4 - Navigating Viewports

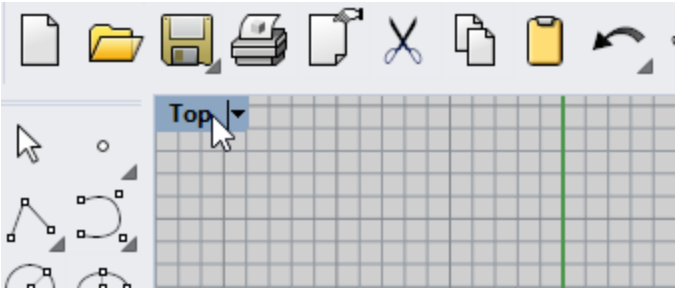
Viewports are windows in the graphics area that display views of your model. They can be docked or floating.

You can customize the viewports and their positions to suit your preferences. The size and position of viewports is adjustable; they can be any rectangular size and shape.

Each viewport has its own construction plane and grid that the cursor normally moves on and a projection mode. To toggle between a small viewport and one that fills the graphics area, double-click the viewport title.

Viewport title

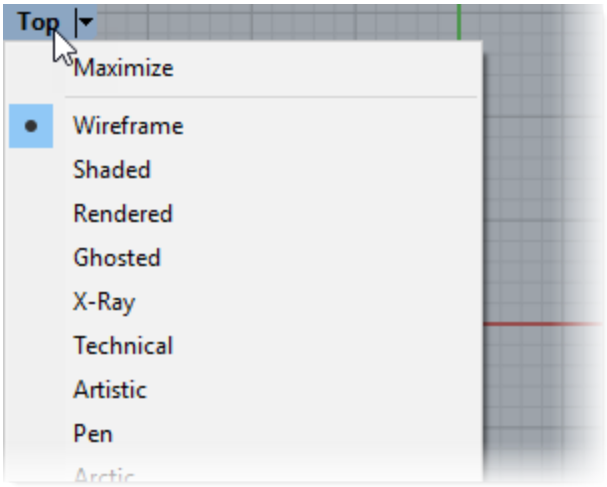
The viewport title has some special functions for manipulating the viewport. To move a viewport, drag the viewport title. To re-size a viewport, drag the viewport border. You can create new viewports, rename viewports, and use predefined viewport configurations from the viewport title menu.



- Click the title to make the viewport active without disturbing the view or the set of selected objects.
- Drag the viewport title to move the viewport.
- Double-click the viewport title to maximize the viewport.
  Double-click again to restore the viewport layout.

To use the viewport title menu

- Right-click the viewport title, or click the small black triangle to display the viewport title menu.

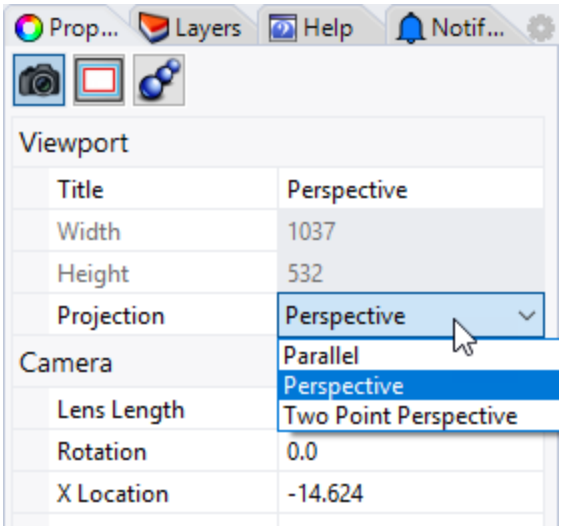


The viewport title menu contains most of viewport and display related commands. The same commands can be found in the **View** menu on the main menu bar.

Viewport projection

Graphical *projection* is used in technical drawing to project an image of a three-dimensional object onto an imaginary fixed plane.

The viewport projection can be parallel, three-point perspective, or two-point perspective. The viewport projection is set in Viewport Properties. When no object is selected, the Properties panel shows viewport properties.



