Lesson 4 - 3DS MAX, 3D Modeling, Parametric, Mesh

3D – Four types: Parametric, Mesh, NURBS, Polygons

Internal – Built-in to 3ds MAX.

1. Parametric - Primitives (Boxes, Teapots), Extruded shapes (Extrude, Lathe, etc…)

    More Modifiers – May need to add segments to underlying geometry
        Bend, Taper, etc…

2. Meshes ("Triangles ") – No primitives, must convert to an Editable Mesh (or import).
    Object level – Attach, Attach Multiple

    Sub-Object level - Use F4 (show edges)
        Vertex - Move

        Edge – Move, Chamfer

        Faces (Face, Polygon, Element) - Edit Geometry
            Move
            Create
            Attach/Detach
            Extrude, Bevel

            Surface Properties
                Normals
                Material ID
                Smoothing Groups

3. NURBS – NURBS Toolbox. Specific commands.
    Primitives
        Point Surface/Curve – “Interpolate Point Curve”
        CV Surface/Curve – “Control Point Curve”

    Converted – “Convert to NURBS” from (2D or 3D) object

    Sub-Objects – Surface, Curve, Curve CV (control vertices), Points

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4. Polygons – No primitives. Must convert to an “Editable Poly”
   Contextual Ribbon (Shift + Command, activates "Caddy")
   Command Panel – More basic commands

   Paint Deformation
      Object or sub-object level
      Push-/Pull+, Brush size

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   Turbosmooth – Polygon specific modifier

External – Bring in from outside 3ds MAX. Merge, Link and/or Import

   Merge - MAX format only.
      All types of objects can be merged (i.e. 2D & 3D Geometry, Lights, etc…)

      Materials and animation settings also merged in

      Must select objects to merge from list.

   Link - Autodesk formats only:

         DWG – AutoCAD or exported DWG’s from other CAD programs

         RVT – Revit. Includes lights and materials.

         FBX – Alternate format.

      Creates “Linked Geometry”, only modified in original program (i.e. Revit)
      Updated when:
         1. MAX file with link(s) is opened
         2. Manually from “File/Reference/..Links..”

      In MAX, one may add modifiers and materials to linked geometry
      Can link multiple files.

      Can link exported files (i.e. a DWG from Sketchup).
         To update, export and overwrite linked file

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External (cont…)

Import – Independent. Geometry type depends on format (most are meshes).

Primitives – None. Use Merge for native MAX geometry.

Meshes:

DWG – All geometry on a layer becomes a single 3ds MAX object
2D & 3D geometry on same layer, become separate objects

3DS – Original (old, pre-Windows) 3D Studio format.
Geometry, Materials, Cameras and Lights.

RFA – Revit "symbol". Must use FBX format
Open in Family Editor (not Project environment)

SKP – 2020 or earlier. Only 3D Geometry.
Up Axis = "Z-Up"
Hierarchy Mode (Organization):
"Use Groups" – If SKP has only "tags" (layers)
"Use Layers" – If SKP has Groups/Components
"Flattened" – No

"Preserve Layers" – If imbedded in groups/components

Cameras (current default view + any scenes)
Materials & Textures

NURBS

FBX – Imports surfaces and curves. Each object separate.
Objects on the same layer are linked to a dummy (helper).
"Surface Approx" - Tessellation – Adds more divisions (detail)

"Body Objects" (nPower plugin). Surfaces only (No curves).
SAT (separate objects)
IGES (adjacent surfaces may join) – "Convert to Mesh" = OFF
SLDPRT (Solidworks) - "Convert to Mesh" = OFF

Polygon – No polygon-specific formats.
Use Merge for MAX polygons.
FBX files from Rhino using "Mesh Only" export option will convert to

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Obtaining models

Manufacturers – Download from website
Look for links – “Resources”, “Planning”, “Symbols”, “3D Models”, etc...

Revit – Typically RFA’s which must be exported from family editor
MAX - Merge
SKP, 3DS, DWG – Import

BIMObject.com
Repository for manufacturers.
Primarily RFA files, but many other common formats available
May login using Autodesk account

Sketchup “3D Warehouse” (3dwarehouse.sketchup.com)
SKP-only (Might need to save down to an earlier SKP version)
Free, although quality of models vary

Consignment models – ex. Turbosquid (Must register, Free)
High quality, and frequently expensive, models
Some free geometry.
Check offered formats, especially if purchasing.
Many models use materials from plug-ins (i.e. V-Ray). Likely need to redo.