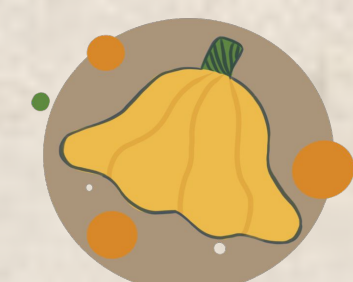
Short Film

The team

Core

Kate Bieriezjanczuk
art director/ project manager/ character artist/ lighting

Amelia Tzemis
character artist/ prop artist/environment lead
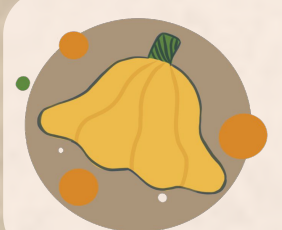
Kirsten Tadique
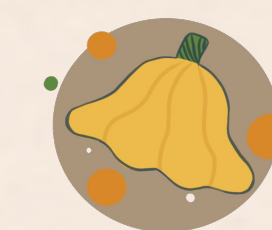Animator

Freelancers

Kathrine Padley
Rigger

Grace Parker
2D Effects

Jenna Bushell
Animator

Lisa Blackwell
Prop Artist

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com   Amelia Tzemis: ameliatzemis@gmail.com

Narrative

First version storyboard

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Amelia Tzemis: ameliatzemis@gmail.com

STOPS CRYING

AHA!

CHAOTIC COOKING

GOURMET COMPOST

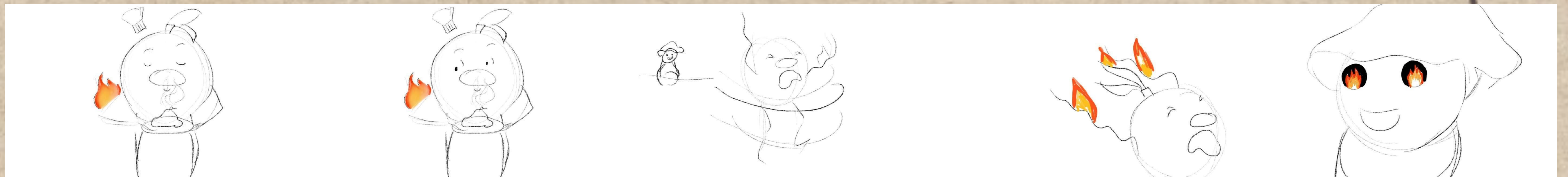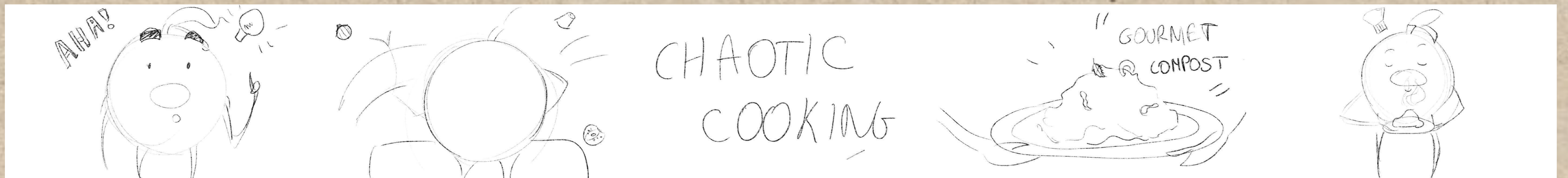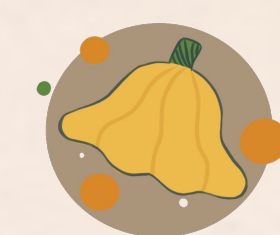This is the first version of our narrative. The premise was based on the radish having to injure himself to console the baby. After much thought and feedback we decided that it was too violent for the young audience we were aiming for and that it wouldn't be pleasant to watch a radish get set on fire.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Amelia Tzemis: ameliatzemis@gmail.com

Improved synopsis

Set in a world of humanoid vegetables, Patty Pan focuses on a Bachelor Radish man who suddenly has the responsibility of parenthood thrust upon him when he finds baby Patty Pan on his doorstep. Patty seems sweet at first, but things soon descend into chaos when she starts screaming like a demon. Radish man desperately tries to console Patty by tending to her needs (as outlined in a baby manual), but finally realises that the only thing that'll cheer this baby up is him goofing around and showing off. Eventually, Patty calms down, the exhausted Radish cradles her to sleep and the manual is thrown away.
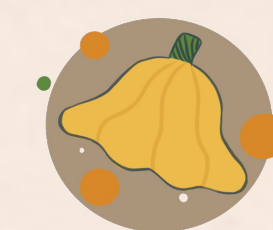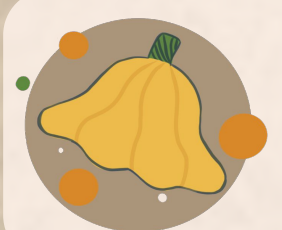
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Amelia Tzemis: ameliatzemis@gmail.com

Visual Development

Character Style References

2D Effects References

Our aim is to combine 2D and 3D animation together. We want to include onomatopoeia words in places with loud noises. Also scenes such as whisltling will have music notes 2d animated on top and when the baby is crying there will be zigzags around her head.

We want to include such lines and have them 2D animated.
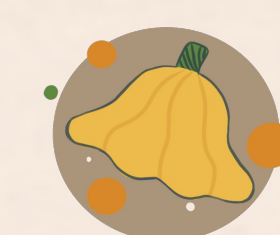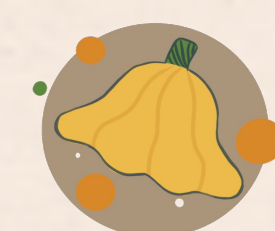
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com   Amelia Tzemis: ameliatzemis@gmail.com

2D Effects Development

Chose
CHARCOAL
PENCIL

KYLE BONUS CHUNKY CHARCOAL
KYLE HAPPY HP
KYLE PASTEL PALOOZA
KYLE CHARCOAL PENCIL
KYLE PENCIL HARD

Poppy's Handwriting → with pencil grain

paddy pan   paddy pan

Grace Parker: graceparker@gmail.com
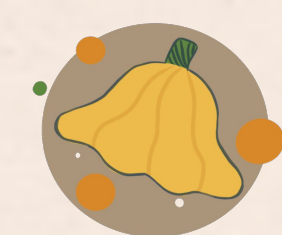
Character Inspiration
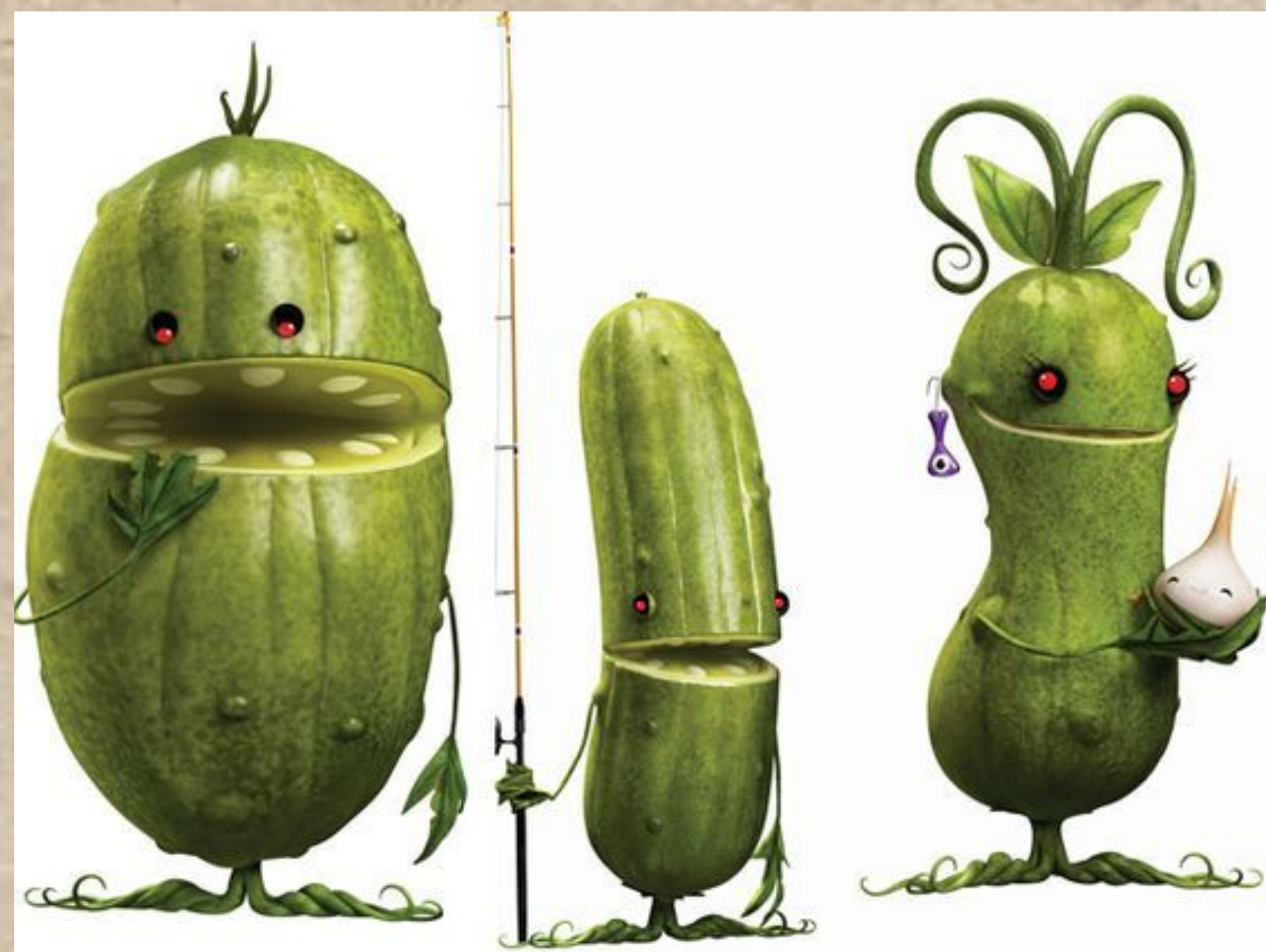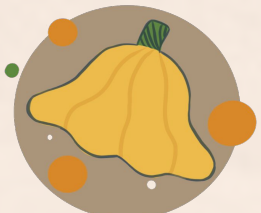
As we knew we wanted stylised vegetable characters for our film, we went about finding some existing examples. The character in the top left corner served as inspiration for our baby character. We liked the big eyes and round proportions and decided this would help with making our character look innocent and cute. At this stage we weren't sure if we wanted one or two 'parent' characters, but we knew they'd be a different species of vegetable to the baby to show they're not biologically related.

Amelia Tzemis: ameliatzemis@gmail.com

Radish Man

By Amelia Tzemis: ameliatzemis@gmail.com

Initial Character Concepts

I started on some concepts for the adult character here. At this point we decided to cut back and only have the one 'parent' but we were unsure if we wanted them to be a mother or father. In the end we decided on a female baby and a male adult as we thought a father-daughter dynamic would be the most interesting. In terms of proportions and designs, we liked options 1 and 4 most, and decided to make the adult protagonist a radish.

Amelia Tzemis: ameliatzemis@gmail.com
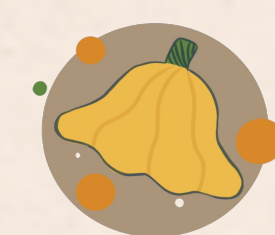
From the previous concepts, we decided we wanted the radish to have long gangly limbs and a round body. This is what we ended up with. We also wanted simple facial features that we could separate from the main mesh as this would make animation easier. Our main inspiration for this was an animated short called 'The Stained Club'.

The red-pink tone we used for the character was something we really liked as it ended up contrasting nicely with the yellow colour in the design for the baby as well as with the green tones of his leaves and in the foliage in the environment.

Amelia Tzemis: ameliatzemis@gmail.com

At one point we contemplated adding dungarees to Radish Man's design, but they were either too baggy or the straps looked awkward so we scrapped this idea. We also tried thicker eyebrows on him which we liked as it gave him an older, more fatherly look.

Amelia Tzemis: ameliatzemis@gmail.com

Juggling Concept

Amelia Tzemis: ameliatzemis@gmail.com

Making the Model

As the radish is such an organic character, I started out with sculpting him out of Zspheres instead of modelling him in Maya. At this rough stage, we were generally happy with how he was looking but decided he needed to have more exaggerated proportions, such as longer limbs and even more rounded features.

Amelia Tzemis: ameliatzemis@gmail.com
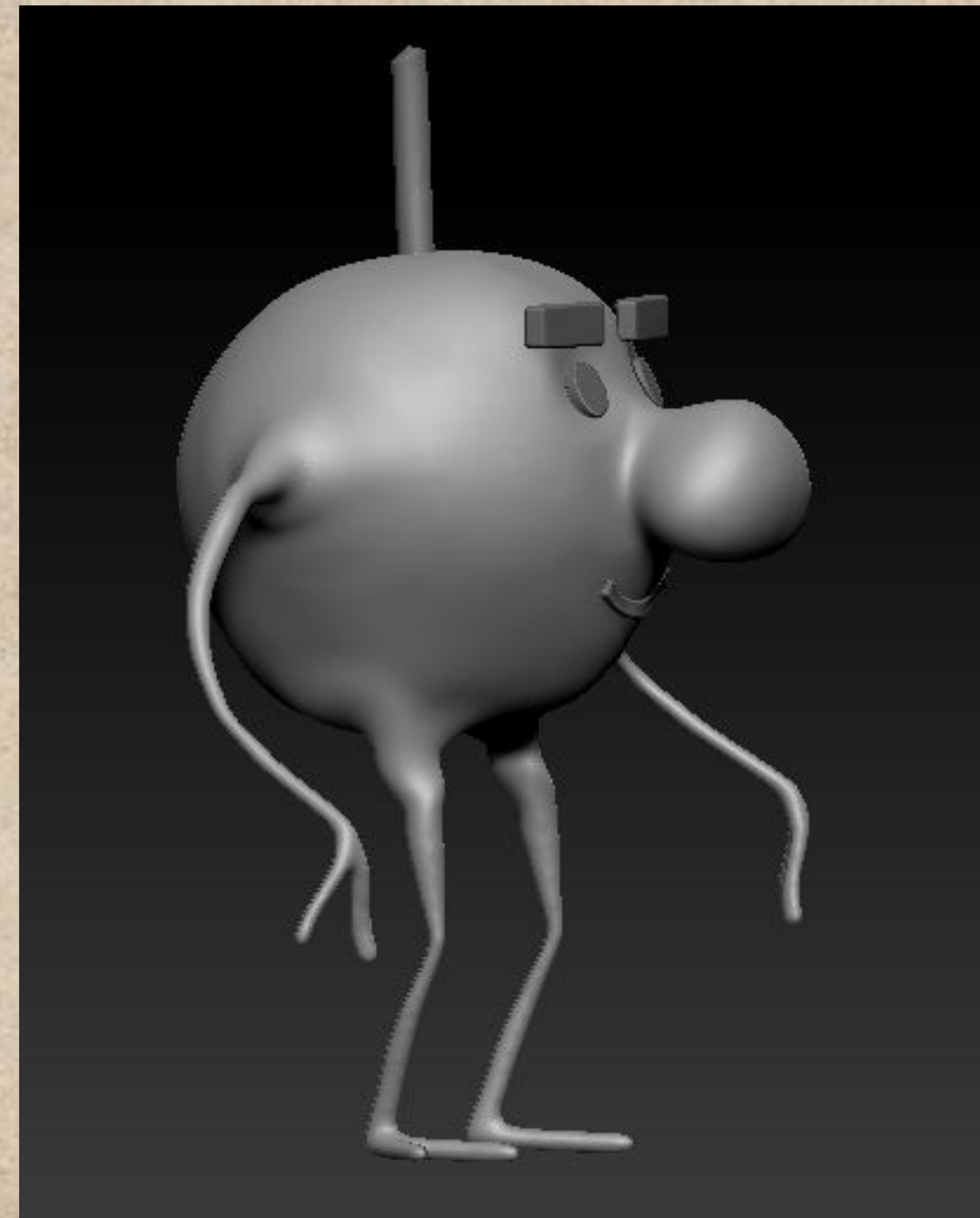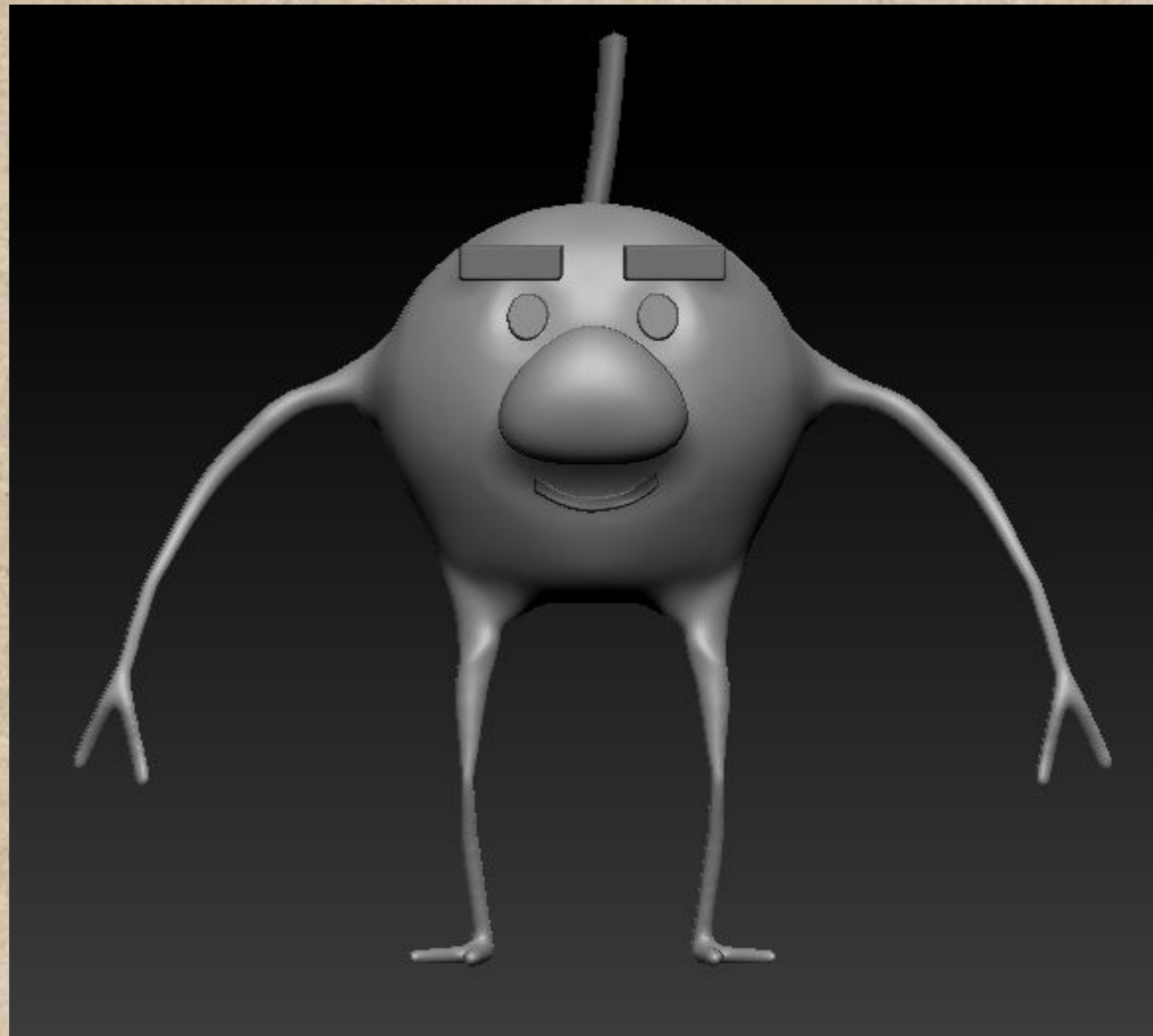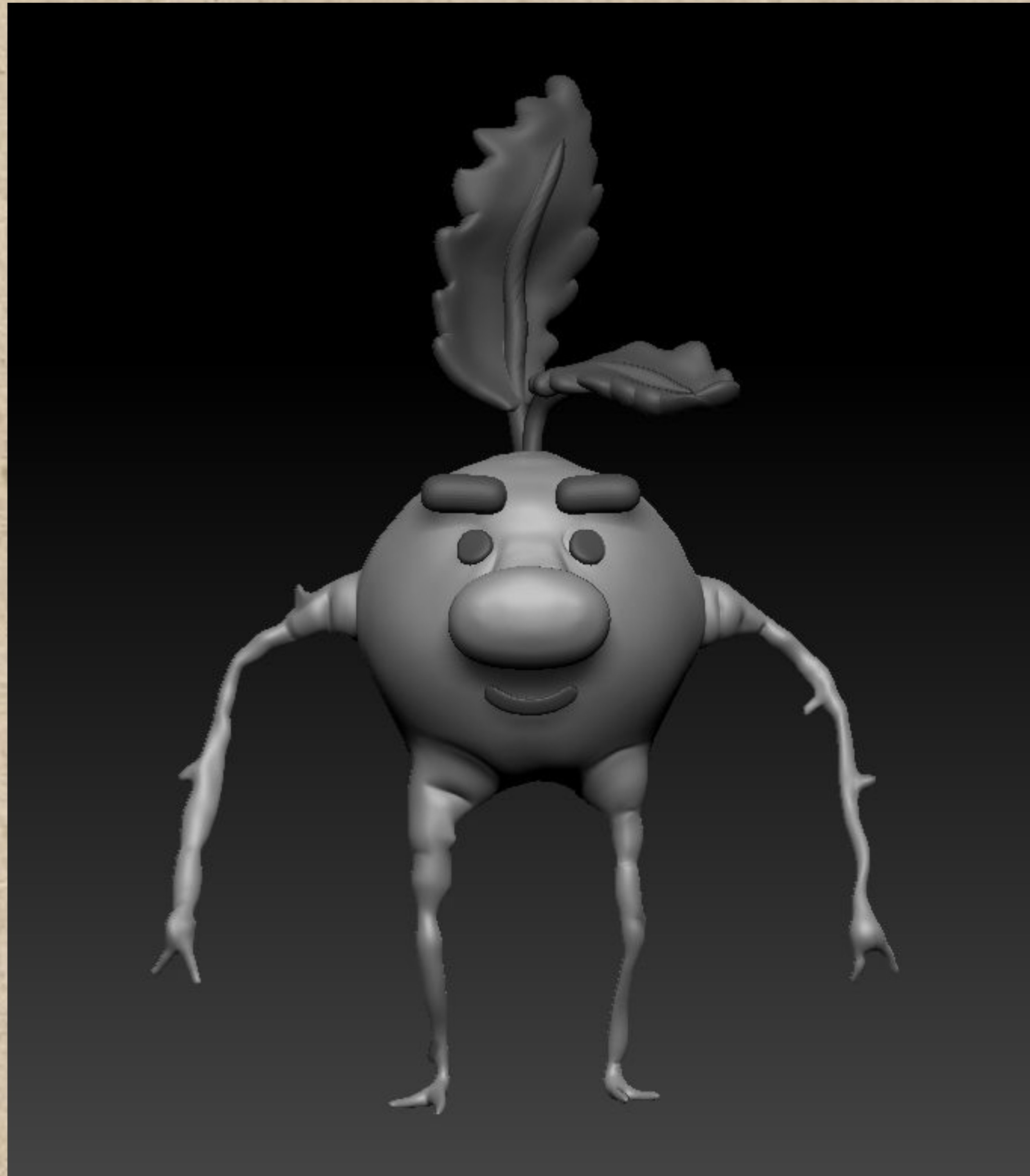
At this stage I had added the leaves and had their general shape blocked out. I also experimented with giving the radish more lumpy root like limbs and a more rounded mouth and eyebrows. While we liked the limbs with added roots and wrinkles we decided they were too chunky and made him look stockier than we would like.
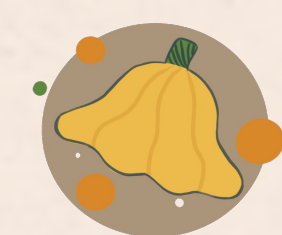
Amelia Tzemis: ameliatzemis@gmail.com
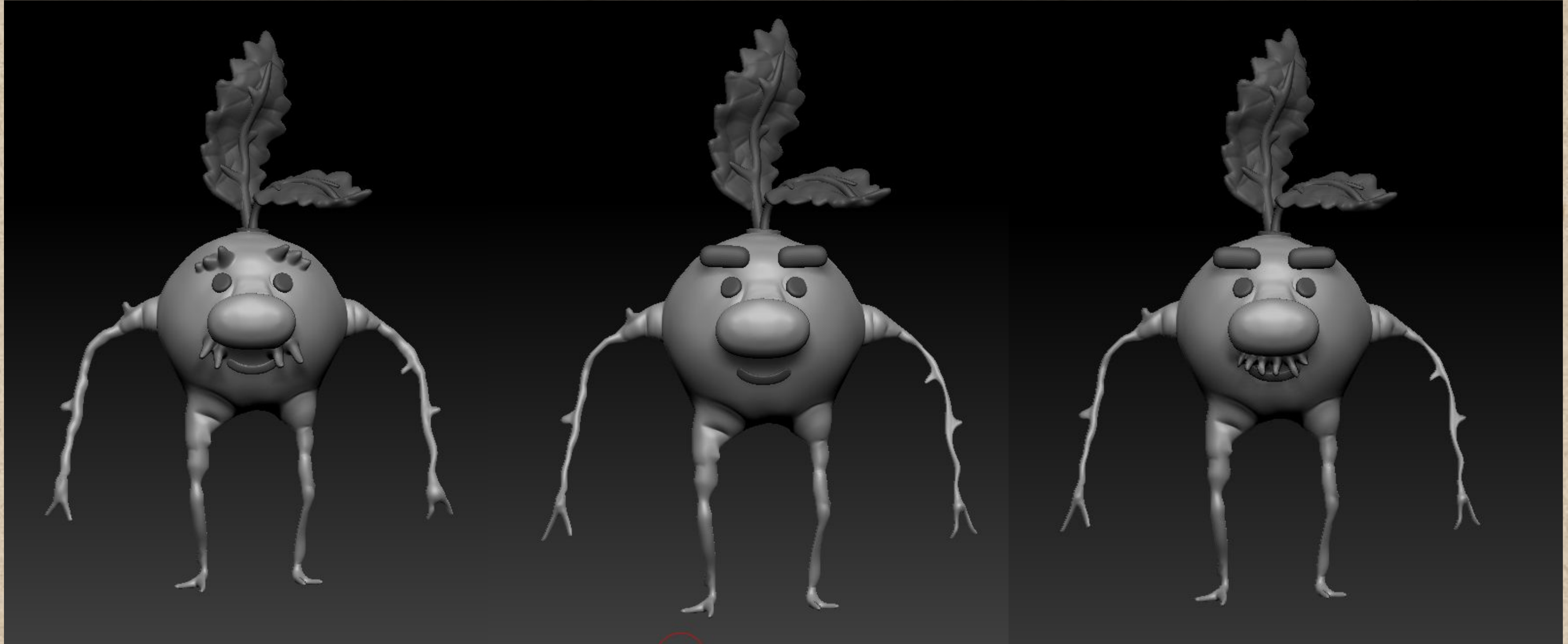
Here I stretched out the Radish's limbs and made his arms a lot slimmer while still giving him some chunky shoulders. I also experimented with giving him a 'moustache' made out of roots as we wanted him to look appropriately mature to be a father figure. The leaves were fleshed out here too with some veins and more offshoots from the stalk added.