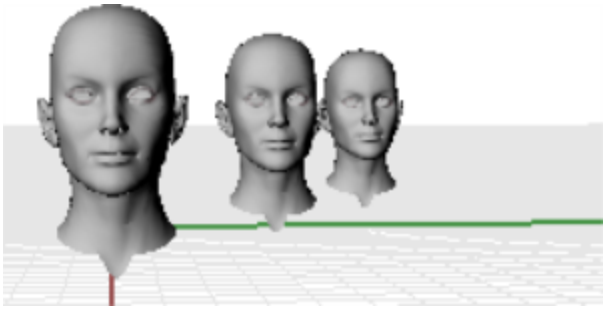
In the default four-viewport layout, there are three parallel viewports (Top, Front and Right) and one perspective viewport. For more information about graphical projections, see https://en.wikipedia.org/wiki/Graphical_projection.

Parallel

In a parallel view, all the grid lines are parallel to each other, and identical objects look the same size, regardless of where they are in space. Parallel views are also called orthogonal views in some systems.

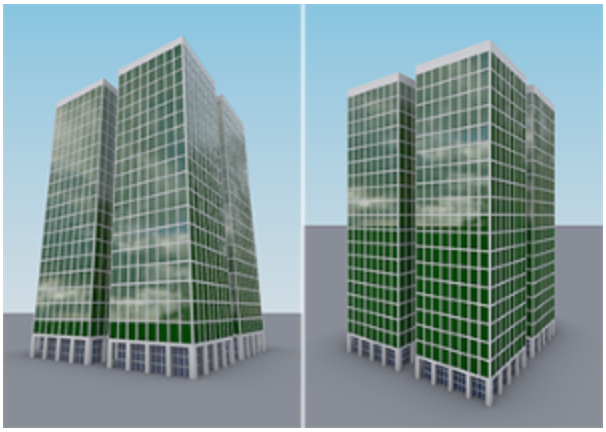
Perspective

A perspective view, uses three-point perspective. Grid lines converge to a vanishing point. This provides the illusion of depth. Perspective projection makes objects farther away look smaller.



Two Point Perspective

In a two-point perspective view, objects look smaller as their horizontal distance increases, but look the same as their vertical distance increases.



Perspective (left) vs. Two Point Perspective (right).

Viewport navigation

Working in 3-D on a computer requires visualizing 3-D objects drawn on a 2-D medium - the computer screen. Rhino provides tools to help do this.

Rhino's easy view navigation helps you visualize your model. You can look at you model from any direction, look at the whole model, or look into the details. You can change your view in the middle of a command to see precisely where you want to select an object or pick a point.

Mouse navigation

Dragging with the right mouse button easily manipulates the views so you can look at the model from various angles. Mouse navigation works differently in parallel and perspective viewports. In parallel viewports, right mouse drag pans the view. In a perspective viewport, right mouse drag rotates the view, and you must use the **Shift** key modifier to pan the view.

To pan the view

- In a viewport with a parallel projection, such as the **Top** viewport, drag the mouse with the right mouse button held down.
- In the **Perspective** viewport, hold the **Shift** key, and drag with the right mouse button held down.

Undo or redo view changes

If you get lost, there are several ways to get yourself reoriented:

- Press the **Home** key to step back through your view changes.
- Press the **End** key to step forward through your view changes.
- To bring all your objects into view, use the **Zoom** command, **Extents** option.

To rotate a perspective view

- In the **Perspective** viewport, drag the mouse with the right mouse button held down to rotate the view and see the objects from a different angle.

To zoom in and out

- Hold down the **Ctrl** key and drag up and down with the right mouse button held down.
- If you have a mouse with a wheel, you can also scroll the wheel to zoom in and out.

Key and mouse combinations

Pan

In parallel viewports (for example: Top, Front, and Right), **drag** with the right mouse button.

In perspective viewports, hold the **Shift** key, and **drag** with the right mouse button.

RotateView

In perspective viewports, **drag** with the right mouse button.

Note: Rotating a parallel view is not common. It is a special operation that should be used rarely and with caution.

In parallel viewports (for example: Top, Front, and Right), hold the **Ctrl** and **Shift** keys, and **drag** with the right mouse button.

Zoom

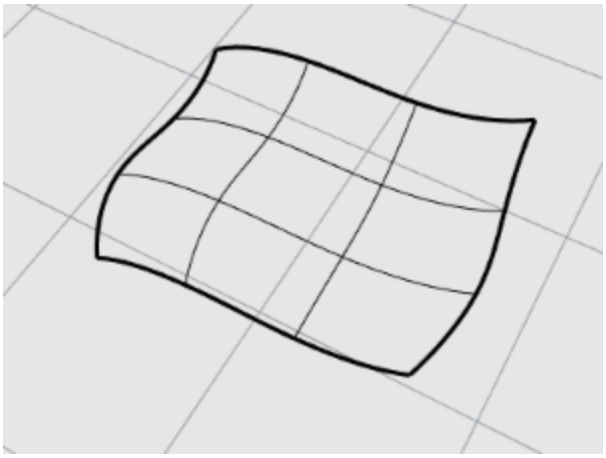
Hold the **Ctrl** key, and **drag** up and down with the right mouse button, or rotate the mouse wheel.

