Tools for Large Scale Adjustments and Modular Asset Creation

"<u>Asset</u>" in general – Any singular mesh, shader, texture, system or file associated with a project.

"<u>Asset</u>" in Modeling 1 and 2 – Any singular mesh that can appear on its own in scene, possessing a silhouette that clearly conveys its purpose and/or function.

Small scale adjustments can be made to a mesh with straightforward Edit Poly commands such as "Extrude", "Connect", and just by moving, rotating and scaling either specific selections of subobjects or the overall object itself. Sooner or later you will want to make much broader adjustments or changes in form, and there are several modifiers and Edit Poly commands that will allow you to make changes to your mesh over a large area

Large scale modifiers:

Soft Selection
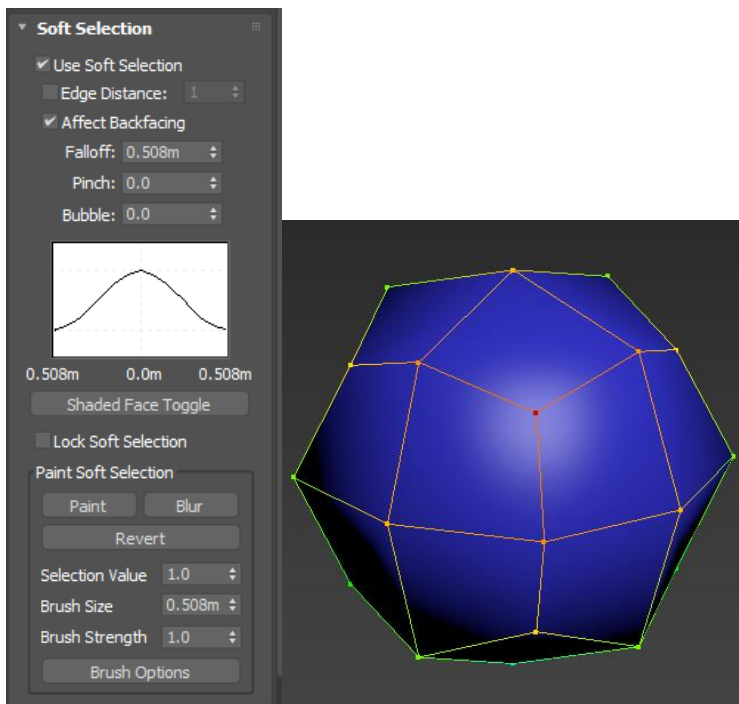
The simplest of the methods for creating large scale changes to a mesh. Only accessible from the Edit Poly commands, once one or more subobjects are selected Max will display a heat map at a distance based on the "Falloff" distance. This heat map will color nearby vertices or edges to show the degree to which any movement, rotation, or scale of your selection will affect them.
Your selection which is shaded red will directly receive the move/rotate/scale information, and then the adjustment's strength will decrease in line with the "warmth" of the color displayer.

Shaded Color:
Red>orange>…. cyan>blue

Strength of move/rotation/scale
100%>80%>…. 20%>0%

The falloff strength and rate can be controlled with the "Pinch" and "Bubble"

