User Interface Software Projects

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Intro to Blender

http://wiki.blender.org/index.php/Doc:2.6/Manual

MicroLesson #1
Orientation

What is Blender?

What is Blender?

- Blender first launched in August 1994
- Tool to make 2D and 3D content
- Blender supports:
  - modeling, texturing, lighting, animation and video post-processing
- open source/cross platform (GNU GPL)
- Intended users are media professionals, artists, visualizers
- The Blender Foundation in the Netherlands coordinates its ongoing development.

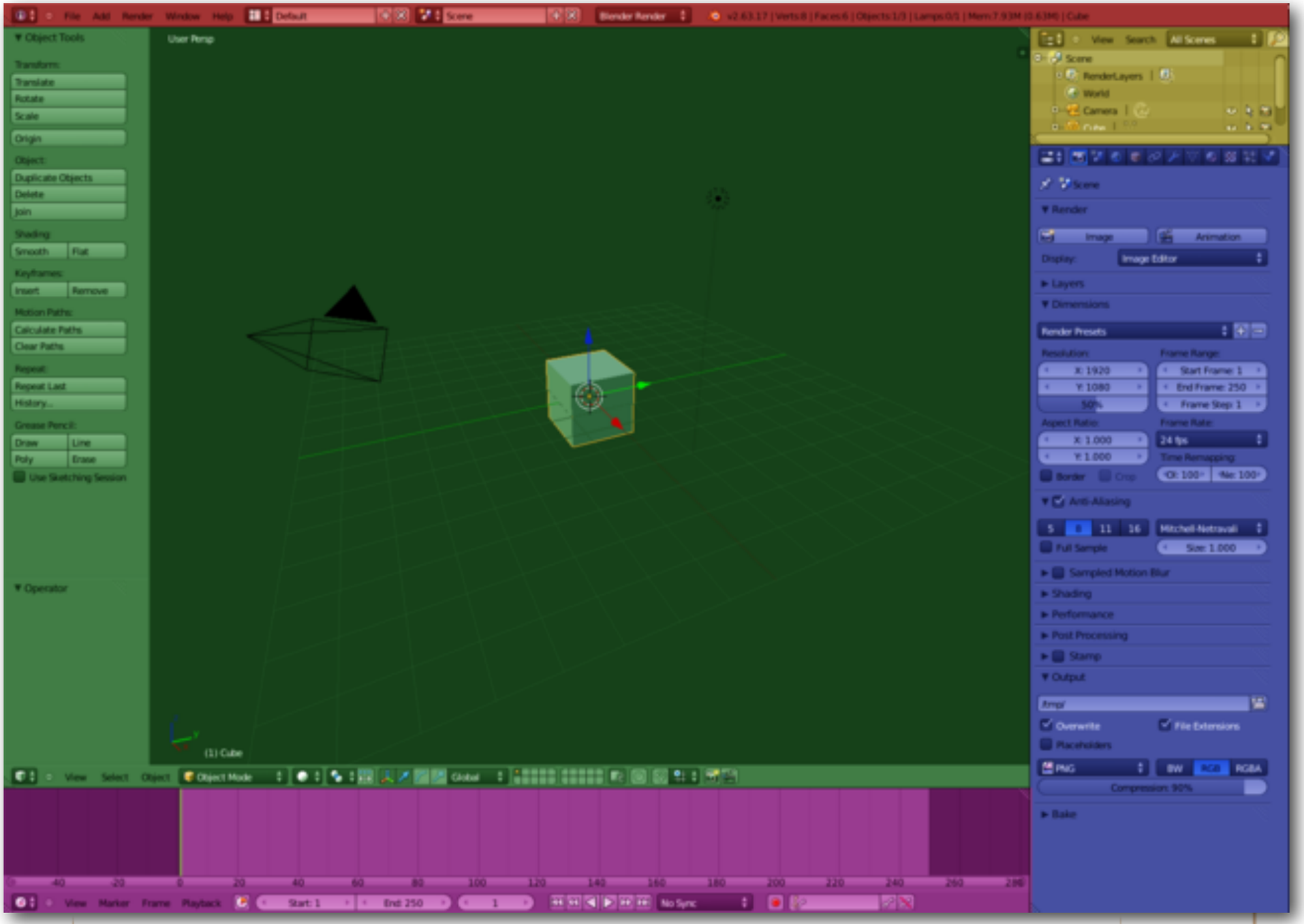
What is Blender?

What is Blender?

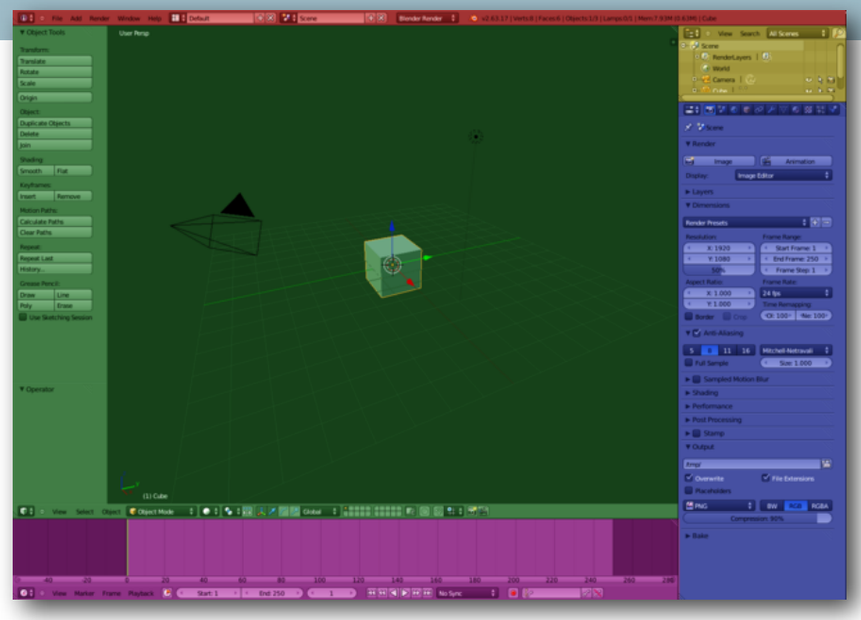
- Key Features:
  - Fully integrated creation suite
  - Supports modeling, uv-mapping, texturing, rigging, skinning, animation, particle and other simulation, scripting, rendering, compositing, post-production, and game creation
  - Cross platform, with an OpenGL GUI that is uniform on all platforms (customizable with python scripts), ready to use for all current versions of Windows (XP, Vista, 7), Linux, OS X, FreeBSD, Sun and numerous other operating systems
- User community
  - http://BlenderArtists.org
  - http://BlenderNation.com

- Examples
  - open source philosophy (http://www.blender.org/features-gallery/blender-open-projects/)
  - Big Buck Bunny (http://download.blender.org/peach/trailer/trailer_480p.mov)
  - Tears of Steel (http://www.youtube.com/embed/Gjbhp94dWM0?rel=0)

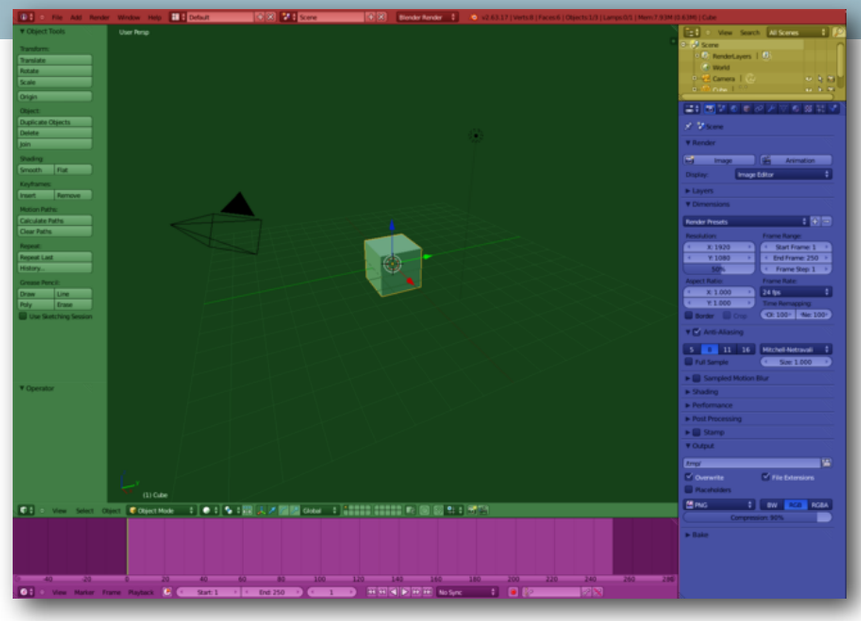
Using the interface



Using the interface

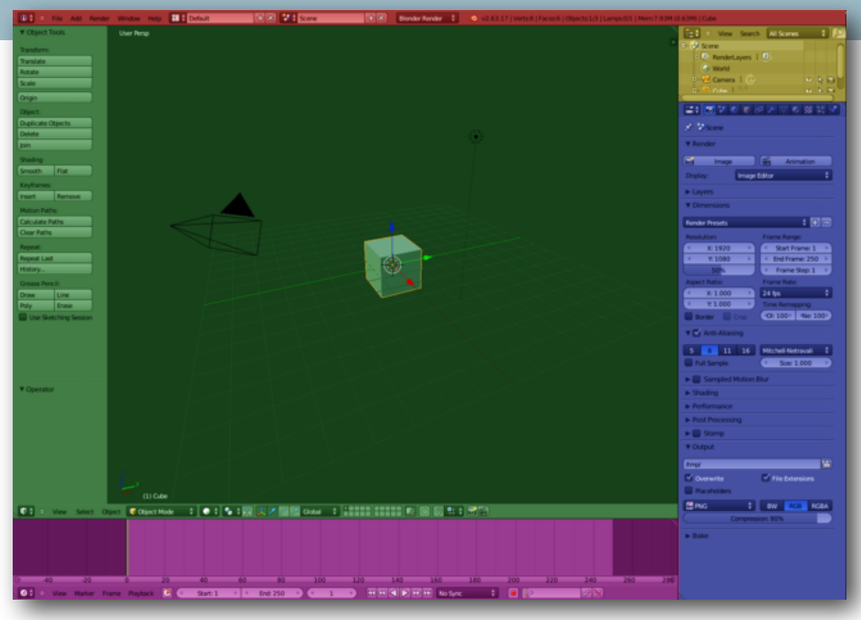


Using the interface



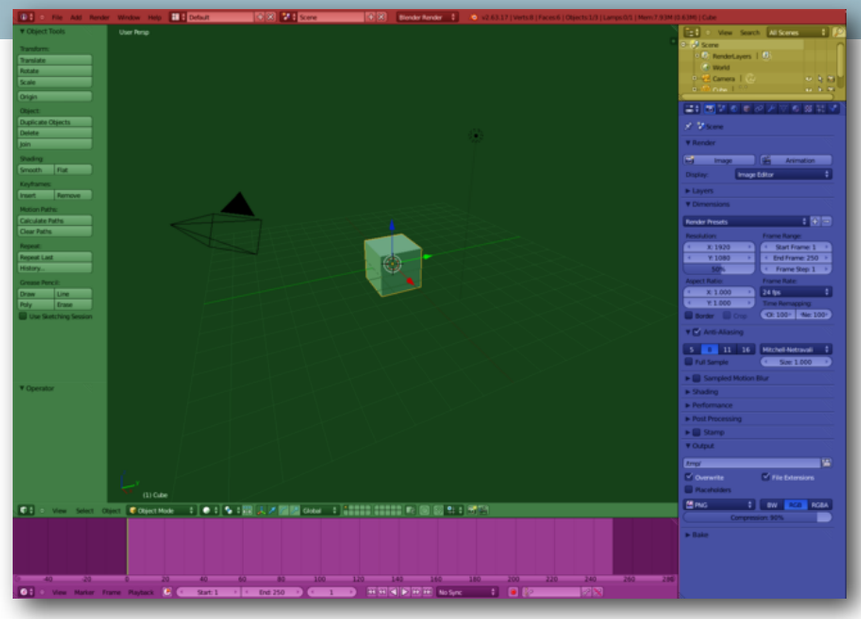
- The Info window (shaded red) at the top. The Info window is comprised solely of a header.
- A large 3D window (3D View) (shaded green).
- A Timeline window at the bottom (shaded purple).
- An Outliner window at the top right (shaded yellow).
- A Properties window (Buttons window) at the bottom right (shaded blue).

