

Realistic Environments

Flix Interactive

DEVELOPMENT DIARY

JAKE HILTON

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THE GUIDELINES

Produce a sacred grounds environment. A magical and mysterious location where relics and monoliths receive worship. Include or imply religious motifs. For example, ancient titans or malicious machines.

Your environment must contain the following components.

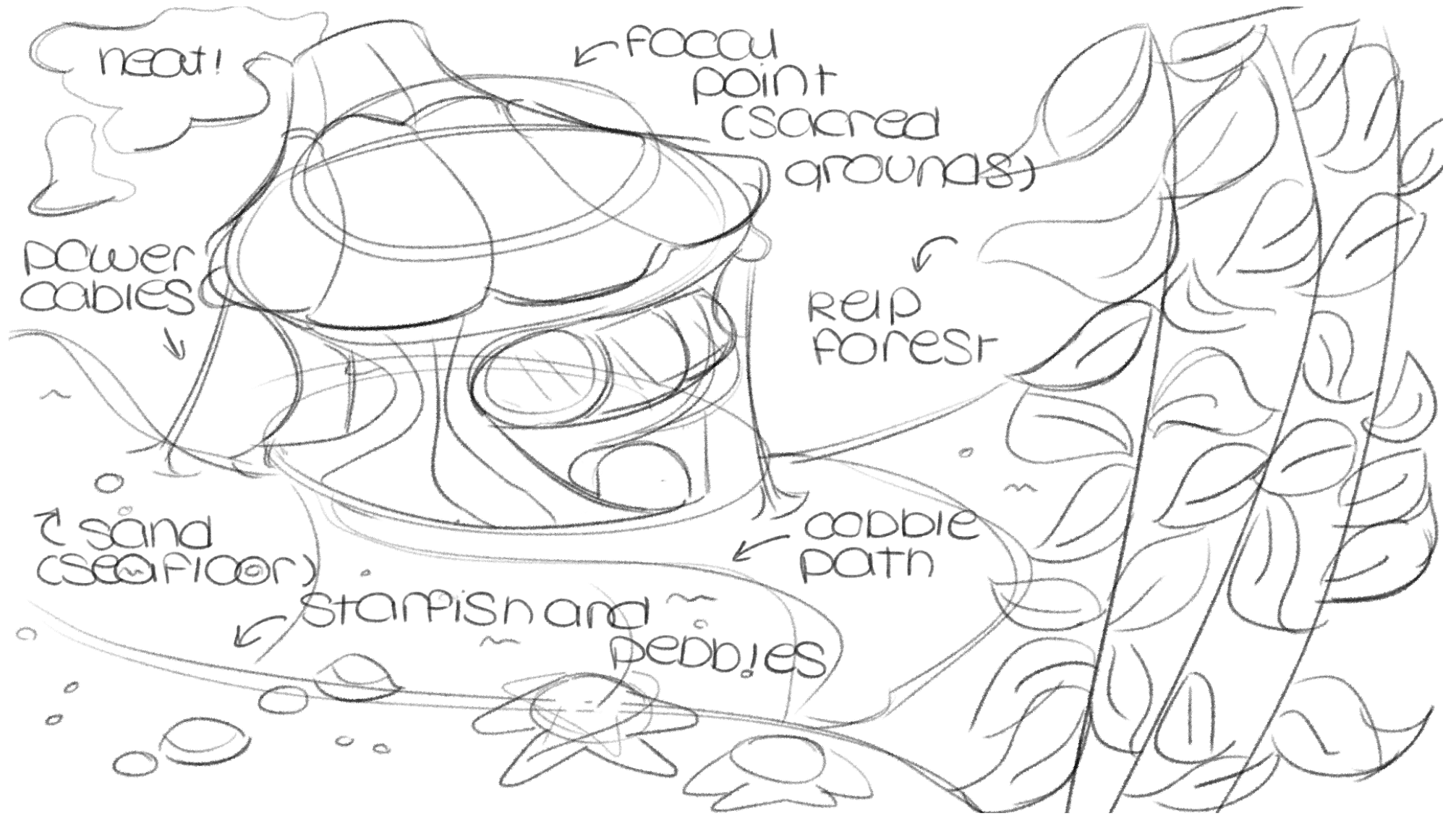
- A fantasy or science fiction setting.
- PBR materials.
- Modular buildings and architecture.
- Unreal Engine 5 real-time lighting.
- An environment function and narrative.
- Five (minimum) high-resolution screenshots.
- A video to showcase scale and performance.
- A development diary to document progress.
- An Unreal Engine 5 playable scene with collisions.

THE CONCEPT



- Natives descend from jellyfish.
- Considered omnipotent beings.
- Endangered and recovered.
- Temperature regulation reduces once you mature.
- Jellyfish conserved in a manufactured tropical climate.
- Intertwined organic and mechanical elements.
- Concealed and protected by location.
- Share prayers, worship and search for guidance or solutions.

THE CONCEPT

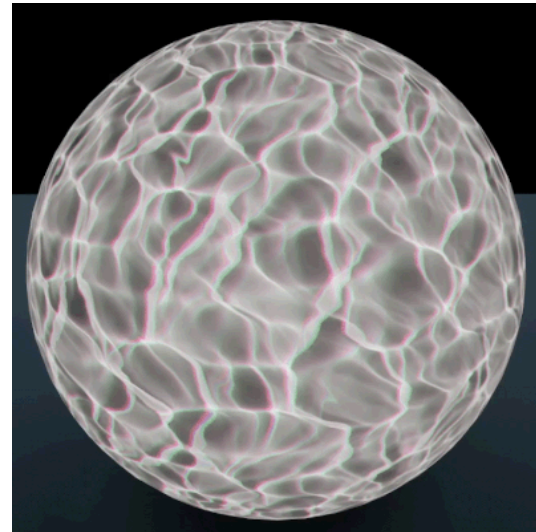
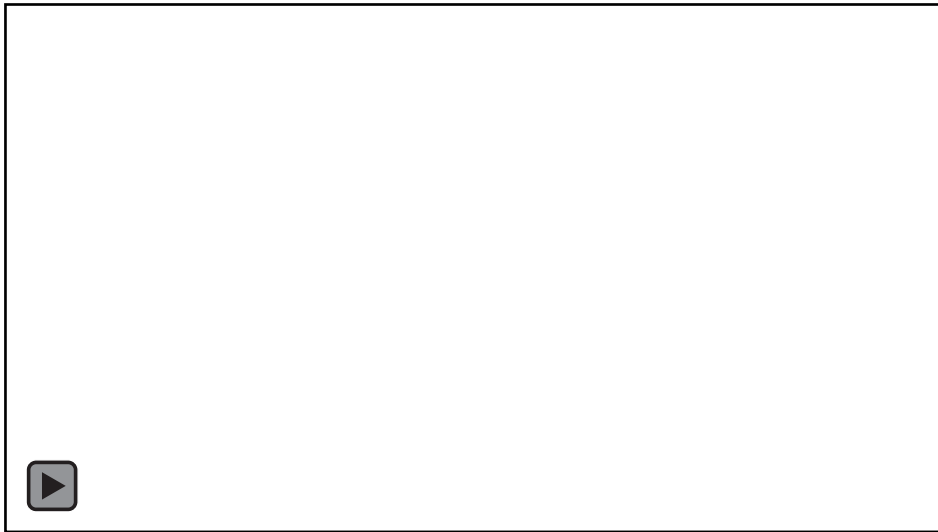
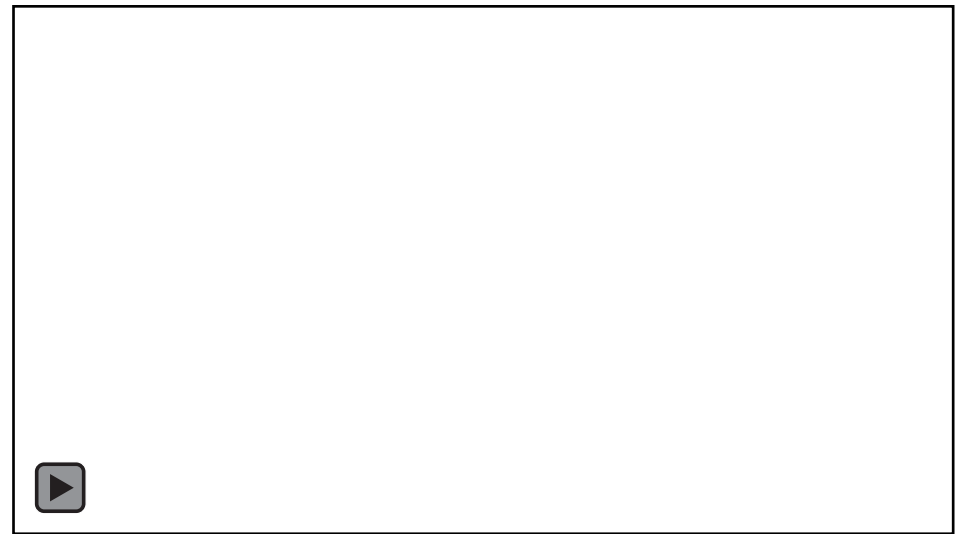
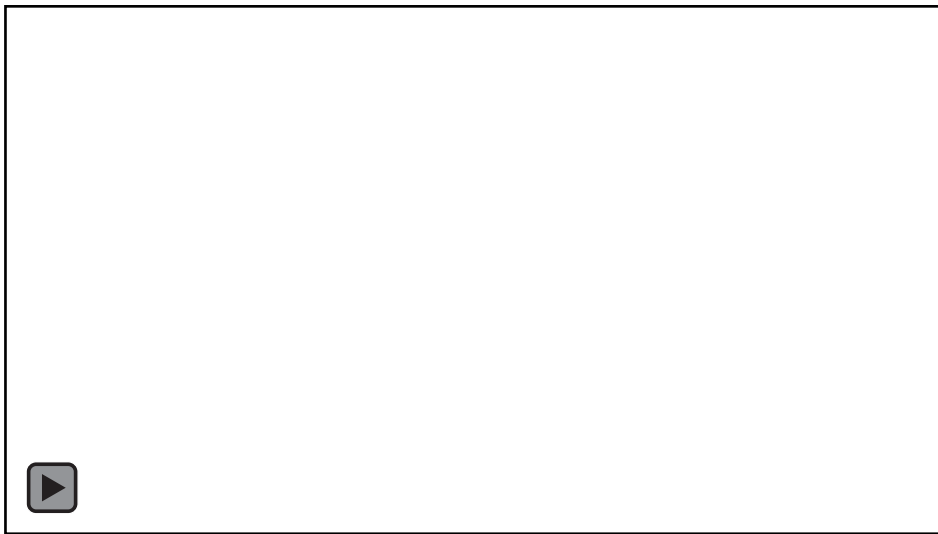


THE INDUSTRY STANDARD



- The human eyes need oxygen to process light.
- Absorbed from the atmosphere.
- Oxygen isn't available underwater.
- Refraction and hyperopia distort surroundings.
- Azurean Depths environment by Stef Bracke.
- Post-processing and programmed materials (shaders).
- Procedural generation protects realism.
- Wave reflections remove open space.

THE INDUSTRY STANDARD



RESEARCH

foreground asset

erosion creates round shape language

human influence

the site has been defiled?

wall and pillars frame the focal point

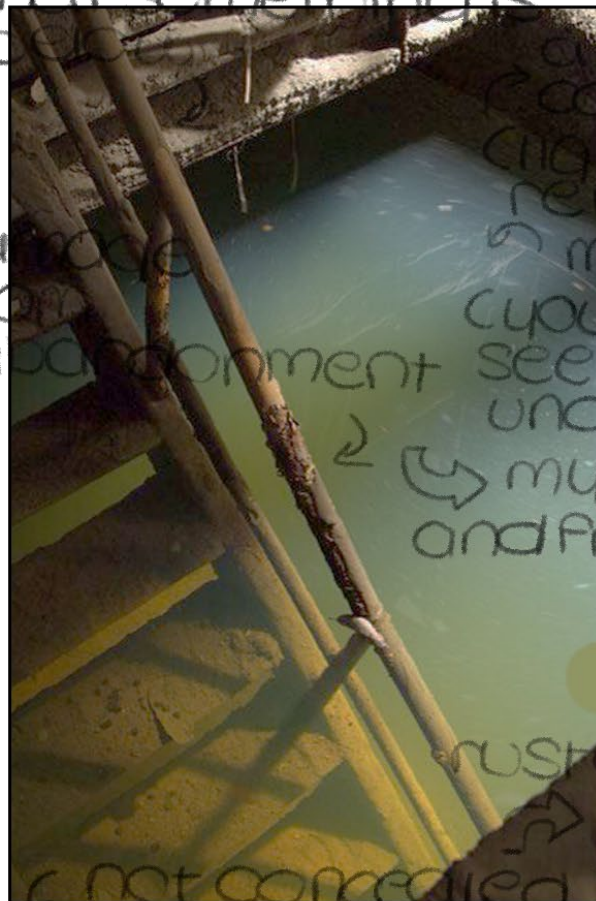


primary colour directs attention (saturated)



implied narrative pathway suggests (has this person that something is failed to escape?)

limiting (narrow) with repeated structures

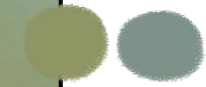


damage from

not corrected (shallow depth)



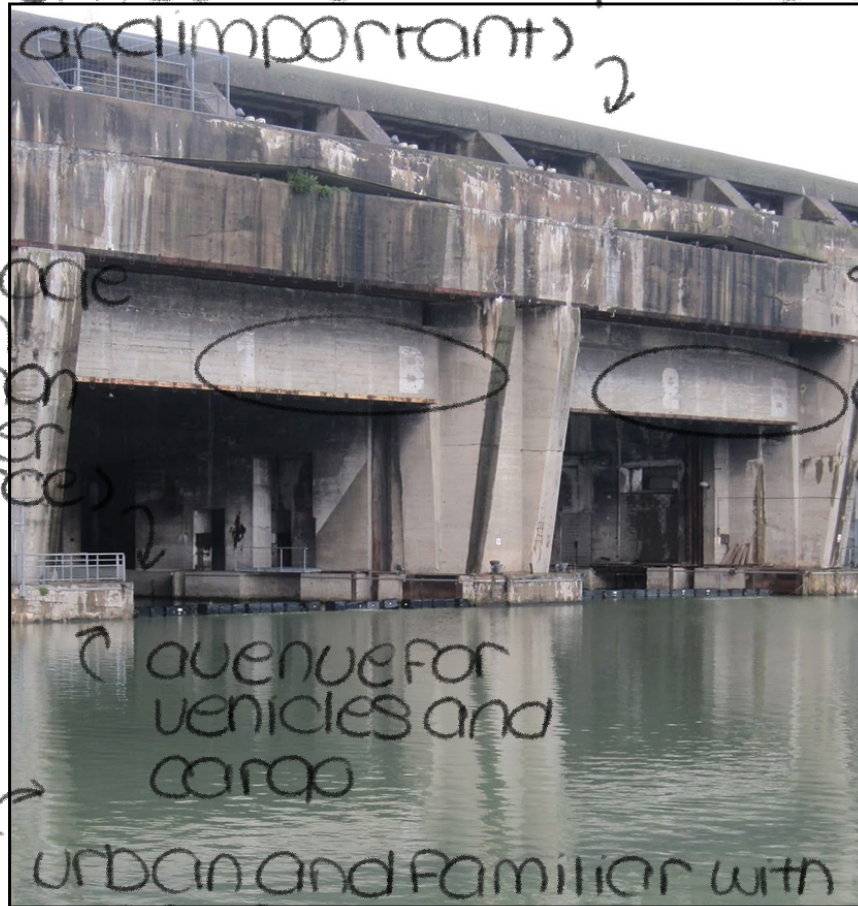
change of colours (light reflections) murky (you cannot see what's underneath) mysterious and frightening



rust (particles) affect water properties

RESEARCH

large and distinctive silhouette (recognisable and important)



damage from location (water source)

avenue for vehicles and cargo

urban and familiar with uncanny elements (named buildings)

geometric and modern (form and function over appearance)



organic & surrounded by manual (importance and protection)

manufactured "roundness" (too perfect to be organic)

future components stand out

recognisable present day features

RESEARCH

empty background
(concealed threats)

occupy with shape
language

focal point



distinct dark and
light colour locations
(safe and dangerous)



precarious location
(challenging to travel to)
intense drive / purpose

unstable structure in
challenging location to
access



damage
suggests
location
timeframe



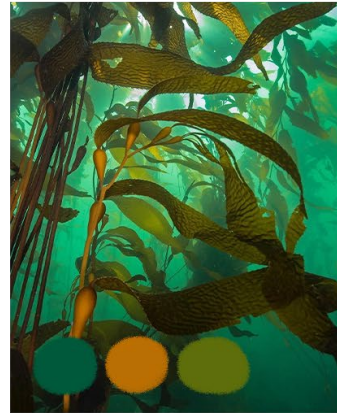
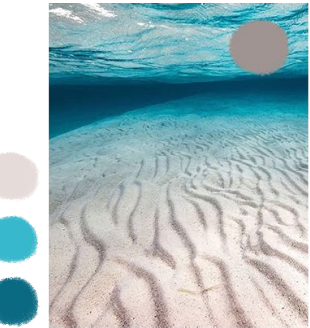
strong
support
presence of
audience
or visitors



snow means sources of
warmth must be available
(evolved species?)

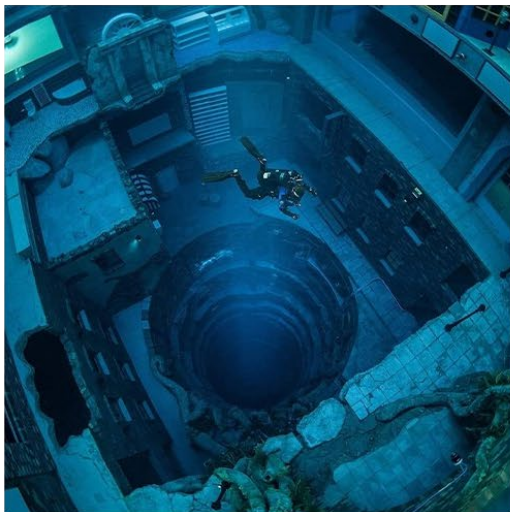
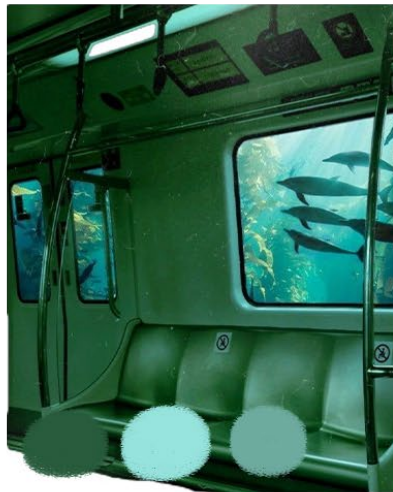
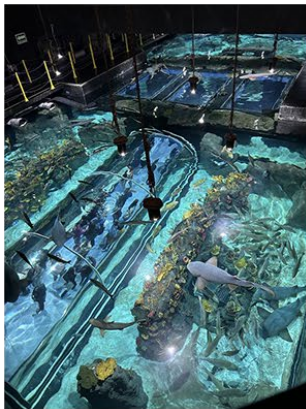


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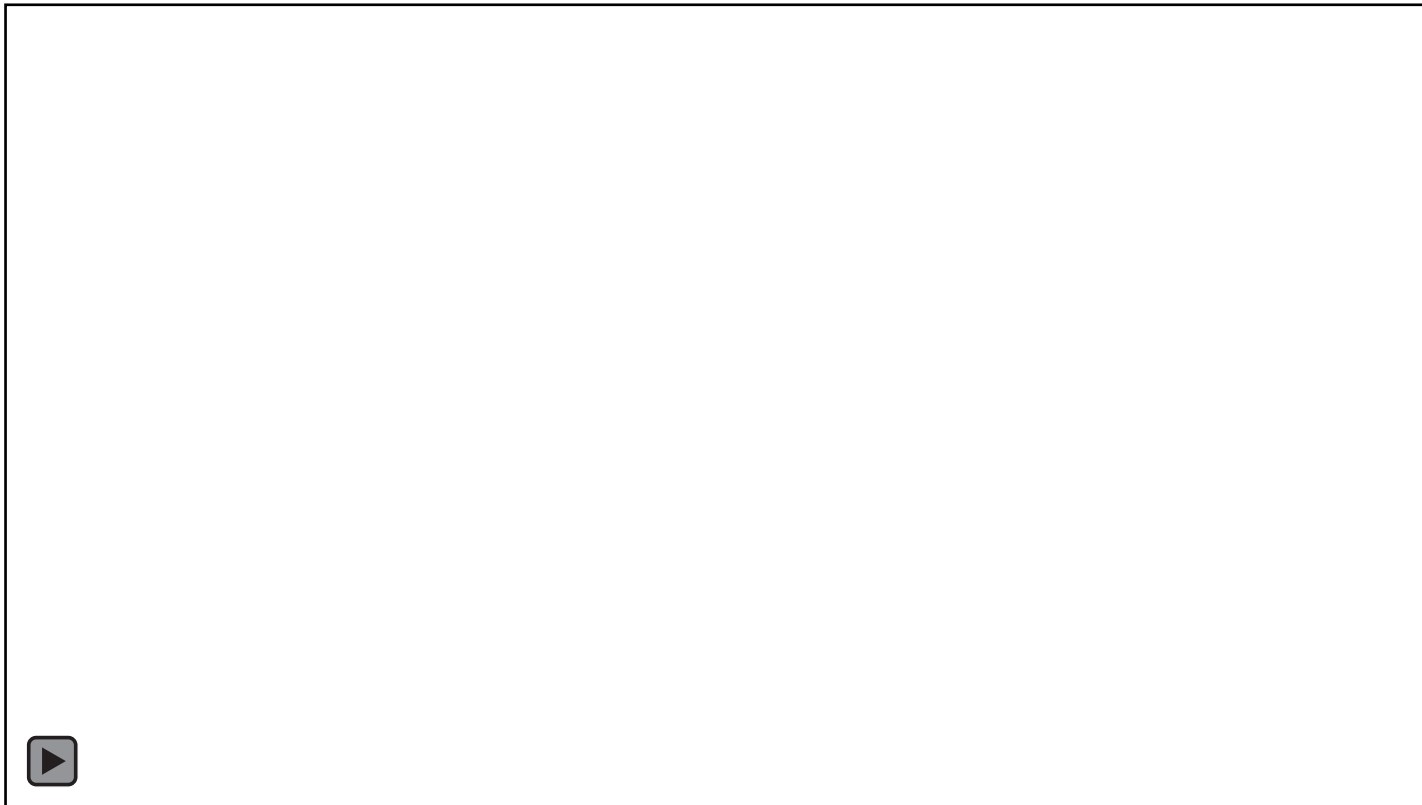


- Saturated and warm colour palette.
- Translucent. Light source reveals anatomy.
- Round shape language from natural growth.
- Planet atmosphere determines water colour.
- Pollutants create murky water.
- Colour variance to encourage pollination.
- Withstands moisture without decomposing.

RESEARCH

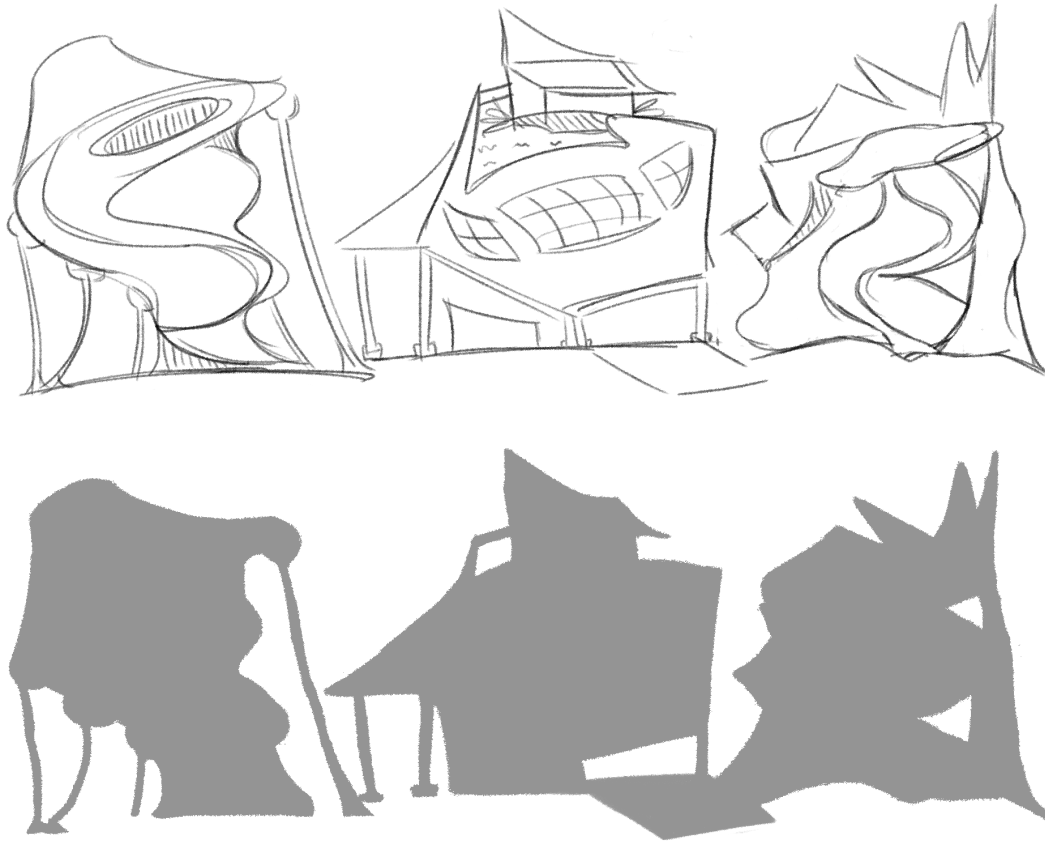


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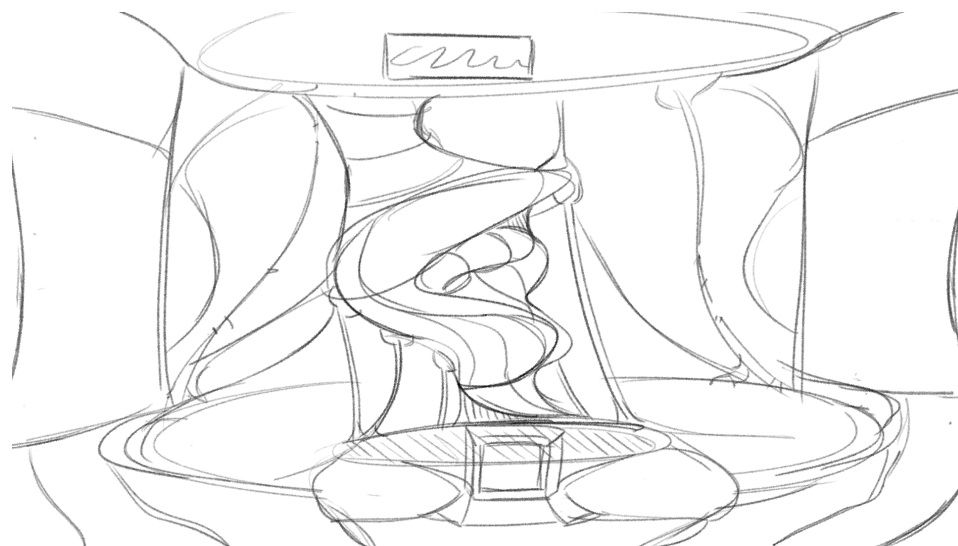
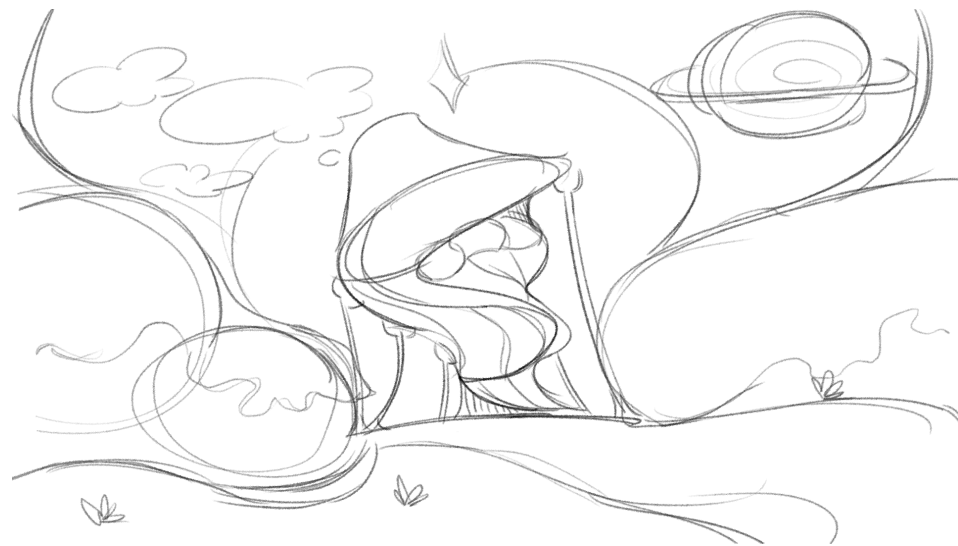
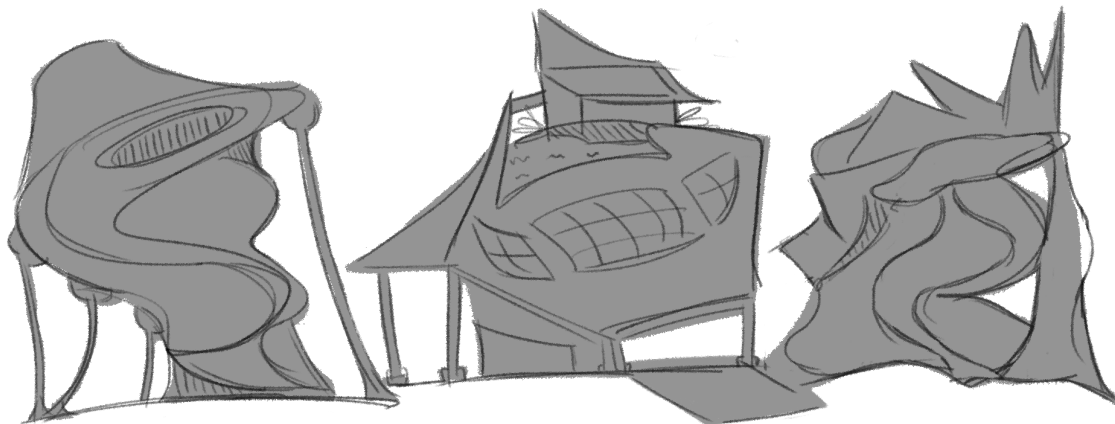
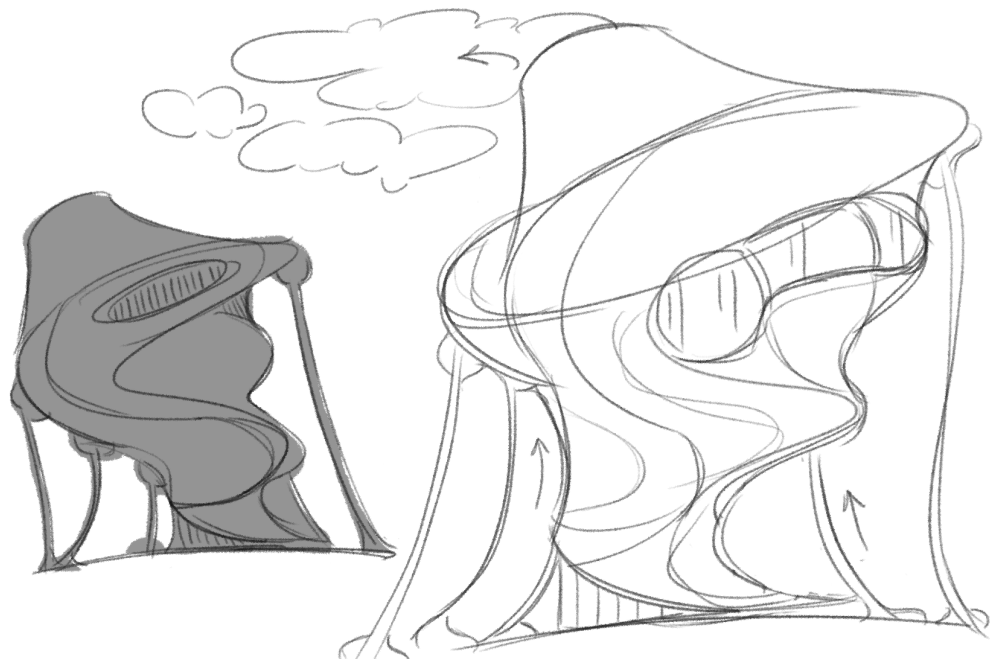
- Ocean spreads light source.
- Natives adapt to environment.
- Broad shoulders, concave arms and tails.
- Flickering. Waves conceal and reveal god rays.
- Healthy from consistent upkeep.
- Diverse plant and creature species.
- Constant movement from wind pushing the ocean.
- Bubbles accompany oxygen.
- Ripples once colliding with or emerging from ocean surface.

PLANNING

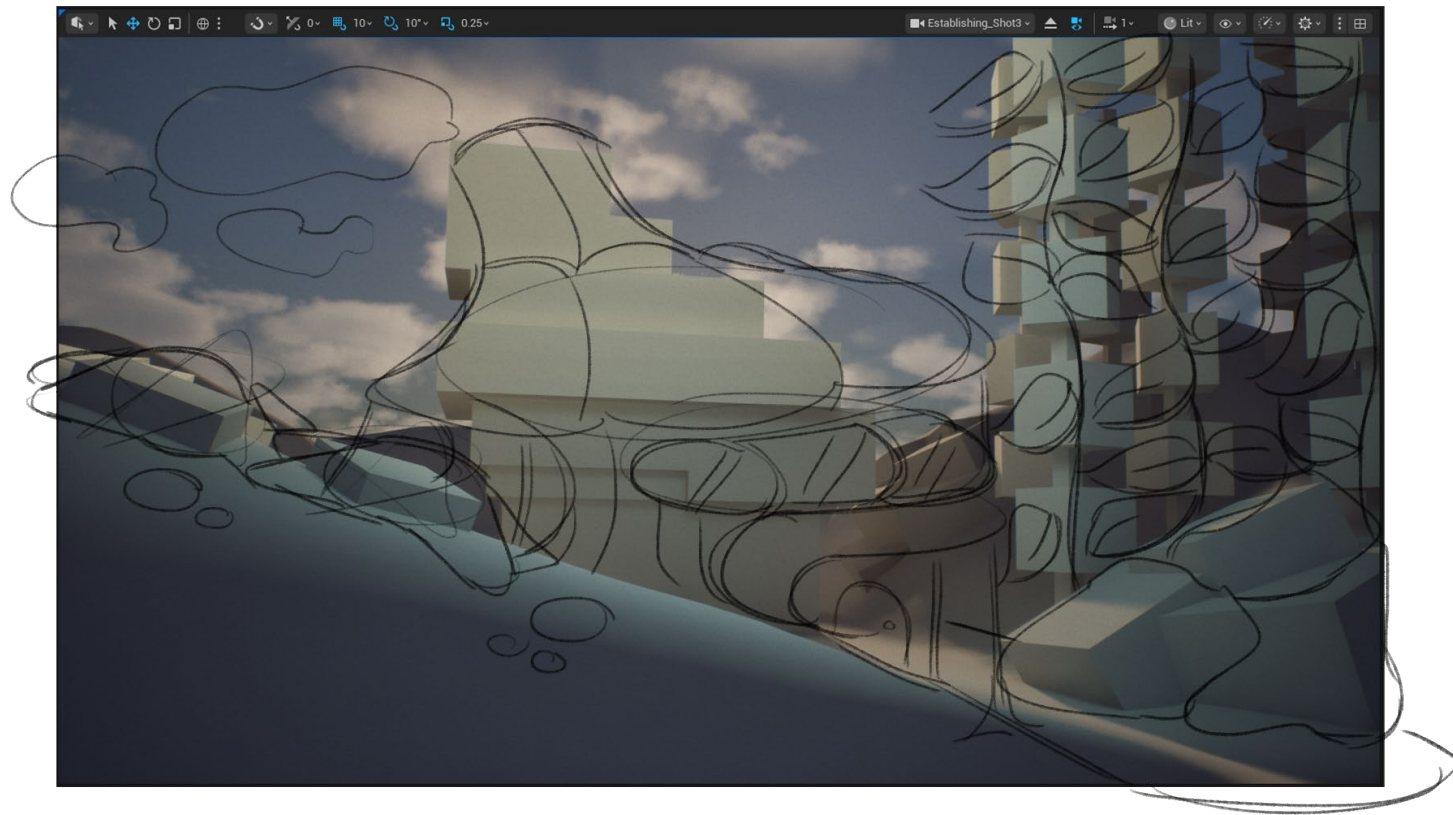


- Architecture from concealed scribbles.
- Round, sharp and balanced shape language.
- Distinct and imaginative silhouette.
- Questionable real-world physics.
- Recognisable amongst harsh shadows.
- Expanding visual library. Avoiding common shapes and design tropes.
- Repurposing organic lines (e.g. animals and plants).
- Rough and adaptable drawings.
- Beams support building weight.
- Depend on comfortable pipelines.
- Movement from purposeful open space.

PLANNING

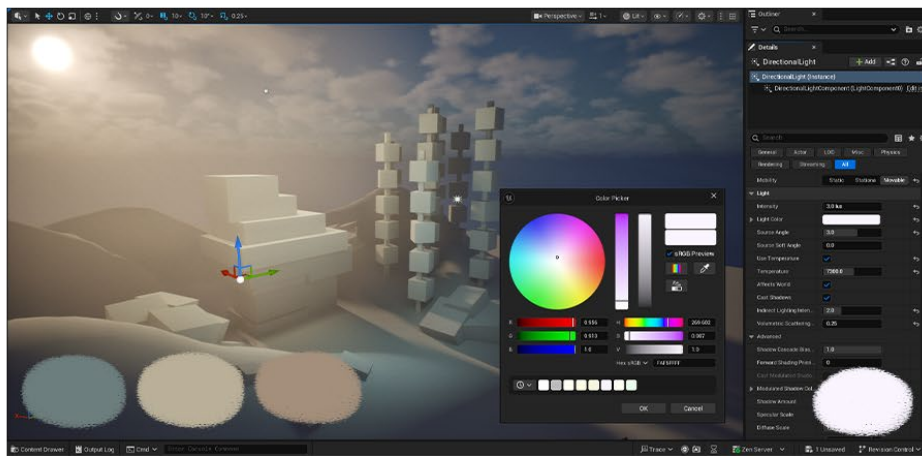
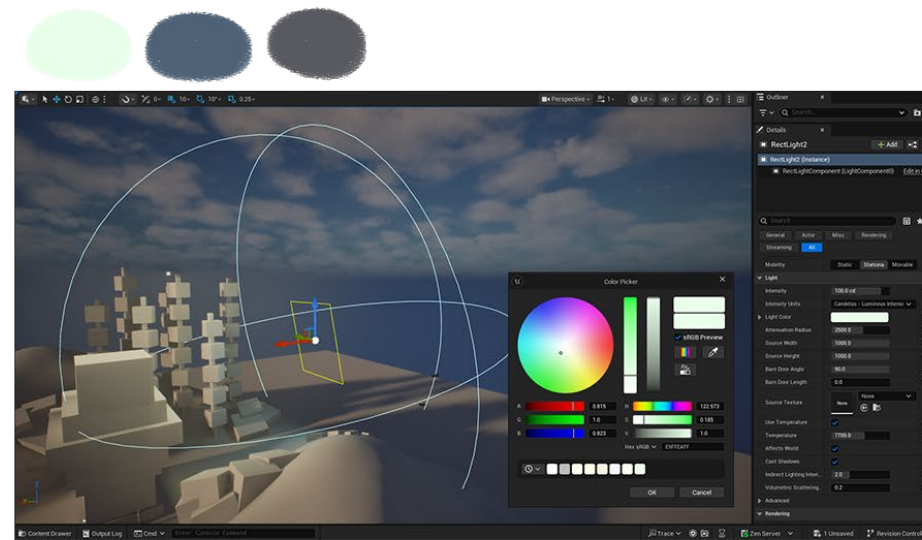
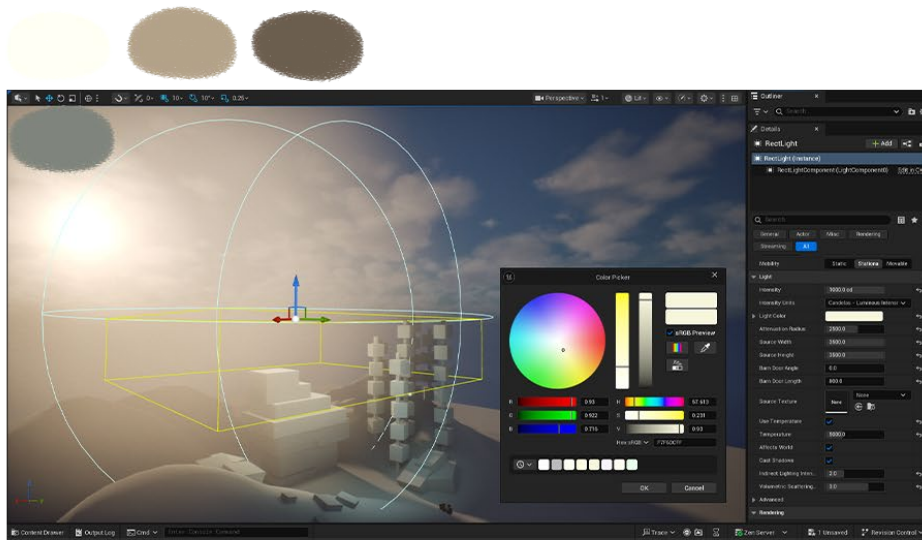


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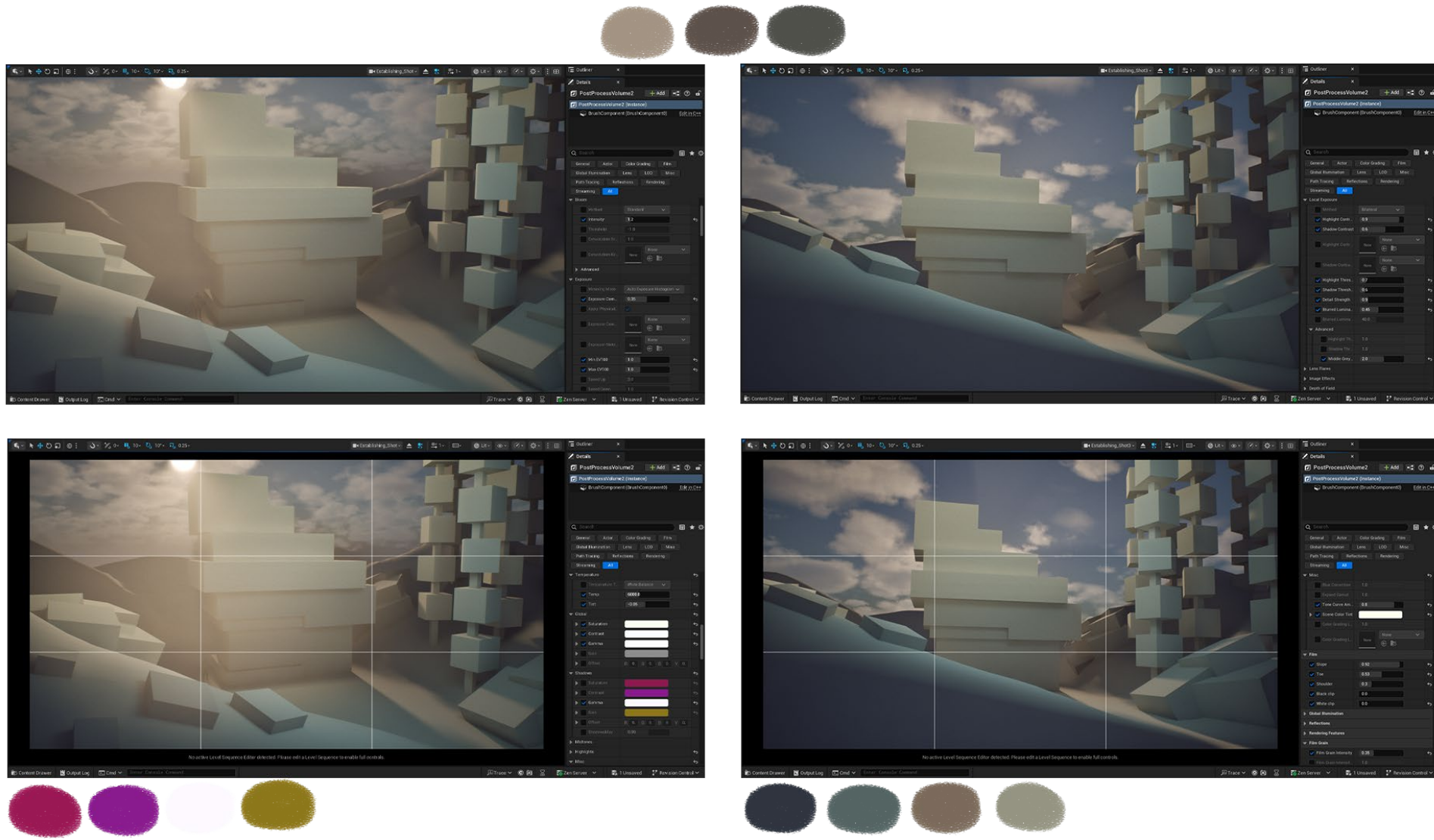


- **Dark. Bioluminescent light source from building roof.**
- **Versatile. Can achieve quick changes building with blocks.**
- **Vertical lines imply movement.**
- **Temperature from light source placement.**
- **Values from distance. Guides audience attention to focal point.**
- **Replace or remove clouds for clear ocean atmosphere.**
- **Improve saturation. Warmth encourages tropical species.**
- **Organic and imperfect placement.**

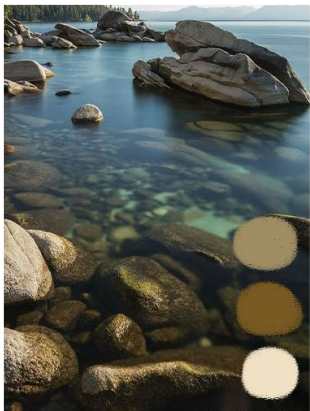
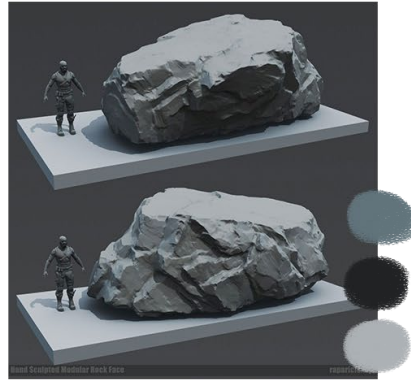
PLANNING



PLANNING

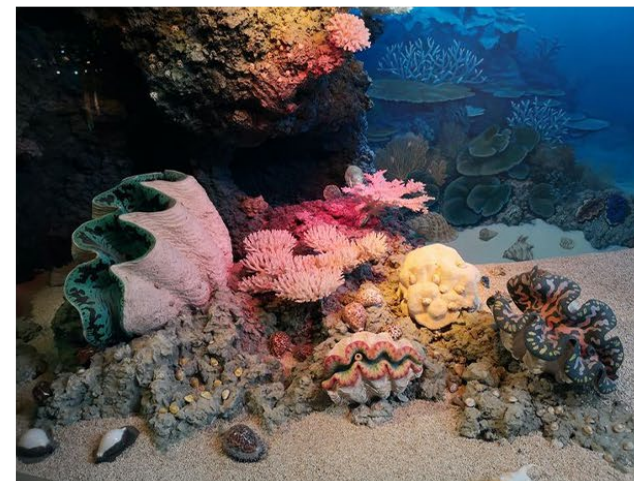
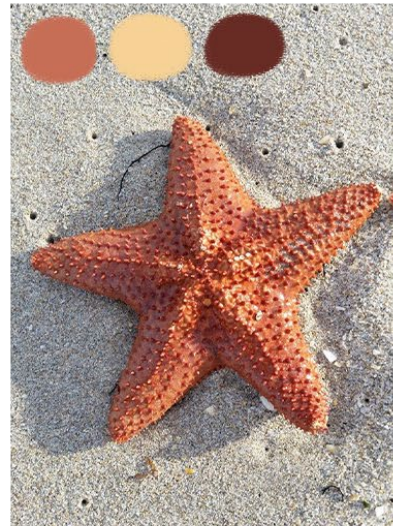


RESEARCH

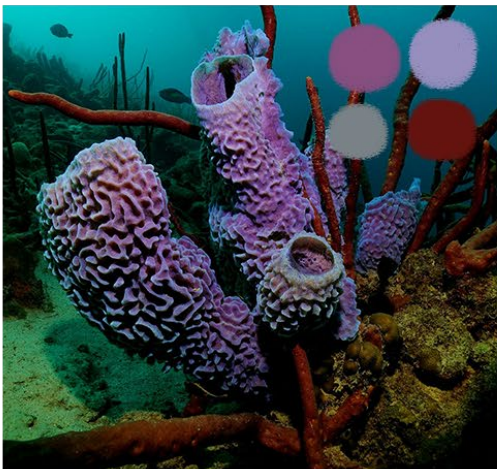
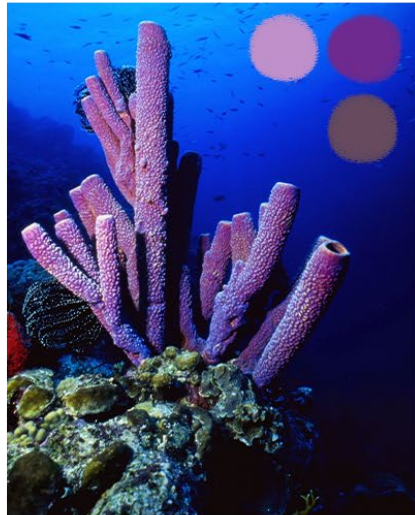
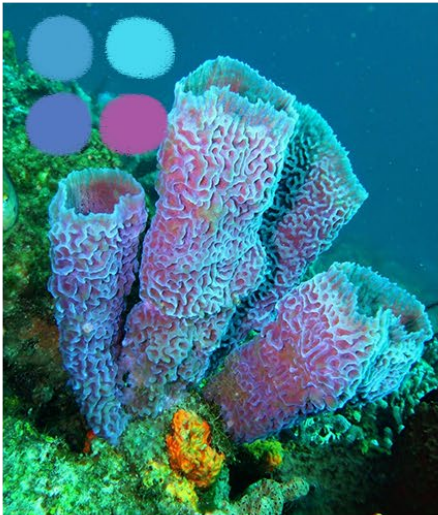


- Environment impacts boundaries.
- Constant moisture erosion form smooth edges.
- Sharp corners from conversing current directions.
- Deep saturation and tone.
- Water fills mineral pores.
- Reduces sub-surface scattering and absorbs light.
- Temperature contrast from warm sand.
- Bacteria grow on damp surfaces.

