Selected and Active modes

Selection is the process of indicating to the software which items are to be worked on. In Blender’s Object mode there are two levels of selection: Selected and Active. Selected objects are outlined in orange, while the last object selected (the Active object) is outlined in yellow. The Active object can always be changed by holding down the Shift key and selecting another item.

Here the two left hand cubes are Selected while the right cube is Active. Active items become the parents or controlling objects of the others in the selection set. We could define the left most cube as the Active object by holding down Shift and clicking it. It would then be the last selected, and outlined in yellow.

Mouse selection

Blender’s mouse selection is the same in Object and Edit modes. The simplest way to select something with the mouse is to right click on it (or Control click on a Mac). If you click on something else the previous selection is replaced with the new selection; however if you hold down the Shift key the new selection is added to the previous selection. Right clicking again on an item with Shift removes it from the selection set.

Blender’s selection shortcuts are A, B, and C. If anything is selected pressing A will deselect it; pressing A again will select everything. Continuing to press A will toggle select all/select nothing.

B starts the Border selection process. A crosshair appears on the screen, and by holding down the left mouse button and dragging anything touched by the rectangle produced will be selected (in some applications this is known as a Crossing Window). As soon as you release the mouse button the selection crosshair disappears. Hitting B again will allow you to add to the selection. Dragging with the middle mouse button instead of the left will deselect items.

C starts the Circle selection tool. Press C and a circular cursor like a brush appears. Scrolling the middle mouse wheel forward and back will increase and reduce its size. Dragging with the left mouse button down will select anything the circle crosses; dragging with the middle mouse button will deselect. The circle selection tool is persistent, however – you need to right click or hit Escape to stop the selection process.

The fourth mouse selection process is Lasso, started by holding down the Control key and drag-
ging with the left mouse button pressed.

**Selecting an object when in Edit mode for another object**

This is needed for operations such as Knife Project. Just hold down Control while right clicking.

**Geometric selection**

The Select pop-up menu in the 3D window’s button bar changes depending on whether you are in Object or Edit mode. The image below shows Edit mode on the left and Object on the right. You can see the Object options are quite limited. In Edit mode, however, it is worth taking some time to become familiar with the selection tools available, in particular the options under Similar. One of the most common key shortcuts in Edit mode is holding down the Alt key when right clicking on a edge: this selects the entire edgeloop that that edge is part of. You have to be in Edge Selection mode in Edit to do this.

**Overlapping objects**

If several objects overlap and it is hard to select the one you need, use Alt with RMB to create a drop down list of options.

**Linked flat faces**

This is a useful option in Edit mode. Using face selection, choosing Linked Flat Faces in the pop-up menu will select every linked (that is, directly connected) face within the angle defined in the left fly-in. This defaults to one degree, but in the image here faces within five degrees of the base of Suzanne’s nose have been selected. This command is particularly useful when reducing the detail of imported geometry. The area of selection can also be increased or reduced one face (or vertex, or edge) at a time with Control and the number pad + or – keys.
**Proportional Editing**

All previous types of selection described are direct selection – in other words, you are precisely specifying what is in the selection set and what is not. A more technical description is to say that every item selected has a weighting of 1.000. Proportional editing, however, allows items within a specified distance of the selection set to be influenced by the movement, rotation, or rescaling of that set. Proportional editing is toggled on or off with the O key or by clicking this button at the foot of the 3D window.

In the images above, proportional editing is off, top, and on, below. The shape next to the on/off icon shows the falloff type.

However, this only activates the default proportional editing options. Let’s look at some of them. Enable means that any item within the specified 3D radius of the selection will be influenced in the manner determined by the falloff curve. Projected means that depth into the screen is ignored when applying the influence radius. Connected means that only linked items within the radius will be affected. This last means that a lower lip, for example, can be moved down without affecting the upper.

The Falloff curve controls how sharply and in what way non selected items in the radius of influence are affected by their distance from the selection. A Smooth falloff is the default and is best in most cases, but there are occasions when a Linear, Constant, or Random falloff is useful. Experiment with these options until you know what they can do.

Note that editing an object with proportional editing is similar to using the Sculpt brushes and that it is often more intuitive to work in Sculpt mode. A proportional editing selection is also identical to a weight paint in Weight Paint mode, and it can also be more intuitive to use that.

**Other options**

Blender has a wide variety of useful subobject selection options in Edit mode; you can find these in the Select popup menu in the 3D Window button bar. Some of the most useful are:

- **Linked** - items (faces, edges, or vertices) are selected if they are part of the same mesh as the selection
- **Random** - random vertices, edges, or faces are selected up to a defined (in the left fly-in) percentage
- **Select Similar** - vertices, edges, and faces can be selected according to their properties. These properties vary according to which level of selection you’re in. Selecting similar polygon sides when
a quad is selected, for example, and then using Control-I to invert the selection selects all the non-quad faces in a mesh.

- Non Manifold - edges or vertices are selected if they surround a hole in the mesh. A manifold mesh - important for 3D printing and some Boolean operations - is one that is “watertight” or in other words has no holes, so that it defines a volume in space.

**Vertex selection**

Any combination of vertices, edges, or faces can be saved as a vertex group in the Object Data tab in Properties. However, creating a vertex group is not the same as saving the selected vertices into it. The procedure is to select the vertices and then click Assign. If you do not assign the vertices to the group they will not be saved. Once this is done, however, you can reselect the vertex group contents with the Select button.

![Vertex selection](image)

**Weight painting**

Weight painting is a mode like Object and Edit, and available from the pop-up selection list at the foot of the 3D window. This allows you to “paint” a selection on the surface of the mesh using brushes that can have additive, blending, and subtractive qualities. The result is automatically saved as a vertex selection in which each vertex has a selection value anywhere between 0 and 1, rather than the 0 or 1 of conventional direct selection.

![Weight painting](image)

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