# *ASSIGNMENT 3:*

DOCUMENTATION

PROCESS

AVA HALES

CHESTER THE VIKING

Basic Walk Cycle

Starting off with this basic walk cycle, seen in [Figure 1] and [Figure 2]. We can see the different contact, down, pass and up poses. This is a fantastic starting point, however, as Chester is clumsy and heavy in nature, I would like him to have a walk cycle that better reflects this. In addition, his arms are significantly larger in proportion to his legs, meaning his arm movements should be exaggerated.
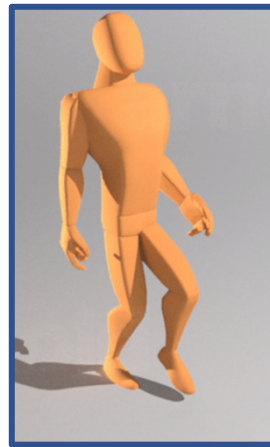
[Figure 1]
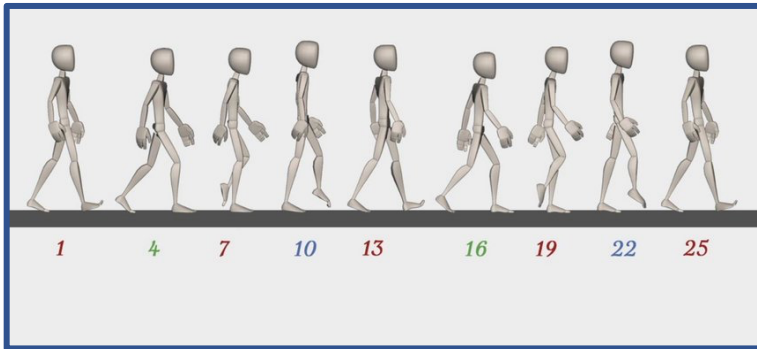
[Figure 2]
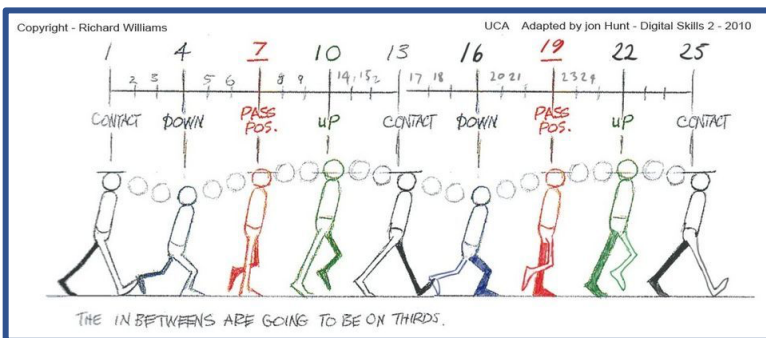
Confident Walk Cycle

While I don't want Chester to embody a confident walk style, this stance seen in [Figure 4] shows a good head position and chest position for the top pose in the Idle animation, where Chester draws a full breath.

[Figure 4]

Heavy Walk Cycle

(https://www.youtube.com/watch?v=Y1OwBiWp_Jc)

Found using this link is a Heavy Walk Cycle from Team Fortress 2. The character depicted in the animation uses movements that I would like Chester to possess.

- Foot/leg movements are relatively small compared to that of shoulders/arms
- Significant arm swings, with a great deal of movement in the hands/forearms – less dependence on shoulders.
- High amount of rotation in hands.
- I also like how his upper body remains stable.

[Figure 3]

Heavy Walk Cycle
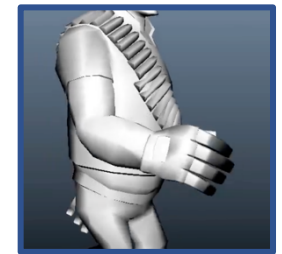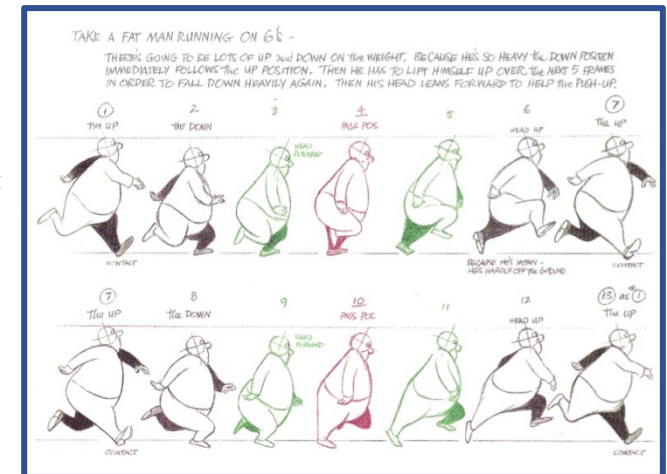
Figure 3 shows a 'heavy' walk cycle, this is good as it over exaggerates the shoulder and arm sing movements, however the leg movement is far too much for Chester. It is interesting to look at the intensified rotation on the back and hip compared to the basic walk cycle, to compensate for the heaviness of the character. Something I would also like to avoid is the effort this walk cycle gives off – particularly in relation to the head movements. This cycle looks like the character is putting in significant effort – something I don't want for Chester as he gives off a more relaxed energy.

