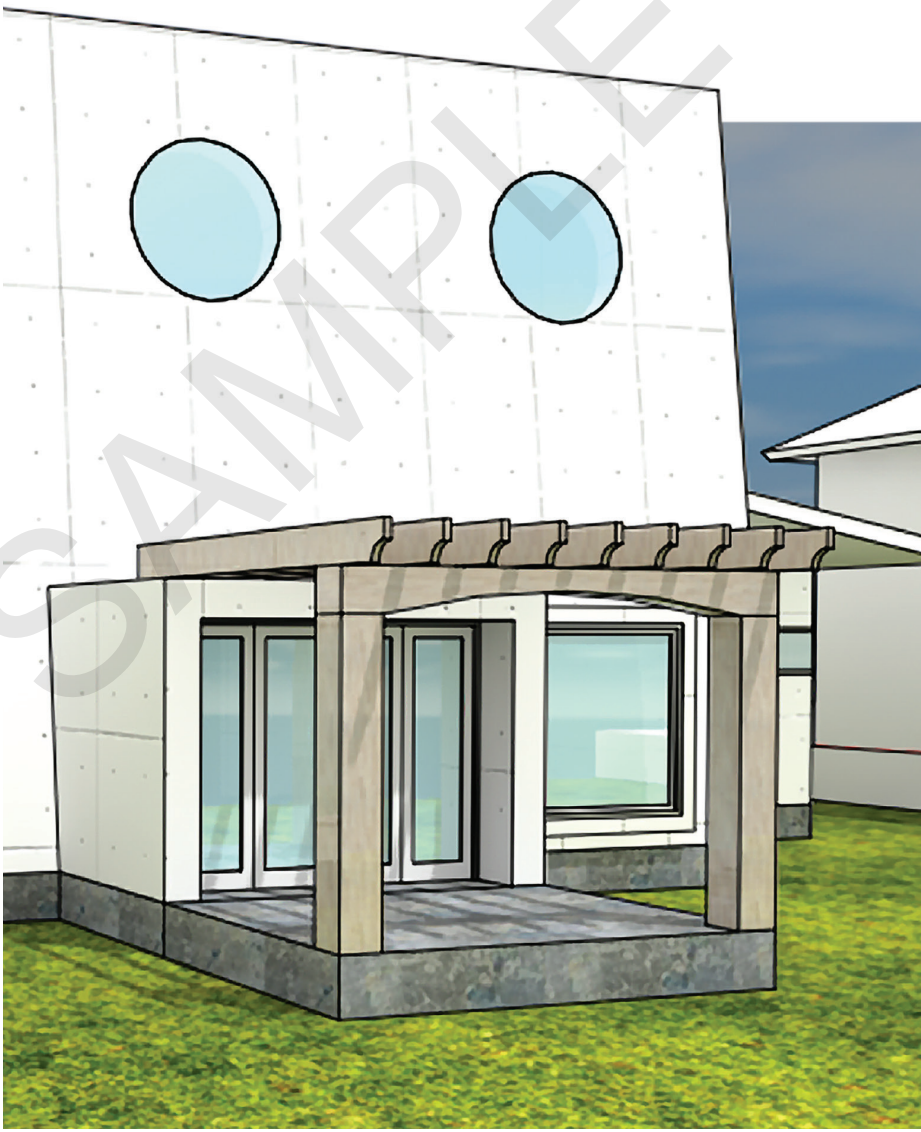
NEMETSCHEK Vectorworks

JONATHAN PICKUP

3D MODELING

WITH VECTORWORKS



7TH EDITION TUTORIAL MANUAL | WRITTEN WITH VERSION 2015

3D MODELING
WITH VECTORWORKS

Jonathan Pickup | seventh edition
written with version 2015

Archoncad

Architecture on CAD, Ltd.
10 Laws Place
Napier, New Zealand
T +64 217 43470
jon@archoncad.com

For more Vectorworks training information or to purchase more copies of this book, please visit www.Vectorworks.net/training, or call us at (410) 290-5114.

There are several people I would like to thank: Steve Scaysbrook, Roger Williams, Bill Vincent, and my good friend, Allan Baggett. Without them, none of my manuals would be as good as they are.

A big thank you to my wife, Marie, and my children. I need your support and understanding to invest the hours necessary to create these manuals.

