3.2.2.2 Editors - 3D View - Navigation - 3D View

3D View

To be able to work in the three dimensional space that Blender uses, you must be able to change your viewpoint as well as the viewing direction of the scene. While we will describe the *3D View* window, most of the other windows have similar functions. For example, it is possible to translate and zoom a *Buttons* window and its panels.

| Tip |
|---|
| Mouse Buttons and Numpad |
| If you have a mouse with less than three buttons or a keyboard without numpad, see the *Keyboard and Mouse* page of the manual to learn how to use them with Blender. |

Perspective and Orthographic Views

| Reference |
|---|
| Mode: All modes |
| Menu: View ‣ Perspective / View ‣ Orthographic |
| Hotkey: `Numpad5` |

Each 3D viewport supports two different types of projection. These are demonstrated in the *Orthographic (left) and perspective (right) projections* image below.
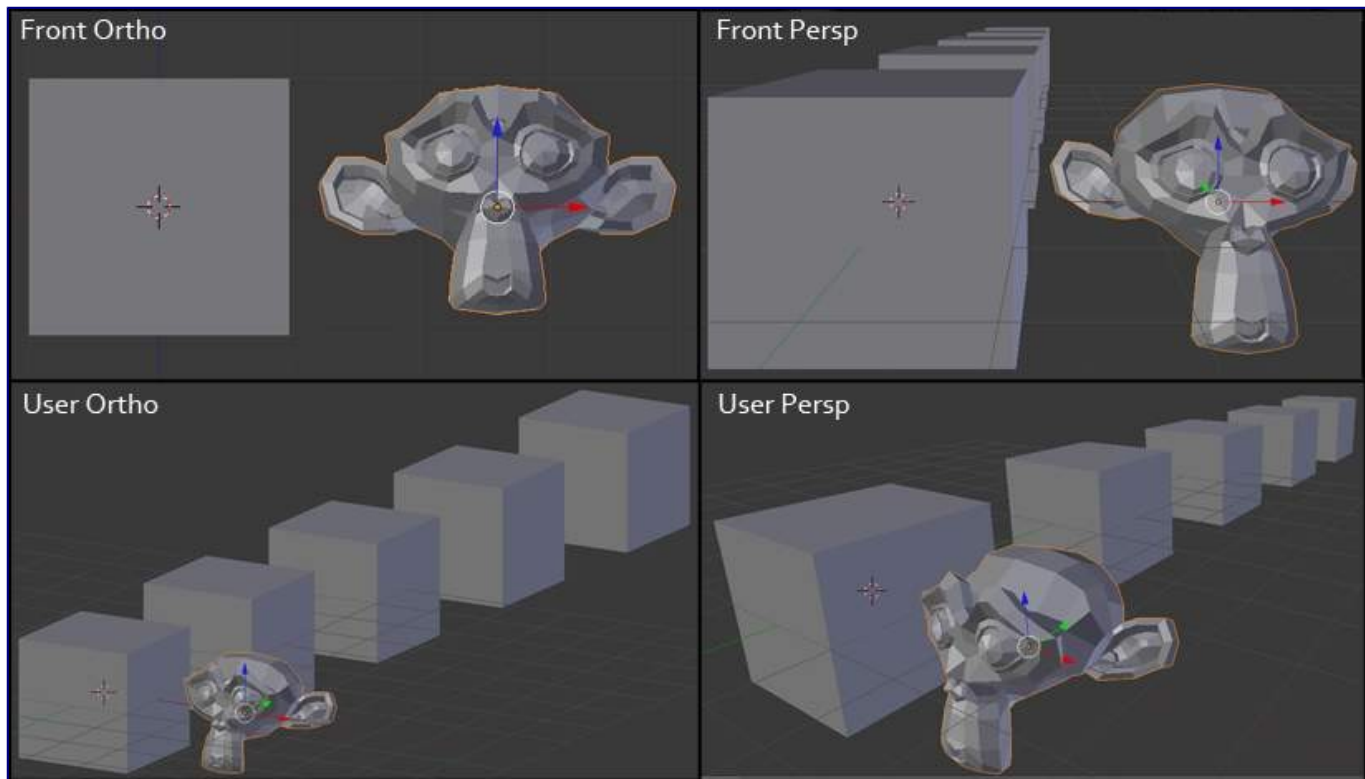
Orthographic (left) and perspective (right) projections.

