Feature Production
Research and Development

During this assignment I will create a matte painting establishing shot. The project will enable me to further my overall digital matte painting ability. I will explore how to achieve a photorealistic environment through researching composition, perspective, lighting and colour. In order to improve my employability as a digital matte painter, I will develop my ability in the 3D software Maya. Maya will enable me to model rough 3D geometry for camera projections to provide a 3D effect. I will also explore incorporating a 3D asset, in which I will carry out a CG paint over.

Concept

A cinematic shot to establish an arctic environment. It will be a wide shot of a CG fantasy style castle towering over a frozen valley. A prominent theme will be a dramatic sunset sky, this will allow me to practice creating photoreal lighting and shadows. There will be heavy cloud atmospherics to create mood and add further interest. The piece will have a fantasy theme and a whimsical mood. I will use photo references of mountain ranges in Switzerland as there are tall mountains with heavy snow coverage, perfect for the piece.

Aims

- To further my ability as a digital matte painter
- A cinematic establishing shot
- A photorealistic matte painting
- Accurate perspective and atmospheric depth
- Eye-catching composition
- To 3D model geometry for projections
- Incorporate a CG asset

Software

- Adobe Photoshop: I will use Photoshop to create the digital matte painting
- Maya: I will use Maya to model geometry and render the CG castle
- NukeX: I will use NukeX for camera projections and compositing
- Adobe Premiere Pro: I will use Premiere to edit the sequence and add music

Research

Perspective

As it was something I struggled with in my last matte painting project, I carried out research into perspective. I looked at a Mattepaint article in which artist Conrad Allan explains the basics of perspective. To attain accurate perspective you must establish the direction in which elements get smaller, known as vanishing points. The images below illustrate the church in one, two and three point perspective. This is highlighted through parallel lines showing the different vanishing points of the church.
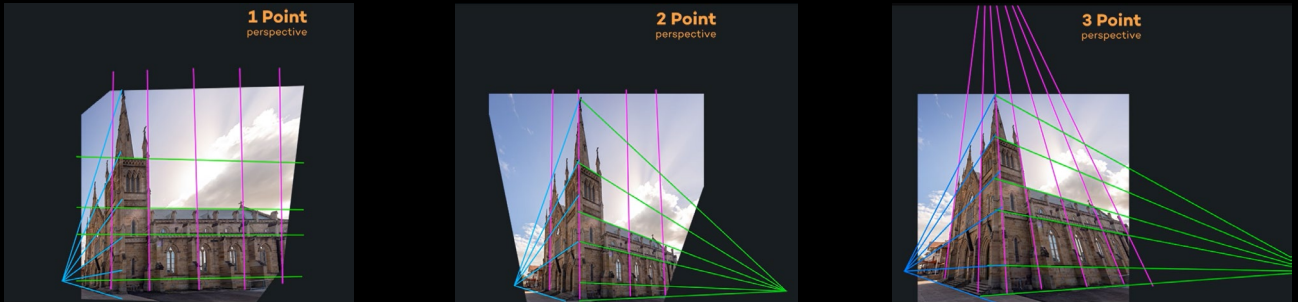

Conrad also explains that in order to attain photorealism, it is important the horizon lines of your images match. As seen below, this can be achieved by adding lines across the images to highlight horizon lines, and then matching up these lines. This helps develop the illusion all the images are part of the same environment.
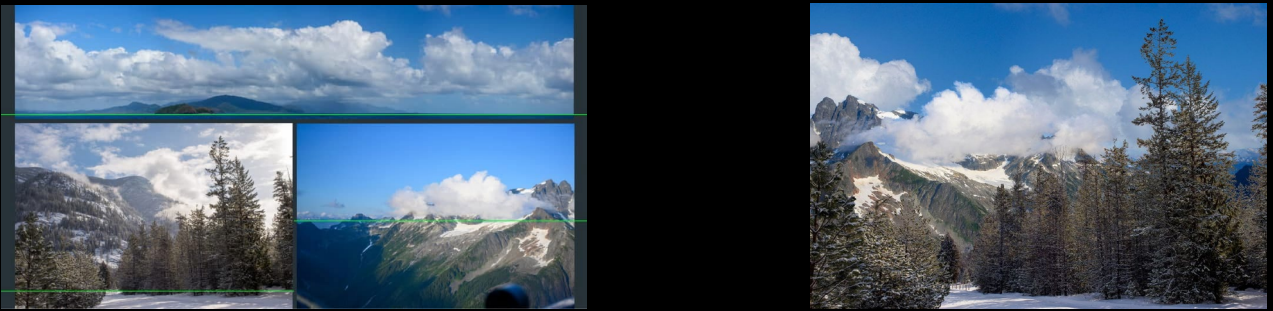
Atmospheric Perspective

I looked at an article that explores how to develop mood through atmospheric perspective. Atmospheric perspective refers to the effect atmosphere has on distant objects. Objects in the distance appear lighter and have less contrast. How far you push the atmospheric perspective can increase the mood of your piece, for example if you can't see clearly into the distance it creates an ominous mood. As I will have a sunset sky in my project, I researched atmospheric perspective on sunset skies. Usually with atmospheric perspective distant objects have cool blue tones to reflect the sky. However, as sunset skies have pink and orange tones the distant mountains in my project will have warm tones in order to achieve accurate atmospheric perspective.
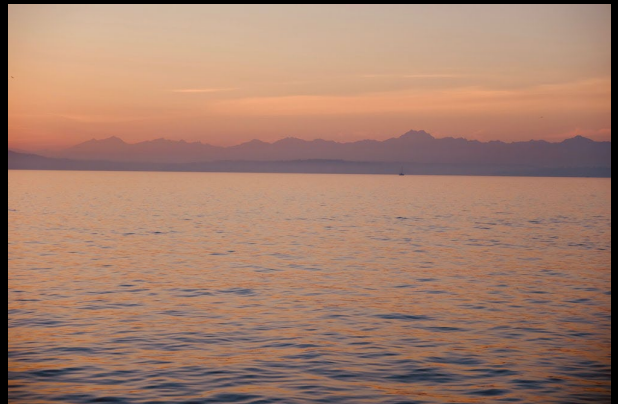
Composition

I looked at an article that explores how to attain effective composition in digital painting. It explains composition is the structure of a piece and how it is laid out, it refers to the relationship between elements and the negative and positive space between them. Effective composition can create a cohesive piece that is easily perceived by viewers.


The article explains the rule of thirds, a simple guide to attain interesting composition. Focal points are placed on the meeting points of the grid and the horizon line on the grid line. I will follow this rule in my own project to create an interesting composition.

It also explores the idea of negative and positive space and how it can create a balanced composition. The idea is that the negative space doesn't pull focus and instead allows focus to be on the positive space that consists of your focal points. For example, in the sketch above, the attention is drawn to the focal points of the people and stone pillar. The sky and foreground rocks are negative space and lack detail to allow the focal points to stand out. The article advises to have more negative space than positive in order to make an eye-catching piece. In the second example above the foreground person and distant village are the focal points and the rest of the landscape is negative space. The landscape lacks detail and colour. I think this technique is very effective, it creates an eye-catching composition that is easy to perceive.

In order to have effective composition it is important to guide the viewers eye and direct them towards the focal points. The article states you should not have any elements pointing out of the scene and drawing the viewers eye away from focal points. Instead, the piece should flow in a way the shapes, lines and angles lead your viewers eye into the scene towards the focal points. In the example the elements are pointing inwards and drawing the viewer in. The focal point of the riders is highlighted through the inward shapes of the rocks and descending slopes, the path draws the viewer in and the light rays hit the negative space of the cliff wall. I will apply these techniques in my matte painting to highlight focal points and create a cohesive and flowing composition.
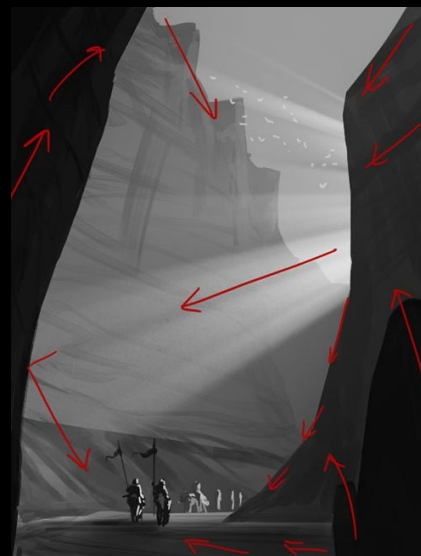
Lighting

As dramatic lighting is a central theme, I explored how to create realistic dramatic lighting. I looked at an article on Mattepaint by Ian Vicknair on god rays. Ian explains the importance of referencing and understanding how light appears in real life before trying to replicate it. He explains key attributes of god rays in real life;

- Light rays look different depending on depth
- Foreground rays appear harsher and more contrasting
- Light intensity is based on cloud density and how big the gap is through which the ray is passing
- Small clouds with multiple holes create smaller and thinner beams of light whereas larger holes with dense clouds create singular and larger light rays
- The god rays illuminate the ground it is hitting, the intensity of this is dependant on the intensity of the light ray

I will apply these light ray attributes in my own matte painting to further the realism.

Using god rays can further the interest of the composition, build mood and help direct the viewers eye to focal points. Ian explains how to create god rays in Photoshop. Painting the god rays yourself enables more control. You should use a soft brush with low opacity and experiment with the brush flow setting to create different effects. To further realism, the colour of the ray should match the most prominent light in the clouds where the ray is coming from. God rays can be used to add depth, by adding less prominent lighter coloured rays further back in depth it increases the atmospheric perspective.

Matte Painting Tutorial - Portal

I looked at a tutorial on Mattepaint by artist Oleksiy Golovchenko. The matt painting is of an arctic environment that incorporates a CG asset; therefore, it is a good example for my piece.