Using the interface



3-button Mouse	2-button Mouse	Apple Mouse
LMB	LMB	LMB (mouse button)
MMB	Alt LMB	⌥ Opt LMB (Option/Alt key + mouse button)
RMB	RMB	⌘ Cmd LMB (Command/Apple key + mouse button)

Using the interface

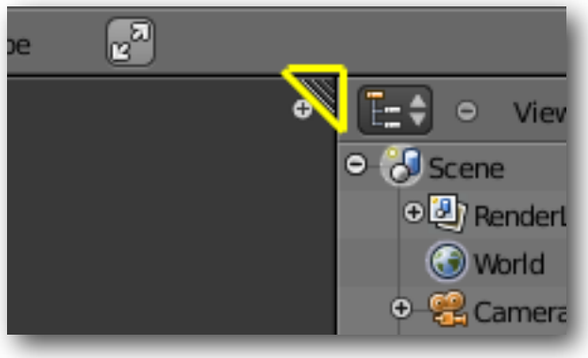


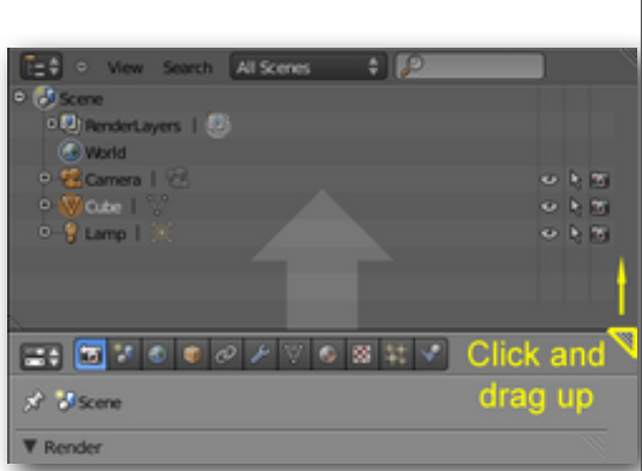
- Custom windows written in OpenGL
- Windows are non-overlapping, non-blocking, non-modal
- Generally left hand on keyboard, right hand on 3 button mouse

3-button Mouse	2-button Mouse	Apple Mouse
LMB	LMB	LMB (mouse button)
MMB	Alt LMB	⌥ Opt LMB (Option/Alt key + mouse button)
RMB	RMB	⌘ Cmd LMB (Command/Apple key + mouse button)

- Turn on 3-button emulation in User Preferences

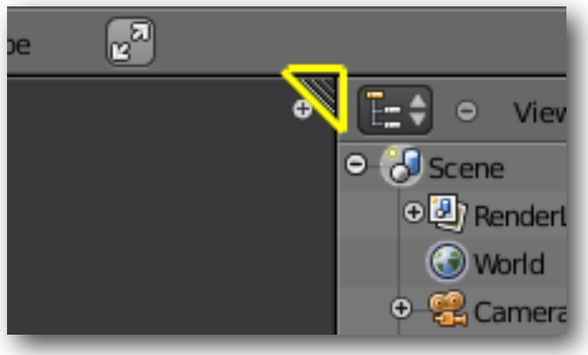
Using the interface

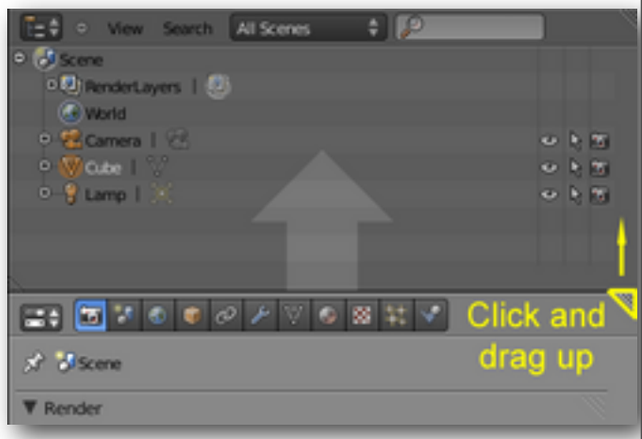




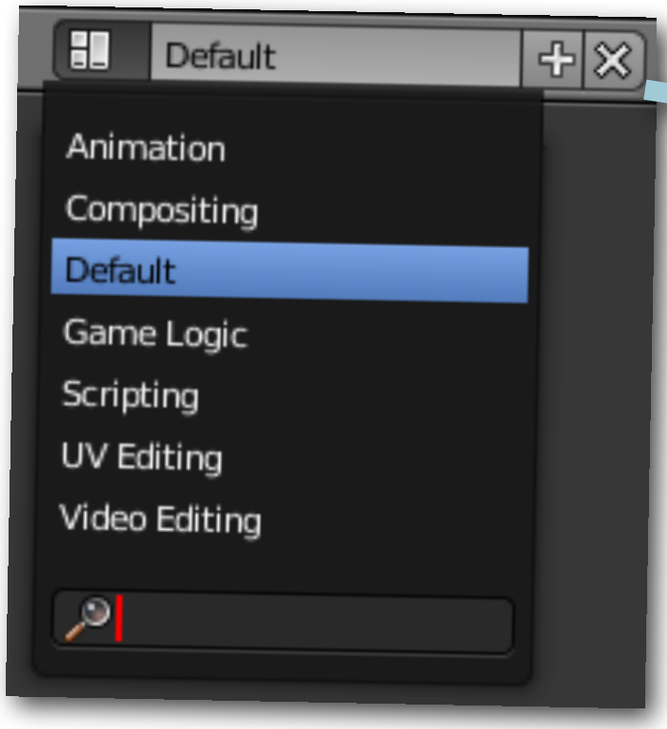
Using the interface

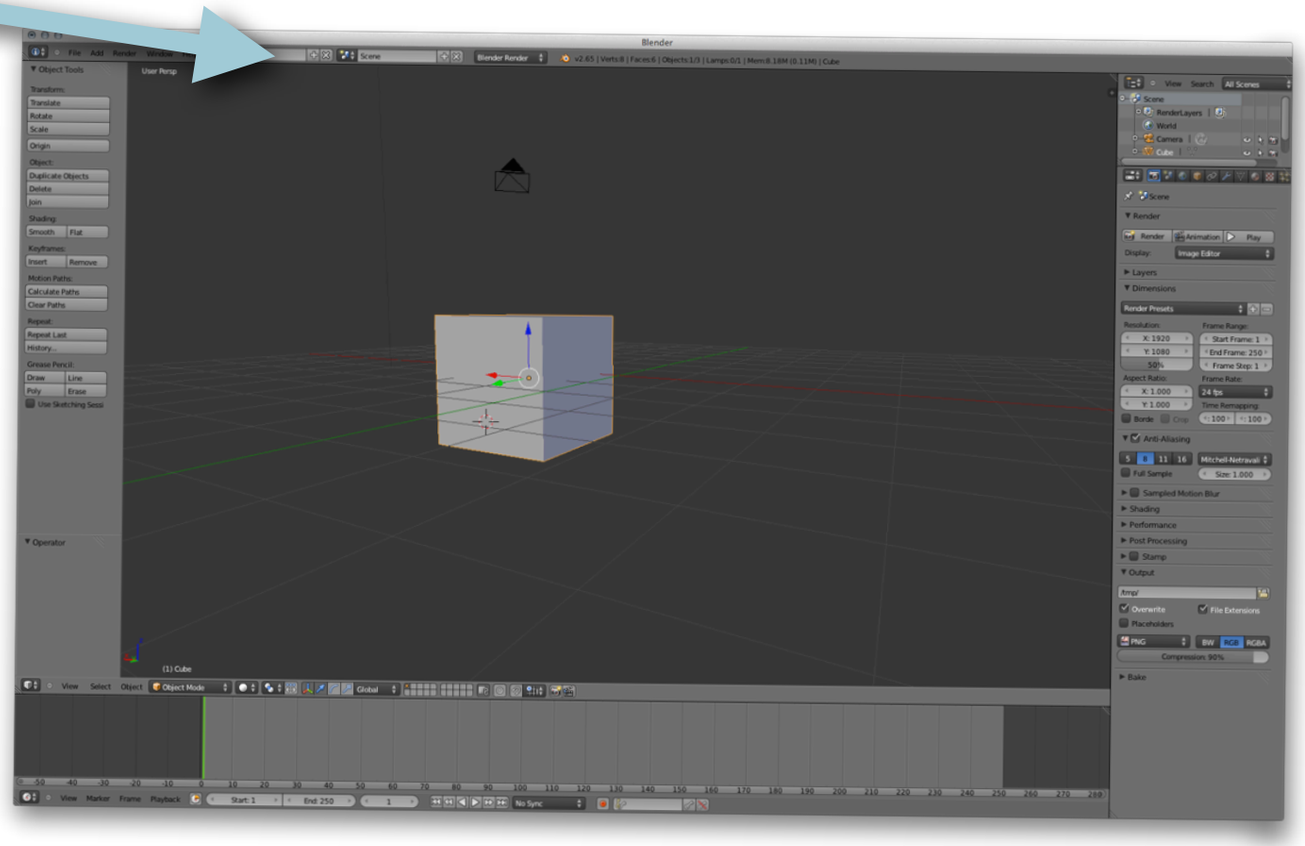
- Modeling requires lots of windows
- Resize a window by grabbing the border and dragging
- Split a window by grabbing the triangle and making it smaller
- Merge a window by grabbing a triangle and making it bigger





