3D Modeling in Unity

Workshop #3
January 30th, 2019

Slack Group
makerspacevrchallenge.slack.com

- Anyone with a uOttawa email address can join directly
  - If you are having issues joining email me at: eprun034@uottawa.ca
- Slack Channels
  - Workshop-ideas
  - Unity-help
  - Solidworks-help
  - Blender-help

Github Repository

github.com/elishapruner/Makerspace-VR-Challenge

- Github repo has:
  - Source code for workshops
  - Powerpoint slides
  - Links to YouTube videos
  - Competition instructions

Focus Group: Reducing Stress and Anxiety

- Focus group notes in the ‘Info about chemo and radiation therapy’ folder on the Github page

Relaxing Ideas

- Walking on the beach
- Orchestra, live music, spa music
- Music is VERY important
- Visiting a destination - seeing a new country, seeing beautiful parts of Ottawa
- Learning about a new culture

Focus Group: Reducing Stress and Anxiety

Empowering Ideas

- Superhero with a weapon, feel powerful
- Visualize efficacy of treatment
- Learn what is actually going on, so won’t be afraid
- Visualize positive outcome - we are fighting this cancer together

Learning Knowledge Ideas

- Move through an art gallery and learn about art history
- Learn about a city or culture - ie. chinese new year celebration
- See kind of cancer, where it is, and how it can be treated

3D Modeling in Unity

Can I use SolidWorks?

- Yes, but it is more difficult than other modelling programs
  - This is because SolidWorks currently does not export to OBJ file format
- Can I still use SolidWorks?
  - Yes, you must save as STL
  - Then you must use another software, like Blender, to convert STL to OBJ
  - Unity uses OBJ meshes

3D Modelling

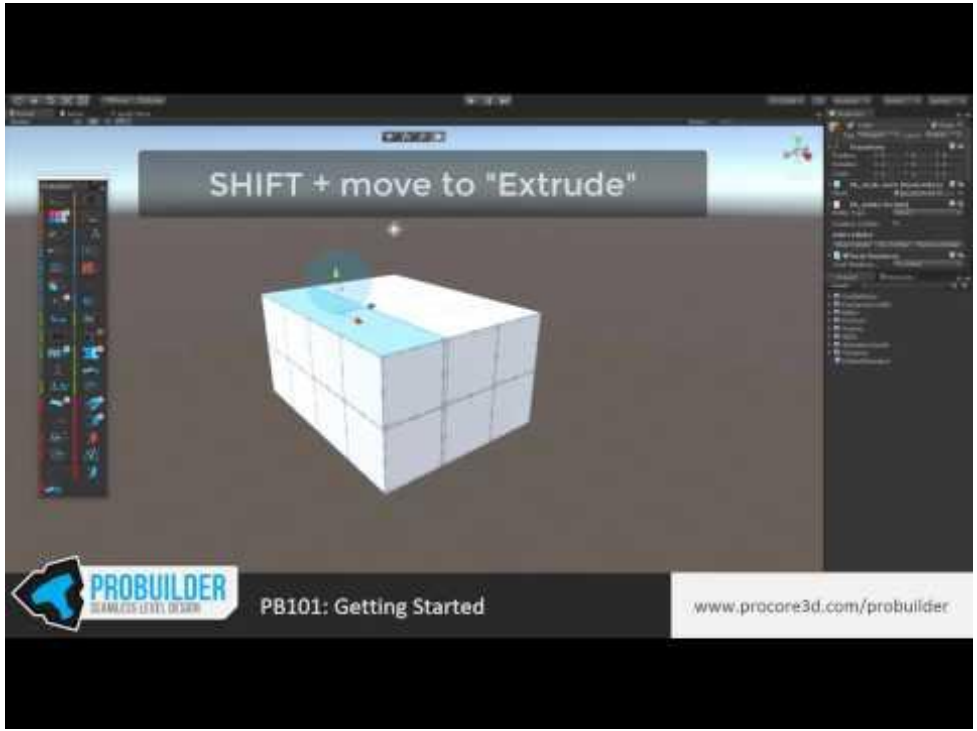
1. 3D modelling tools inside Unity → ProBuilder, ProGrids, PolyBrush
2. Sculptris to do detailed sculpting