The artist provides helpful tips that I will apply to my own project:

• Use the rule less is more and limit yourself to 5-10 images, if you are grading or relighting lots of images it is easy to look wrong
• Start with the rule of thirds and establish a foreground, midground and background before adding details
• When rendering 3D models render any elements separately for better control
• Use HDRI lighting and match the scene lighting of the 3D to the desired matte painting to further the cohesion in the CG paint over
• To further the photorealism of the matte painting check the contrast levels; the background layers should be less contrasted than the foreground to attain atmospheric perspective
• Ensure the main light source in the piece is in the same place for all the elements

Matte Painting & Concept Art Inspiration

To gather inspiration, I researched matte paintings and concept art. I looked at arctic environments with towering snowy mountains and wide shots with dramatic sunset lighting.

This matte painting is a good example of a dramatic sunset with warm lighting, I think the interaction of the light rays and cloud atmospherics add realism. The composition is balanced with a focal mountain in the foreground surrounded by distant mountains.

This is a good example of using dramatic lighting to draw the eye towards the focal point of the piece. I also think the use of the cold blue tones contrasting the warm orange sunset is visually effective.

I think this composition works well, the flat ground and foreground mountains act as negative space to draw the eye to the towering structures. The use of the large mountains behind the focal points balance the composition and adds further interest.

This concept art is a good reference for a fantasy style castle in an arctic environment. The composition effectively highlights the castle, with the sloping path and mountains behind perfectly framing the castle.

A good reference for a dramatic orange toned sunset sky. There is a clear interaction between the sky and environment through the warm haze cast onto the elements. However, as I don't want my environment to be this dark, and in order to highlight the castle focal point, I will use a more subtle sunset sky.

I also looked at further matte paintings and concept art with castle focal points for inspiration.

This matte painting is a good example of an arctic landscape with a castle focal point. I like the use of dramatic lighting that casts onto the distant mountains. I think the composition is effective with an obvious foreground and background, conveying the castle looks over a vast valley.

Here I particularly like how the ice has formed around the castle conveying it has been harsh weather for a long time and furthering the narrative. I think the composition of having the castle and large background mountain works well and is balanced.

This concept art is a good reference for a castle towering over a valley. A lot of mood and narrative is created through the dark and dramatic sky looming over the castle. I also think the use of the bridge and light shining through furthers the narrative and adds visual interest.

This concept art utilises negative and positive space to develop a well balanced composition. The eye is drawn up the path towards the castle and away from the dark jagged rocks surrounding it. I also think the use of snow being primarily only on the path and cliff the castle is on furthers the composition and where the eye is drawn.

This is a good reference for a castle in a valley. I think the cloud atmospherics are visually effective and draw the eye towards the castle. I also think depth is conveyed well, the distant mountains have heavy atmospheric perspective conveying the sheer size of the valley.

This research will be beneficial when creating my own matte painting. I will draw inspiration from elements that worked well such as simplistic composition that utilises negative and positive space, heavy atmospherics, a clear focal point and dramatic lighting.

Film Research: The Lord of the Rings the Two Towers

I carried out research into the opening sequence of The Lord of the Rings the Two Towers. The sequence establishes the snowy mountain environment through cinematic drone shots. The shots are slow and move steadily throughout the mountain ranges showcasing the details from different angles. I think these camera moves develop a cinematic feel which I will reference in my own piece. The sunlight casting onto the mountains adds visual interest and will help to create a whimsical mood in my piece.

The Lord of the Rings: The Rings of Power

The vast snowy mountain ranges and the misty mountains in The Rings of Power are very effective references for my matte painting. The use of atmospheric perspective in the snowy mountain ranges conveys depth. I will reference this in my own project to develop the narrative and convey the valley is vast. The establishing sequence of the misty mountains is very cinematic. The heavy atmospherics wrap around the mountains and the dramatic lighting is effective in conveying the fantasy theme and is therefore a big inspiration for my own project.
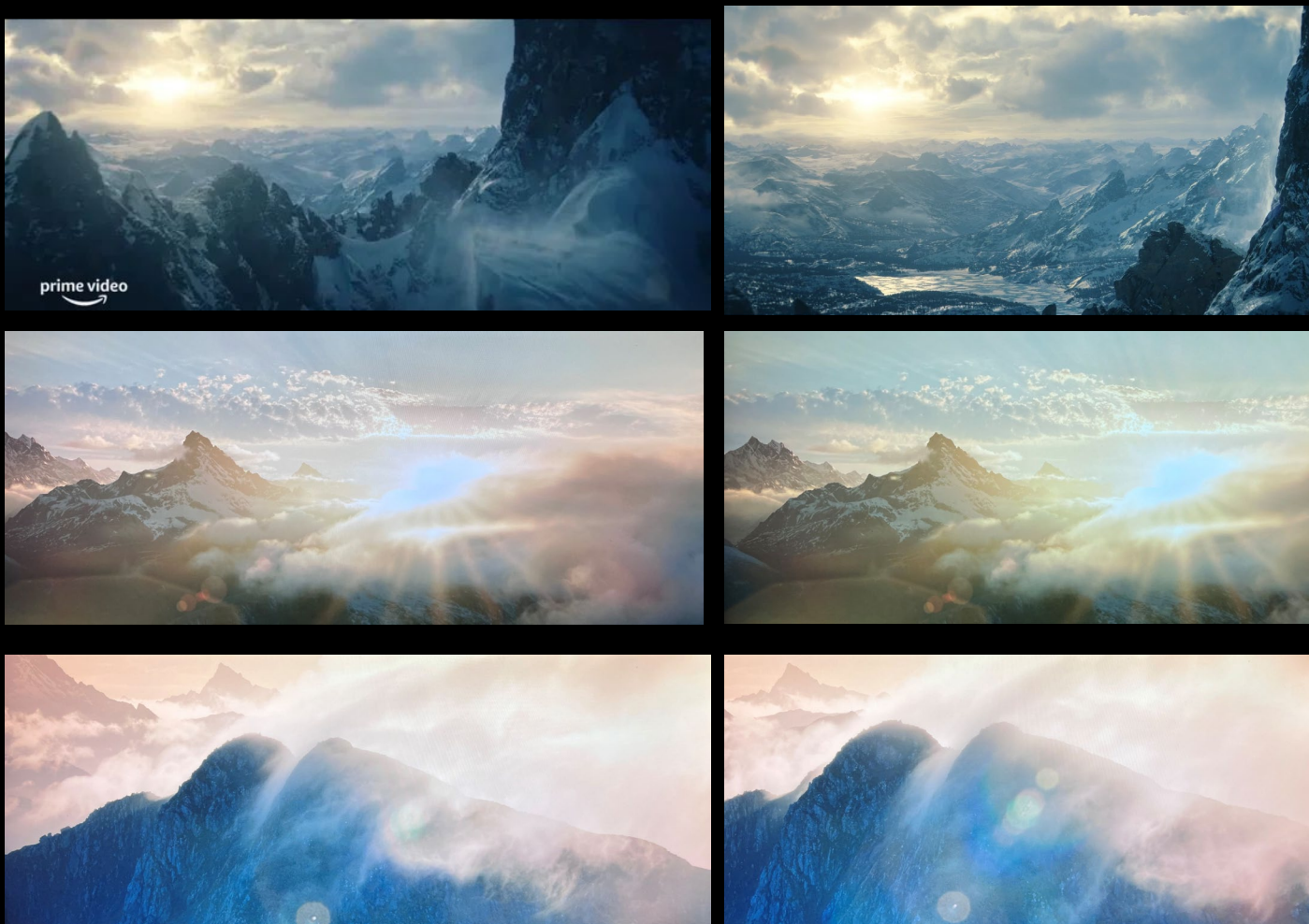
Film Research – The Revenant

The icy landscapes in The Revenant are also good references. I think the vast crisp white blanket of snow leading towards the towering mountains is a simplistic composition but is visually effective. The blanket of snow acts as negative space and draws the eye towards the picturesque mountains creating a balanced composition. The cloudy blue sky with shafts of white light is visually interesting and compliments the cold coloured icy environment. I will reference these elements in my own piece to create a balanced composition that will showcase the castle. Furthermore, in contrast to the usual cold blue tones in snowy environments seen in film, there is a scene with a sunset sky. The warm pink tones cast onto the snow and is therefore a good reference for photorealism in my project.

Film Research – The Witcher

The series The Witcher is good inspiration for a castle in a snowy environment. I think the placement of the castle amongst the interesting rock shapes and on the slope of the mountain integrates it into the environment and furthers the realism. I will draw inspiration from this when integrating my own castle. I will place it amongst the mountains to convey the narrative it has been there a long time and has become a part of the environment.

Narrative Development

In order to create a visually effective piece it is important to have a clear narrative and to derive meaning into the visuals. In the fantasy scene, the castle resides over a picturesque arctic environment. I will place heavy snowfall onto the castle to convey it has been there a long time. However, unlike in The Witcher, the castle will show no signs of damage or decay to convey it has a harmonious relationship with the environment. I will further the positive association and whimsical moods through a bright warm light casting onto the castle. Moreover, I carried out research into establishing shots in film. In The Lord of the Rings: Return of the King, the city is revealed through a slow upwards pan. This move creates a cinematic feel, the steady movement doesn't distract from the environment. The light shining onto the city also furthers the film narrative that it is a beacon of hope. I will use these elements in my own piece to develop a cinematic establishing shot with a clear narrative.