RESEARCH



RESEARCH



PLANNING

Asset Name	Category	Importance	Programs	Status	Completion Date
Building Walls	Modular Mesh Architecture	High	3DS Max ZBrush	Low Poly	March 14, 2024 3:01 PM
Building Roof	Modular Mesh Architecture	High	3DS Max ZBrush	Low Poly	March 14, 2024 3:01 PM
Windows	Modular Mesh Architecture	Medium	3DS Max ZBrush	Low Poly	March 14, 2024 3:01 PM
Door	Modular Mesh Architecture	Medium	3DS Max ZBrush	Low Poly	March 14, 2024 3:01 PM
Chimney	Modular Mesh Architecture	High	SpeedTree ZBrush	Low Poly	March 14, 2024 3:01 PM
Power Cables	Standalone Mesh Material	Medium	3DS Max Unreal Engine 5	Low Poly	March 14, 2024 3:01 PM
Starfish	Standalone Mesh Material	Low	3DS Max ZBrush Substance Painter	Low Poly	March 14, 2024 3:01 PM
Scrp Vines	Standalone Mesh Foliage	Medium	3DS Max Adobe Photoshop	Blocked	March 14, 2024 3:01 PM
Rocks and Pebbles	Standalone Mesh Landscape	Medium	3DS Max ZBrush	Low Poly	March 14, 2024 3:01 PM
Ocean Floor Landscape	Modular Mesh Landscape	High	Unreal Engine 5	Blocked	March 14, 2024 3:01 PM

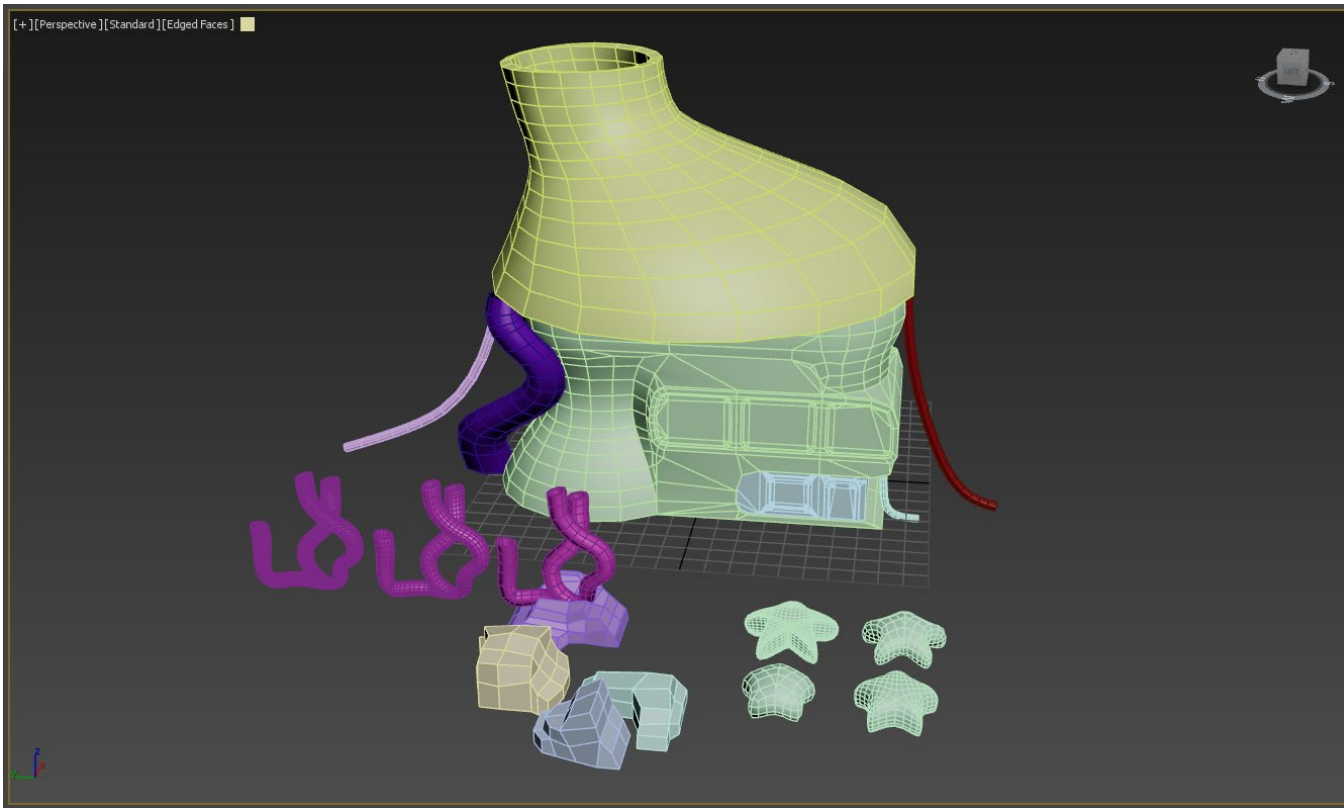
- Week 01 ♥ Pre-Production, Research and Planning
- Week 02 ♥ Low-Poly Construction and Blockouts
- Week 03 ♥ High-Poly Construction and Unwrapping
- Week 04 ♥ Modelling and Sculpting Contingency
- Week 05 ♥ Game Engine Construction and Personal Midpoint Review
- Week 06 ♥ Tileable and Technical Material Production
- Week 07 ♥ Standalone and Creative Material Production
- Week 08 ♥ Game Engine Polishing, Lighting, Post-Processing and Decals
- Week 09 ♥ Summative Submission, Resources and Checklist



Asset Name	Category	Importance	Programs	Status	Completion Date
scarp_vines	Standalone Mesh Foliage	Low	3DS Max Adobe Photoshop	Blocked	March 14, 2024 3:01 PM
scarp_vines	Standalone Mesh Foliage	Medium	3DS Max Adobe Photoshop	Blocked	March 14, 2024 3:01 PM
Rocks and Pebbles	Standalone Mesh Landscape	Medium	3DS Max ZBrush	Low Poly	March 14, 2024 3:01 PM
Ocean Floor Landscape	Modular Mesh Landscape	High	Unreal Engine 5	Blocked	March 14, 2024 3:01 PM
Stream	Material Material	Low	Unreal Engine 5 Substance Designer	Not Started	March 13, 2024 1:30 PM
Coral	Standalone Mesh Foliage	Low	3DS Max ZBrush Substance Painter	Low Poly	March 14, 2024 3:01 PM
Algae and Seaweed Grass	Standalone Mesh Foliage	Low	3DS Max Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Cobblestones	Material Tileable Landscape	Medium	Substance Designer Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Sand	Material Tileable Landscape	High	Substance Designer Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Ended Rock	Material Tileable Landscape	Medium	Substance Designer Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Jellyfish Head	Material Standalone Architecture	High	Substance Painter Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Rubber	Material Tileable Architecture	Low	Substance Painter Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Rusted Metal	Material Tileable Architecture	Medium	Substance Designer Adobe Photoshop	Not Started	March 13, 2024 1:31 PM
Glass	Material Shader Architecture	Medium	Unreal Engine 5	Not Started	March 13, 2024 1:31 PM

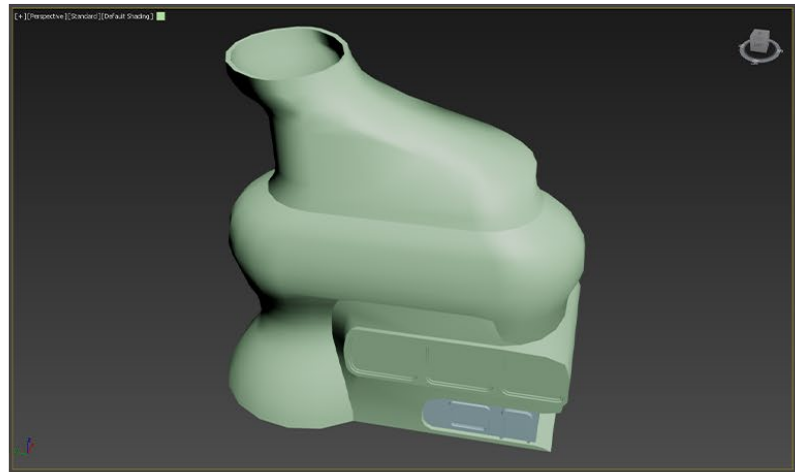
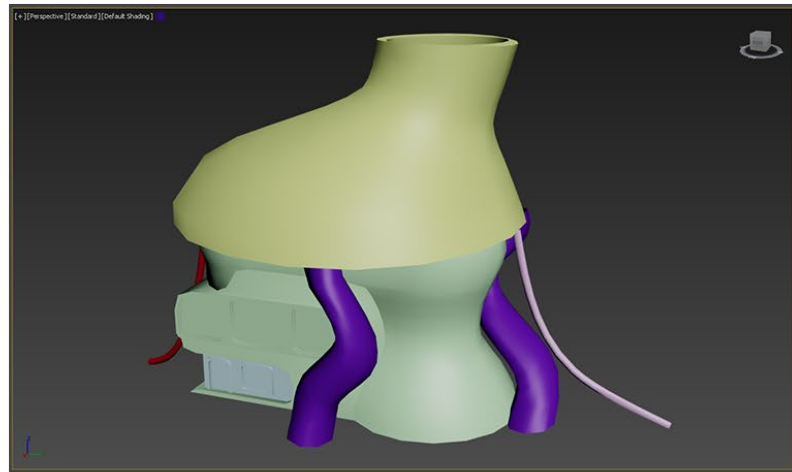
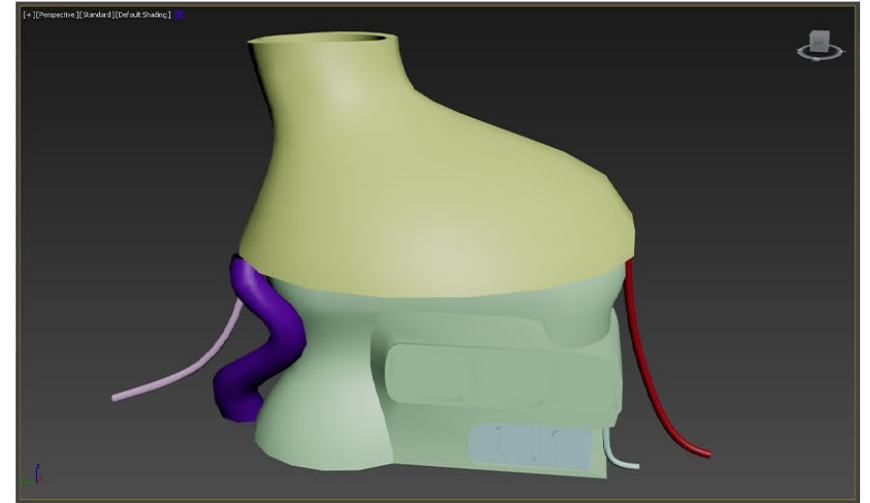
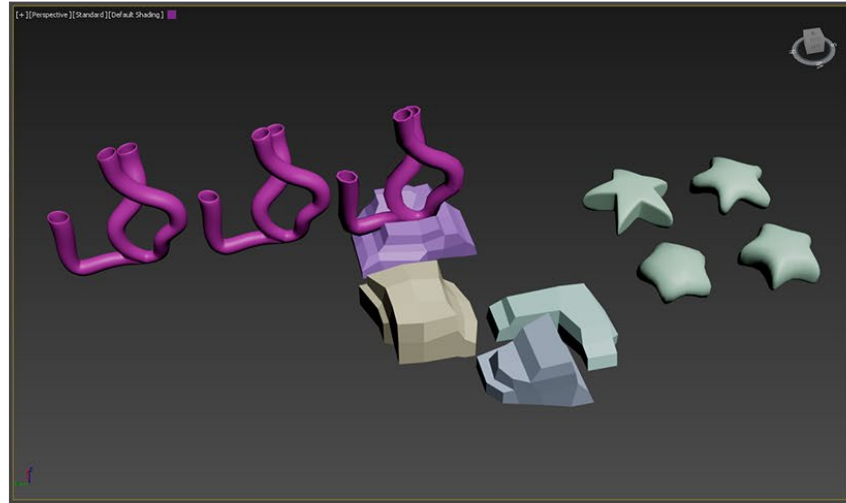
- Colour-coding by importance.
- Remove assets to meet deadline.
- Program denotes expected pipeline.
- Automatic completion date updates.
- Categories disconnect materials from meshes.
- Status available to mentors and management.
- Colour psychology. Red promotes urgency.
- Program function categories.

ASSET DEVELOPMENT

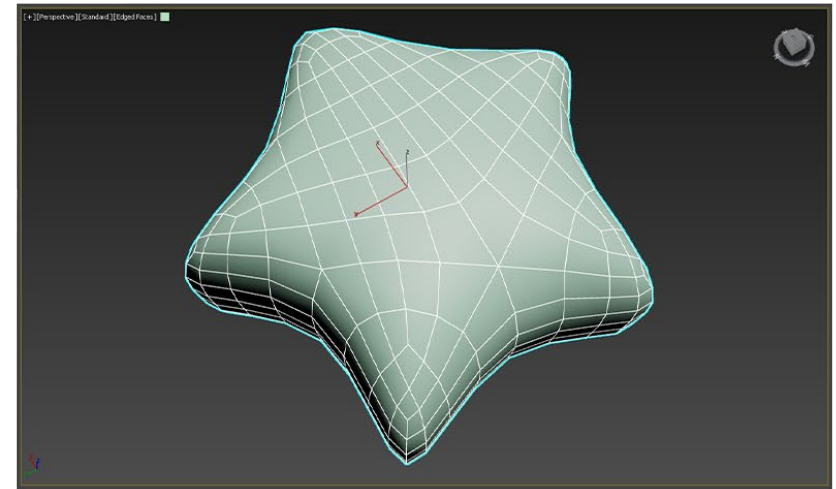
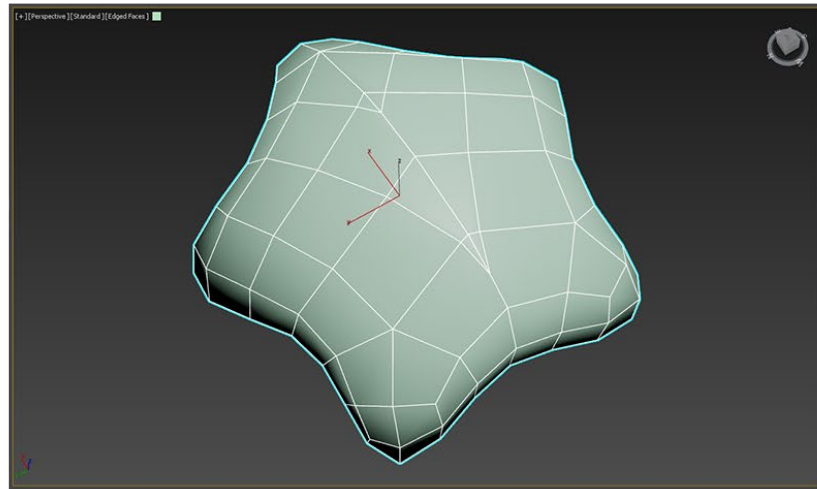
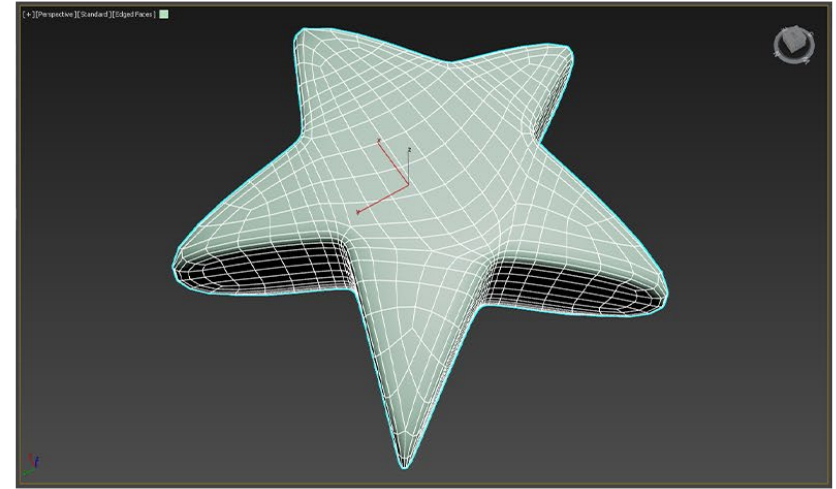
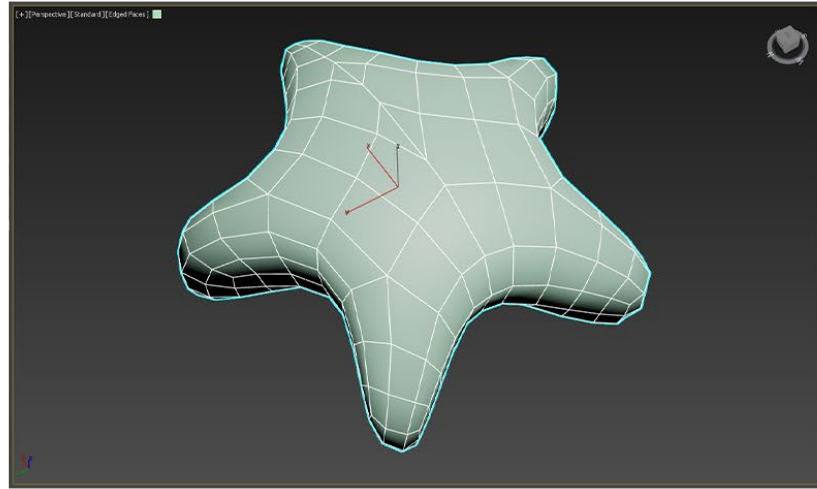


- Low polycount prevents game engine performance impact.
- Reinforce round shape language with FFD.
- Climate and proximate assets impact growth direction.
- Enhance crude shapes by sculpting.
- Modify wireframe with retopology.
- Concave. Broad base supports heavy roof.
- Disconnect walls. Brief demands modular assets.
- Customise to determine function.
- Distinct building entrance and exit.

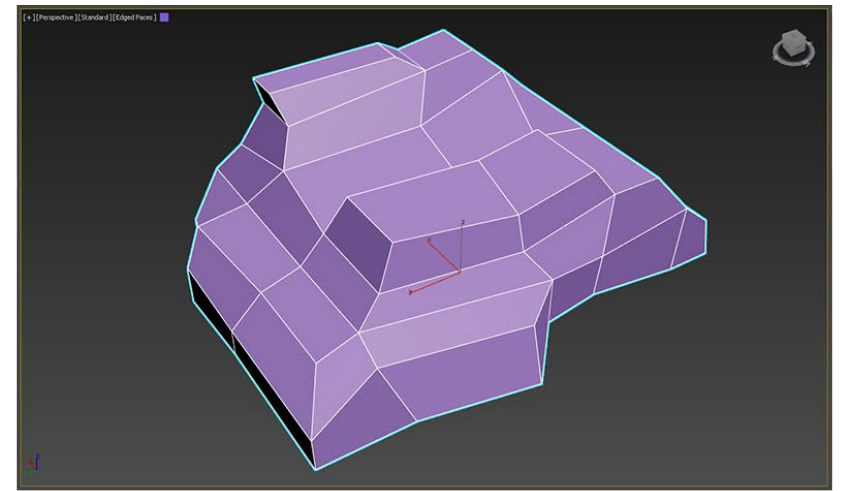
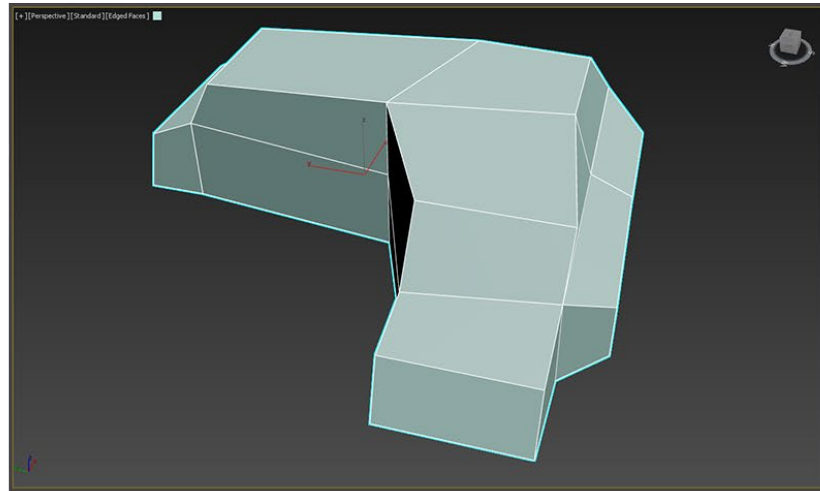
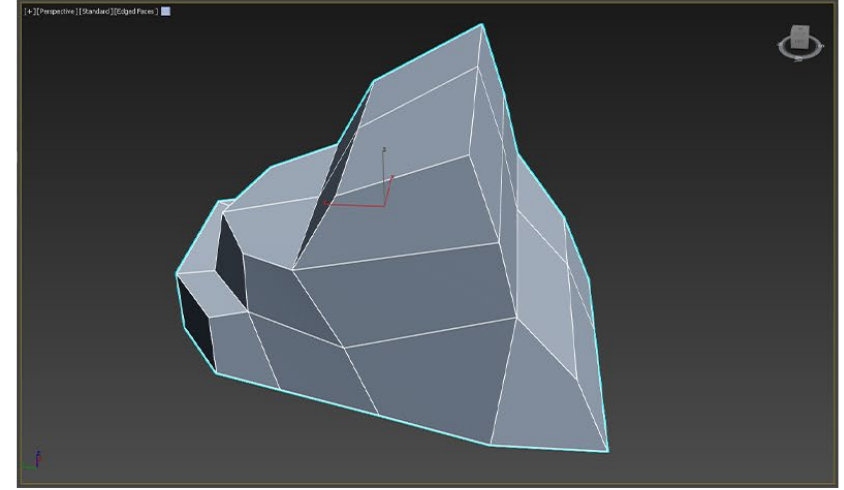
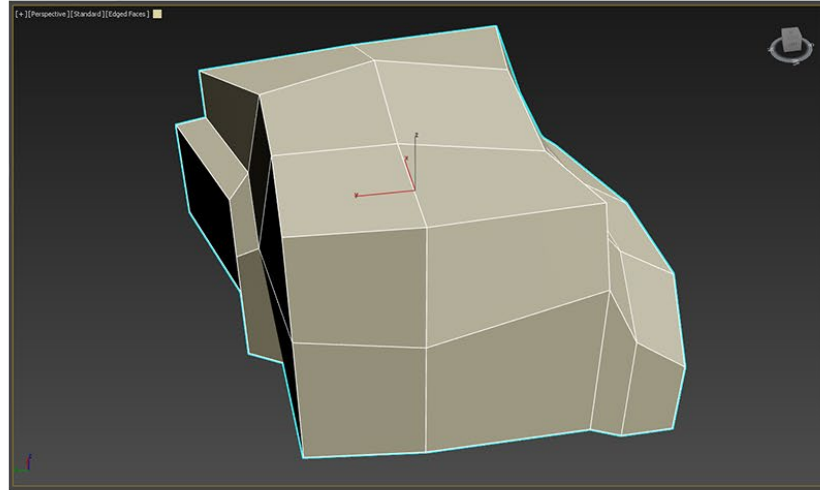
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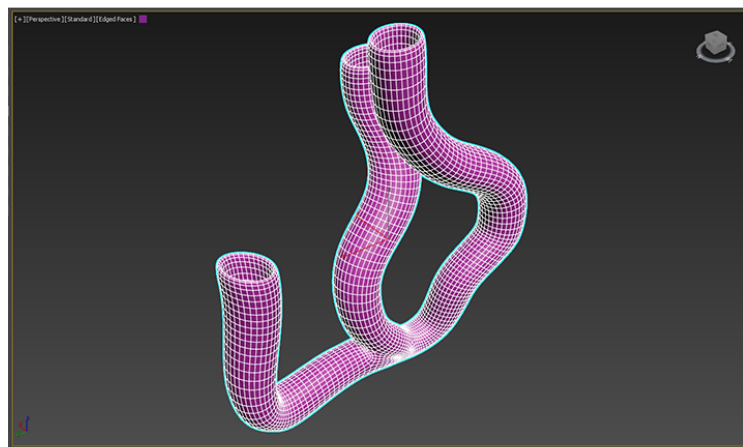
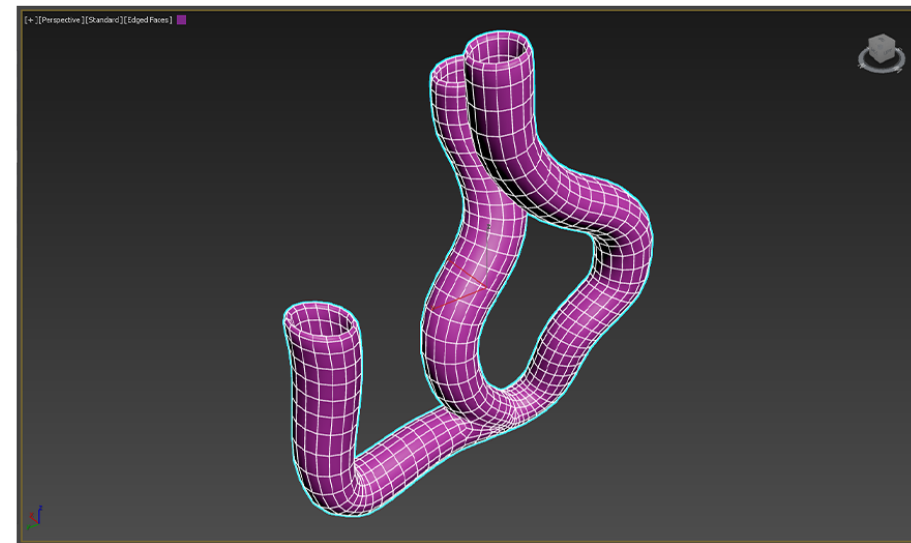
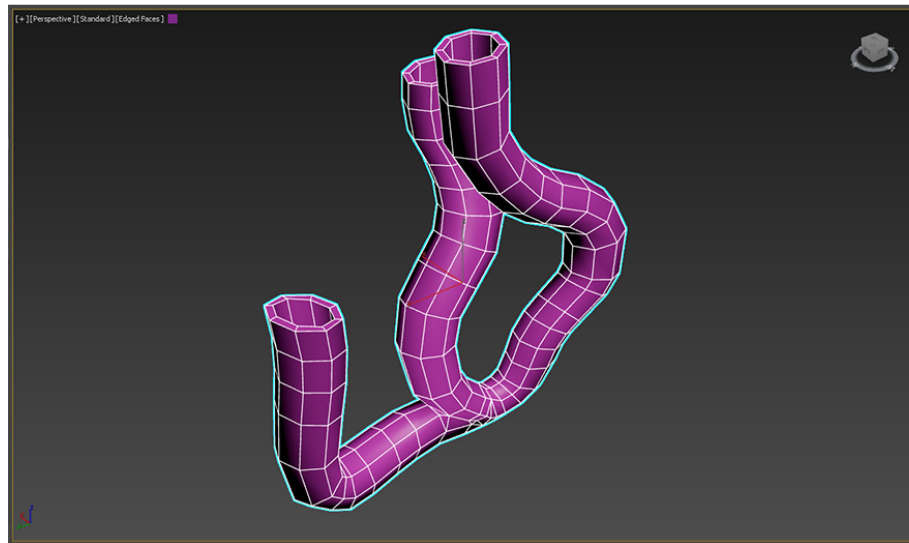
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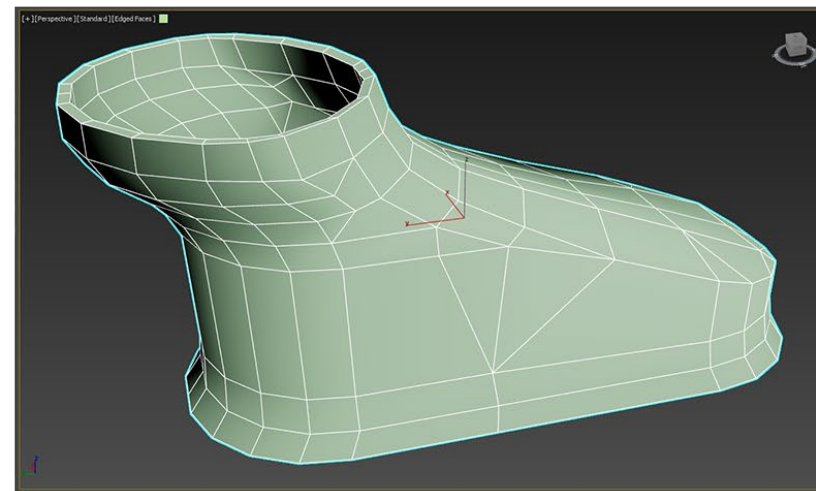
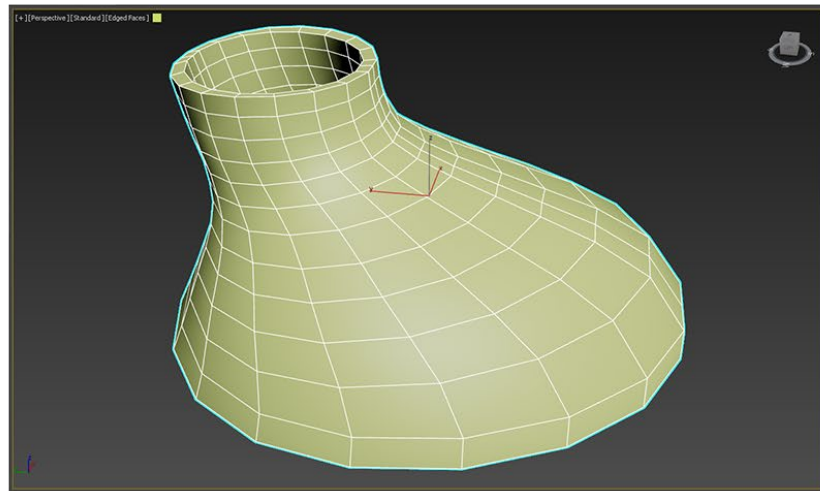
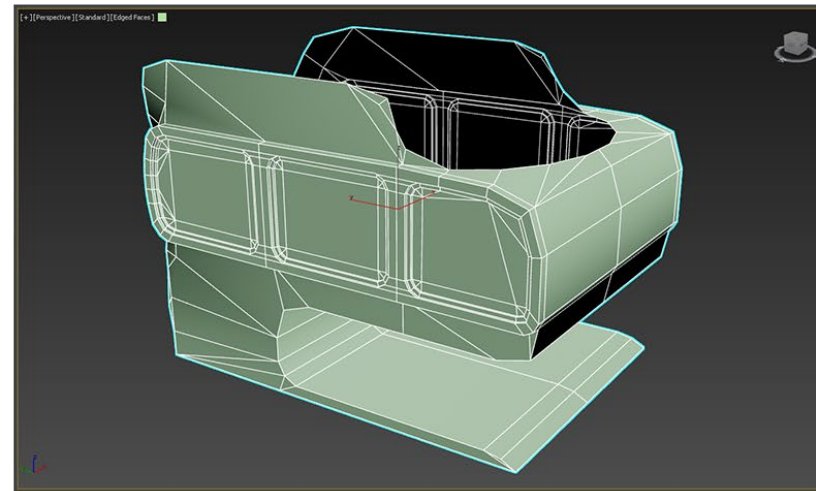
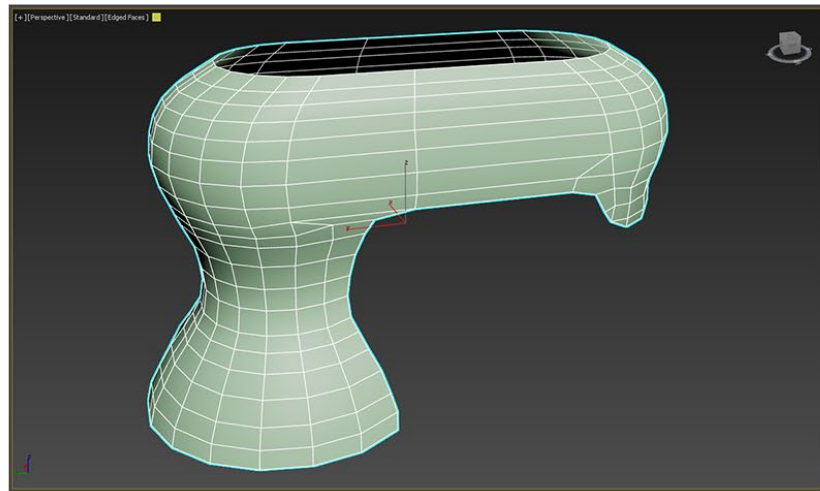
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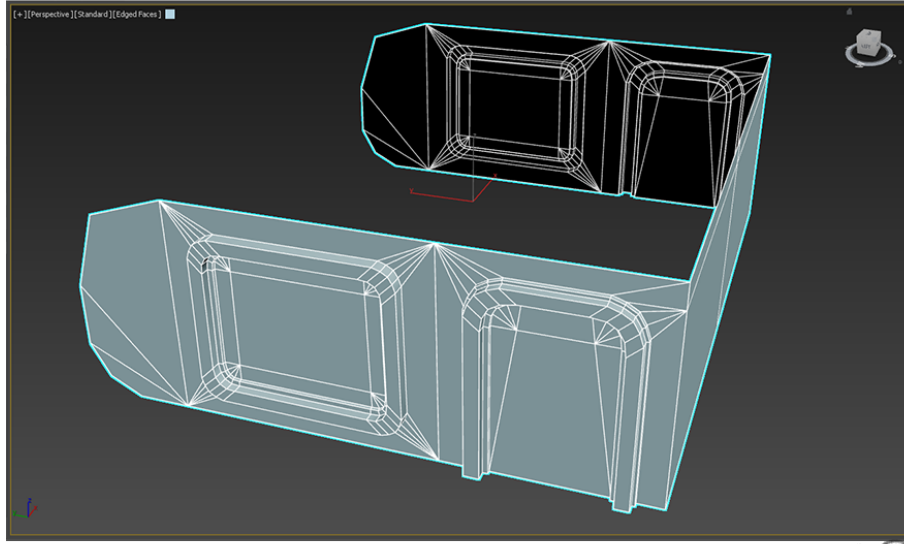
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ASSET DEVELOPMENT



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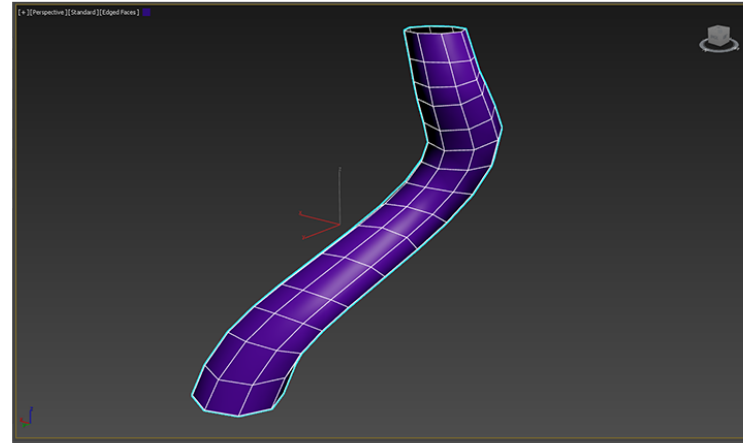
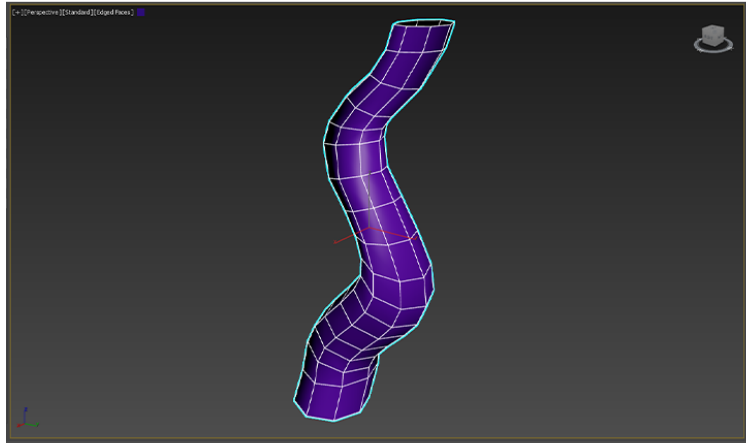
conform to building shape



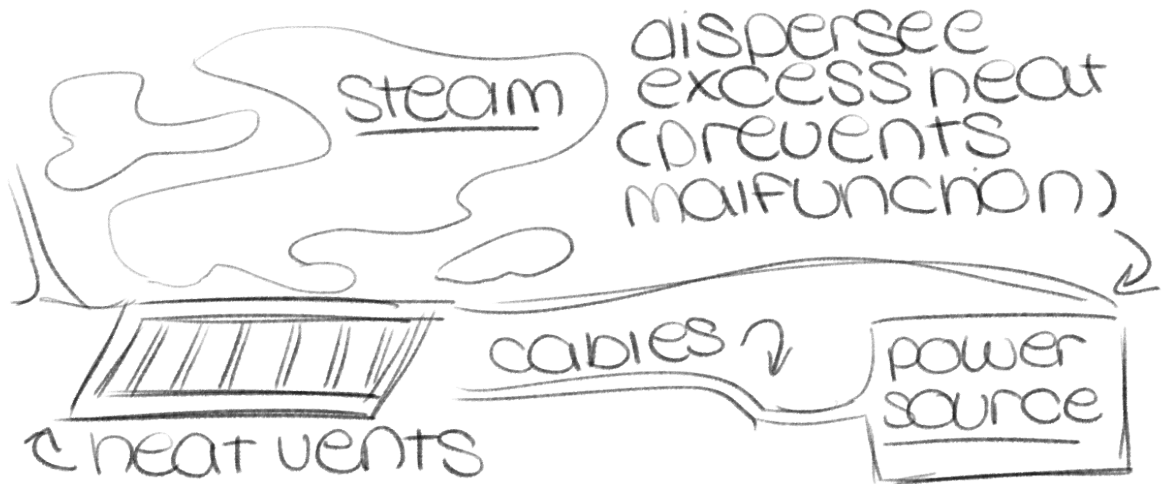
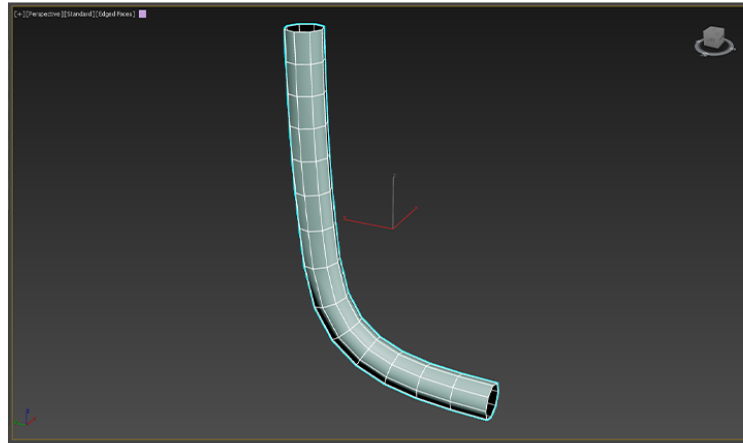
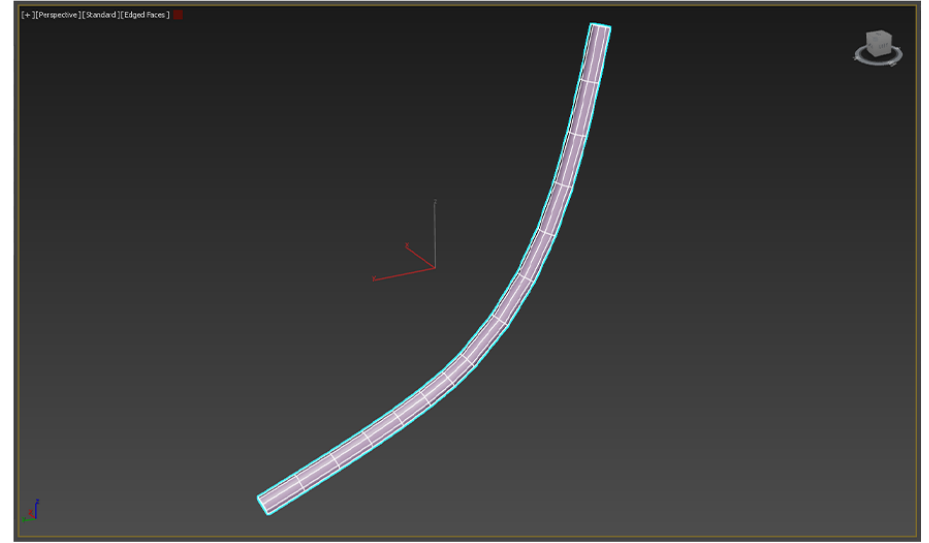
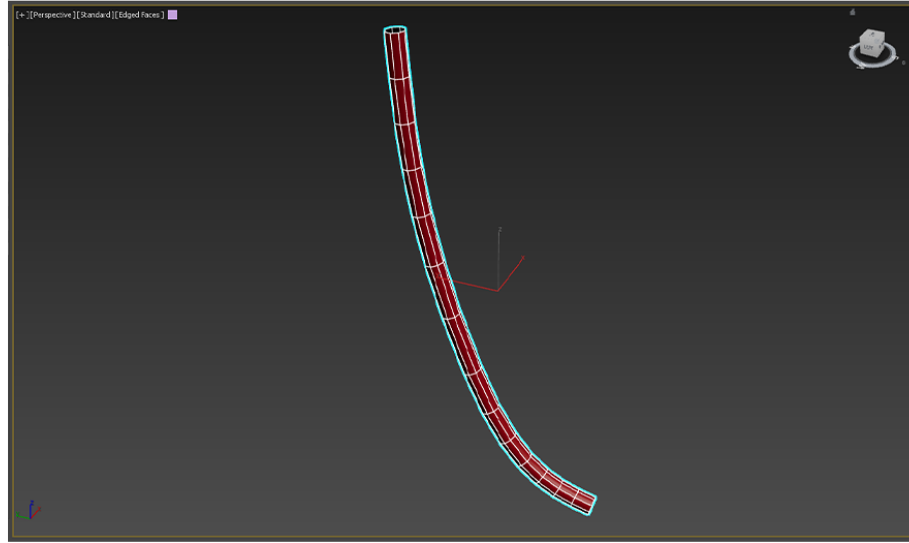
metal

ROCKS

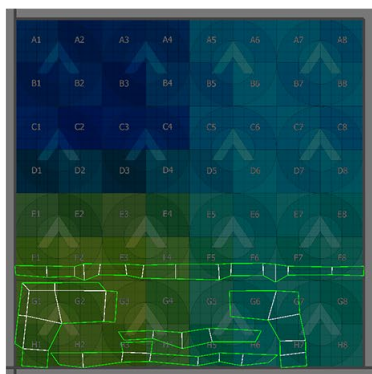
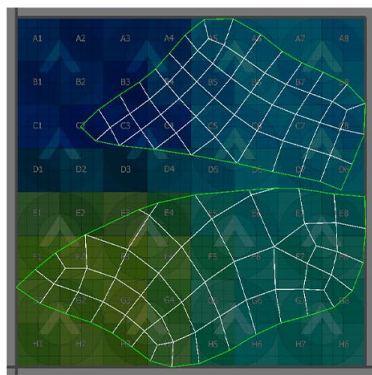
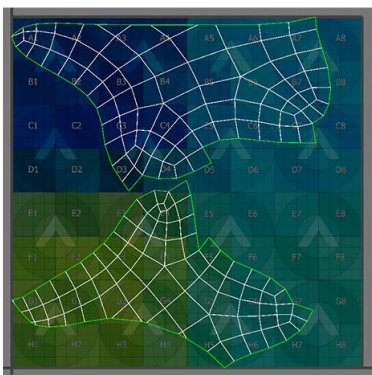
jellyfish head is the tree's crown



ASSET DEVELOPMENT

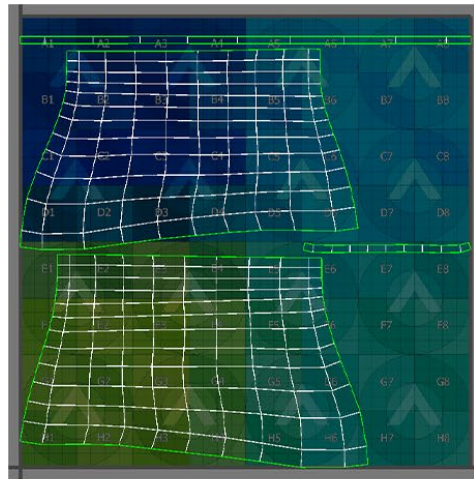
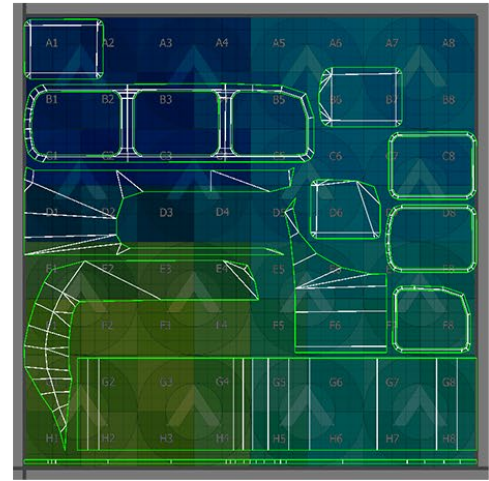
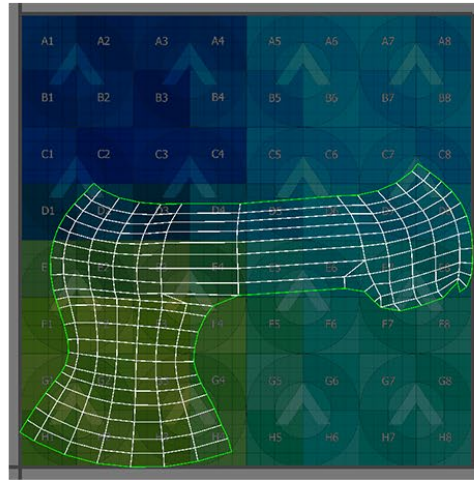
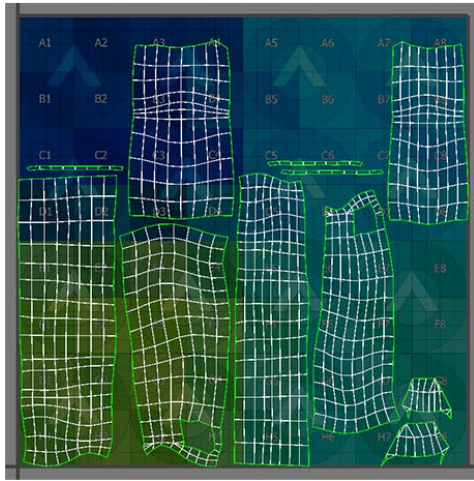


ASSET DEVELOPMENT

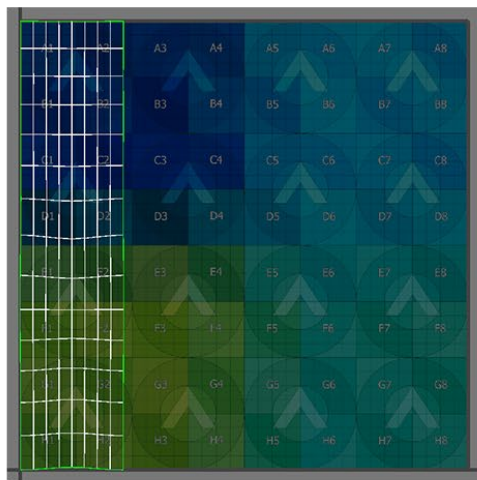
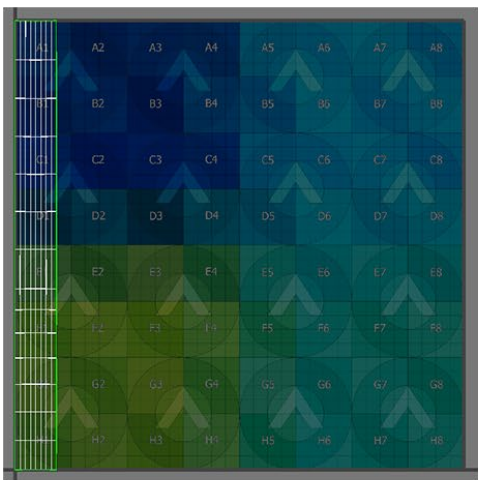
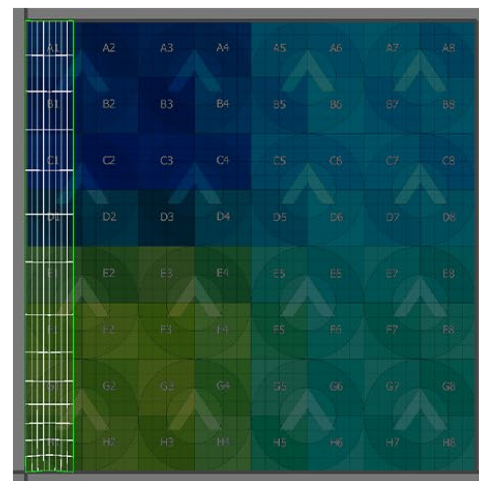
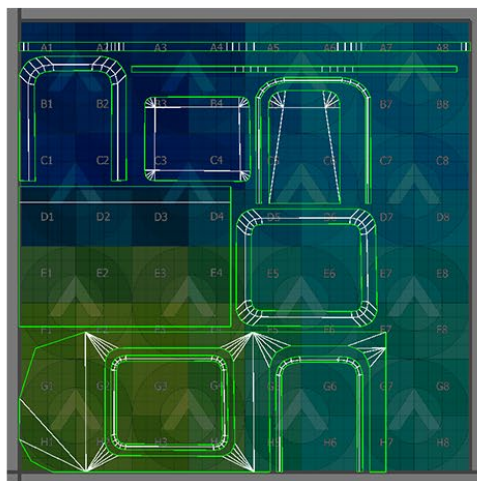
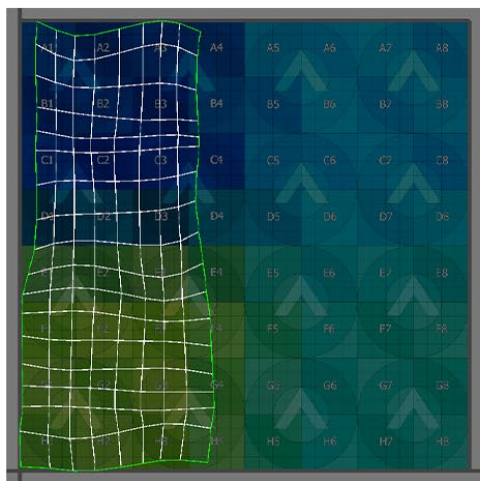


- **Texture space confinement.**
- **Standalone mesh UV format.**
- **Scale determines resolution.**
- **Customise to maintain texel density.**
- **Padding prevents texture bleeding.**
- **Rectangles are easy to stack.**
- **Vertical seams disconnect boundaries.**
- **Straighten cylinder UV shells.**
- **Distortion revealed by texture-checker material.**
- **Correct placement, orientation and shape with commands.**
- **Quick planar map recreates viewport appearance.**

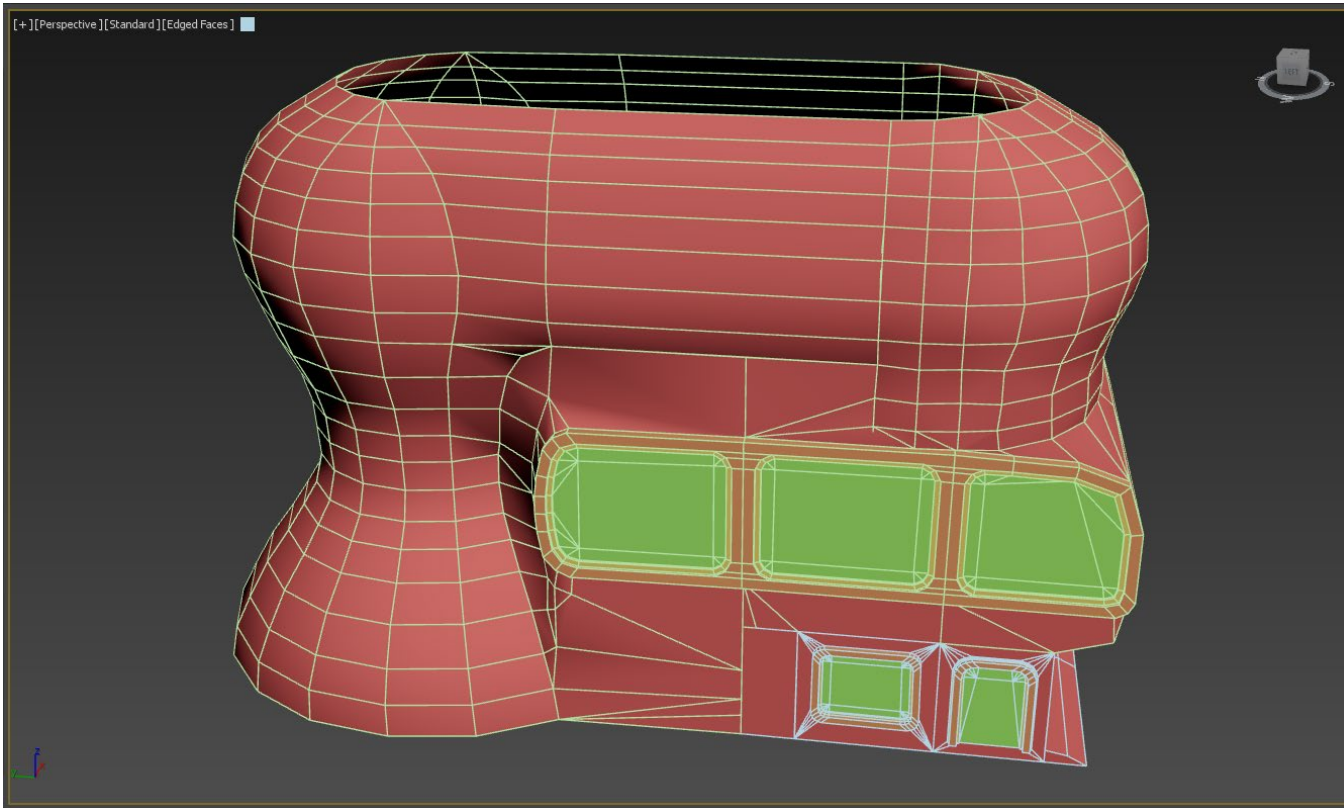
ASSET DEVELOPMENT



ASSET DEVELOPMENT

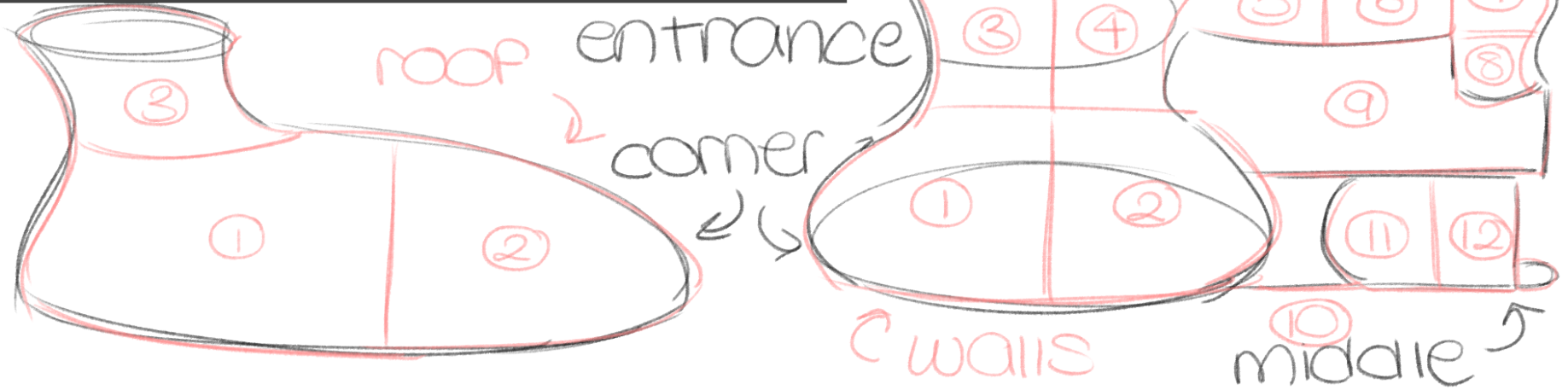
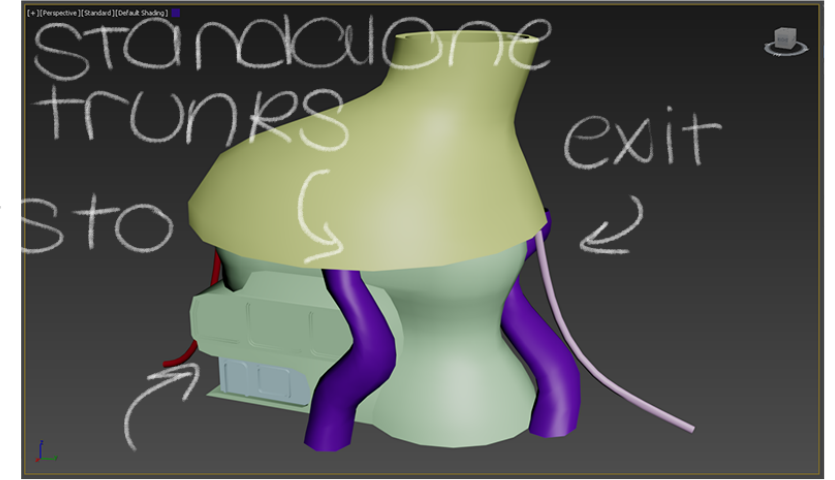
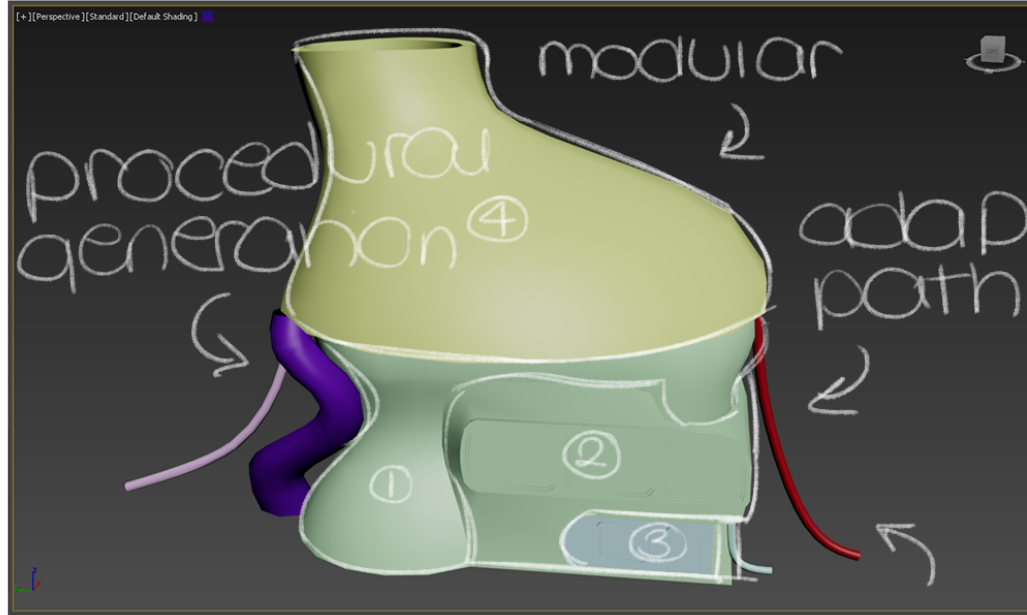