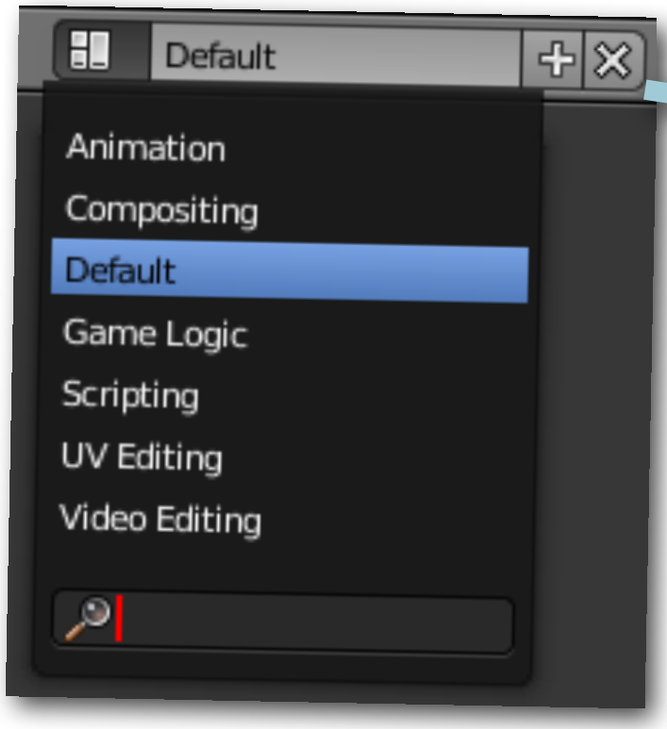
Using the interface

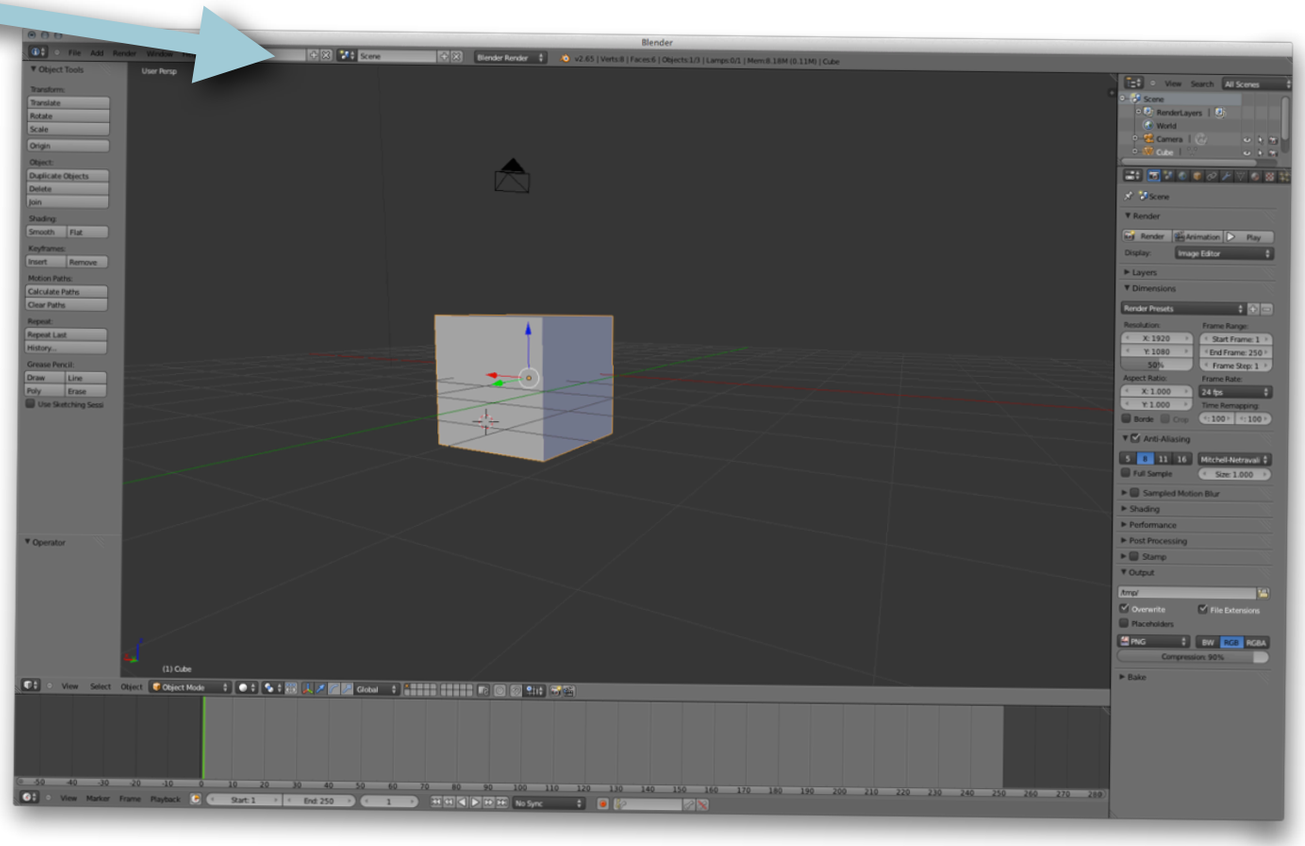




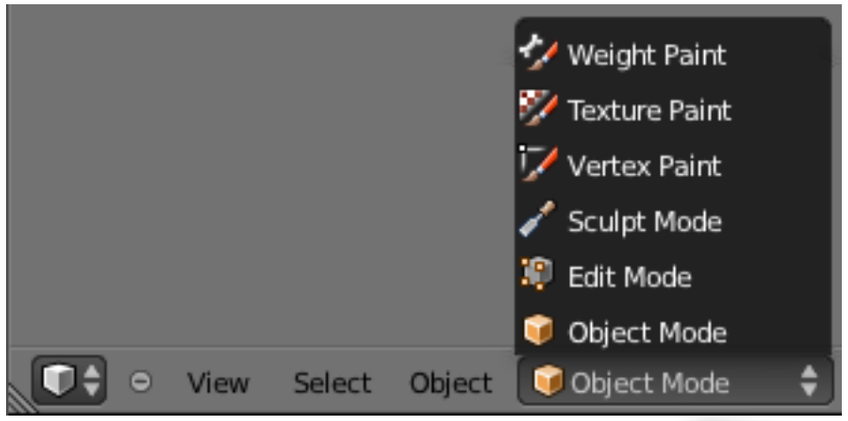
Using the interface

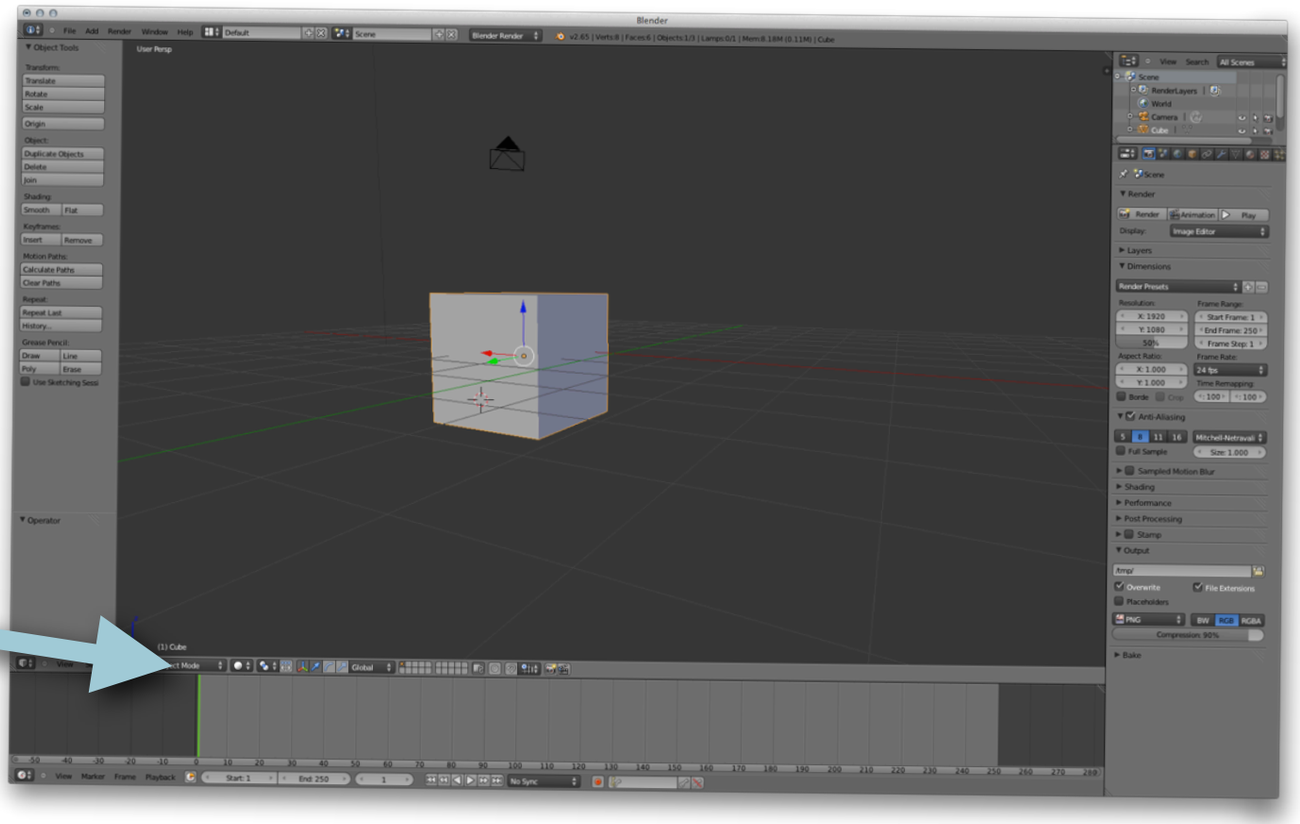
- Predefined screen layouts support common workflows at different stages of development





