

What we will cover in :

Section 1: A brief overview of the default user interface.

Section 2: Navigating 3D Space/Things to keep in mind.

Section 3: Basic mesh transformations: Translation, Rotation, Scaling, and Extrusion.

Section 1: A brief overview of the default user interface.



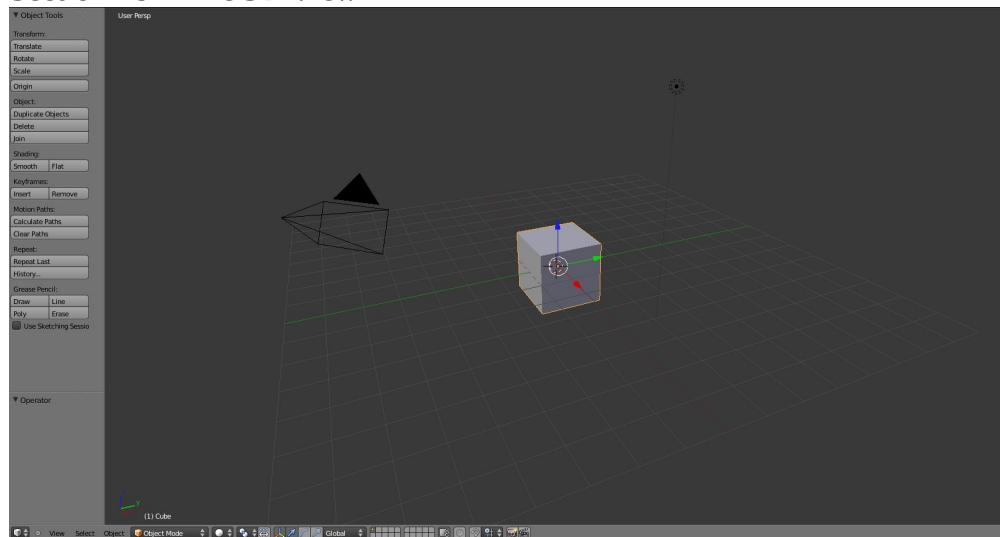
Blender's interface consist of non overlapping panels, each panel is assigned an editor type. Different editor types are used for different functions. Panels can be resized, removed, or added depending on your preferences. The default layout consists of 5 editor types: Info, 3D View, Timeline, Outliner, and Properties.

Section 1a – The Info Editor



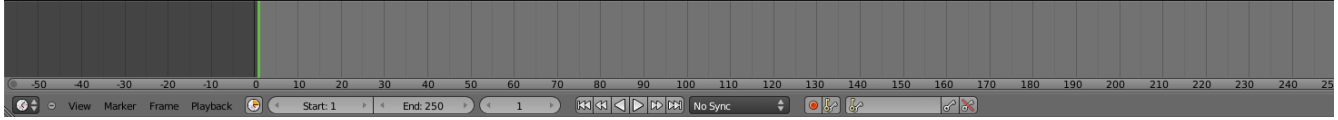
The Info Editor contains all of your basic or “traditional” functions such as saving, opening, and starting a new scene along with several more advanced options for importing objects or even files made with other programs. You can also add objects, and render the scene from here.

Section 1b – The 3D View



The 3D View allows for the manipulation of objects in 3D space. Here is where you create, position, and alter objects in your scene. By default the 3D view is populated by a camera, a lamp, and a mesh cube.

Section 1c - The Timeline



The timeline allows you to move to any frame in your scene. The timeline is used exclusively with animation and allows you to see and edit keyframes as well as adding markers for switching cameras and many other animation centric activities.

Section 1d – The Outliner



The outliner provides a “birds eye view” of what is in your scene. This editor type can also be used to see object data and relationships between objects such as parent/child relationships, and material/texture relationships. The outliner also allows for easily selection of elements in your scene.

Section 1F – Properties

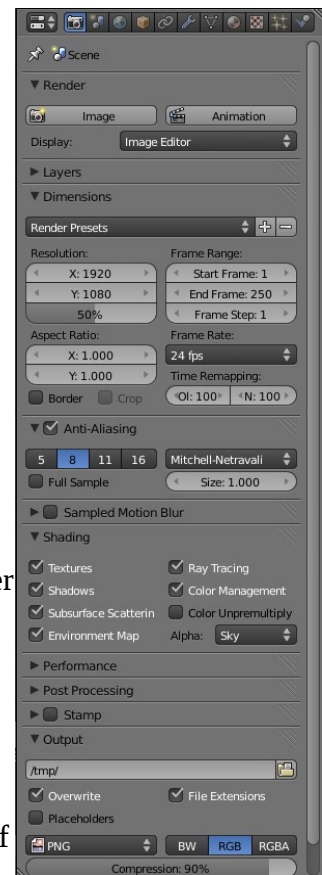
The properties panel is used for a number of functions:

- Rendering settings
- World settings
- Scene settings
- Object settings
- Object Constraints
- Object Modifiers
- Object Data
- Materials
- Textures
- Particles
- Physics

We will cover each of these over time, it would likely take days to cover each individual feature. Instead we will focus on creating a “foundation” to learn from and expand to each function as we use them.