Amelia Tzemis: ameliatzemis@gmail.com

After getting some feedback, I tried stretching out his arms and legs even more, adding more roots to his moustache, giving his torso a rounded triangular shape and making his eyes smaller. We decided that this design had more interesting proportions and and this is the sculpt that I was to take to the next stage for retopology and UVs.
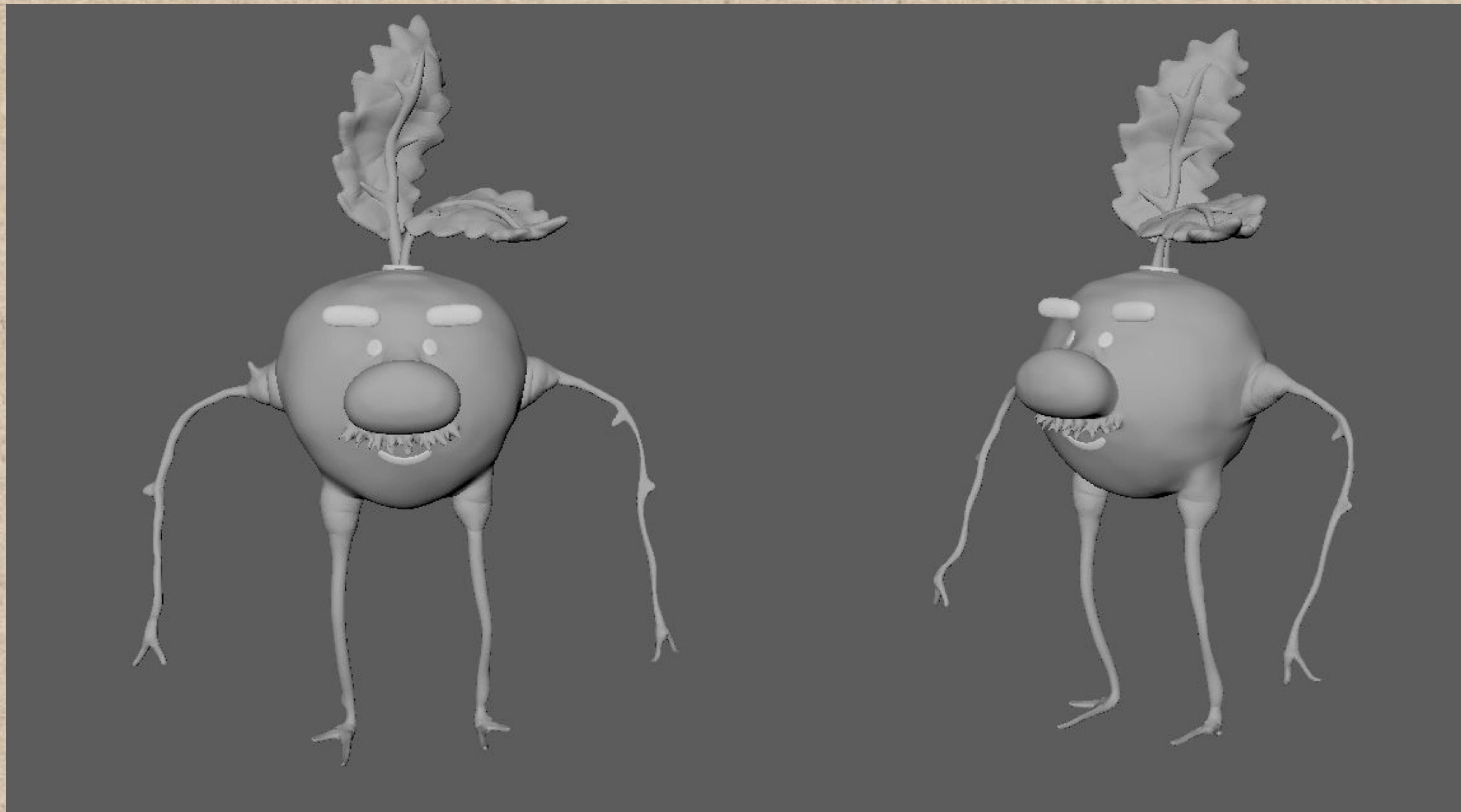
Amelia Tzemis: ameliatzemis@gmail.com

Textured and Lit

This was my first pass at texturing the Radish, just to see what he looked like with colours. We exported it out into UE4 and Kate lit it to see how close to the final result he was. The main thing were weren't happy with was how the moustache looked in this version and we figured it would look better as a seperate piece of geometry as it wasn't baking nicely as part of the radish. The colour scheme isn't far from what we wanted, but I wasn't keen on the eyebrows and moustache being different shades of white/cream.
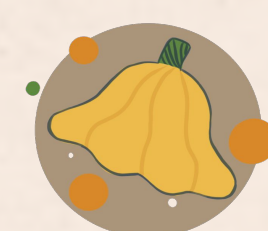
Current Version

This is my second pass at the Radish's textures, which is much closer to our final vision. The new moustache works much better I think and it matches the eyebrows well now. I also added more lumps and bumps to him and more variation in the roughness. As this is presented in Marmoset, I'll have to see how his textures look in UE4 and potentially do another pass at them. We also need to see how he looks with baby Patty and if the level of detail is consistent between them.

Amelia Tzemis: ameliatzemis@gmail.com

Expression sheet

Amelia Tzemis: ameliatzemis@gmail.com
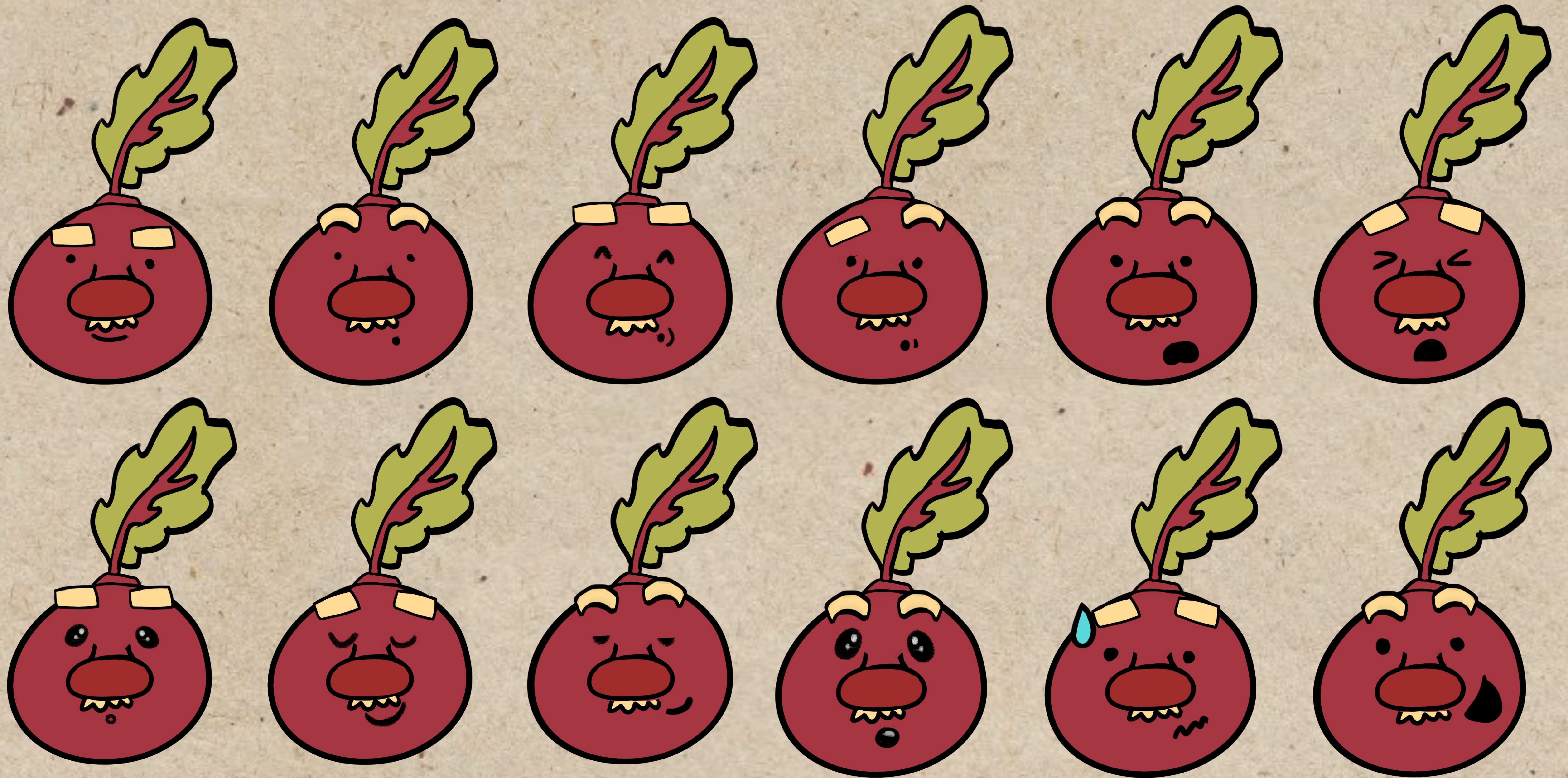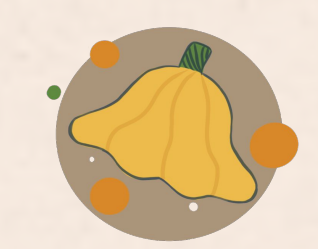
Baby Patty

By   Kate Bieriezjanczuk : k.bieriezjanczuk@gmail.com

Patty pan courgettes - the inspiration for the baby design and the name of the film

Potato Baby

① ② ③
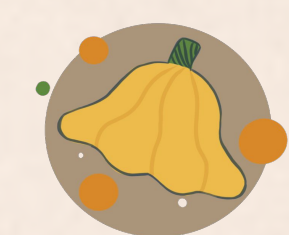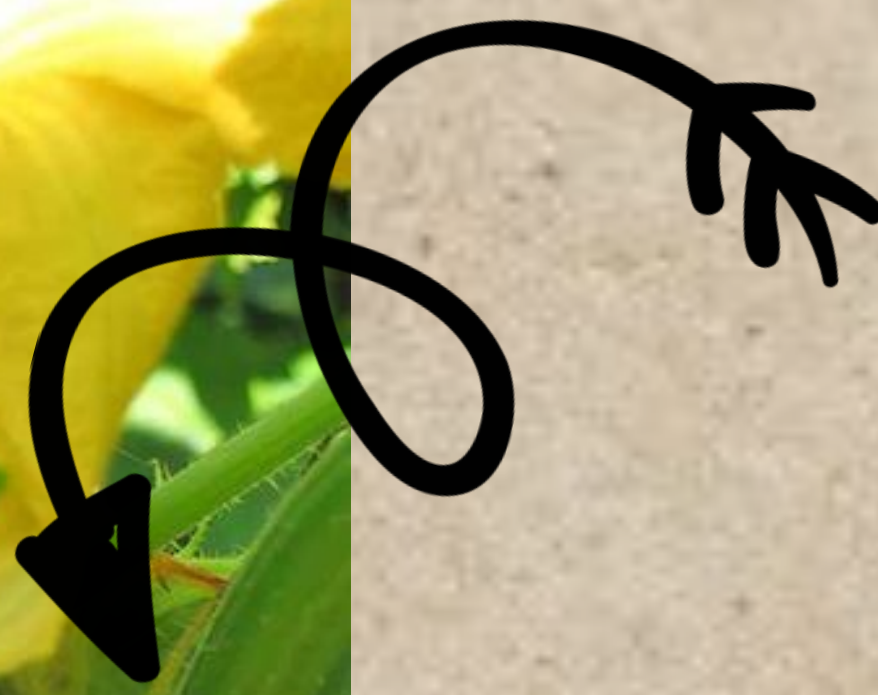
When inventing the character we looked at many types of vegetables that would fit in with the world and radish character but at the same time would stand out visually. A patty pan courgette was the perfect fit with the bright colour and round shapes. The dilemma was how human we wanted to go with the design. Settling on this swaddled baby, she would have mostly a human shape under the swaddle with a funky head. This created a good contrast with the radish who is mostly limbs.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com
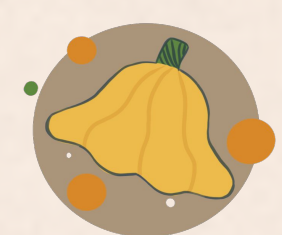
Starting Again
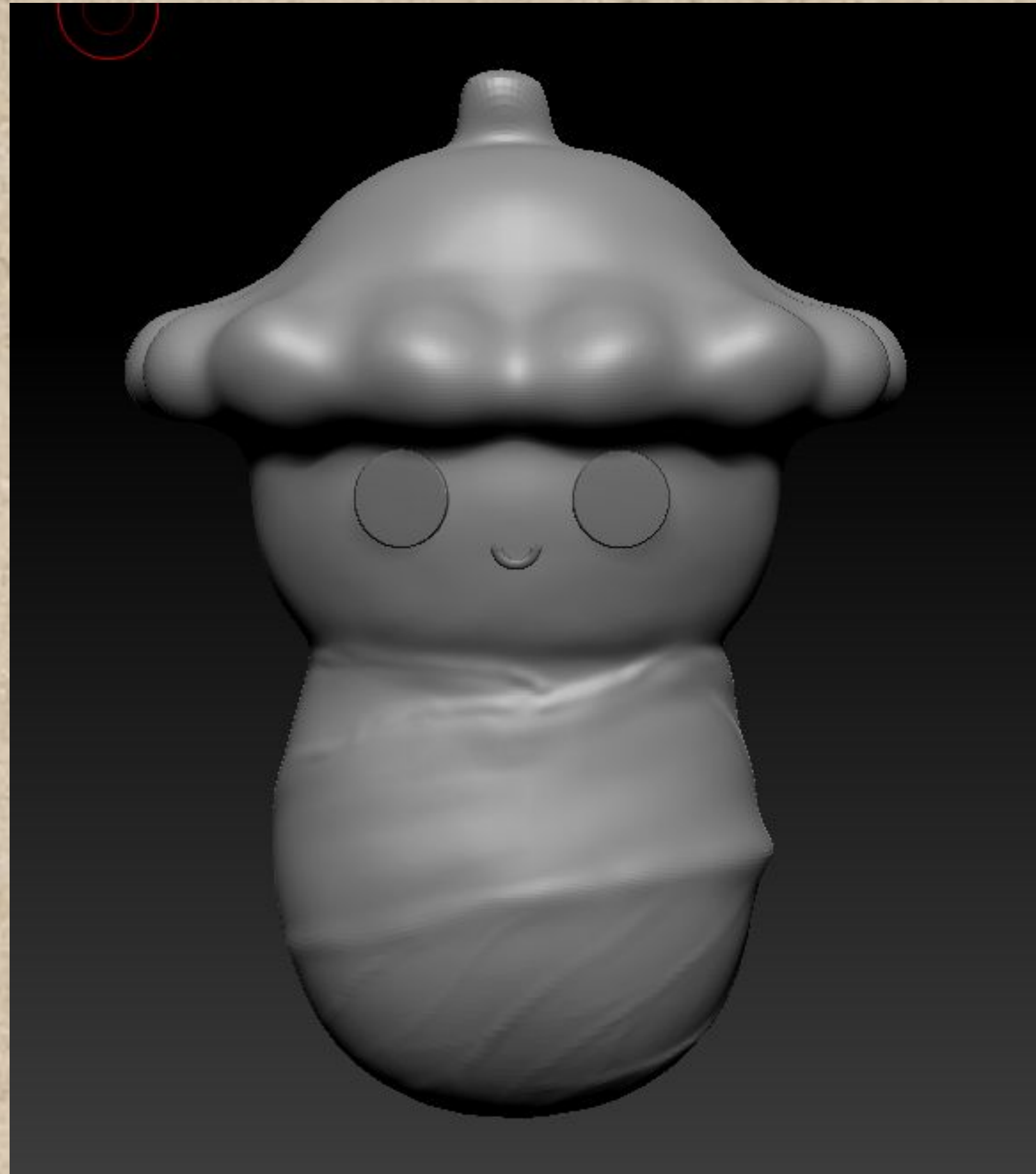
When I got to this point in the sculpt, I realized that the design wasn't working. No matter how I tried to fix it or make it better it just wasn't looking right. We decided to go back to the drawing board and review some of the early concept art. This meant that I had to restart the sculpt.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