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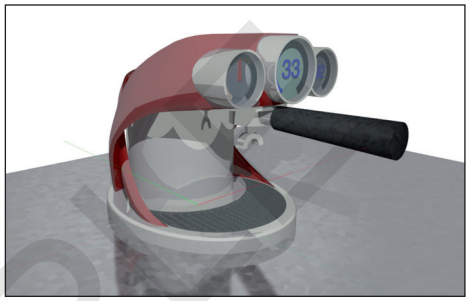
0.0 Introduction

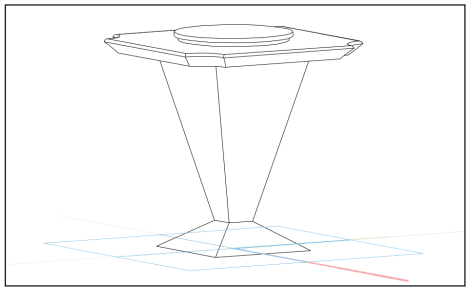
This manual covers one of the best parts of Vectorworks, creating 3D models. It is really fun and rewarding to create the forms you want and be able to move around them to view your work from different angles.

Here is an example from a first-time user of Vectorworks. The project was a high school graphics project, and the user had not used Vectorworks before. The user was given an earlier edition of this manual and worked though the exercises. Then with only a little guidance from an experienced trainer, the user was able to produce this model.

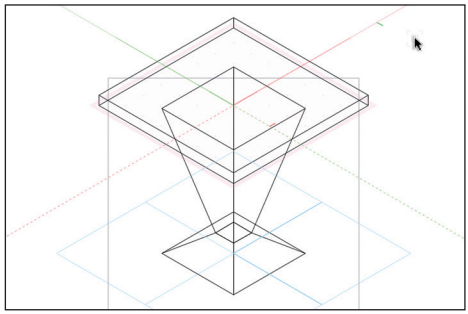


When you first look at this model, you may wonder how it was made because it seems so complex. There is a saying, “How do you eat an elephant? One bite at a time.” This can be applied to your models. How can you create this coffee machine? One part at a time. This coffee machine is mainly made from simple extruded objects with a couple of complex curves. When you bring them all together, the result is magic.

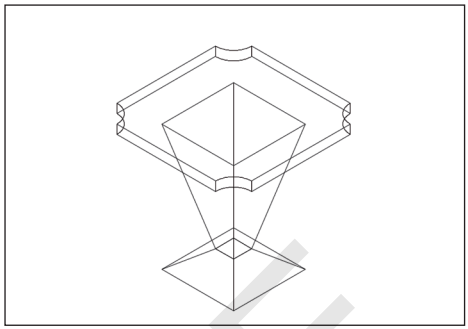
If you look at the top of this table, it looks like a complex form, but if you were to make this from a timber slab, how would you build it?



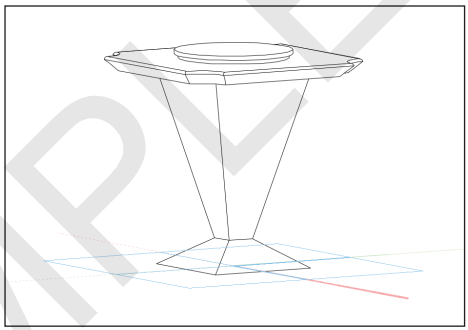
You would probably start with a solid slab of timber.



Then you could cut the corners out.



And then you can add the center piece and edit the edges.



0.1 How to Use this Manual

This manual builds on the Vectorworks Essential manual. The Essential manual is designed to show you basic concepts of Vectorworks, such as drawing, modeling, and basic file organization. If you are unfamiliar with these concepts, then you should get the Essential manual and complete it before you go any further.

Here are some ideas to help you to use this manual better:

Spend the time to work through the manual. The information in this manual will not find its way into your head if you don't complete the exercises. Reading the manual is good; reading the manual and watching the movies is better; reading the manual, watching the movies, and completing the exercises has the best results. Watch the movies, try the exercise, and then play the movie again.

Comments and discussions are shown like this.

- Instructions for you to complete are shown like this.

Tips: Useful tips are shown like this.

Measurements for you to use are shown in both metric and imperial. Metric measurements appear first followed by imperial measurements in brackets. If you are using metric, don't type in the imperial measurements; if you are using imperial, don't type in the metric measurements.

This manual comes as a hard copy with a DVD-ROM.