Our eye is used to perspective viewing because distant objects appear smaller. Orthographic projection often seems a bit odd at first, because objects stay the same size regardless of their distance. It is like viewing the scene from an infinitely distant point. Nevertheless, orthographic viewing is very useful (it is the default in Blender and most other 3D applications), because it provides a more "technical" insight into the scene, making it easier to draw and judge proportions.

Options
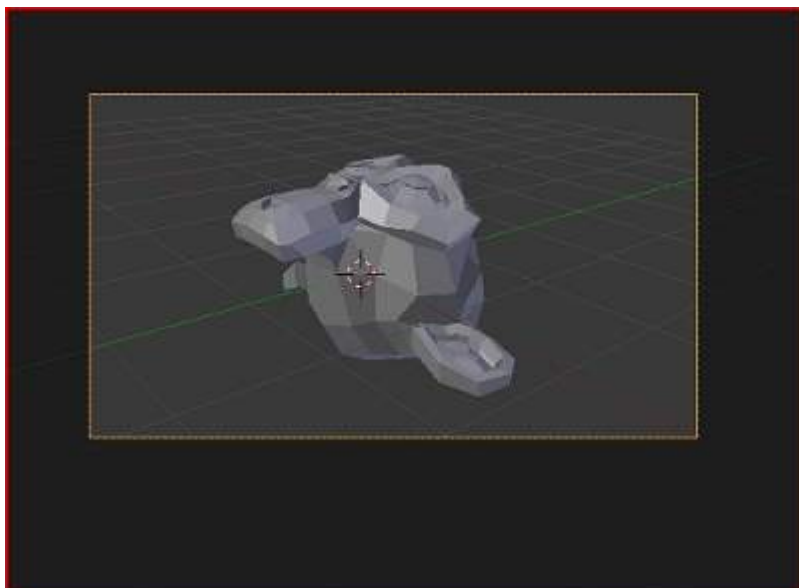
Demonstration of camera view.

To change the projection for a 3D view, choose the View ‣ Orthographic or the View ‣ Perspective menu entry. The `Numpad5` shortcut toggles between the two modes. Changing the projection for a 3D view does not affect the way the scene will be rendered. Rendering is in perspective by default. If you need to create an orthographic rendering, select the camera, go to the *Object Data* context and press the *Orthographic* button in the *Lens* panel.

The View ‣ Camera menu entry sets the 3D view to camera mode (`Numpad0`). The scene is then displayed as it will be rendered later (see *Demonstration of camera view*). The rendered image will contain everything within the orange dotted line. Zooming in and out is possible in this view, but to change the viewpoint, you have to move or rotate the camera.