ProBuilder
ProGrids
PolyBrush

ProBuilder

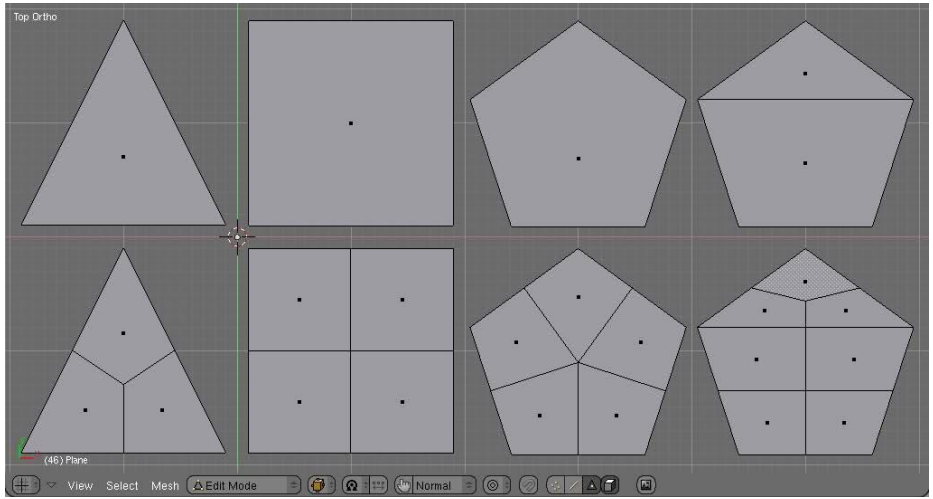
- Documentation
  - procore3d.com/probuilder
- Install using the Unity Package Manager
  - Window → Package Manager

https://youtu.be/Ta3HkV_qHTc



Mesh

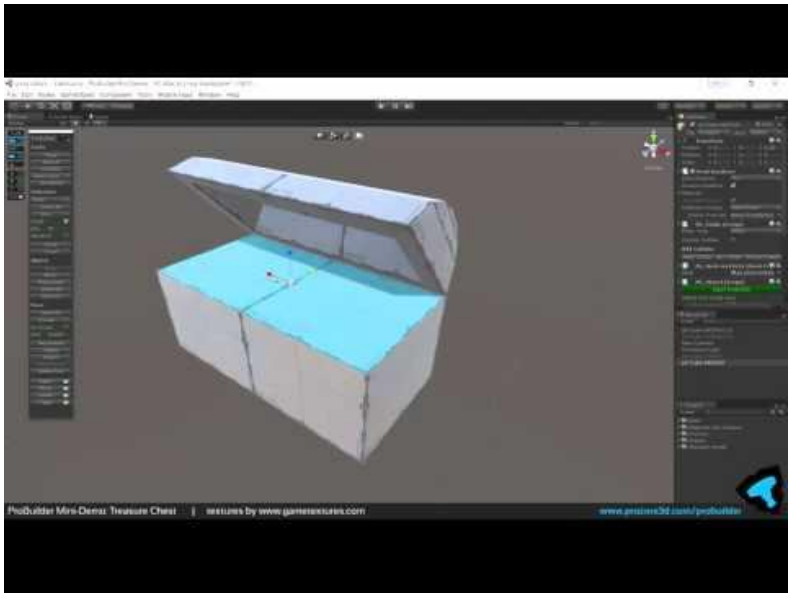
- A mesh has vertices and edges
- Quad meshes are the best
  - Quads have 4 edges
  - This makes subdivision very easy, and you subdivide a lot when modelling
- Meshes with triangles is ok
  - Triangles have 3 edges
  - Try to use quads instead
- Do not make meshes with n-gon shapes (more than 4 edges)
  - This will break subdivision and edge loops



ProBuilder Common Commands

- Unity hand, move, rotate, and scale tools on normal 3D objects
- ProBuilder new shape
- Subdivide
- Vertices, edges, faces → move
- Face mode → extrude using Shift + move tool
  - Rotate and scale extrusion
- Object mode → flip normals
- Edge mode → insert edge loop
- Red options for vertex, edge, and face mode