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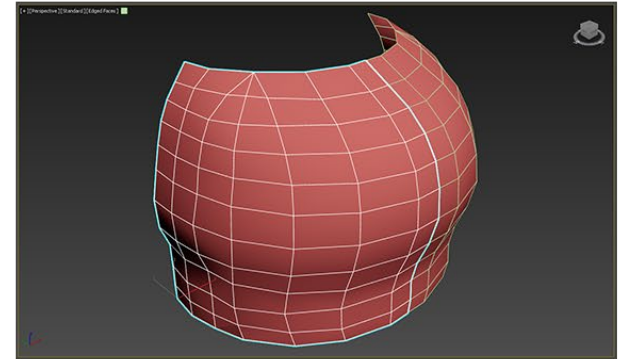
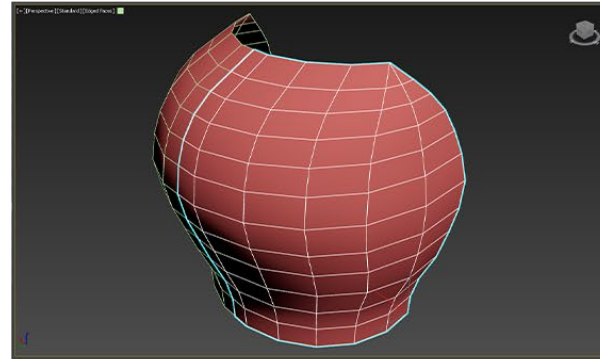
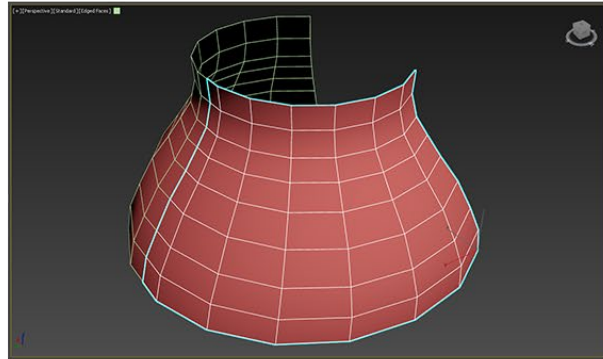
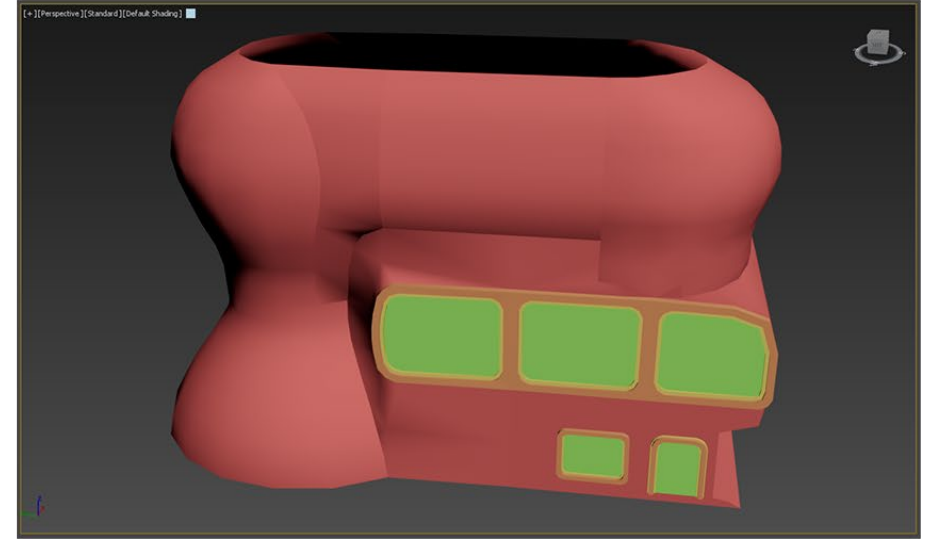
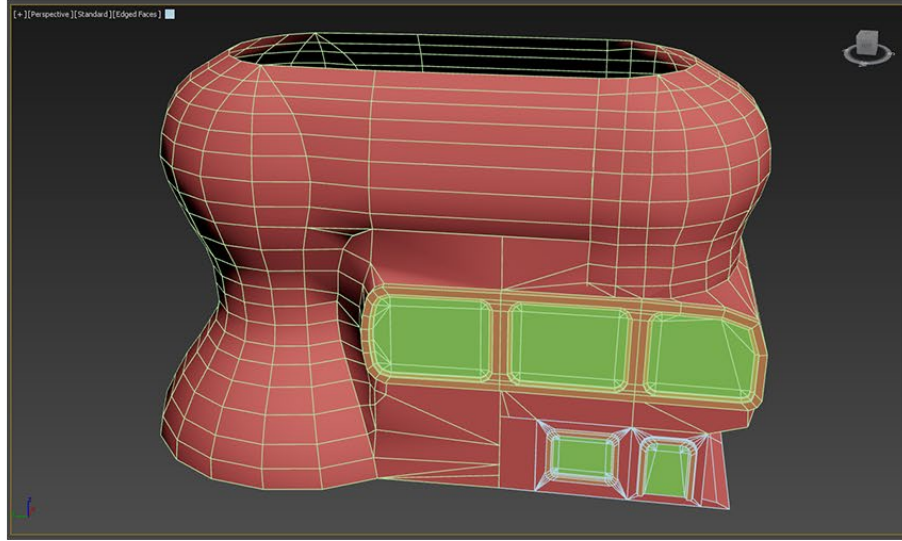


- **Disconnect building floors. Organic and mechanical walls.**
- **Simple wireframe and polycount.**
- **Maintain grid pattern. Smooth deformation.**
- **Straight boundaries. Identical despite orientation and placement.**
- **Curved boundaries. Orientation transforms wall facing direction.**
- **Still triangles.**
- **Round windows. Welcoming shape language.**
- **Current and moisture erosion. Removes sharp edges and corners.**

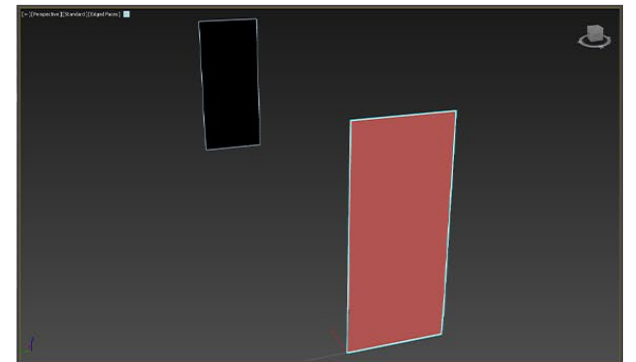
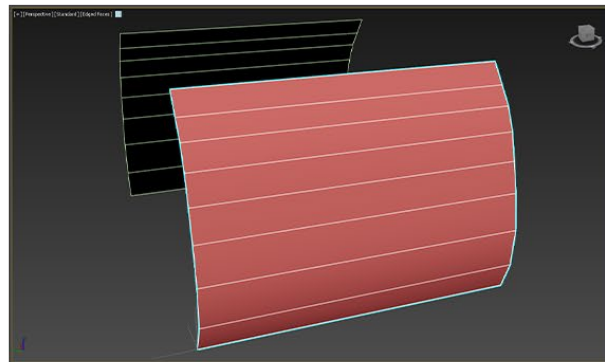
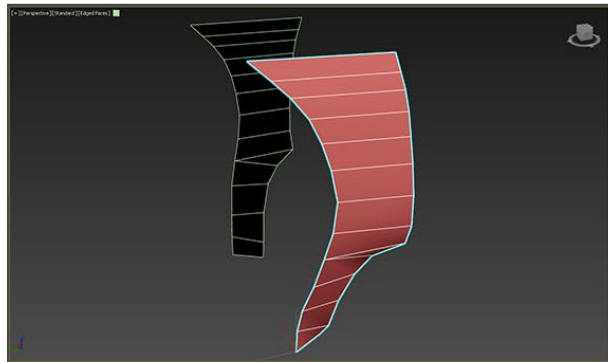
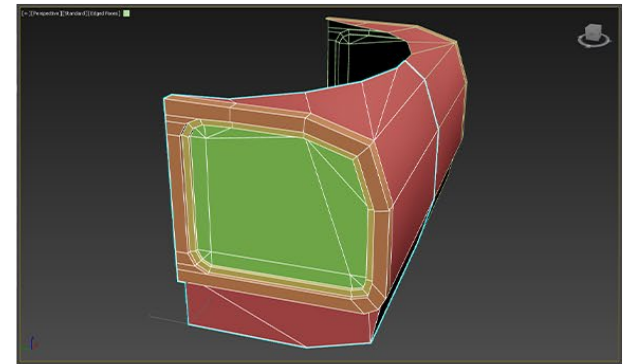
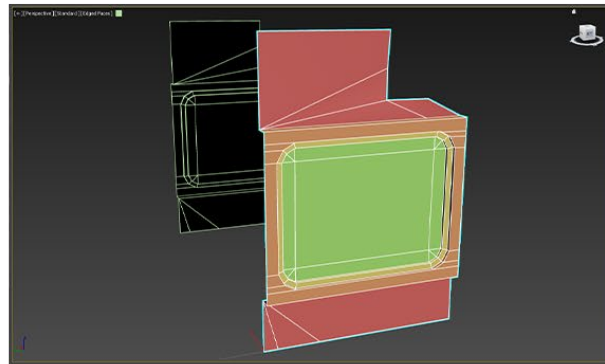
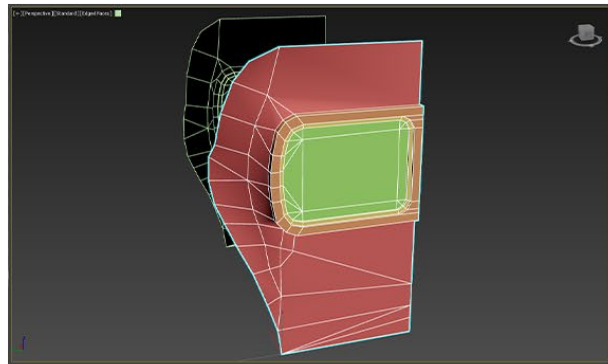
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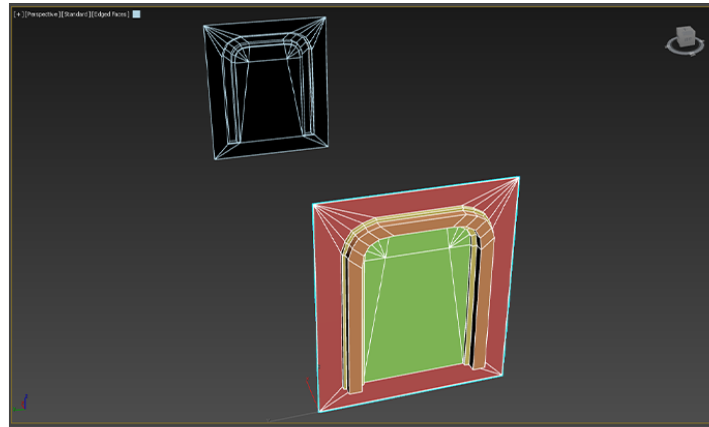
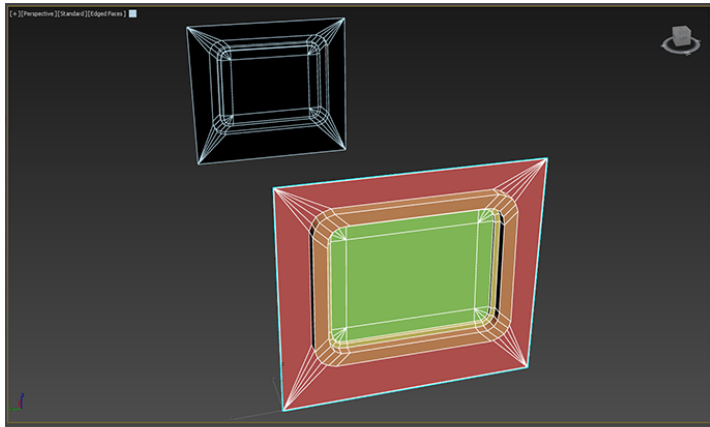
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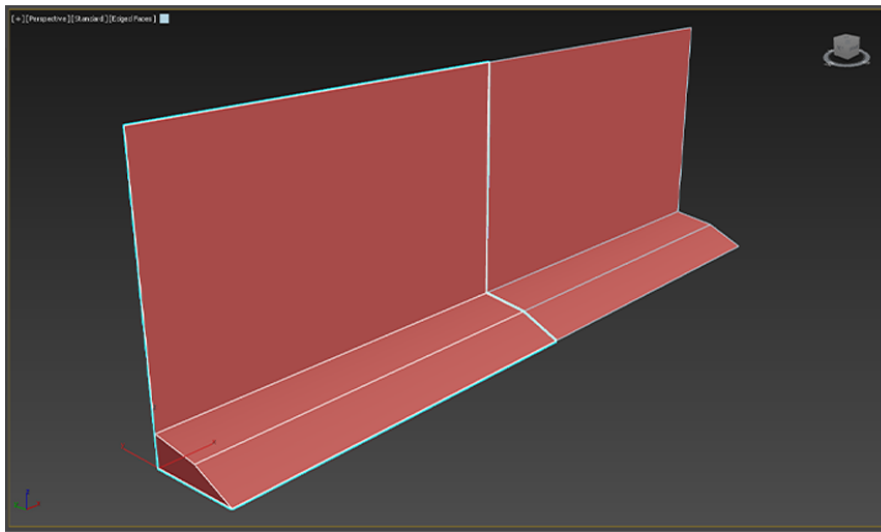
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ASSET DEVELOPMENT

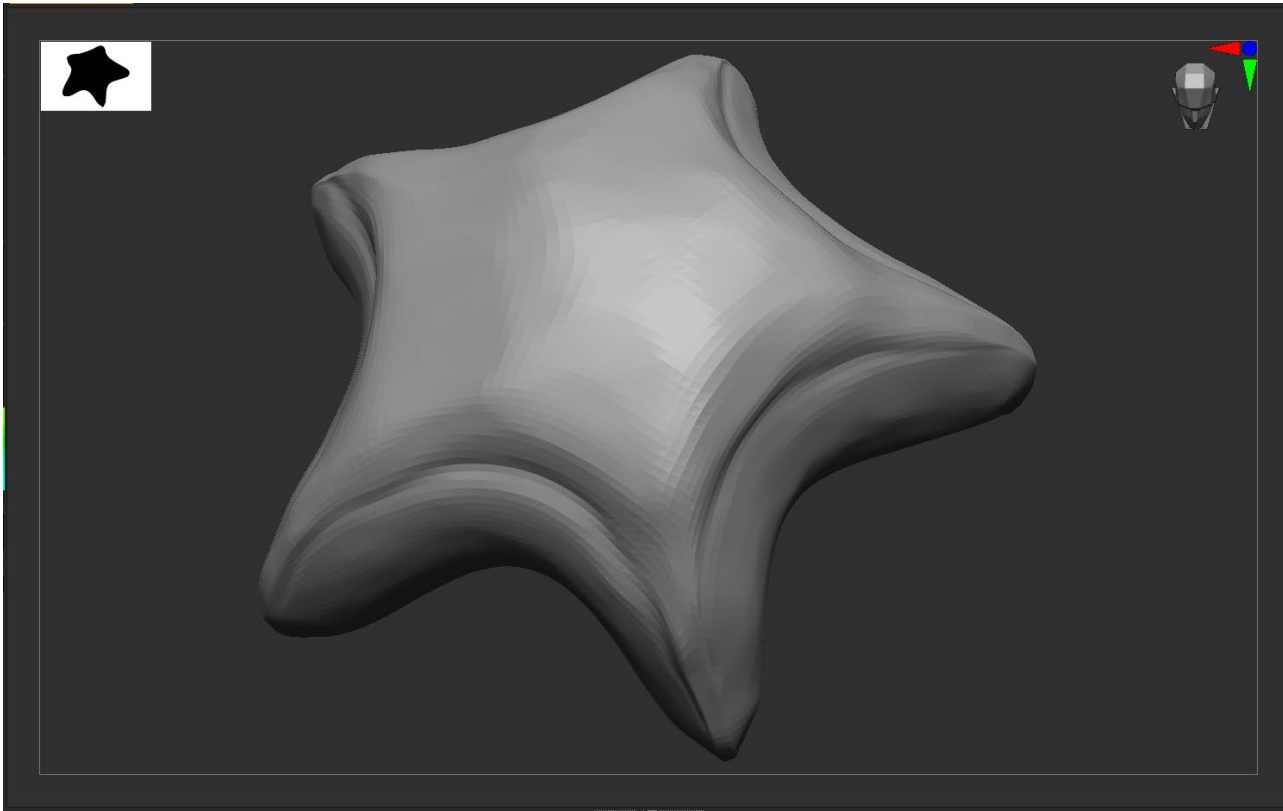


- FOUR map inputs
- in game engine



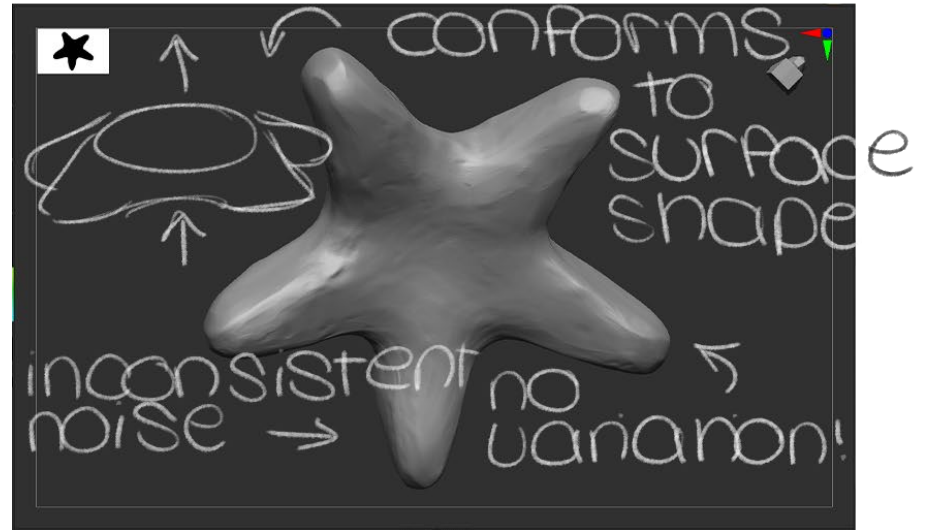
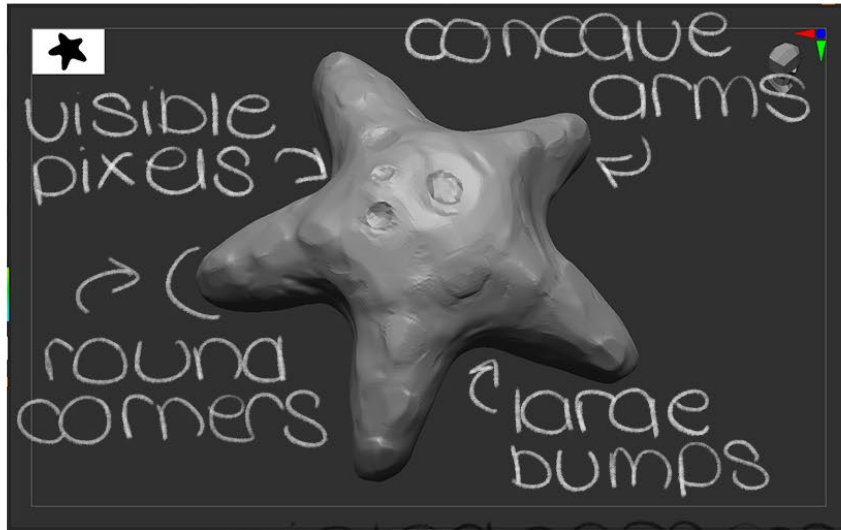
straight boundaries
front / back
curved (boundaries change)
identical from many direction

ASSET DEVELOPMENT



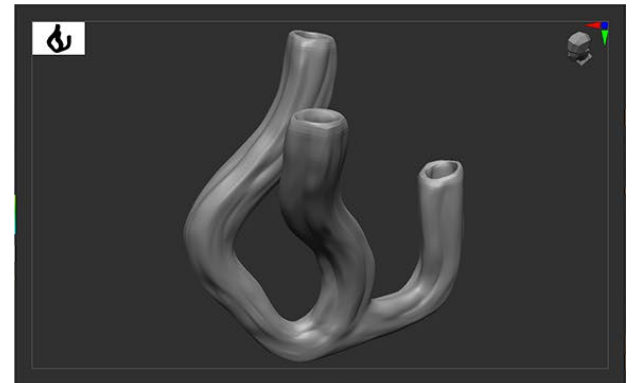
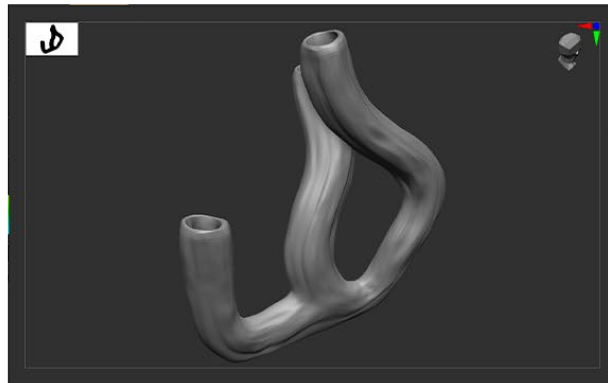
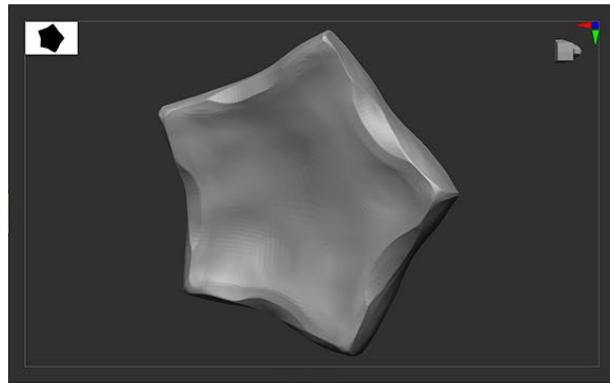
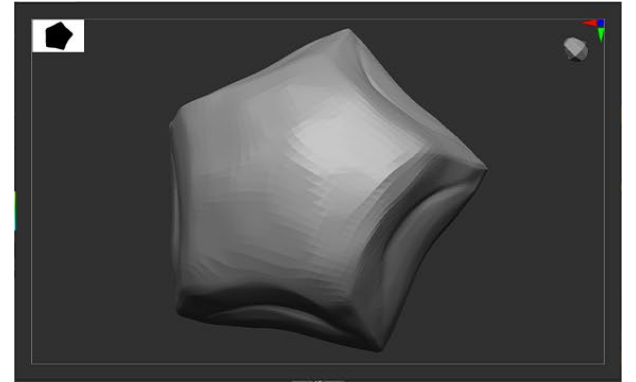
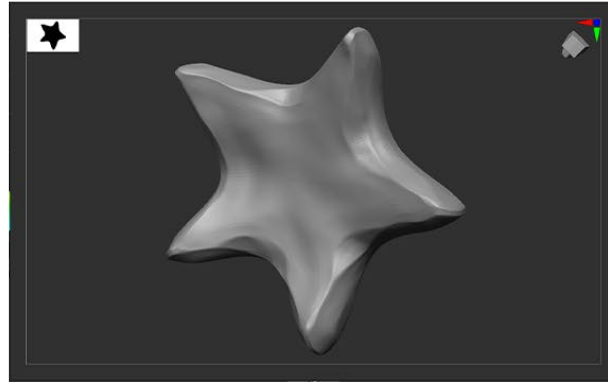
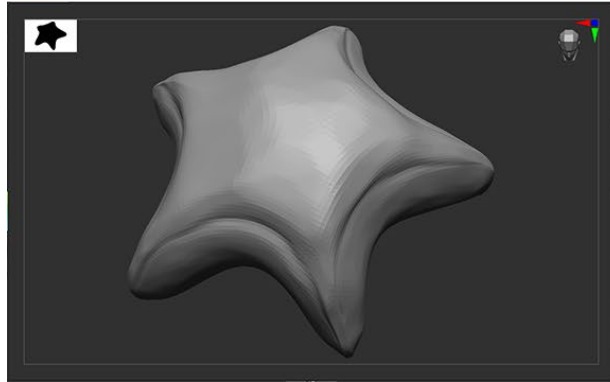
- **Sculpting production phases.**
- **Primary forms. Breakdown and enhance silhouette.**
- **Flatten. Connect surfaces for sharp and inward-moving edges.**
- **Chronological steps prevent overwhelm.**
- **Recreate format for consistent appearance. Maintain immersion.**
- **Examine references. Preserve distinct features. Recognised by audience despite context.**
- **Enhance resolution to conceal construction from pixelation.**

ASSET DEVELOPMENT

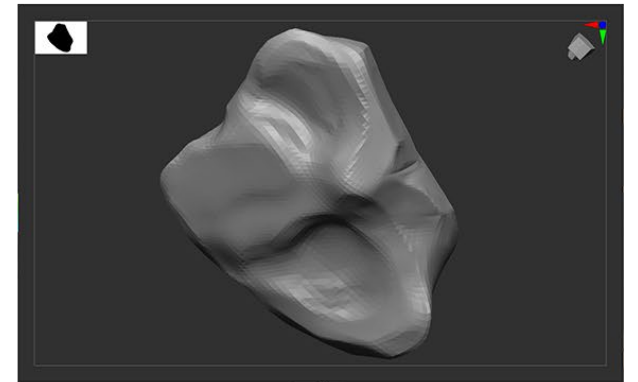
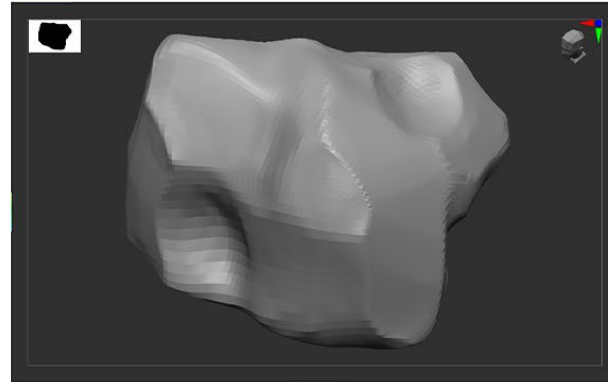
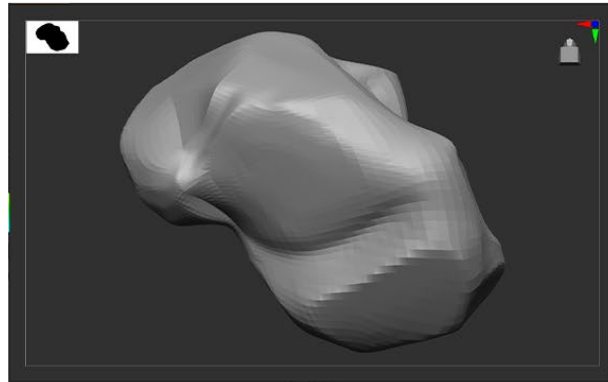
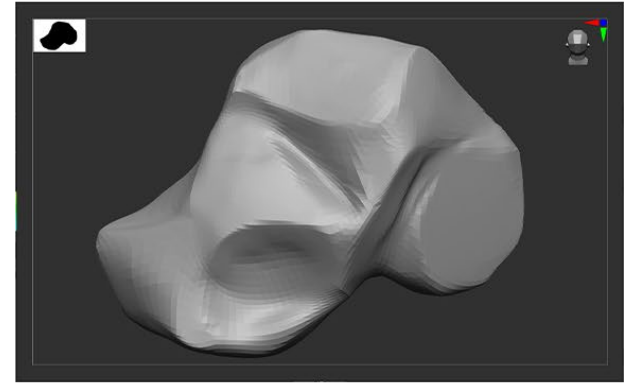
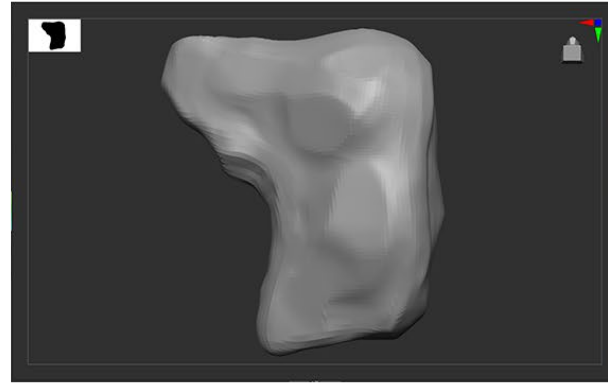
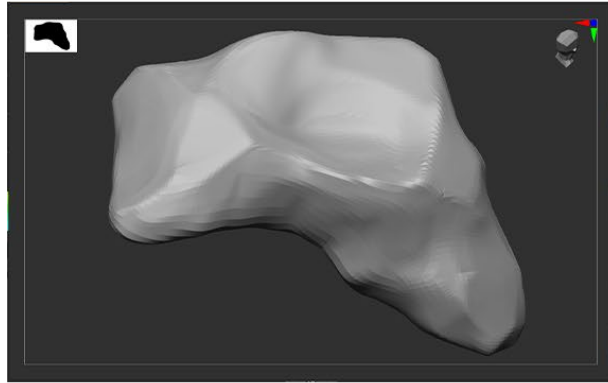


- sculpting means playing with lighting
- primary
- secondary
- tertiary
- noise

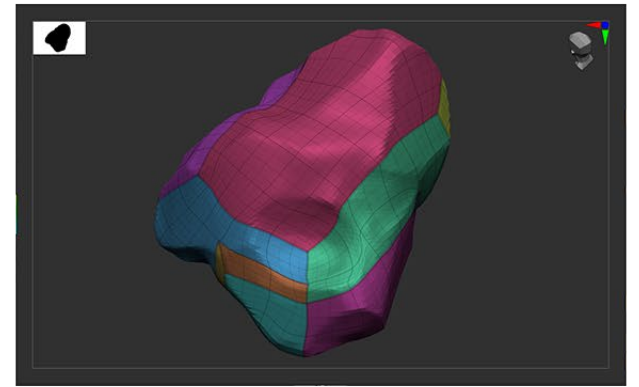
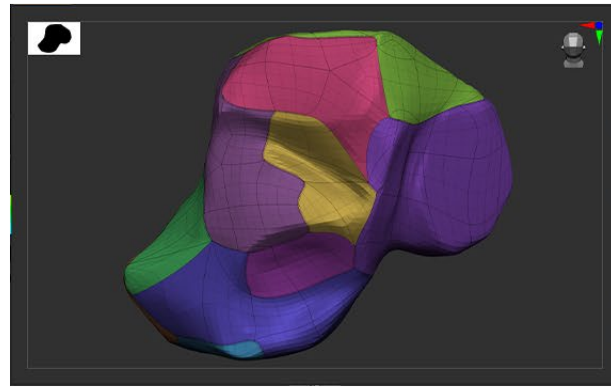
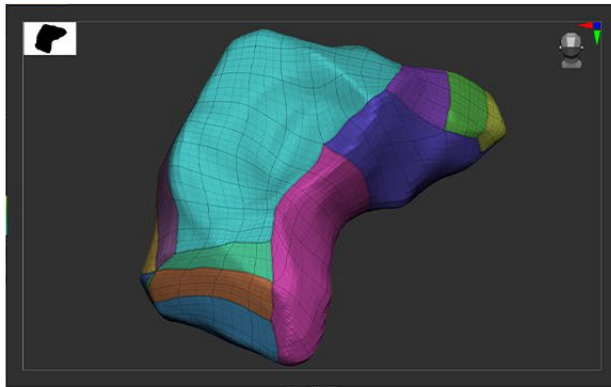
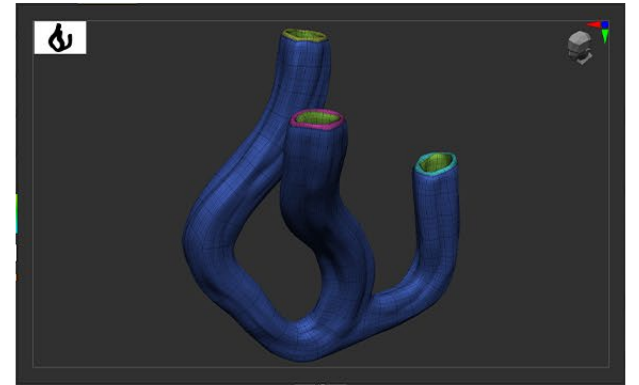
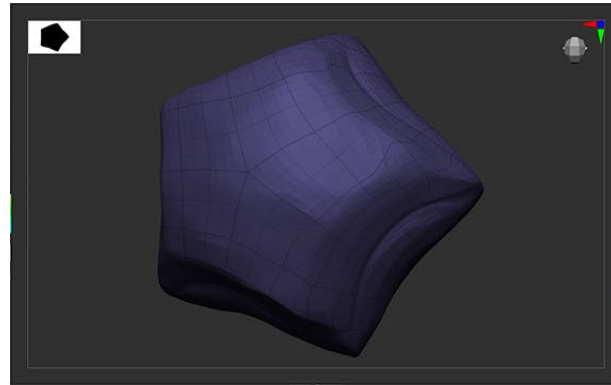
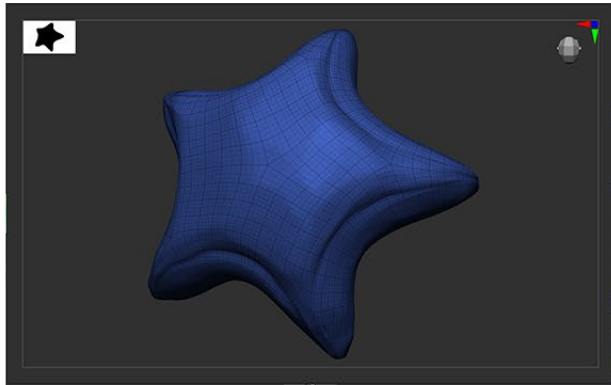
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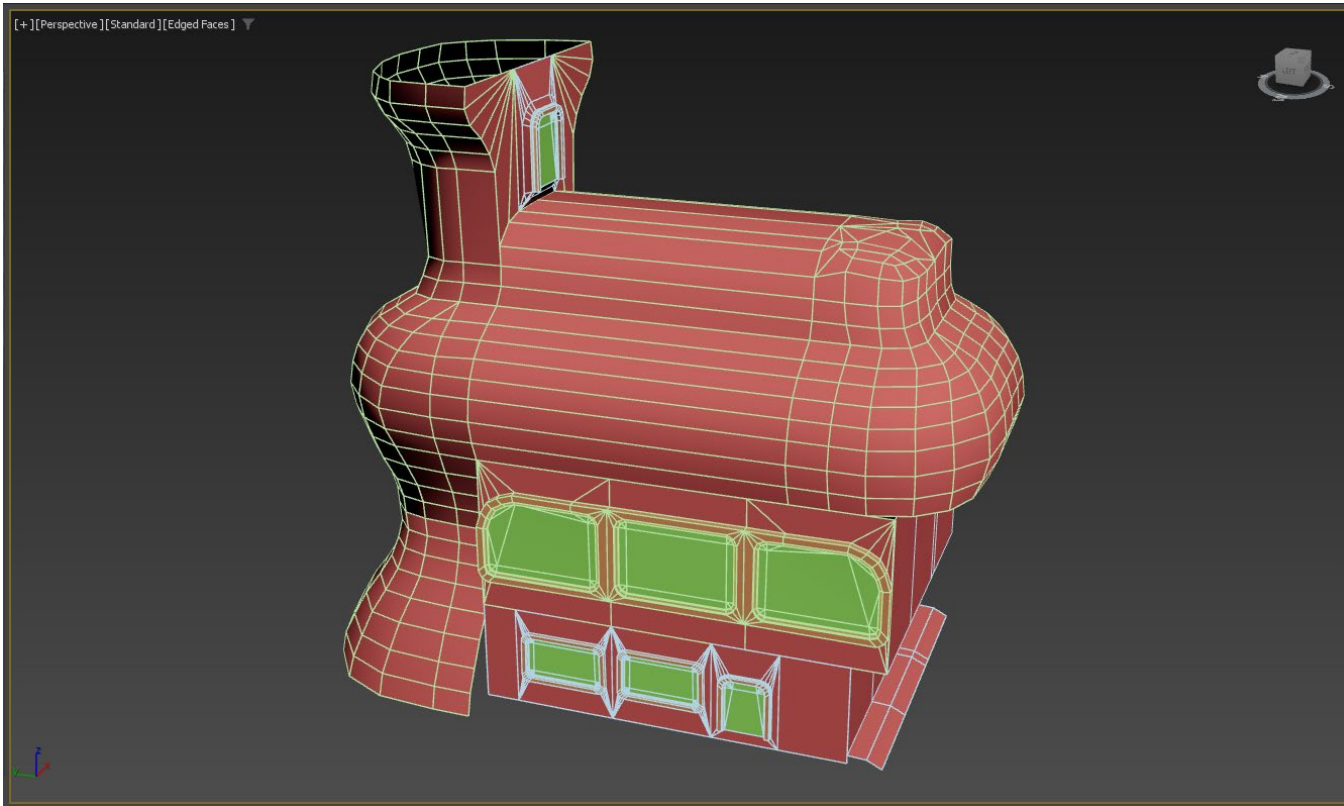
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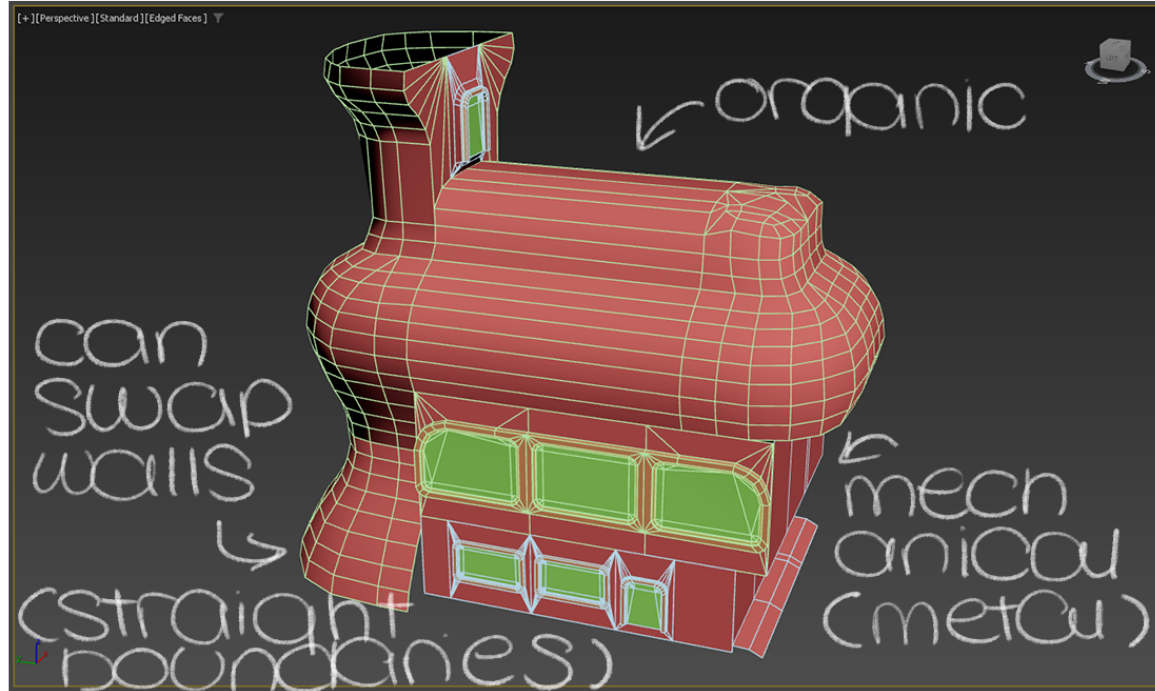


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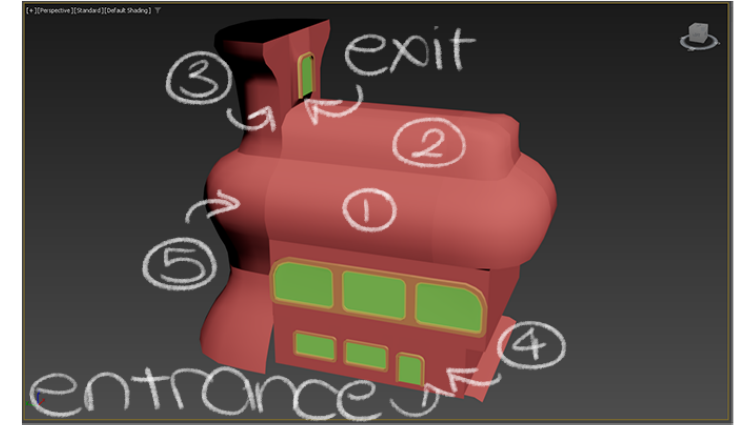


- **Modular assets are reusable.**
- **Duplicate and orient. Identical boundaries maintain alignment.**
- **Alternate and swappable middle sections.**
- **Customise to convey function.**
- **Imagined internal structure. Clear entrance and exit doorways.**
- **Conceal openings with blueprint greenery clusters.**
- **Potential for building shape experimentation.**
- **Round shape language across categories.**

ASSET DEVELOPMENT

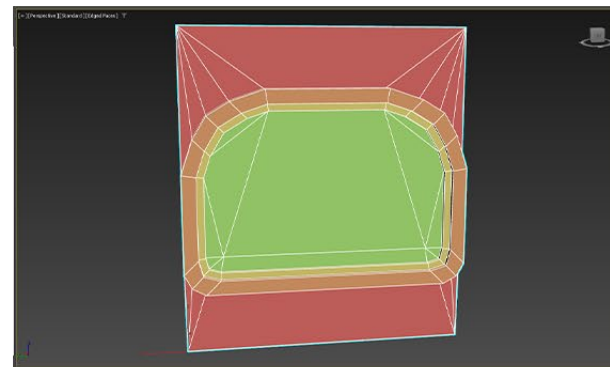
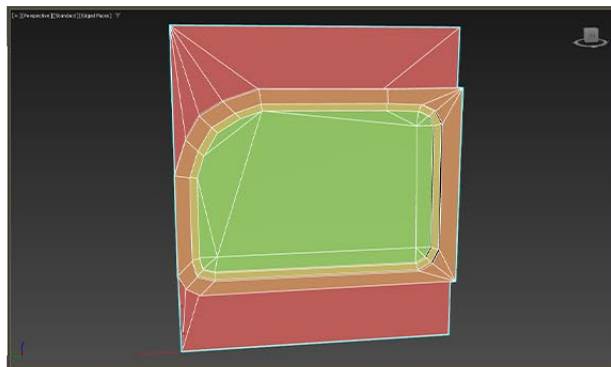
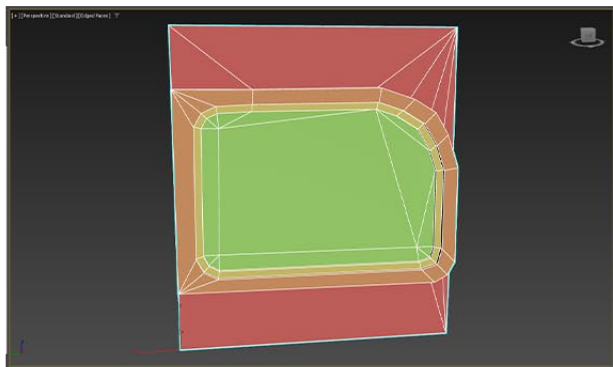
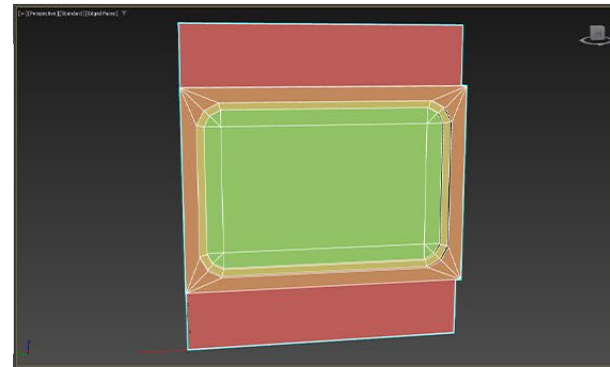
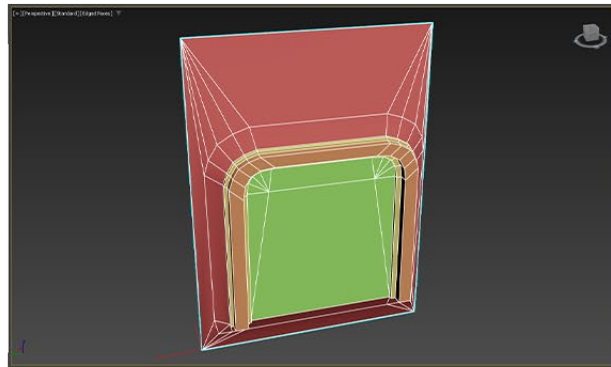
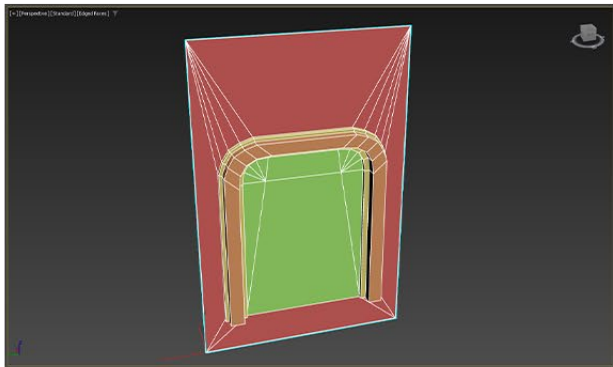


can duplicate and change orientation → boundary sides upheld

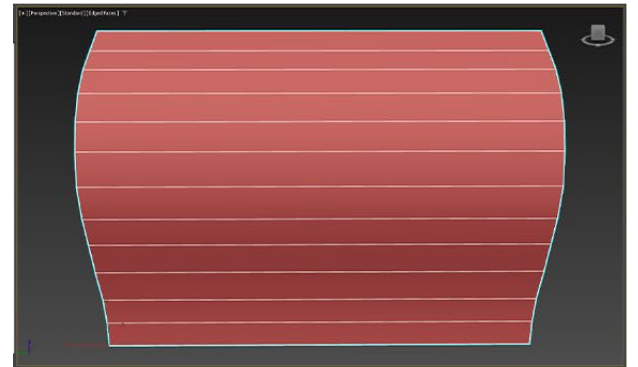
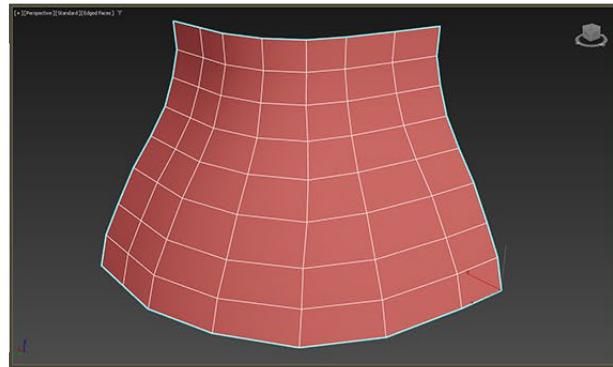
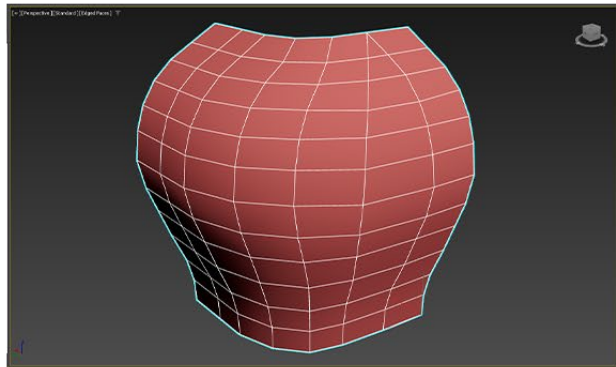
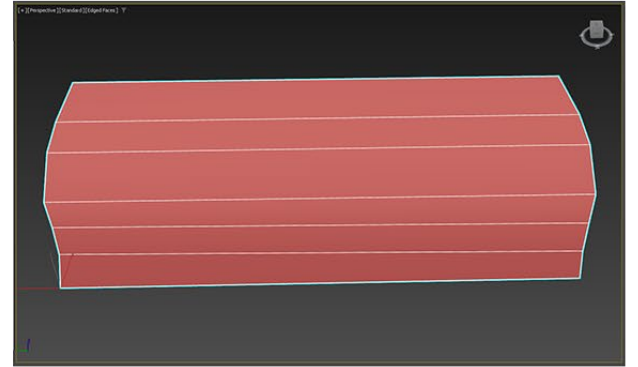
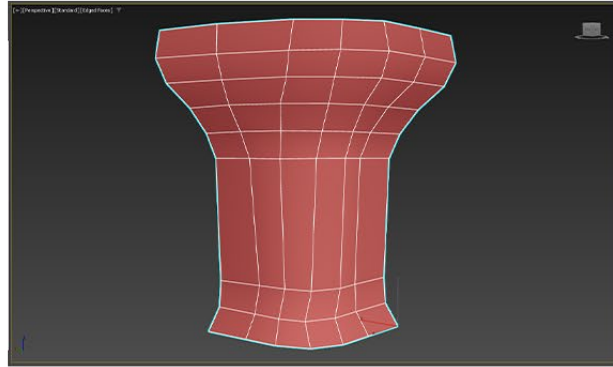
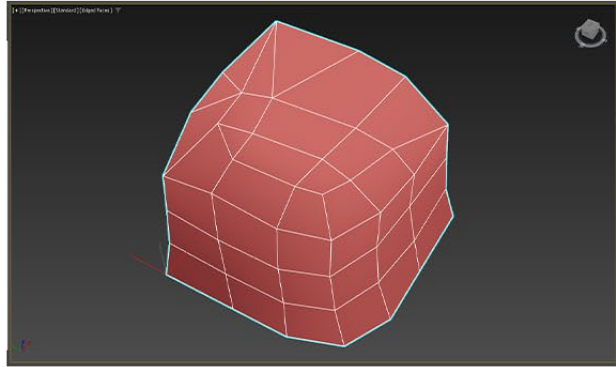


modular assets are reusable
↳ more possible building shapes!
↳ normals reveal mesh separation.