A common theme in films, such as The Witcher and The Revenant, is that arctic environments often have cold blue toned colour grades which convey dark and mysterious moods. However, as I want my piece to convey a whimsical fantasy mood, I researched how this can be achieved in films. I looked at Hogwarts across several of the Harry Potter films. In dark times in the film narrative the castle reflects this with dark colours, stormy skies and thick atmospherics creating ominous moods. Whereas, during the high points in the narrative Hogwarts is accentuated with shafts of warm lighting to convey the uplifting and hopeful mood. I found similar themes in Maleficent. Prominent cold blue tones and stormy skies reflect the dark narrative whereas warm lighting and bright colours convey the whimsical moods. I will therefore incorporate warm colours and lighting in my piece to convey the light-hearted mood and create a positive association with the environment.

Fantasy Castle Film Research

I carried out research into fantasy castles in films to help develop the style of my own.

Mirror Mirror

The castle in Mirror Mirror has an overtly fantasy style with tall turrets and gold roofs. I think it is an effective example of a castle towering over a valley and is a very clear focal point.

Maleficent

The castle in Maleficent has a very detailed and interesting structure, I feel the numerous sharp pointed roofs provide a whimsical and magical feel that would work well in my piece. This is also a good reference for a castle in a sunset sky, where the castle is cast in shadow with the sunlight illuminating the surface.

Beauty and the Beast

The Beauty and the Beast castle is a good reference for where snow falls on a castle; on the roofs and turrets. It's also a very good reference for subtle warm light shining onto the castle. I will reference the appearance of the soft light and shadows on my own castle against the sunset sky.

Harry Potter

The Hogwarts castle successfully attains the fantasy feel through tall turrets and pointed roofs, whilst maintaining photorealism through the brick textures and window details. I will heavily reference this design in my own castle, in order to achieve both a fantasy style and photorealism.

Real-life Castle References

In order to attain photorealism in the CG castle I carried out research into real life castles; Castle Coch, Edinburgh Castle and Caldicot Castle. All the castles have a light brown brick texture and small narrow windows, I think the Edinburgh castle brickwork is particularly visually interesting. Whilst Caldicot Castle has clear turrets, the square shapes feel too traditional and lack a fantasy feel. I also think Edinburgh Castle is shaped like a house and doesn't have the obvious castle shape to communicate my narrative. I therefore feel Castle Coch is the best real-life reference as it maintains a fantasy feel through tall and round turrets with pointed roofs.

Castle Coch

Edinburgh Castle

Caldicot Castle

Furthermore, I gathered references of Castle Coch and Edinburgh Castle in the snow. This allows me to reference where the snow will fall. The snow primarily gathers on the roofs and turrets. I also referenced buildings in arctic environments as this is where I will be putting the castle in my piece. This shows heavy snow coverage on the roofs and grooves of the building.

Real-life References: Lighting & Sky

I researched real-life references of warm toned sunset skies in order to achieve photorealism. As I want the sky to cast a haze onto the snowy mountains, I looked at how dramatic the sky must be in order to have this effect. I found a relatively clear sky with prominent pink and orange tones creates this interaction between the sky and mountains. I think the warm toned sky and haze onto the mountains will work well in creating a fantasy and whimsical feel which is central to my piece. I also think the sky pictured below would work well as the light fluffy clouds can further the light-hearted mood shown in my Harry Potter and Maleficent mood research.

Real-life References: Cloud Atmospherics

As cloud atmospherics are a central part of attaining the whimsical and fantasy themes, I gathered references of real-life clouds in mountain ranges. I found the more prominent shaped large clouds lay at the middle of the mountains, conveying the sheer mountain size. They also wrapped around the grooves of the mountains. When researching the high mountain peaks, the clouds appear soft and hazy and obstruct the view of some of the mountains. I will reference these attributes when adding clouds in my own matte painting in order to achieve photorealism.

Real-life References: Arctic Environments & Snowy Mountains

For my matte painting I gathered photo references of arctic environments in Canada, Alaska, New Zealand and the French Alps. I feel these environments will work well as they have heavy snow coverage and interesting mountain shapes. However, as I am using references from different places, I must ensure the type and colour of the mountain rocks are consistent in order to create the illusion all the mountains are part of the same environment.

Mood Board

I created a mood board to ensure the different elements of my piece work together cohesively. The colour scheme will be warm orange and pink tones from the sunset sky and icy blue tones for the snowy mountains and arctic environment. The sunset sky will cast onto the mountains, light wispy clouds will surround the mountains to further the whimsical theme. Finally, there will be a fantasy style castle with heavy snow coverage on its turrets and pointed roofs. The light from the sunset sky will cast a warm glow onto its surface.

Development

Concept Art

I created concept art in order to develop the composition. I experimented with foreground rocks as I felt it effectively framed the piece and would be a good opportunity to create 3D geometry. Following the rule of thirds, I originally placed the castle on a high cliff to tower over the valley. However, if I placed the castle too far in the distance it wouldn't require a CG model which is an essential element. I will therefore place the castle on the frozen ground amongst the mountains. The vast ground acts as negative space and the castle placed amongst the valley furthers the narrative of its harmonious relationship with the environment.
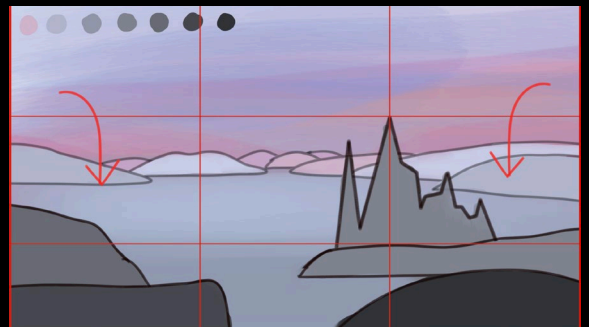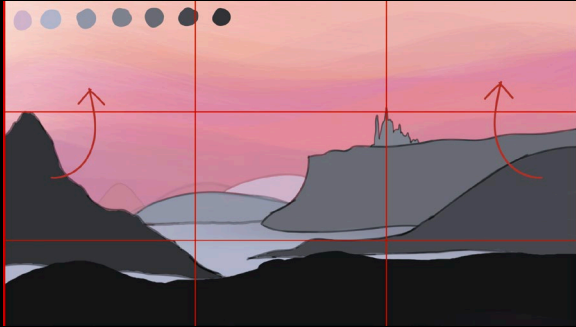
Test Shots

As it was new to me and a key part of the realism, I practiced modelling geometry for projections. Using Maya, I created simple mountain shapes and projected onto them in NukeX. This gave the projections a realistic 3D effect and will work well for the foreground elements in my matte painting.
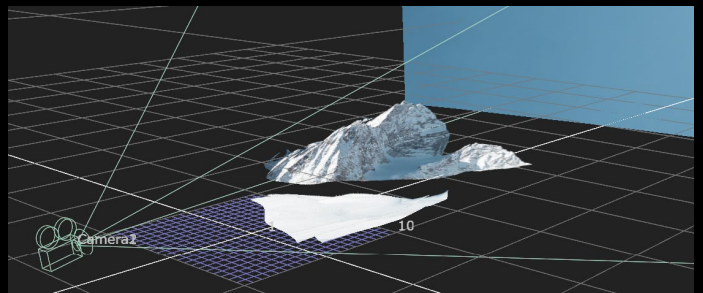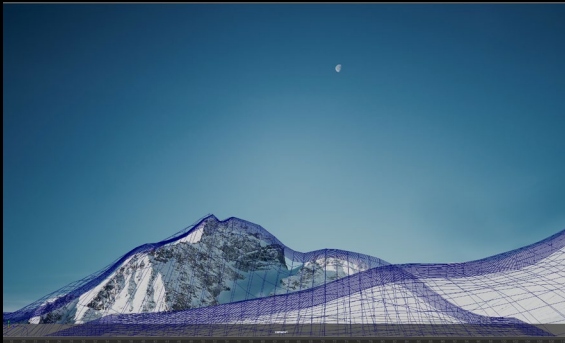
KitBash 3D kit

For the CG castle I will use the KitBash 3D fairy-tale kit. The pack contains a detailed fantasy style castle which will be perfect for my project. The castle is detailed, has tall and round pointed roofs, and narrow windows. This reflects the castles seen in Maleficent, Beauty and the Beast and Harry Potter. The castle also has brick textures on the walls and tiles on the roof, these details will further the realism of the CG asset.

KITBASH 3D

FAIRY TALE

LEGACY KIT
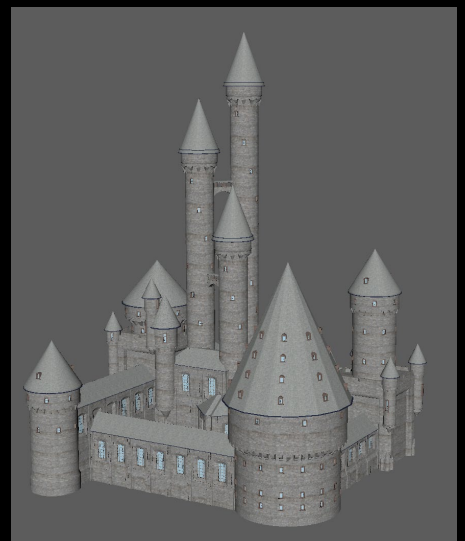
Texturing KitBash Models

To begin the project I opened the Kitbash models in Maya. I planned to use the textures provided in the kit, however the light colours looked washed out and unrealistic. I therefore relinked the textures to Arnold shaders, creating more realistic colours and textures.