Viewport display modes

You can view your model in a variety of wireframe, shaded and rendered methods that depend on your needs. Wireframe mode usually offers the fastest display speed. Shaded modes offer the ability to view surfaces and solids with shading to help you visualize the shapes.

Wireframe

In **Wireframe** mode, surfaces look like a set of curves that cross each other. These curves are called *isoparametric curves* or *isocurves*. Isocurves do not actually define the surface. They are merely a visual aid.



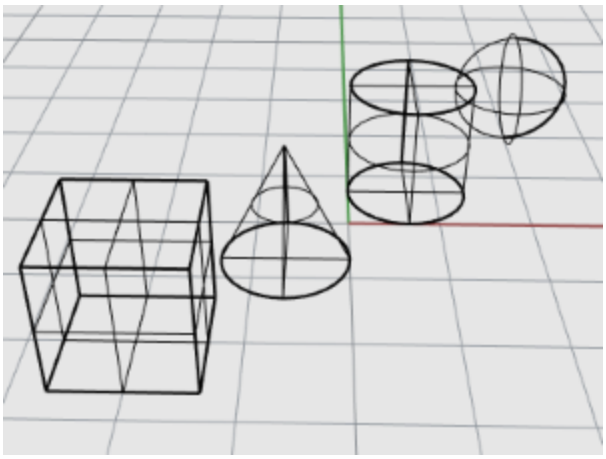
To set wireframe mode

1. Open the sample model, **Start.3dm**.

   (Help menu > *Learn Rhino >Tutorials and Samples > User's Guide > Start)*

2. Click the left mouse button in the **Perspective** viewport to make it active.
   An active viewport is the viewport where all your commands and actions take place.

3. Right-click on the viewport title menu, and click **Wireframe**.

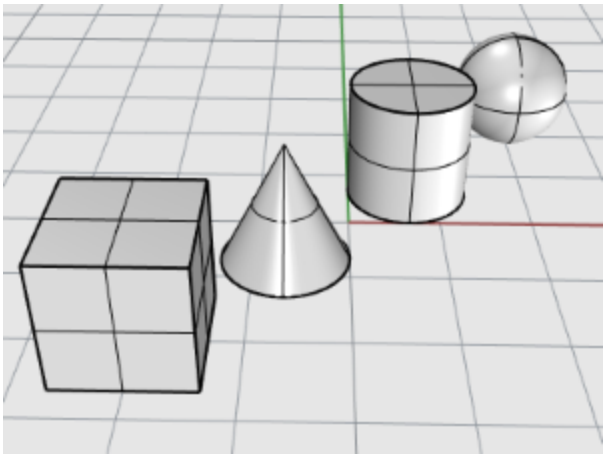


Shaded

The **Shaded** modes, (for example, Shaded, Rendered, Artistic, and Pen) display surfaces and solids with render meshes to show surfaces.

To set shaded mode

1. On the viewport title menu, click **Shaded**.



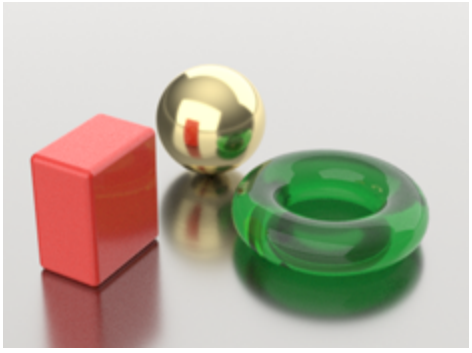
2. Rotate your view by holding down the right mouse button and dragging from the bottom of the view upwards. You are now under the objects looking up. The construction plane grid helps you stay oriented.
3. Press the **Home** key to undo your view changes.

Rendered

The Rendered mode shows objects with lighting and render materials applied.

Raytraced

The Raytraced mode displays objects with materials and raytraces the scene and lighting in real-time.



Other shaded modes

Other display modes and custom settings are described in the Rhino Help.


Artistic (left) and Pen (right) display modes.