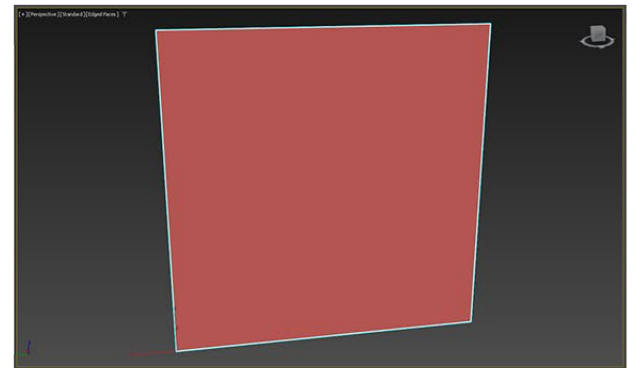
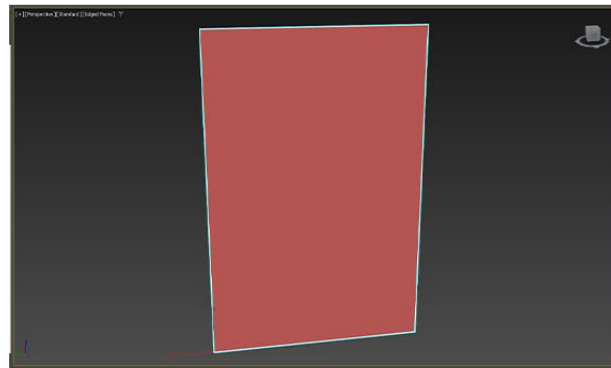
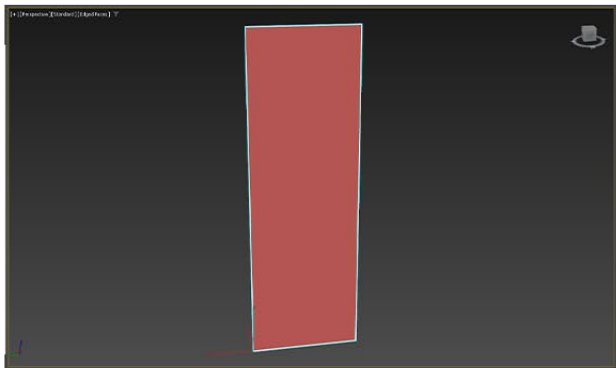
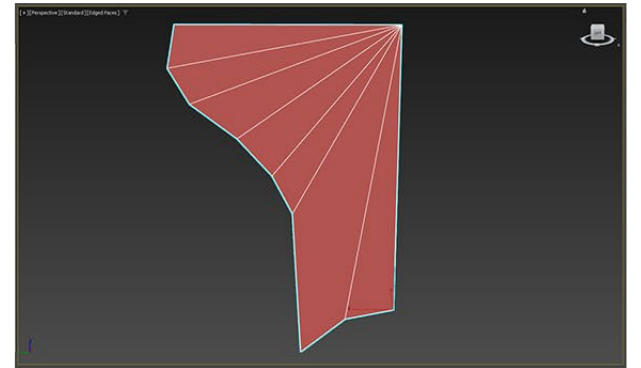
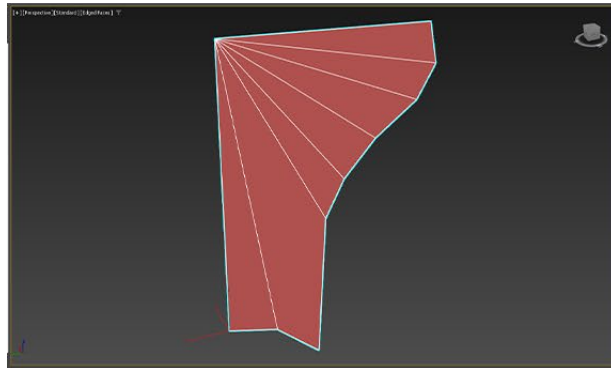
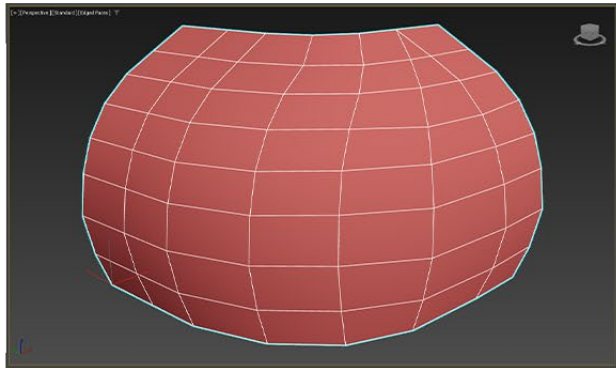
ASSET DEVELOPMENT



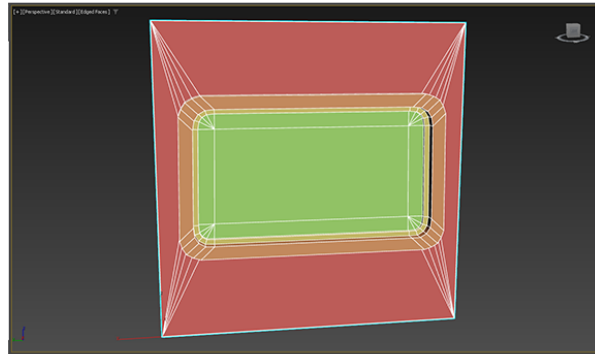
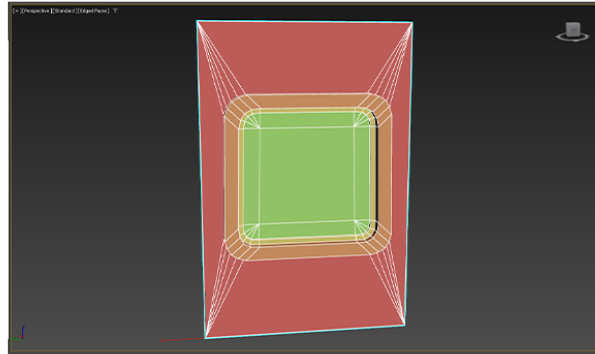
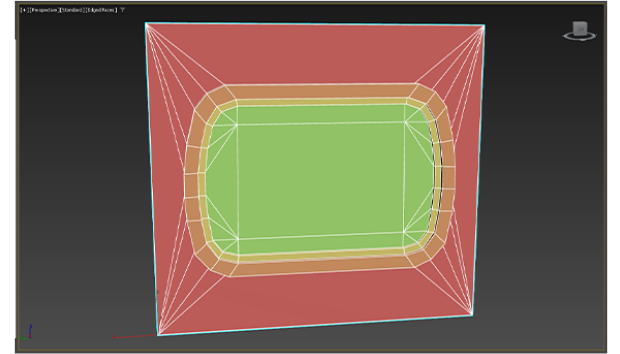
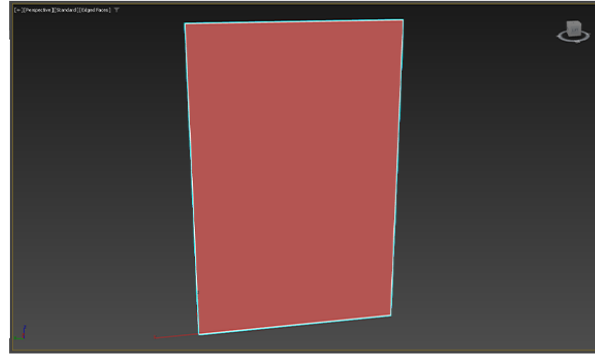
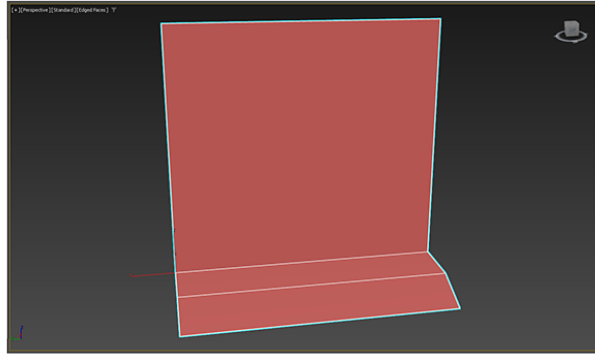
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ASSET DEVELOPMENT

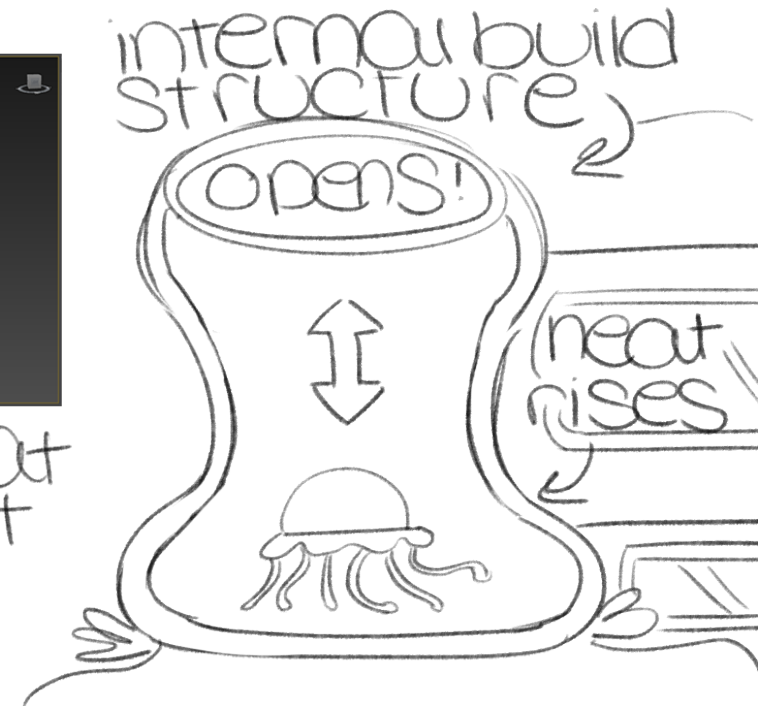


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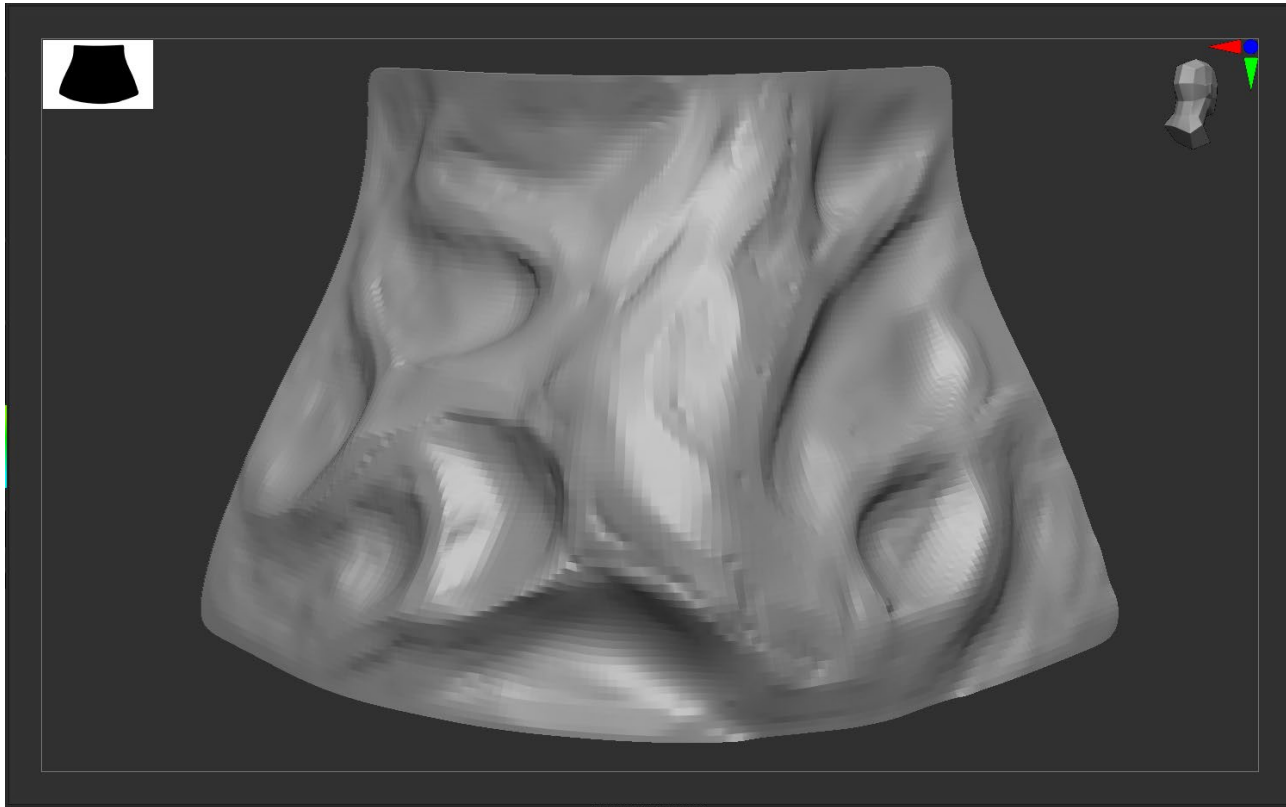


mechanical walls → visitor centre (visual jellyfish access)

tube habitat (movement room) → floating!

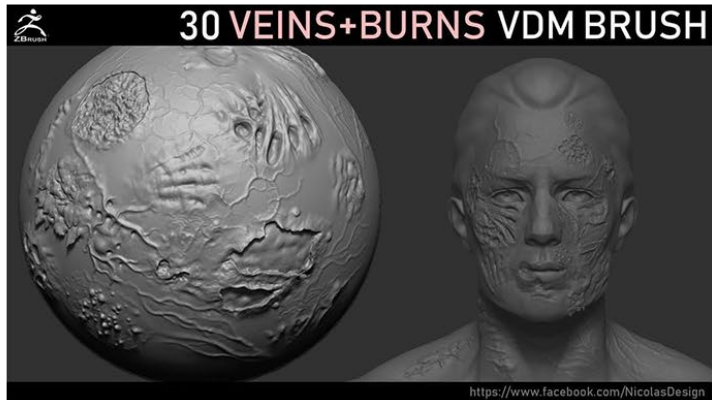


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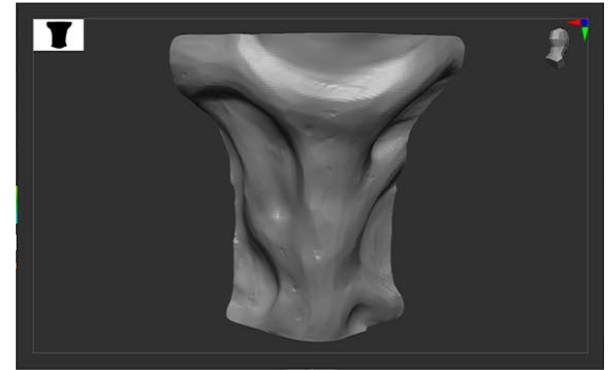
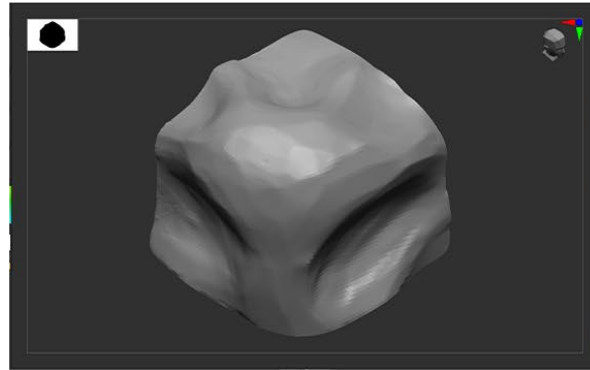
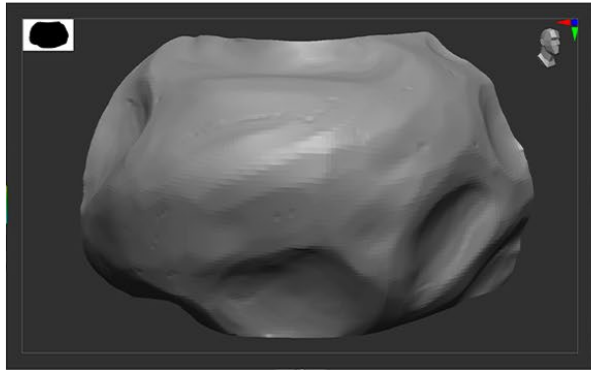
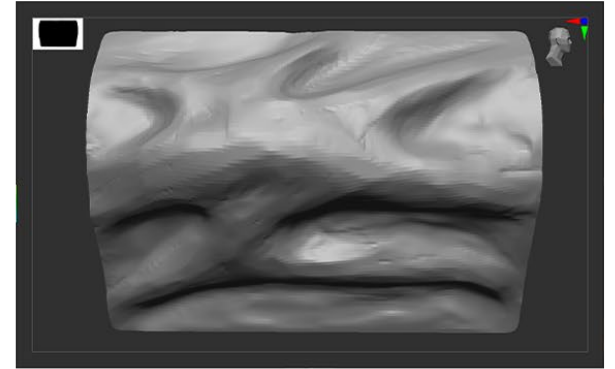
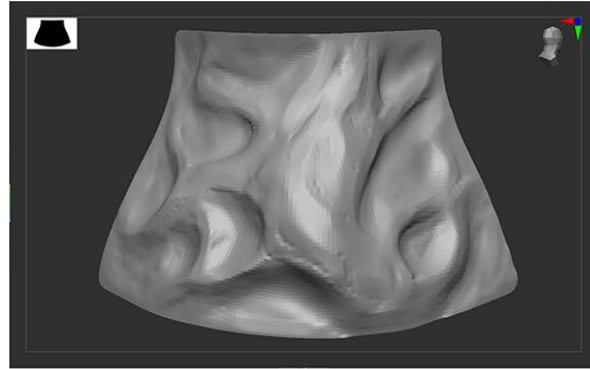
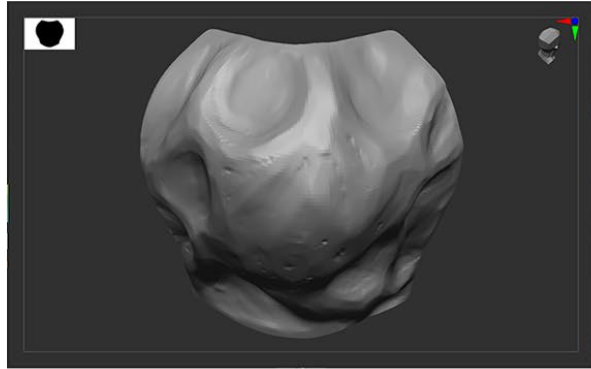


- Personal and customised pipeline.
- Freeform pen movement. Comparable to hand-painting.
- Humanoid references and anatomy.
- Superorganism. Clear blood flowing direction.
- Varied sources. Enhanced scale veins resemble thick tree trunks.
- Small branches leading to imagined organs.
- Convex and concave forms.
- Contrast to exaggerate dimensions.
- Bumpy flesh surface. Imperfect for realism.

ASSET DEVELOPMENT



ASSET DEVELOPMENT



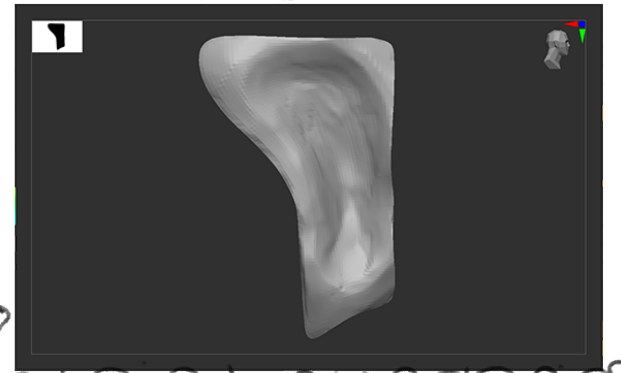
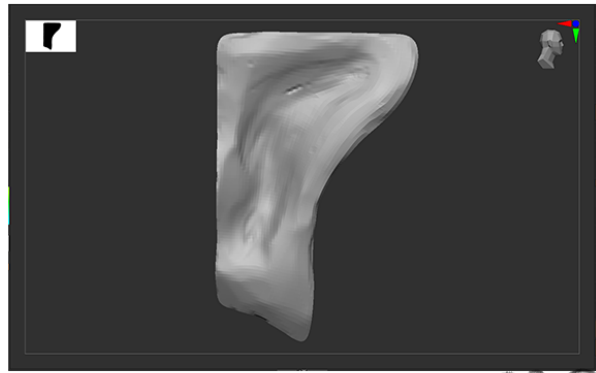
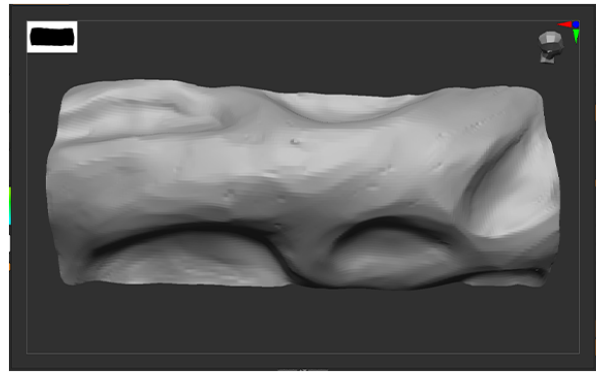
ASSET DEVELOPMENT



vanicose veins
(increased scale)
↳ superorganism
(looks like tree trunks!)

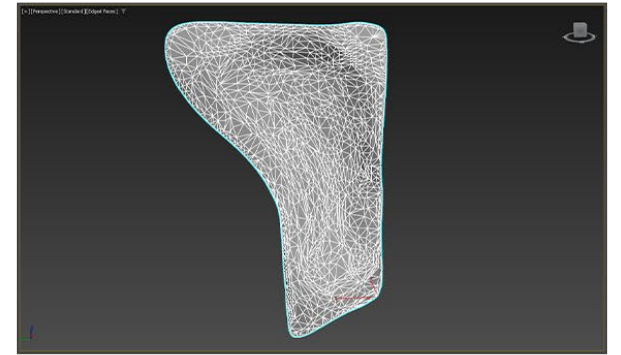
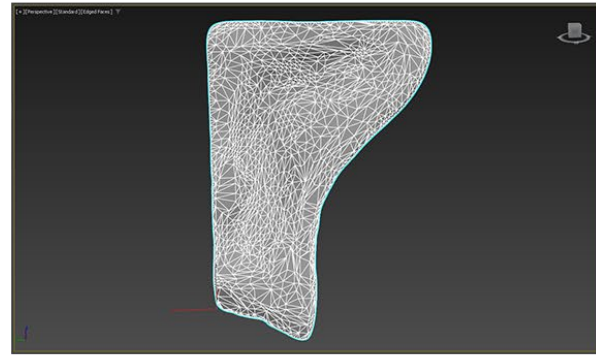
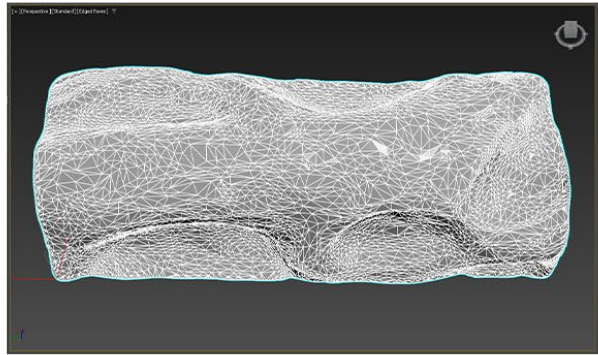
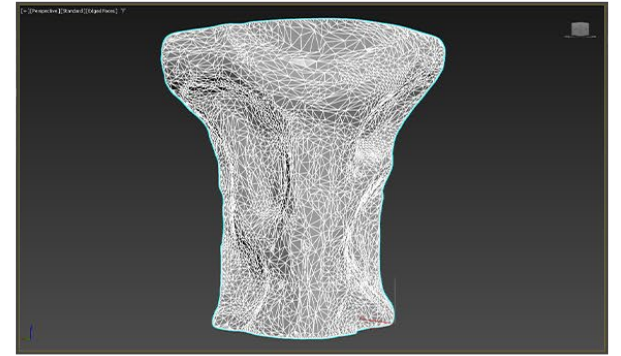
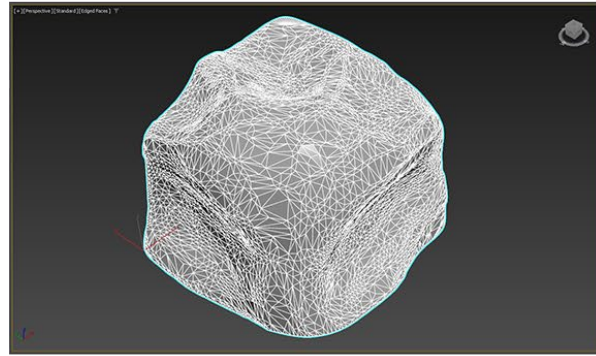
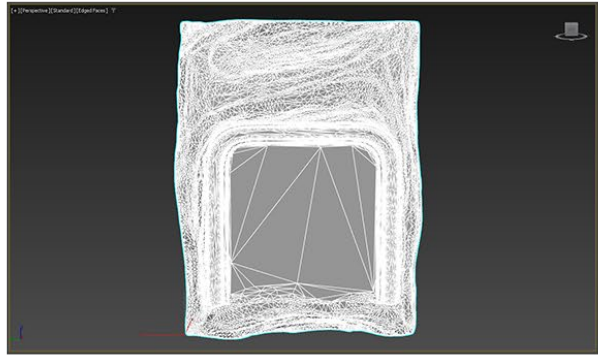
can follow path
(blood flow)

skin beneath
moves
inwards ↴

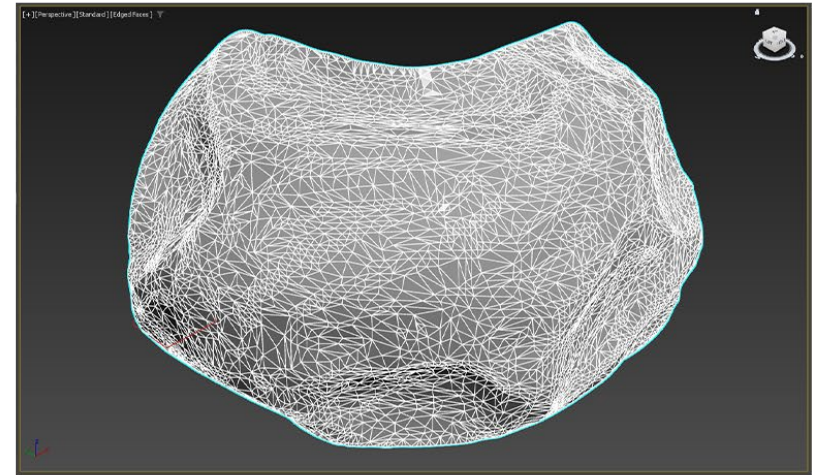
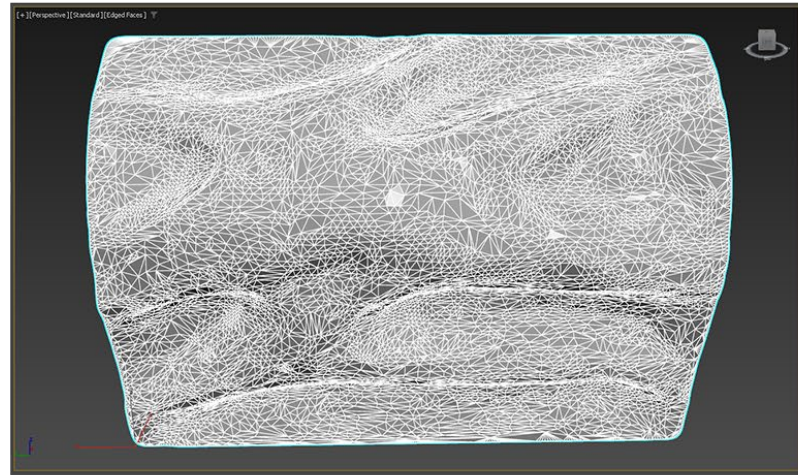
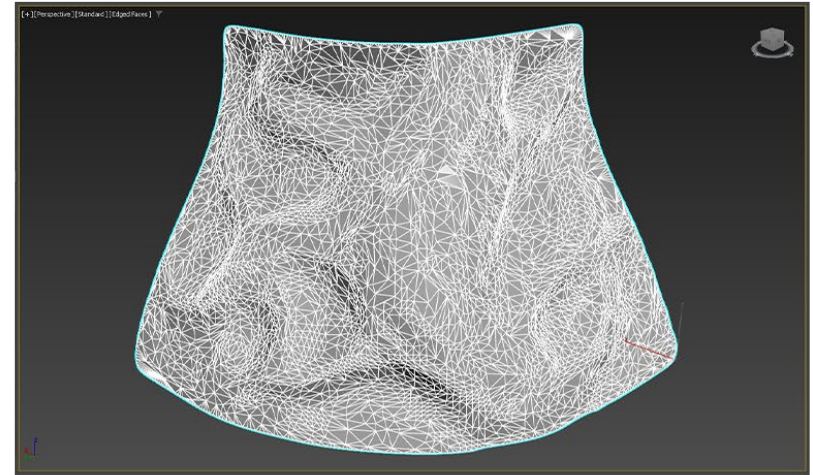
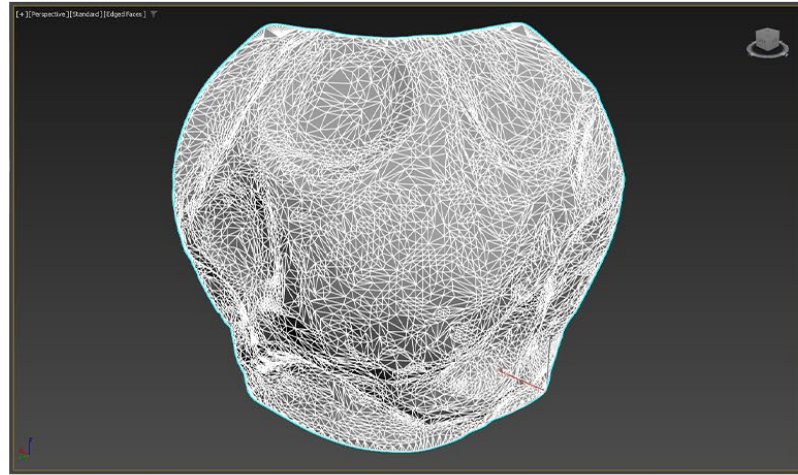


maintain boundaries

ASSET DEVELOPMENT



ASSET DEVELOPMENT

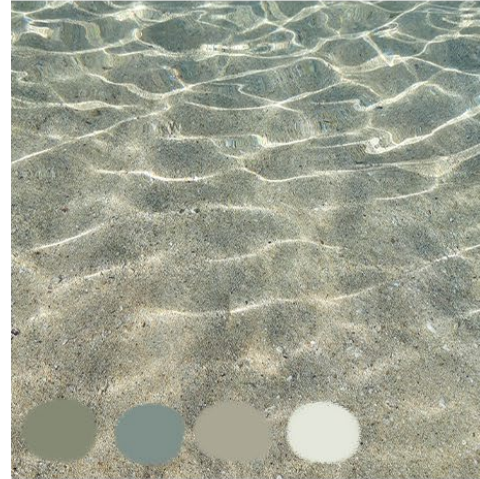


MATERIAL DEVELOPMENT

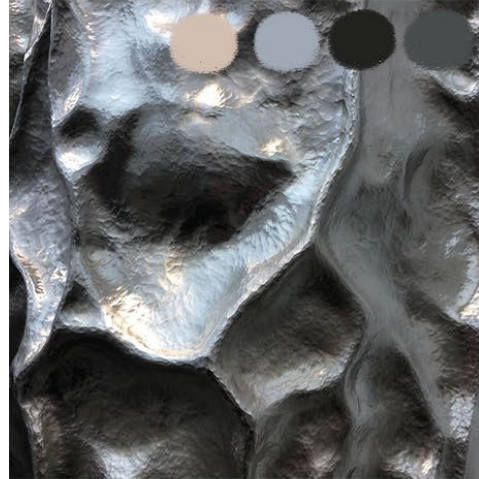
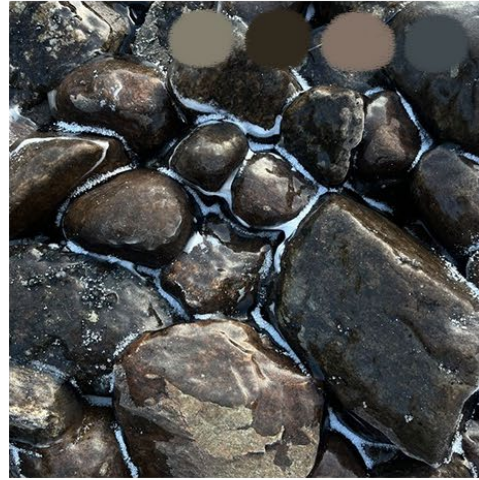


- Chronological steps for quick production. Easy to replicate.
- Maximum grunge map amount to prevent cramped appearance and harsh height boundaries.
- General shape and silhouette. Surface grunge and damage.
- Colour variation from RGB masks to enhance realism.
- Contrast between peaks and valleys. Shadows accentuate dimensions.
- Round and compact noise for grains and organic pores.
- Light source determines palette lightness.
- Colours equalised to contain saturation.
- Duplicate nodes for cohesive creative direction.

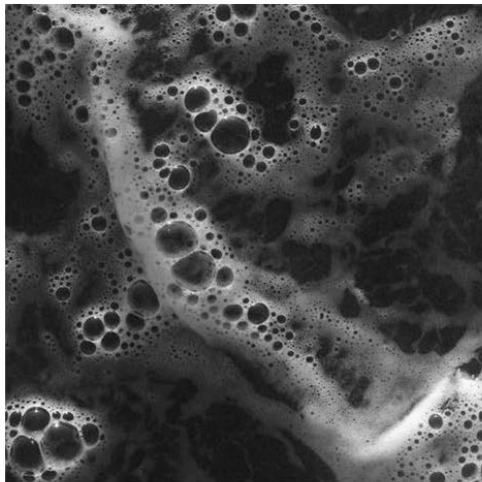
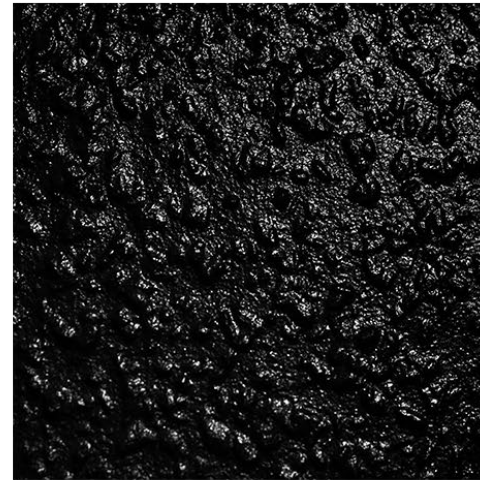
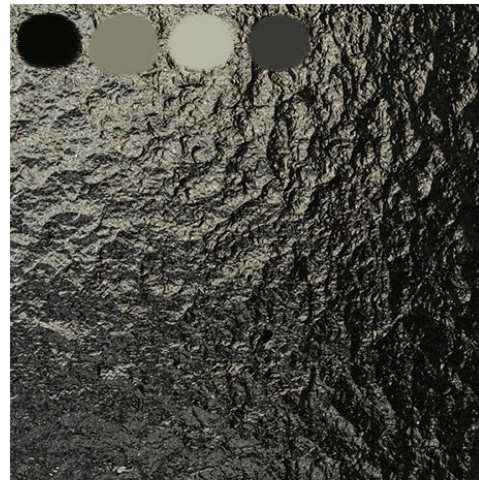
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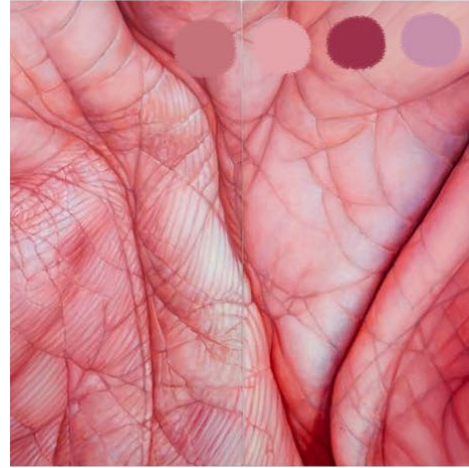
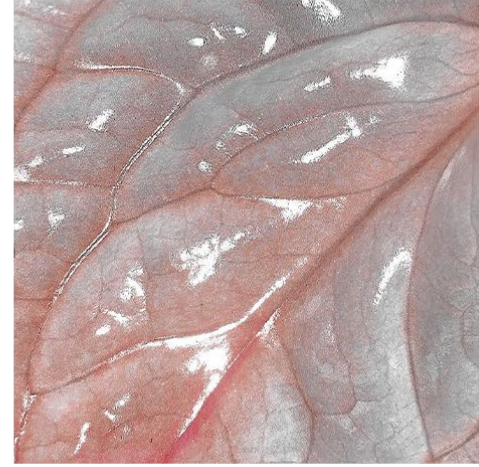
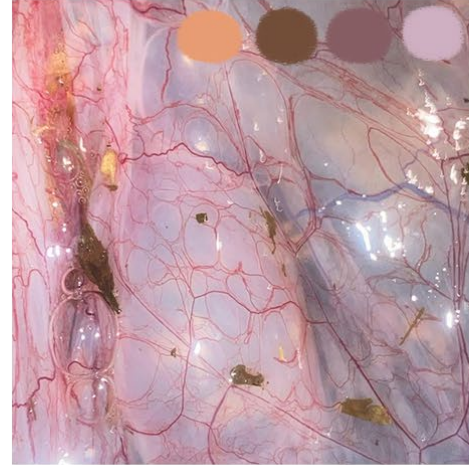
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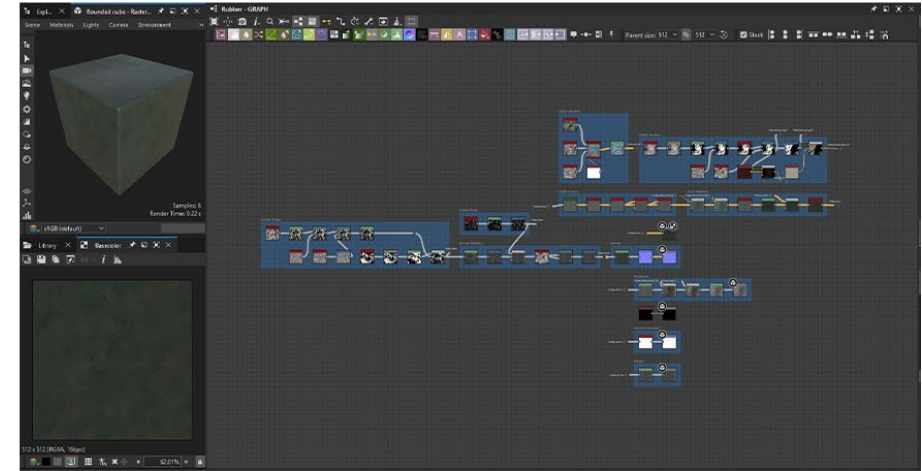
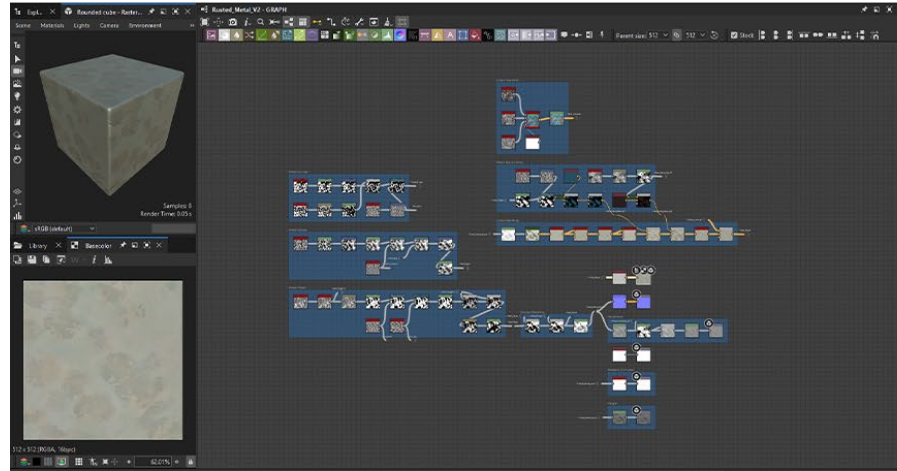
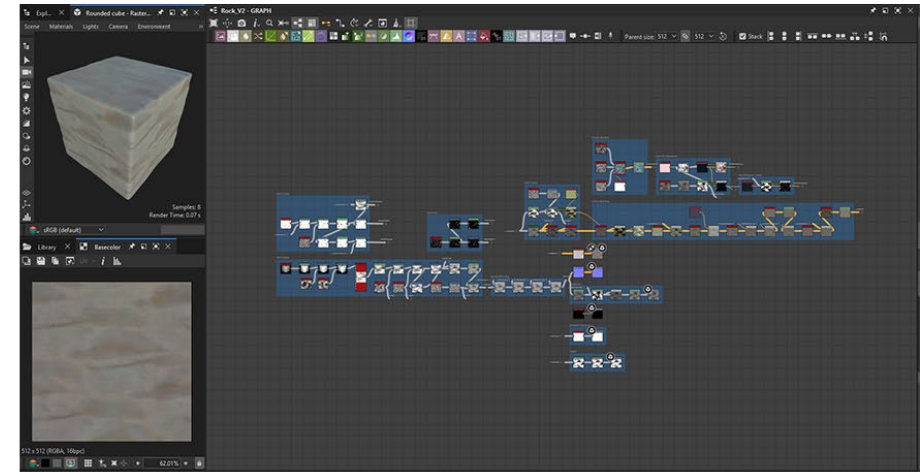
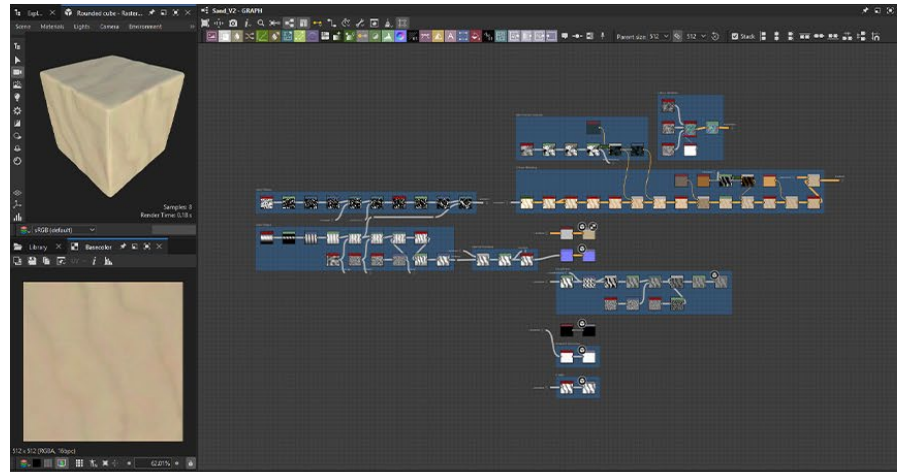
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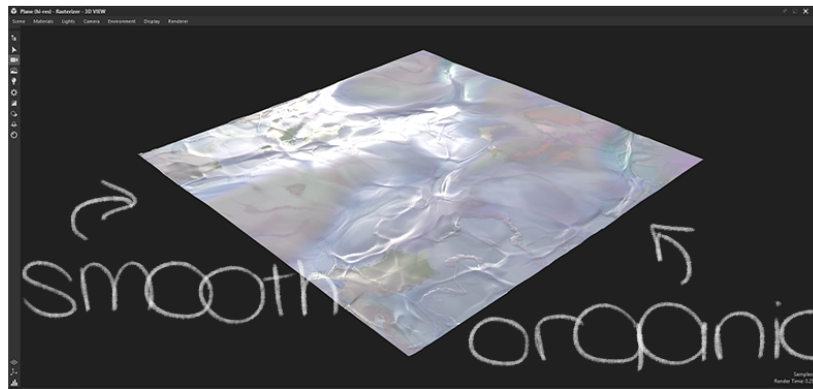
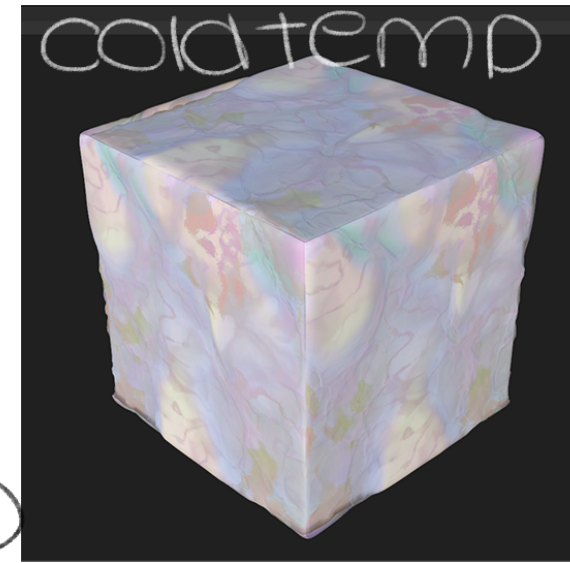
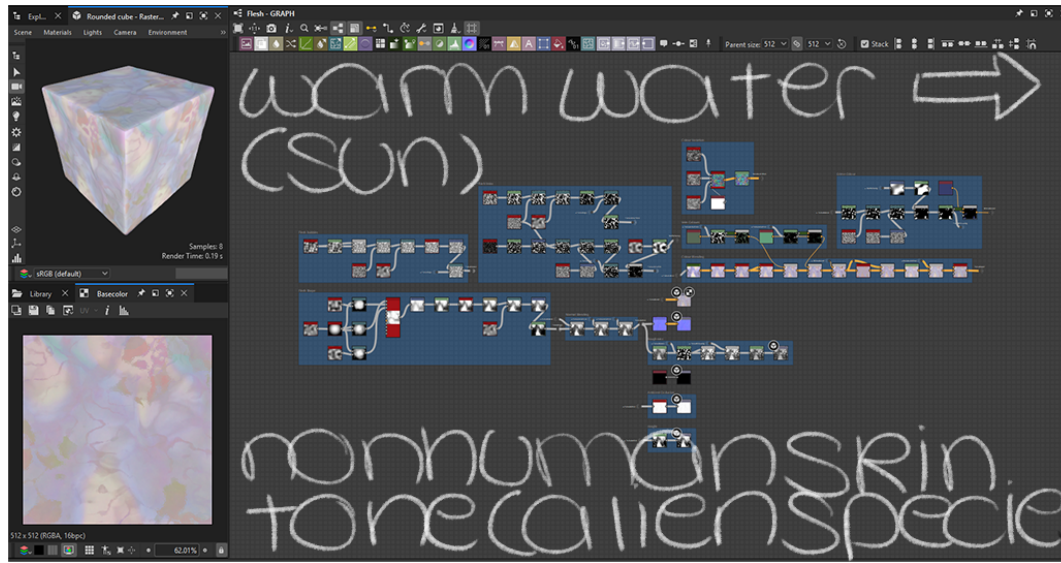
MATERIAL DEVELOPMENT



MATERIAL DEVELOPMENT

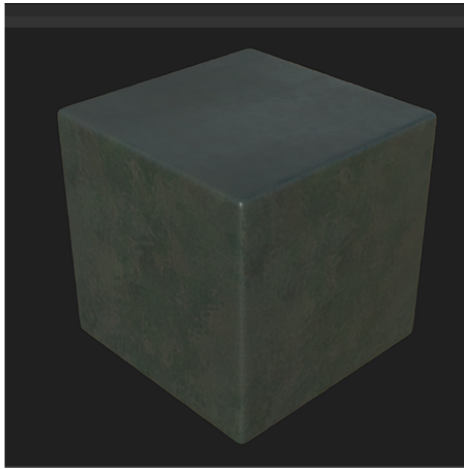
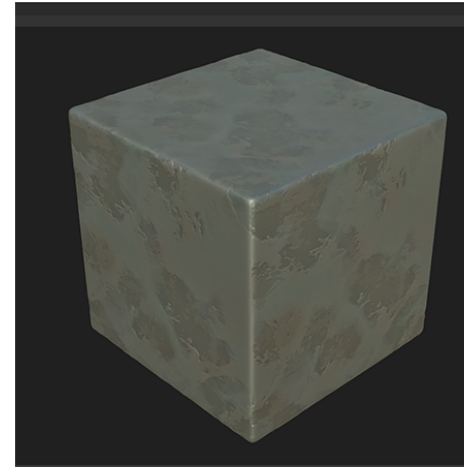
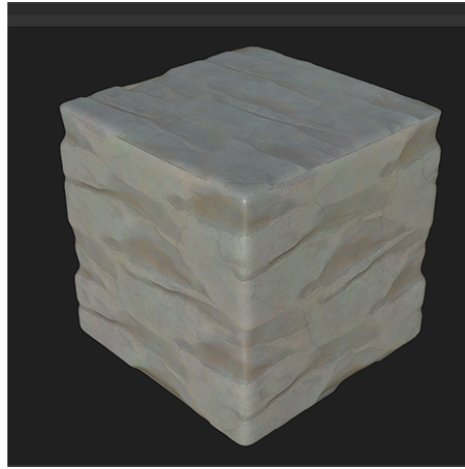


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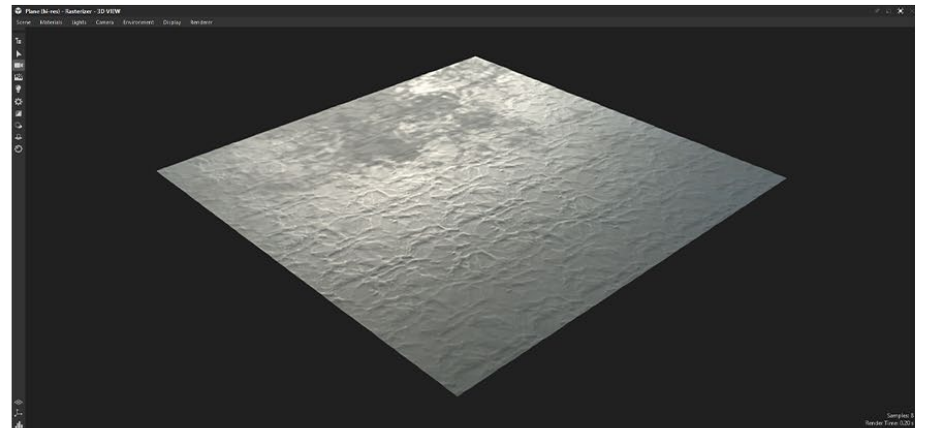
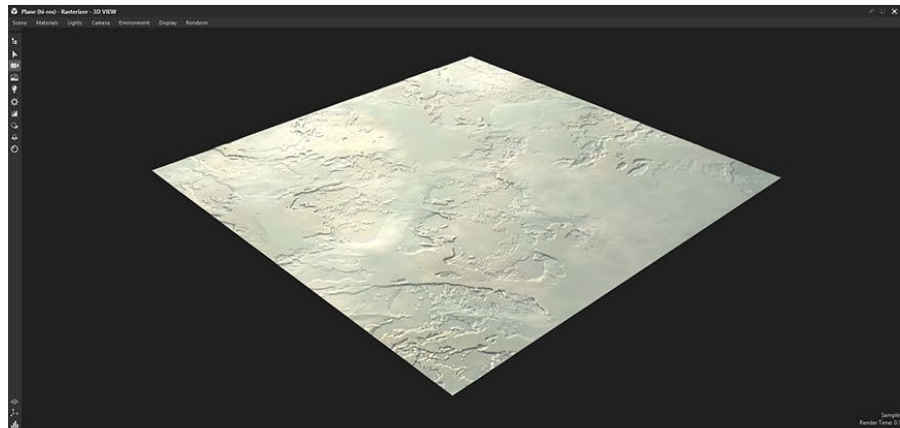
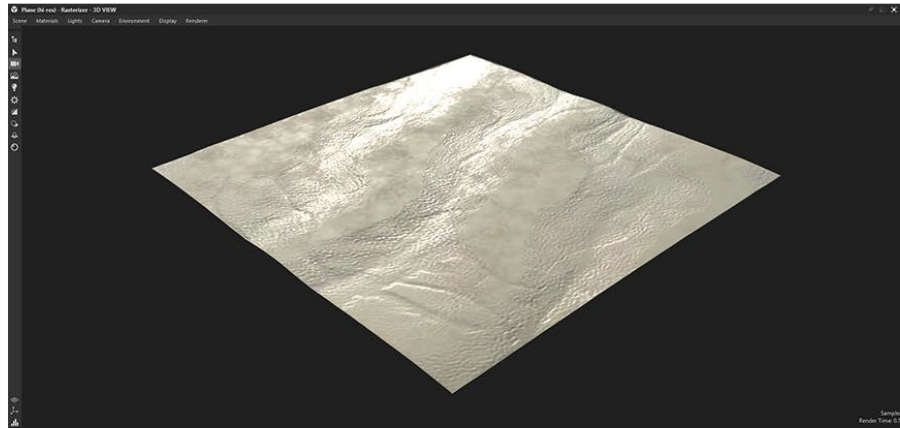
- saturation / lightness
- affected by source
- (C) equalised for realism (moisture film) → customise in game engine

MATERIAL DEVELOPMENT

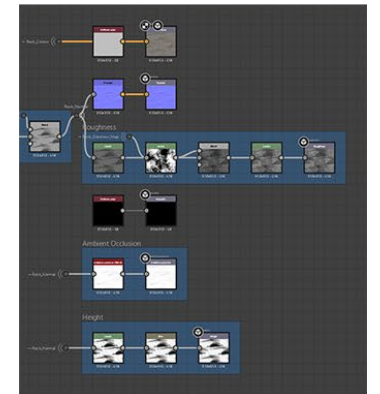
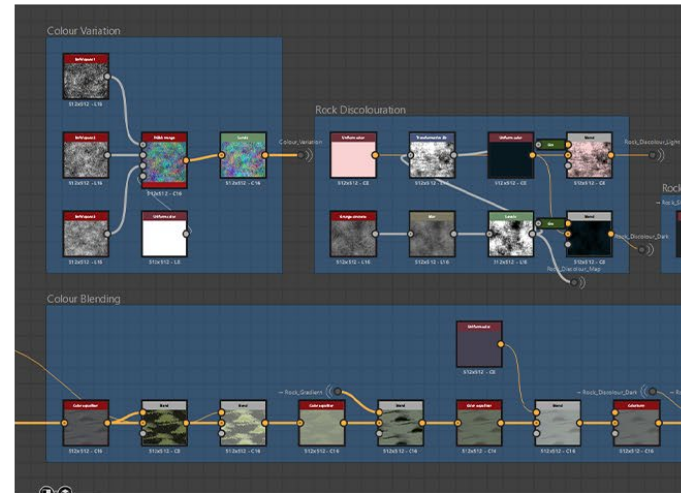
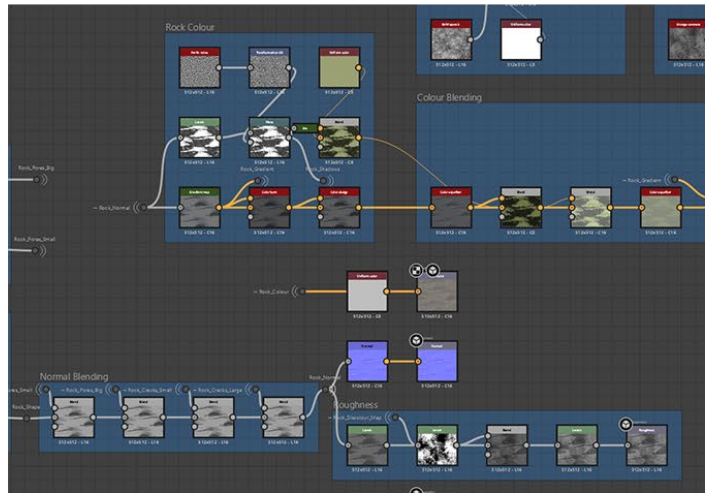
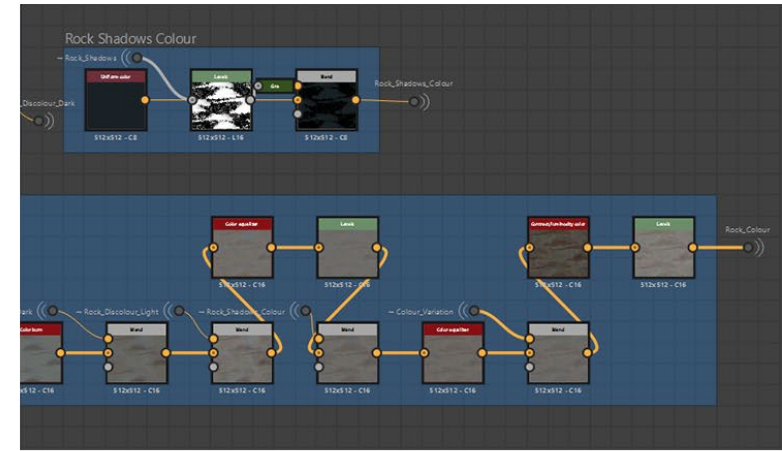
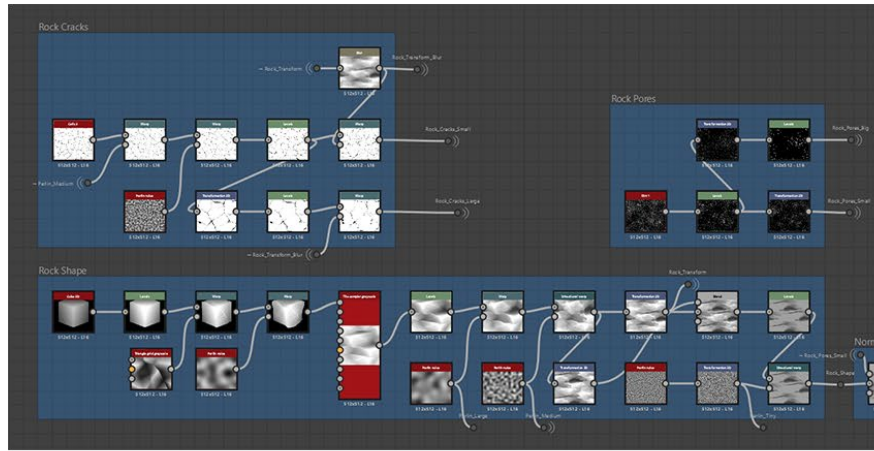


- ↻ changing hue from colour
- variation mask (RGB)
- → combine maps for realism (subtle damage)
- duplicate for unity (saves time!)