②
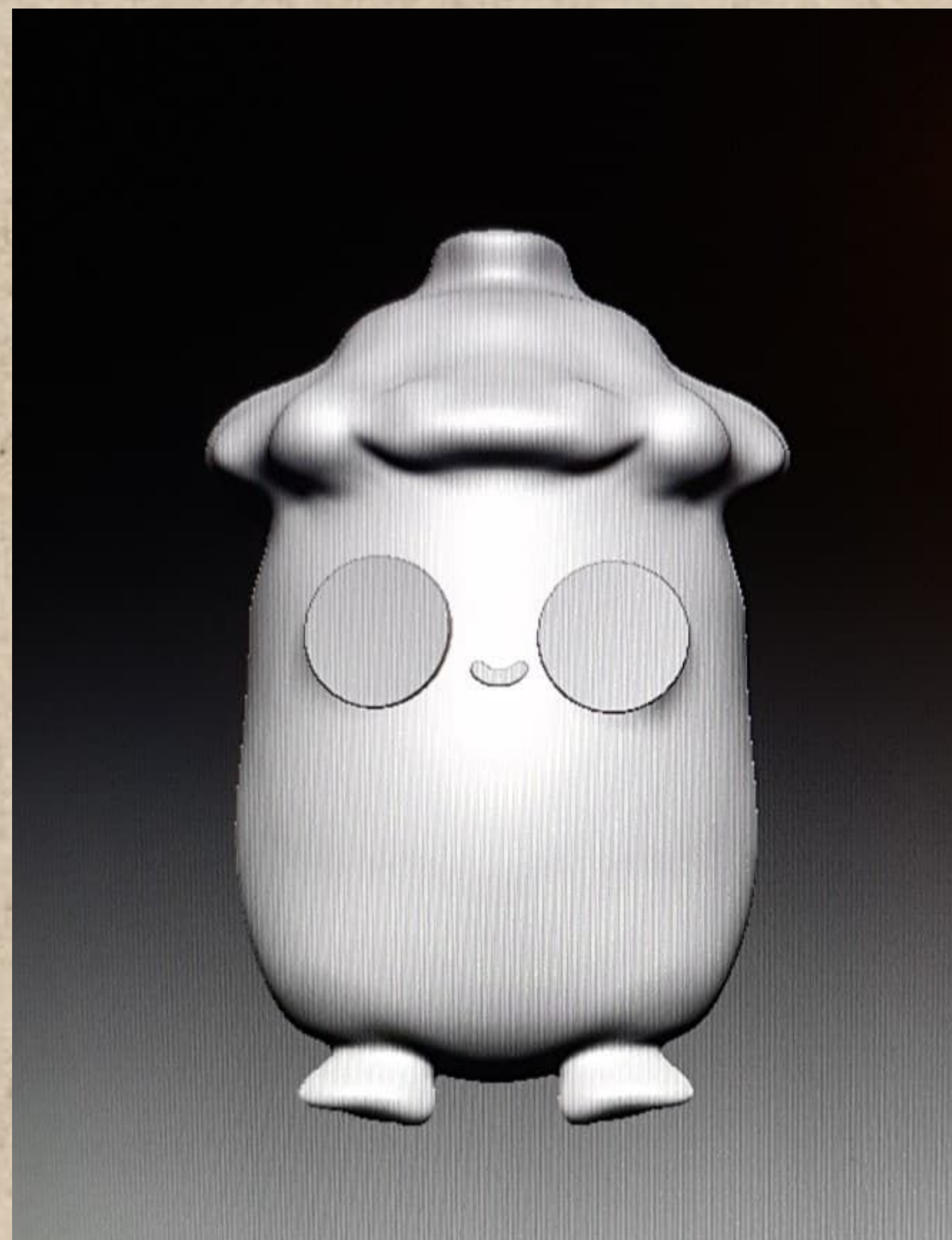
Changing proportions based on feedback from other group members
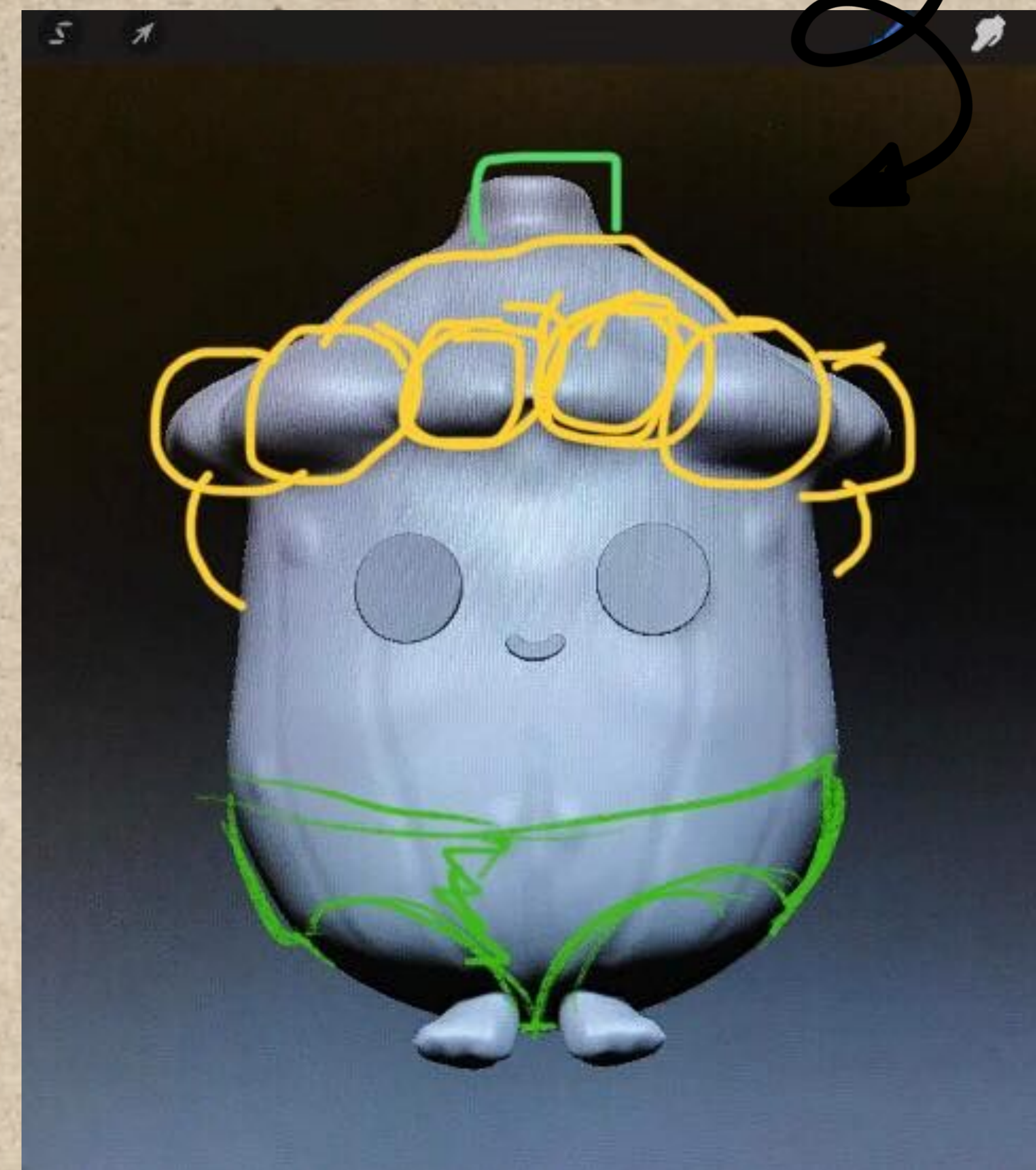
After looking at the very early designs, we settled on this sketch with feet. It was still lacking more detail so after blocking it out in zbrush we decided to add a leaf nappy. This design would work much better, less human looking and more vegetable. The feet will also give more possibilities for animators to play with.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

A before and after adjusting the SSS levels in Marmoset. This was the first block out of the textures. The feedback we received included adding more detail to the textures and fixing the eyes to follow the body and making the texture of the skin more reflective. The next challenge also included moving it into UE4 to achieve the same look.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Amelia Tzemis: ameliatzemis@gmail.com

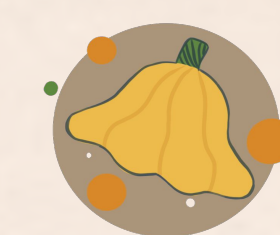On the right, I am trying to create the same SSS level as in Marmoset Toolbag but using the Subsurface option with opacity. This wasn't giving me the right results and was clearly displaying seam lines. After a lot of research I found that there is another technique. I used a Subsurface Profile which creates another node to control the subsurface scattering and roughness. This finally gave me the right look which you can see on the model on the left. This is still not the final look but it is going in the right direction. The scattering colour is not correct and the roughness needs a map to mimic the broken up highlights on courgettes.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com
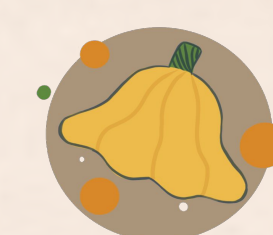
Amelia Tzemis: ameliatzemis@gmail.com

Textured-
Rendered in UE4

Normal maps - Rendered
in Marmoset Toolbag 3

Wireframe- Rendered
in Marmoset Toolbag 3
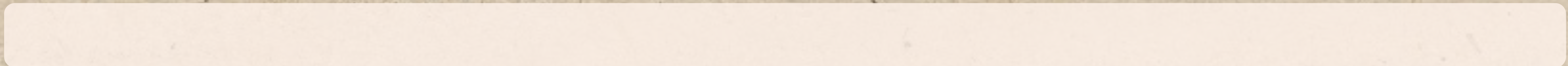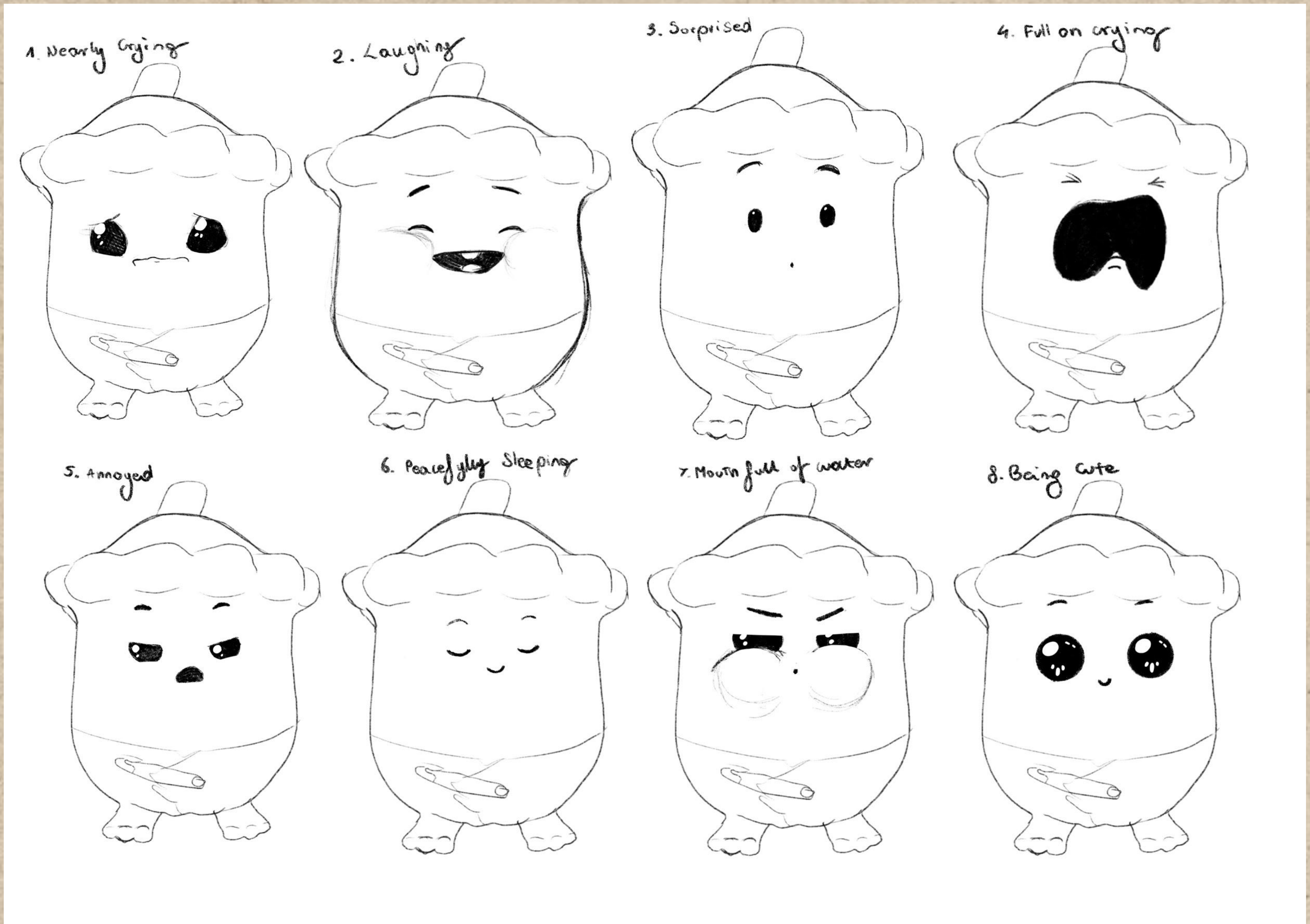
Expression sheet
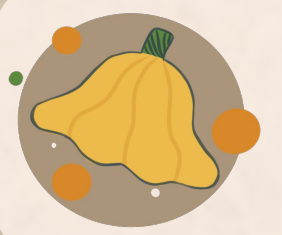
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com
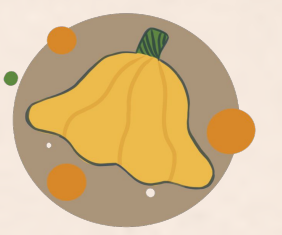
Amelia Tzemis: ameliatzemis@gmail.com
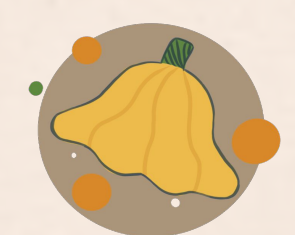
Character Rigs

By 🔔 Katherine Padley : kpadley0@hotmail.com

Radish Man Rig

The Radish Man is the main character for this project. The main features of this rig are the ribbon arms and legs that stretch and deform to give them a more root like movement. I also added a dynamic simulation option for the leaves on its head, to provide easier movement for the animator when the character is moving. There is no dialogue in this film so the character is only required to make cartoon like emotional expressions rather than dialogue movement.

Katherine Padley: kpadley0@hotmail.com
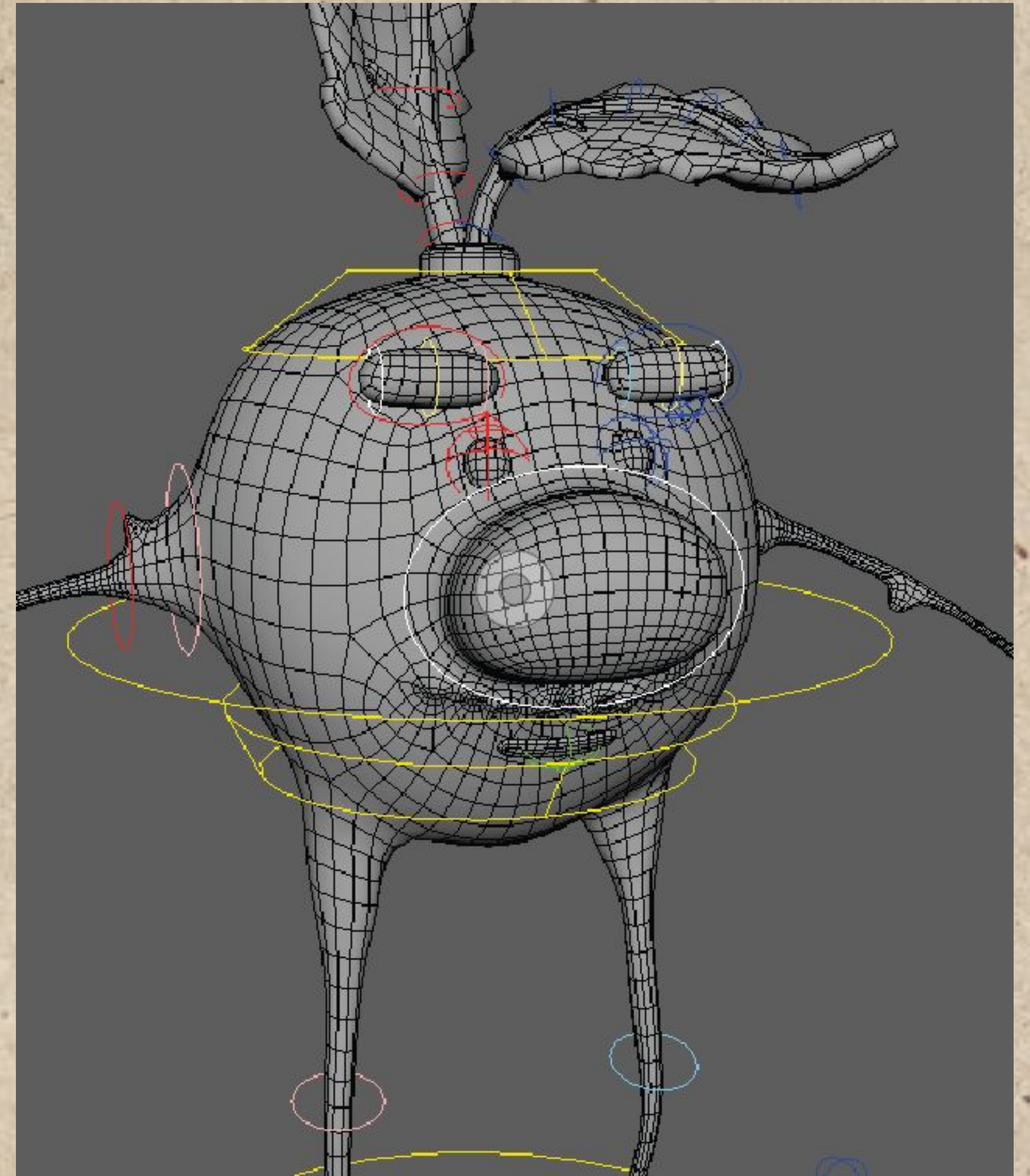
Baby Patty Rig

Baby Patty is the second main character for this project. This character doesn't have much movement in the film so isn't required to have any complicated features. Its main feature is its squash and stretch body which can be shaped to add more expression to the character. This character doesn't walk so the main movement of the feet is moving them to a seated position and wiggling its feet. This character also has no dialogue so only requires emotional facial expressions.