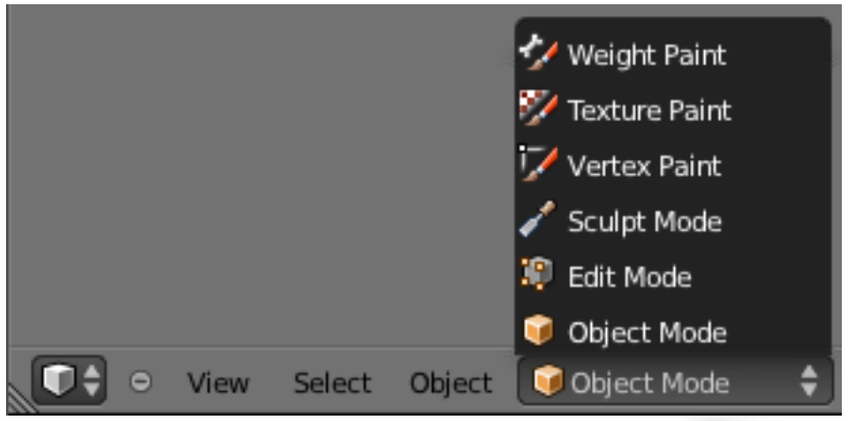
Using the interface

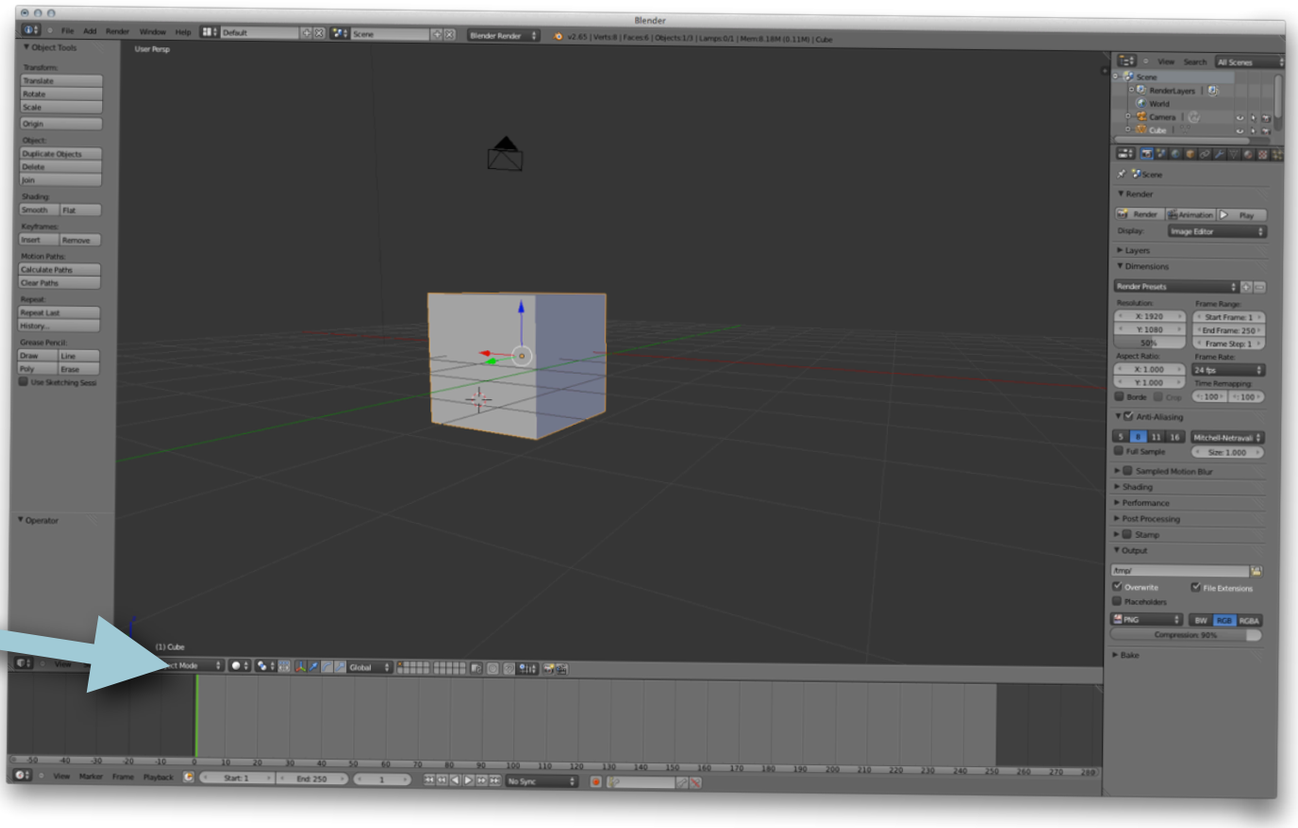




Using the interface

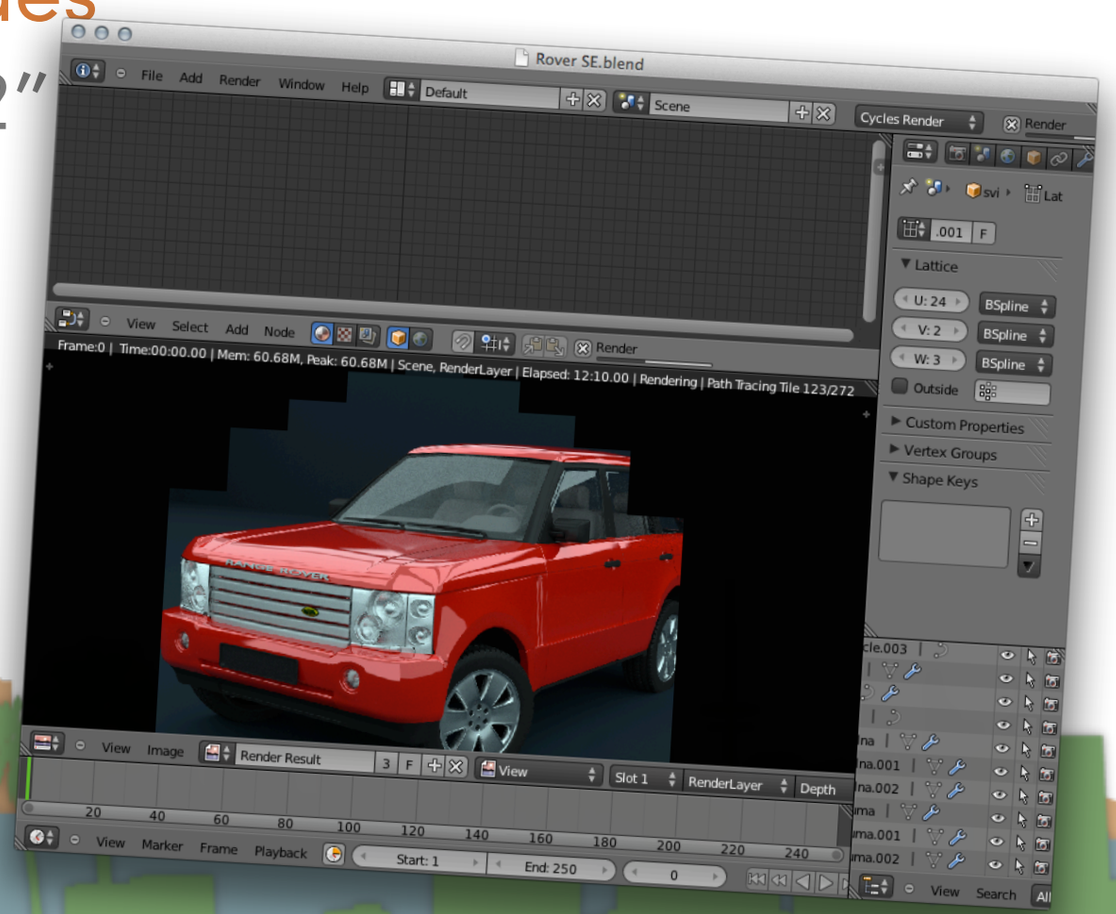
- Modes
  - the whole application is always in one and only one mode
  - Each mode is designed to edit an aspect of the selected object.





Micro-Lesson #1

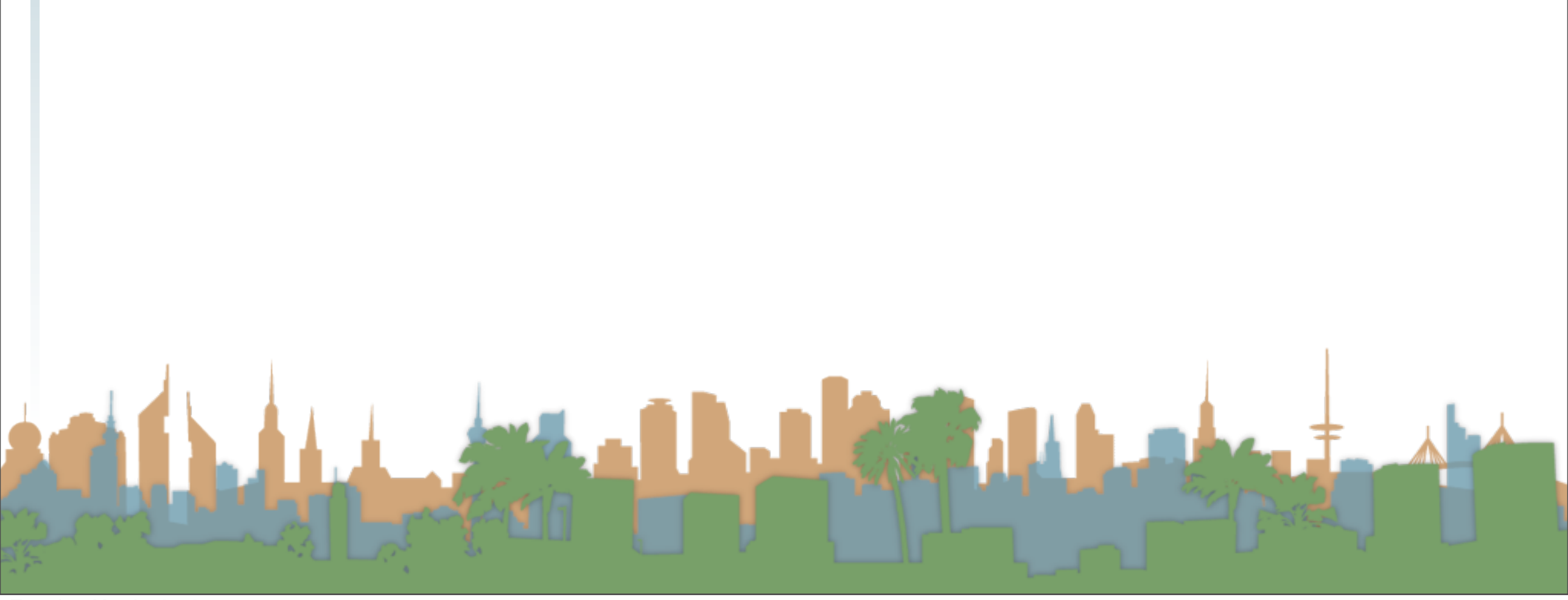
- Open Blender
- Go to blendswap.com
  - register an account
  - download a model
  - open it in Blender
- Switch between different screen layouts
- Switch between different modes
- Render your model using “F12”



MicroLesson #2
Manipulating Objects

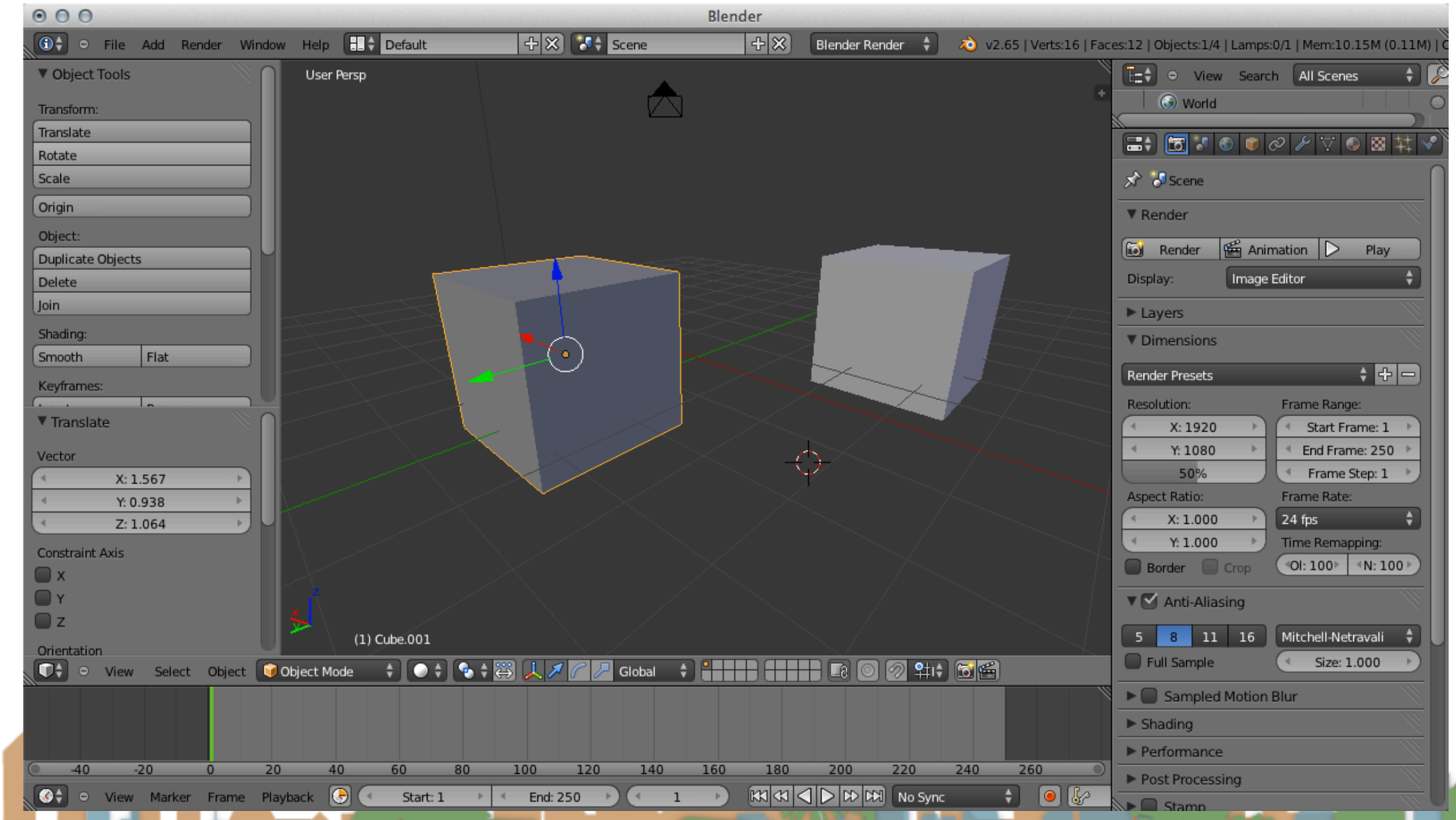
Micro-Lesson #2

- Select
- Grab/Move
- Rotate
- Scale
- Properties Panel



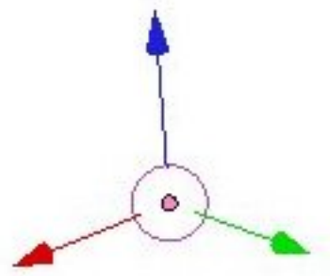
Select

- When in “object mode”, RMB will select an object



Grab

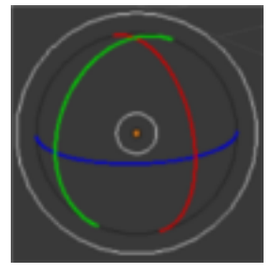
- When an object is selected, grabbing the transform widget will slide the object along the x, y and z axes