Probuilder Example



https://youtu.be/HW5T_KdGl30

ProGrids

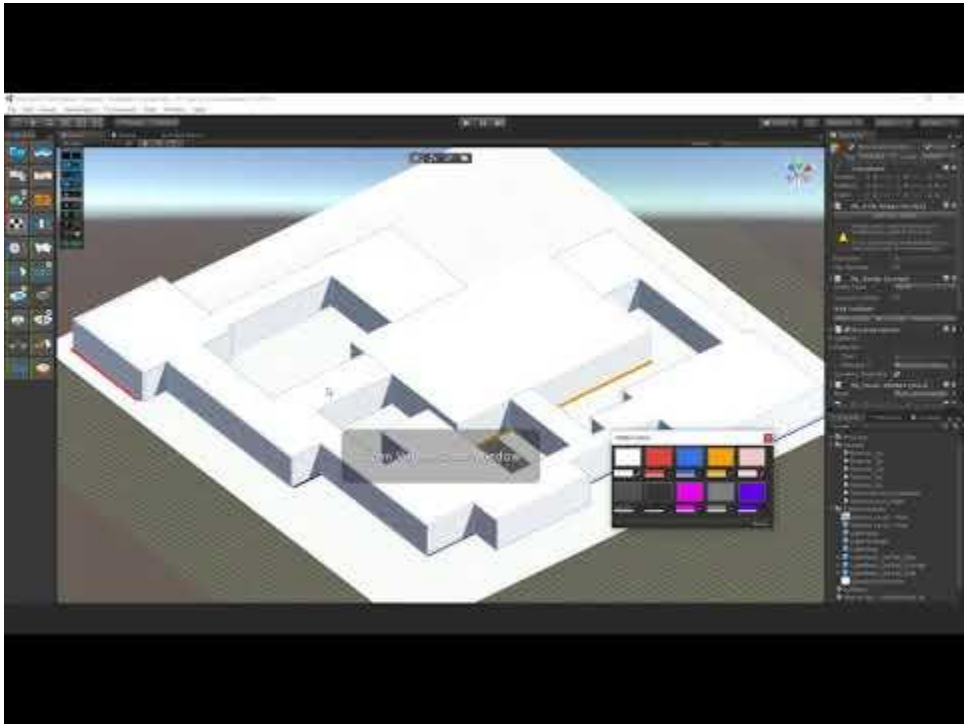
Documentation

- procore3d.com/progrids

Install from the Asset Store

https://youtu.be/1G-0f5m1_lw

ProBuilder and ProGrids to Make Rooms in a Scene



https://youtu.be/dYBOBgfcTgY

Create a Plane for PolyBrush

- Use ProBuilder to make a new shape, and choose Plane
- Subdivide the surface a few times to create more vertices and edges for polybrush to play with
- Polybrush works on any mesh
  - It works on the default 3D objects in Unity
  - It works on ProBrush shapes
  - It works on meshes that you build in other software like Sculptris and Blender
  - It works on downloaded meshes from the Asset Store, so you can modify someone else mesh

Modifying the Default ProBuilder Material

- Create a new folder under Assets called Materials
- Create a new material and name it ‘MyMat’
- In the Shader dropdown choose ‘ProBuilder’ → ‘Standard Vertex Color’
- Drag the new material onto your 3D object

PolyBrush

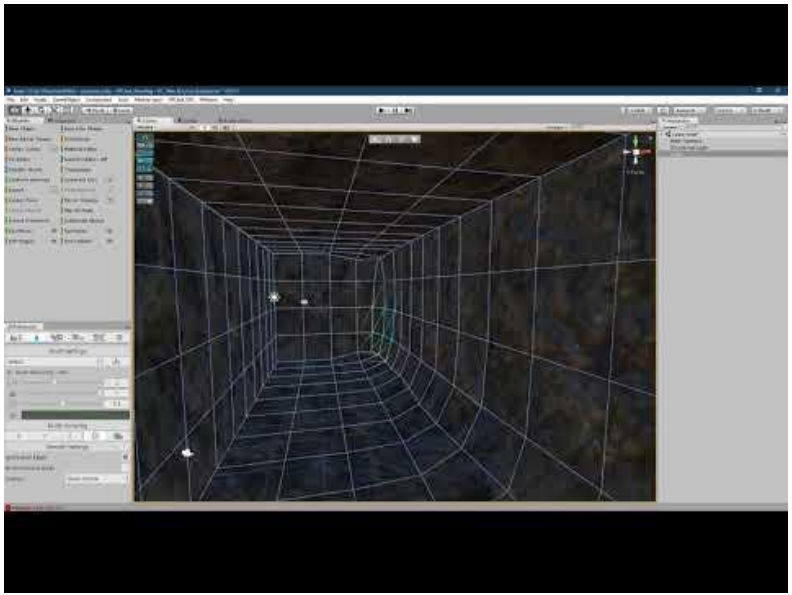
Documentation

- procore3d.com/polybrush

Install from the Asset Store

https://youtu.be/JQyntL-Z5bM

Building a Tunnel with ProBuilder and PolyBrush



https://youtu.be/u2Z7KxnmmTc

Play with PolyBrush

- Create a starting shape using ProBuilder
- Subdivide the shape a bunch of times
- Extrude the shape to make something more complex
- Use the PolyBrush tools to modify the surface