Original Textures
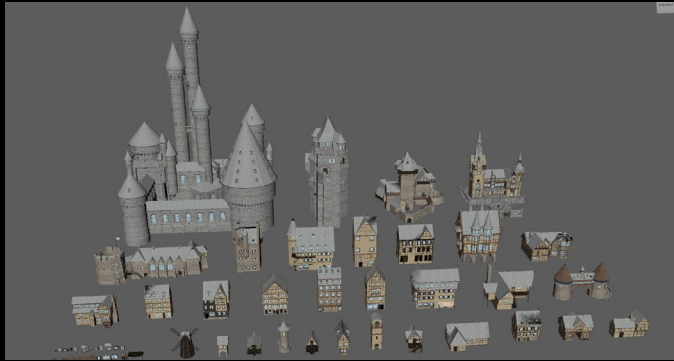
Relinking in the hyper shade
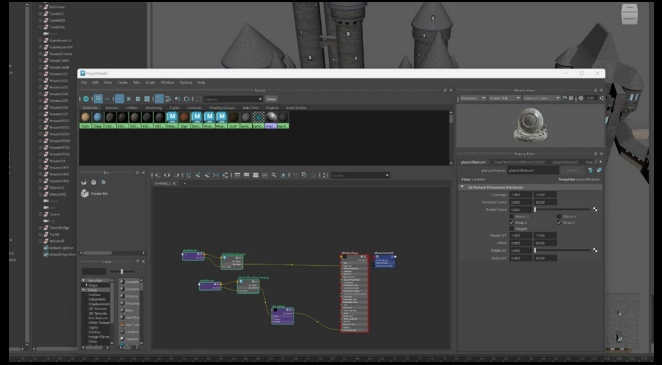
Final Textures
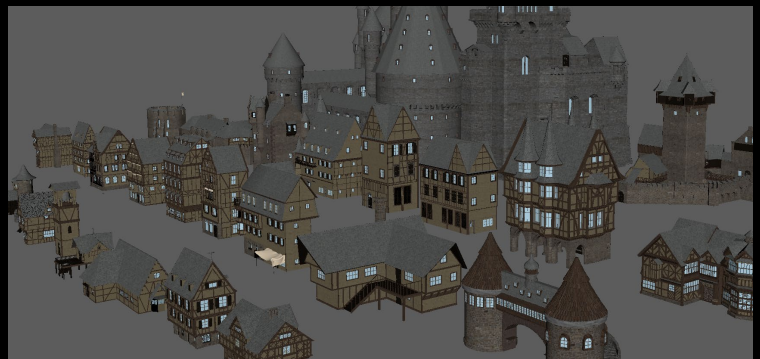
Developing Layout

Using planes and the soft selection tool I created rough mountain shapes to develop the composition of the piece. As I found it difficult to judge the scale, I added distance markers at 100m, 500m, 1km and 5km. This allowed me to ground the piece in real world scales and further the realism.

Distance Markers
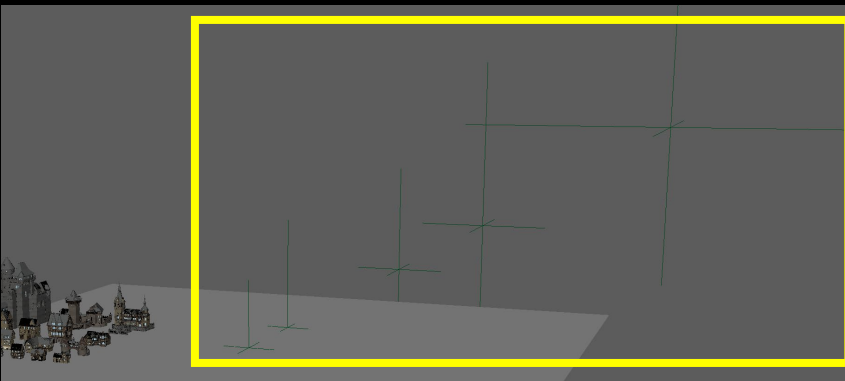
Rough Geo
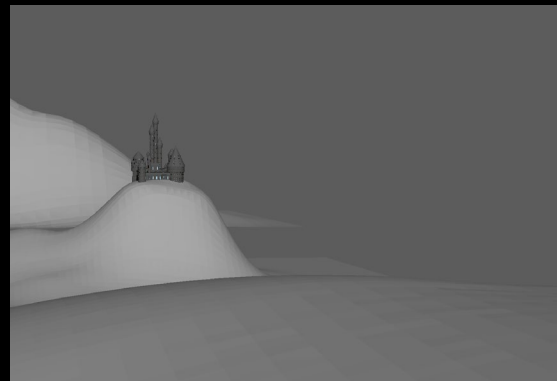
Rough Geo
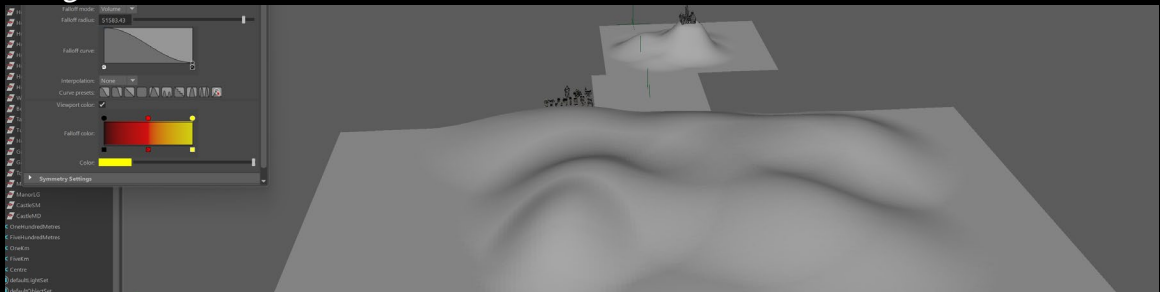
Following my research, I added foreground geometry in order to frame the shot. I also added towering mountains behind the castle to balance the composition and create depth. I experimented with camera moves zooming inwards and gliding over the foreground geometry to develop a cinematic establishing shot.

3D layout

View through camera
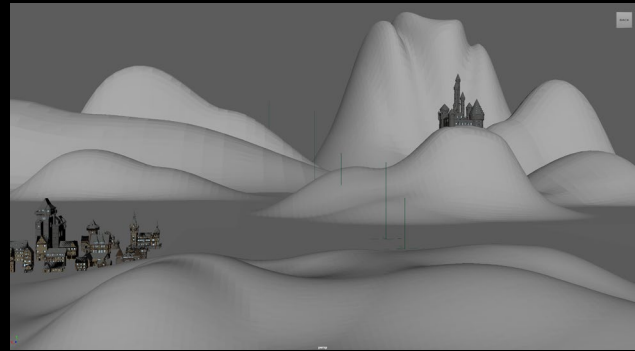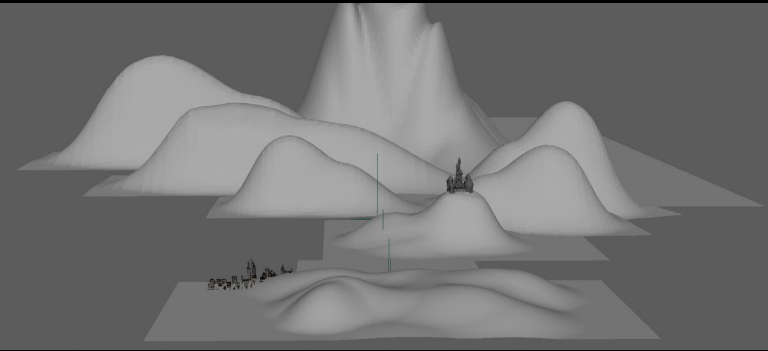
HDRI Lighting

As recommended in the MattePaint tutorial, I experimented with HDRI lighting of a warm sunset. This will realistically light the castle to integrate it into the matte painting.

Rendered view

Rough DMP – Establishing composition

I then began photo bashing in Photoshop roughly following the Maya layout. I found the composition I had created with multiple towering mountains too crowded and would distract from the castle focal point. Therefore, using the rule of thirds I developed a simplified composition using the negative space of an ice lake to balance the composition and draw focus to the castle and distant mountains.

Photo bashing

Too crowded

Rule of thirds

Using negative and positive space
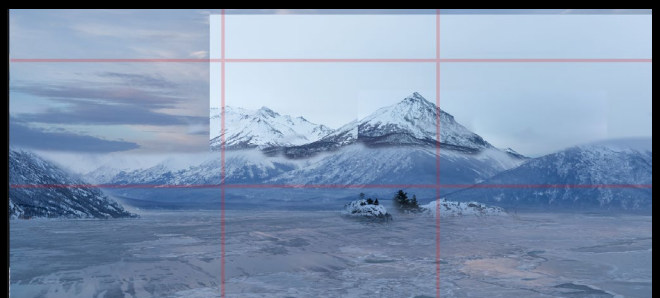
I further developed the composition utilising the rule of thirds and negative and positive space. The composition was made up of foreground rocks, mid mountains and a distant mountain bank. I also created rough geometry in maya for the foreground elements to ensure the new composition was achievable.