- Pressing “g” then moving the object with the mouse
  - LMB confirms move
  - MMB restricts move to x,y,z axes
  - RMB cancels

- “shift {x,y,z}” restricts objects to a plane

Rotate

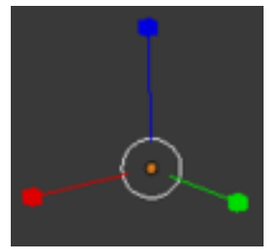


- When an object is selected, grabbing the rotation manipulator will rotate the object around the x, y and z axes

- Tap “r” once to enter rotation mode.
- Rotate the elements by moving the mouse. The closer the mouse is to the elements's center, the higher the rotation influence.
  - LMB confirms move
  - MMB restricts rotate around x,y,z axes
  - RMB cancels

- “shift {x,y,z}” restricts objects to rotate in a

Scale



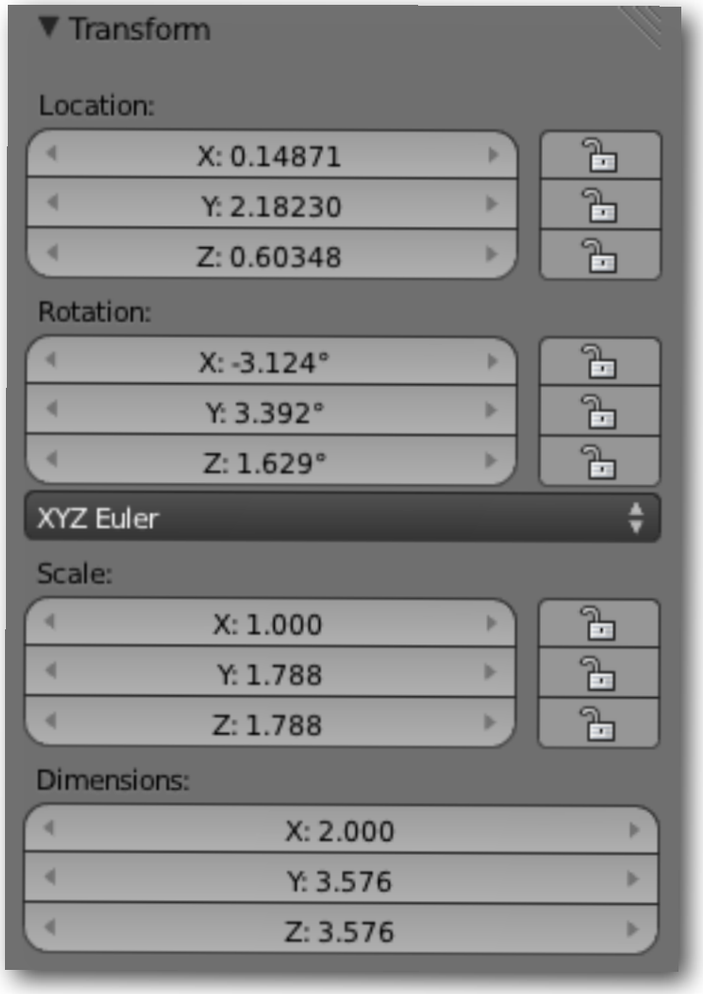
- When an object is selected, grabbing the scale manipulator will rotate the object on the x, y and z axes

- Tap “s” once to enter rotation mode.
- Scale the elements by moving the mouse. The closer the mouse is to the elements's center, the higher the rotation influence.
  - LMB confirms move
  - MMB restricts scales on x,y,z axes or {x,y,z}
  - RMB cancels

- “shift {x,y,z}” restricts objects to scale in a plane

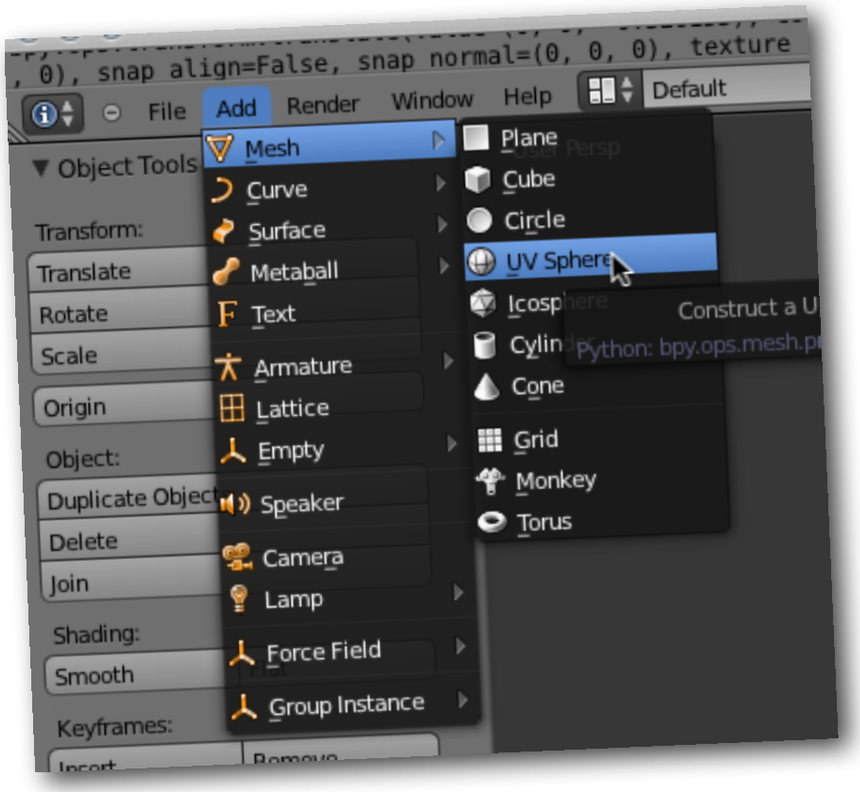
Properties Panel

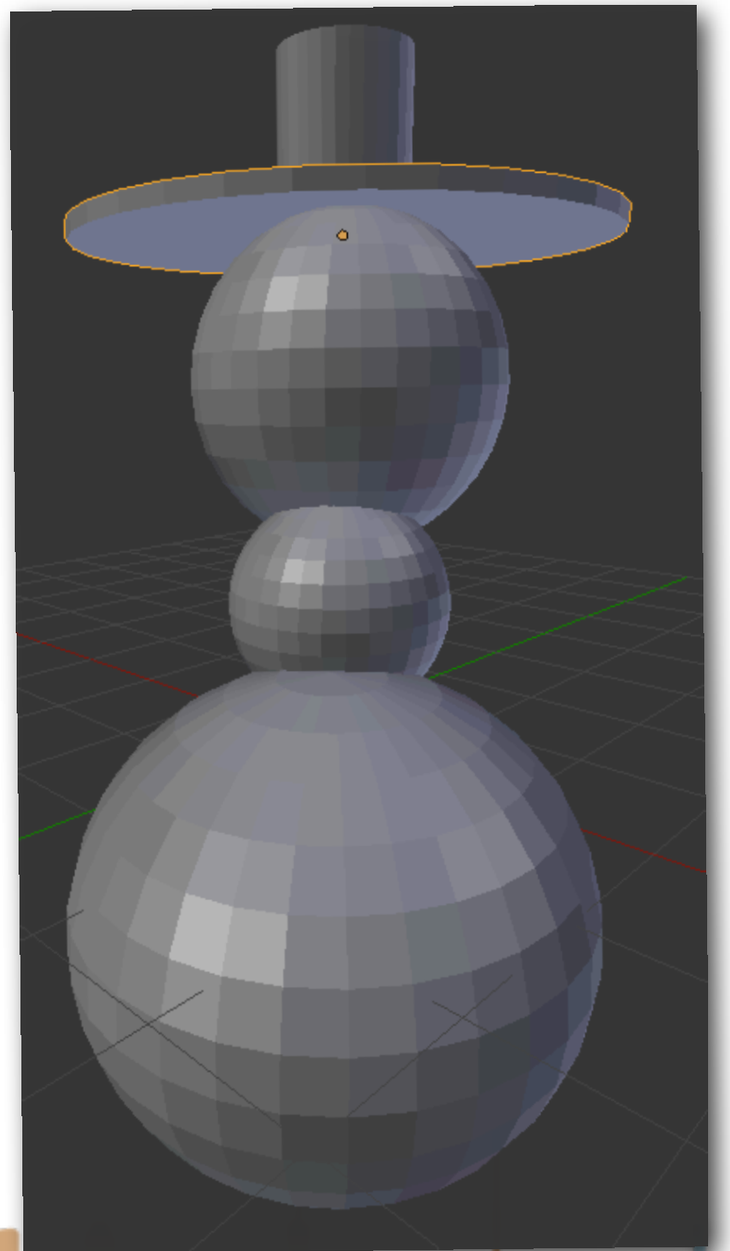
- “n” will make the properties panel appear
- manual editing of object



Micro-Lesson #2

- Make a snow man with 3 spheres, and two cylinders.
- Scale, rotate and grab as necessary