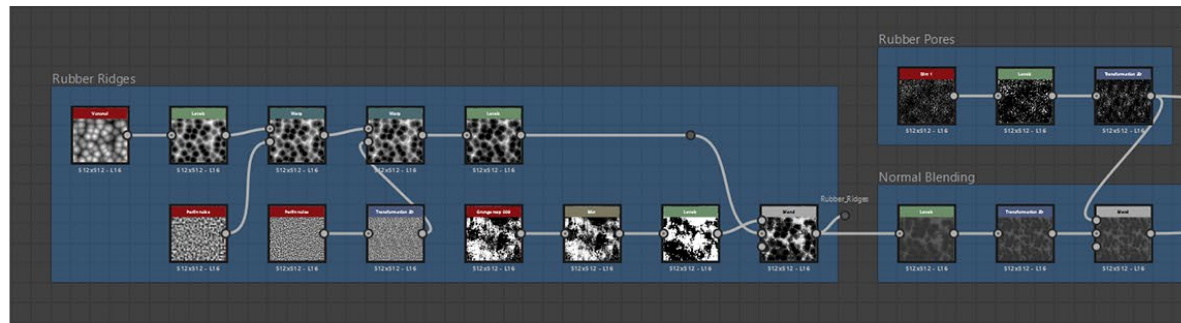
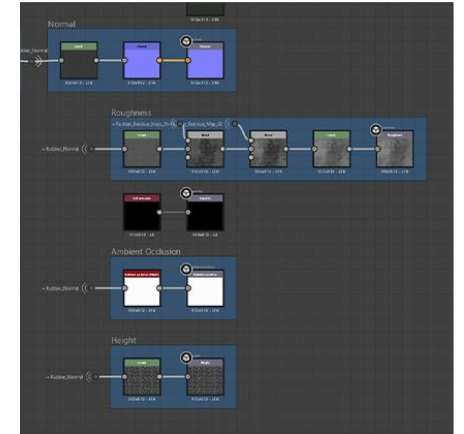
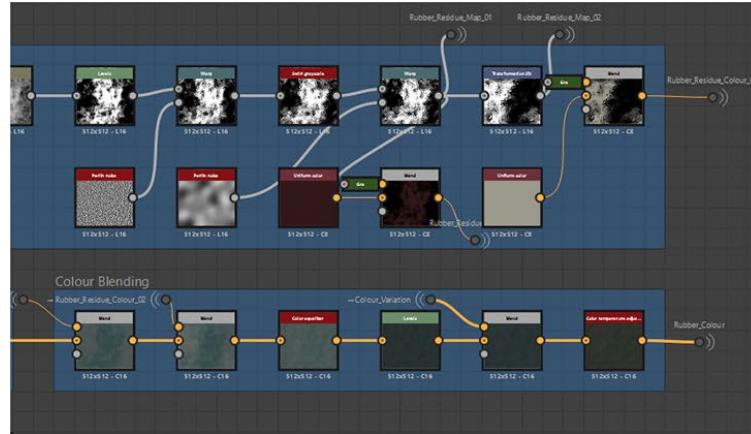
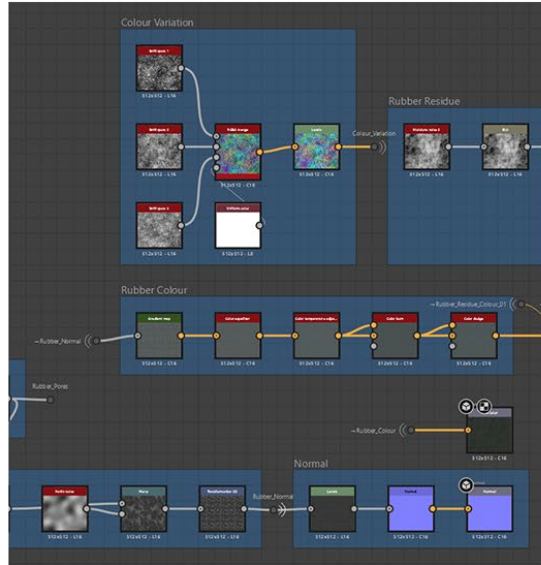
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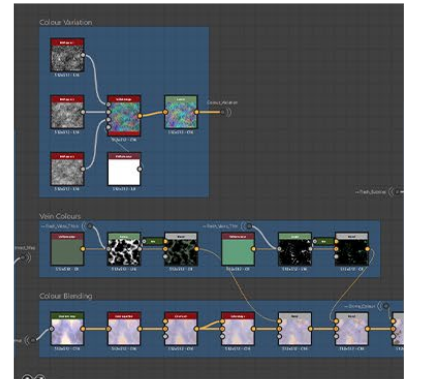
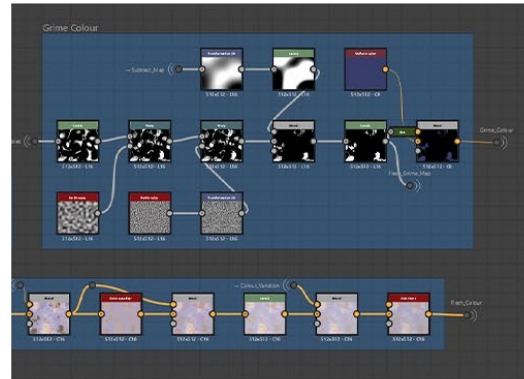
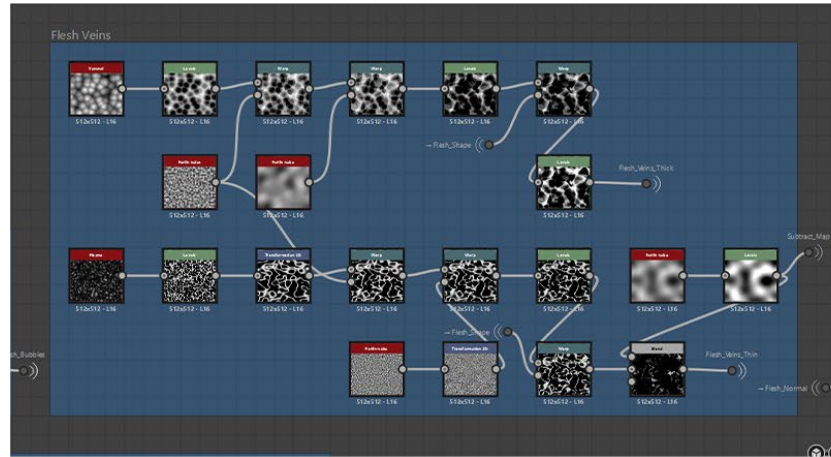
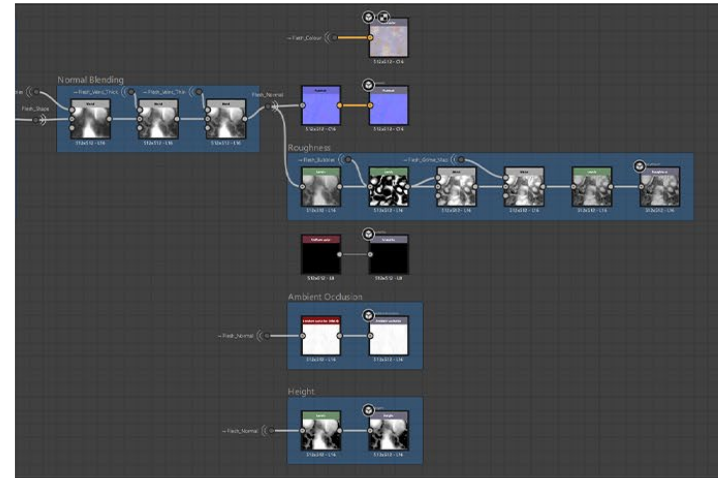
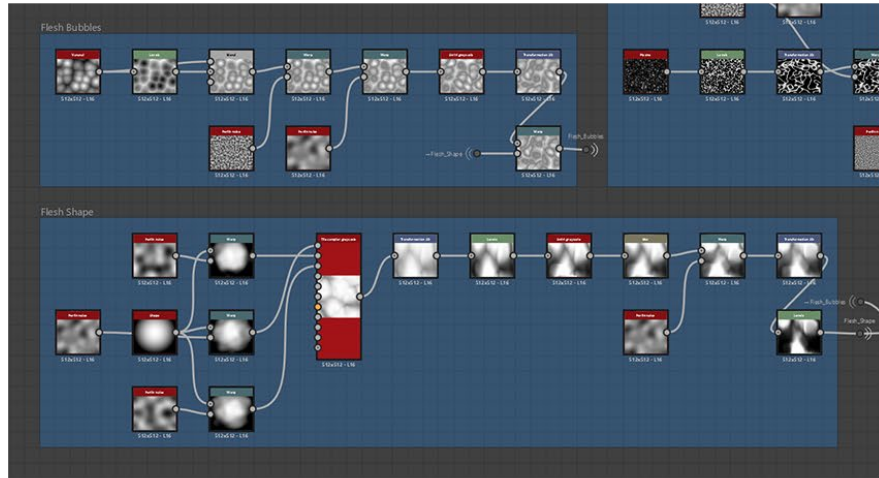
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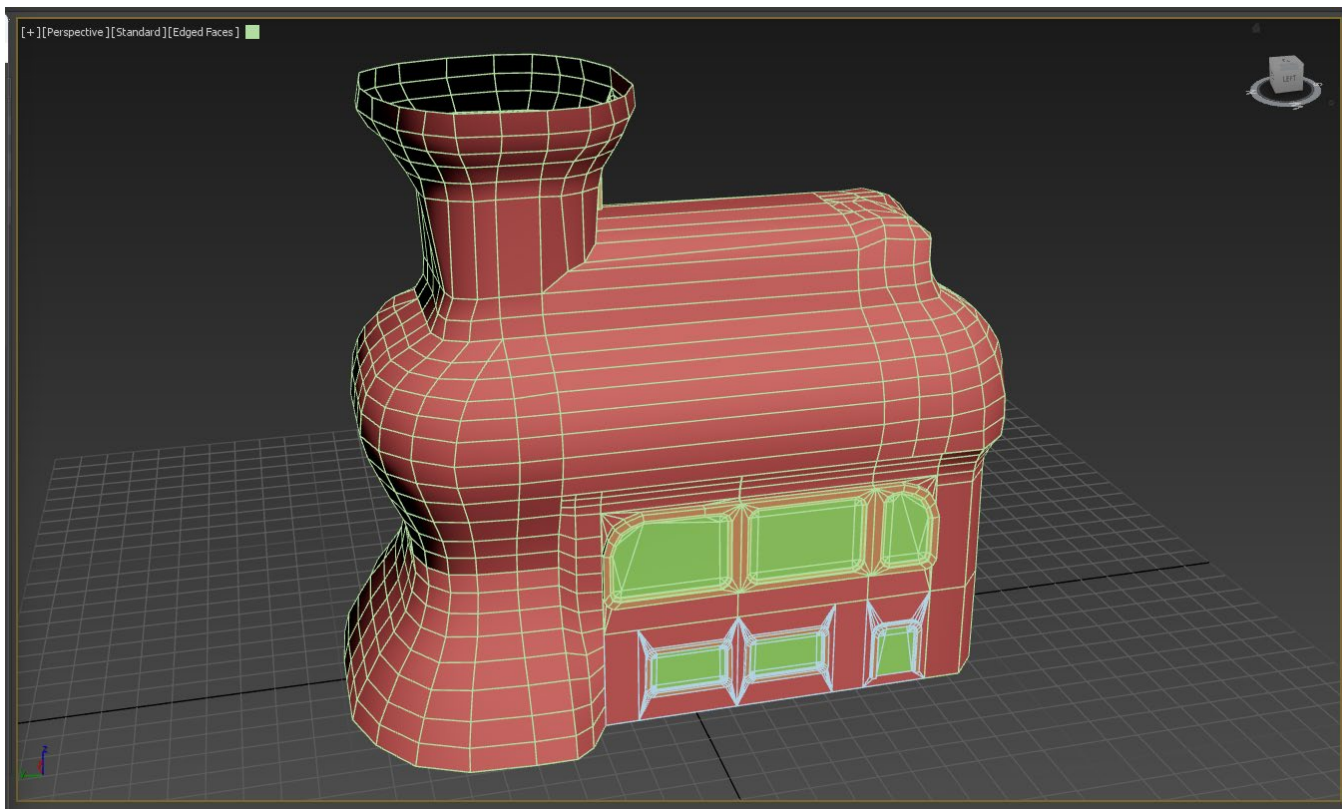
MATERIAL DEVELOPMENT



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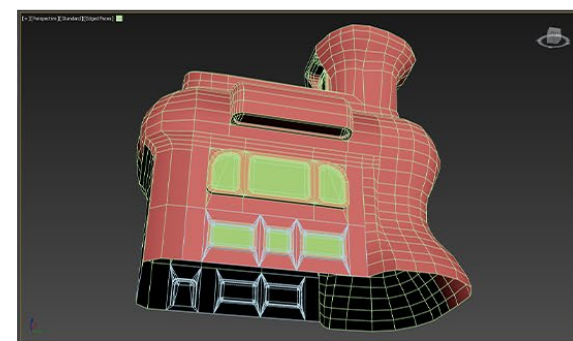
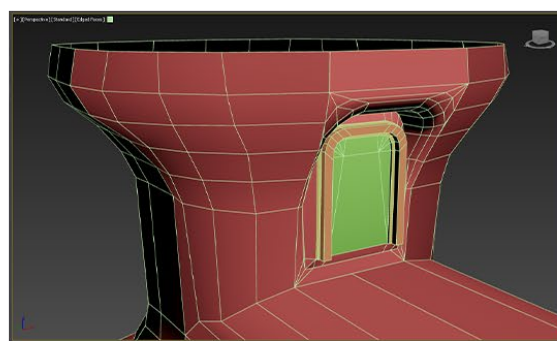
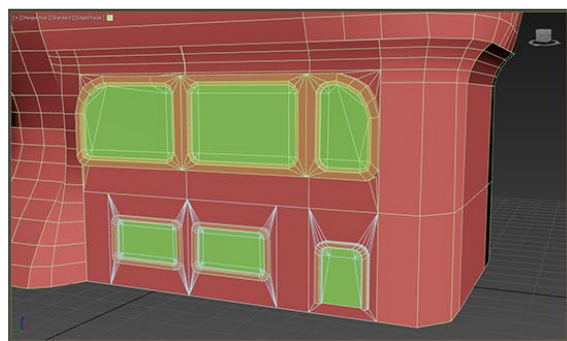
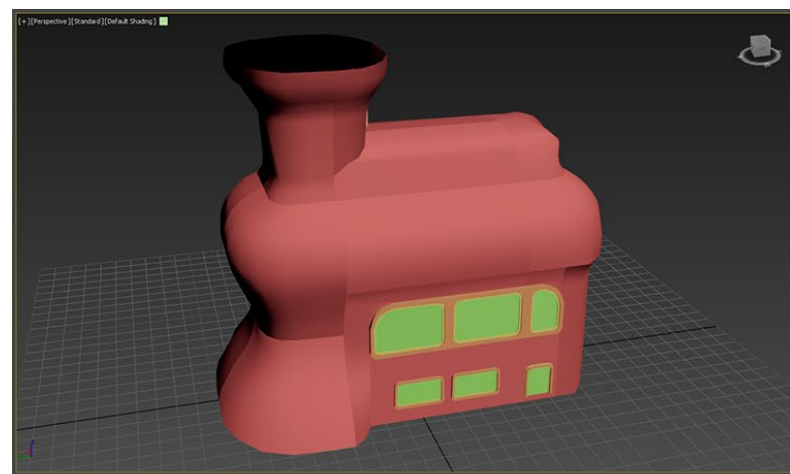
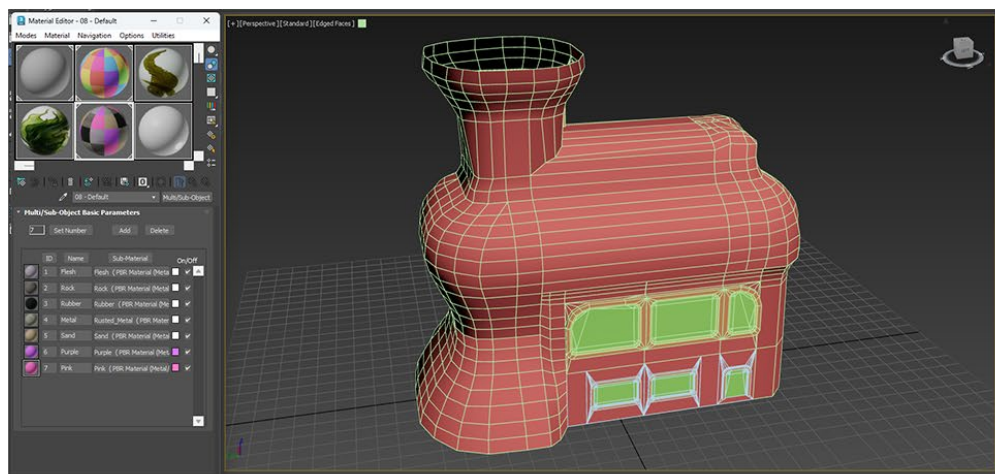


ASSET DEVELOPMENT

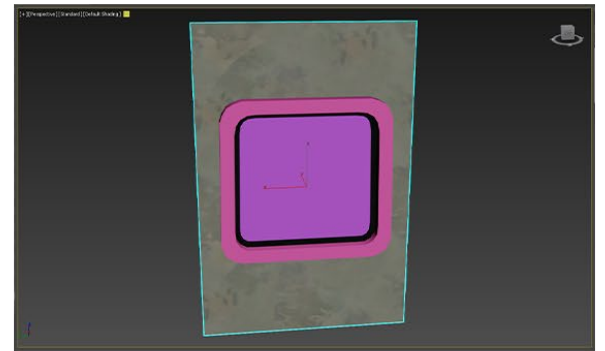
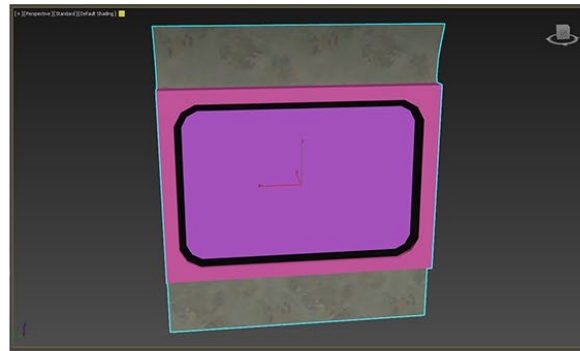
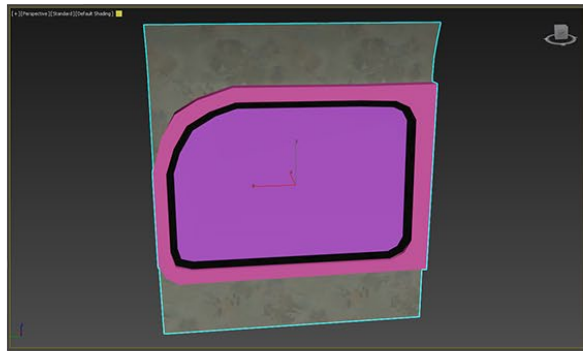
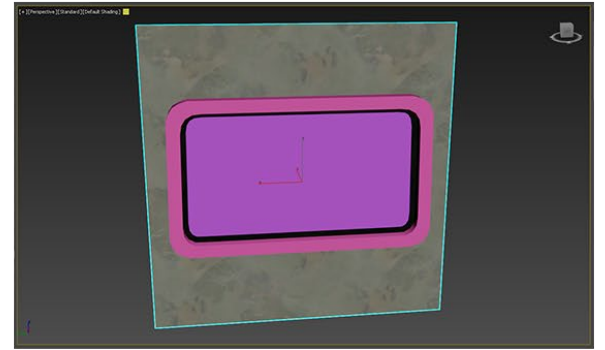
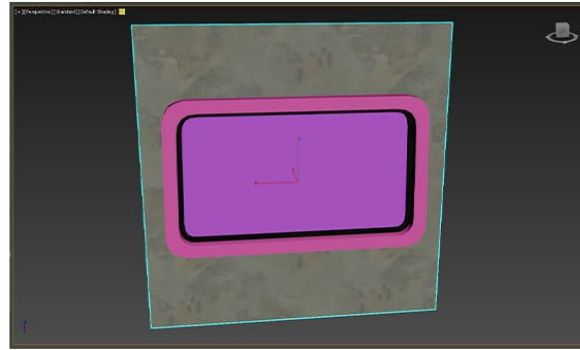
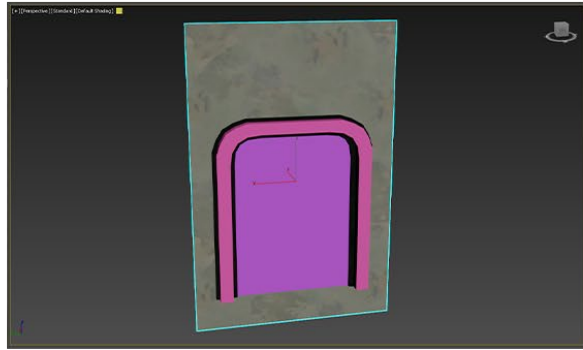


- Smooth progression between organic and mechanic assets.
- Interim mesh.
- Maintained shape language.
- Symmetrical design.
- Round corners. Safe and welcoming atmosphere.
- Compromise to match schedule.
- Standalone assets where modular counterparts don't align.
- Optimised. Open spaces where concealed by landscape or supporting resources.

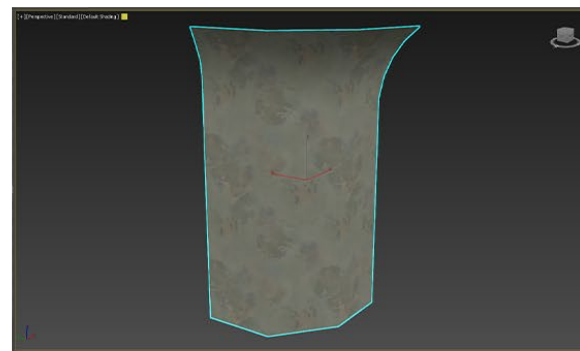
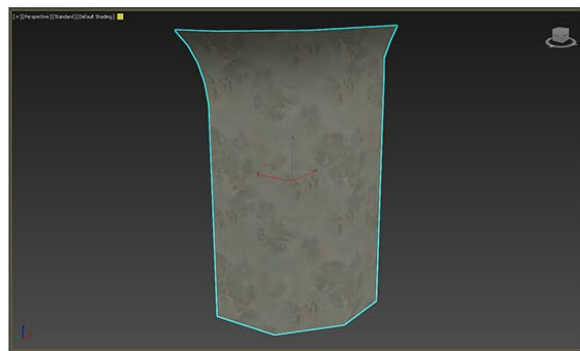
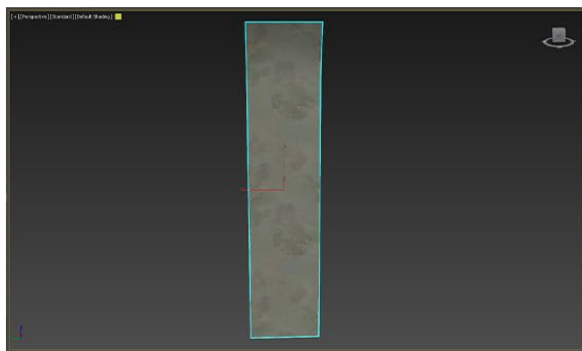
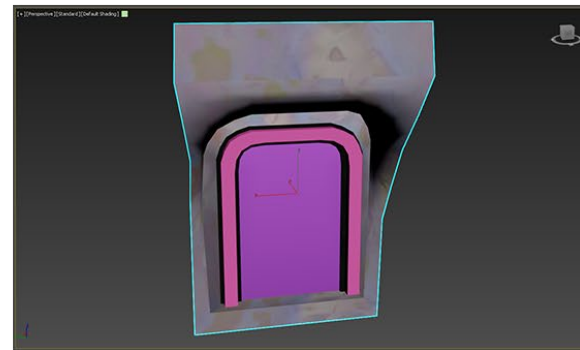
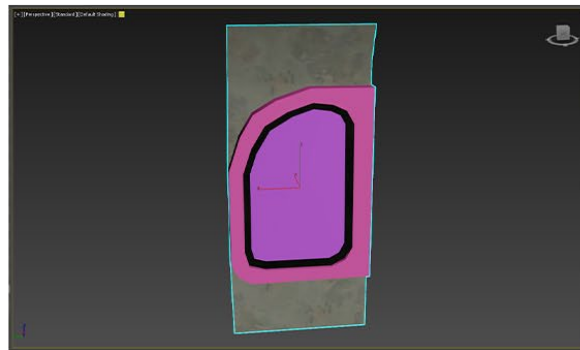
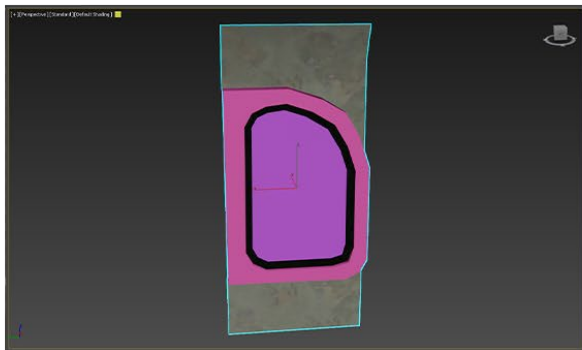
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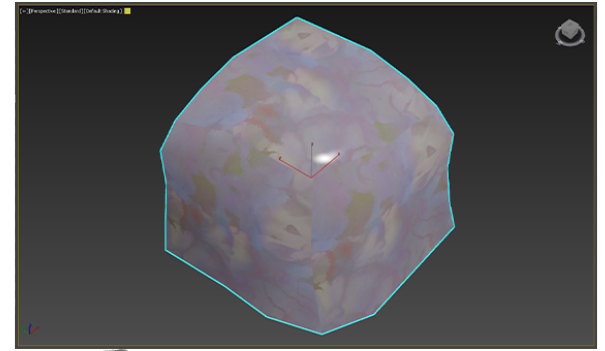
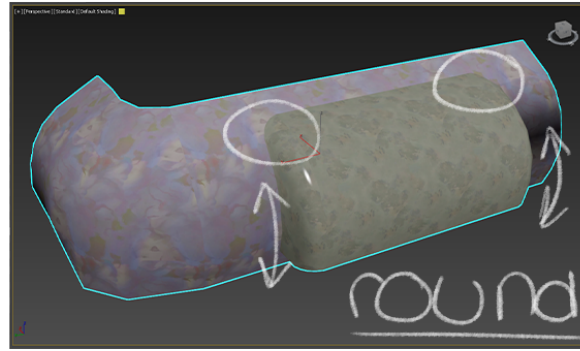
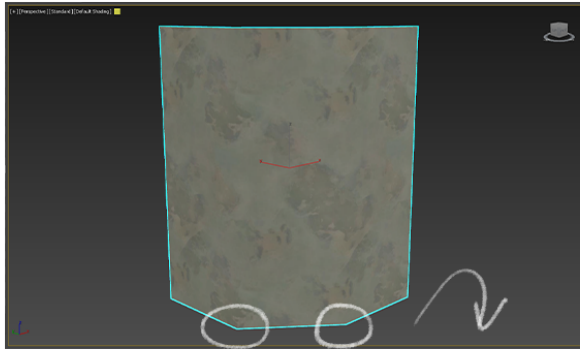
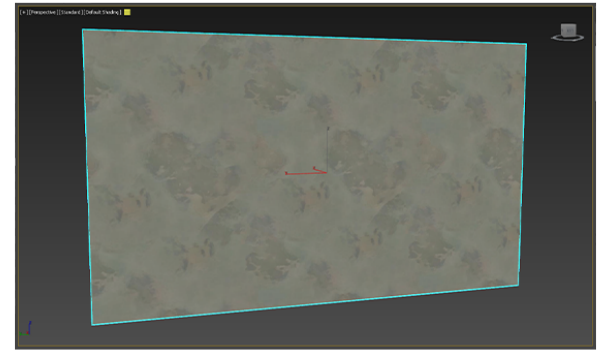
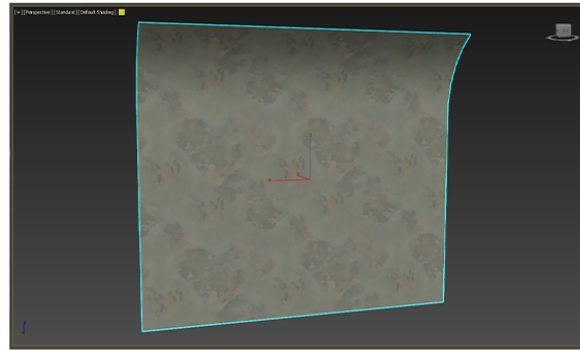
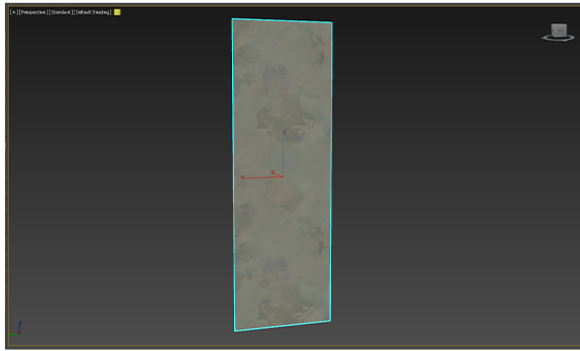
ASSET DEVELOPMENT



ASSET DEVELOPMENT



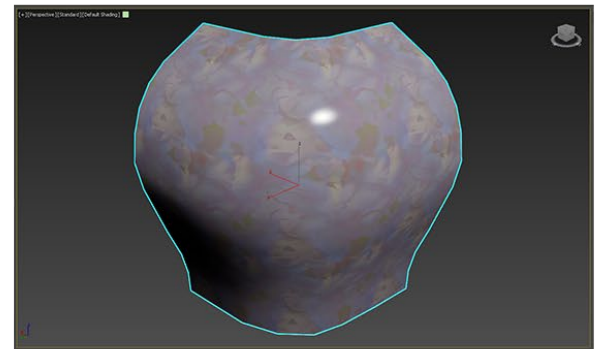
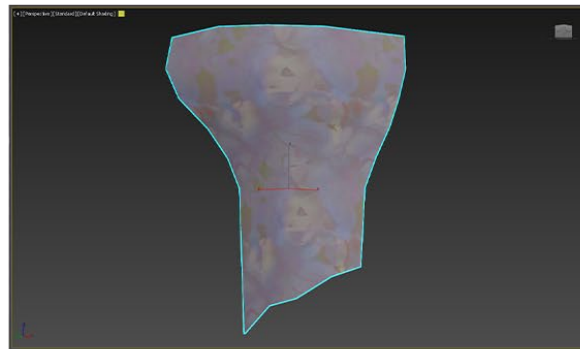
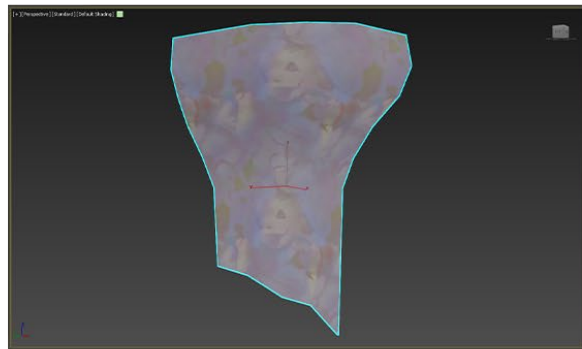
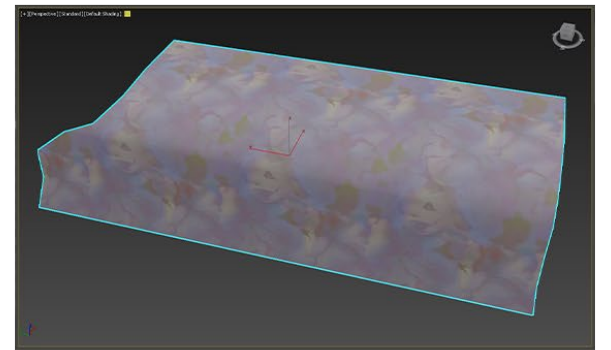
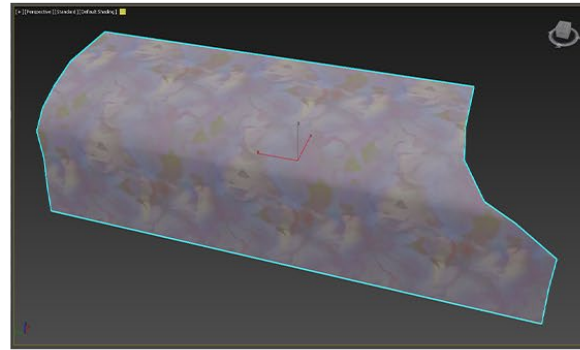
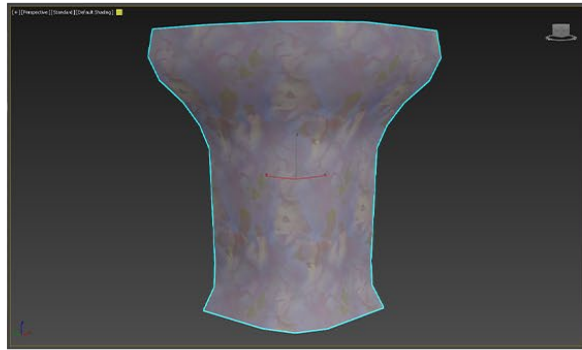
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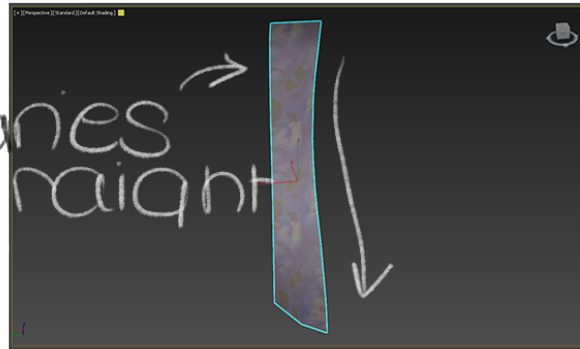
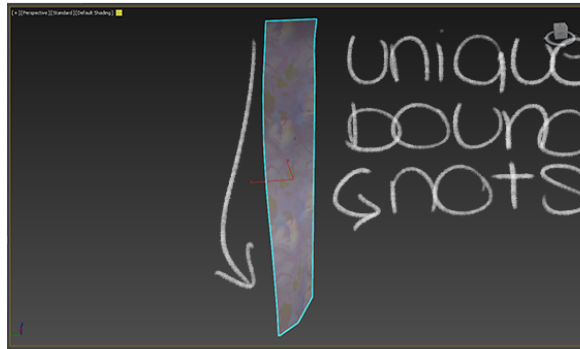
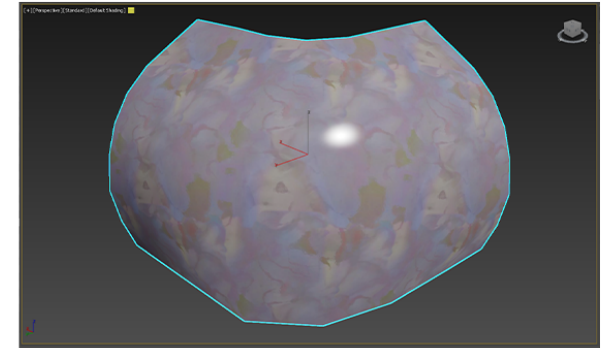
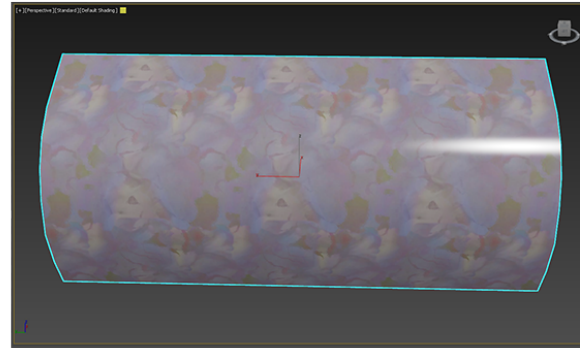
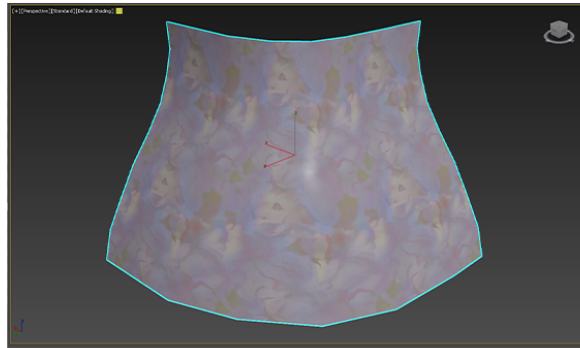
warm palette
↳ tropical!
Sunny climate
! facets!

↳ maintained safe shape language
↳ unique texture density and scale
↳ harsh boundaries (no material transition)

ASSET DEVELOPMENT

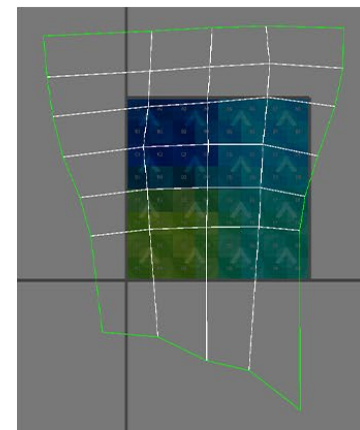
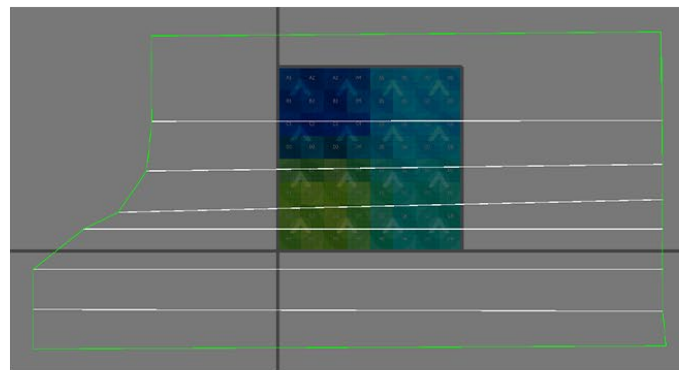
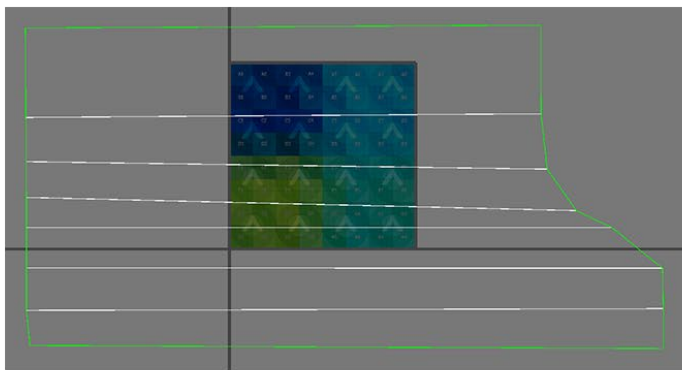
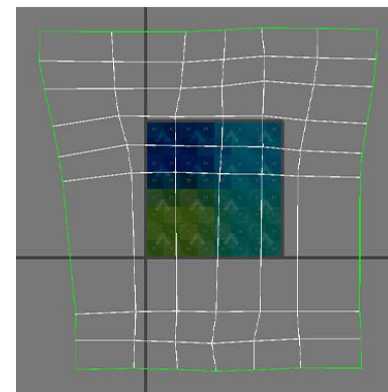
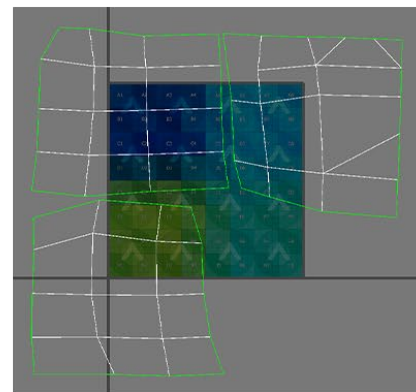
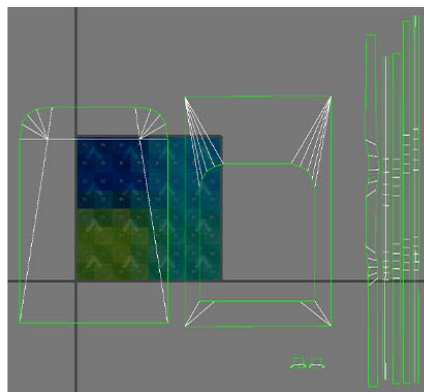
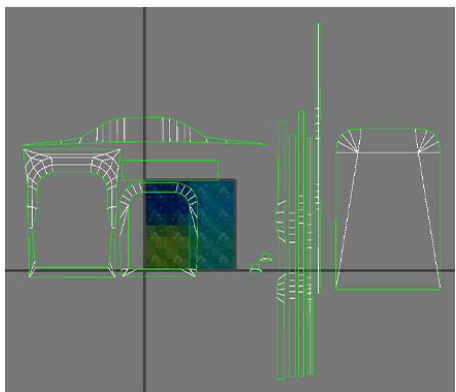


ASSET DEVELOPMENT

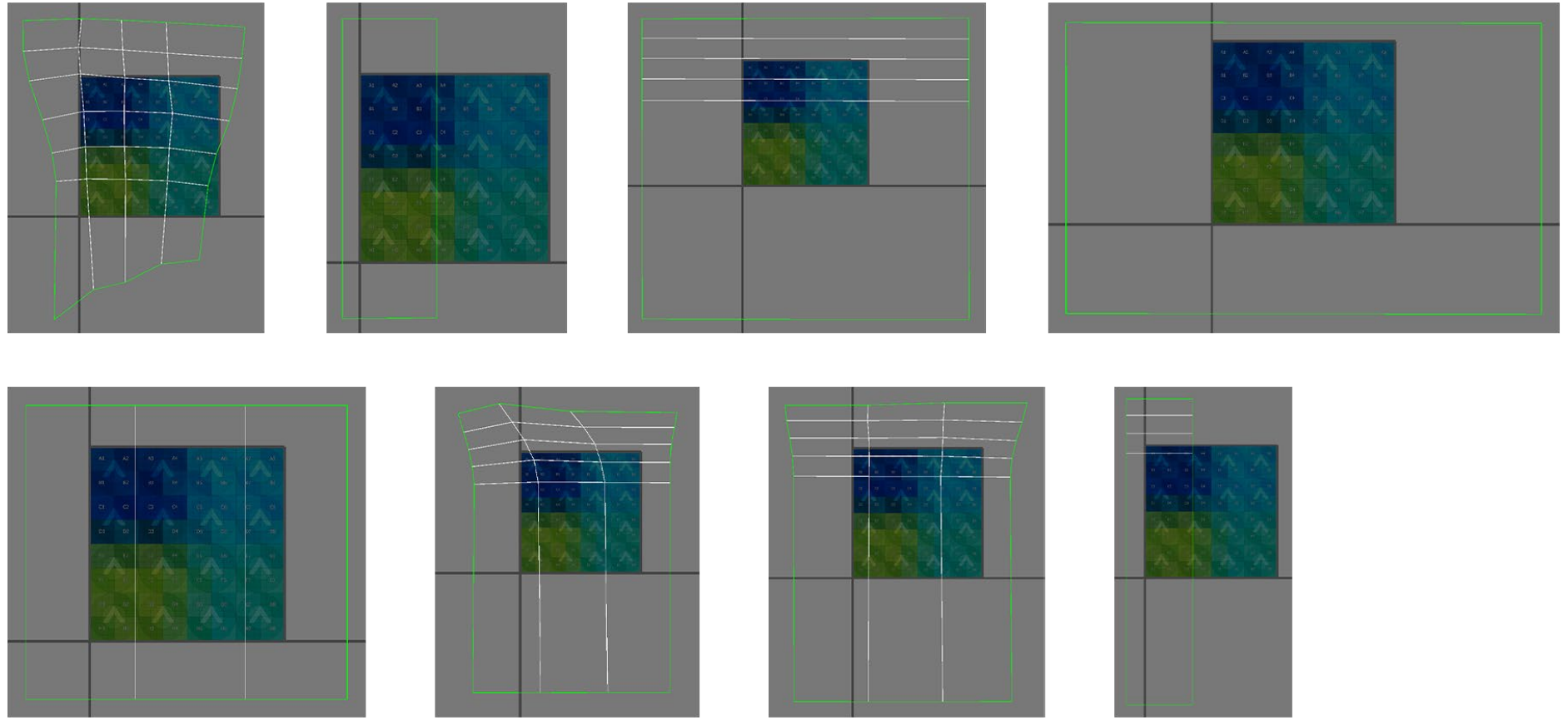


↳ doesn't consider grid alignment ⇒ changed appearance in game engine
↳ (left) and (right) assets → not modular!