Rough photobash
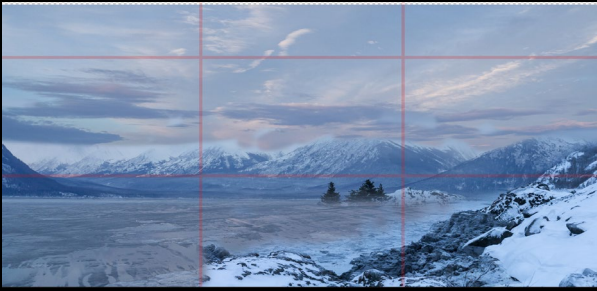
Rough photobash
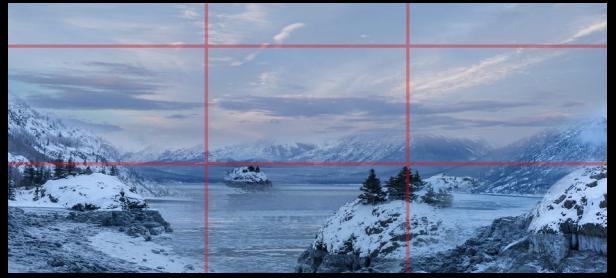
Final composition – Rough DMP
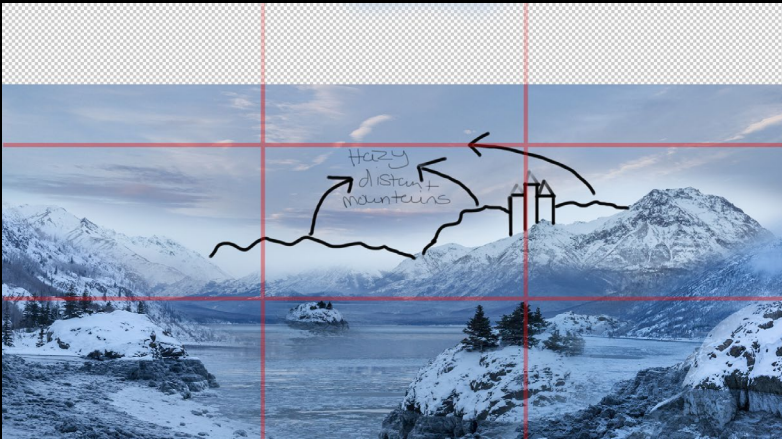
Maya geometry
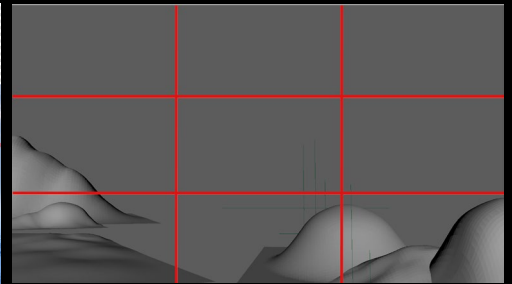
Refining DMP – Background Mountains

I began refining the rough DMP. I felt the bank of hazy mountains looked visually effective however the photo was poor quality. I therefore overlayed detailed mountains at the top of the banks. I think this looked effective but would be difficult to blend with the mountain banks.

Poor quality mountain bank
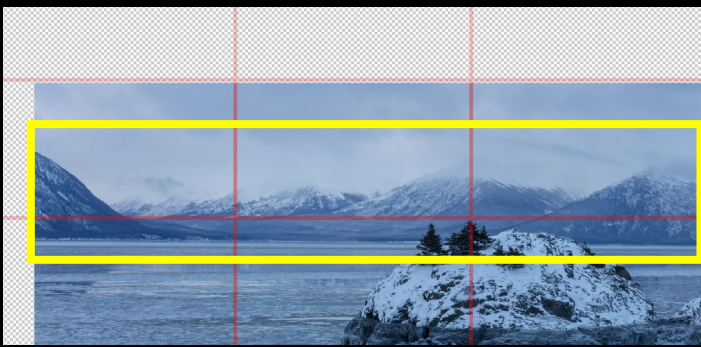
Overlaying tops of mountains
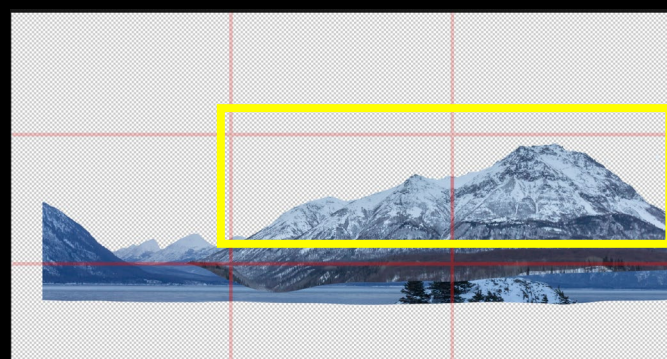
Overlaying tops of mountains
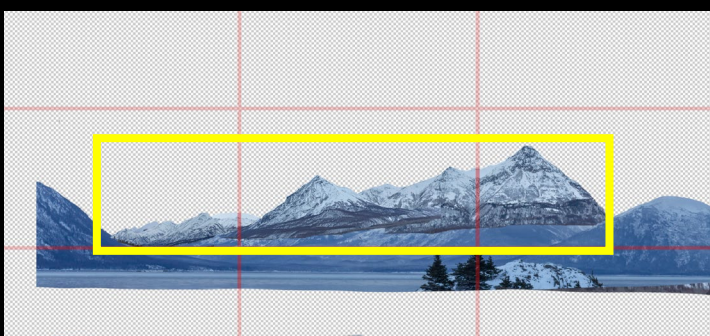
Finished overlay but hard to blend
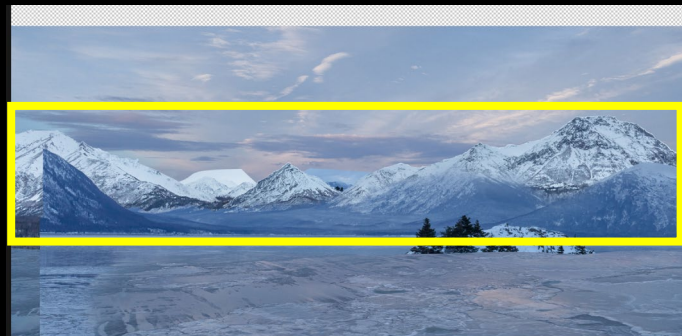
Refining DMP – Mid & Foreground

For the foreground rocks I used two curved rocky shorelines which directed the eye into the composition. For the mid mountains either side I experimented with downward sloped shapes to accentuate the leading lines towards the castle. However, I felt the perspective between the foreground rocks didn't match the rest of the shot. I improved this by removing the left side foreground rocks as they created the illusion the camera was very close to the ground, which didn't match the rest of the elements. I also experimented with the castle placement and adding a small foreground house to add further balance.

Left side foreground rocks

Right side foreground rocks

Mid mountains

Fighting perspective

Castle & house placement

Final castle & house placement

Maya geometry

I then went back to Maya and updated the geometry. I found it difficult to match the perspective of the camera to the DMP. I therefore brought in the same rule of thirds grid so I could match everything accordingly.
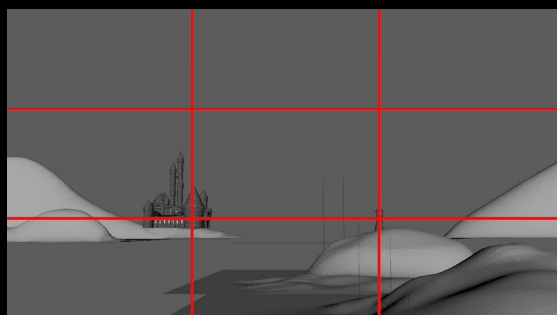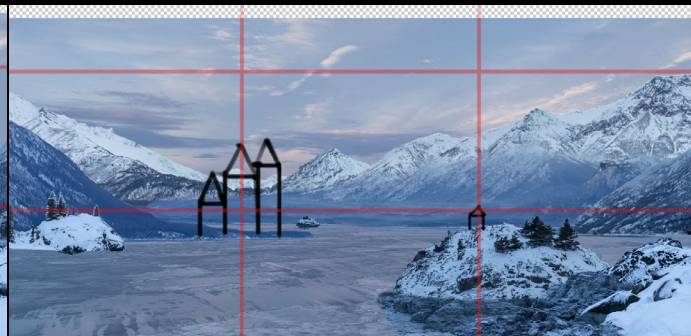
Projecting in Nuke

As I was still struggling to match the perspectives of the Maya scene and the DMP I exported a still of the Maya scene to Photoshop. This helped me to see if any geometry didn't match. Furthermore, I brought the geometry and camera into Nuke. I projected simple checkerboards onto the geometry and was able to assess the parallax of the scene. I also projected the DMP layers. This highlighted some clipping which meant the geometry was too small.
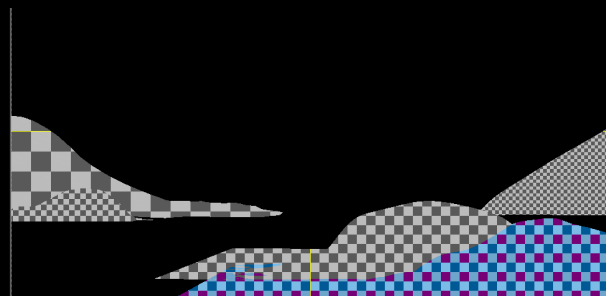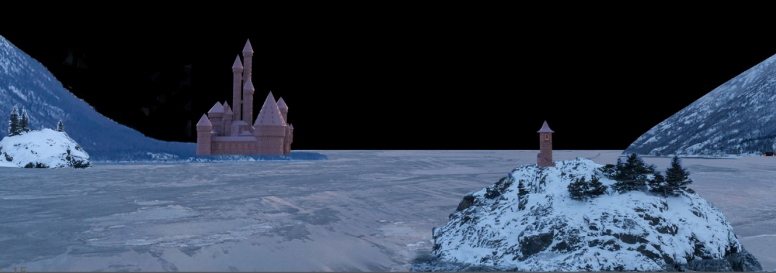
Maya scene into Photoshop
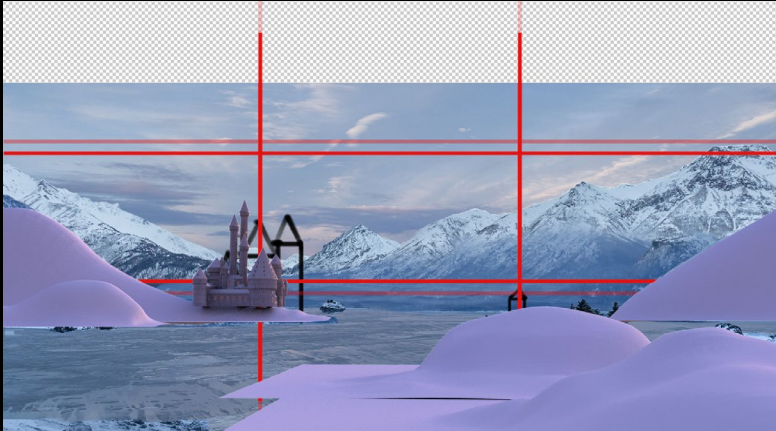
Projecting checkerboard
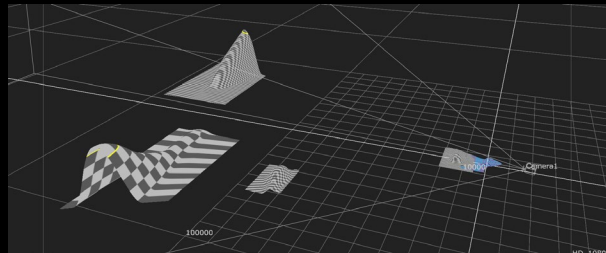
Projecting checkerboard

