

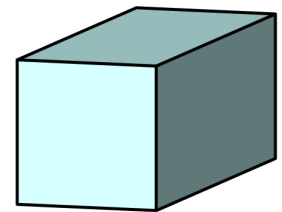
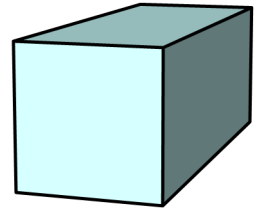
PROJECTION; WALKTHROUGH TOOL; CLIP CUBE

Vectorworks Tutorial by [Andy Broomell](#) © 2020.
Green text indicates advanced or supplementary notes.

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PERSPECTIVE VS ORTHOGONAL

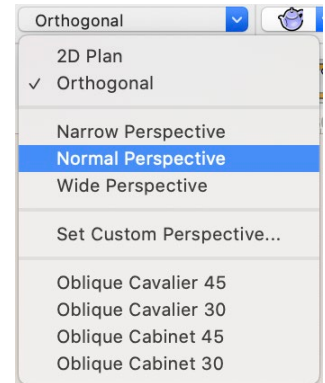
- The “**projection**” of a view determines how Vectorworks displays 3D objects on a two-dimensional screen. Two common projections are orthogonal and perspective.
- **Perspective** views add distortion to the drawing so that objects farther away from the viewer appear smaller than objects that are closer.
 - For example, parallel lines on a box appear to converge in the distance.
- **Orthogonal** projection has no perspective applied; rather, parallel edges are displayed parallel, and distance from the viewer has no effect.
- Human eyes do not see the world orthogonally – they only see in perspective – but in CAD software there are uses for both types of projection. When drafting & modeling objects it’s often easier to work in orthogonal views, and easier to look at and analyze your design in perspective views. On Sheet Layers, orthogonal projection is used when creating measurable views for drafting, and perspective projection is used for renderings and 3D auxiliary views.



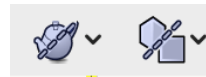
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HOW TO CHANGE THE PROJECTION

- On a Design Layer, the projection can be manually changed at any time by using the “**Current Projection**” dropdown (or **View > Projection** menu commands).









- By default Vectorworks uses orthogonal projection for 3D views, though as of VW2015 there is a preference which can automatically switch you to perspective any time you go to a 3D view. This is set under Vectorworks Preferences > 3D tab > “**Projection when changing from Top/Plan to a 3D view**”.
 - Note you can also select the default render mode for 3D views.
 - Typically you should leave the default projection to orthogonal, and the render mode whichever you prefer.
 - Both of these preferences have quick-preference buttons which can be added to the upper right toolbar.



- Switching the current view dropdown to **Top/Plan** always results in a wireframe orthogonal view, effectively turning off perspective.
- Switching to the **Walkthrough tool** will automatically switch you to perspective projection. Using the walkthrough tool is covered on the next page.
- If you have a **viewport**, there is a parameter in the OIP called “projection” where you can switch the projection.

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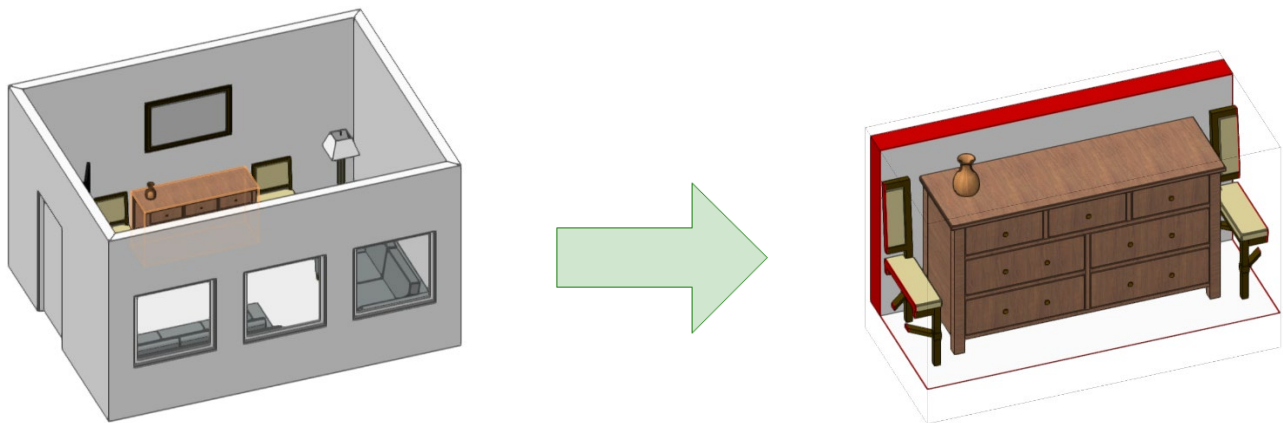
THE WALKTHROUGH TOOL


- The **Walkthrough tool** , in the Visualization tool palette , can be used to simulate movement through a 3D model. It is an additional way to navigate beyond simply zooming and panning.
- **Shift+W** is recommended for the hotkey, though isn't the default.
 - This tool only works in perspective, and will automatically switch you to perspective if currently in an orthogonal projection.
- The first mode, **Walk Mode** , allows you to “walk” through your 3D model by clicking and holding a point on the screen, then dragging the cursor around to move and look in that direction.
 - Up / down moves forward and back
 - Left / right changes direction.
 - The distance from the first click determines the speed of movement.
- The second mode, **Look Around Mode** , keeps the viewer in one spot and allows you to click-drag to look around from that spot.
- The third mode, **Elevator Mode** , allows you to raise or lower the viewer height. You can also type in a height in the mode bar.
- The fourth mode, **Gamer Mode** , allows you to navigate with keyboard keys (set in the Preferences button), similar to playing a video game. Click to look around, and click again to stop looking around. You can navigate and look at the same time.
 - This is the most versatile mode of the Walkthrough Tool.