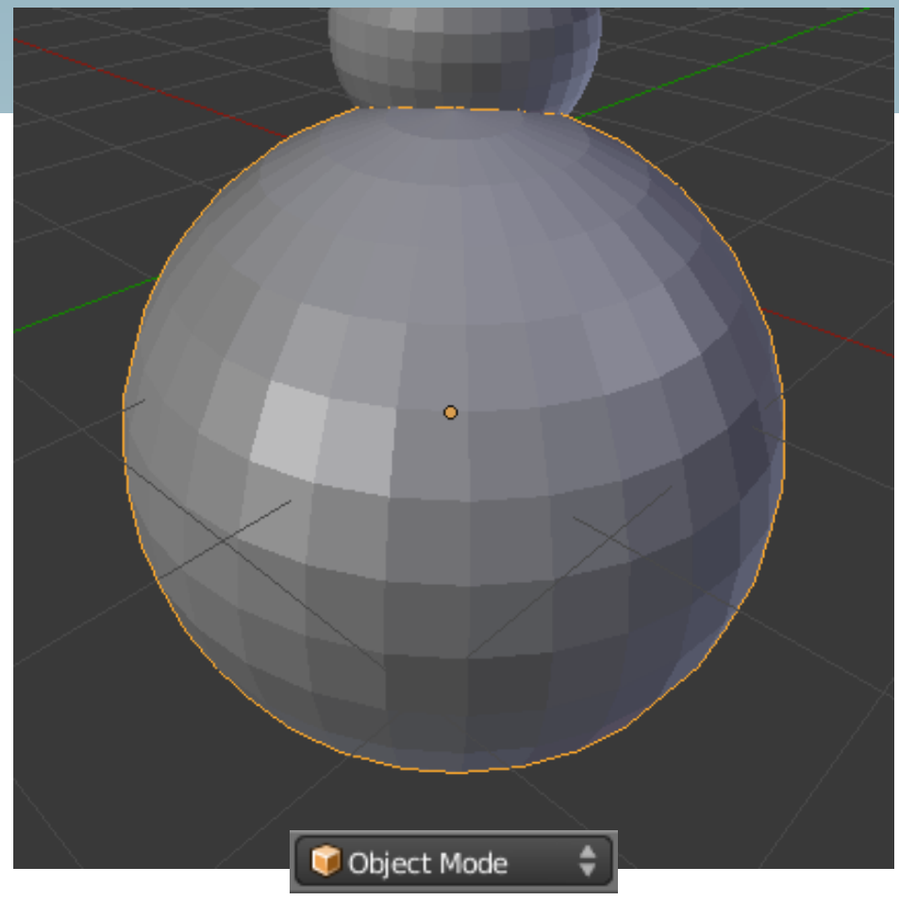


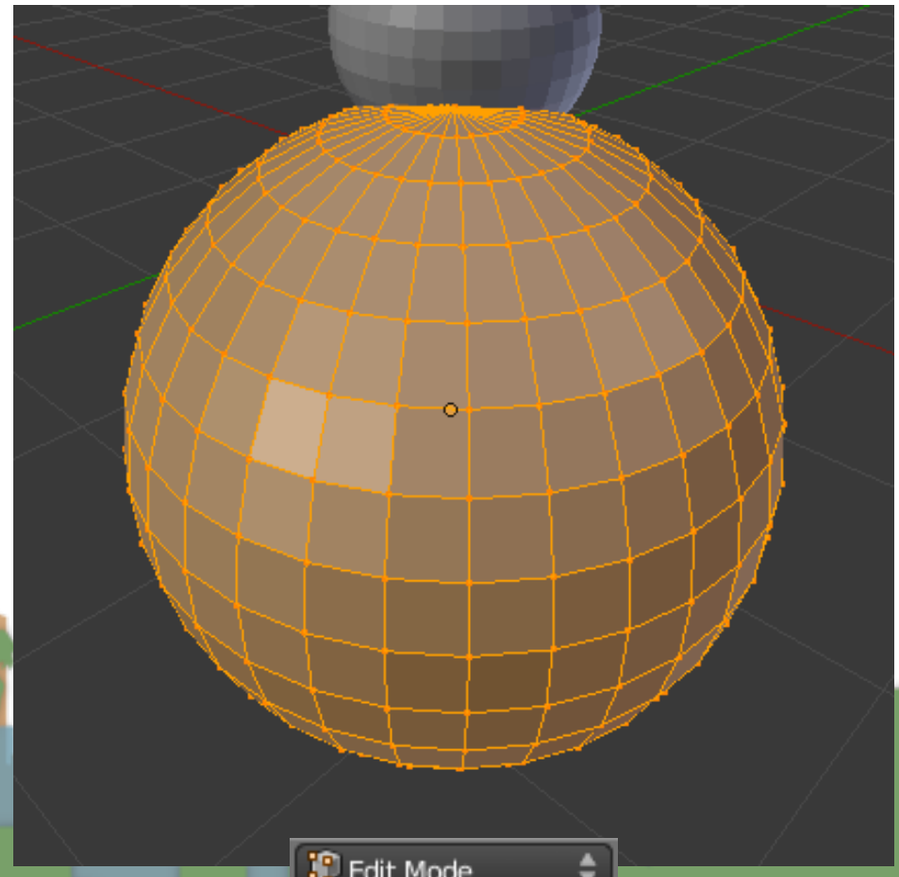


MicroLesson #3
Editing Objects

Edit Mode

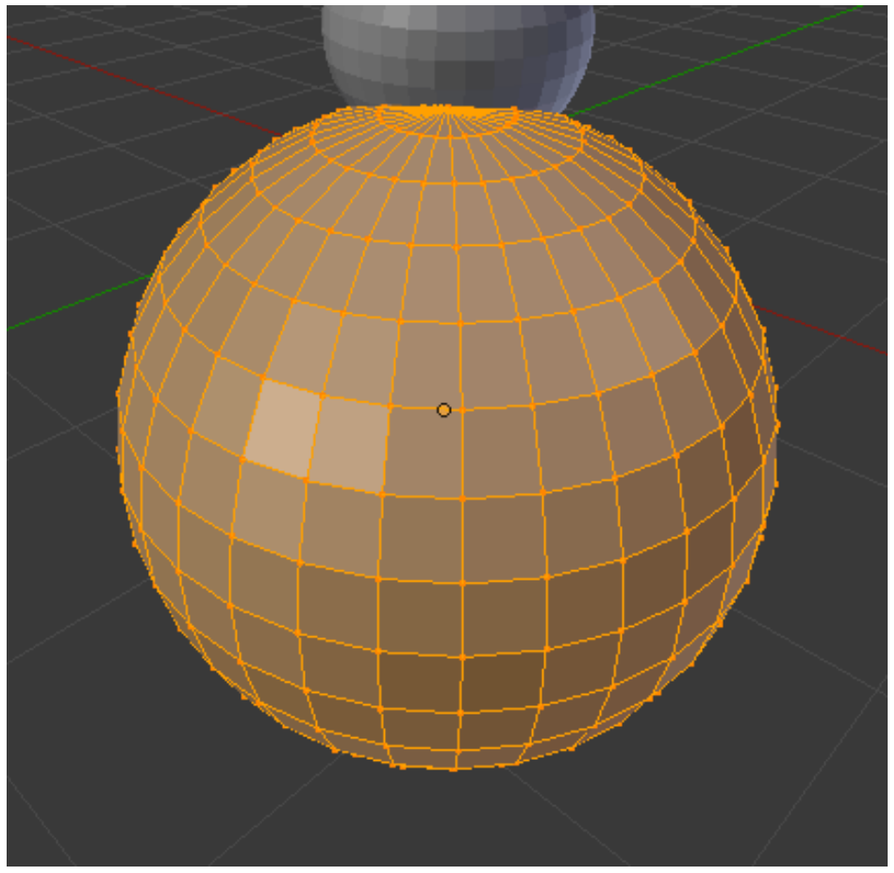
- Select an object in “object mode”
- Switch to “edit mode” to perform fine-grained editing
  - Objects have
    - centers
    - vertices
    - edges
    - faces



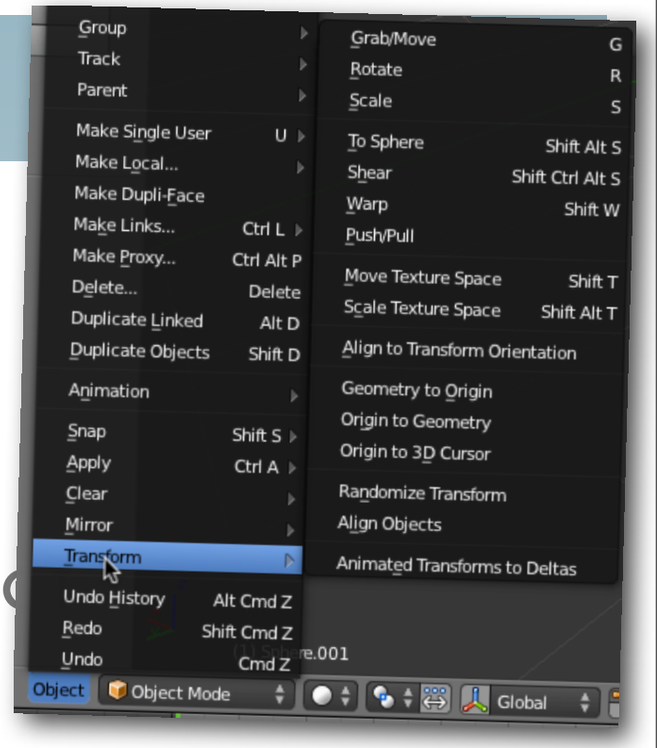


Centers

- Each object has a center or origin point.
- This is where the object is located in 3D space.
- When an object is selected, a small circle appears, denoting the origin point.
- The origin point is important when rotating or scaling an object.



Centers



- Moving Object Centers
  - in Object Mode “Object” -> “Transform
  - Geometry to Origin
    - Move model to origin and this way origin of the object will also be at the center of the object.
  - Origin to Geometry
    - Moves the origin to the average position of the object's components.
- Origin to 3D Cursor Location
  - Moves the origin to the location of the 3d cursor.

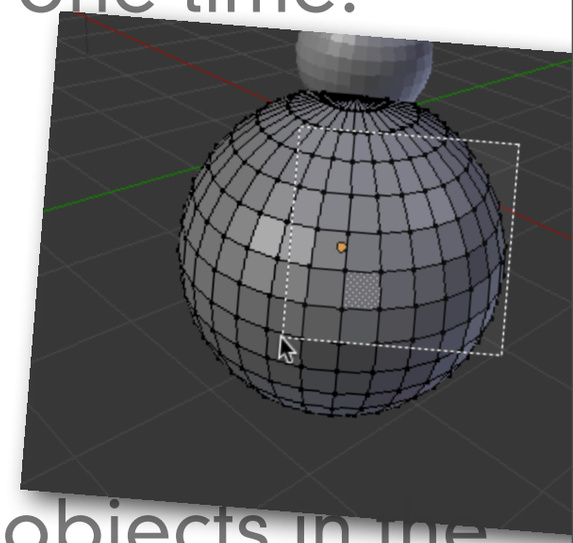
Selecting in Edit Mode

- There is one active object in edit mode
- To select everything / nothing use “a” (ALL)
- Selection Mode:

  - vertex
  - edge
  - face
  - restrict selection to visible

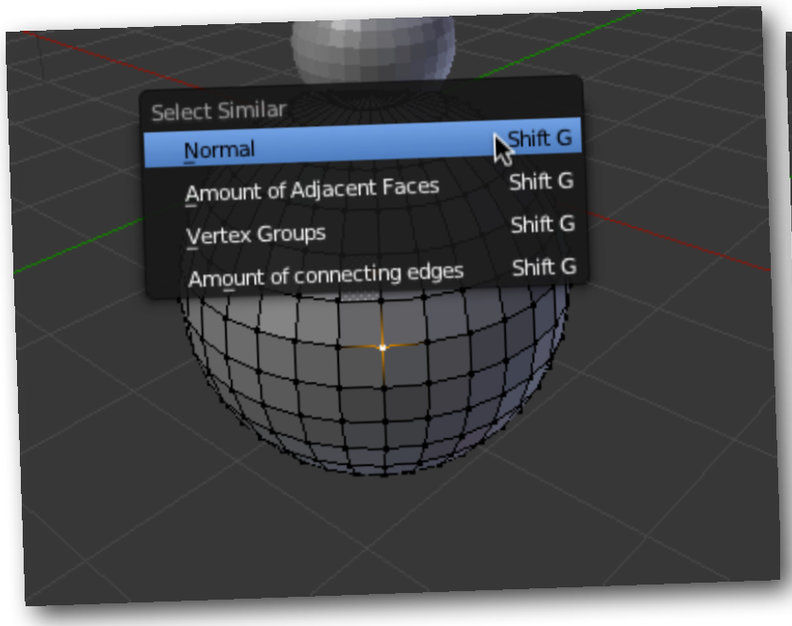
Selecting in Edit Mode

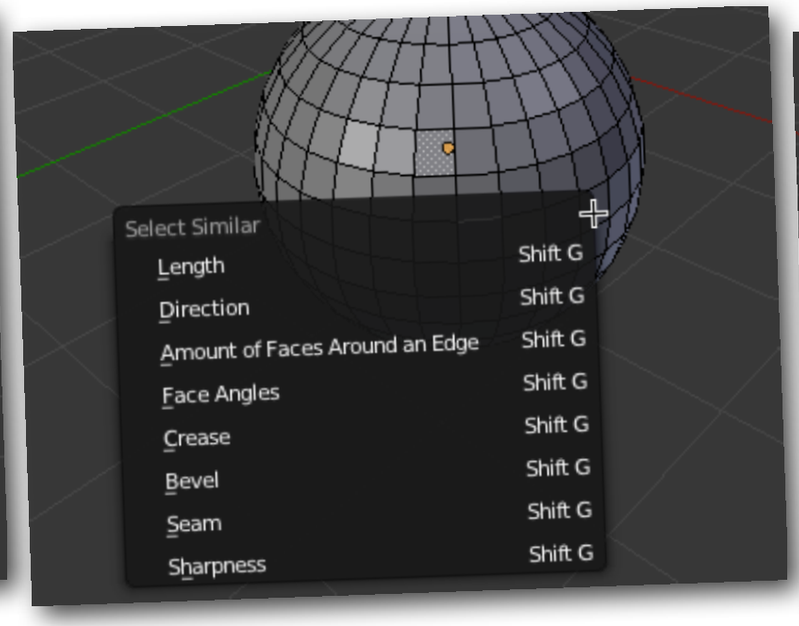
- Basic
  - Select with RMB
  - To add to the selection, use ⇧ Shift RMB on more objects.
  - To deselect an active object, click ⇧ Shift RMB one time.
- Box
  - press “b” to select all elements within a box
  - LMB to draw box
- Lasso Select
  - CTRL-LMB to draw a free hand loop and select objects in the loop. Do it again to add points.
  - Shift-CTRL-LMB to delete points with a free-hand loop

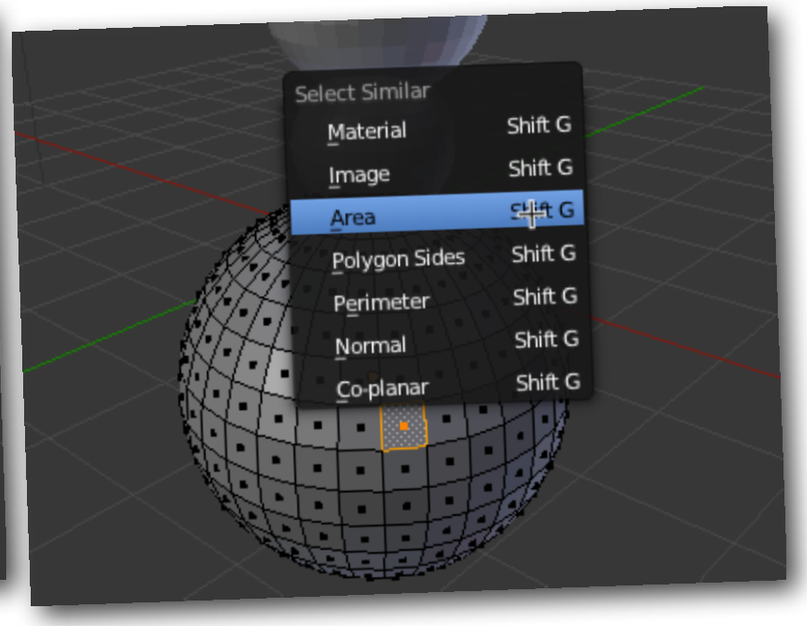


Selecting in Edit Mode

- Semantic Select
  - Shift-G
  - Adds elements that are similar in some way



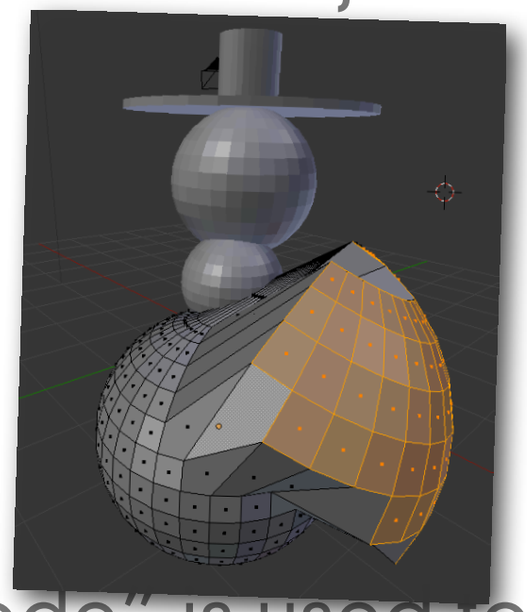




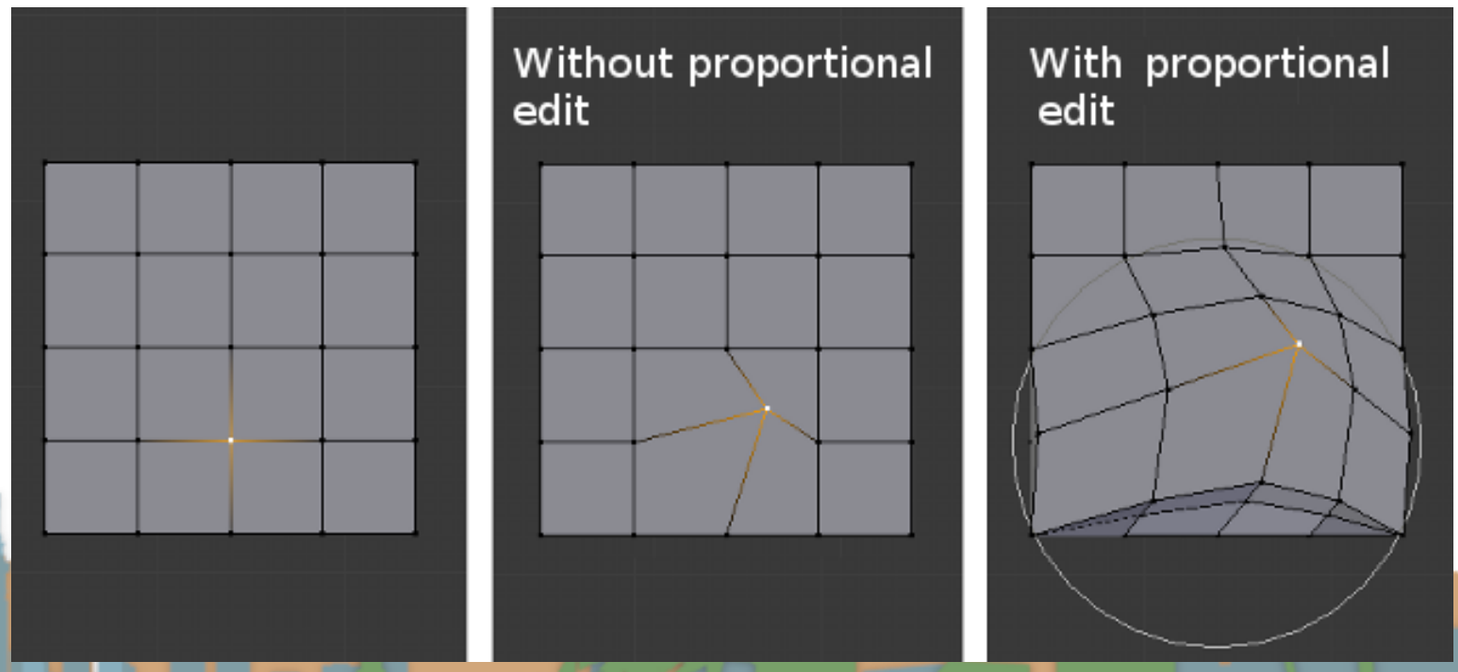
- Select by painting
  - “c”

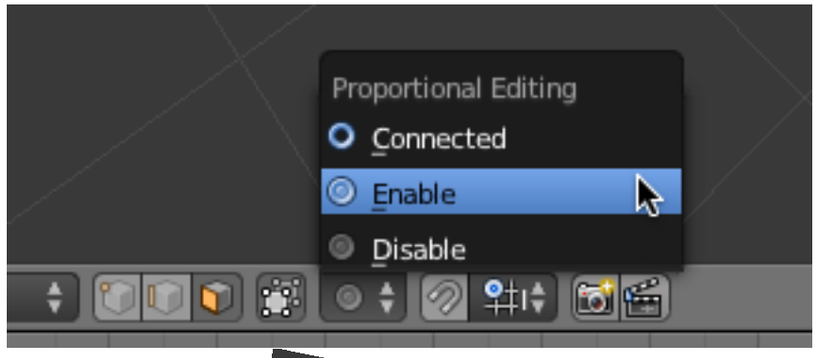
Translation/Rotation/Scale in Edit Mode

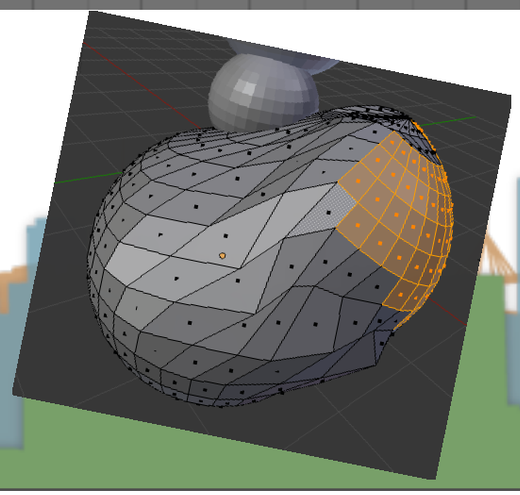
- Just like the objects themselves, individual parts of the objects can be:
  - "g" : grabbed and moved
  - "r" : rotated
  - "s" : scaled
  - attached pieces remain attached



- That can create odd effects, so "proportional mode" is used to cause unselected nearby elements to be changed as well