Projecting Photoshop layers

Further refining DMP – Frozen lake

Once I had a working projection set up, I spent time finalising the DMP in order to attain photorealism. I began with the frozen lake which was acting as negative space to balance the composition. I found a frozen lake with ice detail worked best in adding interest and to enhance the depth. I also experimented with combining multiple lakes with dramatic lighting in order to reflect the sky. This interaction between the frozen lake and sky furthered the realism.
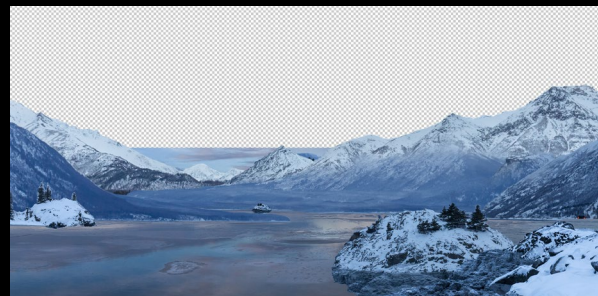
Not enough detail

Too much dramatic light reflections

Too much dramatic light reflections

Created detailed ice with subtle light reflections

Further refining DMP – Sky

Firstly, I tried a pink toned dramatic sky. As per my research, the environment would be dark and cast in shadow. However, when I graded the mountains, I found the heavy colour correction crushed the colour levels and the result was flat and pixelated. As the environment was too different from the lighting of this sky, I tried a warm orange toned sunset sky. This felt much softer and reflected the whimsical fantasy theme. And also, as it was less dramatic, it wouldn't require as much of a grade.
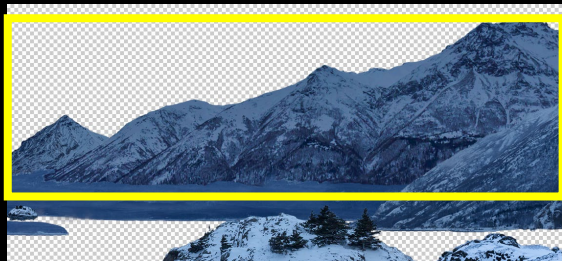
Sunset sky

Crushed colour levels

Chosen sunset sky

Further refining DMP – Mountains

Upon grading the mountains for the new sky I found the heavy blue toned references I had used became pixelated even when darkened only slightly. I therefore found new references with even lighting that were taken late in the day to better match a sunset sky.

*Crushed colour levels*

Crushed colour levels

I found references to begin replacing the distant mountains on the bank. These photos reflected the sunset sky through even lighting with no harsh shadows and would therefore not require heavy grading. As the bank also had the heavy blue tones, I decided to cover it with trees which also established the scale of the towering mountains furthering the depth of the piece.

New mountains

New mountains and trees
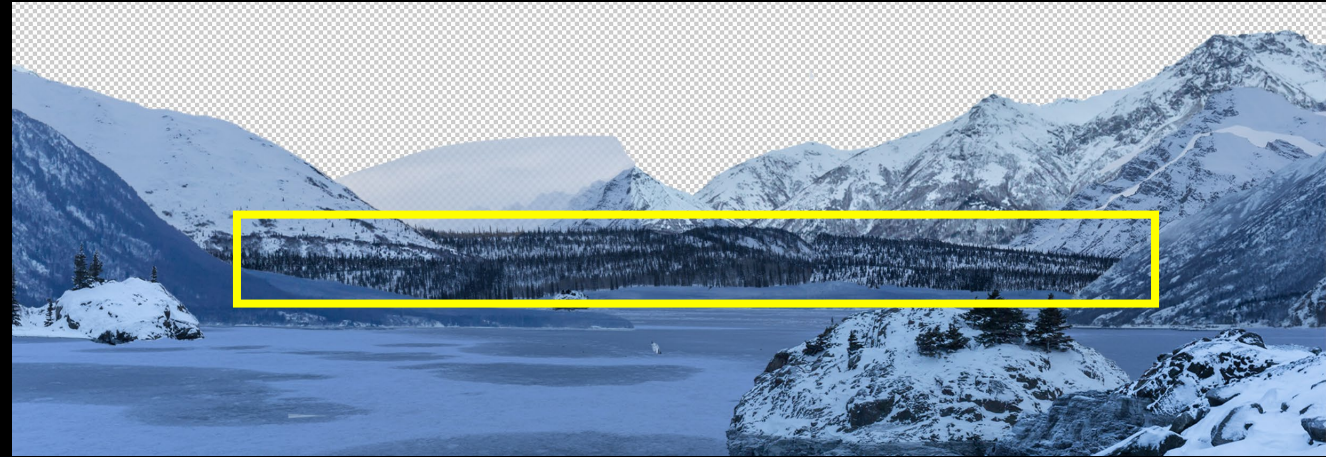
I experimented with adding further mountain layers to the mountain bank. I also added distant mountains to further the depth of the piece. When adding new references I made sure to stick to the original composition of the mountains sloping downwards and drawing the eye to where I would place the castle focal point. I felt the harsh blue tones of the mid mountains either side did not reflect the sky, I therefore tried different references.
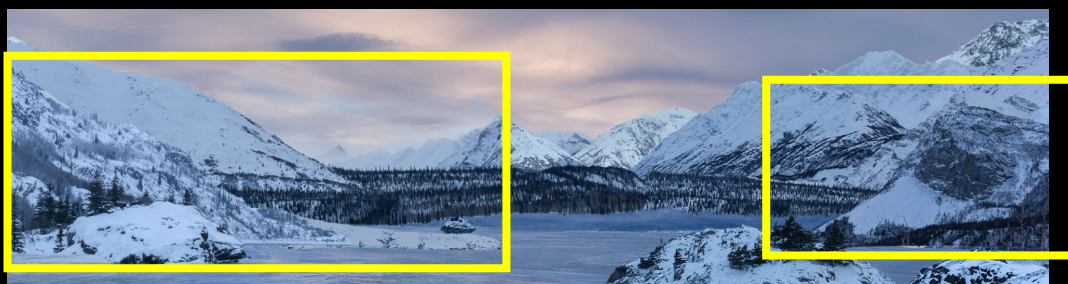
New distant mountains

*New mountains*

New mid mountains

To further the realism, I refined details of the new mountains. The right-side mountain was obscured by tops of trees which wouldn't be found on ice. I therefore used the clone stamp tool to make the branches less noticeable. As the left-hand mountain was covered by the small hill in the photo, I removed some of the trees and greenery using the clone stamp tool. In order to avoid repeated patterns, I also used sections of the mountains as patches.

Before – obscured by trees

Using clone stamp
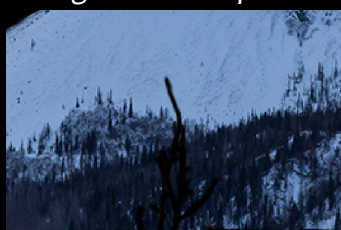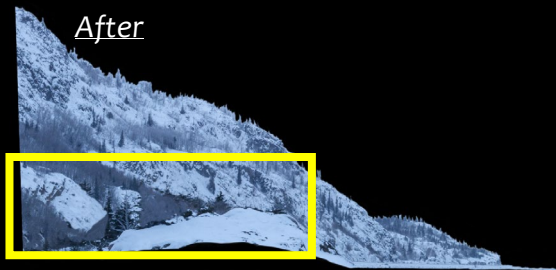

After

Using clone stamp

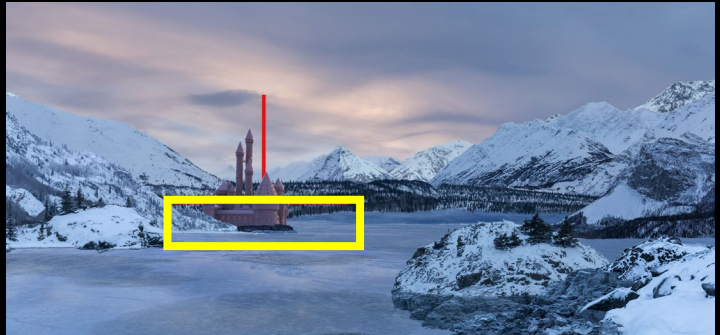*After*

Before

After

Adding details

In order to further the realism and integrate the CG castle I added shrubbery in front of the castle.

After

Before

With castle

Grading

In order to reflect the sky, I darkened and added cold blue tones to the environment. I used the eye dropper tool to sample colours from the sky and lightly painted haze onto the environment to further the interaction of the sky and to reflect the whimsical feel. This added cohesion and furthered the atmospheric perspective.