values. To apply soft select to only one side of a thin box, turn off "affect backfacing", and to further refine your falloff you can set a maximum "edge distance" that soft select will operate over.
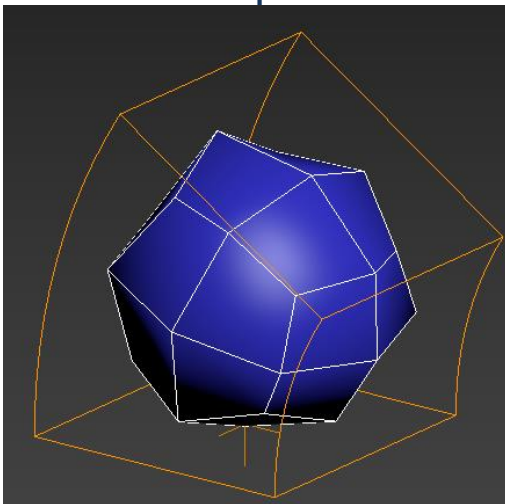
FFD Modifier
(Stretch/Skew/Twist modifier Alternative)
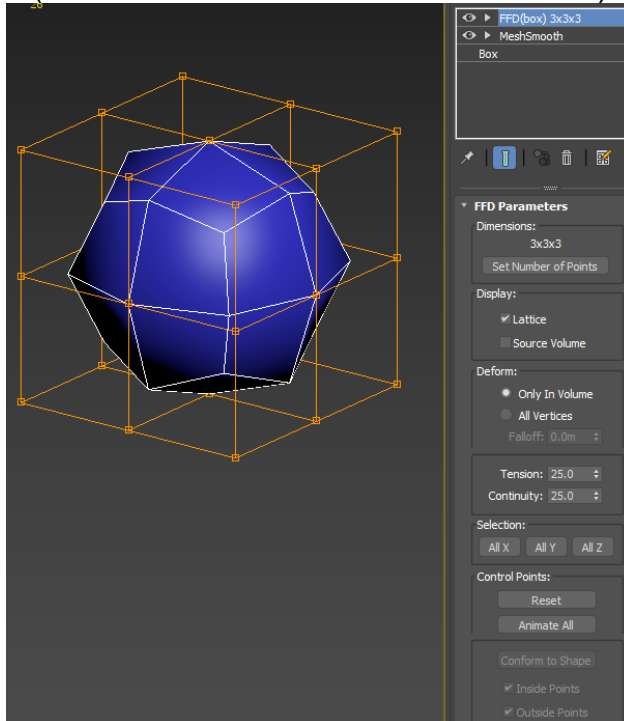
By far one of the more versatile modifiers, once you are comfortable using it this modifier can replace the use of simpler modifiers like Stretch, Skew and Twist. While there are preset variations ("FFD 2x2x2", etc), FFD (box) and FFD (cylinder) will give you the most options for modifying your model.

At its simplest, the FFD modifier will create a new cage around your selection, with subdivisions based on the values that you enter under "Set Number of Points". You can then use this simple cage's control points (the first subobject in the modifier, 1 on the keyboard row) to quickly modify your object. Be mindful that it functions in terms of volume as well as topology, so applying it to a heavily subdivided or high poly object at the same time as a low poly object can cause undesirable results.

Bend and Taper Modifiers

The simplest of the modifiers, since there are not many variables to adjust in these modifiers, mainly the axis on which they function, the axis they affect, and the degree to which they affect the object.

The only thing to be mindful of here is the "center" subobject for both modifiers, as this will act as the point at which these modifiers begin affecting the geometry, which you will most likely want to use the alignment/snap tools outlined below in order to change how your mesh is adjusted by the modifier.
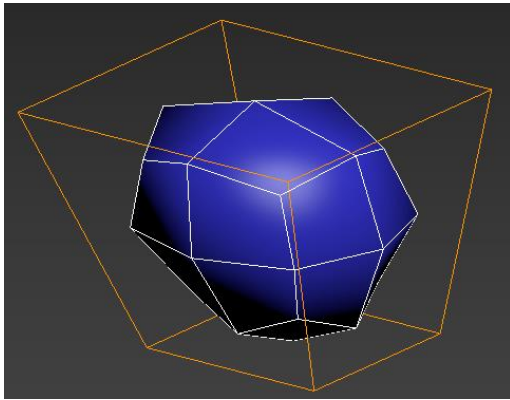
Push and Relax (Modifiers)
## Normal Constraint and Relax Poly Command
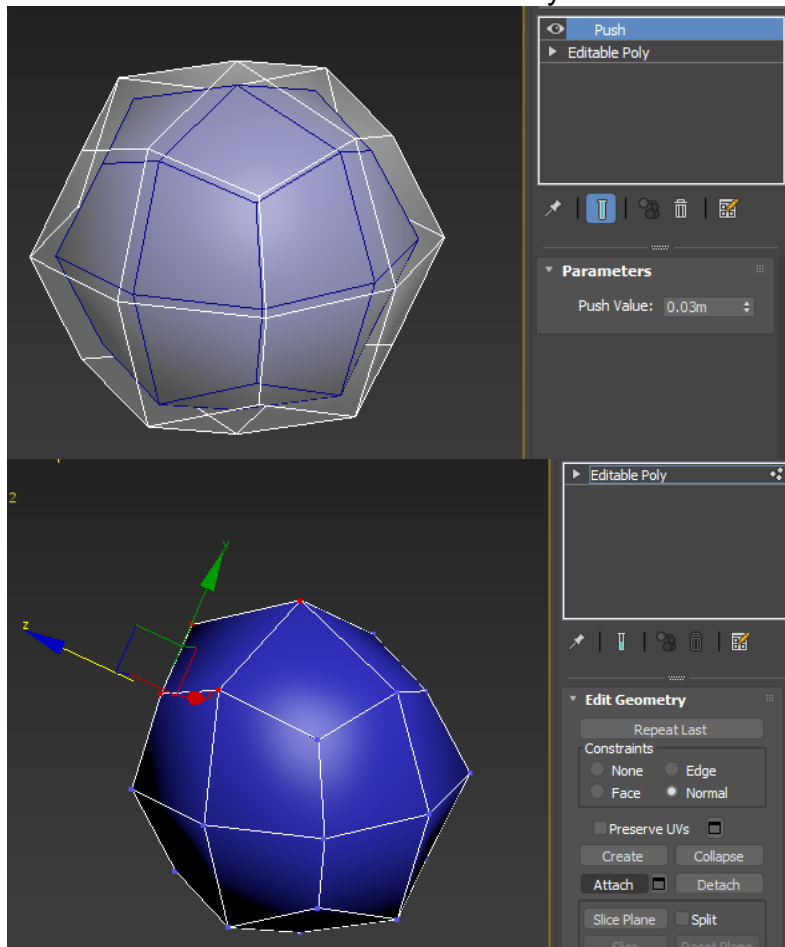
Relatively simple modifiers, Push will either increase or decrease the size of your mesh along the local Z axis, effectively inflating or deflating it. Alternatively, with either vertices or polys selected you can use "Normal" constraints to achieve much the same effect.

