

## Chapter 4: Navigating Viewports

The viewport title has some special functions for manipulating the viewport.

- ▶ Click the title to make the viewport active without disturbing the view.
- ▶ Drag the viewport title to move the viewport.
- ▶ Double-click the viewport title to maximize the viewport. Double-click again to restore the size to normal.

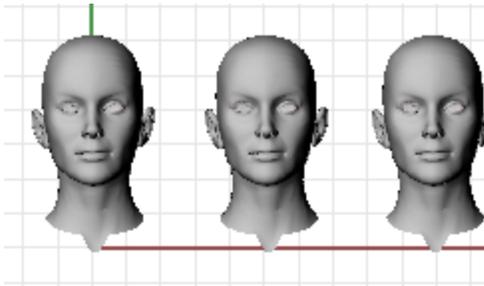
### Viewport projection

Viewports can have one of three projections: parallel, perspective or two-point perspective.

Right mouse navigation works differently in the two viewport styles. In parallel views, right mouse dragging pans the view. In perspective views, right-mouse dragging rotates the view. In the usual four-viewport layout, there are three parallel viewports and one perspective viewport.

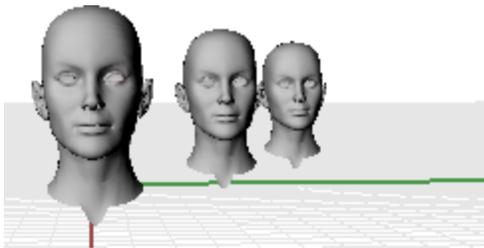
#### Parallel

Parallel views are also called orthogonal views in some systems. 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.



#### Perspective

In a perspective view, grid lines converge to a vanishing point. This provides the illusion of depth in the viewport. Perspective projection makes objects farther away look smaller.



### Viewport navigation

Rhino's easy navigation helps you to visualize your model.

The simplest way to change the view is to drag the mouse with right button held down. This pans the view in parallel views and rotates the view in perspective views.

You can change your view in the middle of a command to see precisely where you want to select an object or choose a point.

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, use the wheel to zoom in and out.

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

In perspective viewports, **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.

## Mouse navigation

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

Drag with the right mouse button to easily manipulate the views to look model from various angles. Use the right mouse button view manipulations in both wireframe and shaded views.




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**To pan in a viewport**

- ▶ In the **Top** viewport, drag the mouse with the right mouse button held down to pan the view.




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**Restore a view**

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 set your view so you are looking straight down on the construction plane, use the **Plan** command.
- ▶ To bring all your objects into view, use the **Zoom** command **Extents** option.

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**Practice rotating the view**

1. 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. The active viewports title highlights so you can easily see which viewport is active.
2. 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.

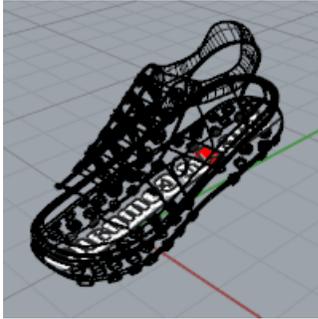
## Viewport display modes

You can view your model in a variety of ways that depend on your own 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.

Standard and customized shaded modes allow easier visualization of surfaces and solids.

## Wireframe

In **Wireframe** mode, surfaces look like a set of crossing curves. These curves are called *isoparametric curves* or *isocurves*.

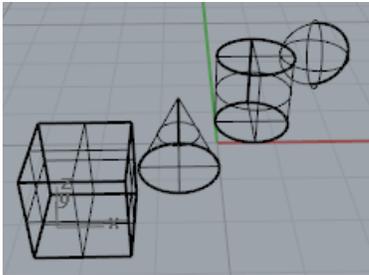


Isocurves do not define the surface the way the polygons do in a polygon mesh. They are merely a visual aid.



### To set wireframe mode

1. Click a mouse button in the **Perspective** viewport to make it active.  
An active viewport is the viewport where all your commands and actions take place.
2. On the viewport title menu, click **Wireframe**.



## Shaded

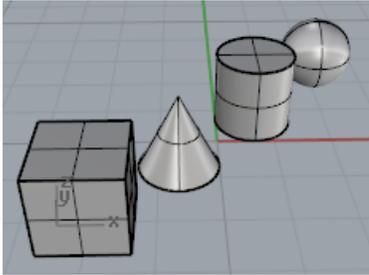
The **shaded** modes, (for example, Shaded, Rendered, Artistic, and Pen) display surfaces and solids with the surfaces shaded using their layer, object, or custom color. You can work in any of the shaded modes. The surfaces are opaque or transparent.





### To set shaded mode

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



Rotate your view by holding down the right mouse button and dragging from the bottom of the view toward the top.

You are now under the objects looking up.

The construction plane grid helps you stay oriented. If the objects are behind the grid, you are looking at the bottom of the construction plane.

2. Press the **Home** key to undo your view changes.



### Rendered

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



### Other shaded modes

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



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

## Viewport title

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Double-click again to restore the size to normal.

### To activate the viewport title menu

- ▶ Right-click the viewport title or click the down-arrow on the menu to display the viewport title menu.

From the viewport title menu you can maximize the viewport, pan, rotate, zoom, set one of the standard views, set a construction plane, set the camera and target locations, choose a shading option, set the grid, and open the **Viewport Properties** dialog box.