After grade

After haze

Reflections

However, I felt the mountain elements didn't realistically sit on the frozen lake. I therefore added reflections. Upon researching references, I made sure to warp, blur and darken the reflections to attain photorealism. This worked well in realistically integrating the mountains into the environment.
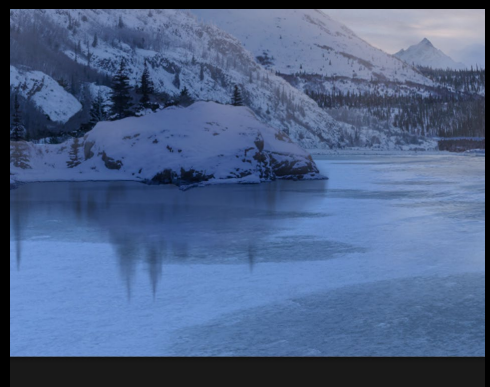
Mirroring the element

*Warp and blurring*

Final reflection

Fixing problems

In the final stages of the DMP I refined areas that weren't blending with the rest of the piece. To integrate the shrubbery, I used the clone stamp to copy the snow textures and colours of the mountain it was on. I also felt where the trees met the bank looked too harsh and unrealistic. To fix this problem I added more trees to cover the whole bank. This worked well in adding more detail.

Problems

Fixed shrubbery, adding trees
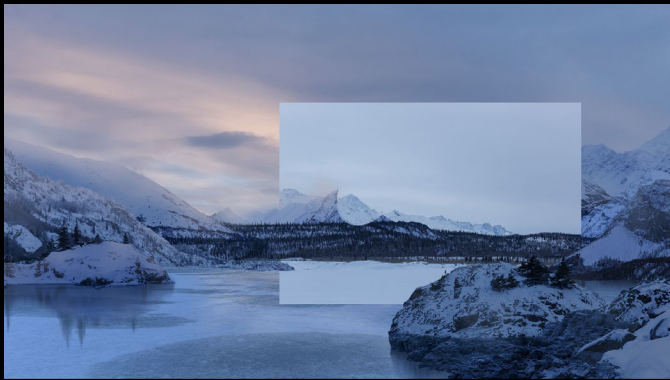
Fixed problems

Clouds

To further the fantasy theme I added wispy clouds. Applying my research, I placed the clouds amongst the mountains, creating the illusion the clouds rest atop. However, I felt the piece was lacking depth. I therefore added large clouds to the foreground sky, this worked well in framing the piece. I graded the clouds incorporating the blue and pink tones from the sky and used different opacity levels to further realism.
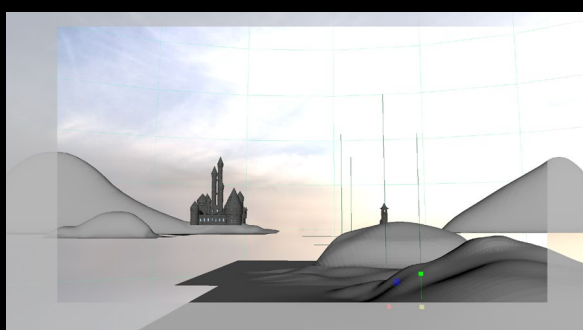
Environment clouds

Foreground clouds

Graded clouds

Castle HDRI

I then went back to Maya and tried a new HDRI that reflected the lighting of the DMP sky. To see how it integrated, I exported a still to Photoshop, but found it was still too light.

Maya HDRI

I therefore darkened the HDRI to reflect the environment. I also felt having the foreground tower element made it difficult to establish the scale of the environment and confused the focal point. I therefore decided to just have the castle and increased its size, so it towered over the environment. Before Nuke projections, I once again brought in the projection geometry to make sure it lined up.
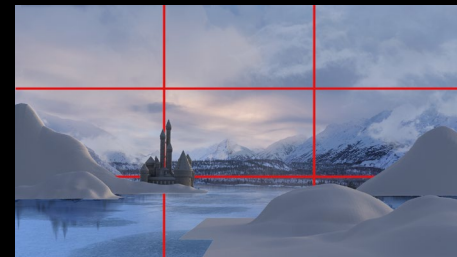
*Before removing tower*

Scaling the castle

Maya geometry

Nuke projections – Clipping problem

I then exported the geometry, castle and camera from Maya. As I began projecting the DMP in Nuke there was a lot of clipping, highlighting that some geometry was not in the correct place. To overcome this, I brought the DMP as an image plane into Maya to more accurately position the scene.

Clipping
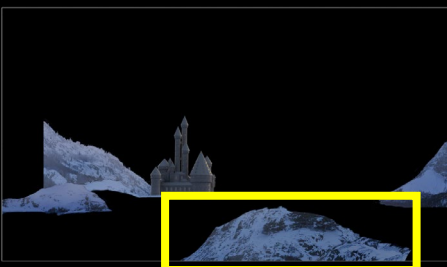
Projections
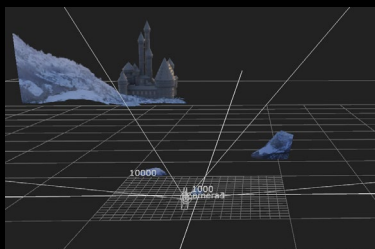
Clipping

Clipping

Ground plane projection
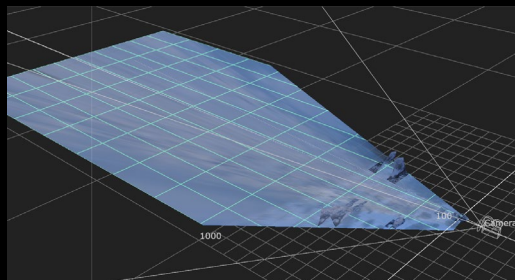
Nuke projections

I then projected the rest of the piece. I made sure the projection set up resembled how the scene would look in real life. I projected the distant mountain bank on cards, separating all the elements and spreading them out in 3D space to attain realistic parallax. Unfortunately, the trees on top of the foreground and mid mountains looked very flat. I therefore separated the trees and projected them on cards atop the geometry.

Projecting trees
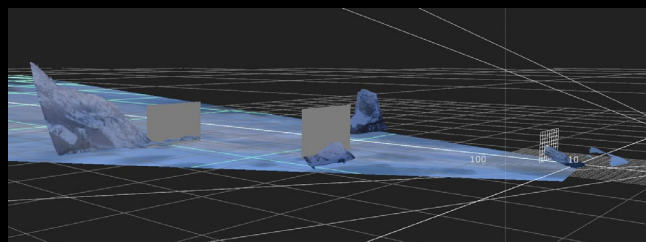
Projections
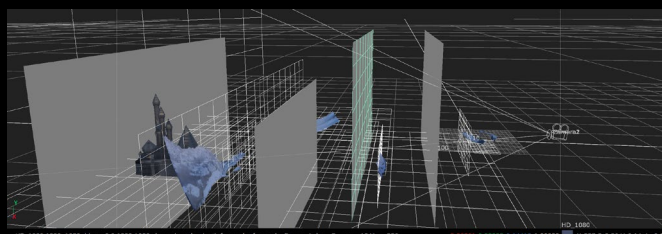
When projecting the distant bank of trees, I originally positioned the card vertically with a slight slant. However, I found when played, this made the bank look flat and unrealistic. I therefore positioned the card flat on the ground with a subtle rotation. This created the illusion the bank was sloping upwards.

Original tree blank placement

Fixed projection

Nuke projections – Reflection clipping

I found it very challenging to project the reflections without causing clipping. When the cards were placed horizontally on the g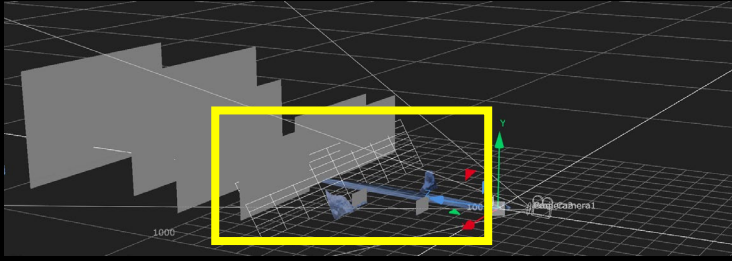round it would clip the ground layer and would warp with the camera move. To overcome this, I positioned the cards vertically underneath the geometry which prevented the warping. However, as the tree bank card was at an angle, I found it difficult to position this reflection. I therefore created the tree bank reflection in Nuke. This meant I could copy the exact positioning of the tree bank to avoid clipping. I created the reflection through mirroring the tree bank, blurring it and using a feathered roto to create the gradual fade effect.

Reflection clipping

Reflection clipping

Creating reflection

Creating reflection

Castle clipping

My original plan for the castle was to export a still of the textures and project it onto the castle geometry in Nuke. However, I found this caused lots of clipping and warping. Therefore, I rendered an exr sequence of the castle. I merged this clip over the Nuke scene which worked well as it was tracked perfectly. However, this method meant I had to split the Nuke projections so everything in front of the castle was placed after.

Castle clipping

Using exr sequence

Castle snow

When analysing the shot I felt the castle stuck out and didn't look believable in the arctic environment. I therefore added snow to the castle in Photoshop. Applying my research, I placed the snow on the turrets, roofs and any other surfaces the snow could gather. I decided on quite a heavy coverage to reflect the environment. I found it difficult to attain realistic looking fine snow. I therefore used photo references and the magic wand tool to preserve the fine edge detail. I added blue tones to the snow to reflect the cold environment. However, in Nuke I projected the snow layers onto the castle model and found there was lots of clipping and warping.

Adding snow

Finished snow

Clipping in Nuke

Snow geometry & castle reflection

Using basic cone shapes and planes I created geometry for the snow projections and placed them over the castle model to ensure they were in the correct 3D space. I made the geometry larger than the castle model to avoid any clipping. Once projected in Nuke, the geometry worked effectively and there was no clipping or sliding. Overall, the snow helped to integrate the castle into the environment and furthered the realism of the CG castle. To further integrate the castle, I created a reflection using a blur and a feathered roto.