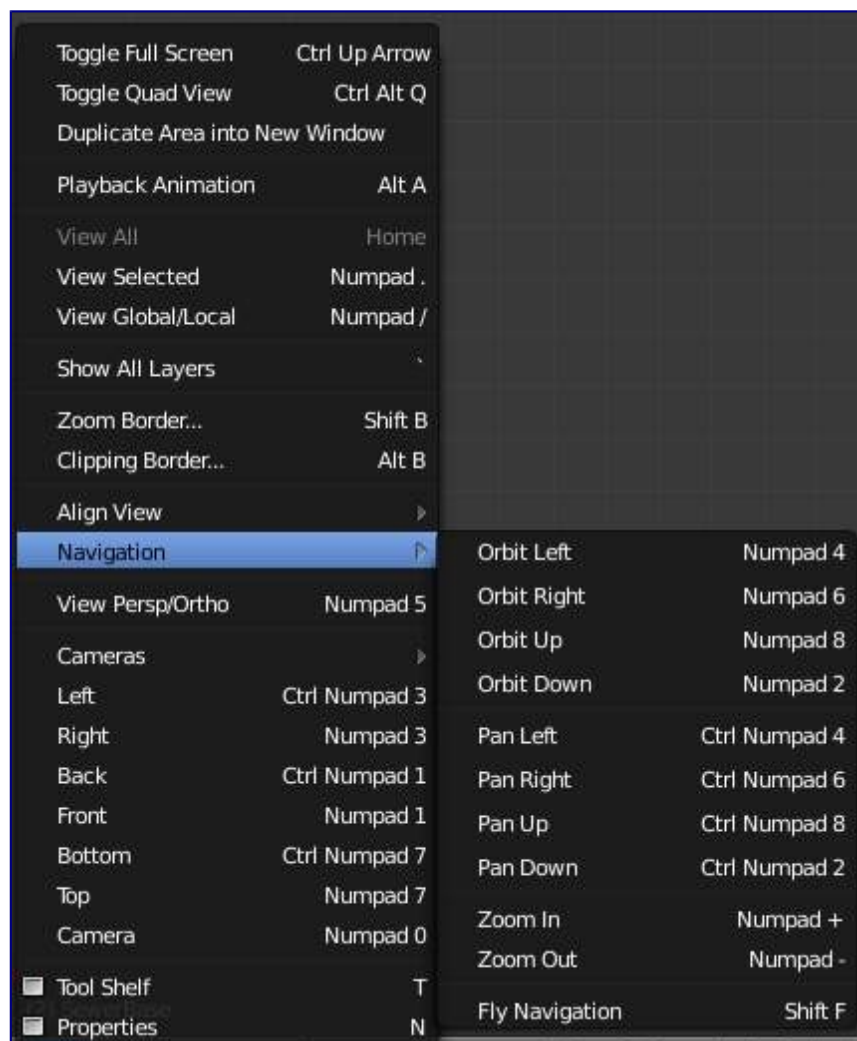| See also |
| --- |
| • *Render perspectives*
 • *Camera View*
 • Camera Clipping
 • `Camera Projections` |

Rotating the View

Reference
Mode: All modes   Menu: View ‣ Navigation   `Hotkey: MMB / Numpad2 / Numpad4 / Numpad6 / Numpad8 / Ctrl-Alt-Wheel`

A 3D viewport's View menu.

Blender provides four default viewing directions: *Side, Front, Top* and *Camera* view. Blender uses a right-angled "Cartesian" coordinate system with the Z axis pointing upwards. "Side" corresponds to looking along the X axis, in the negative direction, "Front" along the Y axis, and "top" along the Z axis. The *Camera* view shows the current scene as seen from the camera view point.

Options

You can select the viewing direction for a 3D viewport with the *View* menu entries, or by pressing the hotkeys `Numpad3` for "side", `Numpad1` for "front", `Numpad7` for "top". You can select the opposite directions if you hold `Ctrl` while using the same numpad shortcuts. Finally `Numpad0` gives access to the "camera" viewpoint.

Apart from these four default directions, the view can be rotated to any angle you wish. Click and drag `MMB` on the viewport's area. If you start in the middle of the window and move up and down or left and right, the view is rotated around the middle of the window. Alternatively, if the *Emulate 3 button mouse* option is select in the *User Preferences* you can press and hold `Alt` while dragging `LMB` in the viewport's area.

To change the viewing angle in discrete steps, use `Numpad8` and `Numpad2` (which correspond to vertical `MMB` dragging, from any viewpoint), or use `Numpad4` and `Numpad6` (or `Ctrl-Alt-Wheel`) to rotate the scene around the Z global axis from your current point of view.

Note
Hotkeys
Remember that most hotkeys affect **the active window** (the one that has focus), so check that the mouse cursor is in the area you want to work in before your use the hotkeys.