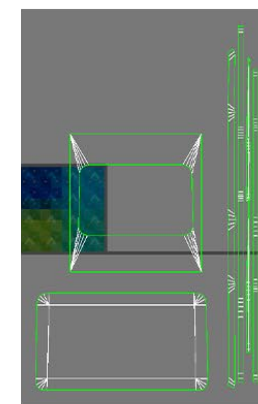
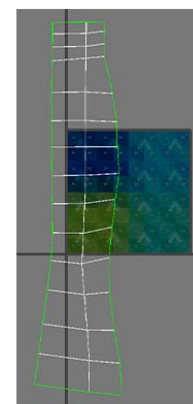
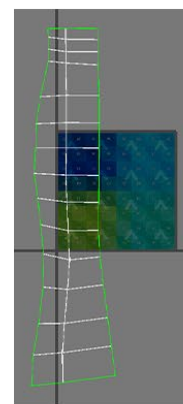
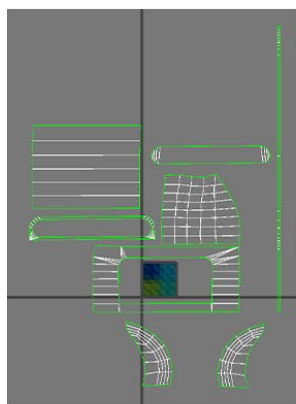
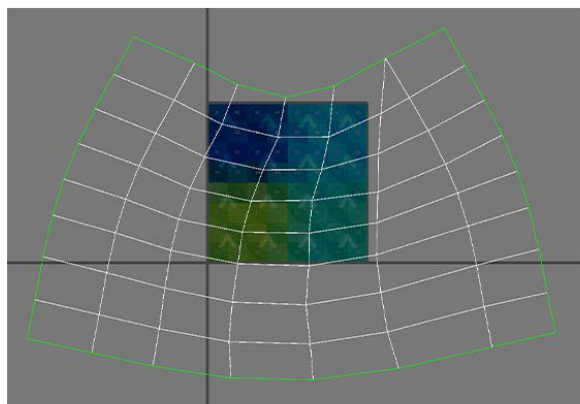
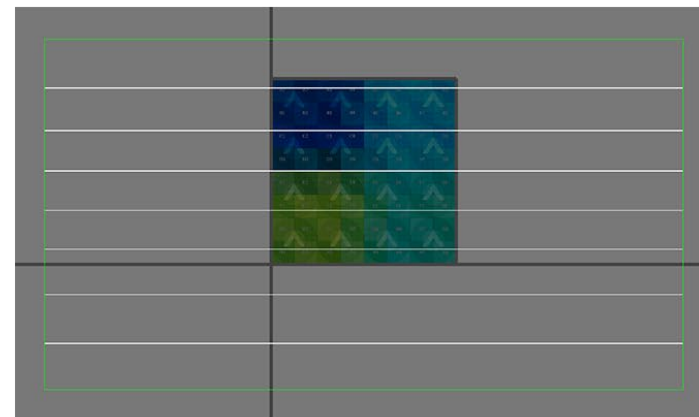
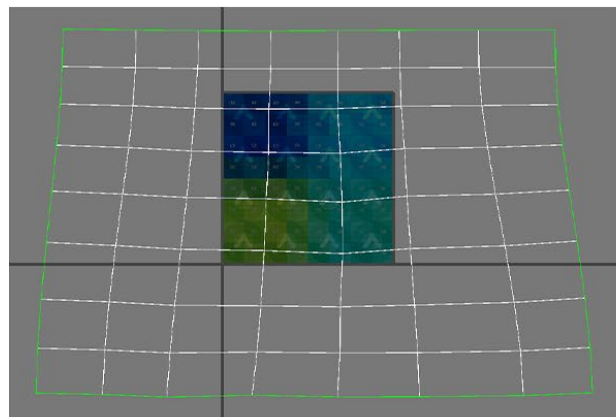
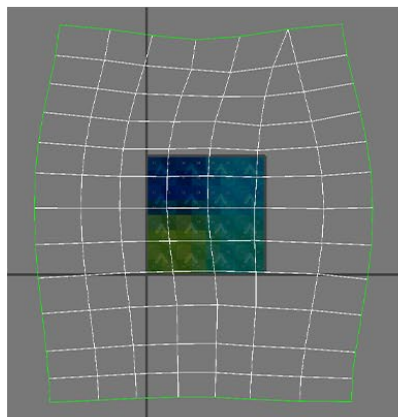
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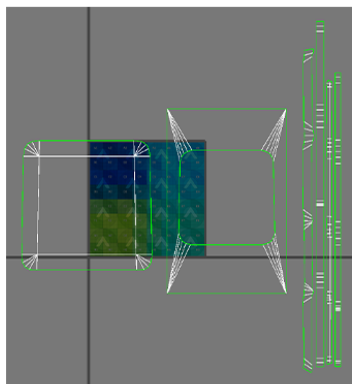
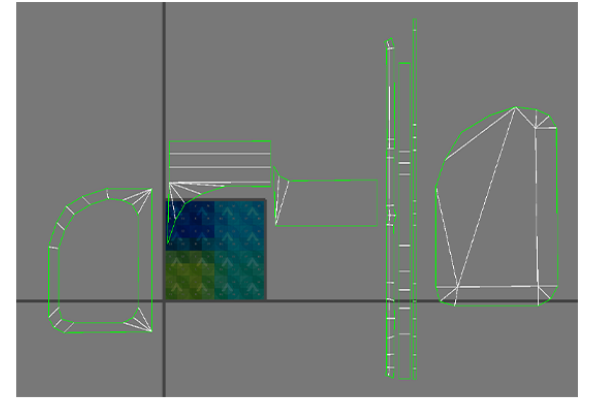
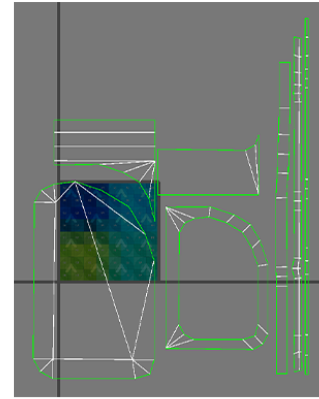
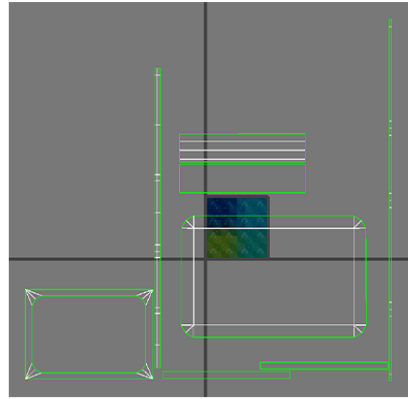
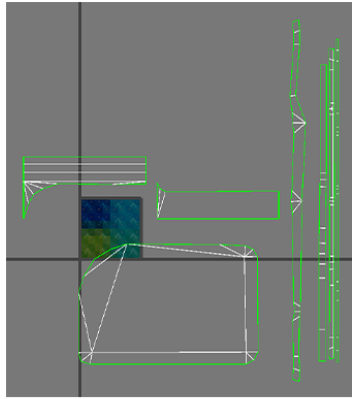
ASSET DEVELOPMENT



ASSET DEVELOPMENT



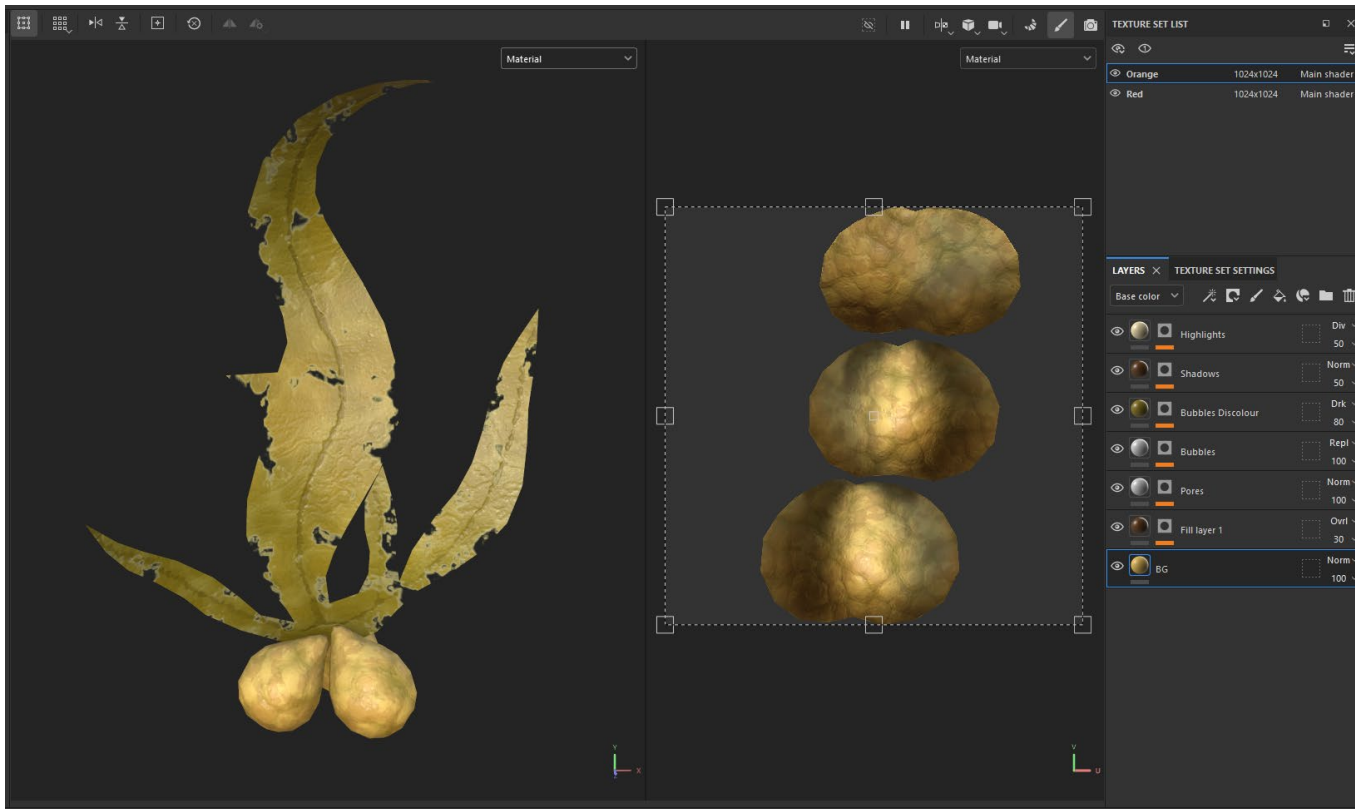
ASSET DEVELOPMENT



tileable unwraps → outside of texture space → not recognised when baking ⇒ rearrange current shells to save time!

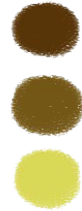
unique → channel one } switch with game engine nodes
tileable → channel two }
↳ texture coordinate!

MATERIAL DEVELOPMENT

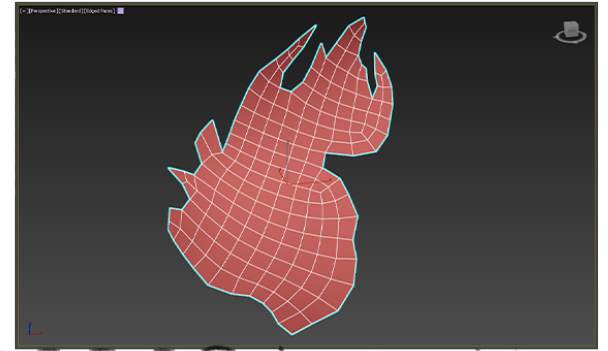
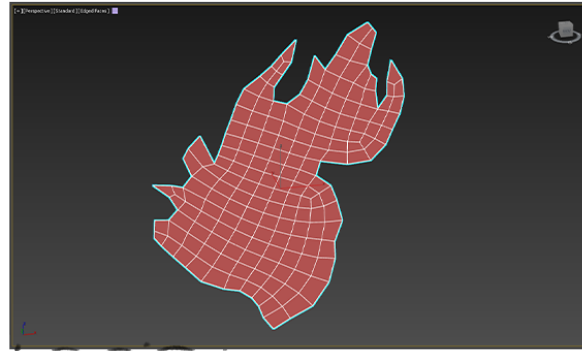


- Reframe mindset.
- Compare to programs where comfortable with realism.
- Environment determines upkeep.
- Opacity mask breaks apart silhouette.
- Intentional point placement.
- Height variance from grunge maps.
- Flat and one-dimensional. Seen from far distances.
- Discolouration. Cohesive colour palette.
- Warmth from tropical climate.

MATERIAL DEVELOPMENT

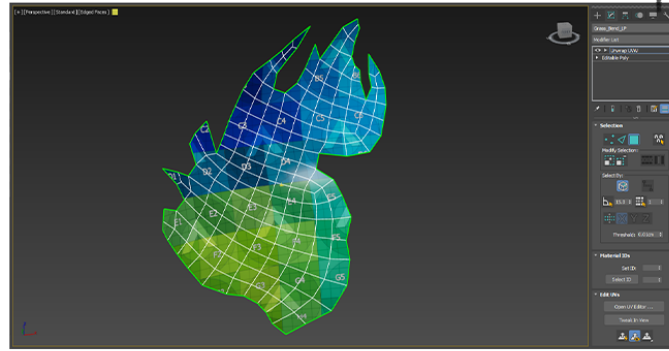
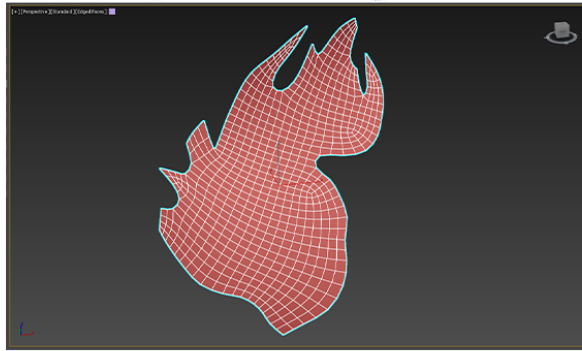


MATERIAL DEVELOPMENT



reference material

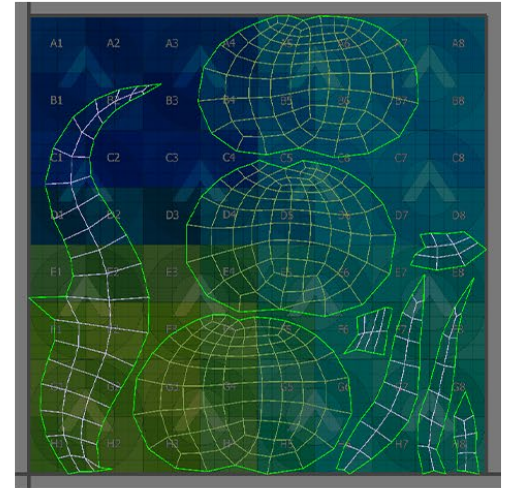
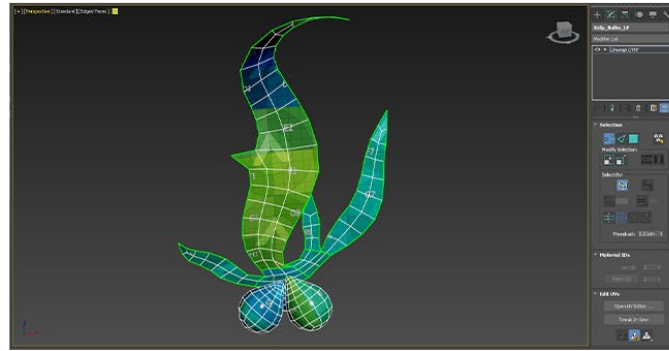
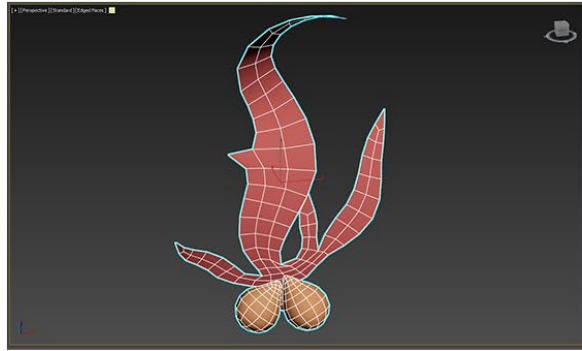
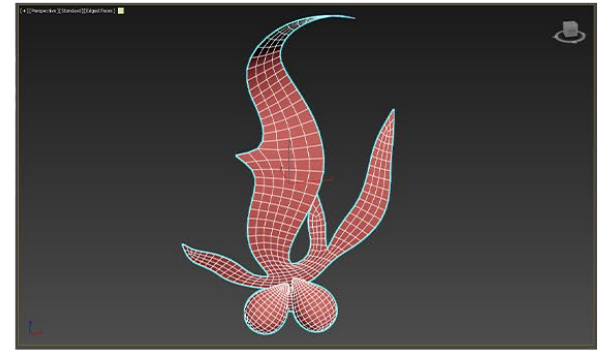
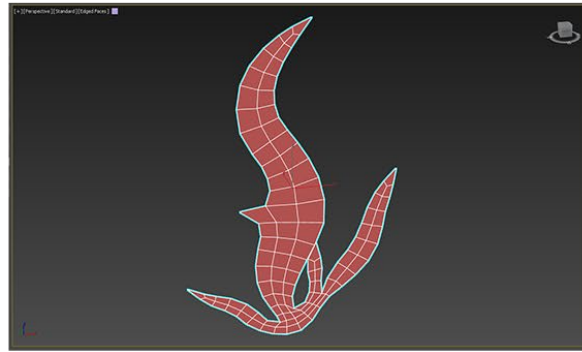
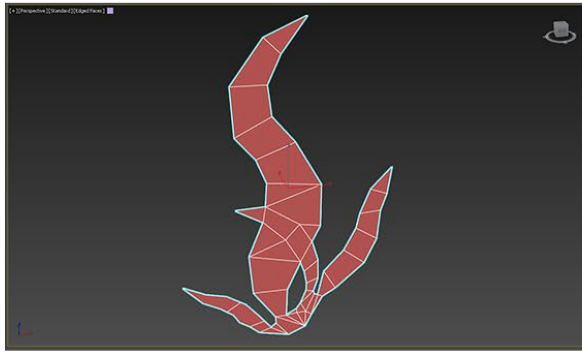
grass blades



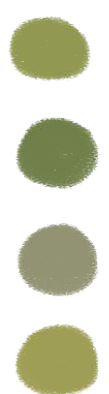
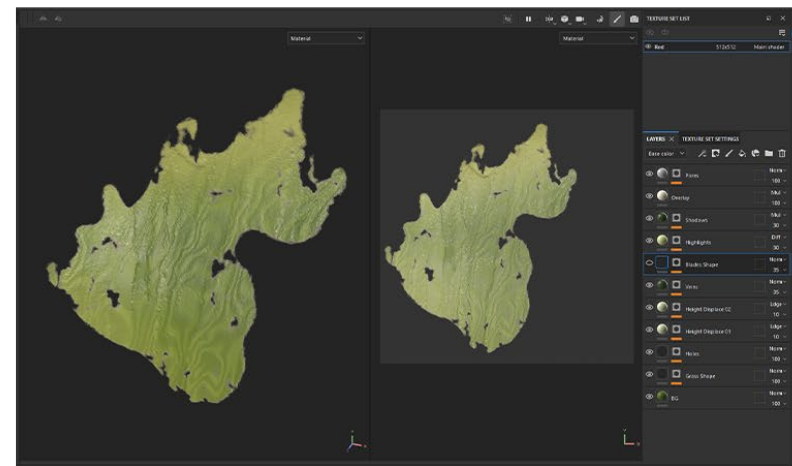
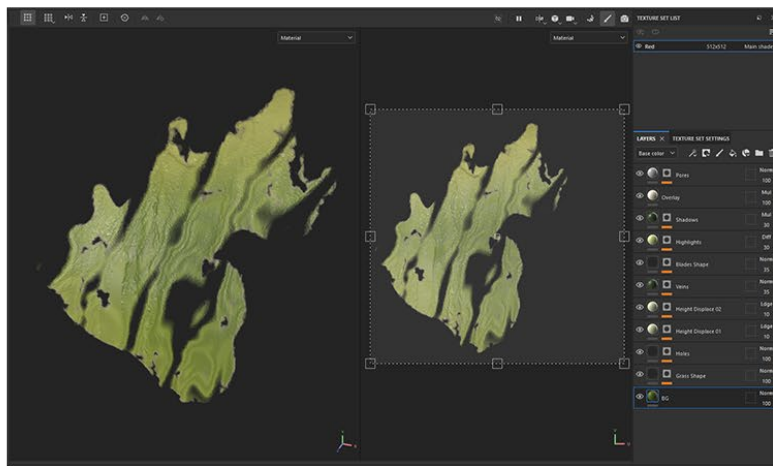
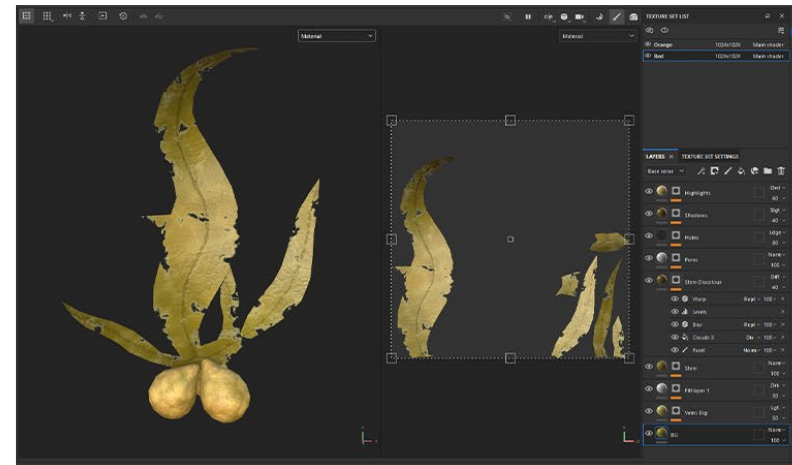
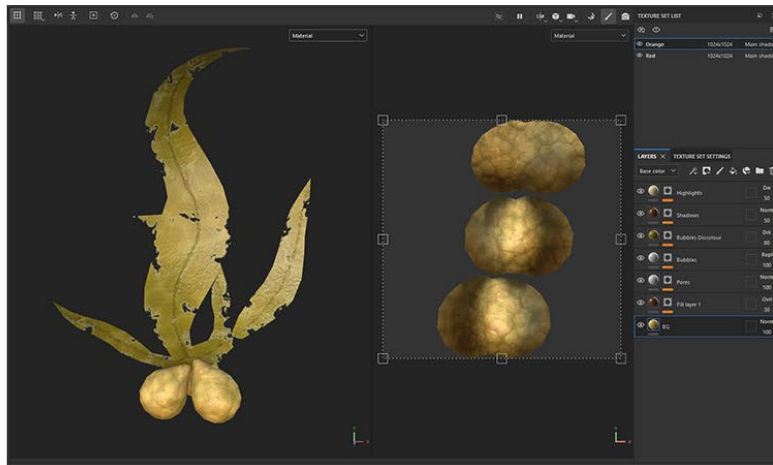
bend for organic/messy shape (wind influence)

retopology + openSubdiv → smooth corners

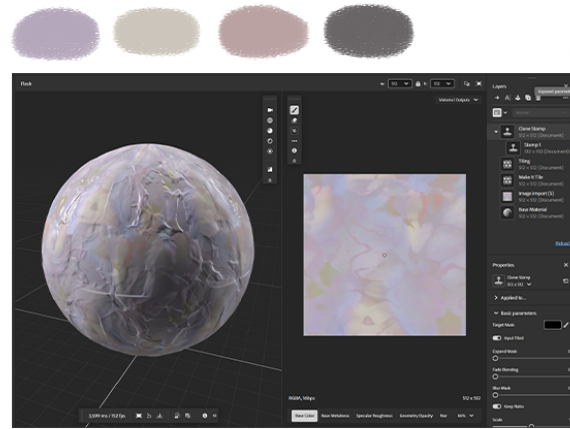
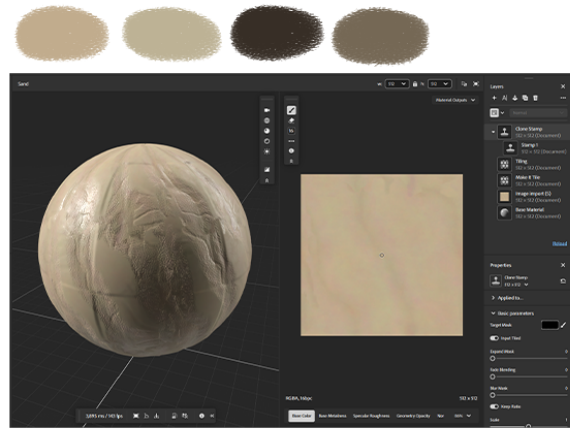
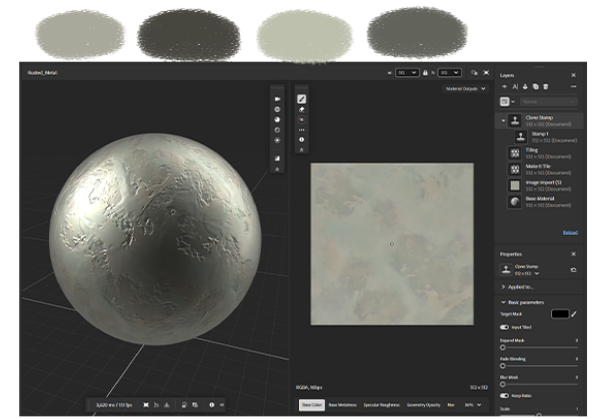
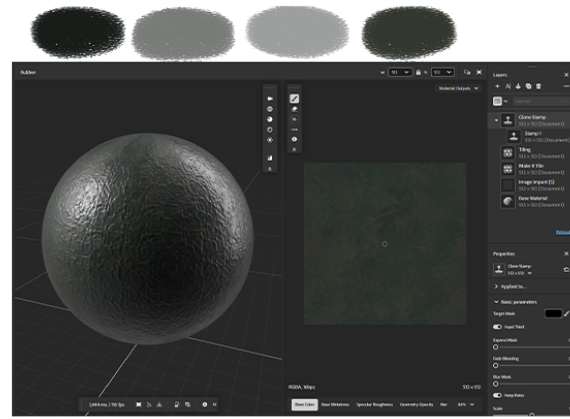
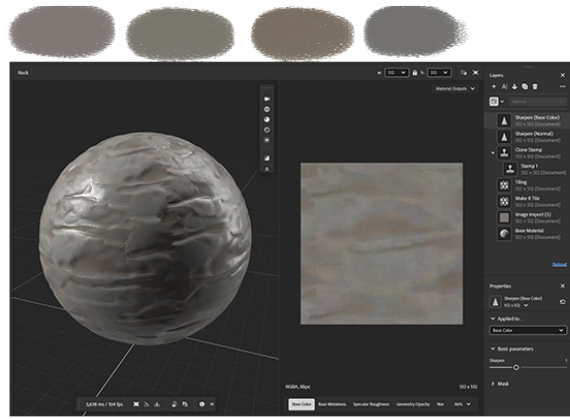
MATERIAL DEVELOPMENT



MATERIAL DEVELOPMENT



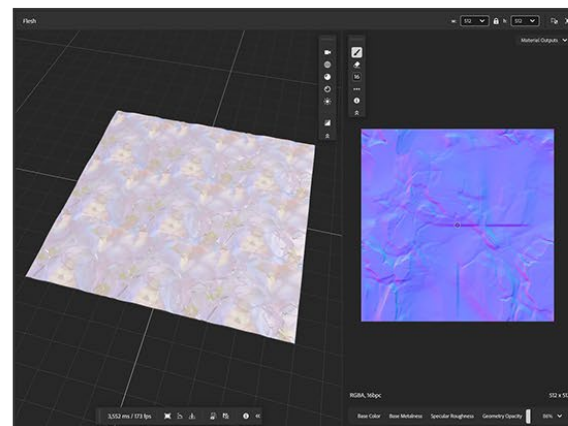
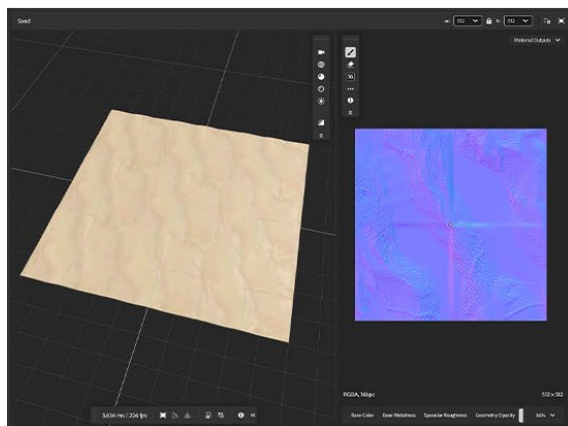
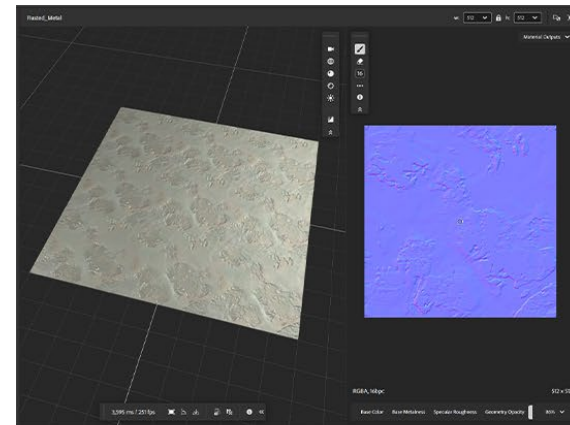
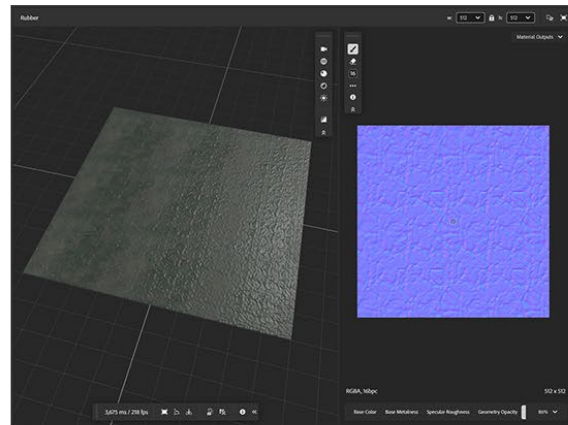
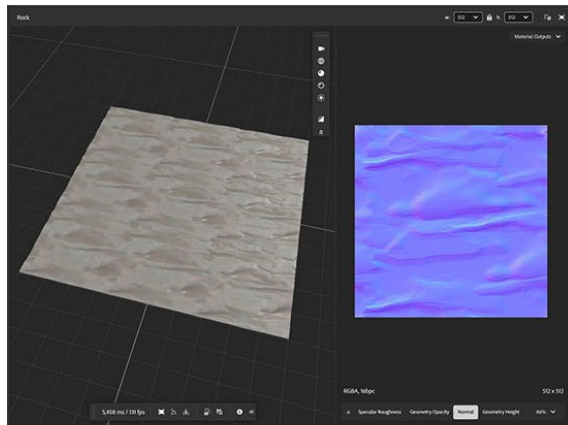
MATERIAL DEVELOPMENT



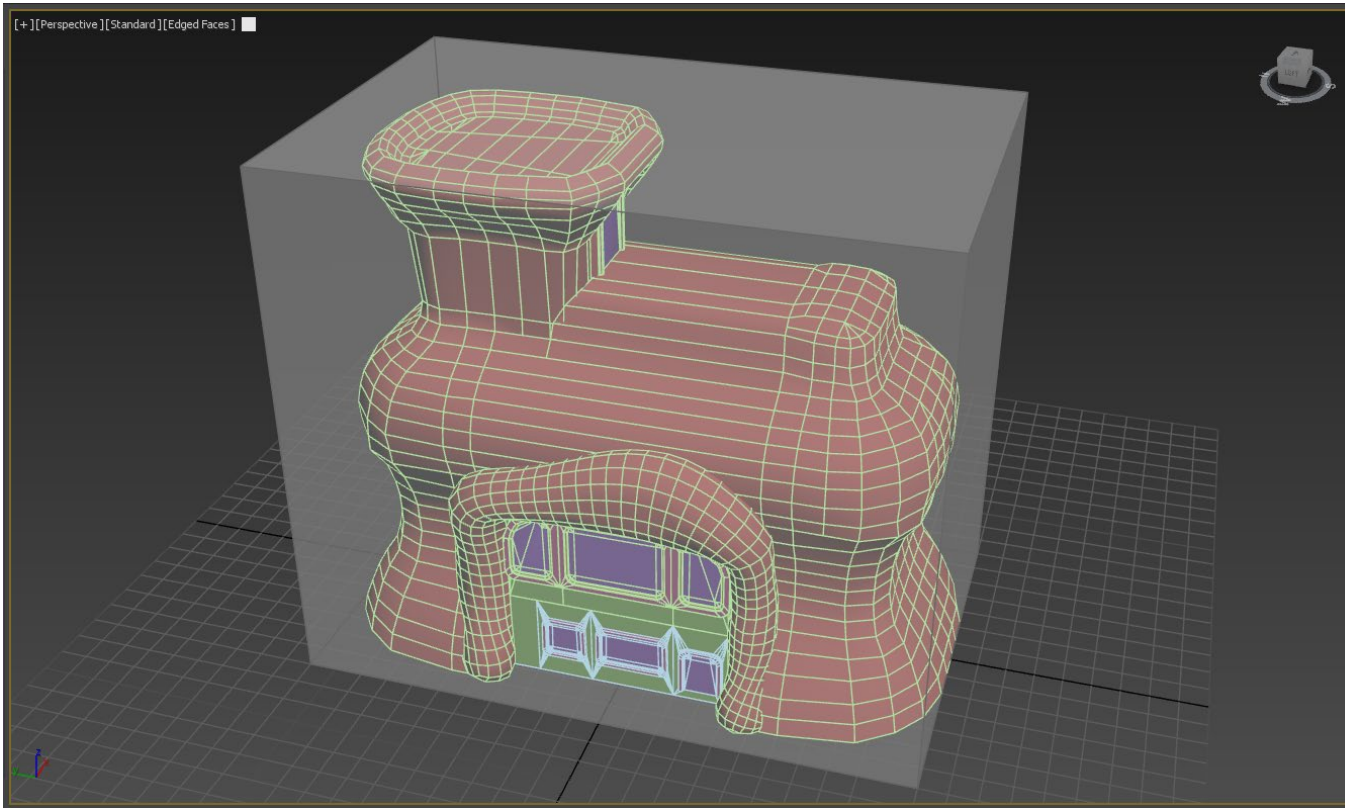
removing
marsh
repeated nile
boundaries
GalonesStamp
for stubborn
lines

↳ non-specific movement
direction ⇒ conceals nile
duplication → currents move / lower sand

MATERIAL DEVELOPMENT

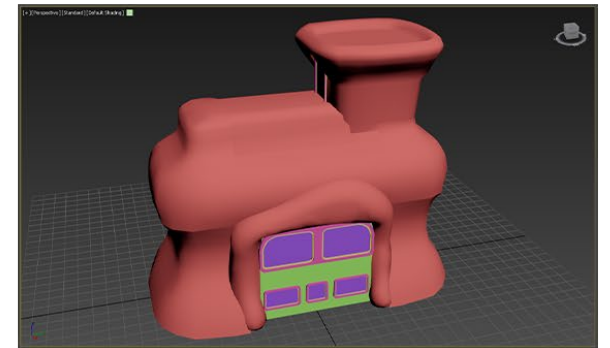
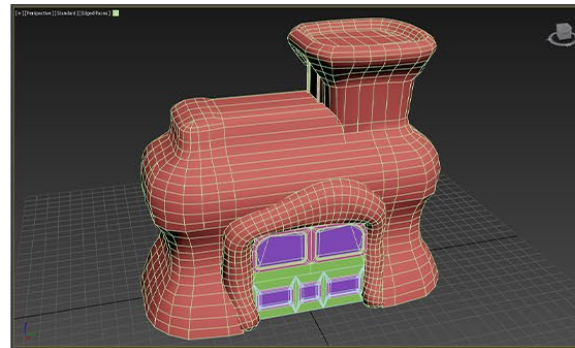
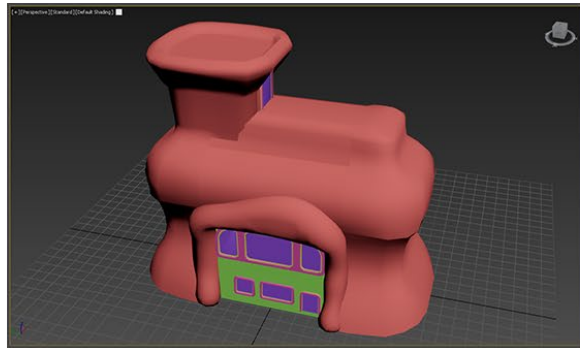
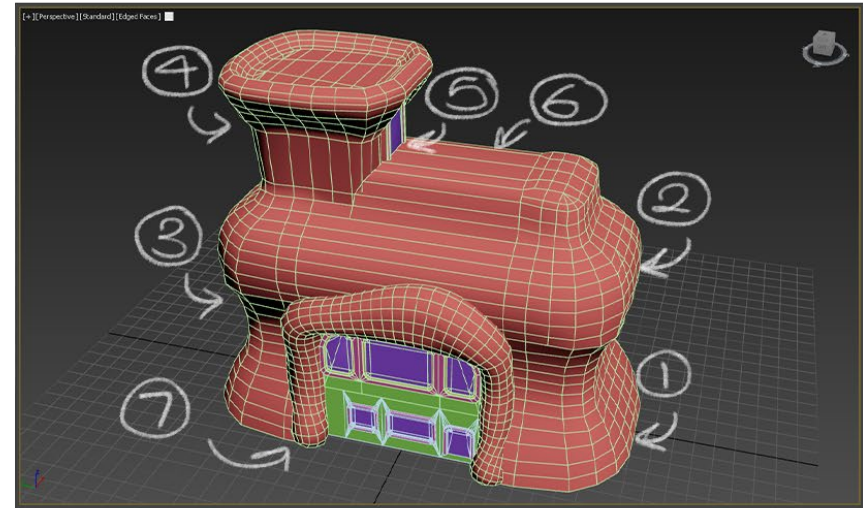
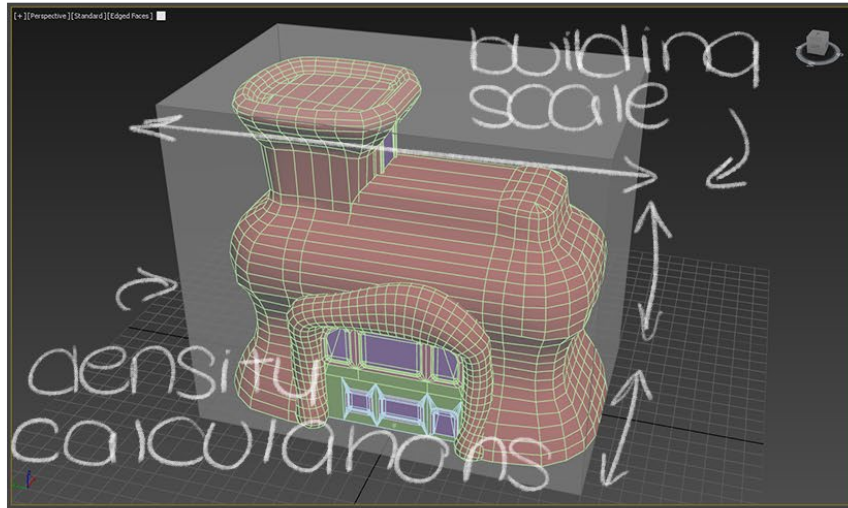


ASSET DEVELOPMENT



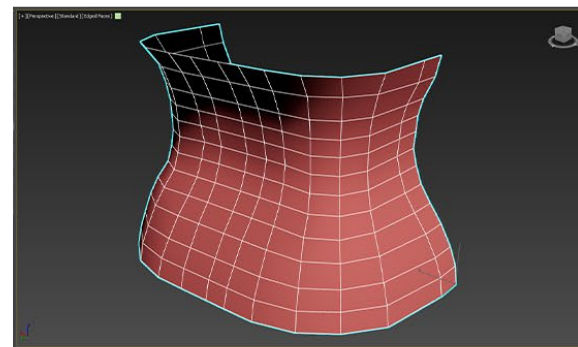
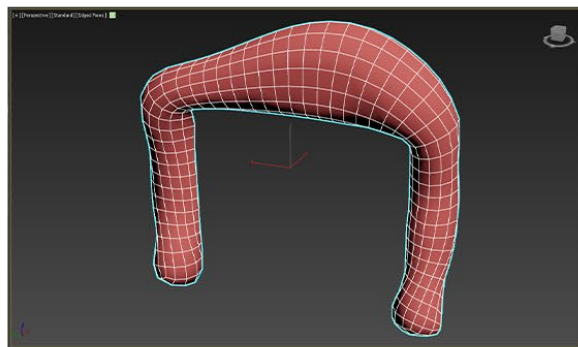
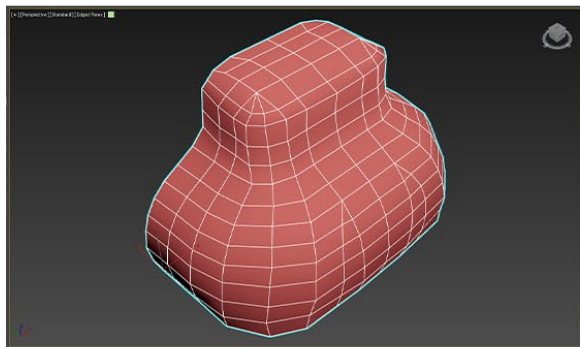
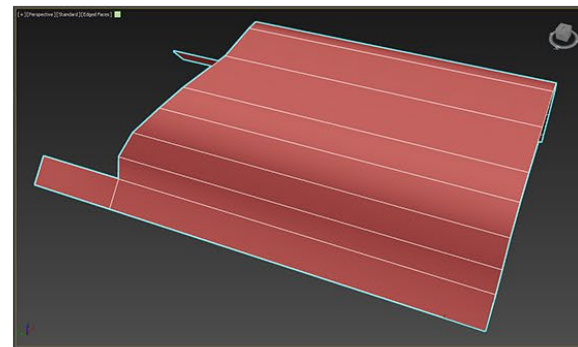
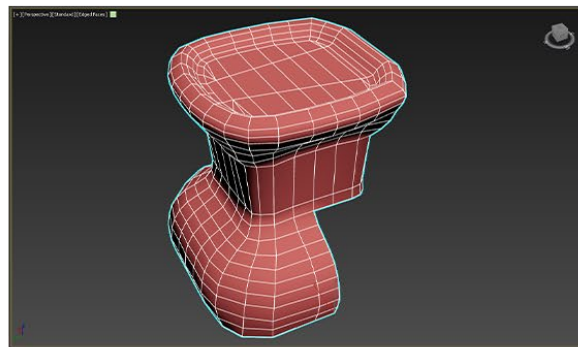
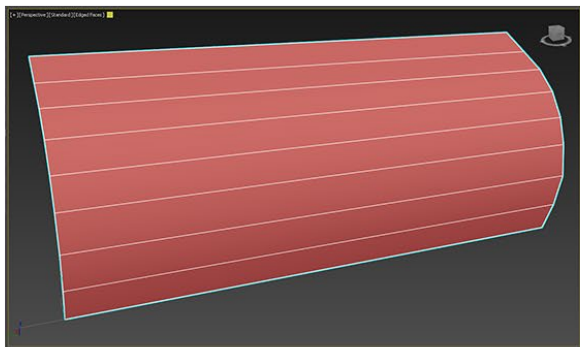
- Building dimensions determine texture resolution.
- Game engine measurement units.
- Broad modular assets for quick construction.
- Trunk removes openings between organic and mechanical walls.
- Round, welcoming and safe shape language.
- Chimney closed to conceal construction. Contents implied with materials.
- Intentional overlap. Maintains reusable structure.

ASSET DEVELOPMENT

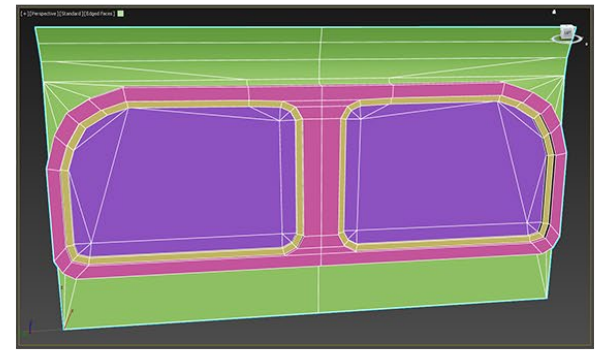
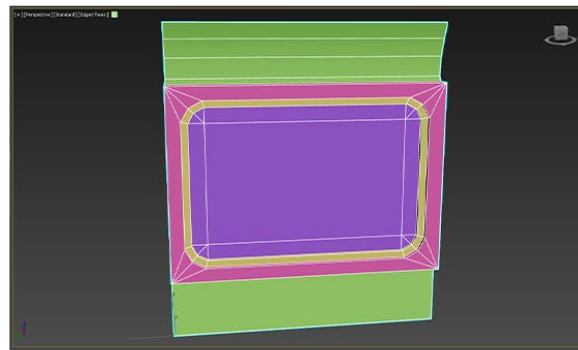
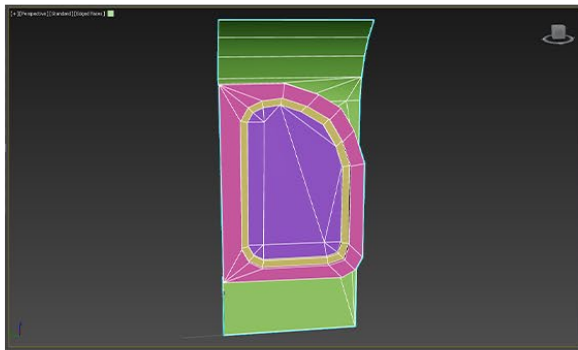
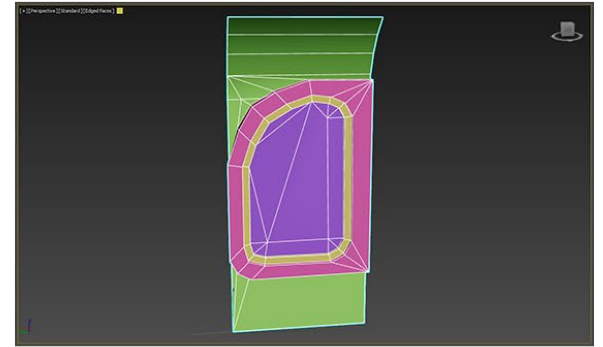
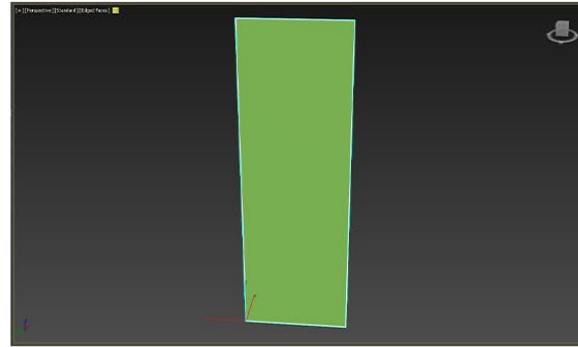
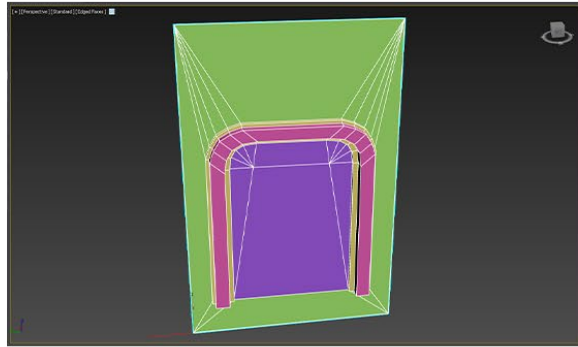


↳ BIG sections = less time on construction in the engine (easy/straight boundaries)

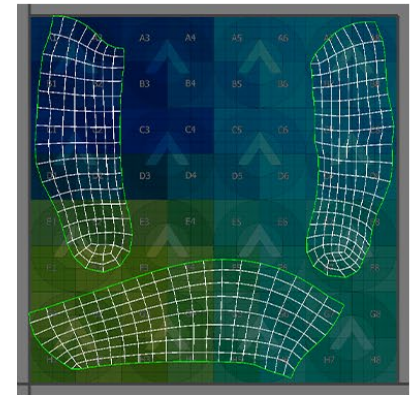
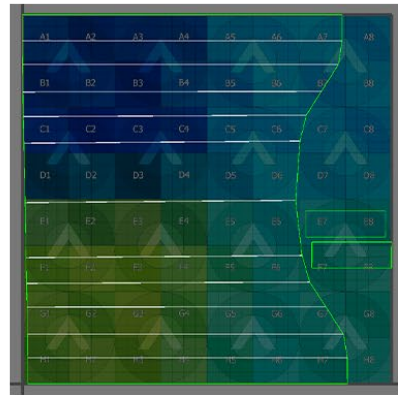
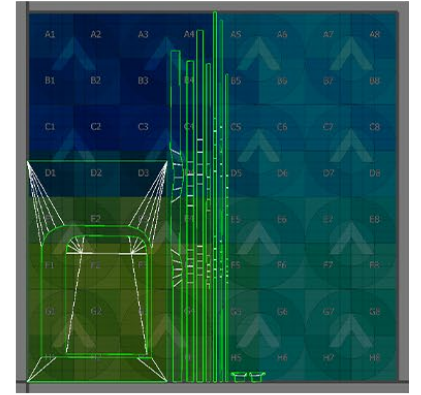
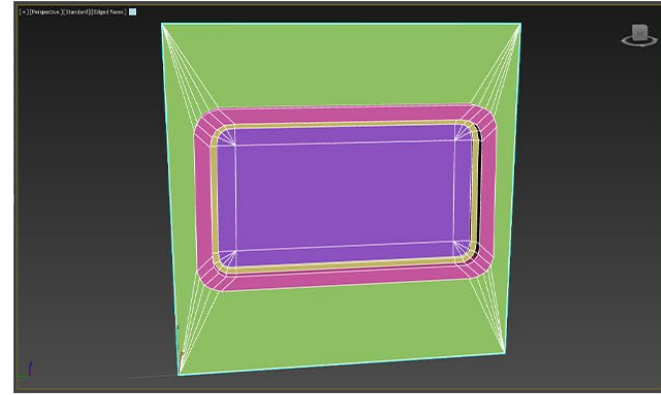
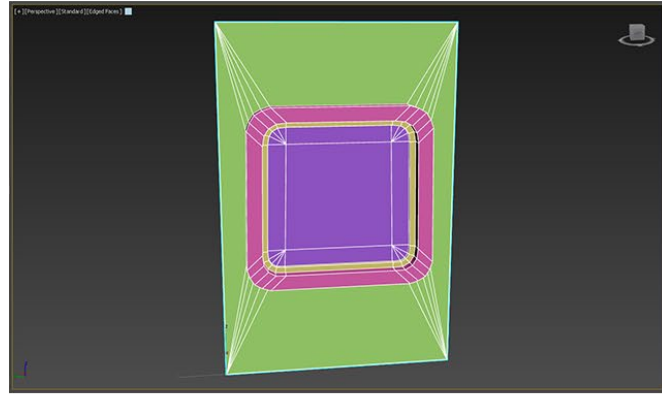
ASSET DEVELOPMENT



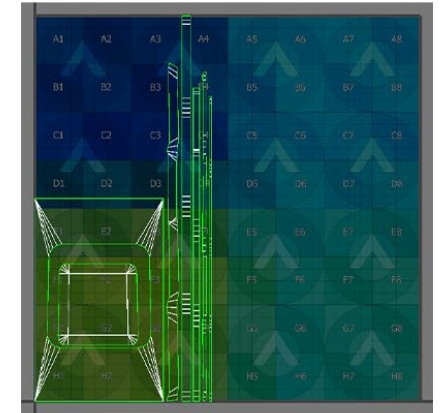
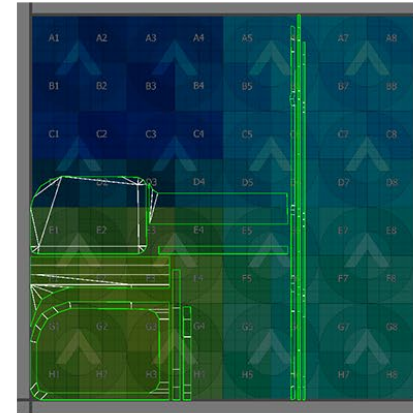
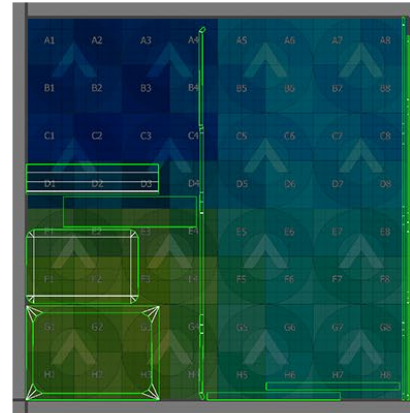
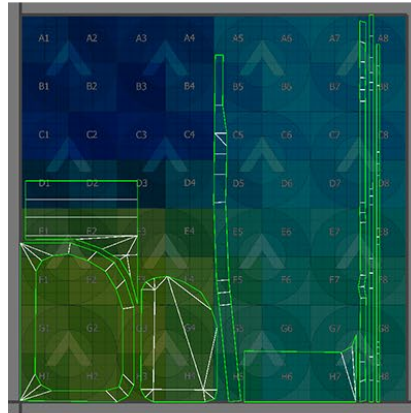
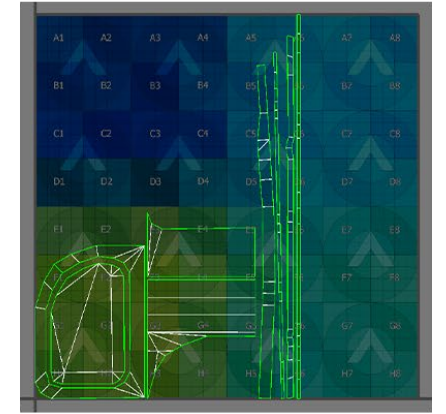
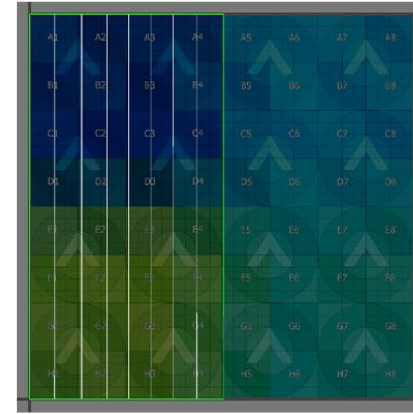
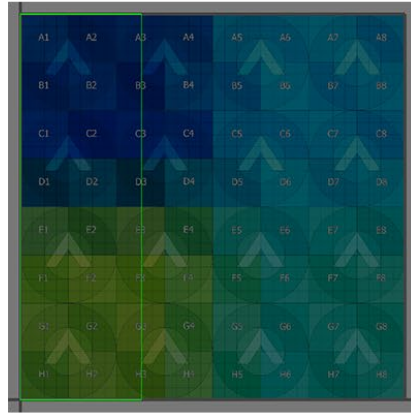
ASSET DEVELOPMENT