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CLIP CUBE

- The **Clip Cube** command allows you to temporarily view only the geometry contained within the Clip Cube by clipping away other portions of the model. Only objects within the Clip Cube are displayed and are snappable.

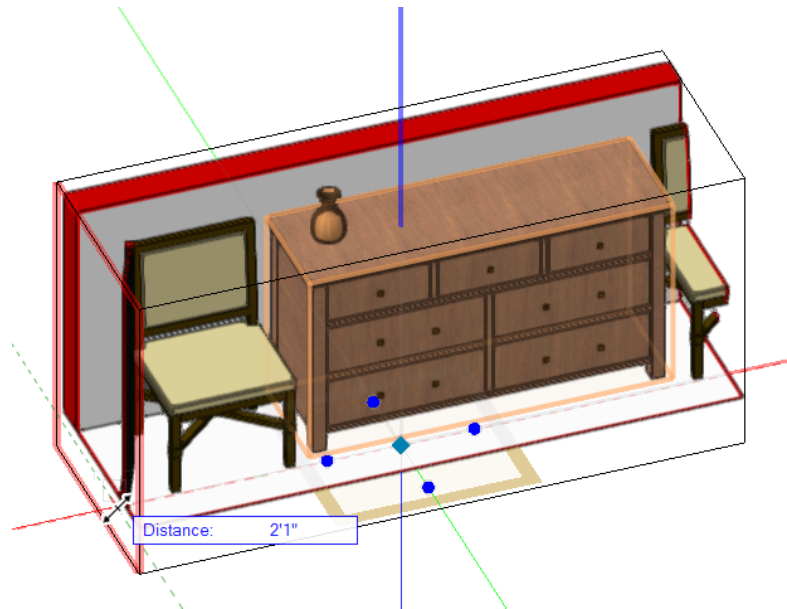



- In a 3D view, select the object(s) that you wish to focus on (if no objects are selected, the cube will include all currently visible objects.)
- Go to **View > Clip Cube**, or click the **Clip Cube button**  in the Quick Preferences toolbar.
- The view is then clipped to show only the area of the model that contains the selected object(s). The thin black wireframe cube that appears is the Clip Cube.
 - By default, areas of solid objects that are sectioned by the Clip Cube are displayed in red (customizable in VW Preferences).
- As of VW2019 you can also have Clip Cubes displayed in Viewports.

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MODIFYING THE CLIP CUBE

- To **modify** the Clip Cube, first click on a black wireframe edge of the Clip Cube with the **Selection tool**. You know it's selected if an axis and some handles appear.

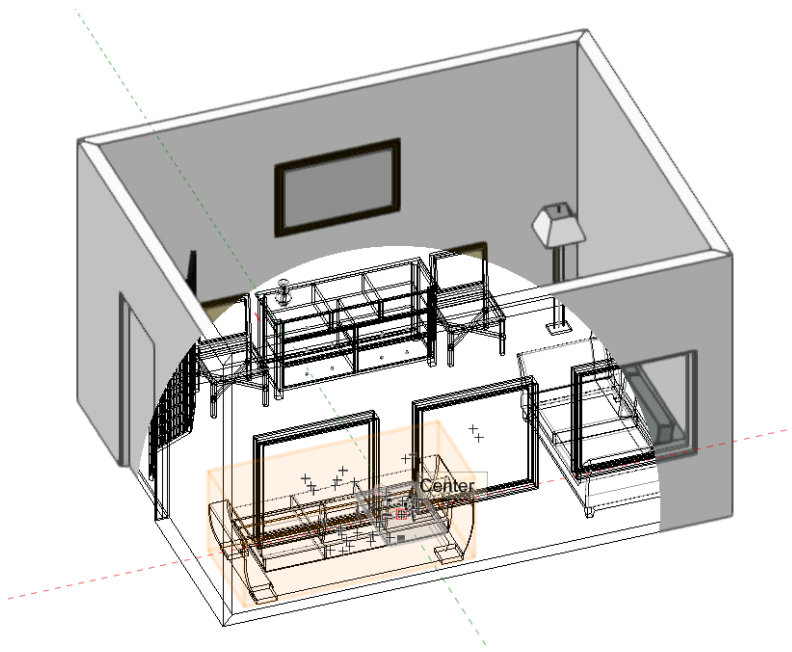


- Once you've selected the Clip Cube itself, simply **click on a face** then drag inward or outward (similar to Push/Pull tool) then click again.
 - It may be helpful to hold the **tilde key** (~) to **disable snapping**.
- You can grab the blue handles of the editing frame if you want to rotate the entire Clip Cube.
- To turn off the Clip Cube, simply click the Clip Cube button  again.
- Clicking the button yet again will create a new Clip Cube from scratch. If you want to instead **restore the previous Clip Cube**, hold **Ctrl** (Mac & Windows) when clicking the button.
- If you want to save a Clip Cube into a **Saved View**, make sure "Save View Orientation" is checked when making the Saved View.

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X-RAY SELECT MODE

- Another quick tool that is helpful for working in 3D is **X-Ray Select Mode**.
- When in OpenGL, holding down the **B key** will hide the fills of objects and show a bubble of wireframe, allowing you to more easily select obscured objects.



- This tool also works in Top/Plan to hide 2D fills.
- The hotkey can be changed in the third tab of the Workspace Editor.