Sculpting with Sculptris

What is Sculptris

- 3D modelling tool that lets you sculpt 3D objects
- Sculpting is one of the easiest ways to make your 3D models, it feels just like sculpting a piece of clay
- Industry leading sculpting software is called ZBrush
  - Sculptris is the free student version of ZBrush
- Sculpting is very popular and is now part of most 3D modelling softwares
  - So Blender, Maya, etc all have sculpting tool inside their softwares to work with

Download and Install Sculptris

http://pixologic.com/sculptris/

Click on ‘Free Download’

Mouse and Keyboard Commands

- Draw (add material) = left click and drag
- Draw (remove material) = Option (Alt) + left click and drag
- Rotate = right click and drag
- Pan = Option (Alt) + right click and drag
- Zoom = middle mouse
- Mask = Ctrl + left click and drag

Sculpting Brushes

- Grab = grabbing the clay
- Draw = draws or removes, clay mode
- Inflate = like a balloon
- Crease
- Flatten and Pinch
- Smooth
- Rotate and Scale
- Wireframe = see triangle mesh
- Reduce = reduces number of triangles
- Symmetry → on/off to add or remove mirroring line

To change brush size click on the space bar on your keyboard

- Move up and down to change size
- Move left and right to change strength

Paint a texture onto your shape

- Click on ‘Paint’
  - Once you click on paint you cannot sculpt anymore → Save before you do this
- Choose a material
- Paint on color with a brush

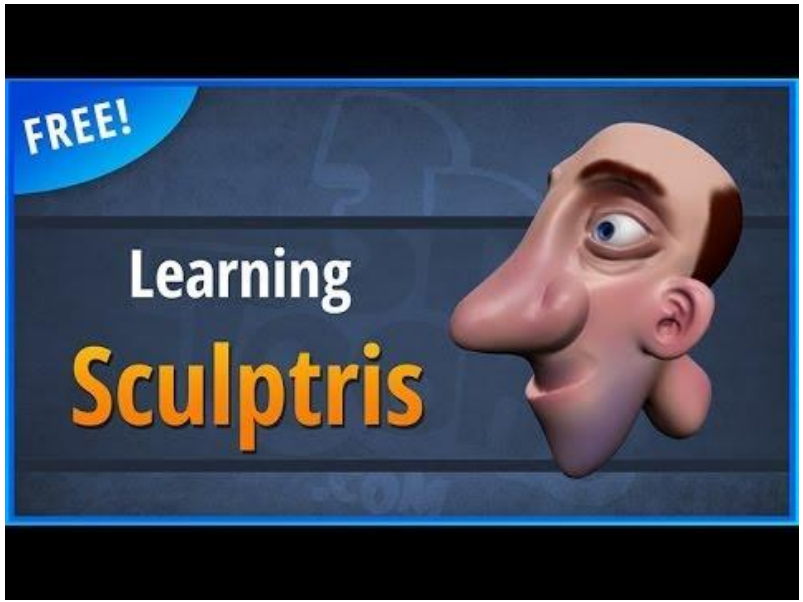
When you’re done

- Click on ‘Export’
- Click on ‘Advanced Tools’ and save texmap and save normals

Bring the Sculptris 3D Model into Unity

- Create a new folder under Assets called ‘3D Models’
- In this folder drag in the Sculptris model that you saved
  - Click on the PreFab that you just brought in, in the inspector under Materials click on ‘Extract Materials’
  - A material will be added inside your folder
- Drag in the texmap and normal images into the 3D Models folder
  - Drag these images into the Albedo and Normal sections for the material

Full Sculpting Tutorial



https://youtu.be/U9Dxi5fCd0Q

Next Week’s Tutorial

Next Week’s Tutorial

- VR interactions in Unity
- Specific to your projects for chemotherapy and radiation therapy patients