See also
• Orbit Style Preference • Auto-Perspective Preference

Panning the View

Reference
Mode: All modes Menu: *View –> Navigation* Hotkey: `Shift-MMB` / `Ctrl-Numpad2` / `Ctrl-Numpad4` / `Ctrl-Numpad6` / `Ctrl-Numpad8` / `Shift-Alt-LMB`

To pan the view, hold down `Shift` and drag `MMB` in the 3D Viewport. For discrete steps, use the hotkeys `Ctrl-Numpad8`, `Ctrl-Numpad2`, `Ctrl-Numpad4` and `Ctrl-Numpad6` as with rotating (note: you can replace `Ctrl` by `Shift`). For those without a middle mouse button, you can hold `Shift Alt` while dragging with `LMB`.

Zooming the View

Reference
Mode: All modes Menu: *View –> Navigation* Hotkey: `Ctrl-MMB` / `Wheel` / `NumpadPlus` / `NumpadMinus`

You can zoom in and out by holding down `Ctrl` and dragging `MMB`. The hotkeys are `NumpadPlus` and `NumpadMinus`. The View ‣ Navigation sub-menu holds these functions too as well. Refer to the 3D viewport's *View* menu image above for more information.

If you have a wheel mouse, you can perform all of the actions in the 3D viewport that you would do with `NumpadPlus` and `NumpadMinus` by rotating the `Wheel`. To zoom a *Buttons* window, hold `Ctrl-MMB` and move your mouse up and down.

Hint
If You Get Lost

If you get lost in 3D space, which is not uncommon, two hotkeys will help you: Home changes the view so that you can see all objects (View ‣ View All menu entry), while NumpadPeriod zooms the view to the currently selected objects when in perspective mode (View ‣ View Selected menu entry).

Zoom Border

The *Zoom Border* tool allows you to specify a rectangular region and zoom in so that the region fills the 3d view.

You can access this through the *View* menu, or the shortcut `Shift-B`, then `LMB` click and drag a rectangle to zoom into.

Alternatively you can zoom out using the `MMB`.

Dolly the View

Reference
Mode: All modes
Hotkey: Ctrl-Shift-MMB

In most cases its sufficient to zoom the view to get a closer look at something, however you may notice that at a certain point you cannot zoom any closer.

This is because Blender stores a view-point thats used for orbiting and zooming, This works well in many cases but sometimes you want to move the view-point to a different place - This is what Dolly supports, allowing you to transport the view from one place to another.

You can dolly back and fourth by holding down `Ctrl-Shift` and dragging `MMB`.

Aligning the View

Align View

These options allow you to align and orient the view in different ways. They are found in the *View Menu*

Align View to Selected menu

These options align your view with specified local axes of the selected object, bone or in *Edit* mode, with the normal of the selected face.

Hold down `Shift` while using the numpad to set the view axis.

Center Cursor and View All (`Shift-C`)

moves the cursor back to the origin **and** zooms in/out so that you can see everything in your scene.