Step 1:

Rigging

Video File

Following the file path below, I have included a time-lapse highlighting the main steps of the rigging process

Video File Path:

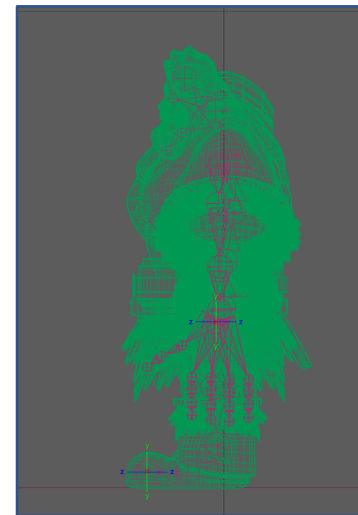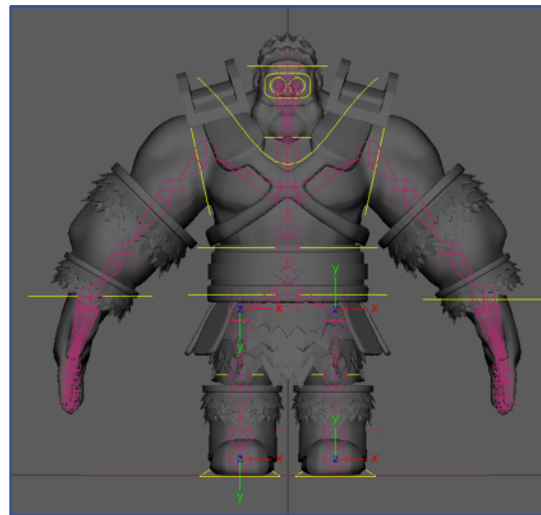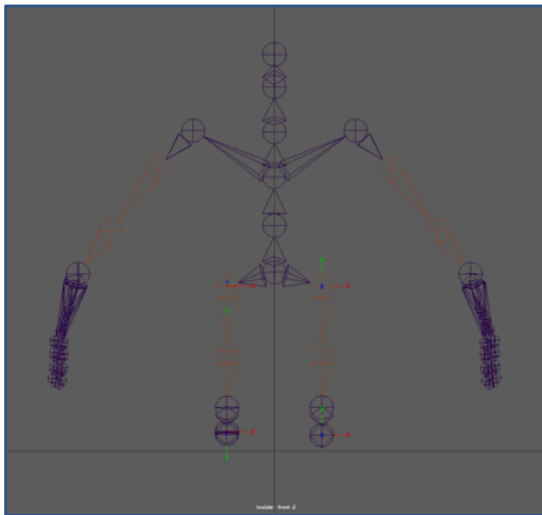**'AvaHales_Assignment3 > Documentation > RiggingProcess.mp4'**

Rigging Process

The rigging process took several attempts and involved using the techniques taught in Week 9 and Week 10 tutorials. The creation of joints was very simple. The rigging process became most difficult when adding IK Handles and controls – with constraints taking quite some time to navigate. While I felt this part of the animation process was not difficult relative to other parts, it was still very challenging and very time consuming. Ensuring all joints and controls were in their appropriate group, connected to and correctly associated with their controls and IK handles using constraints was a very particular and specific process.

Video File

Attached with the submission folder is a time-lapse highlighting the main stages of the rigging process. File Path:

AvaHales_Assignment3 > Documentation > RiggingProcess.mp4


Ava Hales

Step 2:

Skinning

Video File

Following the file path below, I have included a time-lapse highlighting some of the skinning process that is outlined below in the documentation

Video File Path:

'AvaHales_Assignment3 > Documentation > SkinningProcess.mp4'

1. Blocking Out Main Sections:

I started using simply the **replace Paint operation** in combination with the **Paint and Select Modes** and blocked the main sections of Chested out, flooding regions with either value 1 or 0. This was a very time-consuming process but eventually I got the desired results. In doing this, I was able to remove some of the distortion I was experiencing when I was trying to move Chester. For example, when I would move his left foot, some of the fur on his mid-section would move and distort the shape – this process solved that issue and was a good starting point.
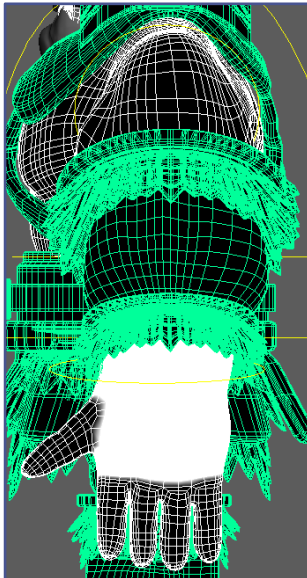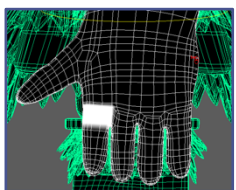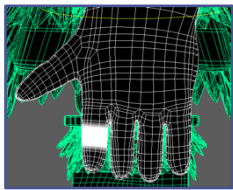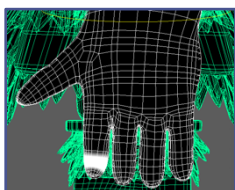
L_Shoulder
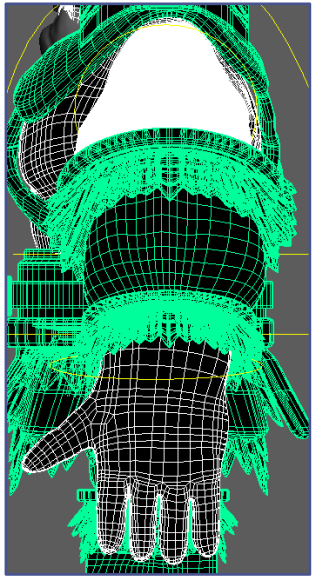
L_LowerArm
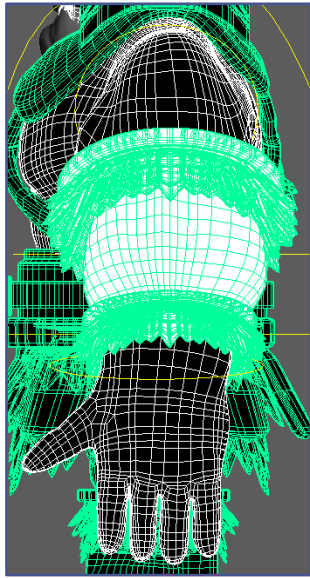
L_Hand