Katherine Padley: kpadley0@hotmail.com
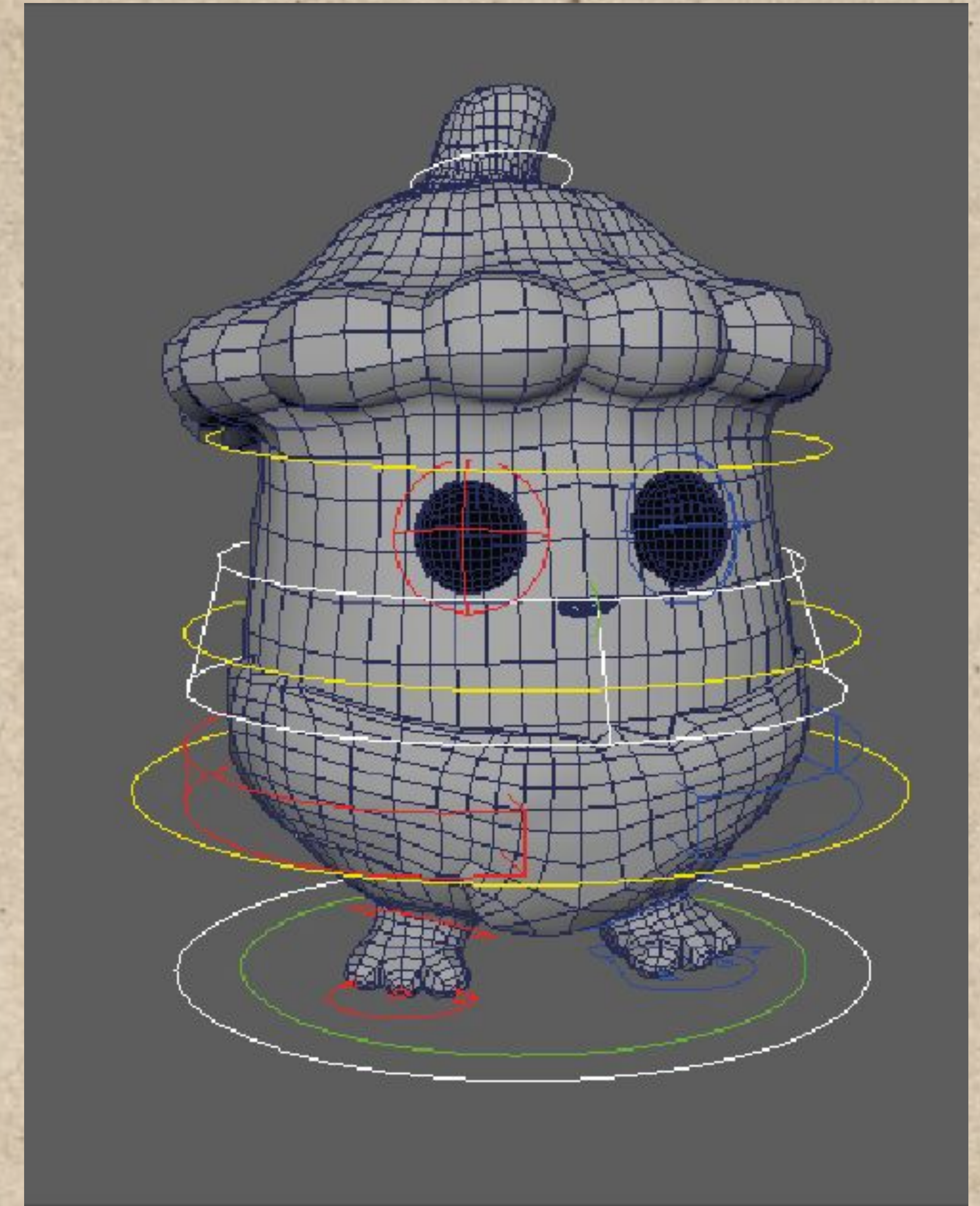
Radish Man: Limb Deformation

The radish man has very thin and spindly arms and legs which made it hard to maintain the volume of the mesh when deformed by joint skinning. I found it was too sharp a bend with one joint so instead I added 2 joints for the elbow to create a smoother and more rounded curve in the arms. The only adjustments to the IK FK arm setup was halving the rotation of the single elbow control, between both joints so the animator doesn't have to animate 2 elbow parts separately.

Before

After

Katherine Padley: kpadley0@hotmail.com
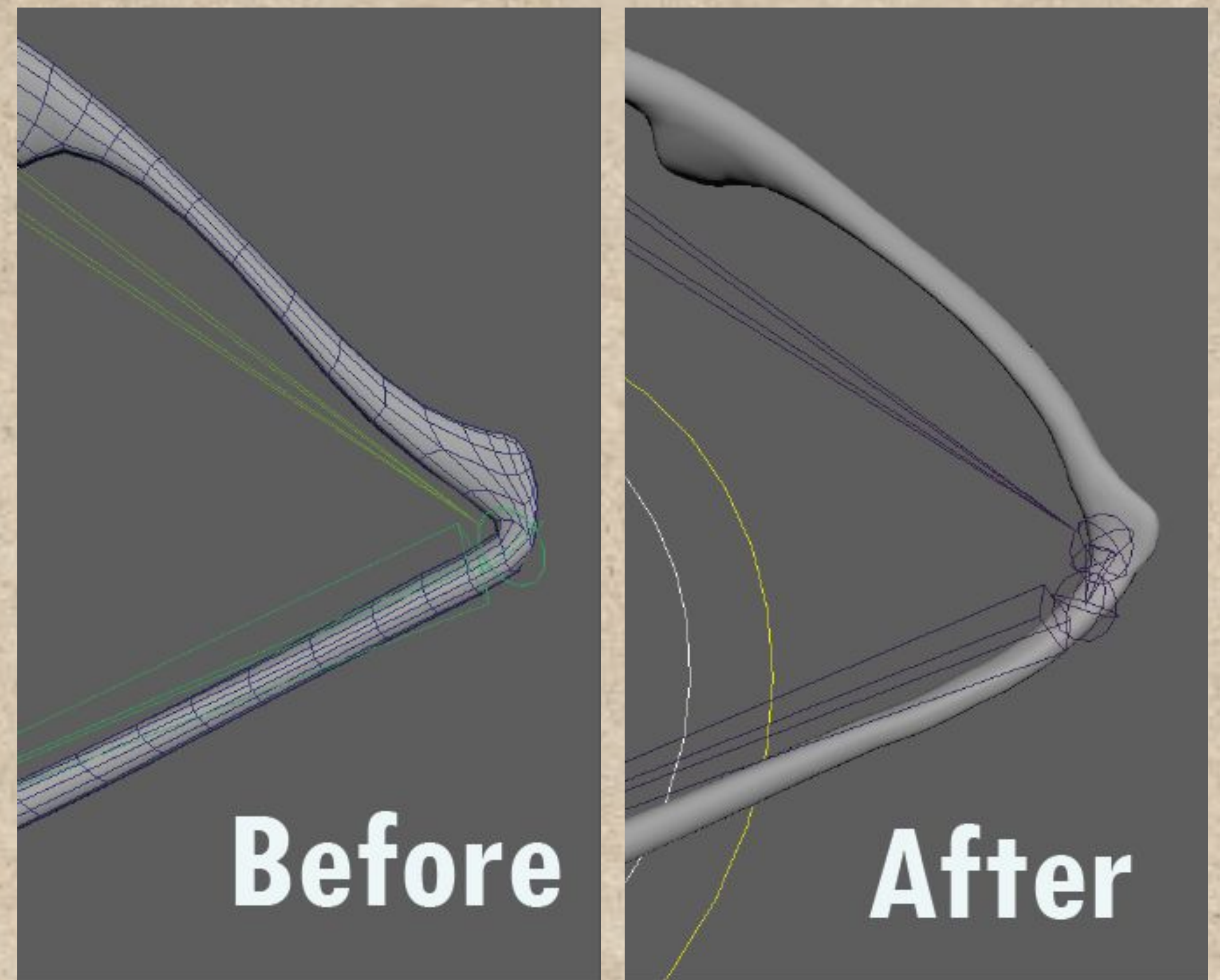
Radish Man: Ribbons

I added ribbons to the arms and legs which are joints that follow a nurb plane allowing for more deformation whilst also keeping the volume of the mesh, even when its deformed. This also gave the animator more control over the overall curve and shape of the limbs. Using Blend shapes on the nurb plane allowed me to add deformers to the limbs. Using the Sine deformer allowed me to create a wave effect on the limbs creating more interesting shapes for the animator to use.

Katherine Padley: kpadley0@hotmail.com
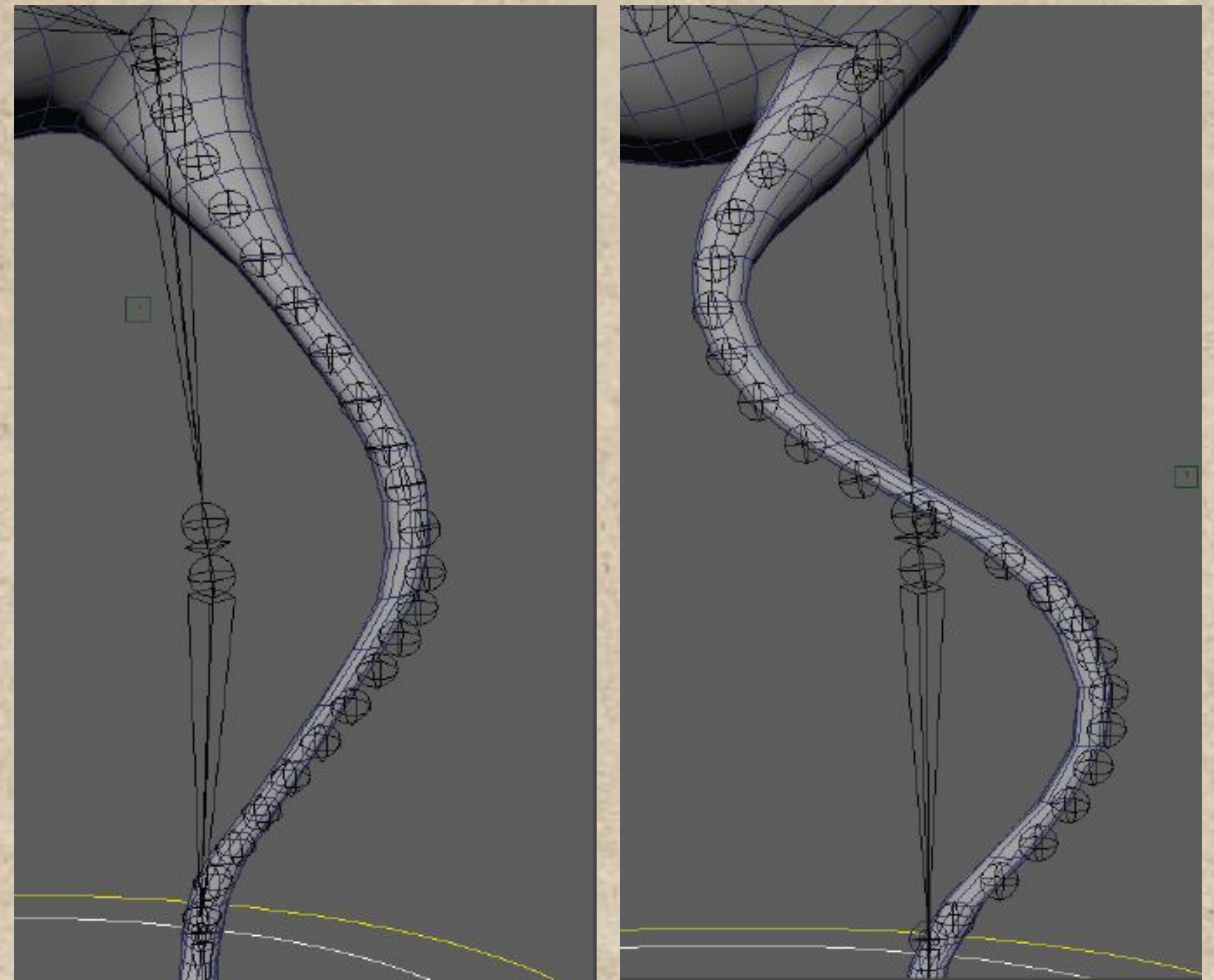
Radish Man: Ribbon Twist

Initially to create a gradual twist up the limbs to avoid the mesh from twisting in on itself, I used a twist deformer as a blend shape of the ribbon. However, while this worked for small rotations, if rotated too far it would distort the mesh and could only be twisted along a straight line so it wouldn't deform the mesh evenly as the limbs aren't straight. Instead I multiplied the rotation X value of the wrist control by a percentage value from 0.9 - 0.1, decreasing by 0.1 with each ribbon joint to create a gradual twist along the limbs.

Katherine Padley: kpadley0@hotmail.com
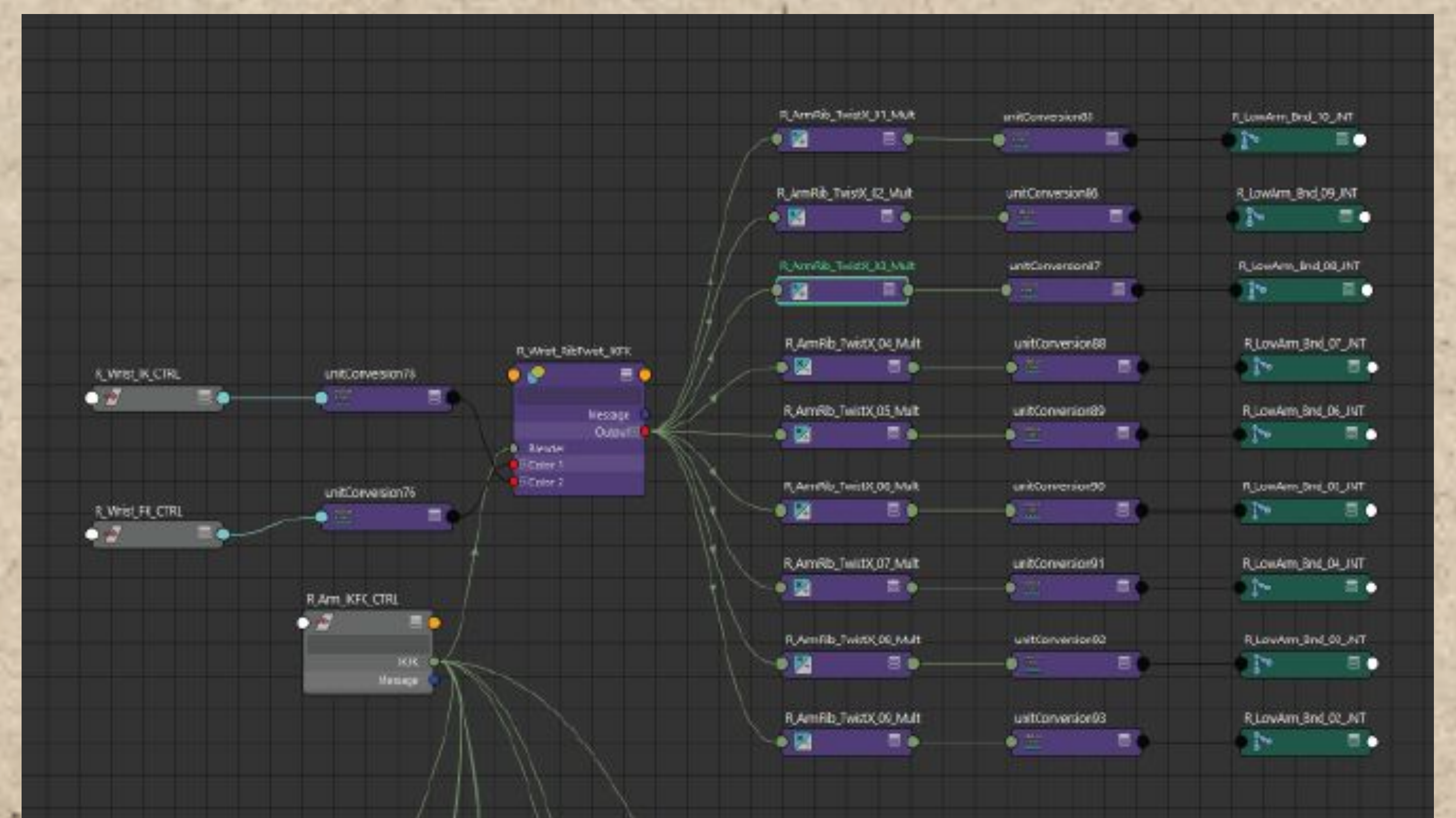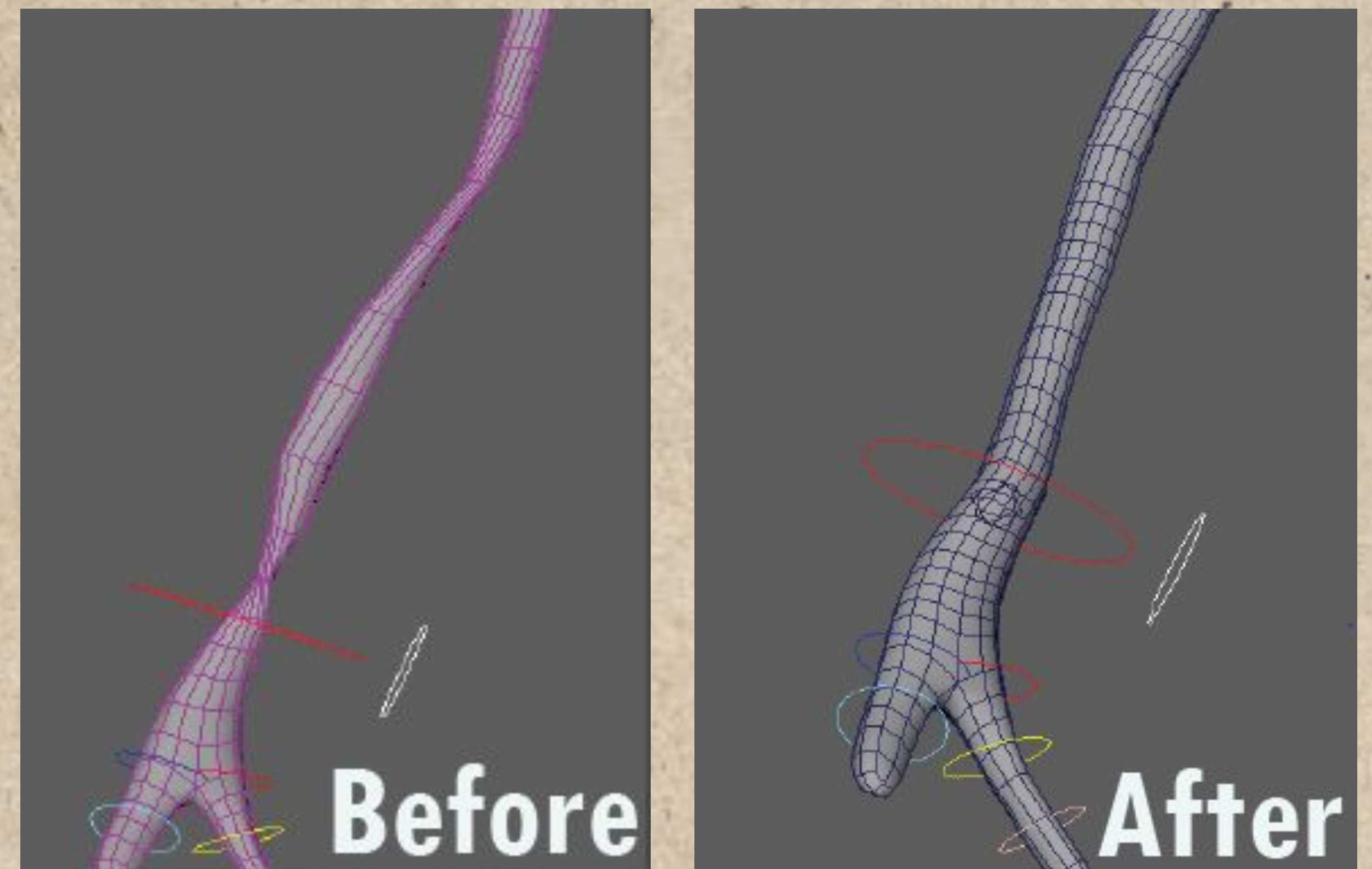
Radish Man: Stretchy Limbs

To help show more cartoon like movement I added an option to stretch the limbs when in IK mode by increasing the translations between each joint on the limbs. I provided the option of turning this on and off to give the animator more control over the length of the limbs, so it stretches when they want it to.