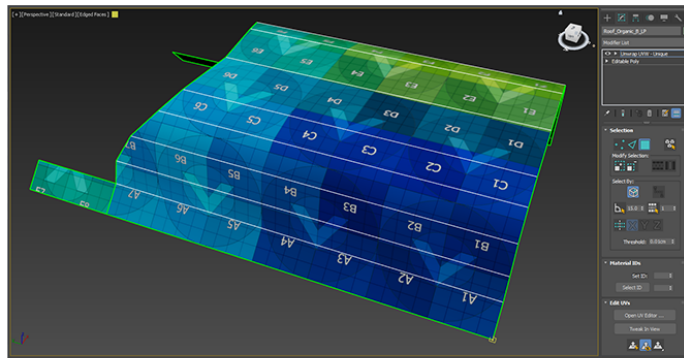
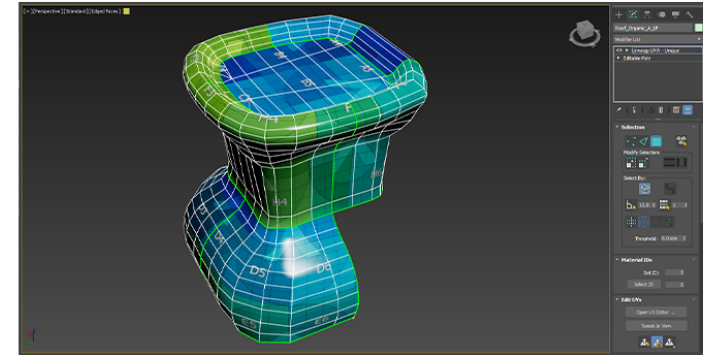
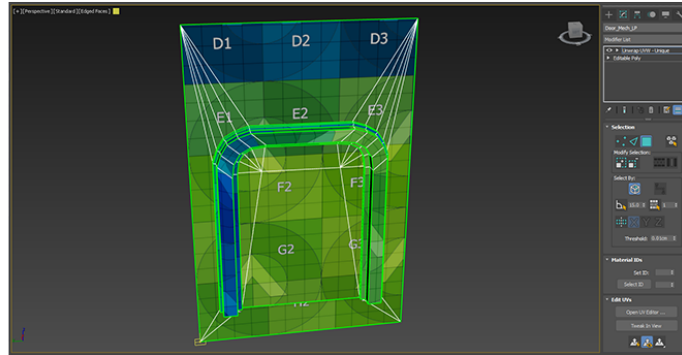
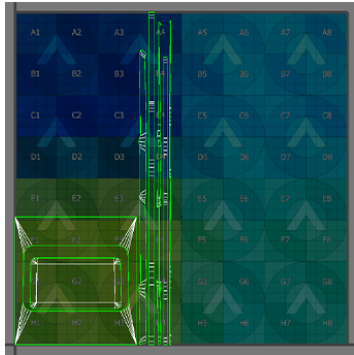
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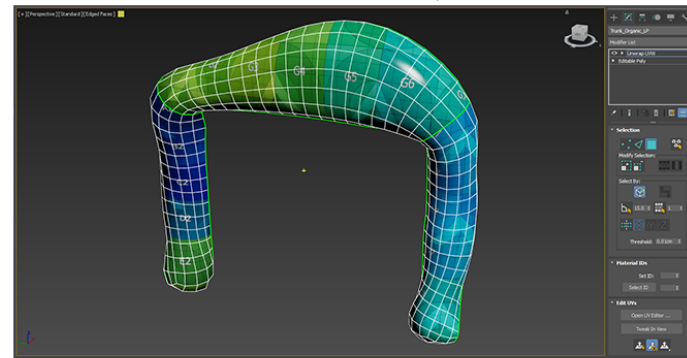
ASSET DEVELOPMENT



ASSET DEVELOPMENT



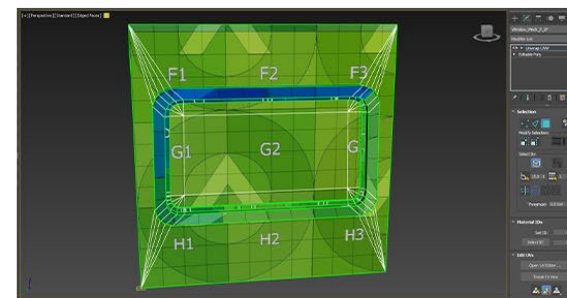
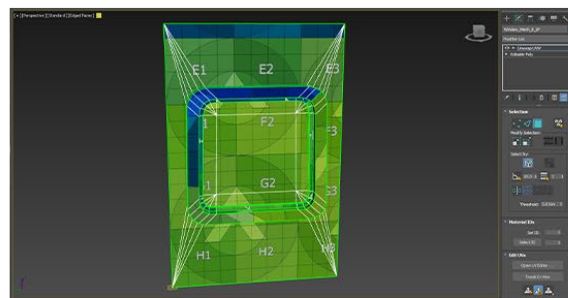
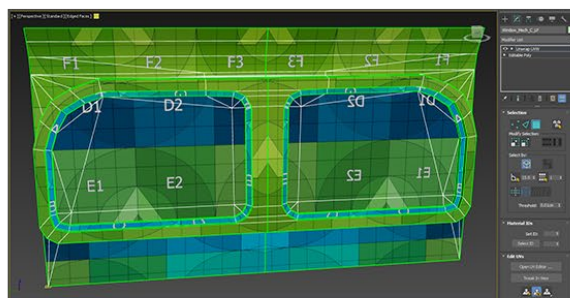
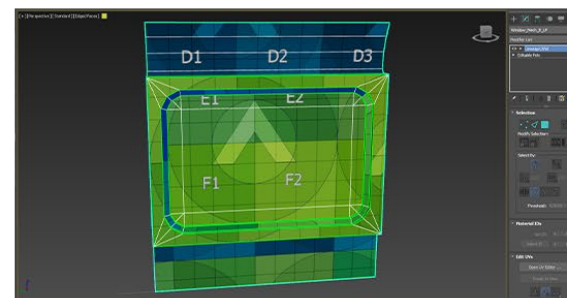
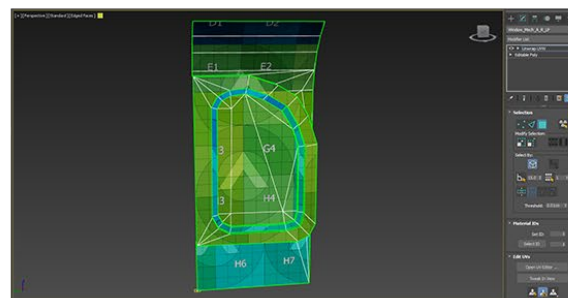
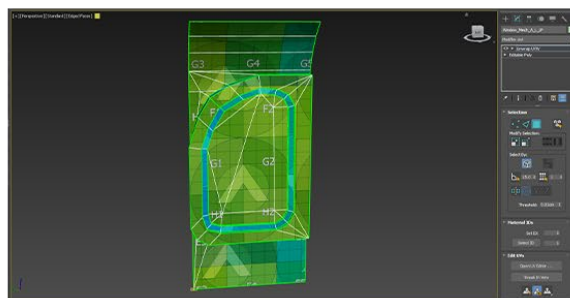
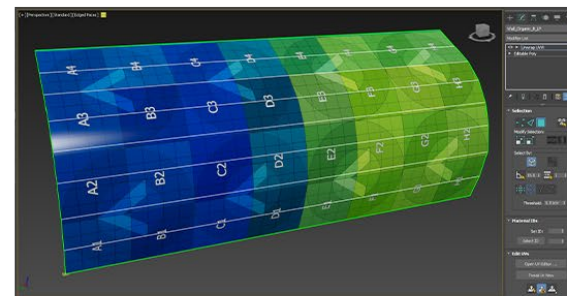
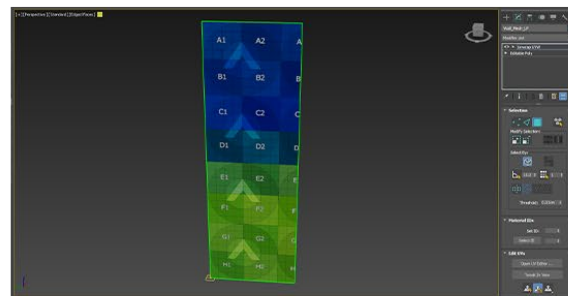
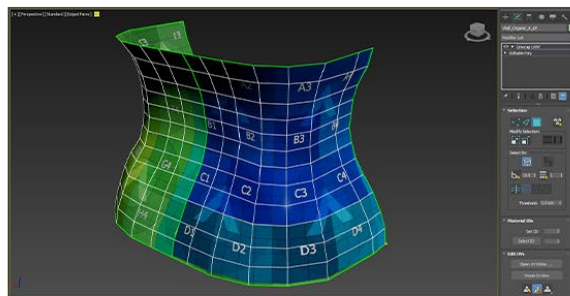
removes gaps



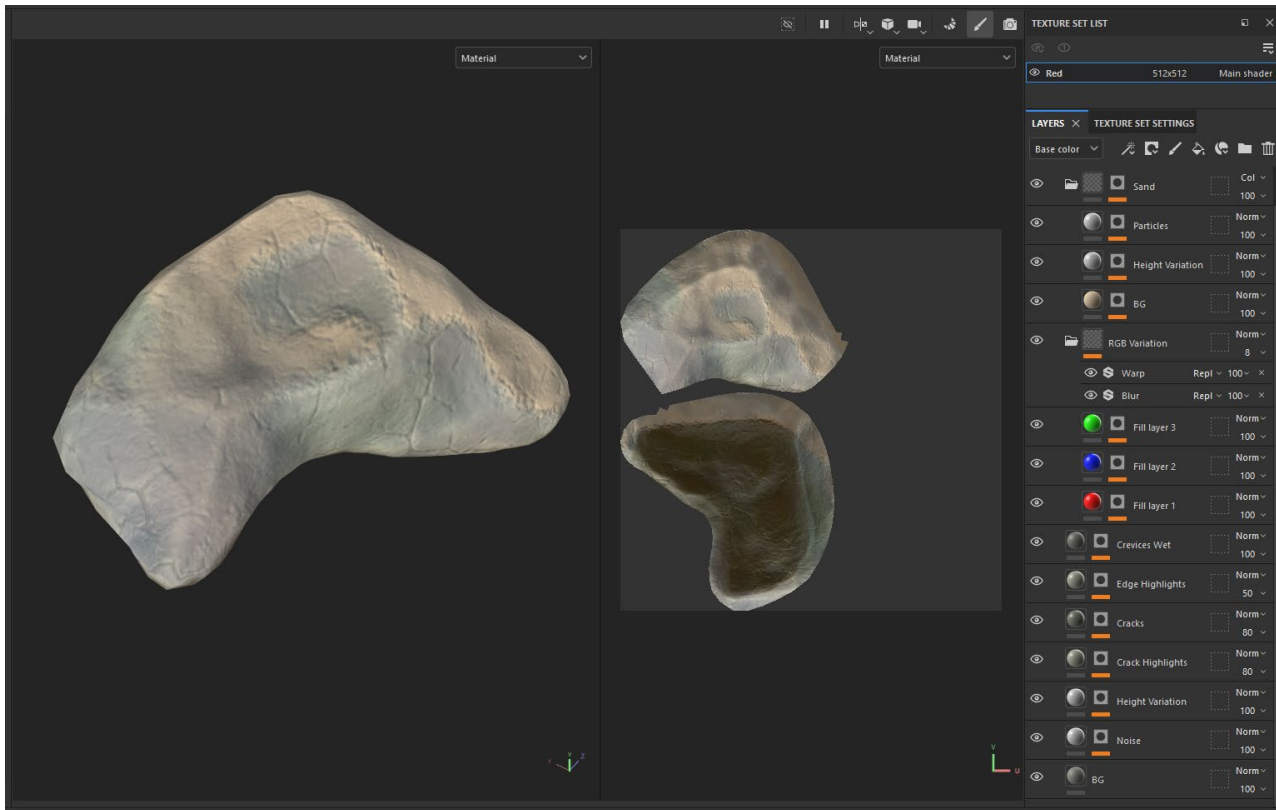
transition trunk
& balances organic + mechanic (wall vines)

unique unwraps → seams on hard edges
duplicate ⇔ change scale ⇔ change placement
(nearly unwraps → abandon scripts if no time is available (deformation))

ASSET DEVELOPMENT

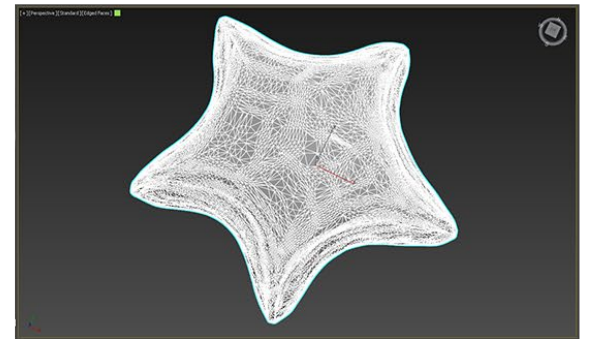
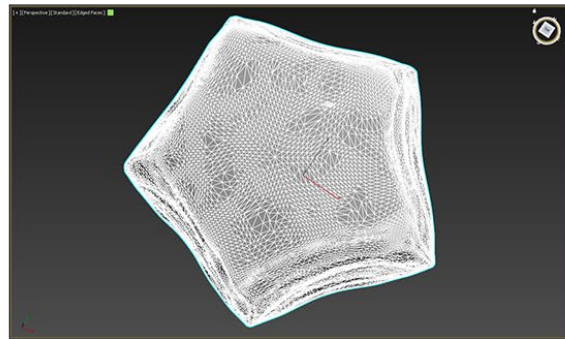
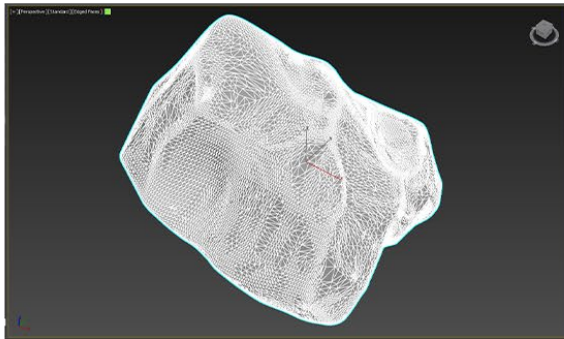
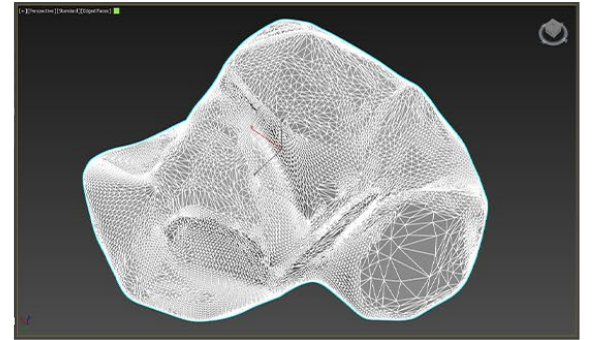
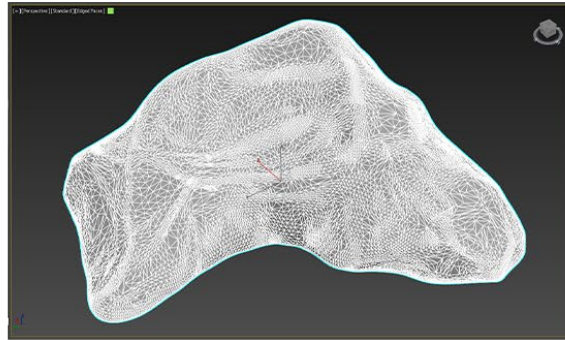
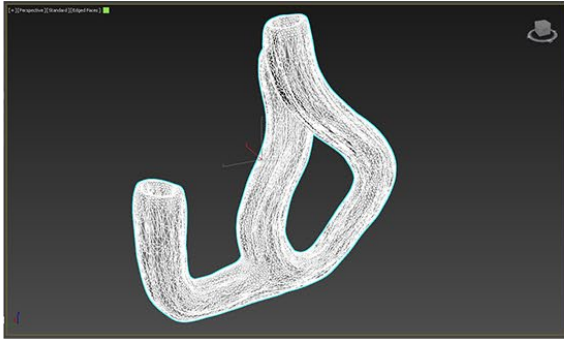


MATERIAL DEVELOPMENT

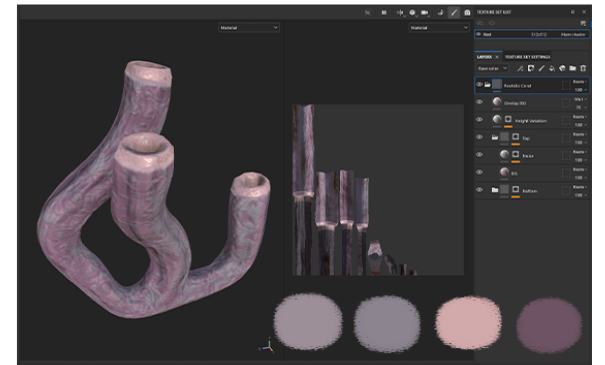
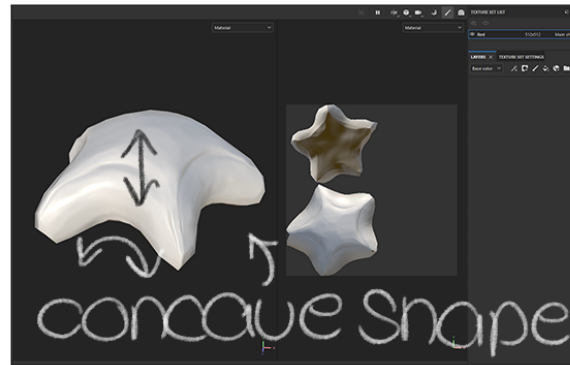
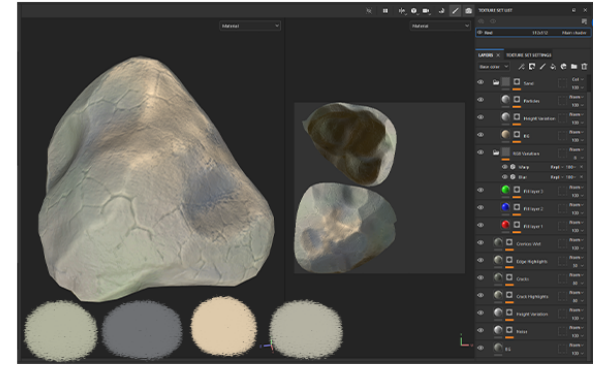
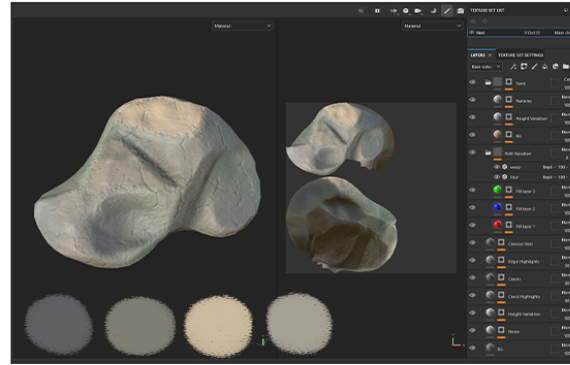
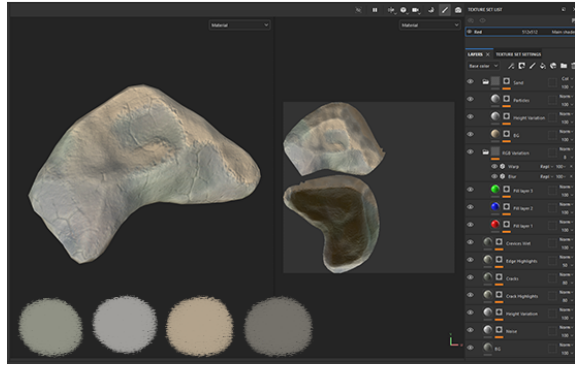


- RGB mask colour variance.
- Smooth boundaries. Gradients to maintain realism.
- Cracks from constant current exposure.
- Sand determines upward facing surface.
- Opacity change. Sand returns to ocean floor from rock slopes.
- Accentuate dimensions and contrast with shadows and highlights.
- Moisture and bacteria collect in recesses. Boosted roughness.
- Grunge maps for height variance.

MATERIAL DEVELOPMENT

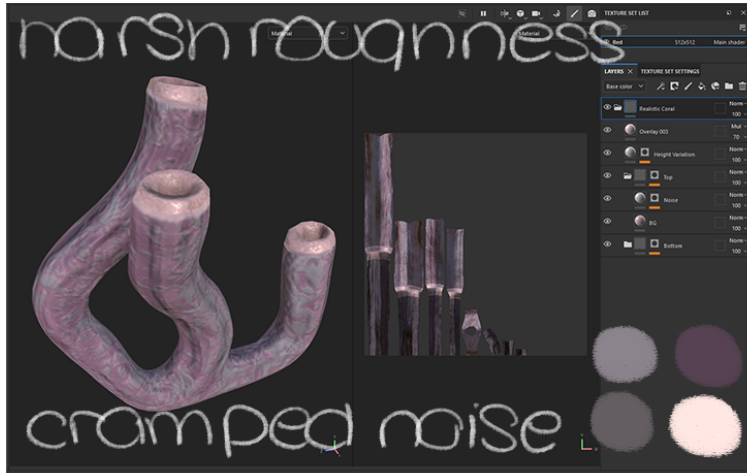


MATERIAL DEVELOPMENT

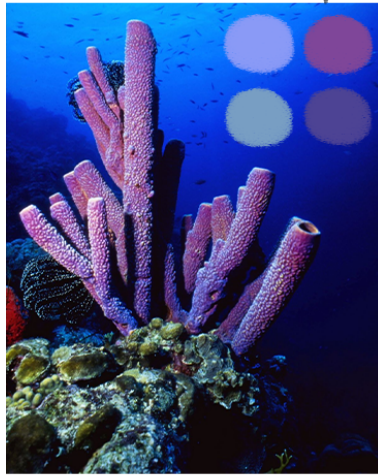


smart materials for quick production → customise generators to match asset shape
↳ niceable roughness quality (appears as it would on dry land) → RGB colour variance (smooth/blur).

MATERIAL DEVELOPMENT



↳ too many grunge maps



no impact from specular reflections

Modular Tileable Unwrapping Planner V2

Your building's total surface area multiplied with its square root.

01. Calculate the area of each cube face. Length multiplied by width.
02. Add the areas of each cube face together.
03. Find the square root of the cubes surface area. Which number could you multiply by itself?

Length = 2200
Width = 1400
Height = 1900

2200 (The cube's longest bottom edge).
1400 (The cube's shortest bottom edge).
1900 (The cube's side / vertical edge).

The front and back faces.
 $2200 * 1900 = 4,180,000 * 2 = 8,360,000$

The side faces.
 $1400 * 1900 = 2,660,000 * 2 = 5,320,000$

The top and bottom faces.
 $2200 * 1400 = 3,080,000 * 2 = 6,160,000$

$8,360,000 + 5,320,000 + 6,160,000 = 19,840,000$

Surface Area = 19,840,000

$19,840,000 / 2 = 9,920,000$

Building Resolution = 9,920,000

harsh colour balance and boundaries ↳ raised "squiggly" heights (would have to be scripted!)

(conserve performance)

Material Resolutions

Flesh = 2048
Metal = 2048
Sand = 4096
Rubber = Unsure
Glass = Unsure

Consider separate surface area equations for each asset and average them.
e.g. What's the average surface area of the glass window panes / rubber trims?

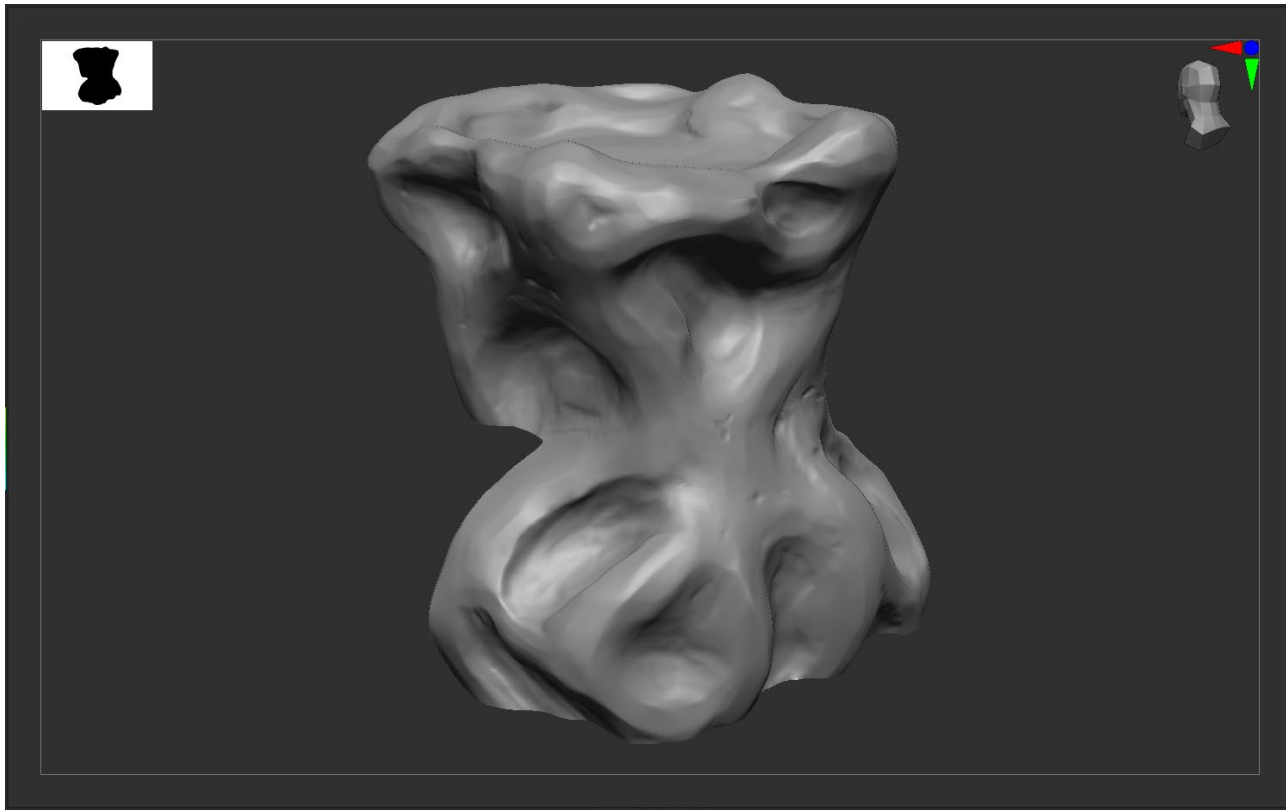
To calculate the dimensions of your UES landscape, multiply the number of quads by its X / Y scale. The default is 100. The common UES landscape contains 56 quads and measures 5600 x 5600 centimetres.

Your scene cannot contain more than one 4K resolution map, or more than two 2K resolution maps.
Can you lower the resolution to account for its distance from the camera?

↳ building is too large! (blurry tileable resolutions)

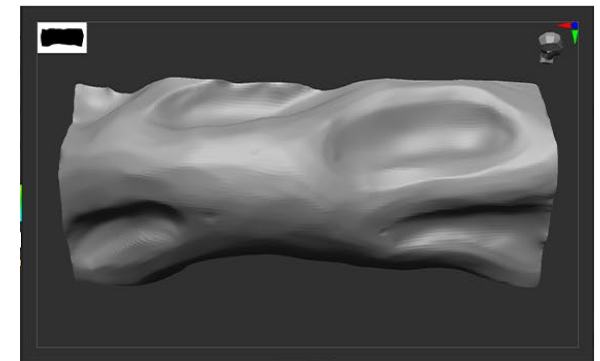
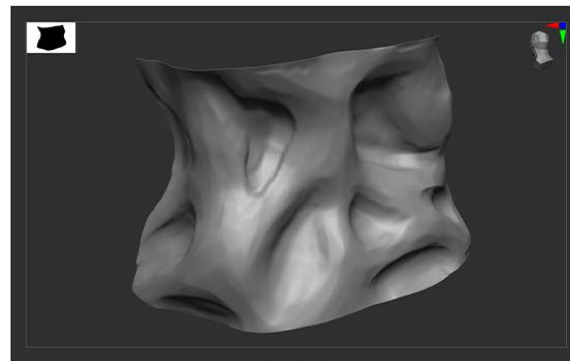
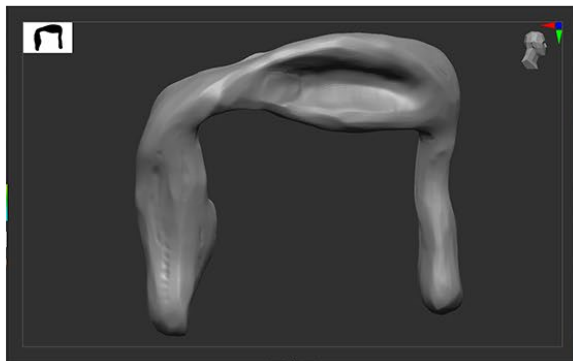
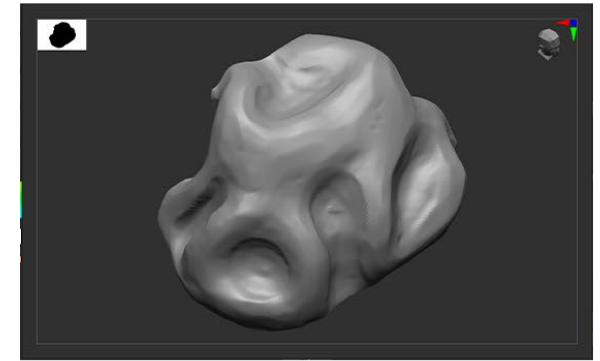
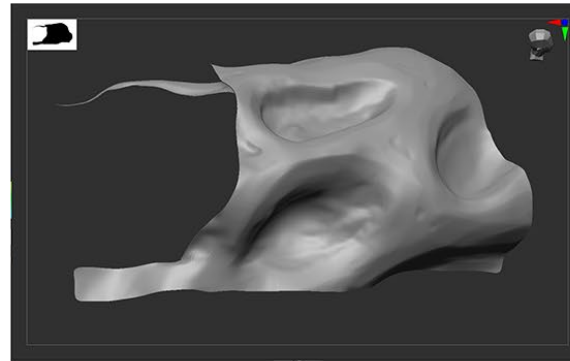
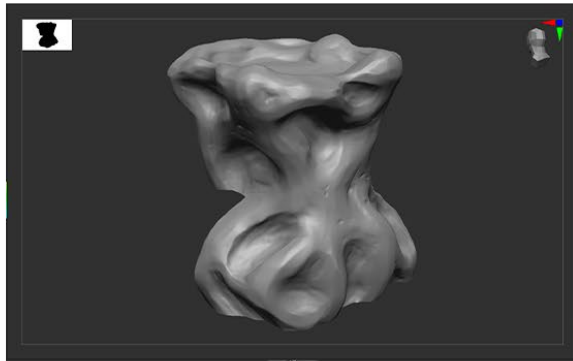
↳ brief amount limits

ASSET DEVELOPMENT

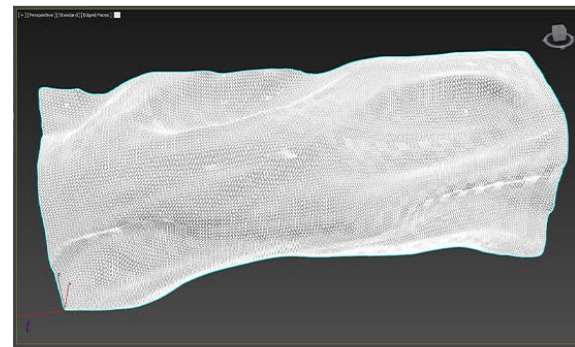
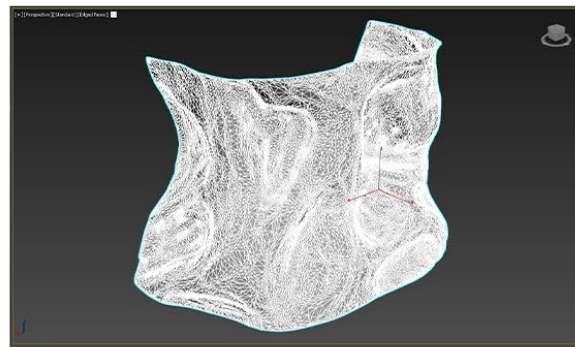
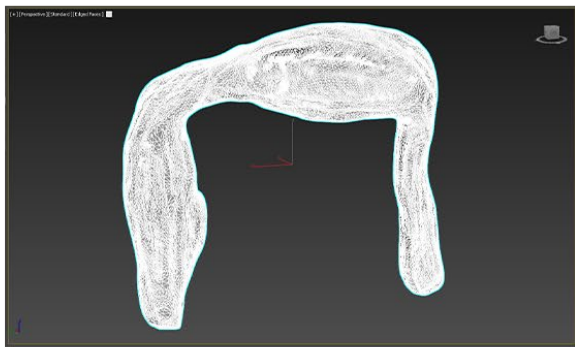
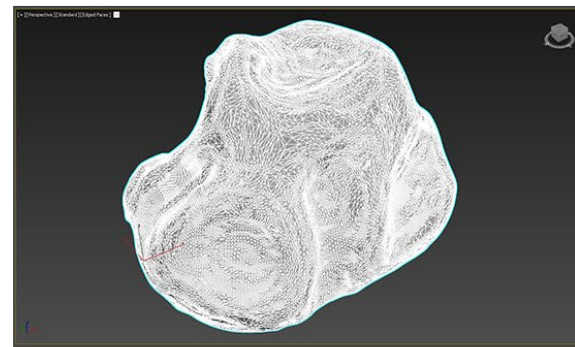
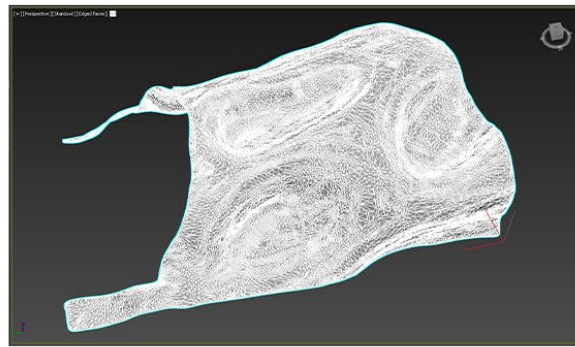
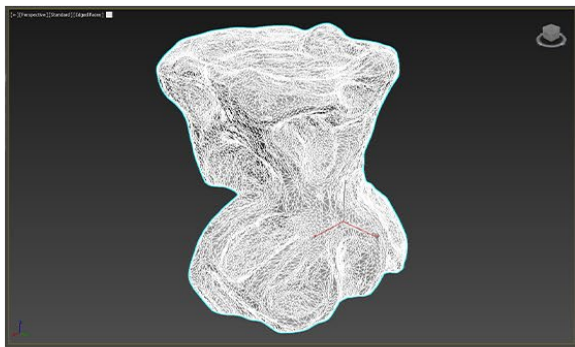


- Shape and structure have changed.
- Reconstruction. Following the same principles.
- Adding and removing volume.
Contrast between peaks and valleys.
- Intentional direction.
- Blood supplied to imagined organs.
- Organically-grown. Conforms to internal components.
- Round shape language. Welcoming.
- Contrast with mechanical components. Sharp and straight boundaries.
- Smooth. Squishable to the touch.

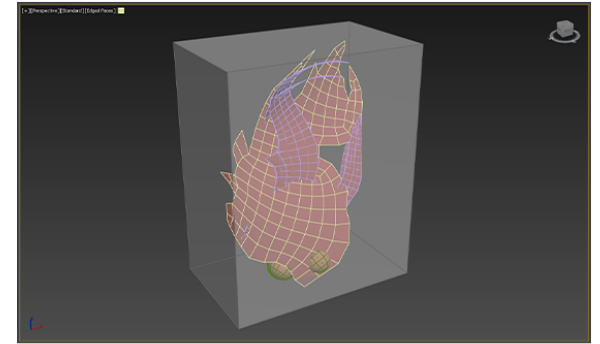
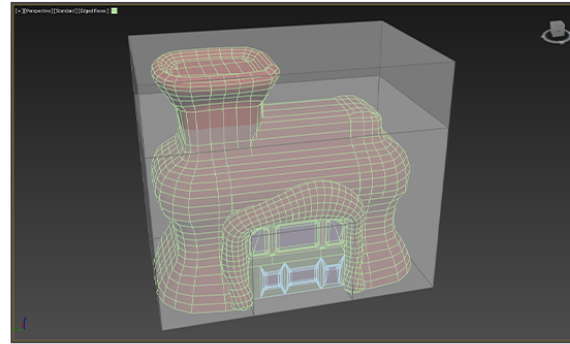
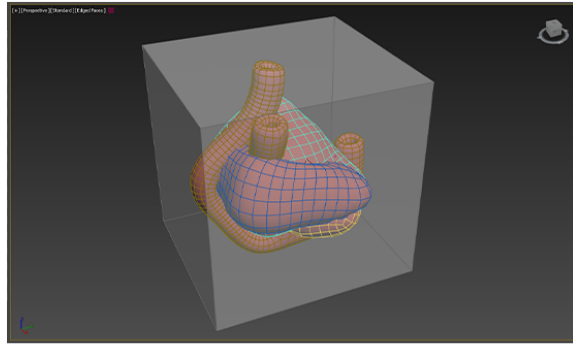
ASSET DEVELOPMENT



ASSET DEVELOPMENT



ASSET DEVELOPMENT



Modular Tileable Unwrapping Planner V3

Your building contains two categories of modular assets. Organic and mechanic. Calculate the surface area of their average dimensions. Multiply with the surface area's square root to determine the appropriate texture resolution for that category. Organic meshes contain flesh. Mechanic meshes contain metal.

Your environment must adhere to the following material restrictions.

Your building contains three textures. Flesh, metal and rubber.

Four 2K resolution (2048) textures for the surrounding environment. Three more with a landscape present. Your landscape contains one tileable texture. Sand.

Change the resolution of your unique materials (props) according to their scale. For example, the rocks are much bigger than the starfish and other greenery.

There are no restrictions on texture resolutions below 2K (e.g. 1024 or 512).

01. Create a default cube that encompasses your asset(s).
02. Calculate the area of each cube face with length multiplied by width for its surface area aka bottom multiplied by side edges.
03. Find the square root of the cubes surface area. Which number could you multiply by itself?
04. Multiply the cubes surface area with the square root of its surface area.

To calculate the dimensions of the UE5 landscape, multiply the number of quads (sections) by the X/ Y scales available under the mesh settings. A common UE5 landscape contains 56 quads and measures 5600 x 5600 centimetres.

If your asset's surface area becomes too large when combined, calculate each material it contains separately. For example, the glass window panes and rubber trims.

Length = Front bottom edge.
Width = Backward or forward moving bottom edge.
Height = Vertical or side edge.

maintain ideal map resolution

method reference!

The internet suggests another way to calculate an asset's ideal texture resolution. The amount of pixels required is determined by its physical world scale.

Texture Resolution = Object Dimensions * Desired Texel Density
For example, a 1024 resolution is applied to a 1 metre wall. $1024 / 1 = 1024$.

Consider your asset's distance from the camera and the screen's resolution. Label each asset category with an ideal texture resolution based on its scale relative to the environment's landscape or building.

01. Determine your asset's ideal texture resolution based on its camera and screen size.
02. Multiply your asset's width with its ideal texture resolution.

Modular Organic (With Chimney)

01. Large (4096)
Length = 2200cm (22m)
Width = 1400cm (14m)
Height = 1900cm (19m)

Modular Mechanic

01. Medium (2048)
02. Length = 800cm (8m)
Width = 1400cm (14m)
Height = 700cm (7m)

calculated with program units (centimetres).

assets are too big! (would need texture resolution above 4R) -> "alien" heights

Modular Glass Window Panes

01. Small (1024)
02. Length = 800cm (8m)
Width = 1400cm (14m)
Height = 700cm (7m)

Unique Rocks

01. Medium (2048 or 1024)
02. Length = 500cm (5m)
Width = 450cm (4.5m)
Height = 500cm (5m)

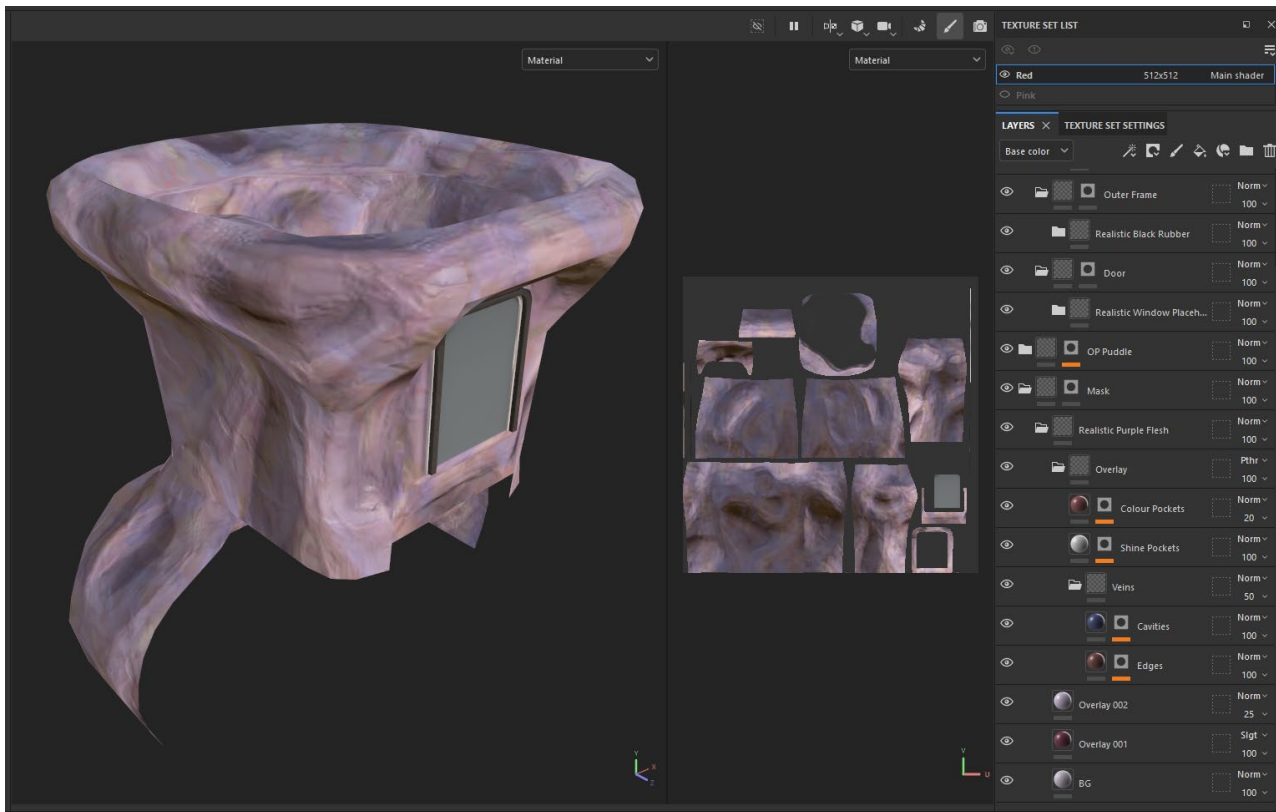
Unique Coral and Starfish

01. Small (512 or 1024)
02. Length = 500cm (5m)
Width = 450cm (4.5m)
Height = 500cm (5m)

Unique Kelp Leaves and Grass

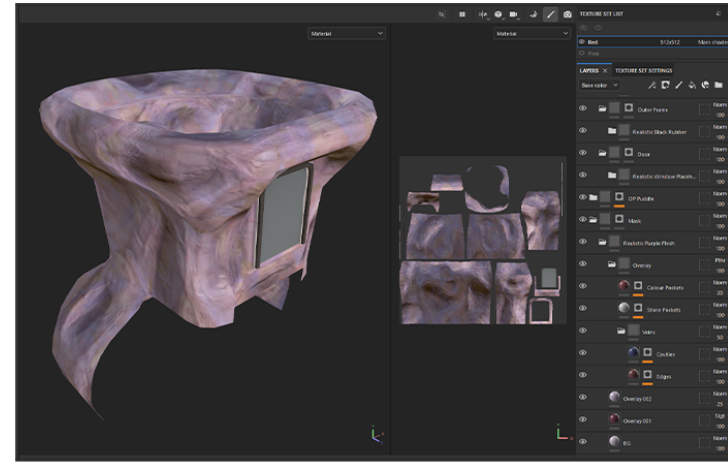
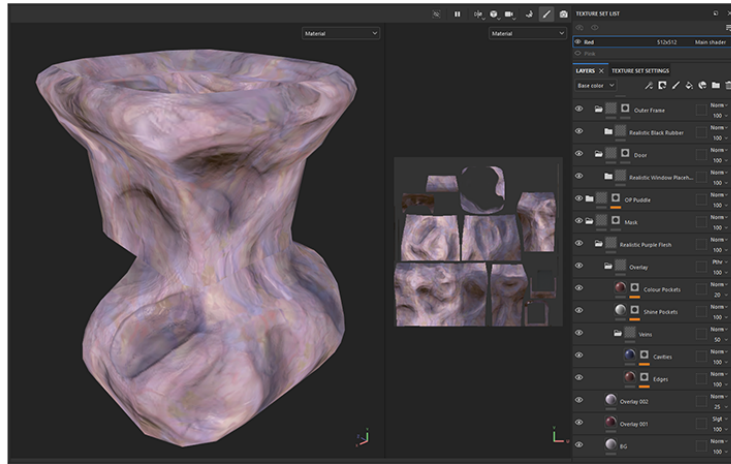
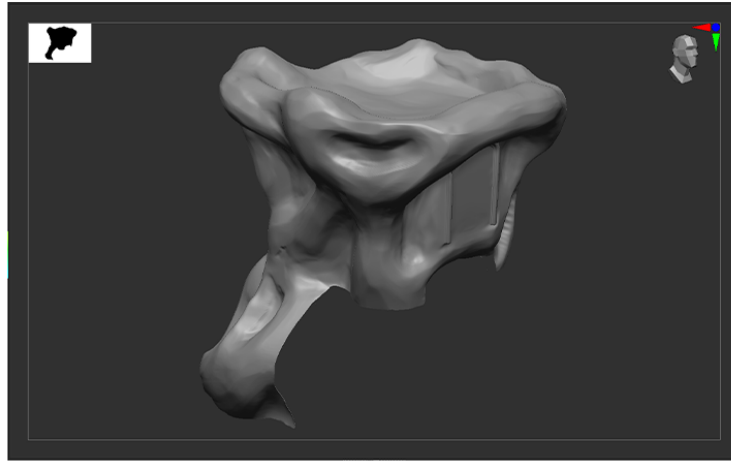
01. Small (512)
02. Length = 500cm (5m)
Width = 800cm (8m)
Height = 1000cm (10m)

MATERIAL DEVELOPMENT



- Saturation implies blood supply.
- Warmth from healthy function.
- Alien species. Humans cannot have purple skin.
- Supernatural and fantastical. Aligns with industry demands.
- Yellow discolouration from damage. Infection or bruising.
- Broad structure exposed to weather conditions.
- Lower texture resolutions.
- Maintains steady performance. Respects restrictions.
- Unique materials. More texture maps.

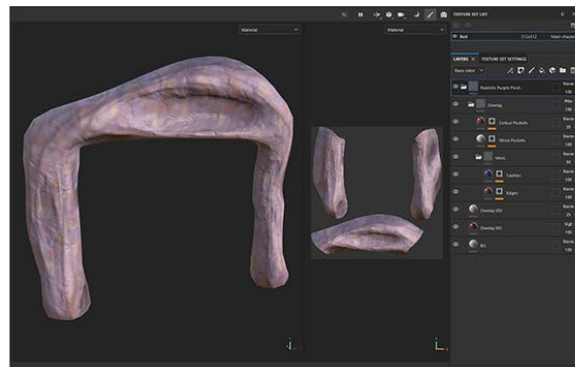
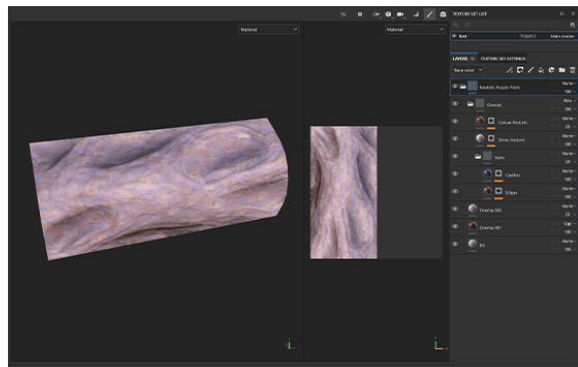
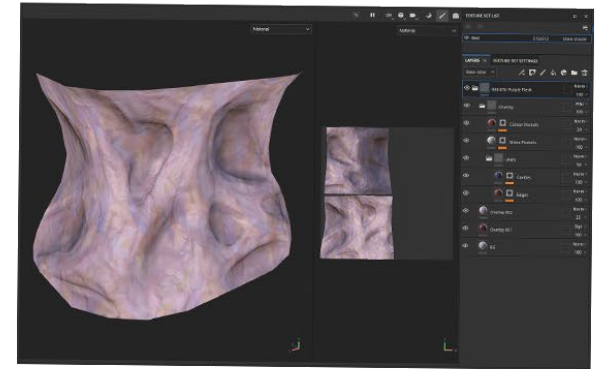
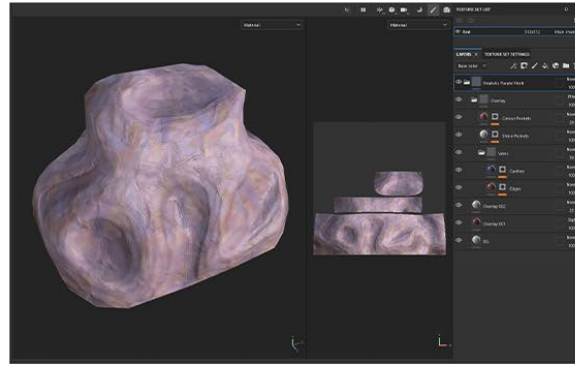
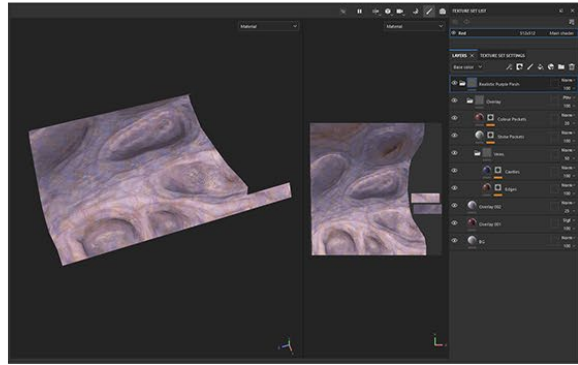
MATERIAL DEVELOPMENT



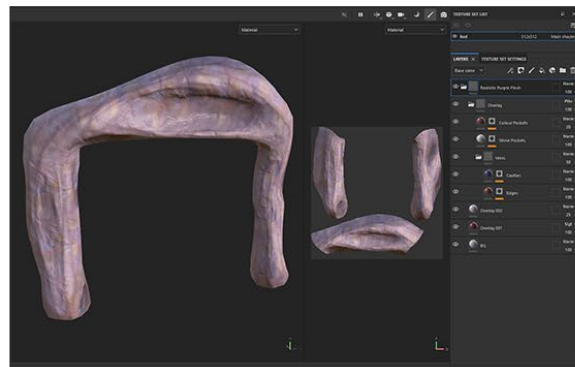
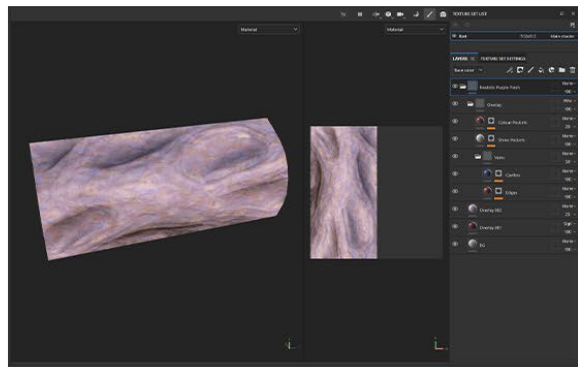
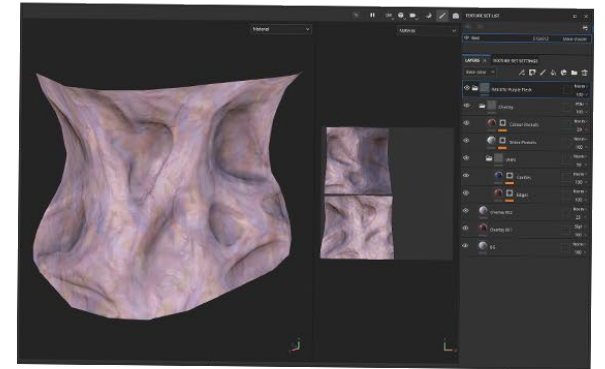
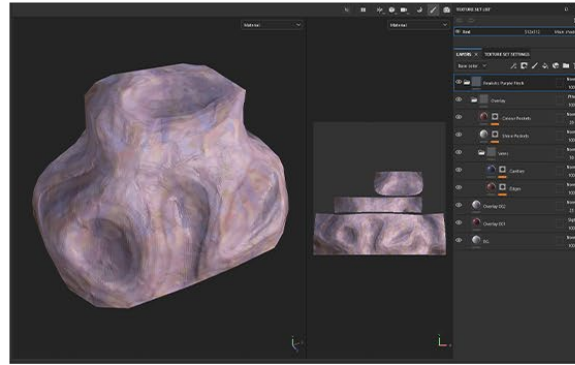
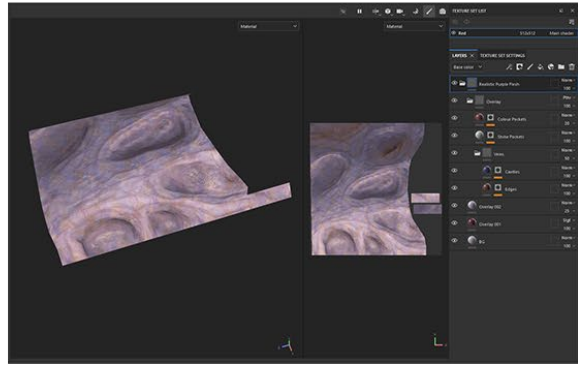
→ equalise palette!
Cwarmth shows life → blood supply).

deepening colour saturation
↳ combining normal bake albedo with texture map (elements/veins follow mesh shape!)
↳ smaller resolutions
↳ more texture sets (follow brief restrictions).