L_Index1

L_Index2

L_Index3

L_IndexTip
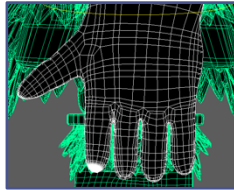
Hip
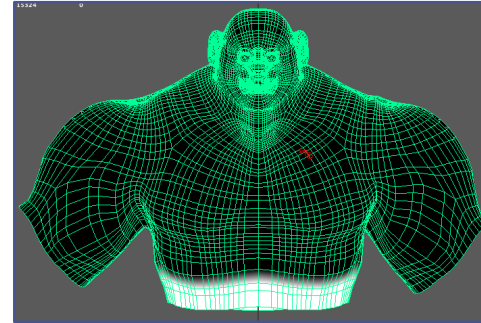
Spine1
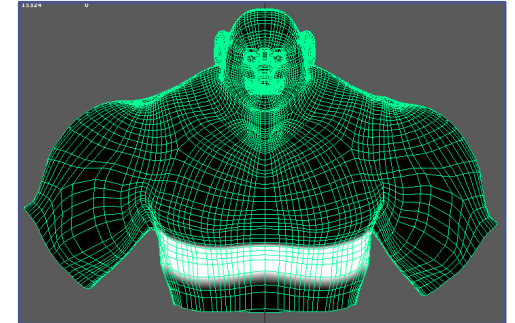
Spine2
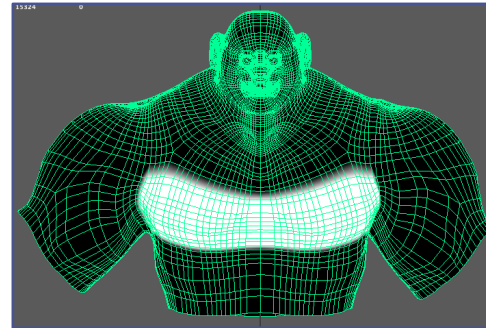
Spine3
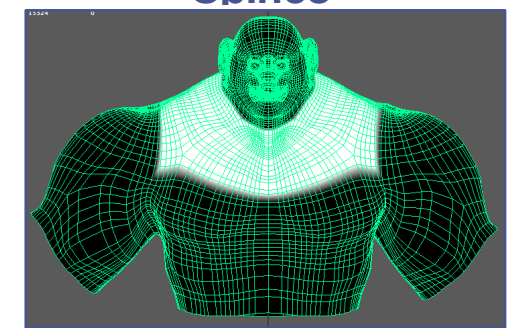
Neck
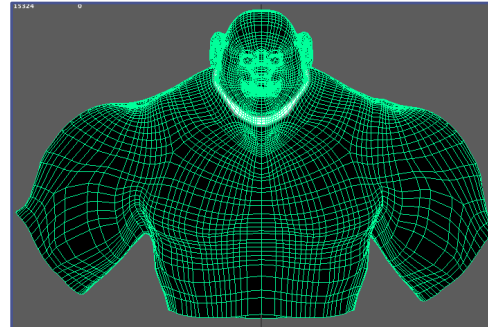
Head
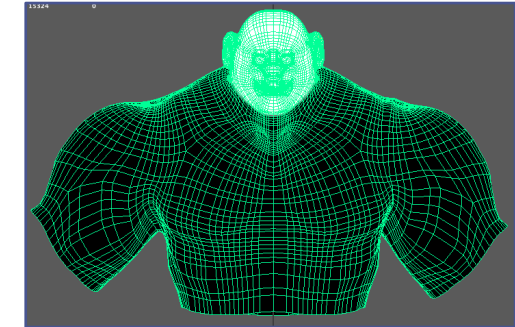
L_Foot
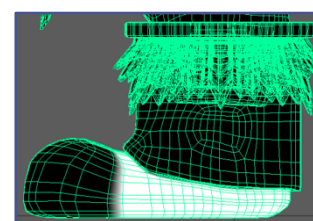
L_ToeTip
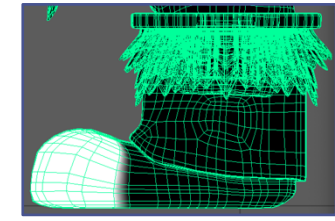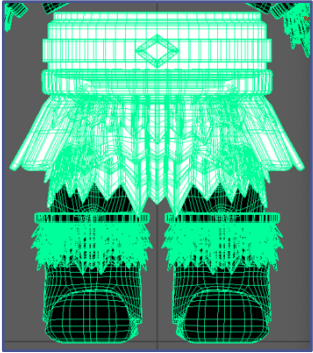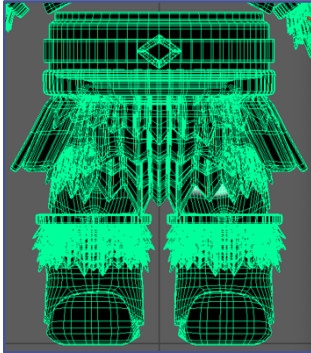
Hip   **L_UpperLeg**   **L_LowerLeg**
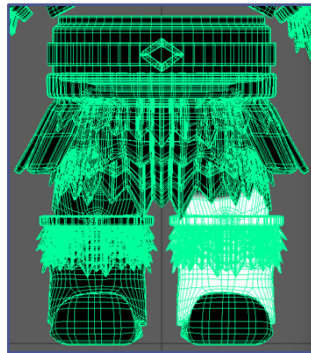
2. Smoother Borders: I quickly ran into my next issue that developed from the previous skinning technique – that as Chester was distinctly sectioned out whenever I moved a control, these sharp edges were not realistic and created harsh separations in his skin.