> **Align Active Camera to View, `Ctrl-Alt-Numpad0`**
>
> > Gives your active camera the current viewpoint
>
> **View selected, `NumpadPeriod`**
>
> > Focuses view on currently selected object/s by centering them in the viewport, and zooming in until they fill the screen.
>
> **Center view to cursor, `Alt-Home`**
>
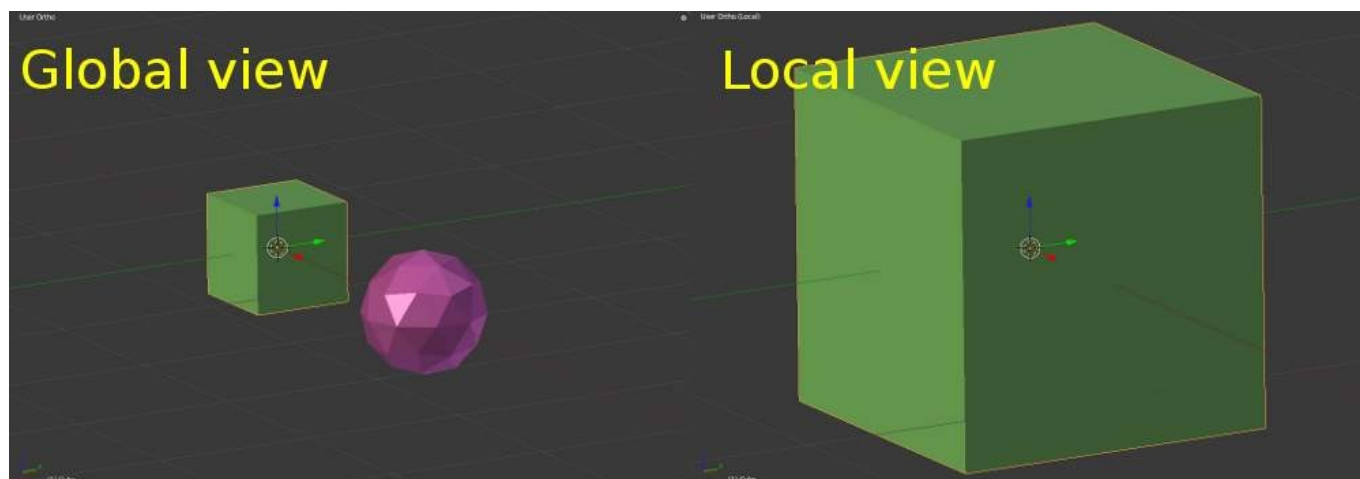> > Centers view to 3D-cursor

View Selected
See above

View All `Home`
Frames all the objects in the scene, so they are visible in the viewport.

Local and Global View

Global and Local view