Section 2: Navigating 3D Space/Things to keep in mind

Scene navigation is one of the harder things to get the hang of at first. The most efficient way to move around your scene involves the combination of a standard 3 button mouse and numeric keypad. Although it is possible to “get by” without one or the other, lacking either or both will prove to be a serious hindrance to efficiency and speed.



The Middle Mouse Button:

Pressing down on the **Middle Mouse Button** and moving your mouse around will rotate your view around the what is currently selected, by default this is the cube in the center of the scene. To change the object that your view rotates around select the object with the **Right Mouse Button** and press the . Button on your number pad. Using the scroll wheel zooms the view in and out allowing for greater precision.

The Number Pad:

NUMPAD 1: Sets you to front view.

NUMPAD 3: Sets you to a side view/the front is facing left.

NUMPAD 7: Sets you to a top view.

CTRL(Control)+NUMPAD 1: Sets you to a back view.

CTRL(Control)+NUMPAD 3: Sets you to a side view/front is facing right

CTRL(Control)+NUMPAD 7: Sets your view facing the bottom.

NUMPAD 4: Rotates view left along Z axis

NUMPAD 6: Rotates view right along Z axis

NUMPAD +: Zoom in

NUMPAD -: Zoom out

CTRL(Control)+NUMPAD 4: Pan view left.

CTRL(Control)+NUMPAD 8: Pan view up.

CTRL(Control)+NUMPAD 6: Pan view right

CTRL(Control)+NUMPAD 2: Pan view down

*You can move around your scene in a much more organic way by pressing **SHIFT+F**. This moves your viewport by using your mouse. Use your **Middle Mouse Button/Scroll Wheel** to zoom in and zoom out, clicking the **Left Mouse Button** ends the zooming and panning.*

NUMPAD 5: Changes between orthographic (grid) view and perspective view. Orthographic view facilitates precise transformations.

NUMPAD 0: Shows you the perspective of the active camera. Everything within the border is what is seen for rendering purposes.

NUMPAD /: Takes your current selection and hides everything else. Useful for editing single objects in more complex scenes, or individual sections. Referred to internally as a “local” view.

Things to keep in mind:

Right Mouse Button is the global keyboard shortcut for selection.

The **Right Mouse Button** can be used in conjunction with the **SHIFT** key to make multiple selections.

A is the global select/deselect all key.

Space Bar is a great tool that allows you to search for functions by name.

CTRL(Control)+Z is your friend, and allows you to undo your last action*. **SHIFT+CTRL+Z** is the global redo command.

The **TAB** key switches between the last two modes used. Initially we will solely use **Object Mode** and **Edit Mode**.

It is good to **save often!** The **F2** button brings up the save menu, pressing the **NUMPAD +** key will increment the file name by 1. This is a very fast way to save new versions in case you find that you have run into problems.

Section 3 – Basic Mesh Transformations

A Note about **Object Mode** and **Edit Mode**: **Object mode** transformations change an object as a whole globally in a scene. All objects have a little orange dot in the center called the **Origin**, global transforms use the **Origin** as a reference point. By default **Rotating** the cube in **Object Mode** will make it rotate from its **Origin**.

Edit Mode allows changes to the mesh to be made. This is the mode used to alter the object by using one of the four basic transformations. In **Edit Mode** there are three **Selection Modes**:



-Vertex Select Mode

-Edge Select Mode

-Face Select Mode

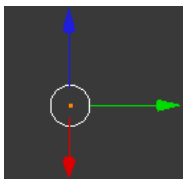
A **Vertex**(Plural **Vertices**) is a single point that has no dimensions and lies in one spot along the **X**, **Y**, and **Z** axes. Since a **Vertex** has no dimensions, selecting one an attempting to **Rotate** or **Scale** it will do nothing.

An **Edge** is a line that connects two **Vertices**. Any transformations performed on a selected **Edge** will affect the **Vertices** it is made up of.

A **Face** is a flat surface comprised of connected **Edges** and **Vertices**. Any transformations performed on a **Face** will affect all connected **Edges** and **Vertices**. Traditionally **Faces** are comprised of either 3 **Edges** (Triangles or Tris) or 4 **Edges** (Quads). Blender 2.63 added the option to make **NGONS** or **N-Sided Faces** which allows for **Faces** to be comprised of more than 4 **Edges**.

Each **Selection Mode** focuses on manipulating a specific element, to switch between **Selection Modes** in **Edit Mode** press **CTRL(Control)+TAB**.