Katherine Padley: kpadley0@hotmail.com
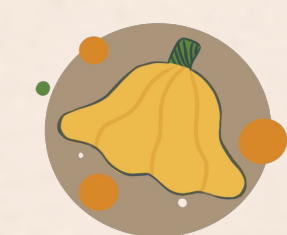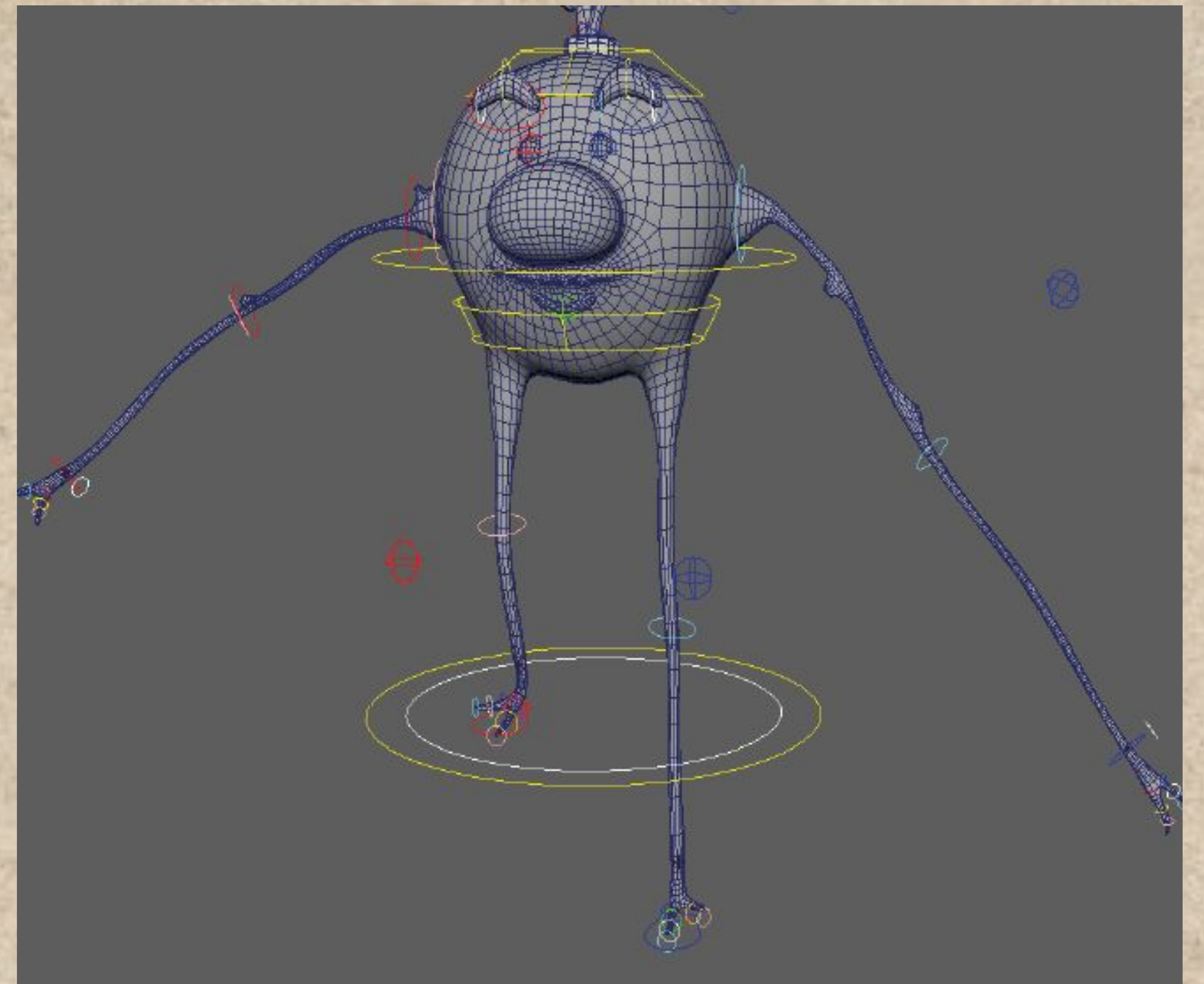
Baby Patty: Squash & Stretch

For the baby I also added a squash and stretch feature for its cylindrical body. I used power math to calculate the scale value for each spine joint from a given value, that the animator can change allowing them to control the characters shape as they are squashed and stretched.
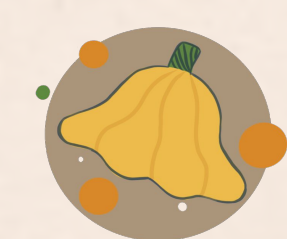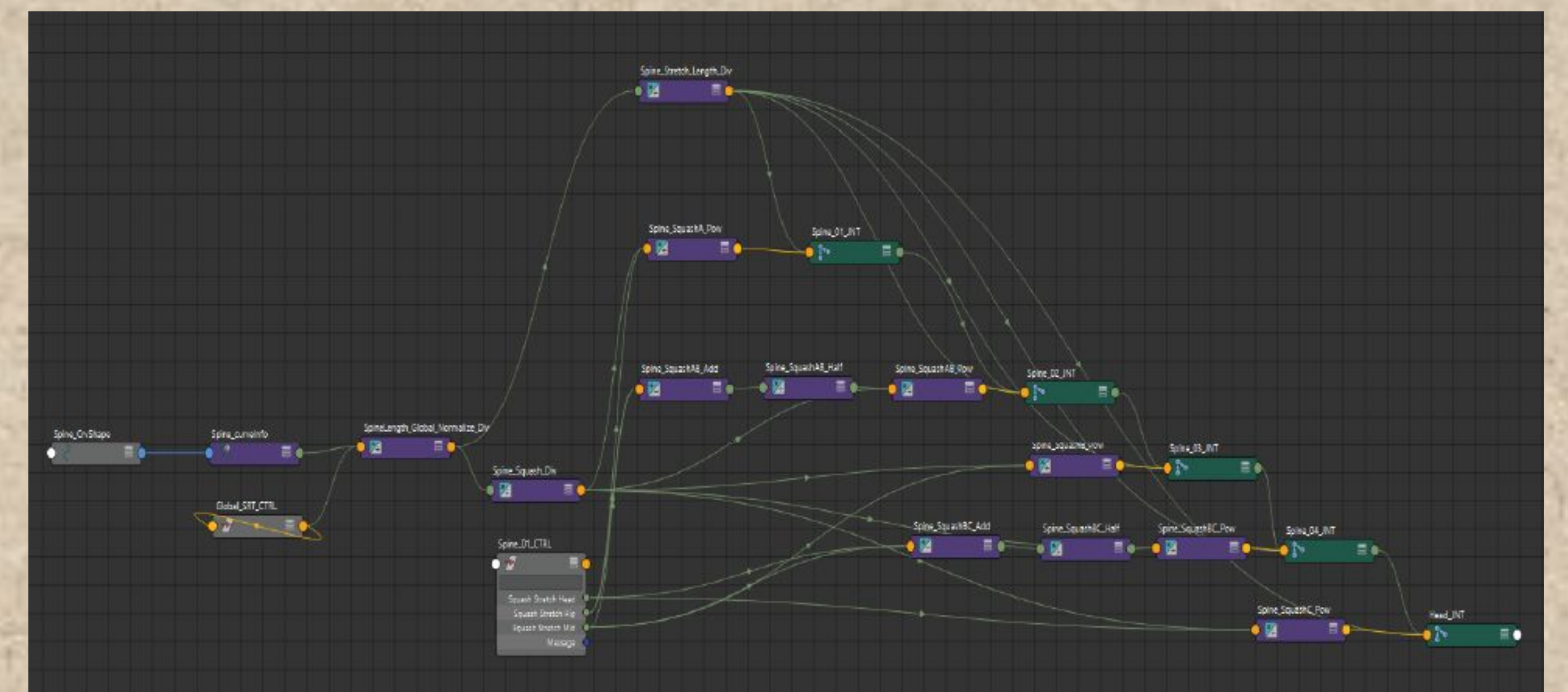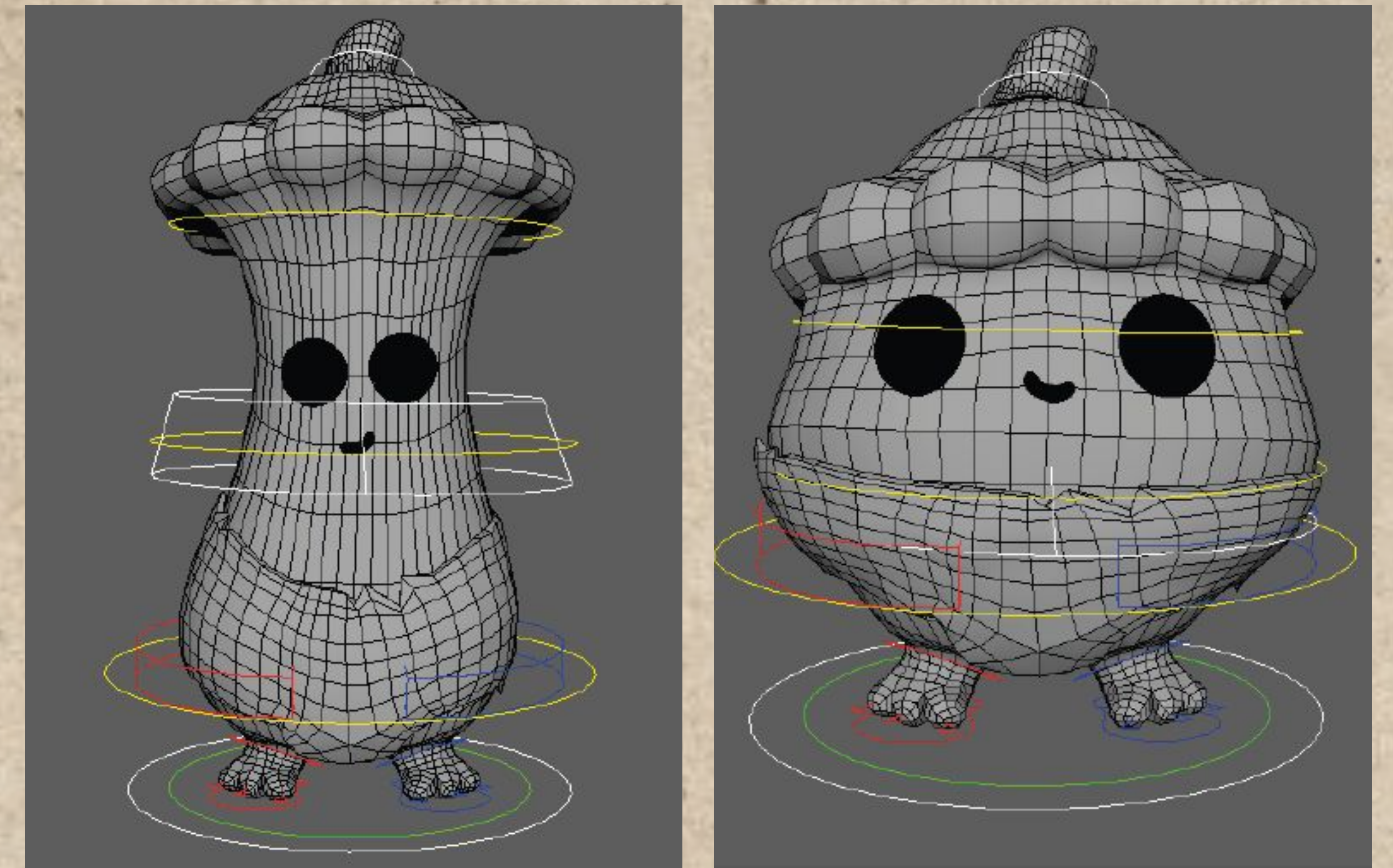
Radish Man/Baby Patty: Facial Expression

Both Characters have cartoon like facial expressions. However, both use separate 3d meshes for each part of their face such as the eyes, eyebrows and mouth. This presents the challenge of getting them to follow around the body when moved or shaped, so they don't intersect or are lost inside the body. To do this I placed the pivot of the controls at the centre of the body around the eyes and mouth and used a geometry constraint to keep the mouth and eyes following along the shape of the body as they were moved.

Katherine Padley: kpadley0@hotmail.com
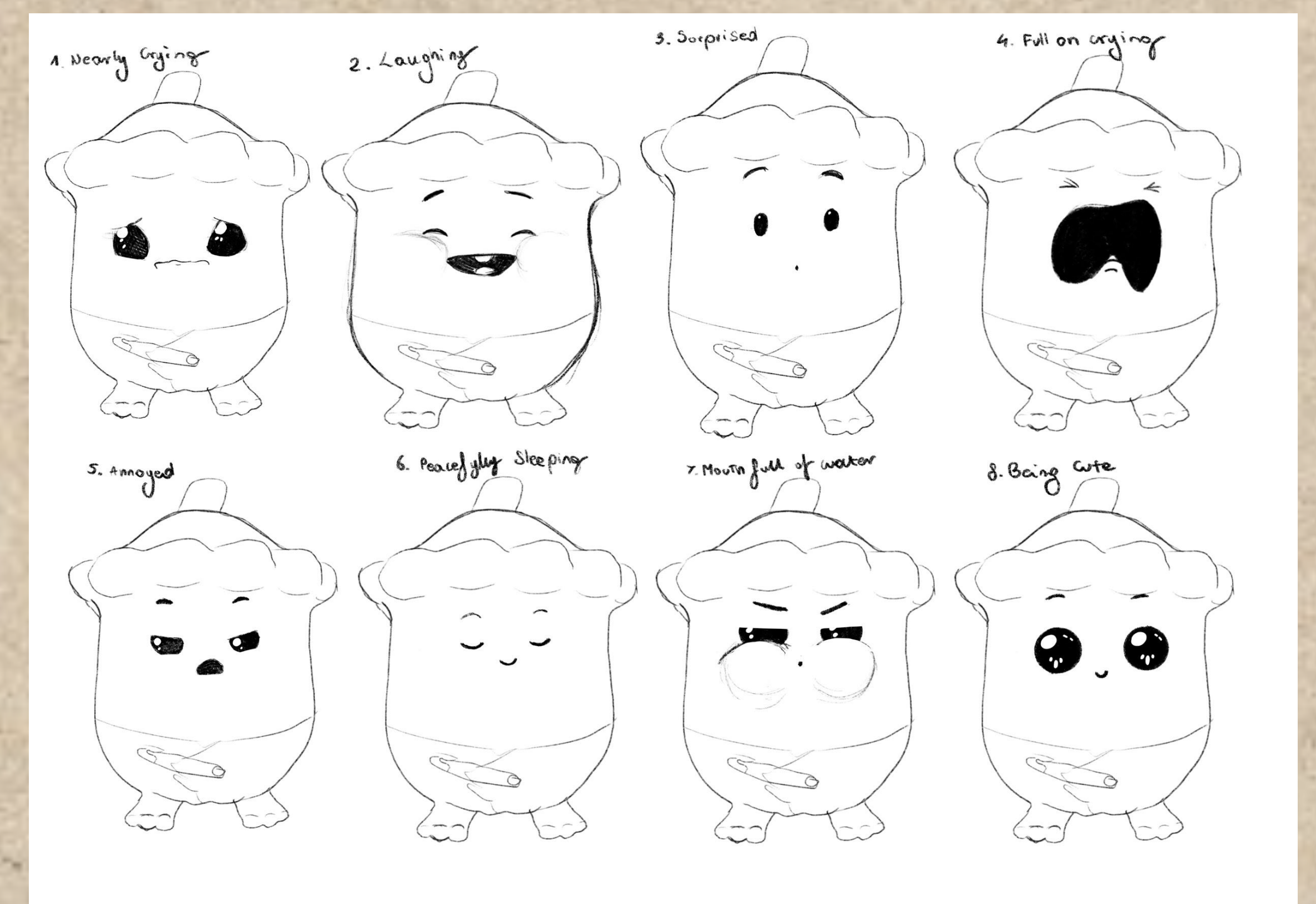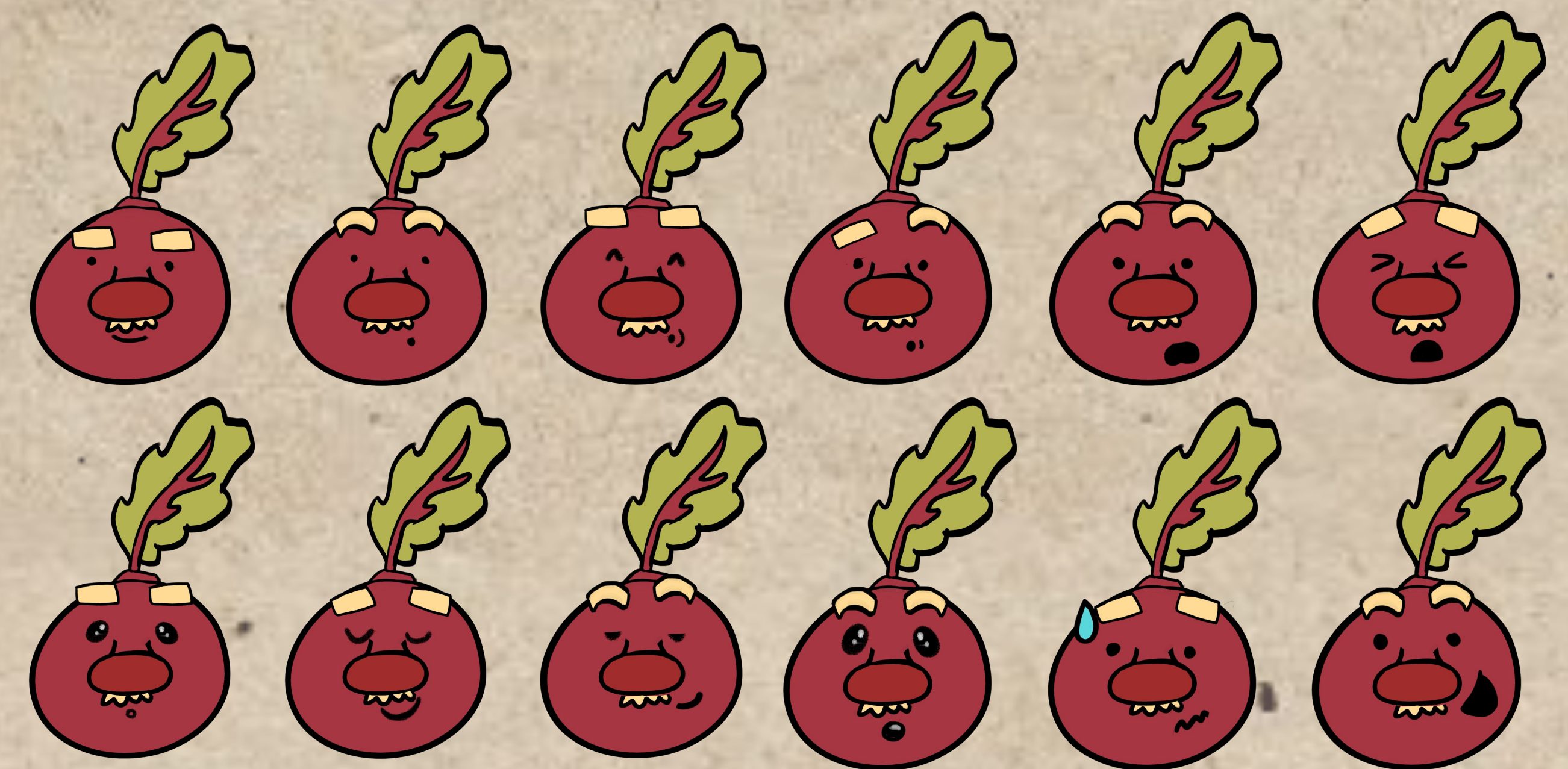
Radish Man: Eyebrows