You can toggle between *Local* and *Global* view by selecting the option from the *View Menu* or using the shortcut `NumpadSlash`. Local view isolates the selected object or objects, so that they are the only ones visible in the viewport. This is useful for working on objects that are obscured by other ones, or have heavy geometry. Press `NumpadSlash` to return to *Global View.*
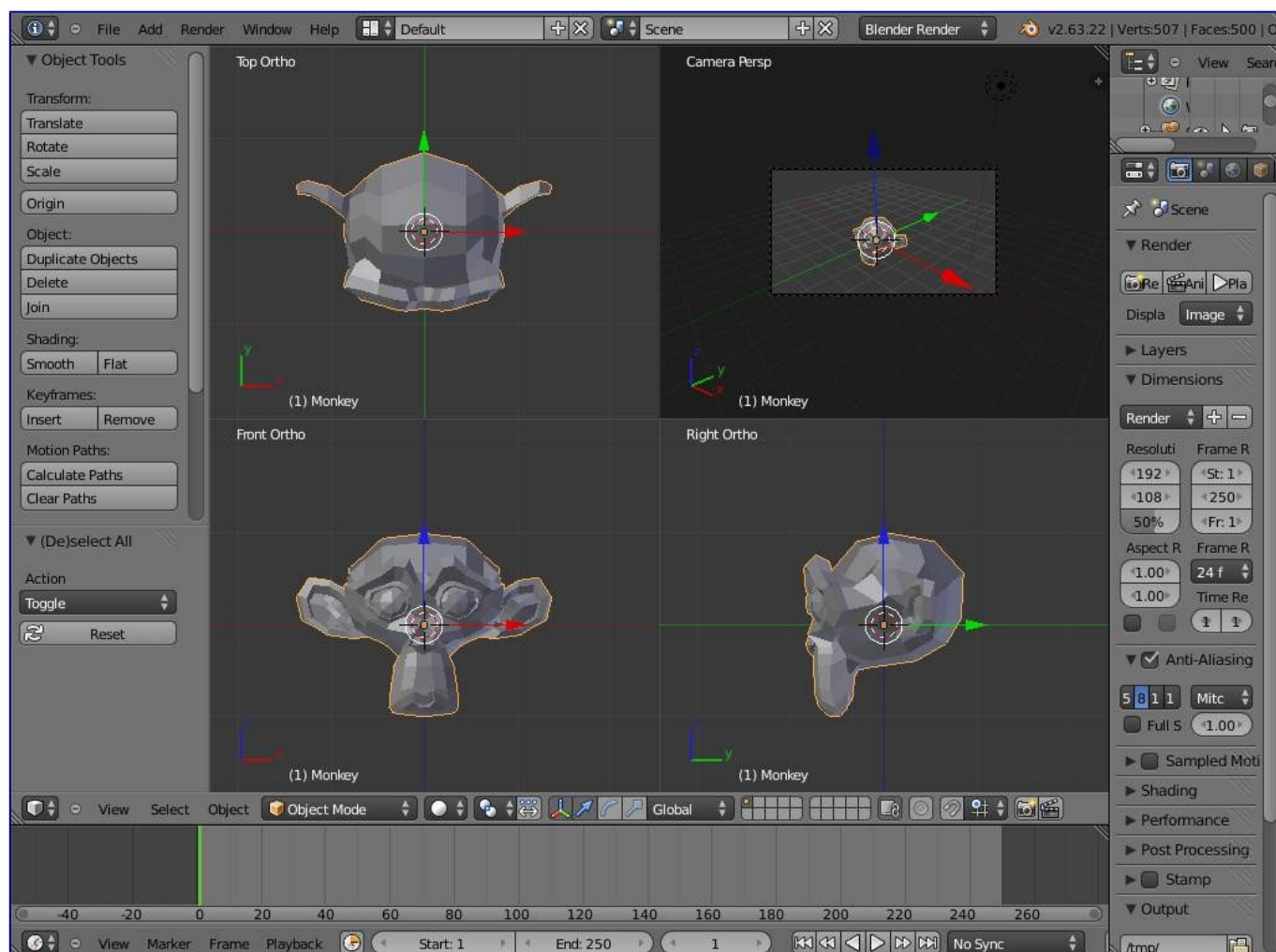
This can be used to speed up viewport performance in heavy scenes, or allow you to focus on a specific object without others getting in your way.