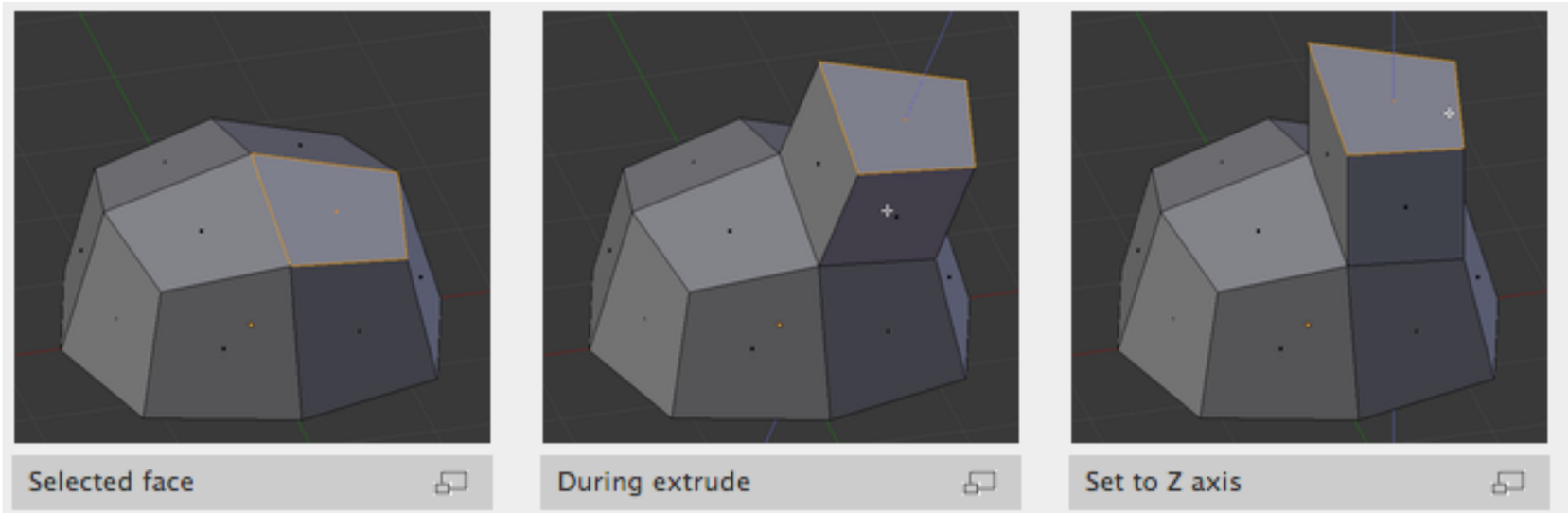




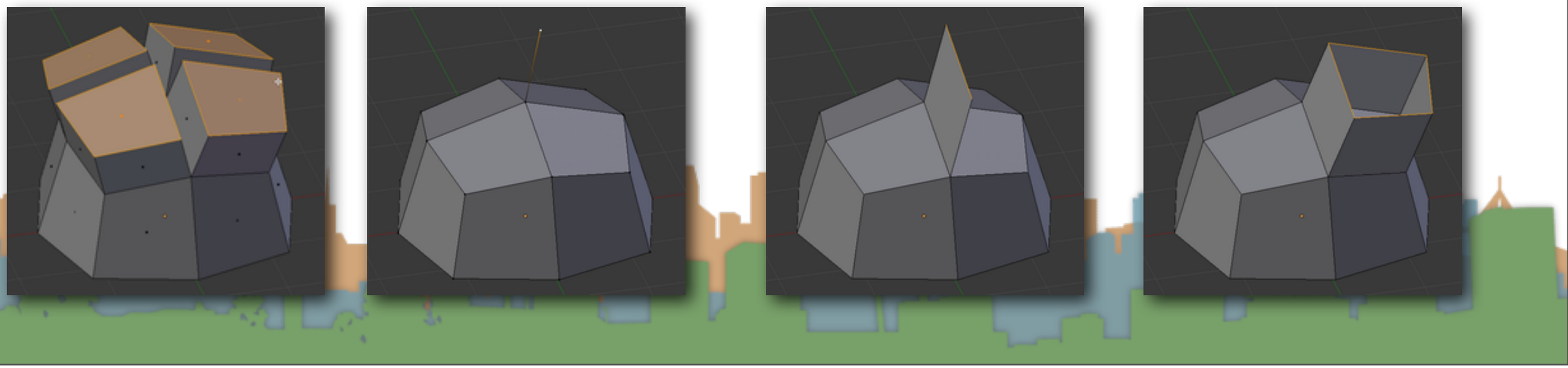


Extrusion

- Extrusion is a way of extend a model with new faces
- In edit mode, select some elements
- “e” extrudes the elements

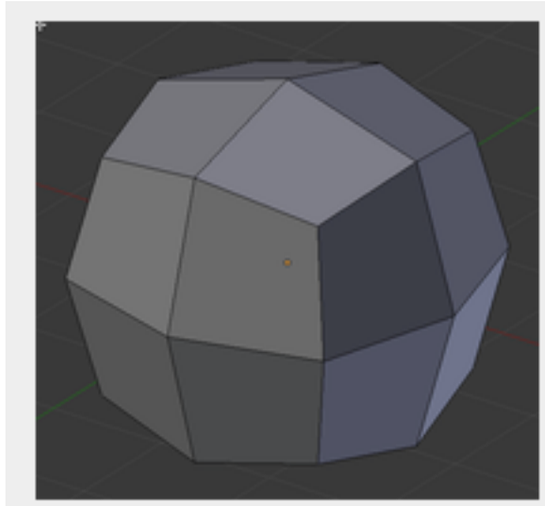


- ALT-e gives some other options

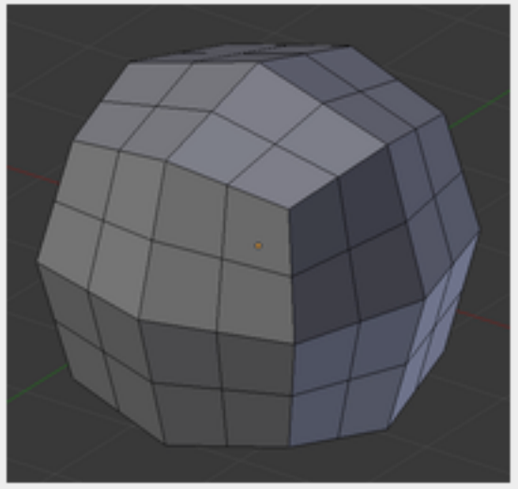


Subdivide

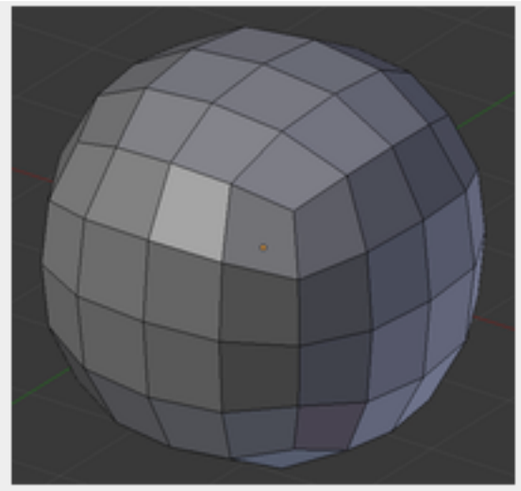
- Subdividing splits selected edges and faces by cutting them in half or more, adding necessary vertices, and subdividing accordingly the faces involved
- “w” then select subdivide



Mesh before subdividing



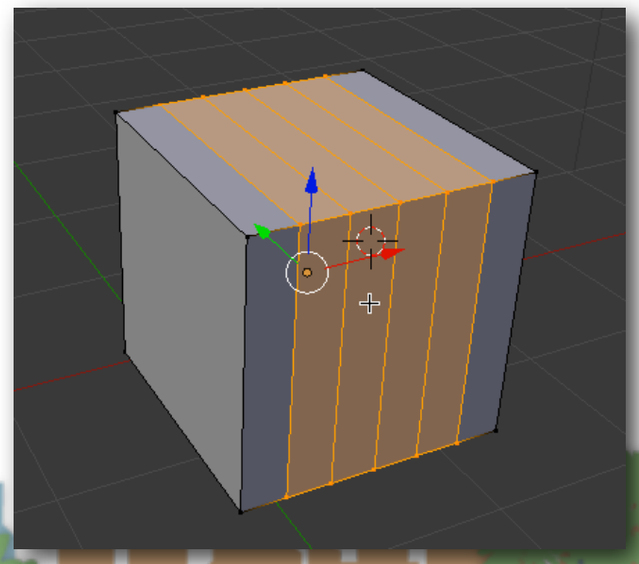
Subdivided with no smoothing

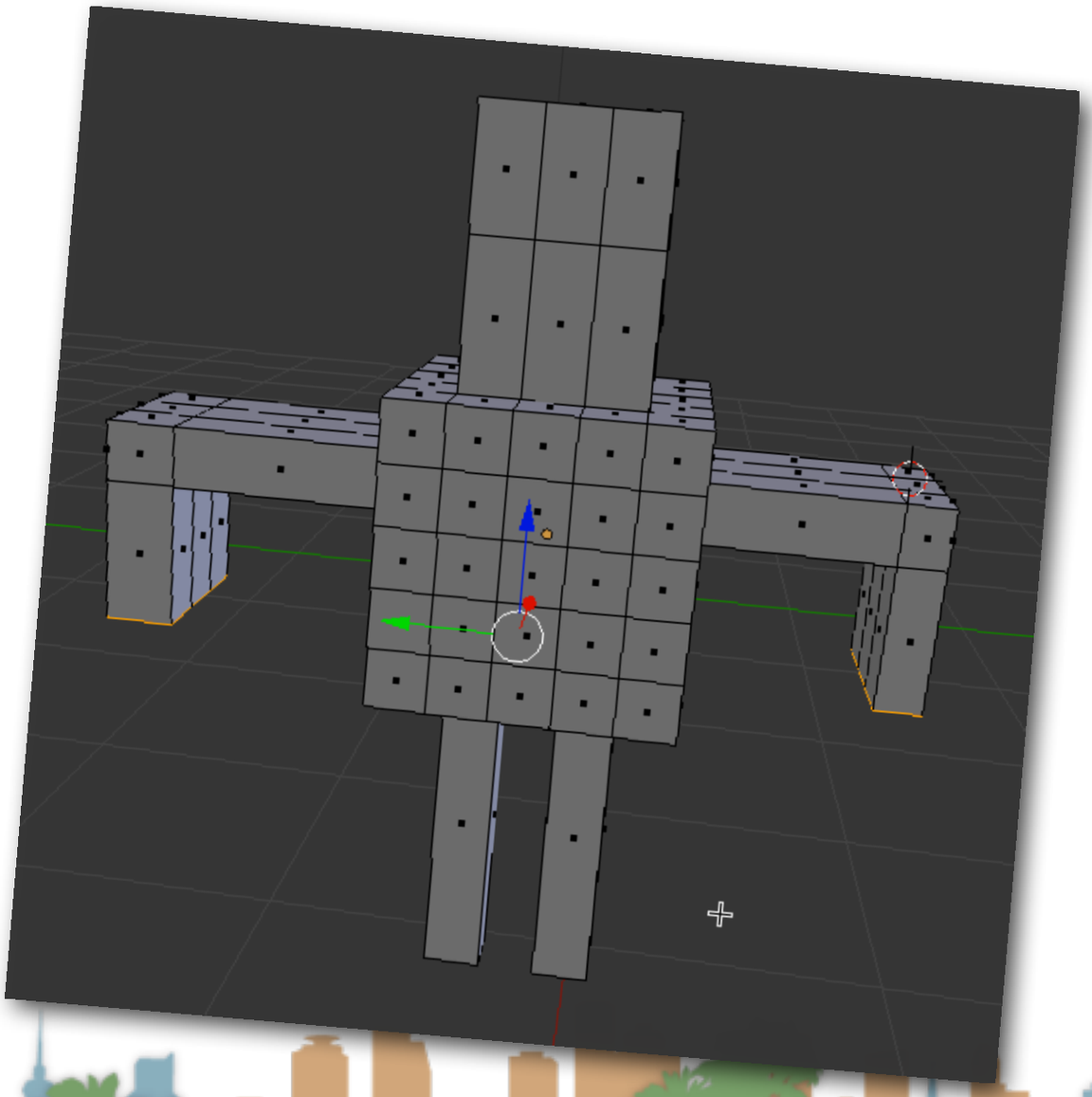


Subdivided with smoothing of 1

Loop Subdivide

- Loop Subdivide splits a loop of faces by inserting a new edge loop intersecting the chosen edge. The tool is interactive and has two steps:
- “CTRL-R”
  - Step 1: visualize the cut with magenta line
    - enter a number or use the mouse wheel to select multiple cuts
  - LMB to accept placement



Micro-Lesson #3

- Starting with a cube, create a robot by subdividing and extruding faces
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