To solve this issue, I locked all the layers. I then slowly went through and selectively unlocked layers and used the **smooth Mode** to soften the margins between sections. Once again, this was a very time-consuming process that took many hours and lots of trial and error – this process was done with '**Use Color Ramp**' turned on.
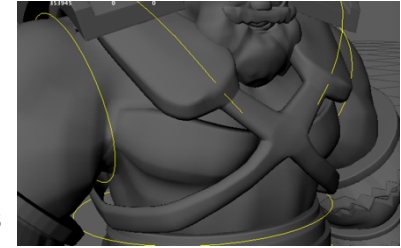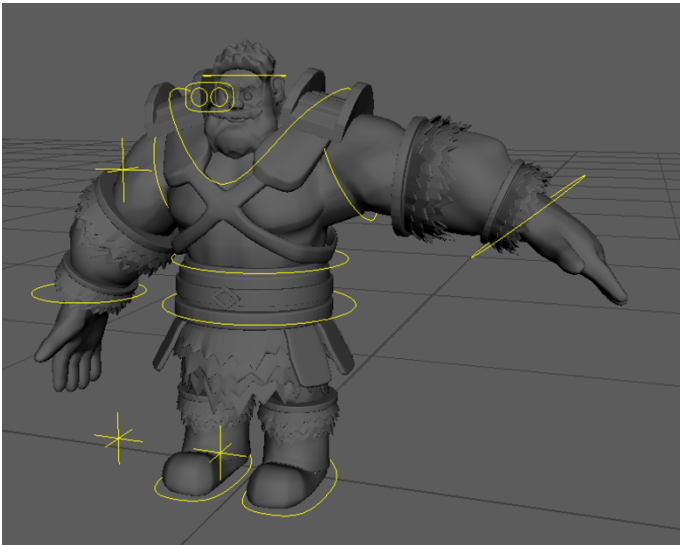
L_Shoulder before   **Smoothed relationship between shoulder and upper arm**   **L_Shoulder after**
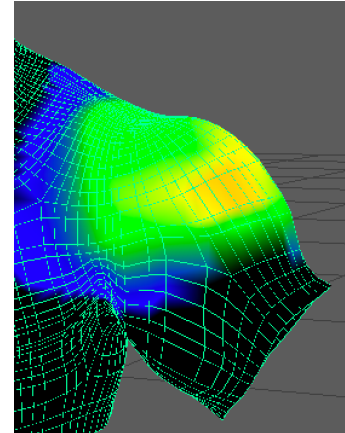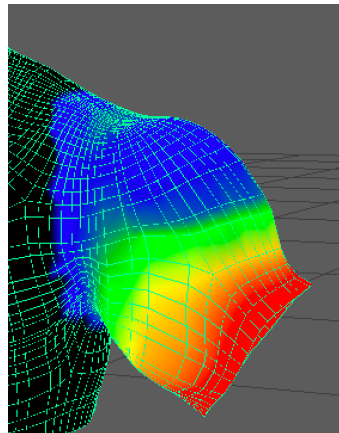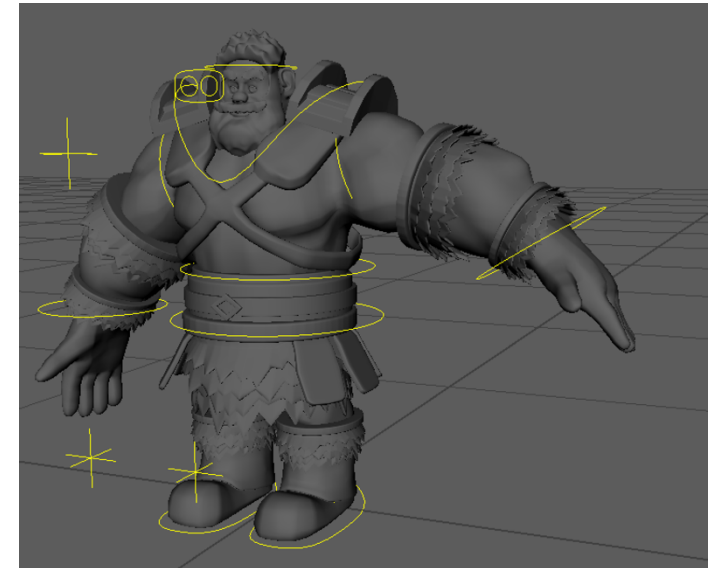
Part 3:

Animation

Video File

Following the file path below, I have included a time-lapse that follows the animation process for the **Gesture Animation**

Video File Path:

'AvaHales_Assignment3 > Documentation > GestureProcess.mp4'