Quad View

Reference
Mode: All modes
Menu: View ‣ Toggle Quad View

```
Hotkey: Ctrl-Alt-Q
```


Quad View

Toggling Quad View will split the 3D window into 4 views: 3 *Ortho* views and a *Camera* / *User View*. This view will allow you to instantly see your model from a number of view points. In this arrangement, you can zoom and pan each view independently but you cannot rotate the view. Note that this is different from splitting the windows and aligning the view manually. In Quad View, the four views are still part of a single 3D window. So they share the same draw options and layers.

If you want to be able to rotate each view, you can un-check the *Locked* option.

However in sometimes its preferable to split the view, so each can have its own configuration.
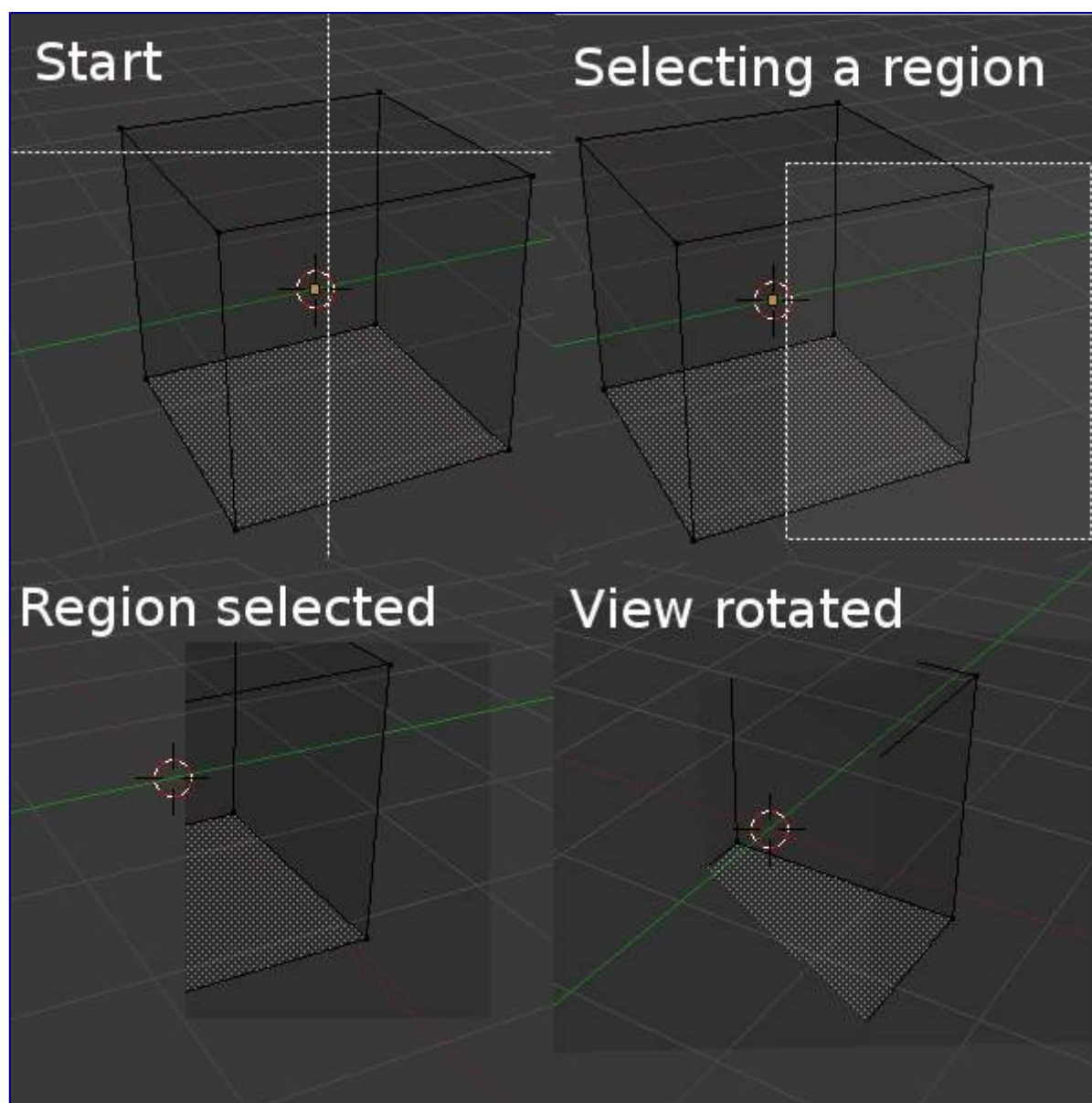
Read more about splitting areas

View Clipping Border

Reference
Mode: All modes
Menu: View ‣ Set Clipping Border Hotkey: Alt-B

Region/Volume clipping.

To assist in the process of working with complex models and scenes, you can set the view clipping to visually isolate what you're working on.

Once clipping is used, you will only see whats inside a volume you've defined. Tools such as paint, sculpt, selection, transform-snapping etc. will also ignore geometry outside the clipping bounds.

Once activated with Alt-B, you have to draw a rectangle with the mouse, in the wanted 3D view. The created clipping volume will then be:

- A right-angled parallelepiped (of infinite length) if your view is orthographic.
- A rectangular-based pyramid (of infinite height) if your view is in perspective.

To delete this clipping, press Alt-B again.

Example

The *Region/Volume clipping* image shows an example of using the clipping tool with a cube. Start by activating the tool with `Alt-B` (upper left of the image). This will generate a dashed cross-hair cursor. Click with the `LMB` and drag out a rectangular region shown in the upper right. Now a region is defined and clipping is applied against that region in 3D space. Notice that part of the cube is now invisible or clipped. Use the `MMB` to rotate the view and you will see that only what is inside the pyramidal volume is visible. All the editing tools still function as normal but only within the pyramidal clipping volume.

The dark gray area is the clipping volume itself. Once clipping is deactivated with another `Alt-B`, all of 3D space will become visible again.