Relax will take an average of the placement of your vertices and slowly start to move them to that average, or more accurately it will reduce indentations or peaks, smoothing out the mesh and evening out distribution. The "relax" edit poly command under the Edit Geometry tab of an editable poly has the same function.

Align Tool

Accessed most readily by pressing ALT+A, align allows you to match a selected object or pivot to another based on XYZ position (Align Position), on XYZ rotation (Align Position) or scale (Match Scale). This along with use of the snap tools can make the placement of floor and wall structures, as well as assembling mechanical structures much easier.
For the "Current Object:" and "Target Object"
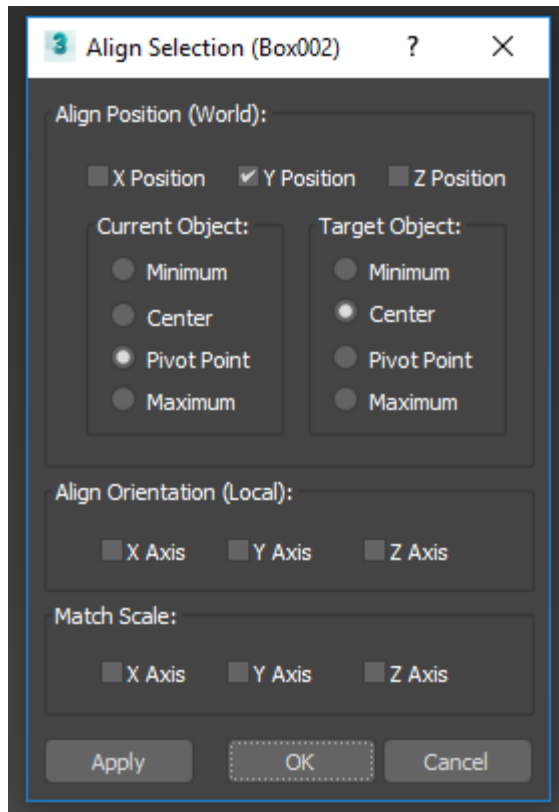
area, think of it this way:

Take the **Current Object**s _____ and
Place it to the **Target Object**s _____

So if you were trying to have to objects overlapping one another, you would ALT+A and choose to take the current objects center and align it to the target objects center.

The only terms here that may be confusing are the "Minimum" and "Maximum" options. Essentially these refer to the maximum value on the __ axis that the object extends to. If you have selection brackets active (J), you will see an implied box around your selected object, which also outlines the Min/Max values of the object.

Snap Tools
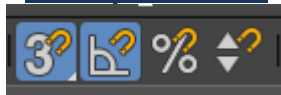
We have already used angle snap in class, the other snapping tool that you will be making heavy use of is the 3D snap tool (S). This tool will allow you to move an object or subobject and precisely place it on another. If you right-click the icon you will be able to set what subobject or world reference point is used when 3D snap is turned on.