Walk Cycle

Frame 1

Frame 4

Frame 7

Frame 10
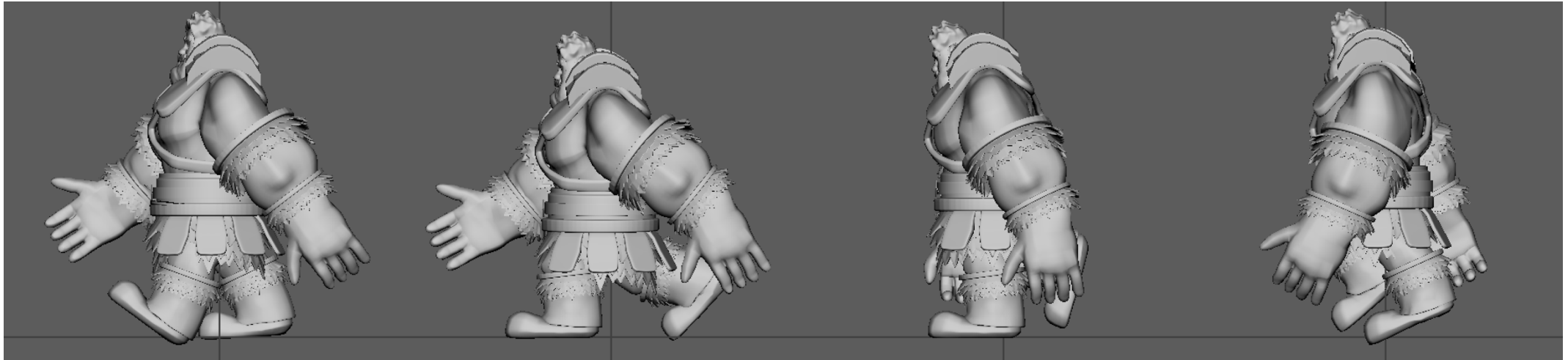
Frame 13

Frame 16

Frame 19

Frame 22
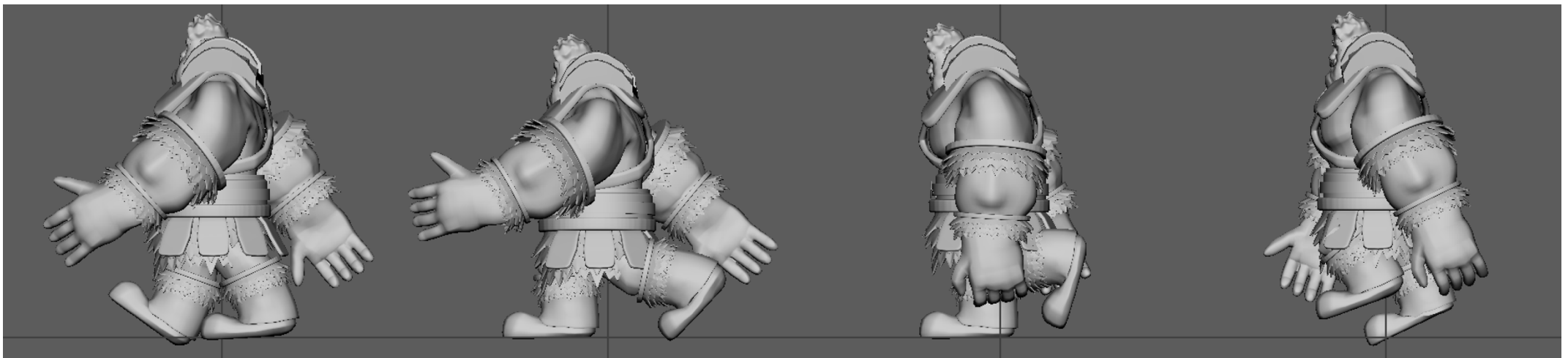
1. Walk Cycle:
The walk cycle was the first animation I developed for Chester. During this process I ran into some issues with the skinning of Chester and I continued to jump back into the Paint Skin Weight Tool.

I also went through all of Chester's controls and ensured only the desired channels were accessible. I used the Lock and Hide Selected feature on the selected channels to do so.
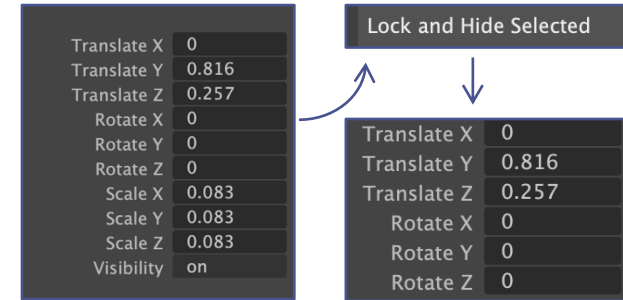
2. Finger Animation:
The next thing I began experimenting with were custom attributes on both the left and right hands. Following the week 10 tutorial I added 5 attributes:

- *Index Curl*
- *Middle Curl*
- *Ring Curl*
- *Pinky Curl*
- *Thumb Curl*

I then used the Set Driven Key window to key 4 different stages between a flat hand and I fist. I used a recording of myself clenching my fist to understand the sequence of joint movements. I used these new movements to during the walk cycle when Chester's hands lower – for example: seen here with the left hand at frame 19 compared to frame 22

Translate X	0
Translate Y	0.816
Translate Z	0.257
Rotate X	0
Rotate Y	0
Rotate Z	0
Scale X	0.083
Scale Y	0.083
Scale Z	0.083
Visibility	on

Lock and Hide Selected

Translate X	0
Translate Y	0.816
Translate Z	0.257
Rotate X	0
Rotate Y	0
Rotate Z	0