Creating geometry in Maya
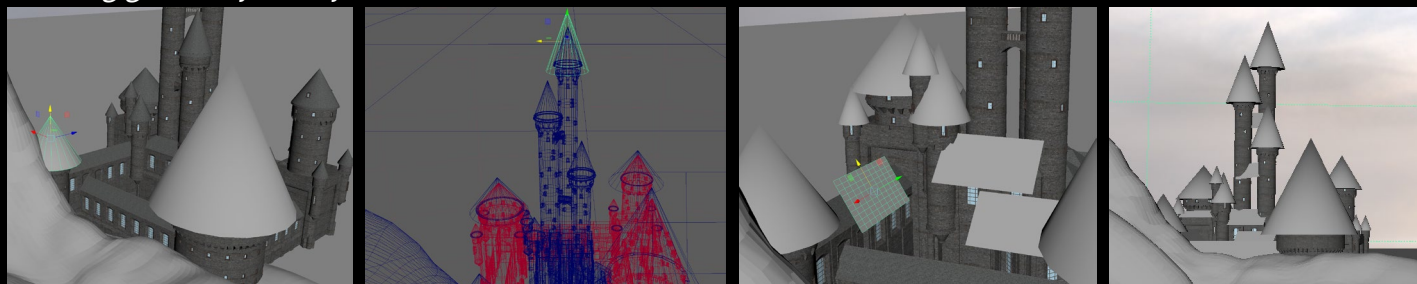
Projected snow in Nuke

Creating reflection

Finished reflection

Clouds

I projected the environment and foreground clouds. I placed the cards throughout the environment creating parallax. The foreground clouds worked particularly well in developing a 3D effect. However, I felt compared to the environment, the castle still stood out. I therefore went back to Photoshop and added clouds in front of the castle. This worked well in integrating the castle into the environment.

Environment & Foreground clouds
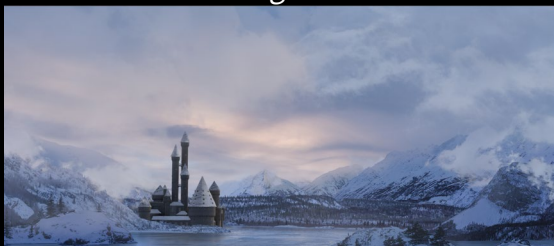
Adding castle clouds in Photoshop

Grading clouds

Final clouds

Experimenting with light wrap

As there was a prominent warm light behind the castle, I experimented with adding light wrap using the light wrap Nuke node. However, I found it difficult to use and the result was a harsh yellow toned blur that could mostly be seen at the bottom of the castle.

Creating light wrap

Unrealistic yellow tones

Castle grade & radial haze

To try and improve the castle integration I added a grade and colour correction. I lightened the castle and added blue hues to reflect the cold toned environment. Instead of a light wrap, I added a blurred radial node and colour picked the orange light in the sky. This successfully cast the light over the castle and integrated the castle into the piece. The warm haze also effectively furthered the fantasy and whimsical themes.

Before castle grade

After castle grade

Creating radial haze

Finished radial haze

Vignette and edge defocus

To further the realism of the shot, and to create the illusion it was shot through a camera, I added a defocus node. I feathered this using a roto so it only appeared around the edges. I also created a vignette using a grade node and a feathered roto. These effects furthered the realism, drawing the eye inwards and towards the castle focal point.

Creating vignette

Finished vignette

Creating defocus

Birds

In order to add more movement and therefore improve the realism of the shot, I experimented with birds. I felt some distant birds would add further interest but not distract focus from the castle. Firstly, I found footage of birds flying in a sunset sky and used a luma keyer to cut out the birds. However, as it required a harsh key, the birds appeared pixelated and choppy compared to the DMP. I also tried a flock of birds which added interest but risked looking like black dots rather than birds.
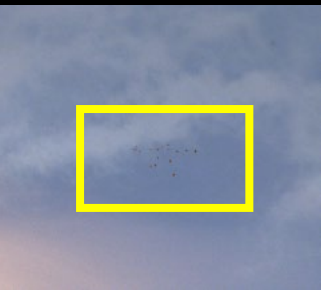
Plate

Single bird

Flock of birds

Flock of birds

I therefore found a bird in a blue toned sunset sky. This would work well as It didn't need such a harsh key in order to fit into the environment. I luma keyed the plate and rotoscoped to cut out the bird. To further the realism and portray the large mountain scale, I scaled down the bird and placed it on the horizon. The bird integrated well into the piece as I placed it on a card and pushed it back in depth, so it appeared from behind a mountain.

Plate
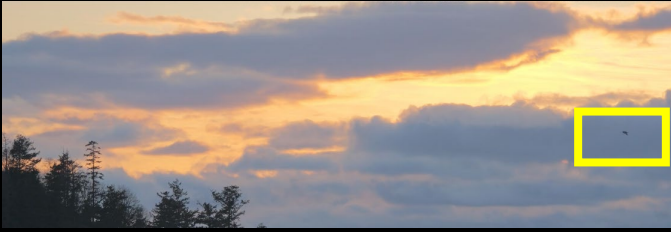
Luma Keying

Finished bird

Finishing touches

To finalise the piece and bring it to life I keyframed the radial haze opacity to subtly fade in and out to create the illusion a cloud had passed in front. I also animated the clouds using a transform node to move slowly to the left. This creates the illusion there is a slight gust of wind, the movement also draws the eye towards the castle. To create the impression it was filmed through a camera I added grain and a subtle camera shake to give the camera move a handheld and less CG feel. To finish the piece I added a fade up and out from black in Premiere Pro to further the cinematic feel. I also added the song Rafiki's Fireflies from The Lion King. The instrumental music furthers the whimsical and fantasy themes.
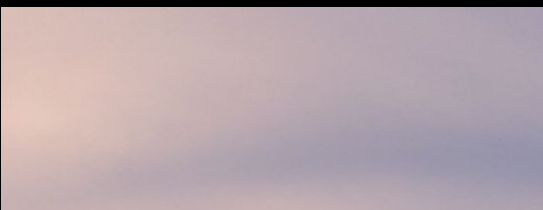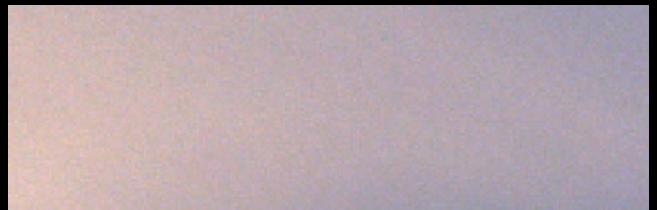
Beginning of shot

End of shot

Sky without grain

Sky with grain

Evaluation

During this project I feel I have improved my overall matte painting ability. Through applying my composition research, the layout of the DMP is easy to read and visually interesting. Following the rule of thirds allows for an effective castle focal point. Also, utilising leading lines through sloping mountain shapes towards the castle and foreground rocks, and clouds that frame the piece, draw the eye into the composition. The negative and positive space where the frozen lake doesn't distract from the castle provides balance. The warm lighting casts onto the environment and the blue toned colour grade furthers the realism as it creates an interaction between the sky and environment. To further improve the shot, I would select more interesting background mountains as I think they risk blending into one.

I have developed my ability in Maya, the projection geometry works well in creating a realistic 3D effect. In future I would experiment with creating the foreground rocks entirely in CG to allow for a more dramatic camera move without risking breaking the illusion. Throughout the project I have taken a back-and-forth approach between the 3D scene in Maya, the DMP in Photoshop and the projections in Nuke. This approach ensured the project ran smoothly without any major problems. The projections in Nuke were challenging as I ran into lots of clipping issues. In future I would ensure all the geometry is large enough, and create the entire projection set up in Maya to ensure it is all in the correct 3D space. I feel the haze radial light works particularly well in bringing the piece together and integrating the CG castle. I think the CG castle provides an interesting focal point for the piece. The use of photo references to create the snow provides the CG asset with photorealism. In future I would use photo references of brick textures to further enhance the photorealism as I feel the CG texture is too subtle.

Overall, I feel I have created a shot that successfully establishes an arctic environment. The slow and steady camera move creates a cinematic feel, and the fantasy and whimsical themes are obtained through the fantasy castle, warm lighting and wispy clouds. The focal point castle positioned amongst the environment, well balanced through the sloping mountains, creates a harmonious feel and a positive association with the environment. This narrative is further developed through the heavy snow on the castle with no signs of decay, this conveys the castle has been there a long time, but the environment is not harsh, but peaceful. Finally, this is reinforced through the distant bird flying gracefully towards the castle, creating the impression it is a haven in this whimsical and fantasy environment.

References

Allan, C. (2021) *How to match perspectives in Matte Painting.* Available at:
https://mattepaint.com/blog/matte-painting-basics-matching-perspectives/ (Accessed 28th March 2023).

Raybould, BJ. (2021) *Atmospheric Perspective – The 3 essentials for creating a convincing feeling of depth and mood in your landscape paintings.* Available at: https://www.virtualartacademy.com/atmospheric-perspective/#:~:text=What%20Is%20Atmospheric%20Perspective%3F,in%20value%2C%20saturation%20and%20hue (Accessed 28th March 2023).

Feghali, W. (2022) *The keys to great compositions in Digital Painting.* Available at:
https://evenant.com/the-keys-to-great-compositions-in-digital-painting/ (Accessed 28th March 2023).

Vicknair, I. (2020) *How to create stunning God Rays in your work.* Available at:
https://mattepaint.com/blog/create-stunning-god-rays/ (Accessed 28th March 2023).

Golovckenko, O. (2019) *Portal: Cover Art Tutorial.* Available at: https://mattepaint.com/blog/art-guide-portal-oleksiy-golovchenko/ (Accessed 28th March 2023).

Deurse, WV. (2018) *Artefact Tutorial.* Available at: https://mattepaint.com/blog/art-guide-artefact/ (Accessed 28th March 2023).