I decided to deform the eyebrows using joints as this would allow the animator to move and shape them how they want easily from the middle or either end of the eyebrow, for any facial expressions.
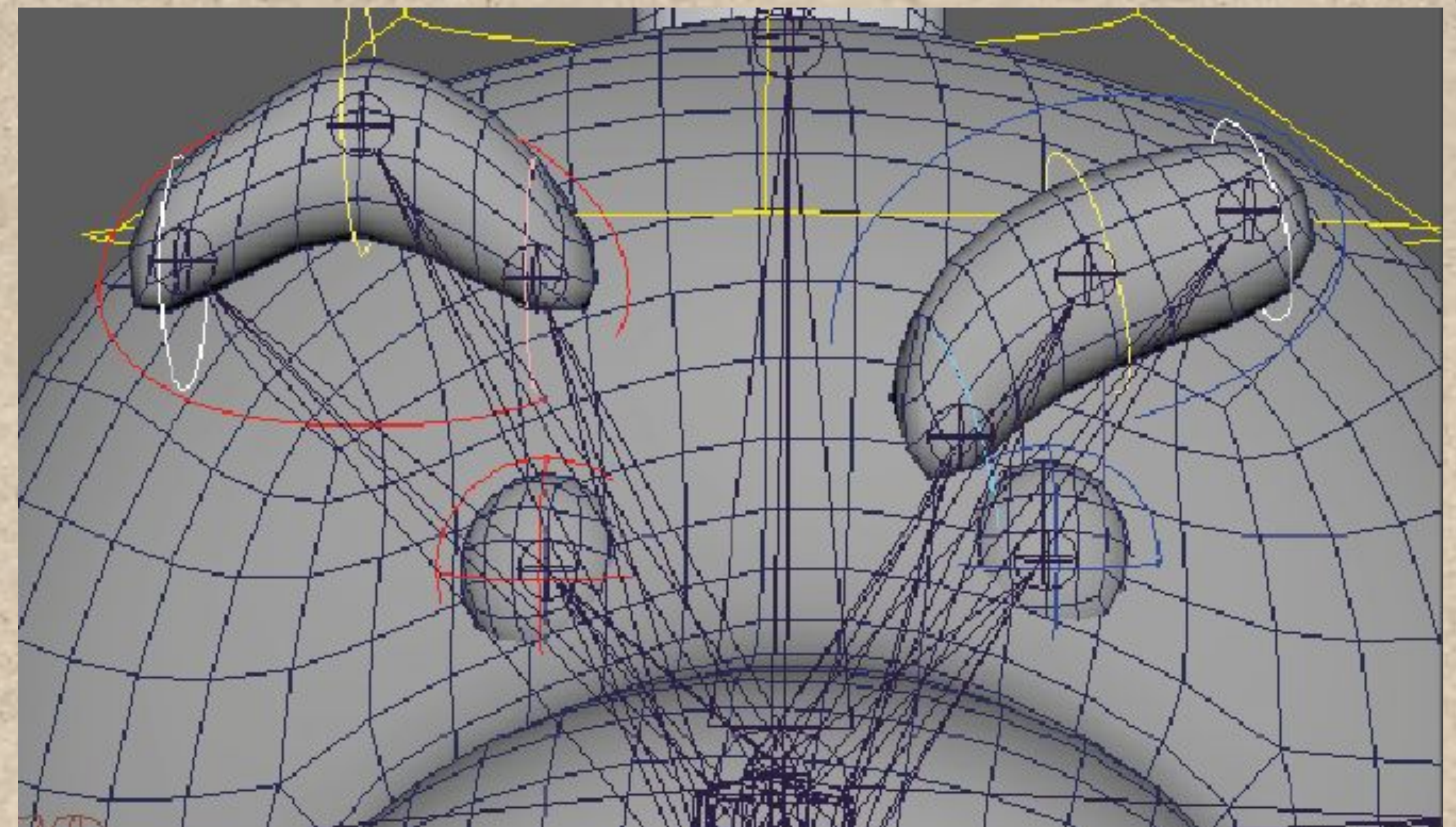
Radish Man/Baby Patty: Blend shapes

For other facial features such as the mouth and eyes, I used blend shapes to create different expressions. I chose blend shapes rather than joints as joints would have not given the range of expression needed and would be more difficult for the animator to shape the expressions how they want and in the cartoon like style of the film. By shaping the blend shapes to fit the curve of the round bodies of both rigs in their default positions, it allows them to be moved around by the control without the shape intersecting the body.
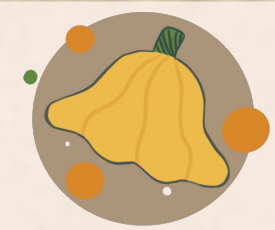
Katherine Padley: kpadley0@hotmail.com

Environment
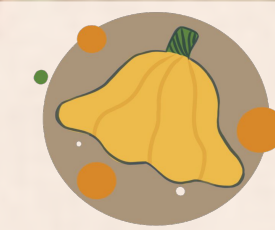
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com   Amelia Tzemis: ameliatzemis@gmail.com

Environment References
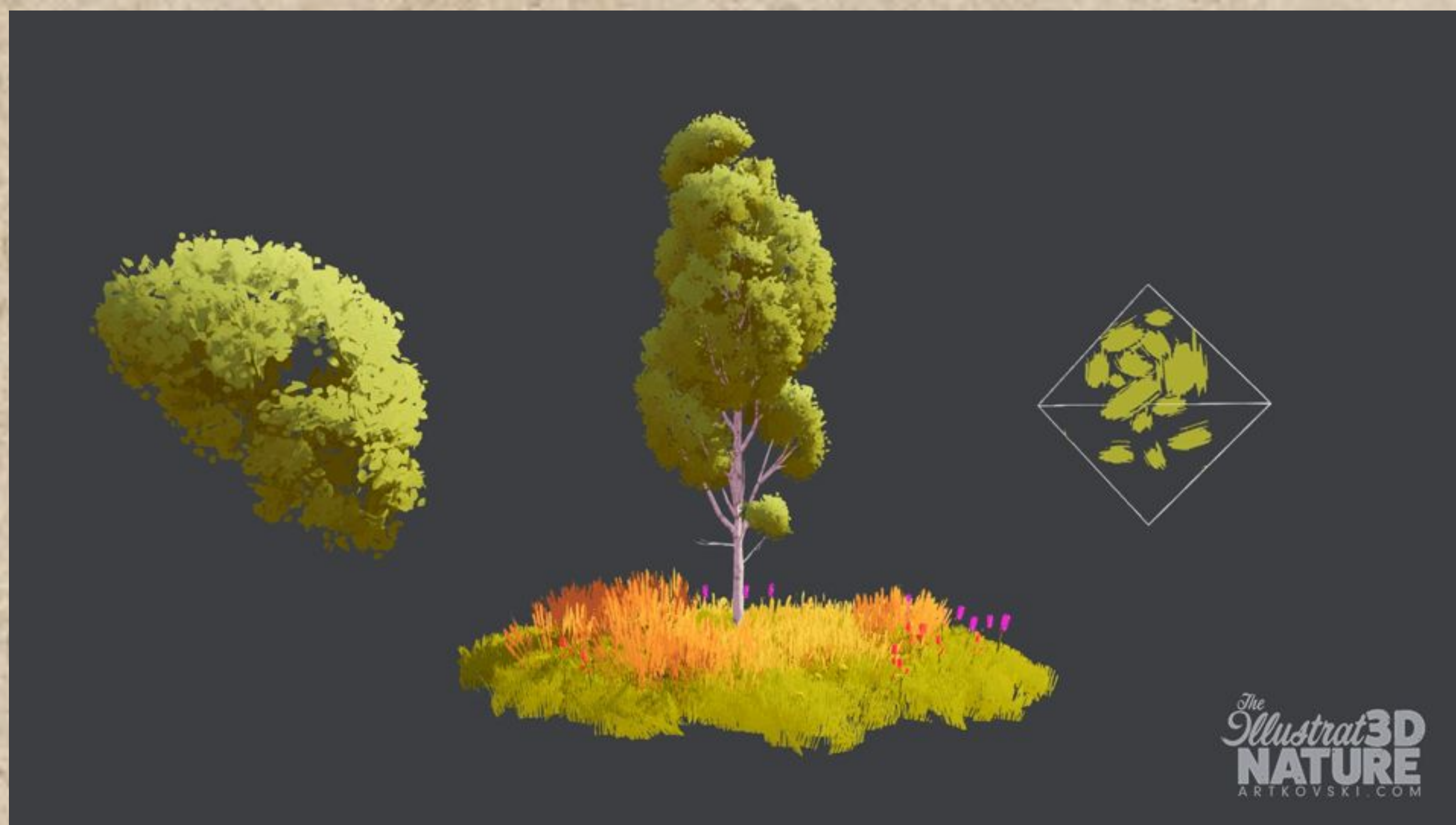
Asset References

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com
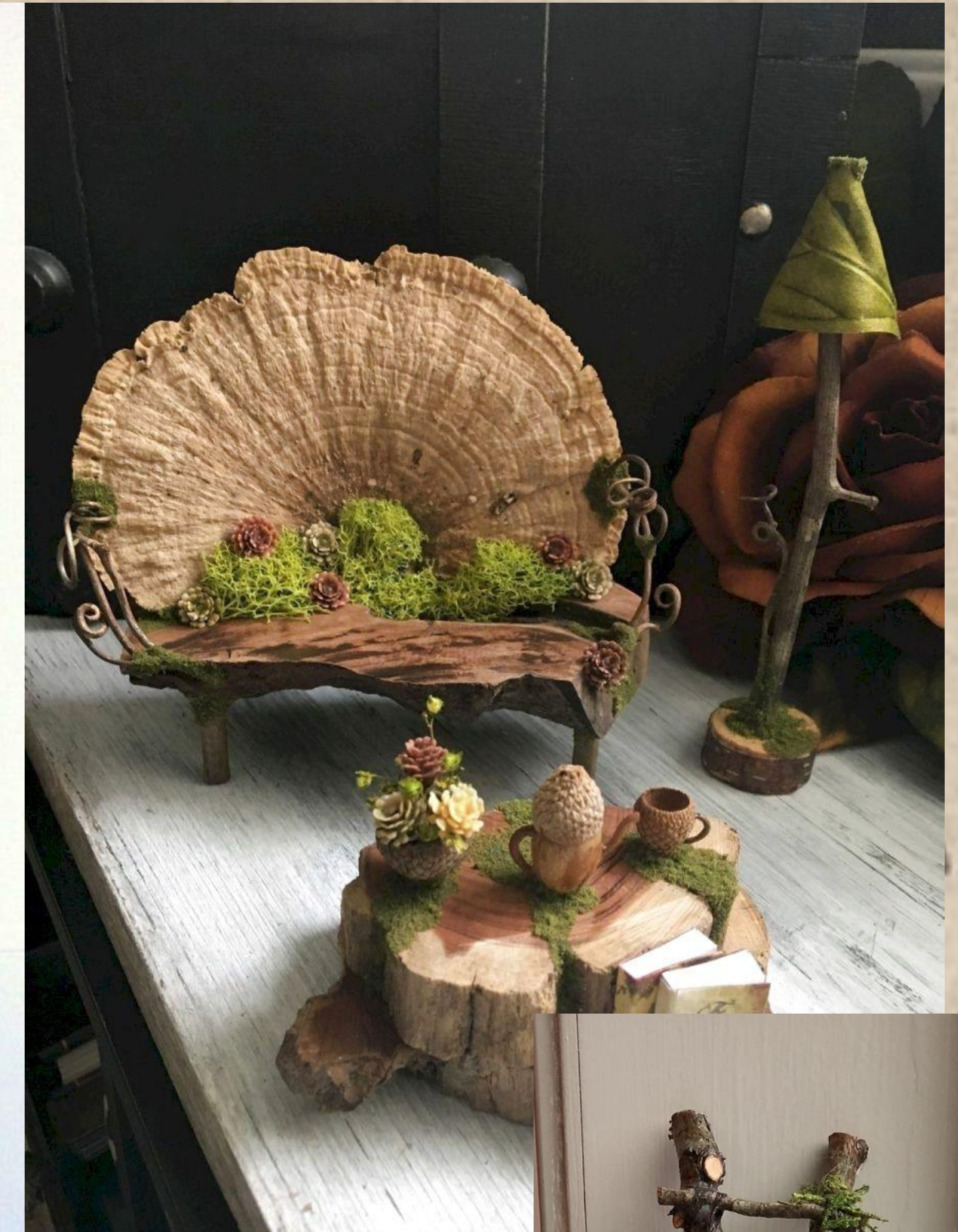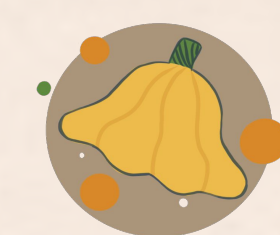
Amelia Tzemis: ameliatzemis@gmail.com

Material References
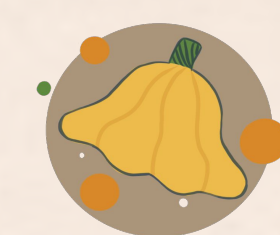
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com   Amelia Tzemis: ameliatzemis@gmail.com

INITIAL DESIGN
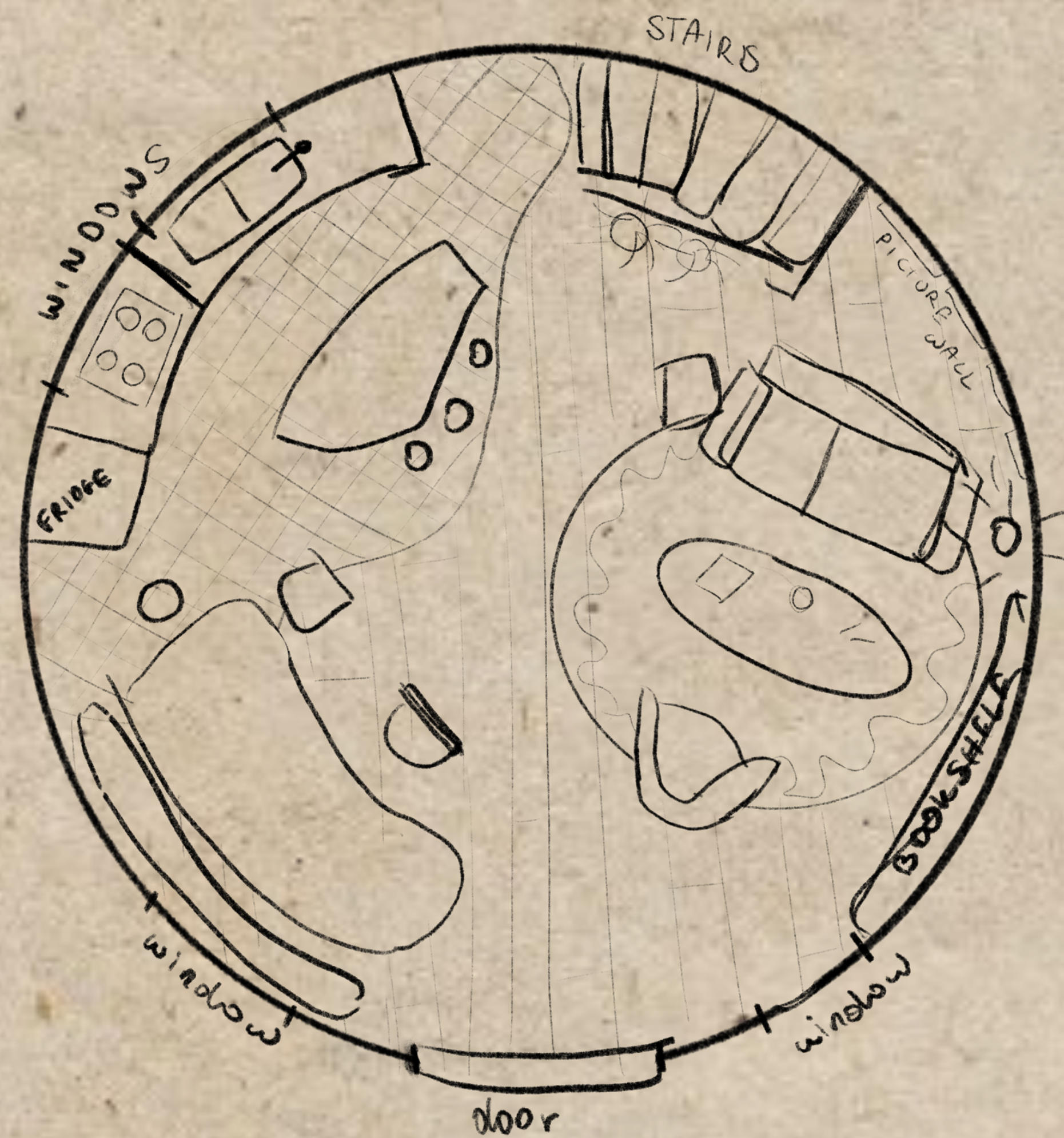
From the start we knew we wanted a terracotta pot to be the house. We looked at many fairy houses for inspiration and liked the look of two pots stacked on top of each other. We wanted to create a garden theme rather than a woodland theme.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com
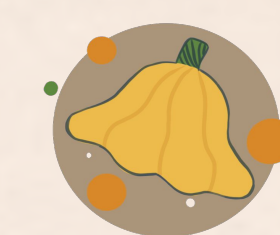
Amelia Tzemis: ameliatzemis@gmail.com

Interior concept art with focus on colour scheme
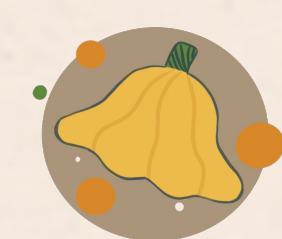
Amelia Tzemis: ameliatzemis@gmail.com

Concept art for first shot of the film
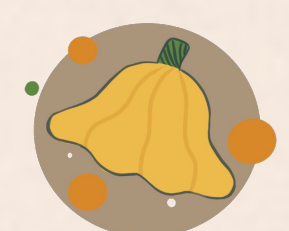
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

House model

This is the model during sculpting and textured and presented in Marmoset Toolbag. It was textured in Substance Painter. The biggest challenge was the moss and achieving the balance of realism and stylization. I sculpted it in Zbrush and transferred the bumps in the normal map. The right propositions were also challenging to figure out. To make sure the house looked small but it was practical for the radish man to live in.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

The working progress of the opening scene. The foliage was created by DragosLicar and purchased on the Epic Games marketplace.. I am working on transferring the textures correctly in UE4 and creating a saturated and sunny scene. I will work on creating more of a 'golden hour' lighting, and the textures will need to be adjusted to match those in Marmoset.
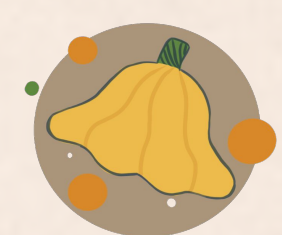
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

First Finished Prop

I wanted to get one of our props taken to completion so we could use it as a style reference to match the other assets to, and was highly inspired by these two shelves. We wanted the Radish's home to look very cluttered and homely and we felt that a shelf like this would add to that vibe. I also decided to make this prop first as it would serve as a good place for us to keep one of our key assets, the watering can.