Key 1: **Key 2:** **Key 3:** **Key 4:**

Frame 19 **Frame 22**

Ava Hales
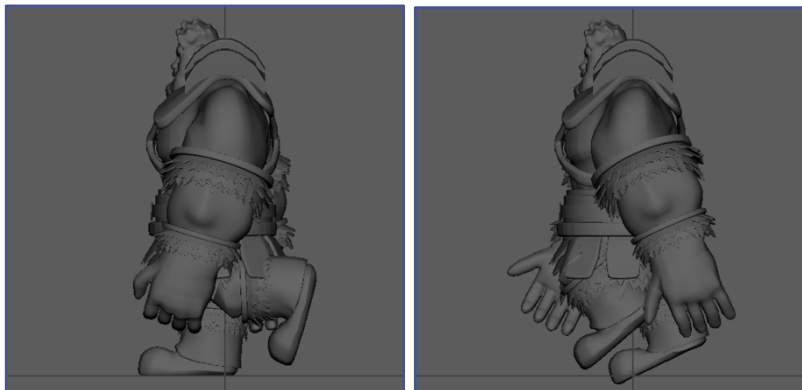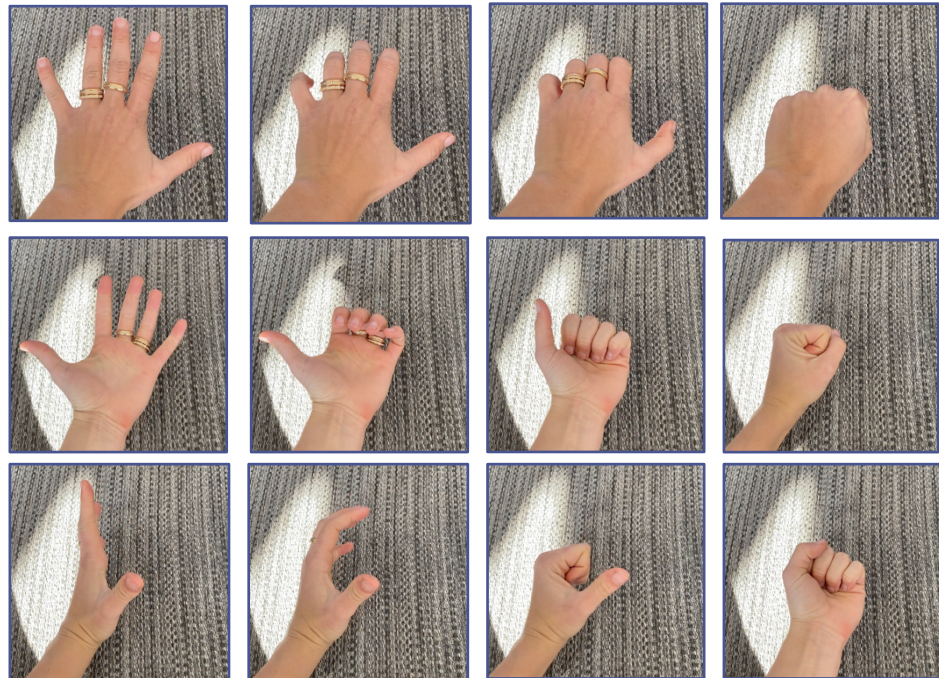
3. Other Additions and Features:
An issue I ran into was the seamlessness between the loop going from frame 25 back to frame 1 (despite them being the exact same). Chester seemed to almost glitch (even when I reduced the frames to 1:24). After much experimentation and with the graph editor, I found the best way to solve this issue was to change the keys at points 1 and 25 from Spine Tangents to Auto Tangents (as seen below with the waist) creating a smoother transition when looping through the animation

Spine Tangent Selected on frame 1 and 25

Auto Tangent Selected on frame 1 and 25

Auto Tangent

Spine Tangent
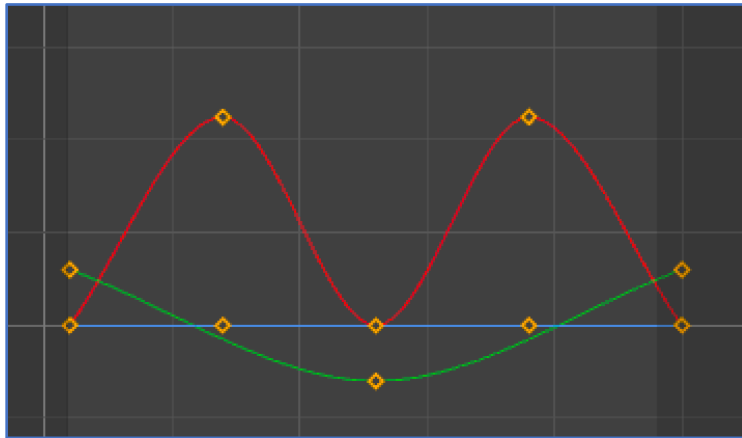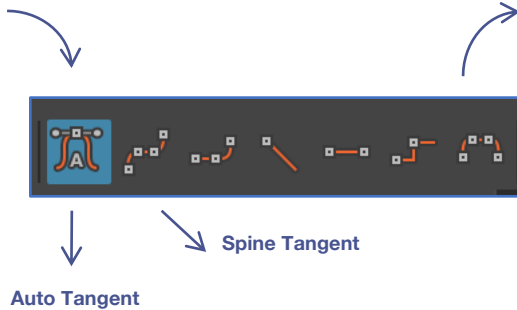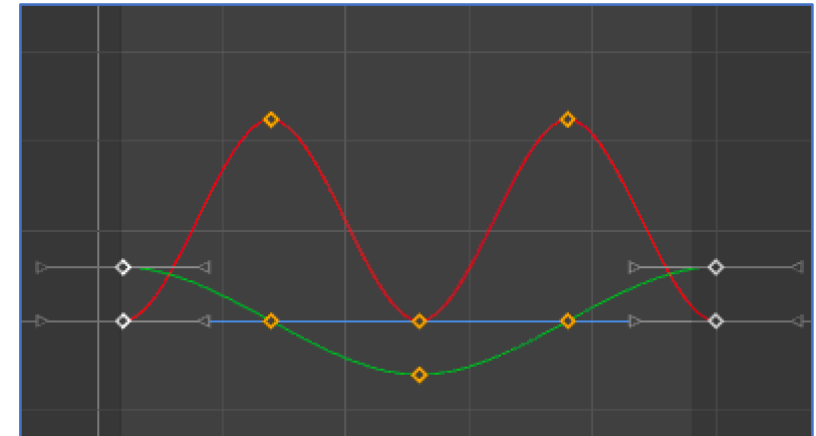
Walk Cycle Reference Sketch – sketched by me