*All modeling is based on four basic functions: **Translation, Rotation, Scaling, and Extrusion.***



*For **Translation, Rotation, and Scaling** it is possible to use the **3D Manipulator Widget**. This Widget allows you to use the **Left Mouse Button** and drag one of the arrows to constrain a transformation along that axis.*



*****All manipulations can use Axes and Numbers as arguments for precision*****

Example 1: Selecting a **Face** and pressing **R X 180** will **Rotate** the selected **Face** 180 degrees on the **X Axis**. **Rotation** values can be between 0 and 360. **Rotations** are typically in degrees.

Example 2: Selecting all of a cube in **Edit Mode** and pressing **S Z 1.5** will **Scale** the object on the **Z Axis**. By default the dimensions of the cube are 2x2x2, this transformation changes this to 3x2x2.

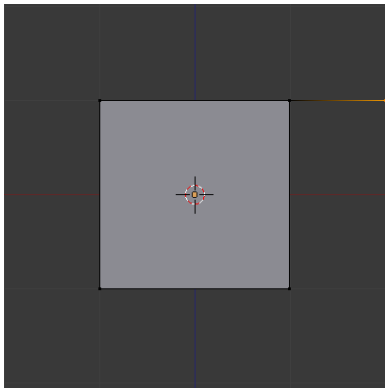
Example 3: Selecting an **Edge** and pressing **E Y 2.5** will **Extrude** a new **Edge** connected to the old **Edge**, and two additional **Edges** on each side with a **Face** by 2 ½ **Blender Units** on the **Y Axis**.

Translation: Movement across 3D space using the view-port angle as reference. The shortcut for **Translation** is the **G** key. You can also use the **3D Manipulator Widget**.

Rotation: **Rotates** the selection using the view-port angle as a reference point by default. The shortcut for **Rotation** is **R**. **Rotation** using the **3D Manipulator Widget** is possible, but it must be changed to the **Rotate Manipulator**.

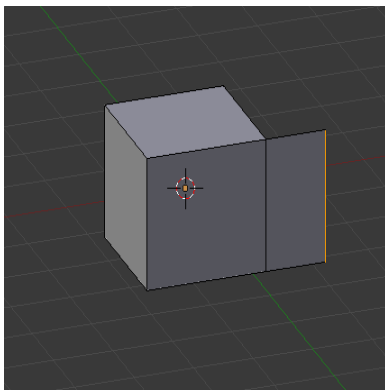
Scaling: **Scales** the selection. The shortcut for **Scaling** is **S**. **Scaling** is also possible with the **3D Manipulator Widget**, but it must be changed to the **Scale Manipulator**.

Extrusion: Unlike the previous modeling tools discussed thus far, **Extrusion** is usable solely in **Edit Mode**. The shortcut key for **Extrusion** is **E**.



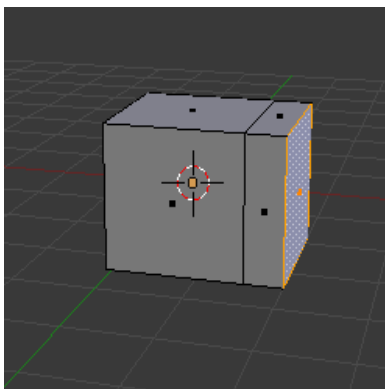
In **Vertex Select Mode**, selecting a **Vertex** and pressing **E** creates an additional **Vertex** and an **Edge** connecting to the **Vertex** selected for **Extrusion**. This new **Vertex** is then automatically selected and can be manipulated via the mouse or can be constrained on an **Axis**.

Just like all other tools we can easily make exact transformations measured in **Blender Units** by using numbers. For instance selecting a **Vertex** and pressing **E X 2** will extrude the Vertex **2 Blender Units** to the right.



In **Edge Select Mode** selecting an **Edge** and pressing **E** creates an additional **Edge** comprised of the **Vertices** that create the **Edge** connected to the **Edge** selected for **Extrusion**. This new **Edge** is now selected is then automatically selected and can be manipulated via the mouse or can be constrained on an **Axis**.

In **Face Select Mode** selecting a **Face** and Pressing **E** moves the selected **Face** and moves new **Edges** and **Vertices** that the **Face** is made up from. This new **Face** will also be surrounded on each side by **Faces** created from all **Edges** touching the **Face Extruded**. The main **Face** will be automatically selected and can be manipulated via the mouse or can be constrained on an **Axis**.



Extrusion is a highly useful modeling tool because it allows us to easily add geometry that is connected to the old geometry. **Extrusion** forms the basis of **Box Modeling**.

Box Modeling is the process of creating a model from a single object, usually a cube. As we build more **Vertices**, **Edges**, and **Faces** we end up with a lot more to work with and we continue to define the shape and bring it closer to what we want.