Amelia Tzemis: ameliatzemis@gmail.com
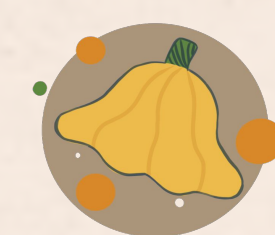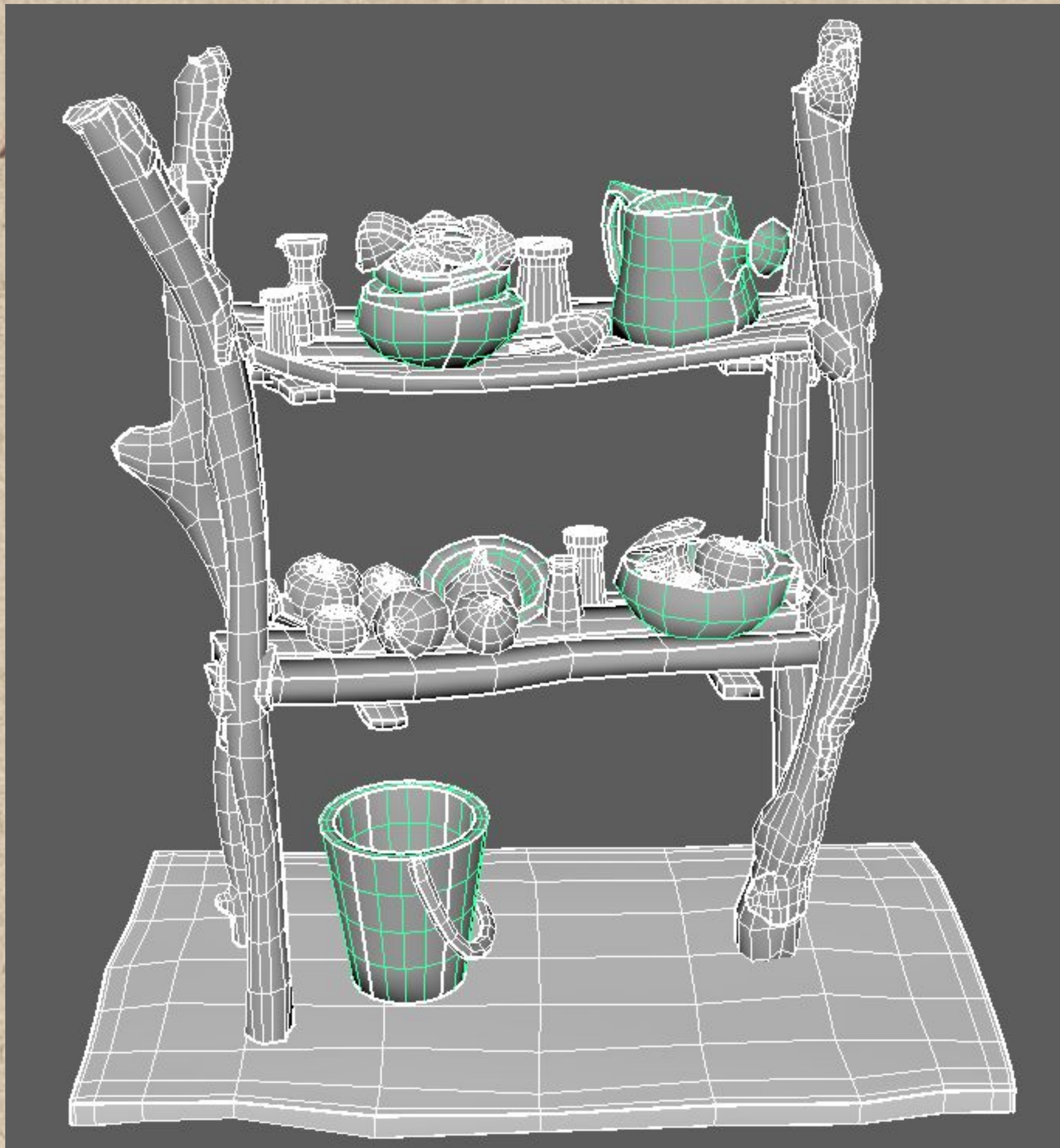
This is the final low poly model of the shelf. I started modelling it in Maya to give the pieces some nice hard edges, and then took it into Zbrush to add some 'wonkiness' and details. As this is where the Radish will be procuring his cooking ingredients, I made some (non-sentient) vegetables, bowls and seasoning shakers. I also added the watering can to the top shelf, as we felt the radish would look more comical reaching it for it with his long arms.

Amelia Tzemis: ameliatzemis@gmail.com
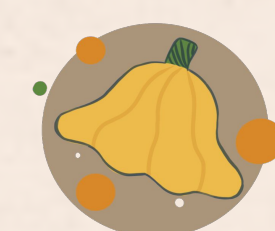
Finished Shelf

This is the shelf textured. I did this in Substance Painter and used procedural texturing methods to add darker edges and highlights in a 'painterly' style. Learning how to use procedural methods will be extremely useful for future assets as this will speed up the texturing process considerably. Some of the assets are a little shinier than I'd like but I will adjust this once this is added to our UE4 interior.

Amelia Tzemis: ameliatzemis@gmail.com

Environment Block out
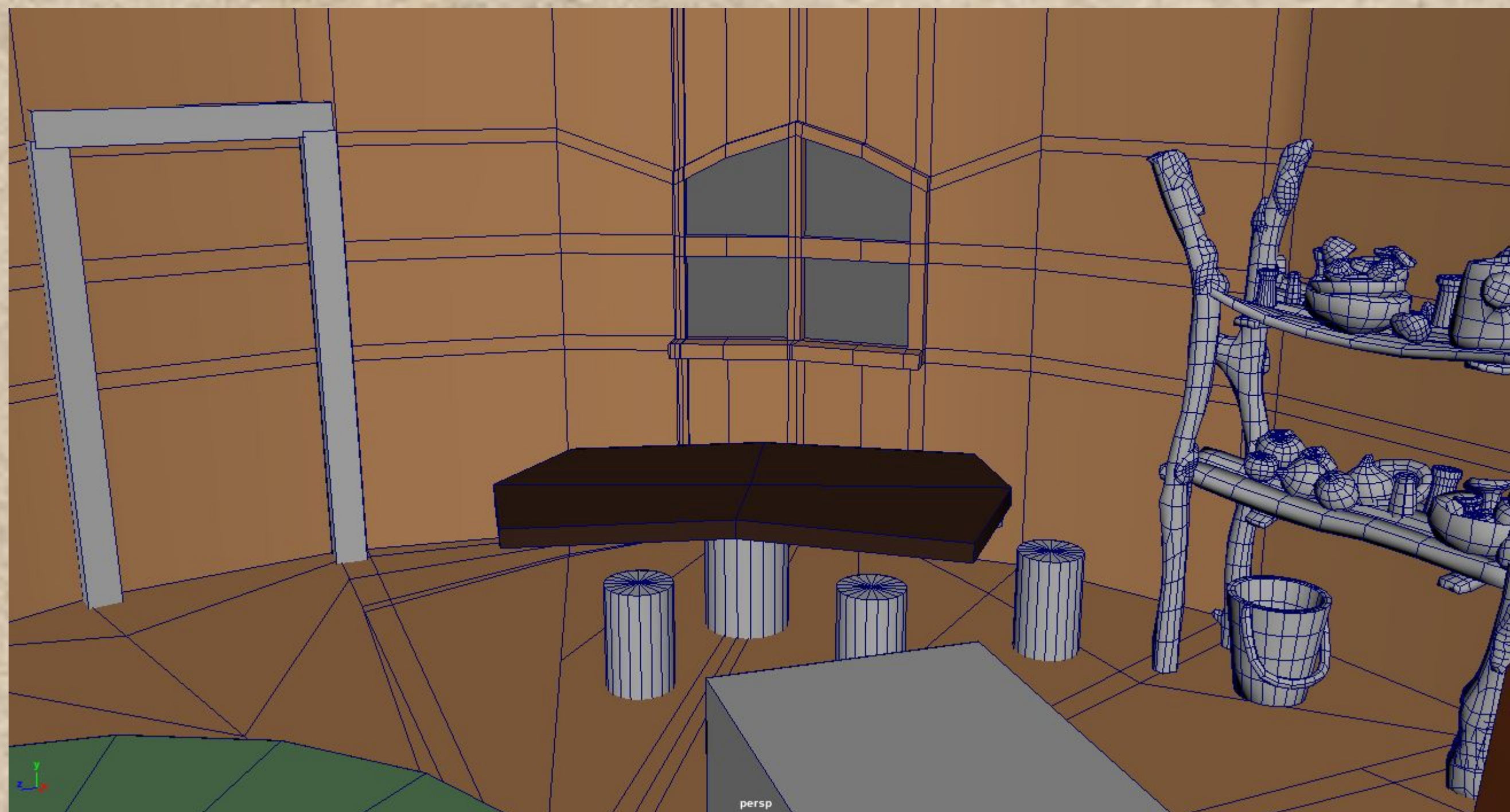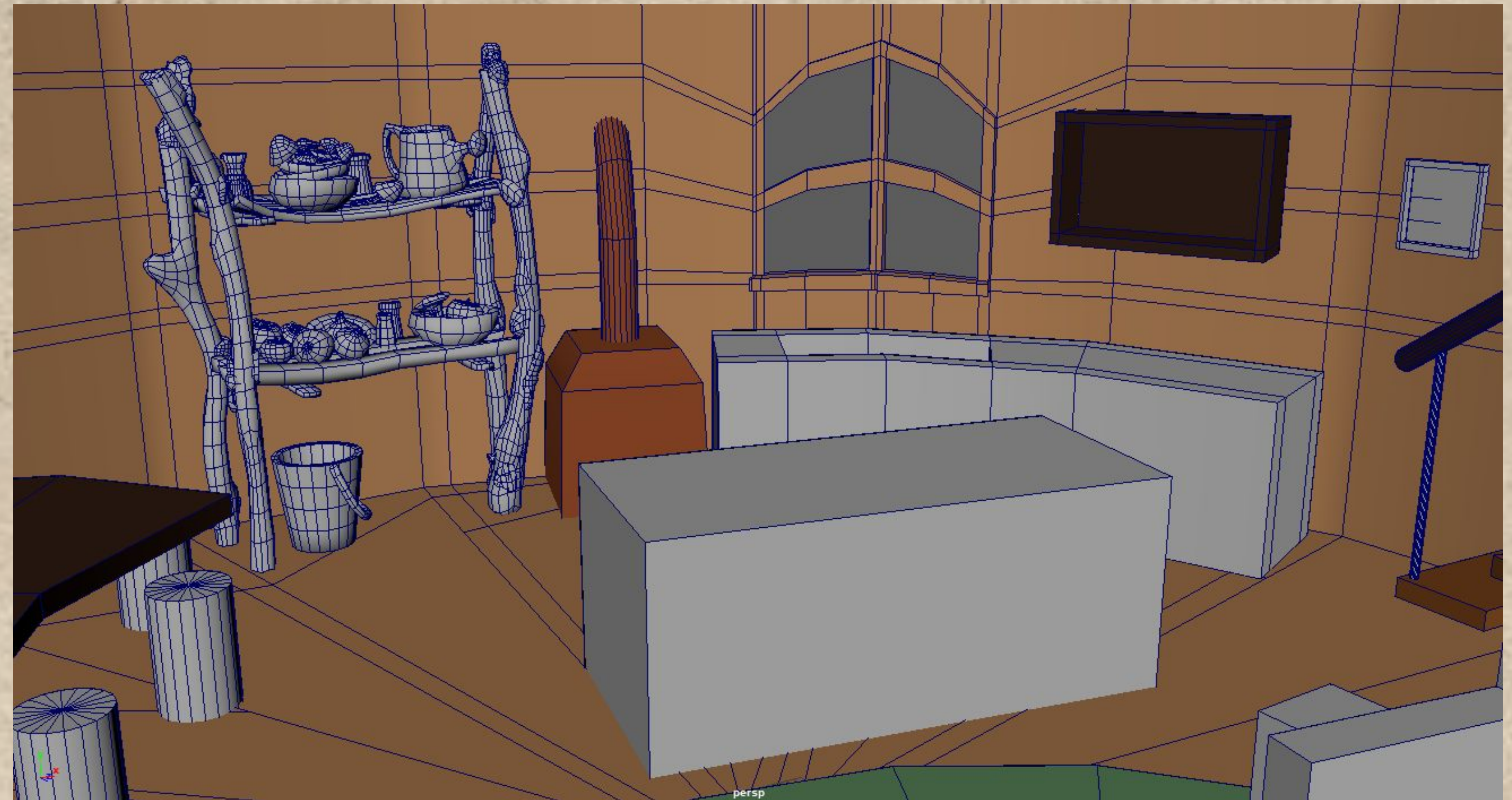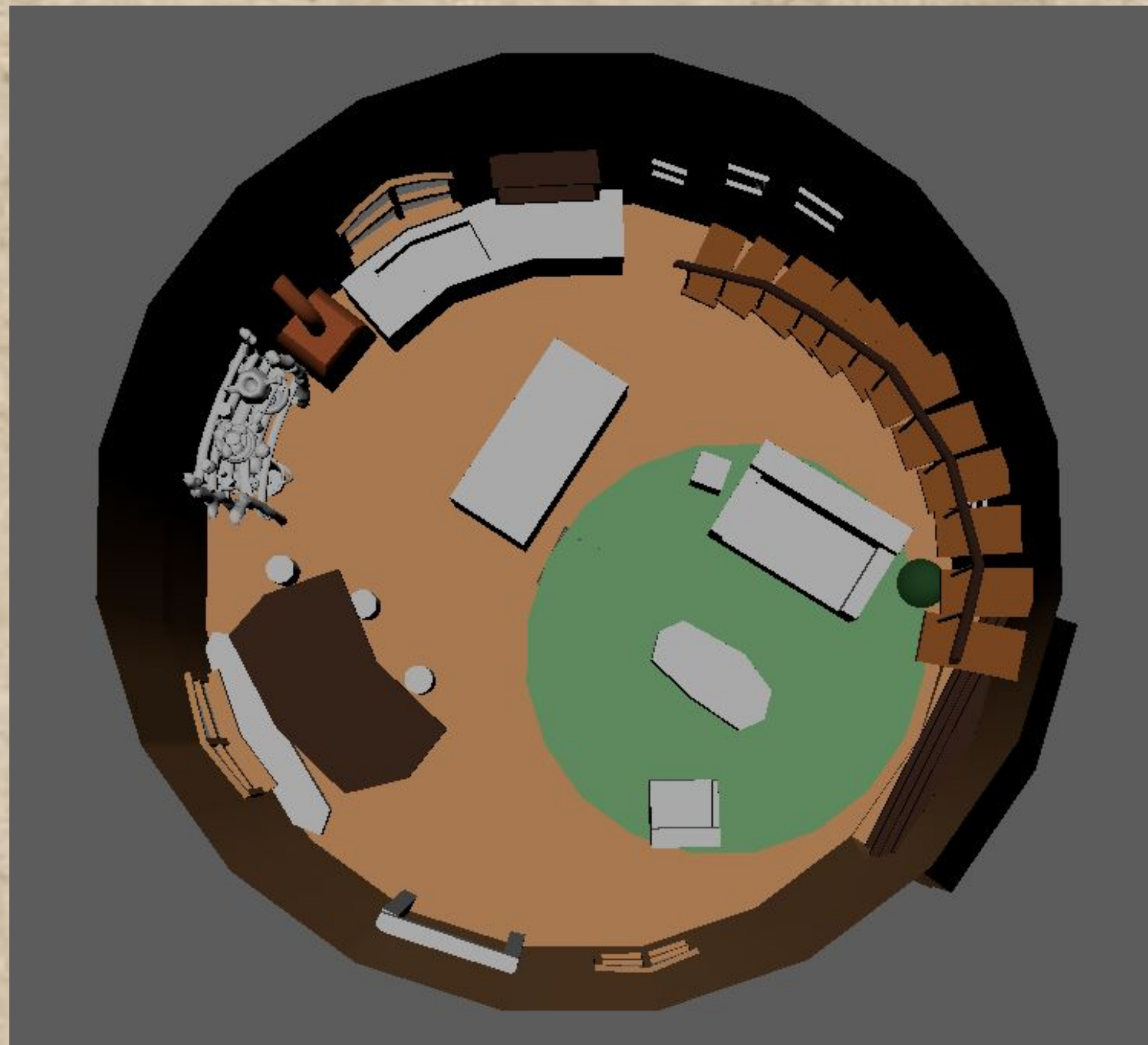
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com
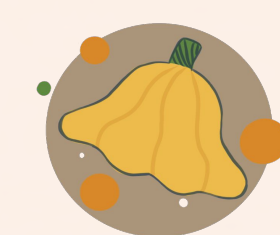
Amelia Tzemis: ameliatzemis@gmail.com

Manual Design

1
WÖTER

2
FOÖDE

3
SENSÖRRED

CLEÅNE NÄPPI

BÄBBI MEÅL

WURM

EGSHÖLL

MÖSHRUM

PÖÖ

Amelia Tzemis: ameliatzemis@gmail.com
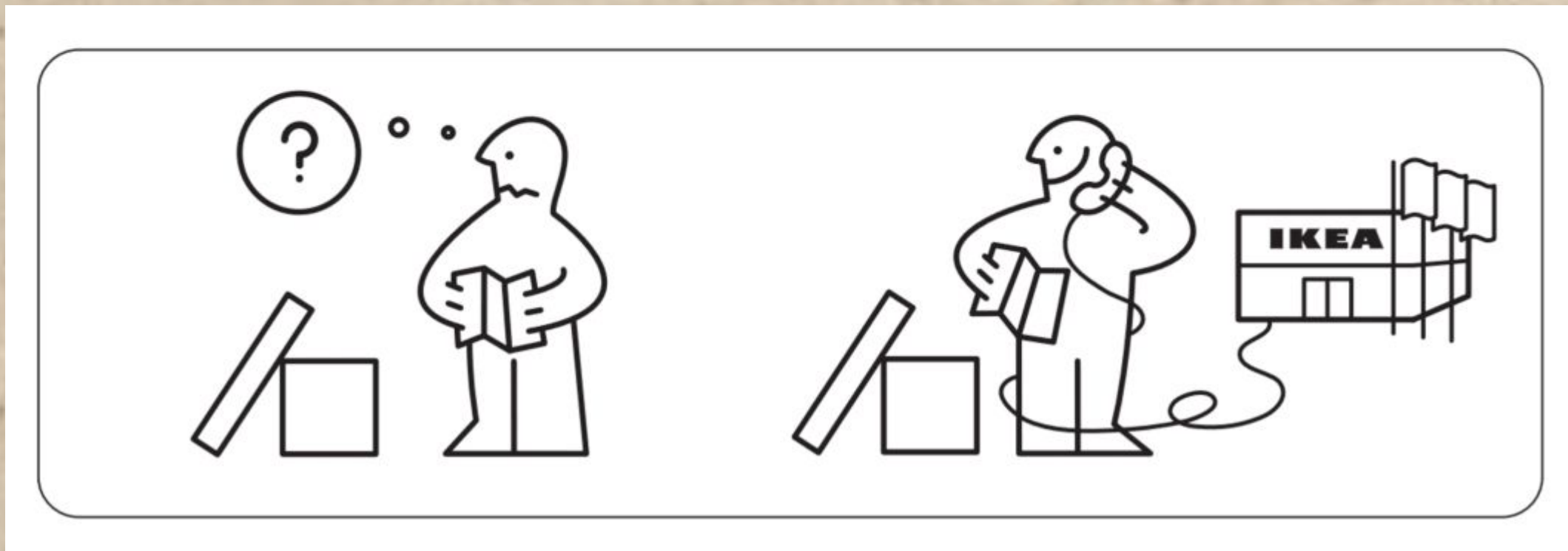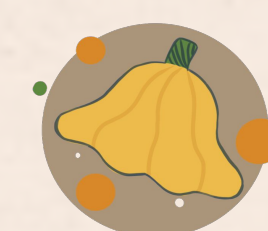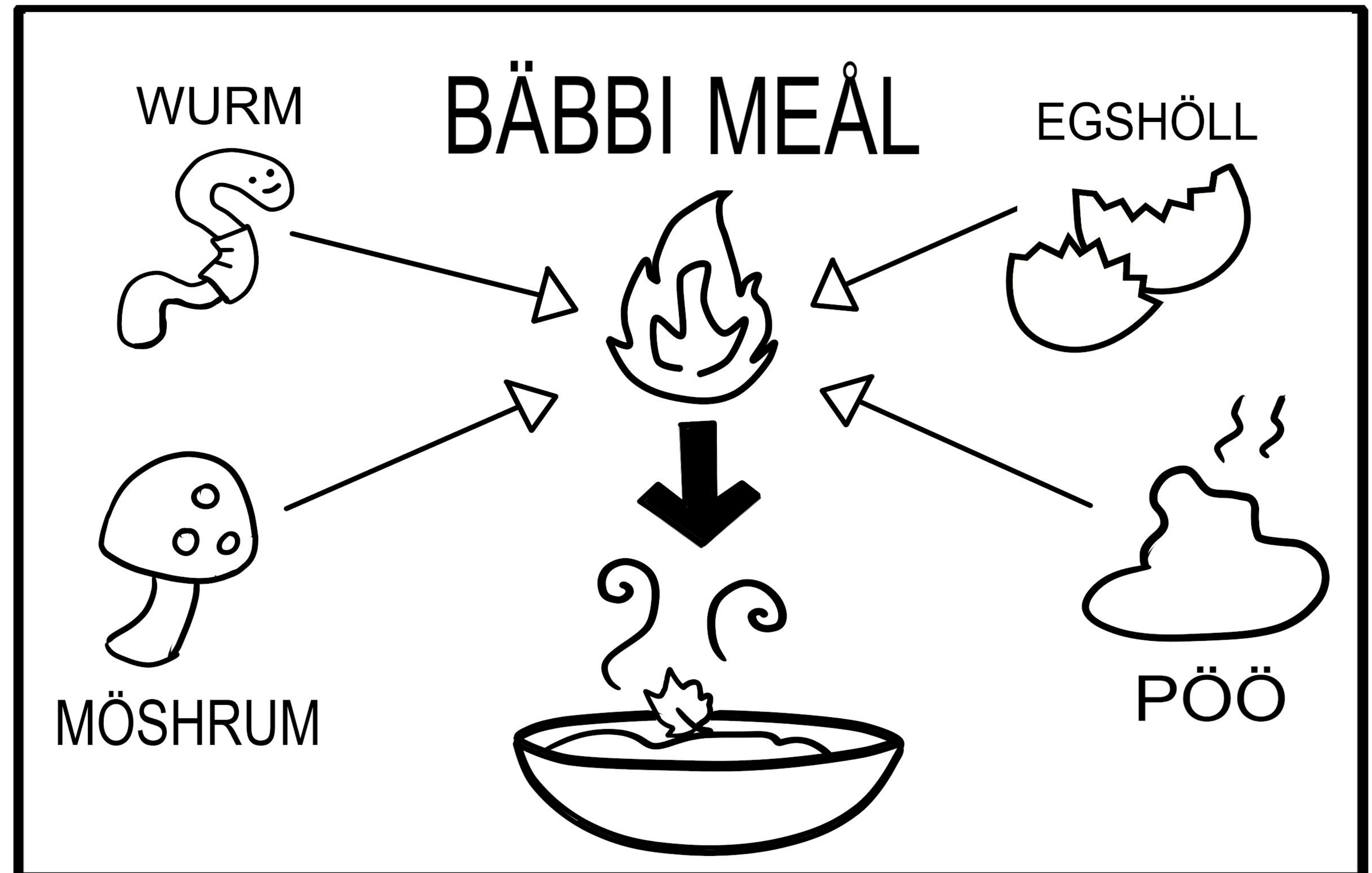
Lighting