Contact   Down   Pass   UP
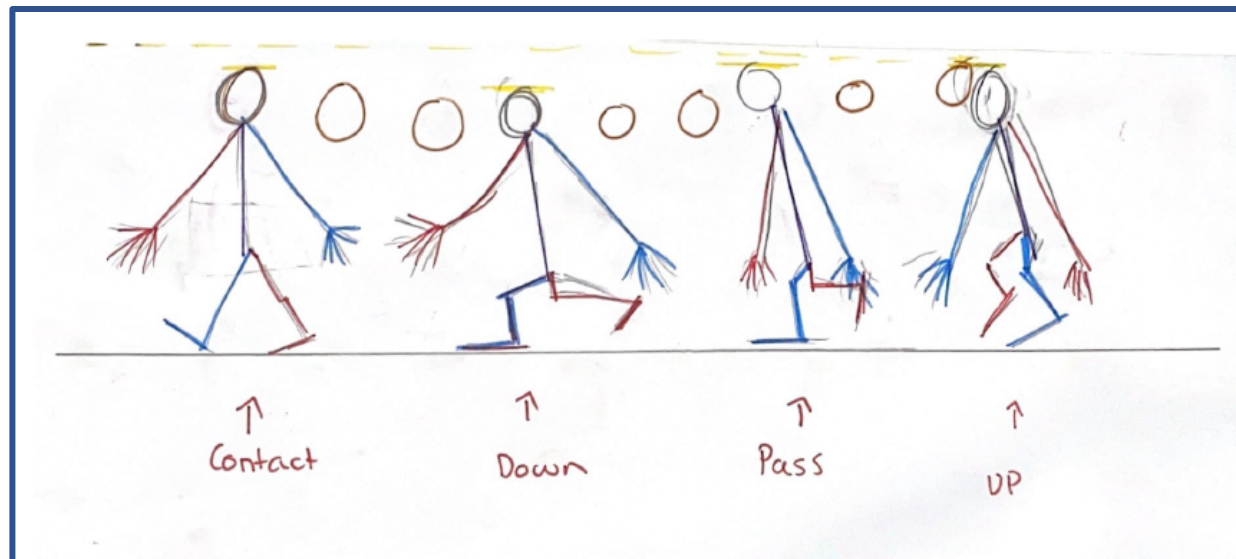
Idle

1. Idle: The Idle pose was the simplest pose to animate having already animated the walk cycle and animated the walk cycle. Using a 100 frame time slider. Chester had 2 main poses

First Pose:

- **Keyframe occurrence**: frame 1 and frame 100.
- **Feet and Toes**: Completely zeroed
- **Hips**: Completely zeroed
- **Waist**: Slight negative X-Rotation to stretch his back backwards
- **Chest**: Completely zeroed
- **Head:** Slight negative X-Rotation, once again so Chester stands taller in this position
- **Shoulders:** Slight Z-Rotation to bring the arms in
- **Hands:** Completely zeroed

Second Pose:

- **Keyframe occurrence**: frame 50
- **Feet and Toes**: Completely zeroed
- **Hips**: Drop (negative Y-Axis translation), slight movement forward (negative X-Axis translation)
- **Waist**: significant positive X-Rotation to lean Chester over.
- **Chest**: Completely zeroed
- **Head:** Slight positive X-Rotation, following chest movement
- **Shoulders:** Increased Z-Rotation to bring the arms in further
- **Hands:** Completely zeroed

2. Additional Techniques: Similar to the technique used in the walk cycle, I used the Animation editor to change the tangents at frames 1 and 100 to 'auto', creating a more seamless transition when looping

Gesture

1. Research: Continuing with the Wreck-It-Ralph theme, I wanted Chester to make use of his oversized arms and hands. With this in mind, I cycled through (https://www.youtube.com/watch?v=8sxUv-RoiqE) this video of all Fortnite emotes to find something that inspired me. The two main emotes that caught my attention were:

Ground Pound

https://youtu.be/8sxUv-RoiqE?t=1200

This emote perfectly captured the final position I wanted Chester to be in – yet less exaggerated and reflected in that Chester's left hand would be hitting the ground. The process that it took to get this character to the ground was not at all how I wanted Chester's to be. Chester is very heavy and clumsy, thus the flip at the start of this video is not realistic to Chester's personality.

Dance Off

https://youtu.be/8sxUv-RoiqE?t=2002

I used this emote to understand and mimic the way in which Chester's hips and legs would move in relation to the wind up section of the animation

Initial Stance

Second Position

Shoulders rotate with leading arm

Hips rotate with almost parallel to shoulders

Slight lift in the heel

Hips continue to rotate, with a slight rotational lift. Lifting up the back leg (right leg)

Both heels continue to lift, with an emphasis on the back leg which completely leaves the ground

Third Position

Shoulders continue to rotate with an additional downward rotation following the leading arm

Fourth Position

Waist also begins to rotate

Hips remain similar, slight rotation continued

Feet move slightly closer together yet height remains similar

Overall weight remains on the left hand side

Shoulder significantly drops as left arm starts so swing back

Feet continue to move closer together. Right foot moves forward yet heel remains in the air

Fifth Position

Shoulders begin to move the swinging shoulder forward. They also begin to move

Waist begins to rotate in the .

Sixth Position

Shoulders rotate significantly with change in leading arm.

Hips drop significantly

Both feet are on the ground flat footed. Slight outward rotation on left foot

Ava Hales

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2. Overview: The gesture animation is split into 3 main sections

- The Introduction
- The Wind-Up
- The Punch

The Introduction animation occurs from frames 1 through 60, whereby Chester lifts up his left hand, scrunches his left hand into a fist, and checks to see if anyone is around by rotating his head to the right and slightly up.

The Wind-Up animation occurs from frames 60 through 75, whereby Chester lifts winds his body up for the main punch. This involves swinging his right arm forward to balance the movement of his left arm moving backwards. He also shifts his weight to the right side of his body in preparation for the main punch.