For example, by selecting a sphere and then turning Vertex snap on, you can click and hold on the central or pole vert on one side of the sphere, then drag it over the central vertex on the cap of a cylinder to perfectly align them. This process has a direct parallel inside of Unity and is idea for placing and arranging floor and wall tiles.
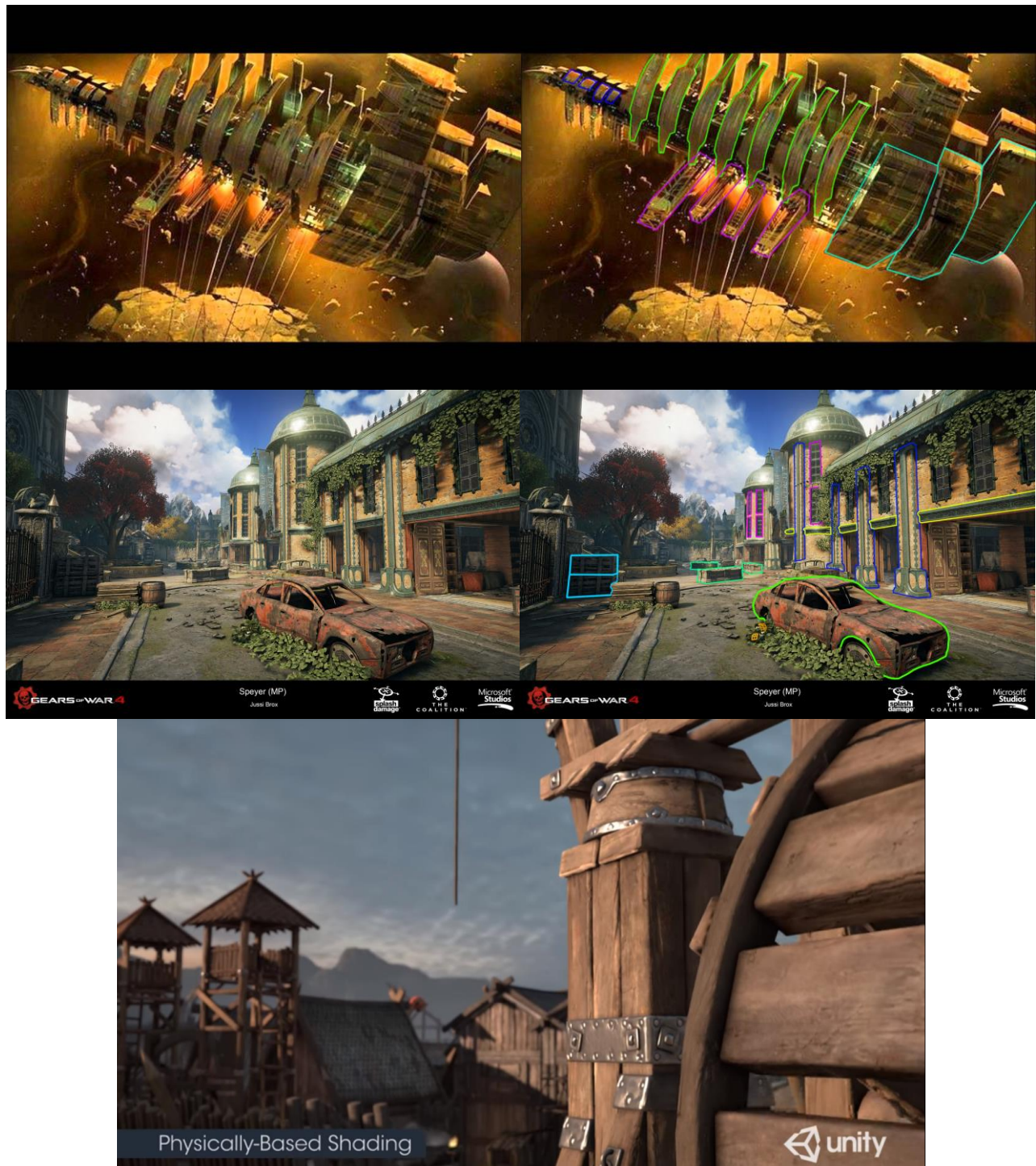
[Promotional Video for Unity 5](#)
*This asset pack is available in the Unity store for free, and it is highly recommended that you download it to get a hands-on experience with a modular asset set
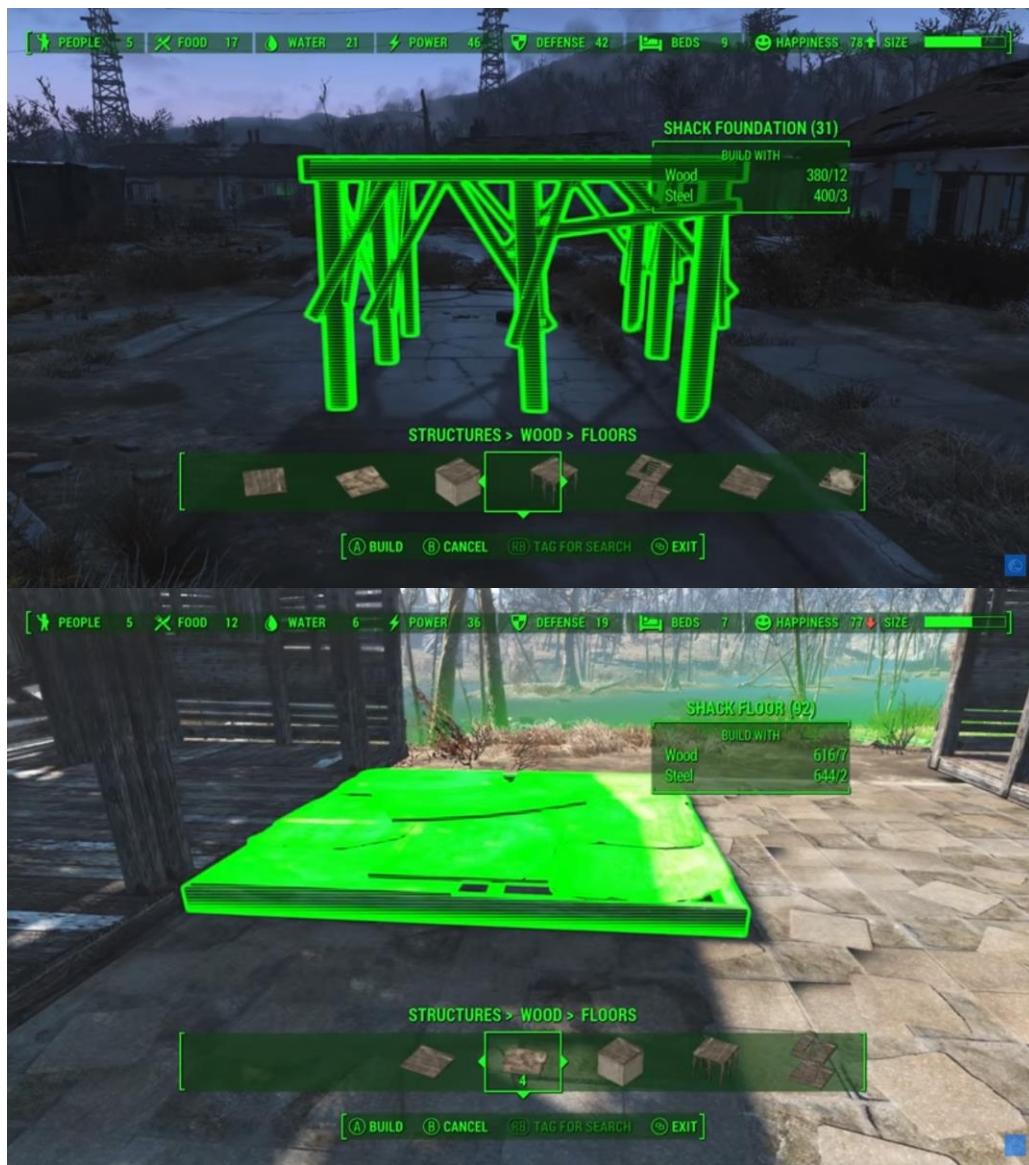
When approaching more complex projects or objects, one of the first things to look for is areas where details repeat: in the first example with the USG Ishimura, most of the ships visual weight is structures that individually have a lot of detail but have then been duplicated and adjusted to increase the complexity of the ship's overall model. With the street shot from GoW3, rather than creating five or six complete plants or formations of debris creating four or five pieces of debris and clumps or formations of leaves and then duplicating, rotating and scaling individual pieces and populating the scene with them.

Break down otherwise complex objects into pieces with visual interest but that are relatively simple and can be presented on their own. You can make minor modifications or duplicate those structures and change how they are combined and arranged to get the most out of the time you spend creating geometry. This also allows for variations to be made quickly and allows you to contribute to multiple aspects of a project at once.

As you get more confident in your modeling skills, start to think about how you can use a model you made as a starting point for future projects, or how it can be modified to create a variant for another entry in an existing project. Creating enemy armor variations for example, can go much faster by breaking the armor into "chunks", and then by mixing and matching pieces you can generate a

number of variations without completely recreating geometry. Similarly, starting with a base object with relatively low overall or distinctive detail can allow you to quickly produce variations.

Gamasutra has an in-depth article about working with grids and expounds on much of what we will look at in class [that can be found here.](#)