By   Kate Bieriezjanczuk : k.bieriezjanczuk@gmail.com

Colour palette

Inspiration

The colour scheme we are aiming for includes a lot of earthy warm tones to reflect the garden setting. The browns and greens will be prominent in the background. Yellow and burgundy of the main characters will stand out in the foreground. Those will be the most saturated colours. Just like in the inspiration painting, we are aiming for a very warm sunlit interior.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Lighting Conepts

These are early lighting concepts for the final scene. We were experimenting with the colour of the walls to see what fit with he colour scheme the best. The narrative has changed slightly where in he is not smoky at the end anymore but the atmosphere will remain the same with a cosy evening scene. The colour of the walls has also changed to a lighter brown.
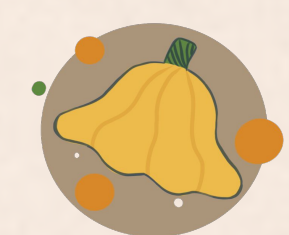
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Paint Over

My aim with this paintover was to improve the lighting in the scene and establish what can be improved in the background. The finished assets will make a significant difference. I also want to add fairy lights on the bookshelf to create a cosy atmosphere. The music notes will be a 2d effect added in post production.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Lighting and post processing research

A lot of my research included learning how to create believable and high quality lighting in UE4. The main key factor are the lightmass settings as they control the light bounces. Without increasing them the shot will look very flat. Another very important factor is to set the reflection capture resolution to 1024. This provides much sharper shadows. This however, uses more resources from the machine but as we are creating a film it is not a significant factor.

A post processing volume will also play a big part in achieving our desired look. We will be able to adjust the colours. We will create an LUT profile which make our film consistent in colour. It will also streamline the workflow as we will be able to plug in the same file into each shot.

To find the world settings, go to settings above the scene. These are the recommended settings for a more realistic looking scene:

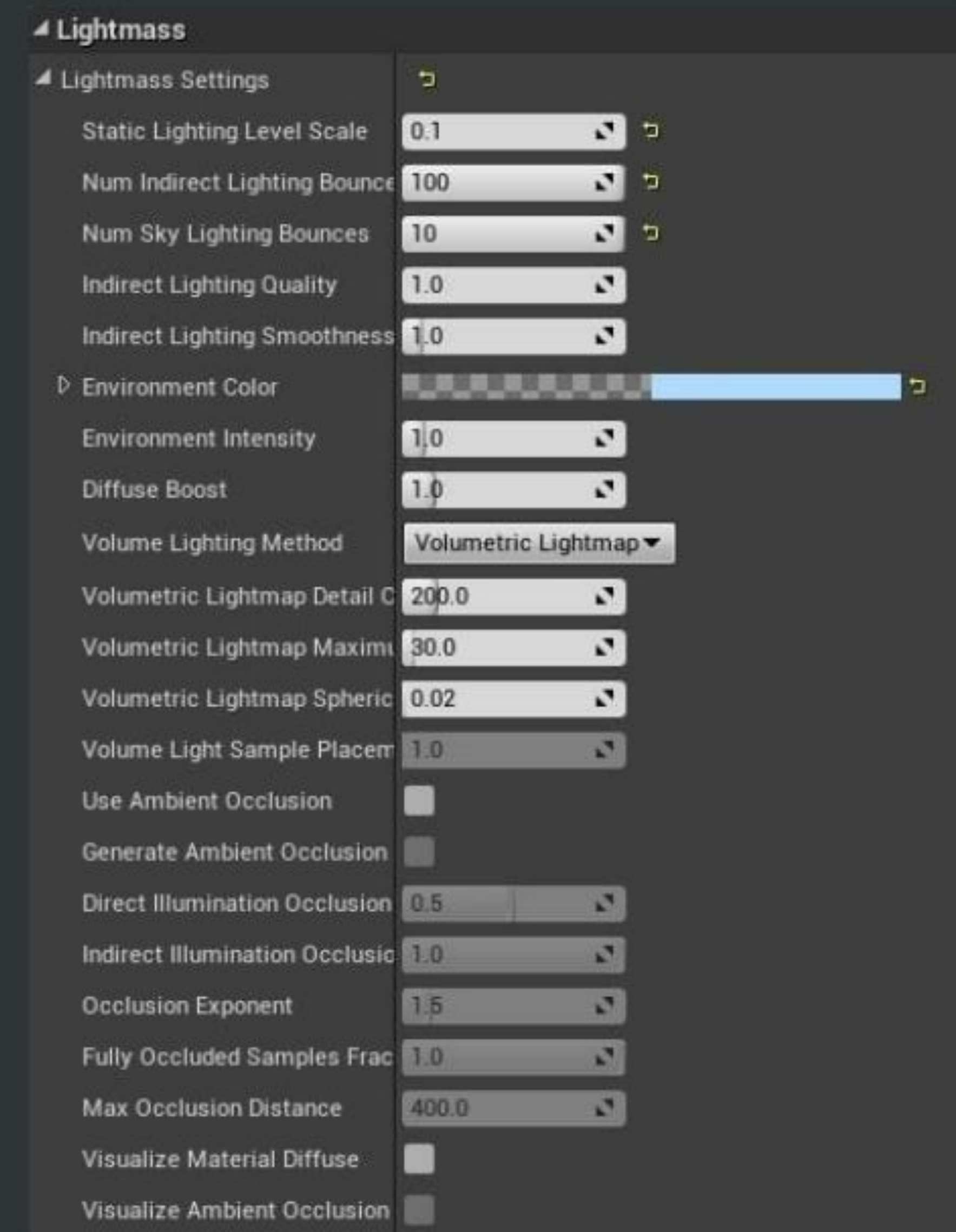| Lightmass		
Lightmass Settings		
Static Lighting Level Scale	0.1	
Num Indirect Lighting Bounce	100	
Num Sky Lighting Bounces	10	
Indirect Lighting Quality	1.0	
Indirect Lighting Smoothness	1.0	
Environment Color		
Environment Intensity	1.0	
Diffuse Boost	1.0	
Volume Lighting Method	Volumetric Lightmap	
Volumetric Lightmap Detail C	200.0	
Volumetric Lightmap Maximu	30.0	
Volumetric Lightmap Spheric	0.02	
Volume Light Sample Placem	1.0	
Use Ambient Occlusion		
Generate Ambient Occlusion		
Direct Illumination Occlusion	0.5	
Indirect Illumination Occlusio	1.0	
Occlusion Exponent	1.5	
Fully Occluded Samples Frac	1.0	
Max Occlusion Distance	400.0	
Visualize Material Diffuse		
Visualize Ambient Occlusion		

The Static Lighting Level Scale has a default value of one. A higher number means a lower graphic quality for your scene. A lower number, meanwhile, means the opposite. Our static lighting level scale is set to 0.1, which is the lowest number you could use to make your lights and shadows sharper. This will take the most time during light builds. Usually, we set this to .35 or .3, especially if you need to produce something quickly. Indirect Light Bounces are also very important, especially if you have interior scenes, since it allows light to bounce naturally from any light sources.

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Post processing effects

We experimented with adding a brush stroke post processing effect. Mark Ranson modified a Chameleon effect for us and adjusted it. There are a couple of problems with this effect. It needs to be more intense in the background than in the foreground. Moreover, it has to work well with moving objects. Currently it is too jarring to watch and we are still considering whether to include it.
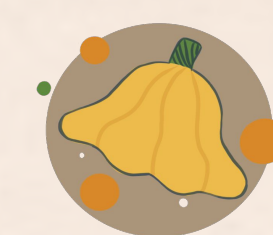
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com   Amelia Tzemis: ameliatzemis@gmail.com

FBX vs Alembic cache

A big part of our pipeline will be importing the animation from Maya to UE4. We consulted artists from Bluezoo who use this workflow and they suggested to use FBX file type. We have tested this method with our rigs and unfortunately due to the deformers and ribbons, UE4 does not support the skeleton and so our rigs can not be correctly imported. We tested out the same animation using alembic caching and the process works when you import it as geometry cache and add it to the sequencer. Due to this we will be using alembic caching.
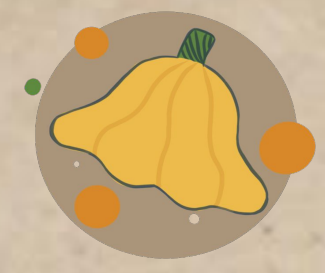
By Kate Bieriezjanczuk

Branding

Title Sequence Inspiration

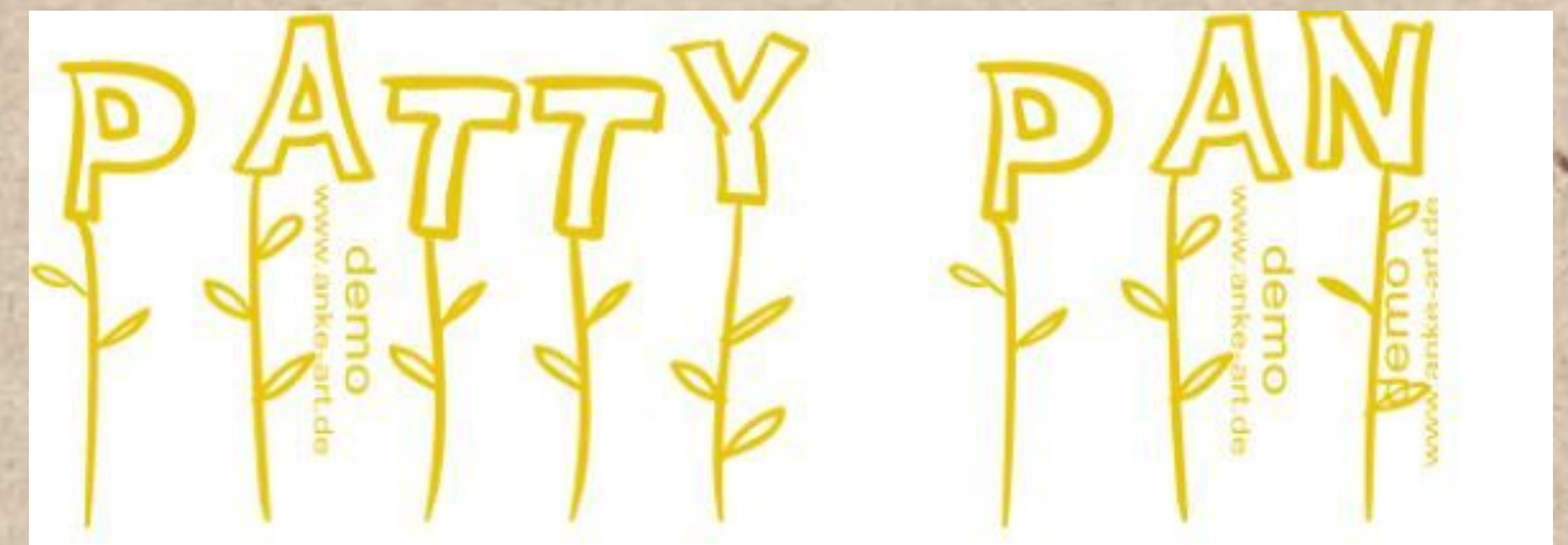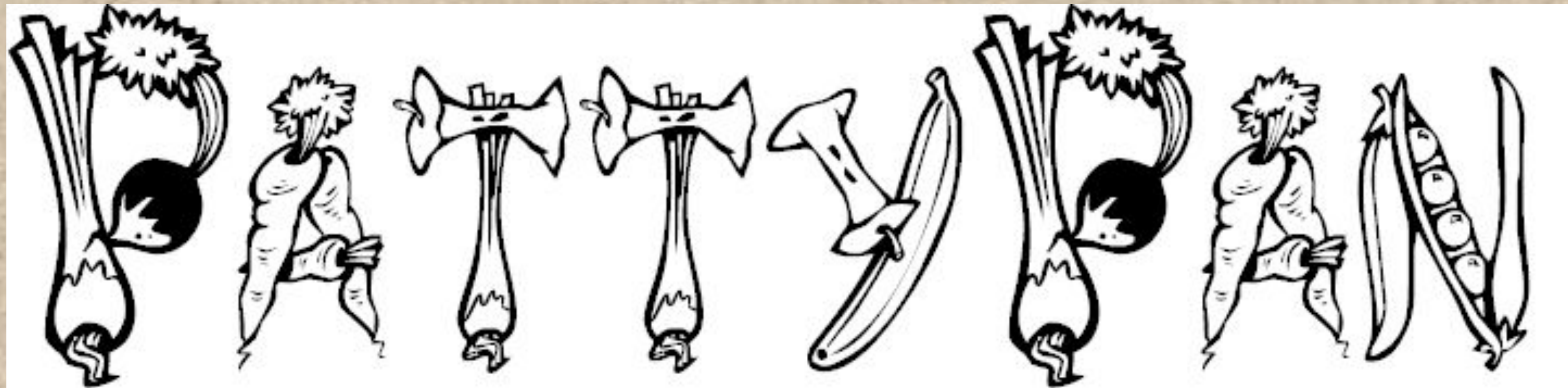For our title we wanted something that would reflect the theme of the film in the typography. These are fonts I found online for inspiration. The vegetable letters are too intense but a good idea that could be incorporated some subtly like the leaf font. All of these have very strong lines which we want to avoid.

To start off I downloaded fonts to use as basis for our font. We wanted to convey the classic cartoon feel that will appeal to small children with recognisable silhouette and bright colours. We also wanted to reflect an earthy texture. Most of these fit under the cartoon section but not textured and that is why we settled on font number two.
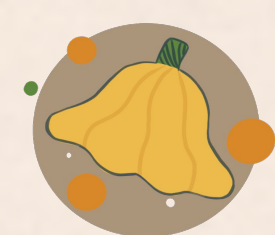
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

ORGANISATION - SHOT LIST

| Shot No.	Image	Characters in S...	Action	Blocked o...	Difficulty	Animator	Animated	Cahed	In Engine	Rendered	2D Effect	2D	Post	Notes
PP_001		None	Zoom into house. Hold longer on the door, he	☐	Easy		☐	☐	☐	☐	Possibly Background	☐	☐	💬
PP_002		Object Radish	Parcel dropped, door bell rings, raddish opens	☐	Easy		☐	☐	☐	☐	'Thud' lines, DING DONG	☐	☐	😀
PP_003		Radish	Puts box on the table	☑	Hard		☐	☐	☐	☐	Music notes for whistling	☐	☐	
PP_004		Radish	Opens box and looks surprised	☐	Medium		☐	☐	☐	☐	Possible stars or hearts on the eyes	☐	☐	
PP_005		Patty	Patty is sleeping and opens her eyes looking c	☐	Medium		☐	☐	☐	☐		☐	☐	Add manual next to baby
PP_006		Radish	Eyes grow bigger and thinks Patty is cute	☐	Medium		☐	☐	☐	☐		☐	☐	
PP_007		Patty	Patty looks cute, eyes glittering and growing.	☐	Medium		☐	☐	☐	☐	stars and lines to make her look cute, Zigzags for crying	☐	☐	
PP_008		Radish Patty	Reads manual frantically.	☐	Hard		☐	☐	☐	☐	Zigzags for crying	☐	☐	
PP_009		None	Pan down the page.	☐			☐	☐	☐	☐	Zigzags for crying	☐	☐	
PP_010		Radish Patty	Holding Patty, Radish looks around in panic.	☐	Medium		☐	☐	☐	☐		☐	☐	
PP_011		Object	Quick pan on the watering can.	☐	Easy		☐	☐	☐	☐	Lines emphasizing watering can	☐	☐	
PP_012		Radish Patty	Feeds water to Patty.	☐	Hard		☐	☐	☐	☐	GLUG GLUG	☐	☐	
PP_013		Patty	Annoyed with cheeks full of water.	☐	Medium		☐	☐	☐	☐		☐	☐	
PP_014		Radish	Water spat on Radish, he wipes it away and pi	☐	Hard		☐	☐	☐	☐	Spitting water and OOF	☐	☐	
PP_015		None	Zoom on the baby food recipe.	☐			☐	☐	☐	☐		☐	☐	
PP_016		Radish	Static camera. Hurries to one side and come b	☐			☐	☐	☐	☐		☐	☐	
PP_017		Radish	Dumps all supplies and food on counter.	☐			☐	☐	☐	☐		☐	☐	
PP_018		Object	Pan following the fruit down to the floor wher	☐			☐	☐	☐	☐	SPLAT	☐	☐	
PP_019		Radish	Radish kicks the fruit up and catches	☐			☐	☐	☐	☐	Lines for object flying	☐	☐	
PP_020		Patty	Patty stops crying and giggles.	☐			☐	☐	☐	☐	Happy lines	☐	☐	
PP_021		Radish	Radish notices the giggling and gets an idea.	☐			☐	☐	☐	☐		☐	☐	
PP_022		Radish	Throws the object around. Does the arm wave	☐			☐	☐	☐	☐	Lines for object flying	☐	☐	
PP_023		Radish	Camera zoomed on the hand and object flies	☐			☐	☐	☐	☐		☐	☐	
PP_024		Radish	Radish has a mysterious grin like a magician.	☐			☐	☐	☐	☐		☐	☐	
PP_025		Patty	Patty looks surprised and intrigued.	☐			☐	☐	☐	☐		☐	☐	
				CHECKED 3.333%			CHECKED 0%	CHECKED 0%	CHECKED 0%	CHECKED 0%		CHECKED 0%	CHECKED 0%	COUNT 30

For our organisation we use Notion. Our shot list allows us to assign shots to specific animators and check off when the shot is done with each stage. This is manually updated every time the pre vis changes with pictures.
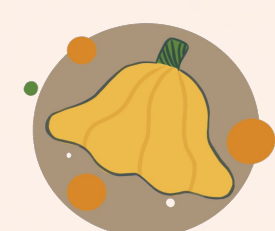
Kate Bieriezjanczuk: k.bieriezjanczuk@gmail.com

Production pipeline

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Story ──────────────────────────────────► Pre-vis ──────┐
  │                                                       │
  ▼                                                       │
Concept Art ──┬──► Character Modelling ──► Character texturing ──► Blendshapes ──► Rigging
  │           │                                                                      │
  │           ├──► Environment Modelling ──► Environment Texturing                    ▼
  │           │                                                               Animation ◄──┘
  └───────────┴──► 2D Effects                                                        │
                                                                                     ▼
                                                                                Rendering
                                                                                     │
                                                                                     ▼
                                                                                   Post
                                                                                     │
                                                                                     ▼
Sound Maquette ──────► Sound Final ──────────────────────────────────────────► Editing
```

Amelia Tzemis: ameliatzemis@gmail.com