The Punch animation occurs from frames 76 through 85. This is the central and panicle point of the gesture animation, resulting in Chester kneeling with his left hand clenched in a fist resting on the floor. This involved Chester lowering his hips, moving his right foot forward and left foot backwards. He also swings his right arm backwards to balance his body while his left arm moves forward again

3. Experimentation: With the general consensus for Chester's movements established, I jumped into maya and began experimenting with the animation. The MP4 file titled "" records this process.

The Introduction

Frame 1	Frame 10	Frame 15	Frame 20	Frame 28	Frame 40	Frame 60

The Wind Up

Frame 60	Frame 65	Frame 68	Frame 70	Frame 72	Frame 74

The Punch

| Frame 76	Frame 78	Frame 80	Frame 82	Frame 84

Issues and Additions:

1. Issues 1 – Clothing Material: After having established the main movements for the Gesture animation I exported Chester into Unity following all the steps from the Week 12 tutorial. I quickly noticed that the clothing was not imported. Moving back into Maya I found that the MAT_Clothing material that was applied to Chesters clothing was not visible in the Hypershade Rendering Editor. Unfortunately, I had no idea how to delete this material as I could not locate it! After much time and fiddling around in Maya I solved this issue by deleting the Clothing_SG (Shading Group) that was associated with the material and created a new one to be applied to the clothing.

2. Addition 1 – Facial Expressions: I also decided I wanted to add facial expressions to Chester – looking back, this is something I should have took into consideration in the planning process as it would have saved me much time. I went ahead and added a jaw and mouth joint – the issue with this however is that I needed to bind these joints to the pre-existing skin of Chester. If I went ahead and chose to 'Unbind skin' then 'Bind skin' with the new joints, the skin painting would be removed, and this is not something I was willing to do again. After doing some digging on the Autodesk Maya Community Forum, the solution was rather simple. I simply had to select the new joints and go to 'Skin' > 'Add Influence' – I then went on to paint skin weights for these joints.

With the new Jaw and Mouth joints, I added a facial expression whereby Chester drops his jaw then he goes to punch the floor. I additionally added animation to Chester's to bring more life to his character

3. Addition 2 – Seamless Loop: Finally, I extended the animation/playback start/end to 120 so that I could animate Chester to stand back up to the position he was initially in, creating a seamless loop between the start end of the animation.

4. Issue 2 – Different Skinning: One final issue is that Chester has different skin weights and additions in his Gesture scene compared to his walk cycle and his idle scene. This is as a result of making additions at the end and not entirely planning for that alteration.
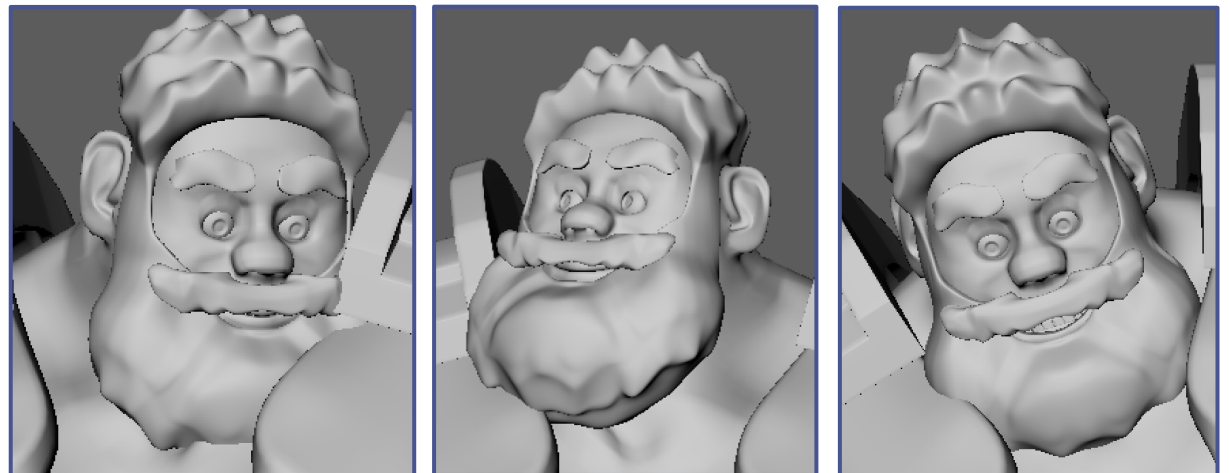
Reflection:

Upon reflection, if I was to restart, I would do the following differently:

- **Less Polygons:** When I submitted assignment 2, I smoothed out Chester's Skin – increasing the polygons dramatically. When I started the skinning process in Assignment 3, I tried backtracking and deleting some edges. While this worked in some areas, it left Chester slightly warped in other regions – I also did not consider the impact this would have on the textures created for Assignment 2, however, when I finally imported everything into Unity, it was far too late to fix this mistake.

- **Planning:** For this assignment, I wish I had a more detailed plan of what I wanted to do with Chester. I had a general overview, and planned the broad details, however the little and intricate features that I later decided to add, and had not planned for, such as greater detail with facial expressions, meant Chester varied across the 3 animation scenes. For example, the skin weights slightly vary across the 3 scenes. Some features that are available in the gesture scenes, are not available in the idle and walk scene, and some control attributes are locked and hidden that are not in other scenes. While this is not too much of an issue as it does not affect the final Unity scene, the slight inconsistency is something that would have not occurred had I planned with greater detail. I also recognise everything cannot be planned for however and find sometimes the best ideas occur mid-development.

- **Pose:** Looking back I also should have modelled Chester to stand in a T pose rather than a V pose, as I think this would have reduced some of the slight deformities Chester experiences with large movements.