Walk/Fly Mode

When you have to place the view, normally you do as described above.

However, there are cases in which you really prefer to just navigate your model, especially if it's very large, like environments or some architectural model. In these cases viewing the model in perspective mode has limitations, for example after zooming a lot of panning is extremely uncomfortable and difficult, or you apparently cannot move the camera any nearer. As an example, try to navigate to a very distant object in the view with traditional methods (explained above) and see what you can get.

With walk/fly modes you move, pan, tilt, and dolly the camera around without any of those limitations.
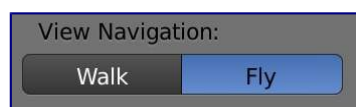
View Navigation.

In the *User Preferences window* select the navigation mode you want to use as default when invoking the View Navigation operator. Alternatively you can call the individual modes from the View Navigation menu.

Note
This mode actually *moves* the camera used by the view. This means that when you are in camera view, it moves the active camera'', which is another way to place and aim it.

Walk Mode

Reference
Mode: All modes
Menu: View ‣ View Navigation ‣ Walk Navigation
Hotkey: Shift-F

Usage

On activation the mouse pointer will move at the center of the view, and a cross marker will appear...

This navigation mode behaves similar to the first person navigation system available in most 3d world games

nowadays. It works with a combination of keyboard keys (`WASD`) and mouse movement. By default the navigation is in the 'free' mode, with no gravity influence. You can toggle between gravity and free mode during the navigation (`Tab`).

To move to places more quickly you can teleport (`Spacebar`) around your scene. If there is an object in front of the walk cross/aim you will move in that direction until you reach the point (offset by the 'camera height' value set in the [Doc:2.6/Manual/Preferences|User Preferences window]]).

Shortcuts

- Move the mouse left/right to pan the view left/right or move it up/down to tilt the view up/down.
- Move the camera forward/backward (`W/S`).
- Strafe left/right (`A/D`).
- Jump (`V`) - only in 'gravity' mode.
- Move up and down (`Q/E`) - only in 'free' mode.
- Alternate between 'free' and 'gravity' modes (`Tab`).
- Change the movement speed: - `WheelUp` or `NumpadPlus`} to increase the movement speed for this open session - `WheelDown` or to `NumpadMinus`} to decrease the movement speed for this open session - `Shift` (hold) - to speed up the movement temporarily - `Alt` (hold) - to slow down the movement temporarily

When you are happy with the new view, click `LMB` to confirm. In case you want to go back from where you started, press `Esc` or `RMB`, as usual.

If the defaults values (speed, mouse sensitivity, ...) need adjustments for your project, in the [[Doc:2.6/Manual/Preferences|User Preferences window]] you can select a few options for the navigation system:

Fly Mode

Reference
Mode: All modes Menu: View ‣ View Navigation ‣ Fly Navigation `Hotkey: Shift-F`

Usage

On activation the mouse pointer will move at the center of the view, and a squared marker will appear – a sort of HUD...

Some of the options of Fly mode are influenced by the position of the mouse pointer relative to the center of the view itself, and the squared marker around this center provides a sort of "safe region" where you can place the mouse for it to have no effect on the view. The more you take the mouse pointer away from the marker, the more you pan, or track, etc.

https://www.youtube.com/watch?v=bTRrHNn-d4w

Shortcuts

- Move the mouse left/right to pan the view left/right or move it up/down to tilt the view up/down.

- Move the view forward/backward: - `WheelUp` or `NumpadPlus`} to accelerate the movement forward. - `WheelDown` or to `NumpadMinus`} to accelerate the movement backward.

    So if the view is already moving forward, `WheelDown`/`NumpadMinus`} will eventually stop it and then move it backward, etc.

- Drag the `MMB` to dolly. In this case the view can move laterally on its local axis at the moment you drag the mouse – quite obviously, dragging left/right/up/down makes the view dolly on the left/right/up/down respectively.

When you are happy with the new view, click `LMB` to confirm. In case you want to go back from where you started, press `Esc` or RMB, as usual.