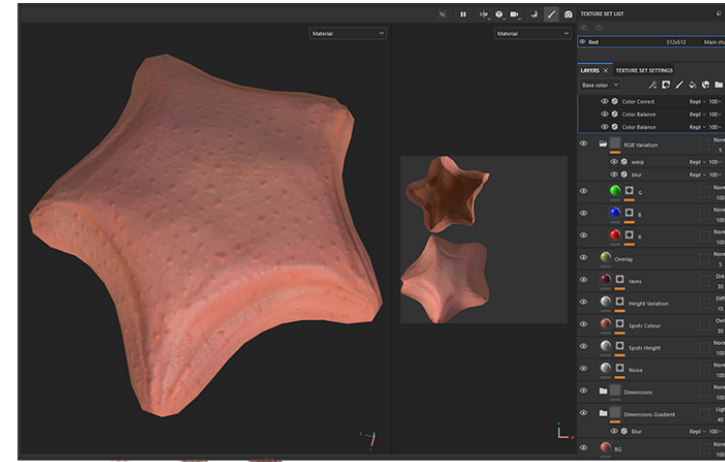
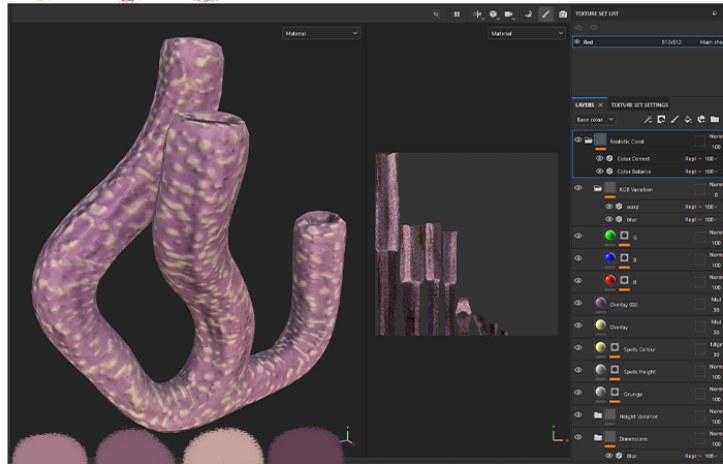
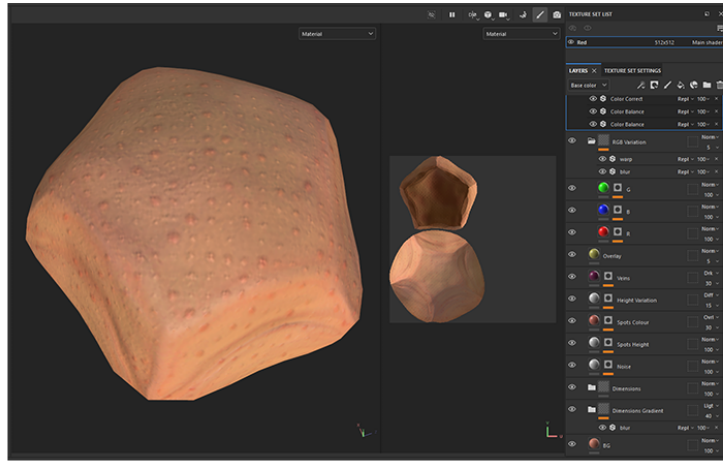
MATERIAL DEVELOPMENT



MATERIAL DEVELOPMENT



MATERIAL DEVELOPMENT



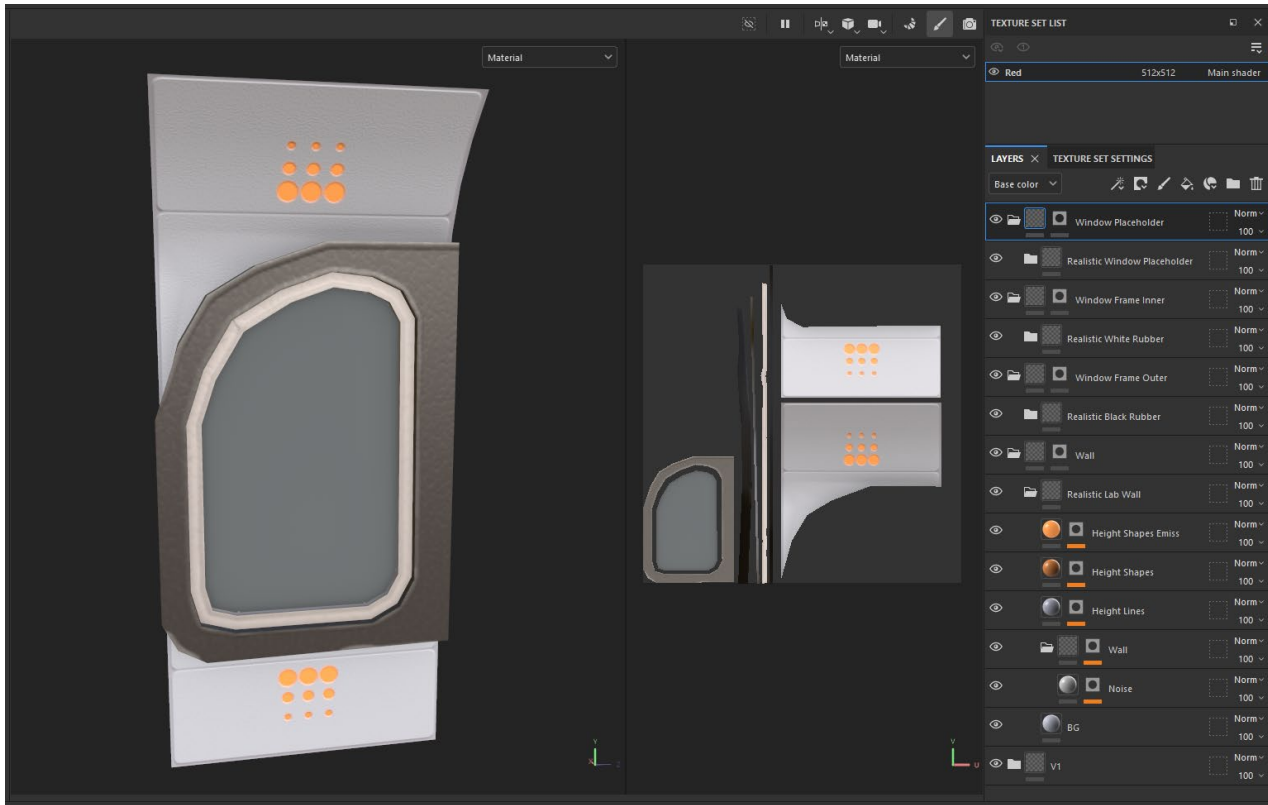
→ tropical climate (bright colours attract pollinators).

↳ simple pattern grunge maps → shallow height / dimensions (no sculpting needed)

→ warm / round / welcoming

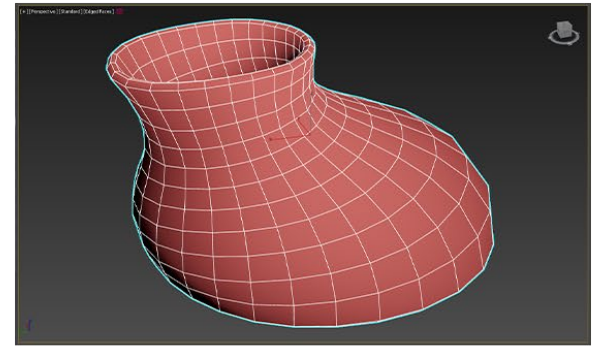
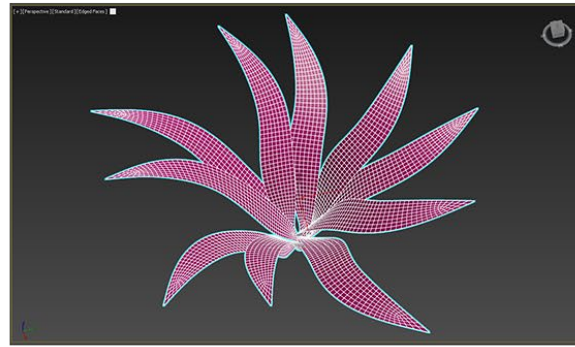
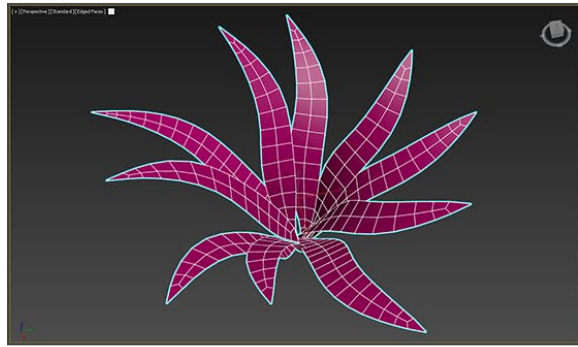
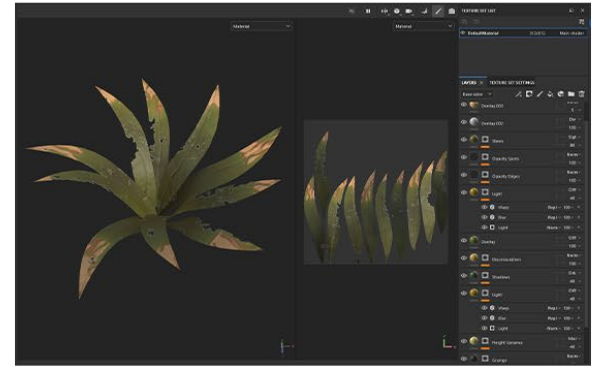
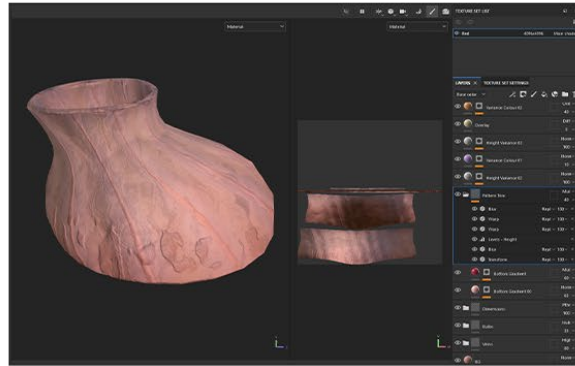
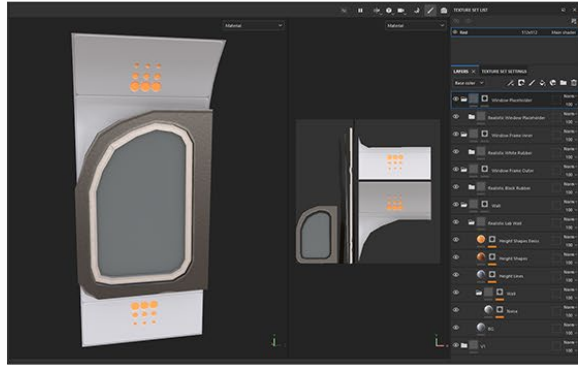
small decor (not close to player) & should consume less time (512)

MATERIAL DEVELOPMENT

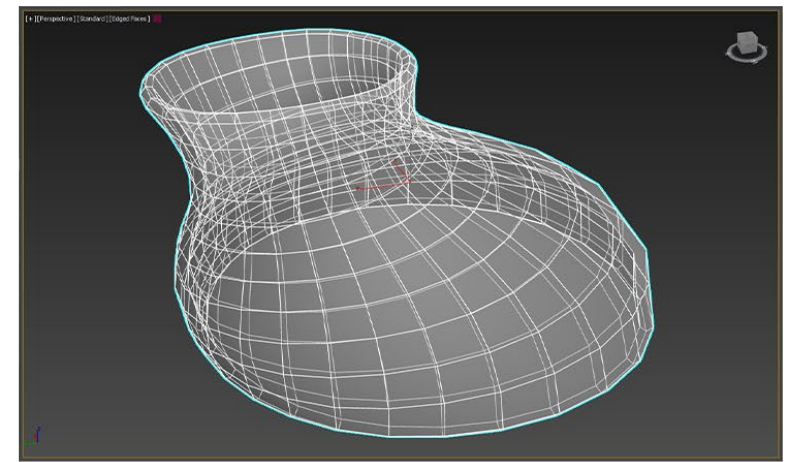
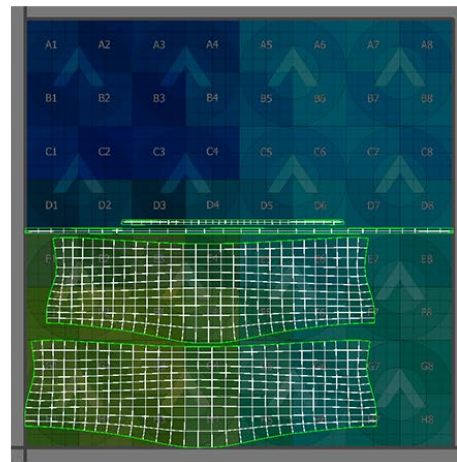
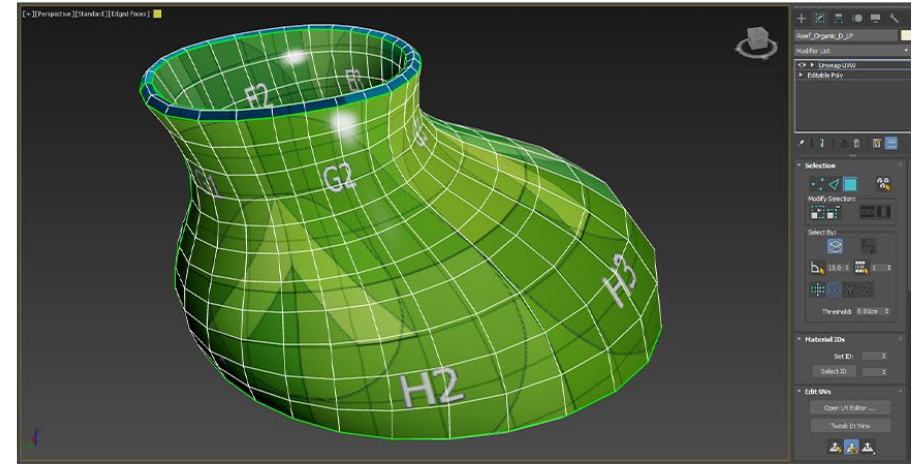
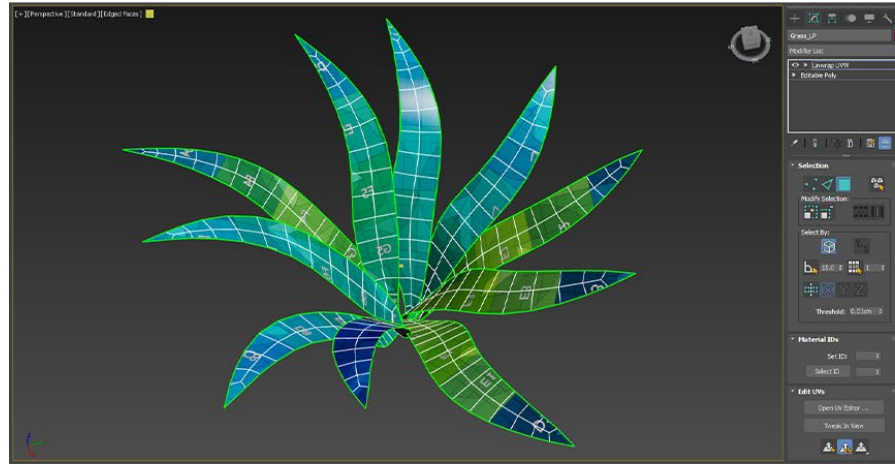


- Cold colour palette.
- Power enables machinery.
- Contrast with organic components.
- Glowing elements. Common in science-fiction media.
- Published reference with underwater environments. Subnautica.
- Complementary colour choice.
- Disconnects focal point from backdrop. Deep blue ocean.
- Icon determines wall placement.
- Consistent grunge scale. UV density.
- Panels explain modular format.
- Real-world construction method.

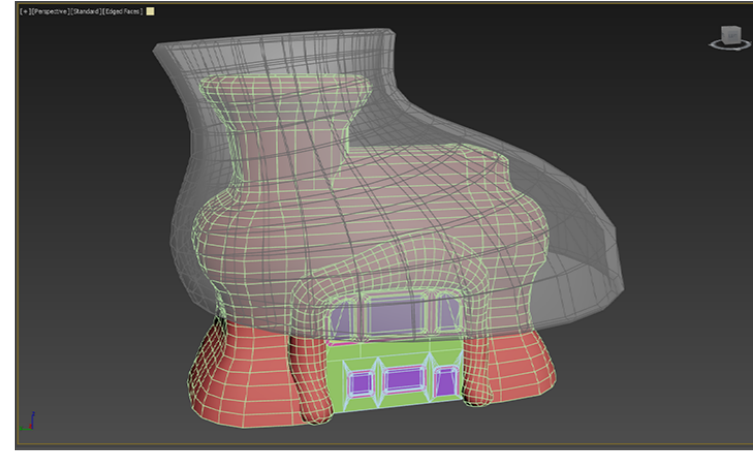
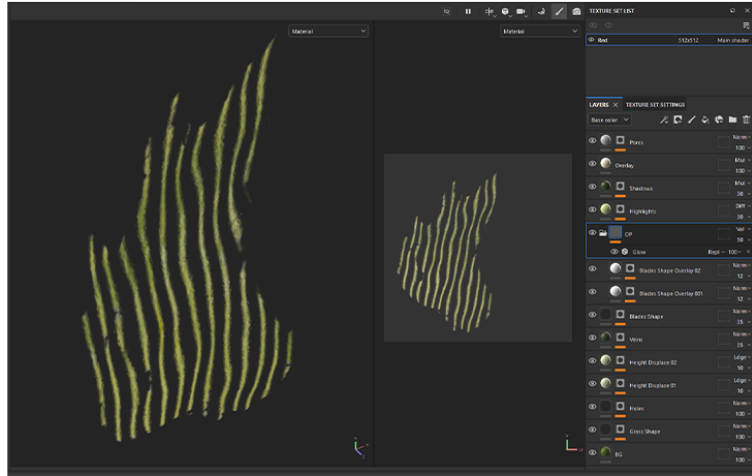
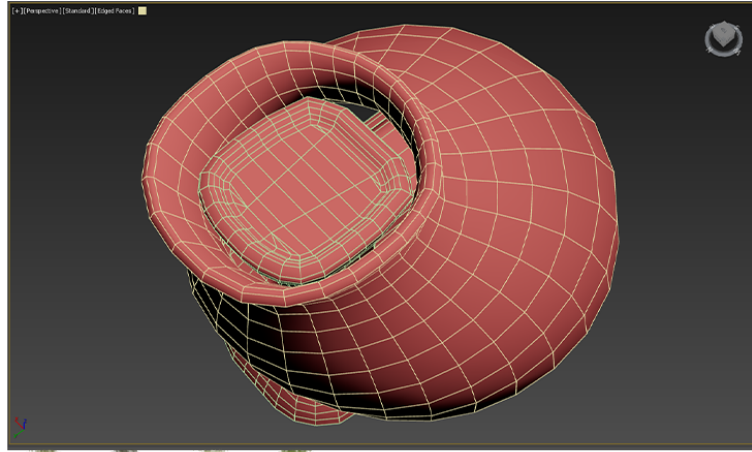
MATERIAL DEVELOPMENT



MATERIAL DEVELOPMENT



MATERIAL DEVELOPMENT



round /
smooth
shape
& open
subdiv
and
retop

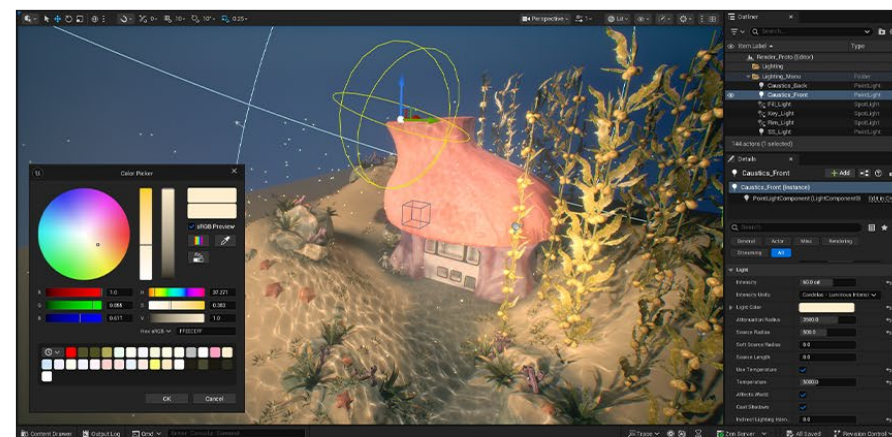
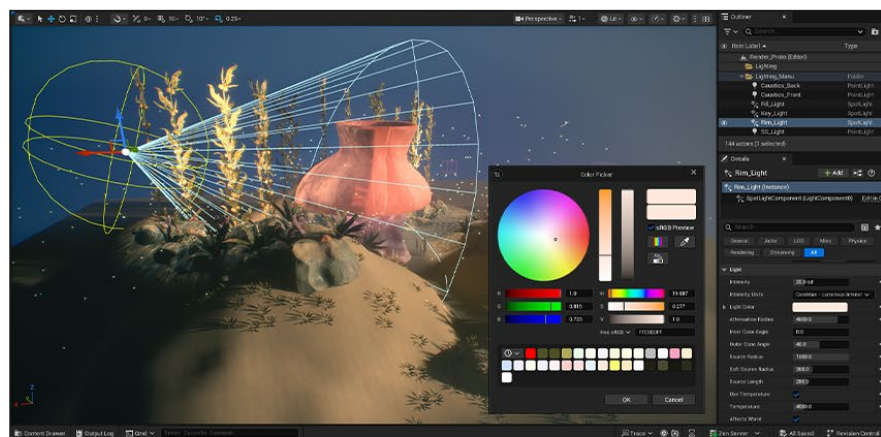
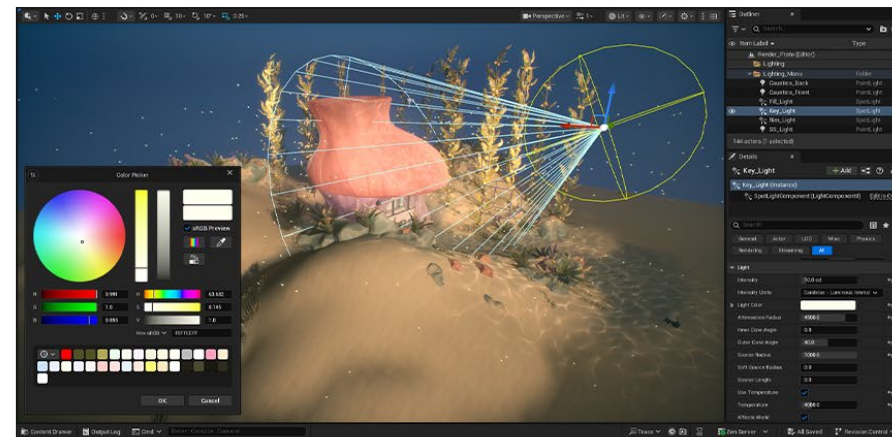
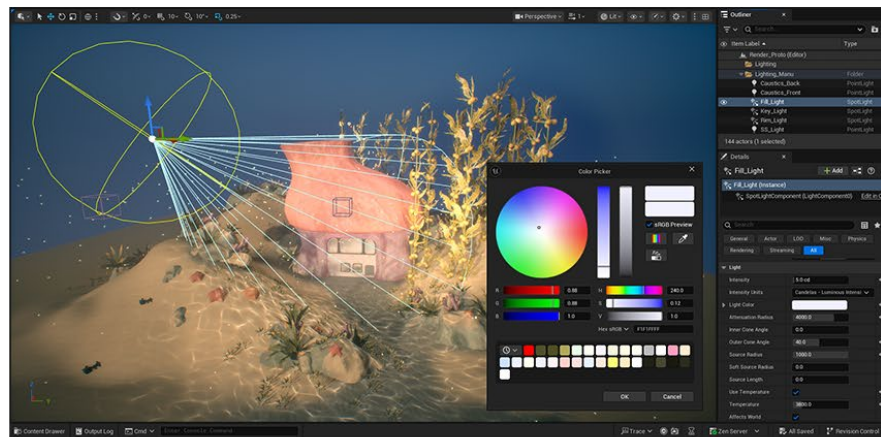
roof conforms to building
shape (engineered support
system) → protects more
fragile surface from
damage (e.g. falling rocks)
→ bouncy or electrically
charged? (tennacles).

SCENE CONSTRUCTION

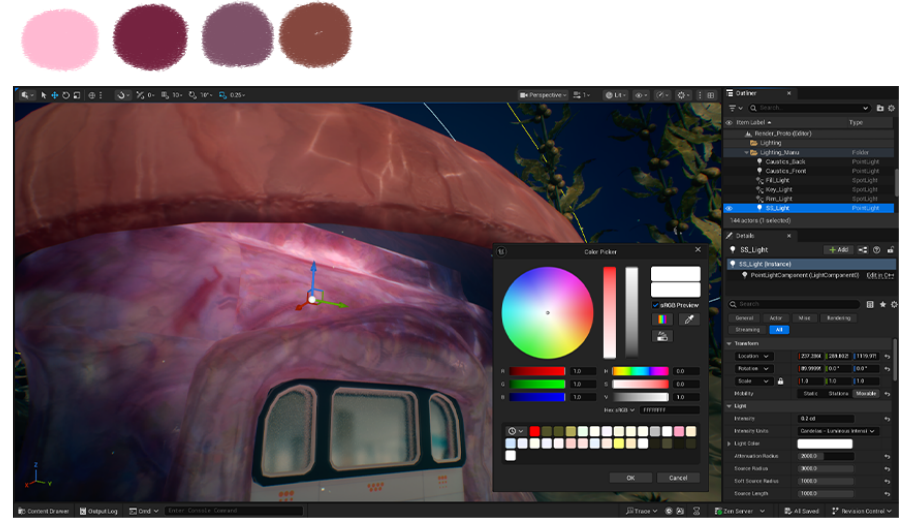
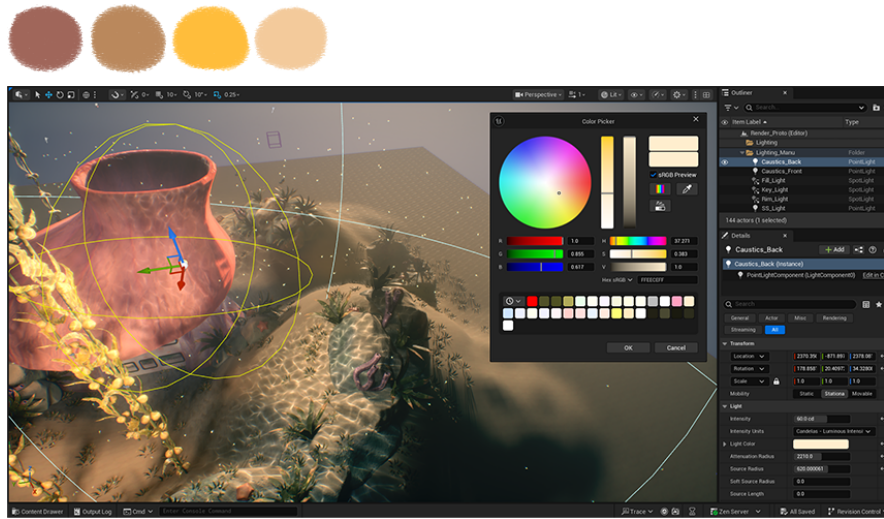


- Photography camera shot principles.
- Imagined composition lines.
- Point toward focal point. Direct audience attention.
- Evening setting. High exposure would conceal caustics.
- Current encourages movement.
- Wind and organism particles.
- Blue colour grading.
- The ocean absorbs long and warm wavelengths.
- Correct organic light interactions. Subsurface scattering. Skin layers.

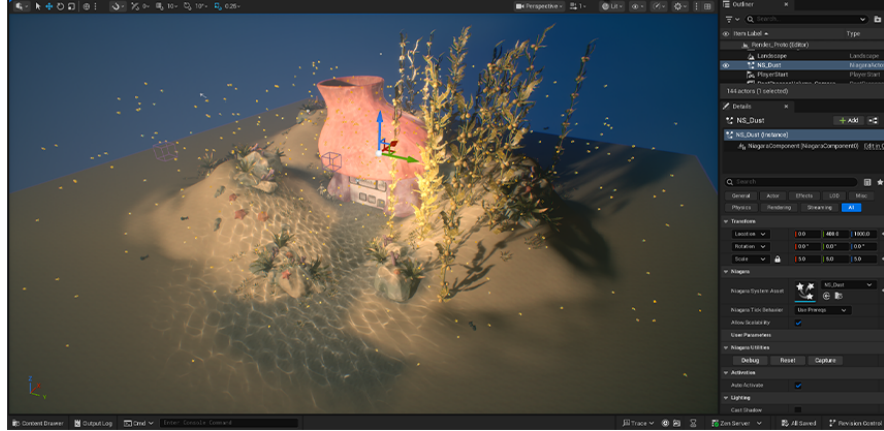
SCENE CONSTRUCTION



SCENE CONSTRUCTION

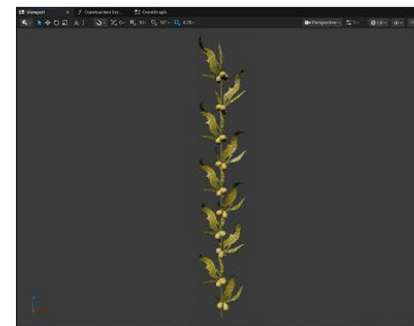
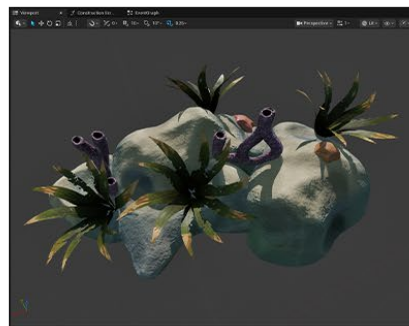
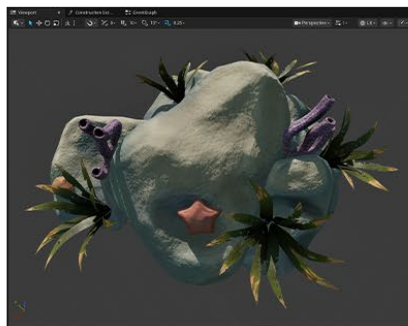


particulates / organisms

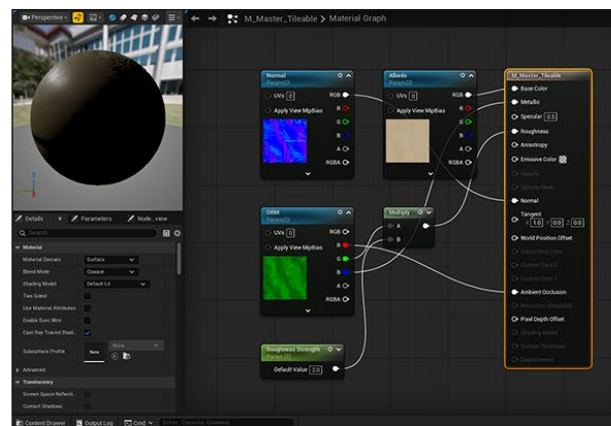
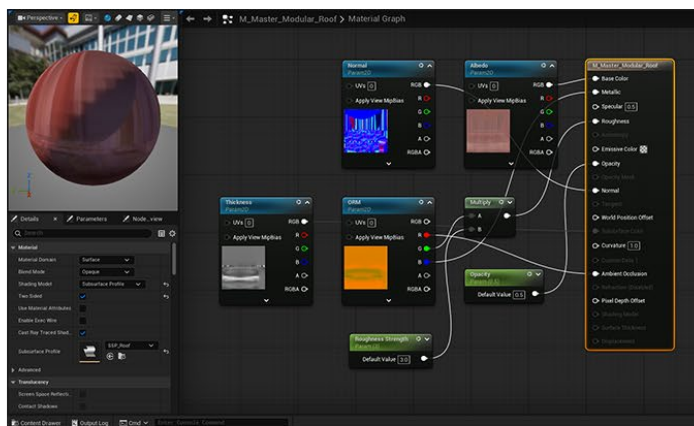
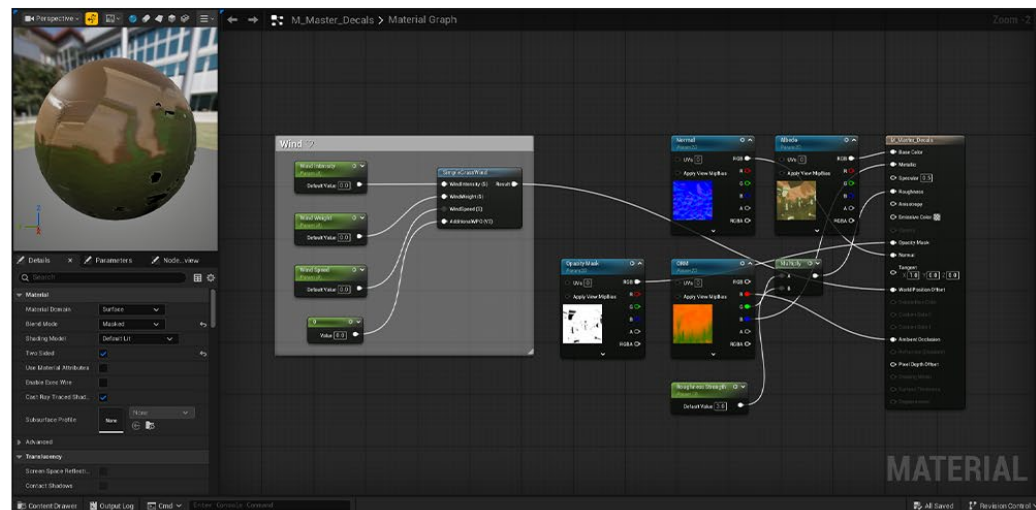
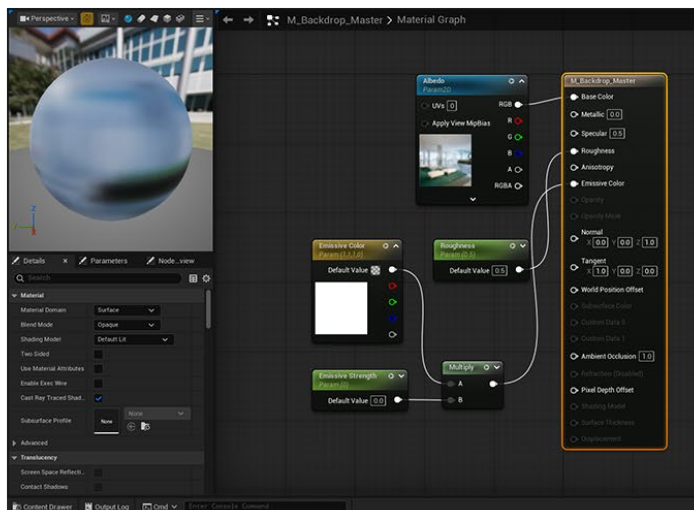


↳ sub surface scattering (thin skin / flesh layers)
↳ light reveals blood colour underneath
⇒ particles / wind physics for currents movement (supports realism) and could be interactive!

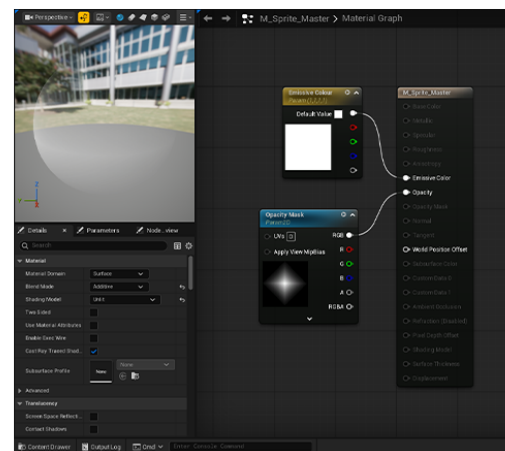
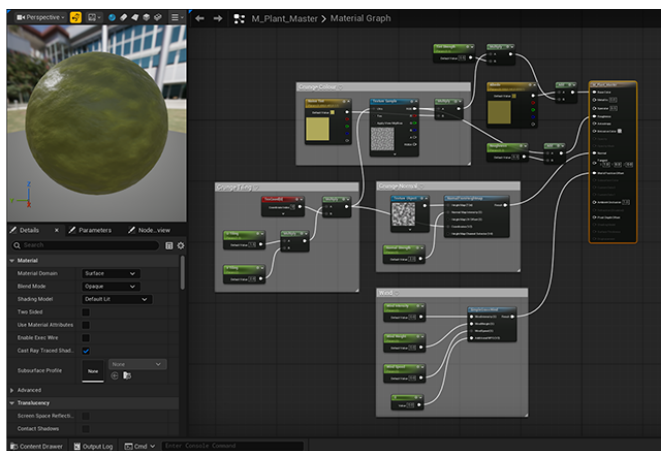
SCENE CONSTRUCTION



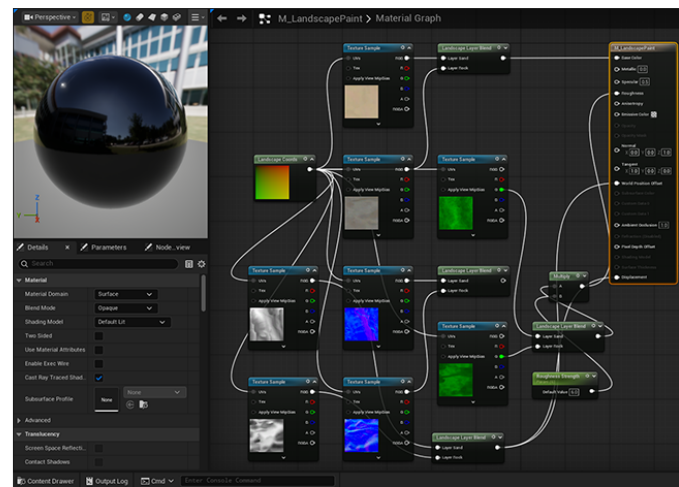
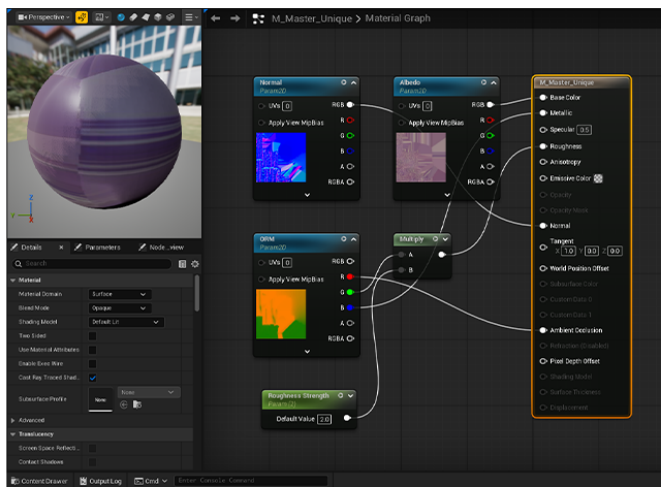
SCENE CONSTRUCTION



SCENE CONSTRUCTION

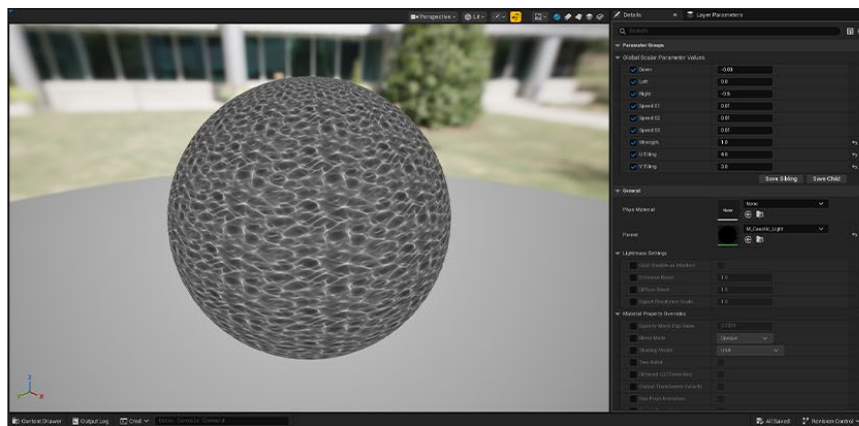


master material
(conserves run
time memory)
↳ less new data
to compute
⇒ custom alphas
in substance
designer



→ removed
normal maps
(obvious hies)
↳ replaced
with nanite
displacement
(entrance
dimensions)

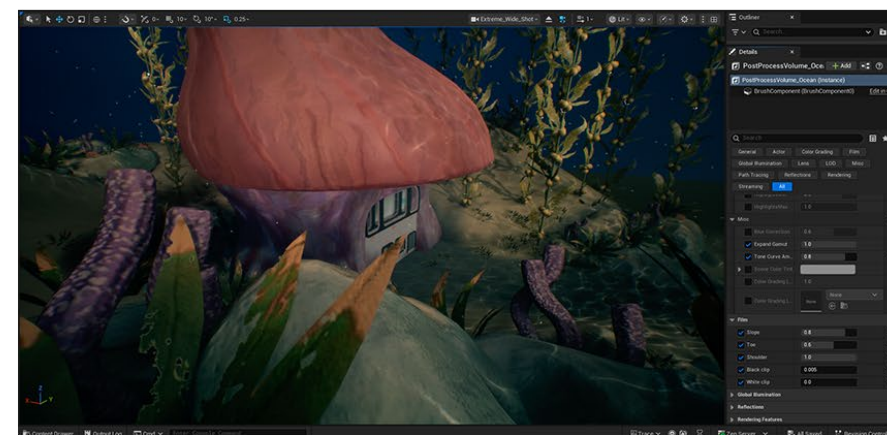
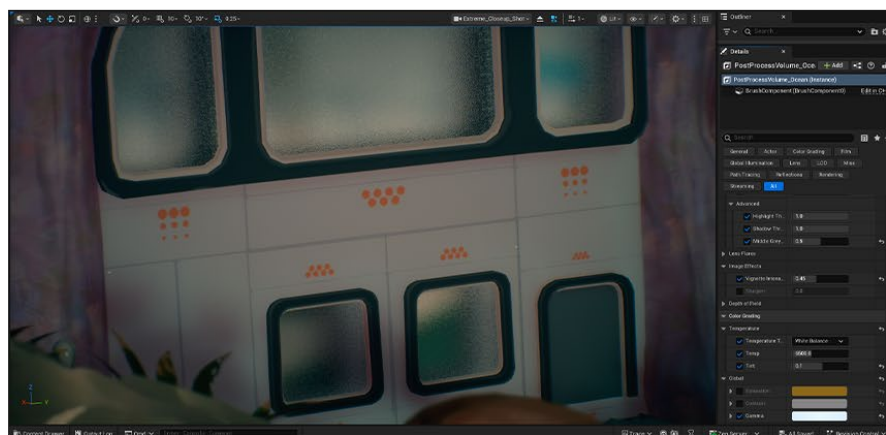
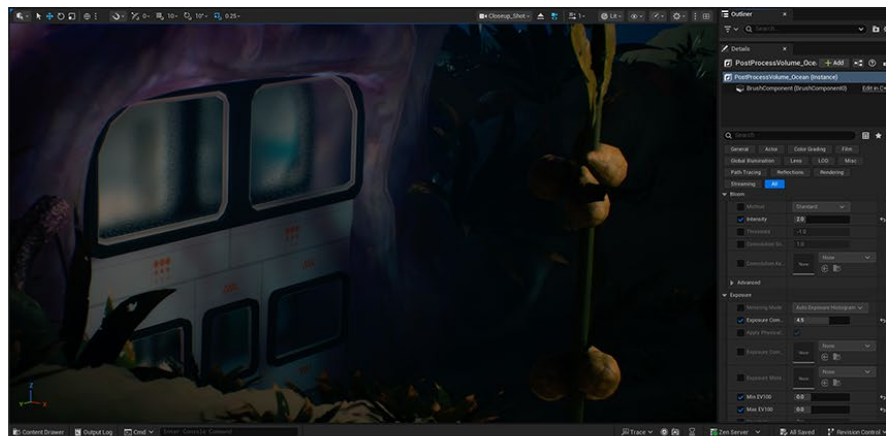
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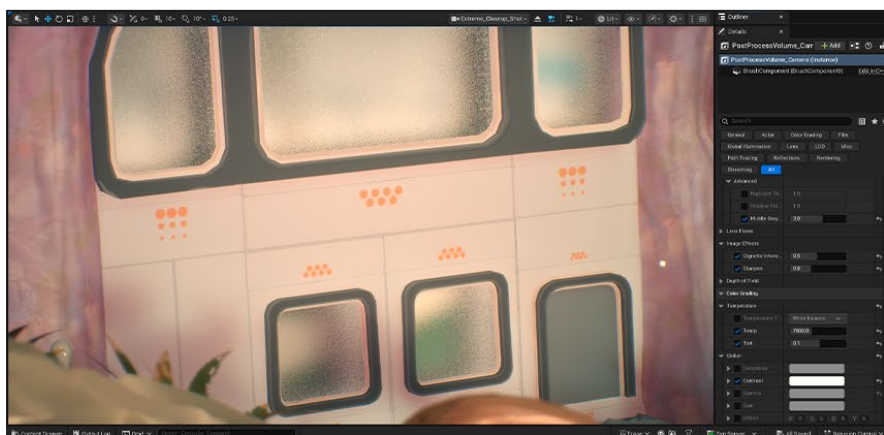
specular reflections from light source (distorted after passing through water) → waves create constant movement
⇒ appears in shadows (underwater sources travel shorter distance)

customise scale based on distance (large when farther away) → creates "spiral" shape when close to asset surface

SCENE CONSTRUCTION



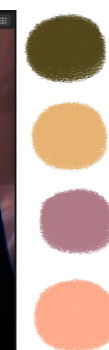
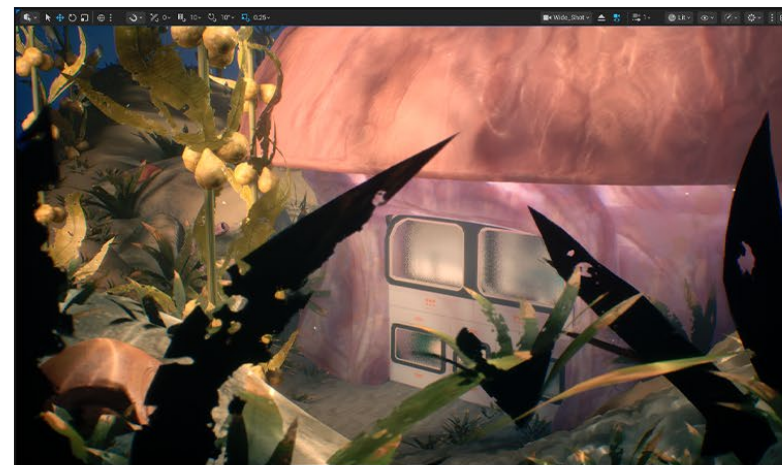
SCENE CONSTRUCTION



SCENE CONSTRUCTION



SCENE CONSTRUCTION



composition leading lines (direct audience attention)

→ values determine foreground and background (bright around focal point)

EVALUATION

Graduation is daunting. You're entering a professional environment with fresh guidelines and mutual reliance. Rehearsing an occupation beforehand develops confidence. A company might examine you to ensure their creative direction can be managed. I generously accepted an environment brief from Flix Interactive. They requested innovation, cohesion and realism with guidance from the heading 'Sacred Grounds'. Personal hardship in the former meant reliance on reference, research and feedback consideration. I uncovered defining the common indicators of genres.

Planning is paramount in pre-production. Catalogue demands and enable consequence on production procedures. Resolution and polygon-count constraints conserve performance. A considerable portion of environments involves balancing time, countenance and function. Resource classes impact mandatory programs and method complication. For example, assets that receive reusable (tileable) UVs renounce the texture space. Whereas, assets involved in normal baking and standalone components, demand snug fit. Resources that don't jeopardise deadline satisfaction can be removed.

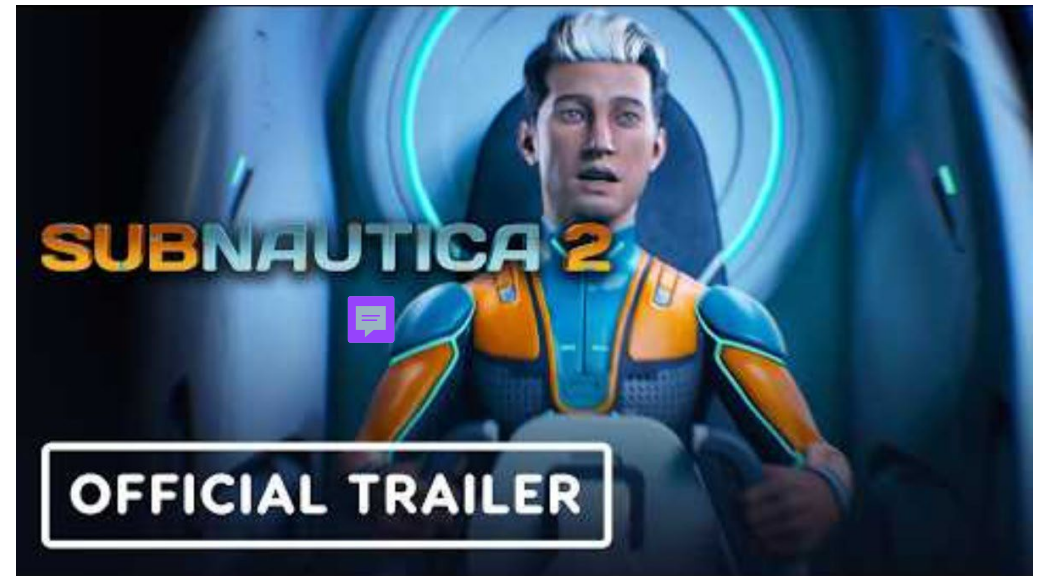
EVALUATION

Sacred Grounds are landmarks where devoted patrons share worship and prayer, claiming guidance from omnipotent beings. An entertaining invented universe is cohesive. Its customs or magical foundations are reasoned. I welcomed influence from Avatar. A franchise renowned for immersive presentation and narration. Descendants to an extinct jellyfish species, encounter a tropical strain abandoned in the cold northern sea. With their monumental intelligence, they manufacture its born climate with advanced mechanics and organic matter. The warm atmosphere sustains the vulnerable: young and old.

Our world is complex. The smallest of beings contain beautiful and intricate components. Respecting them in replication is challenging. From research and personal adventure, I would deem its common elements layering. I examine surfaces from numerous distances to select comparative grunge maps for shape, damage and texture. Procedures we're chummy with have routine and consistent durations. Challenge yourself by mastering something new and secure deadlines with quick procedures. I'm content with material production. I confine high-poly generation to primary details.

EVALUATION

Professional works published by persons in industry occupations should educate our decisions. Columns that celebrate innovations contain insights into methods. Simulating success could induce employment. Subnautica embraces underwater climates. I referenced its modular cubicle materials. Advanced genus and planets often employ sophisticated technology before humans. The franchise wonderfully balances light source colours with ocean attenuation. Grading can smoothly downfall realism with improper and overpowering saturation. My environment would benefit from an obvious light source location, capable of roaming and sustaining player vision.



EVALUATION

While resplendence is subjective, respecting a rhetoric and reference location permits improvement. Compromise and eleventh-hour completion diminish the outcome. Resources contain validation of manufacture. Immersive experiences encourage an audience to disclaim reality. Reminders they're playing or watching diminish engagement. Examples include faceting (rough corners) and openings between modular components. Open space can boundary imagining the concealed enclosing area. Products might match client demands. To seduce your audience, propose a game from one image alone. Its weakest elements will outshine beautiful counterparts.



EVALUATION

● ● ● ● ● ● ● warm near sun source,



light (bioluminescence) and colours around gameplay area

EVALUATION



human influence
(manufactured to accommodate needs)



camouflage (ocean colours)
round shapes

cold or warm
sun position

warm cold
alien = unnatural organic colours (wouldn't appear on earth)
friendly

leading lines

translucence
placement
jelly consistency

sun's warmth / planet atmosphere affects ocean / water colour (attenuation)

EVALUATION



EVALUATION



structures follow landscape
(cannot stand straight without support)

enemies concealed open space
concealed open space
be yond is intimidating



frames scene
(realism → humans need air)

smooth surface transitions

specular wave reflections in light areas

what swim through here?

broad colour palette (close to surface) → longer colour wavelengths (mild currents = less damage)

EVALUATION



surrounded by water
(dangerous if exposed)

camera
suggests
importance

crane artefact (?) →

leading
lines

broken / open electrical
wires

yellow (pathing)
& construction/
interact / hazard

focal
point

cold
palette / light
colours

smooth surfaces / perfect
shapes (ergonomic design)
& hard surface (needs high poly!)

(manufactured)
& contrast with
landscape



EVALUATION

● ● ● ● ● ● ● ● broad colour palette



EVALUATION



ocean floor (more organic structures above)

small area
(no open space / narrow shadows)
↳ feels concealed

↳ intentional shadow placement

rocks with
also accompanying
greenery →
quick placement

leading lines
(pointing toward focal point)

light sneaks
between rock
platform
gaps

opacity masks breaks apart silhouette (far from surface = strong currents and more damage)