There are two exercise folders on the DVD. One is called "Imperial Modeling Exercises," and the other is called "Metric Modeling Exercises." Copy the exercise folder that you want to use to your computer. Place the exercise folder in a location to make it easy to find later, such as in "My Documents."

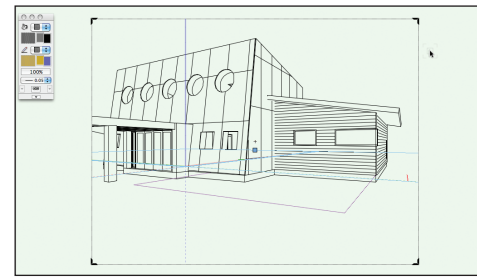
Save any training files that you work on to your exercise folder.

When you want to play a movie that is shown in the printed manual, insert the 3D Modeling Tutorial Manual DVD into your computer's DVD player. Right-click on the file on the DVD called **3D Modeling Tutorial Manual.pdf**, choose Open with..., and choose Acrobat Reader. This is your electronic copy of the manual, and it contains links to all the movies. To play a movie from the electronic copy of the manual, move your cursor over the movie icon (the cursor will change shape), and click once. When the movie is finished, it will automatically close. If you are using a Macintosh, make sure the manual opens with Adobe Acrobat Reader, not Preview. Preview will not display the movie icons. When the movie is finished, it will automatically close. Use Acrobat Reader to read the manual and play the movies; use Vectorworks to do the exercises.

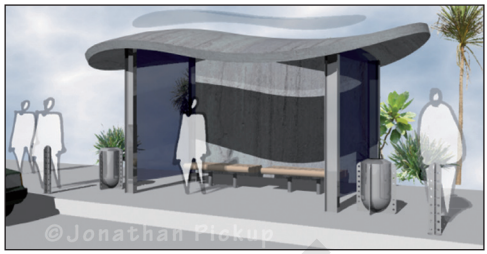
0.2 What's in this Manual

This manual starts with an introduction to modeling in Vectorworks. This section explains the basic concepts you need to create complex models effectively. There are a series of modeling exercises designed to show you how individual tools and commands work. Some of these exercises will use a few tools or commands together to show you the flow of work from a simple block to the final model.

Following the Introduction, there is an architectural modeling exercise to bring several modeling tools, commands, and concepts together to develop a model and create drawings from it.



The final part of the manual is a bus stop exercise. The aim of this project is to work through a long series of exercises to create a final project. You will learn how to break the project down into small parts and model each of these. You will learn how to do more advanced modeling by making street furniture, how to use some of the advanced tools for creating curved 3D models, and how to move through a series of tools and commands to get the model that you want.



0.3 New Ways of Drawing

When you are drawing in Vectorworks, draw the objects to the correct real-world sizes regardless of the scale of the layer that you are working on.

It is much easier to maximize the potential of Vectorworks by using objects to draw with, as they can be easily edited (for example, doors, windows, rectangles, etc.). You could say that Vectorworks is designed to draw with objects.

When you want to draw shapes, you may be tempted to use lines and arcs to draw the shape. Always try to draw with solid shapes, rectangles, and polygons. I have created a series of exercises that show you how to make complex shapes out of simple shapes by adding the shapes together or by clipping a portion of a simple shape away to make a complex shape.

It's very important that you use these new drawing methods to draw your buildings, landscapes, or models.

This manual is intended to be used with the standard Vectorworks workspace. After you have completed this manual, you can change back to your normal workspace and carry out the 3D modeling you want.

- Go to the **Menu bar**.
- Choose **Tools > Workspaces > Fundamentals**.

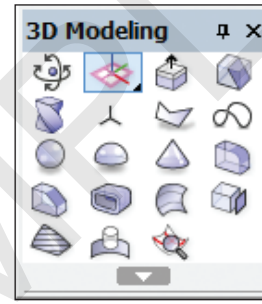
1.0 Simple 3D Modeling

1.1 Working Planes

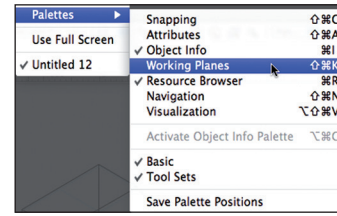
When you create extrusions and primitive shapes, they always start at zero on the working plane. When you want to create more complex shapes, working planes help you to change the active working plane to a position that suits. When you create planar objects, they are created on the working plane, so it is really important to learn how to create and manage working planes.

movie
movie001.mov

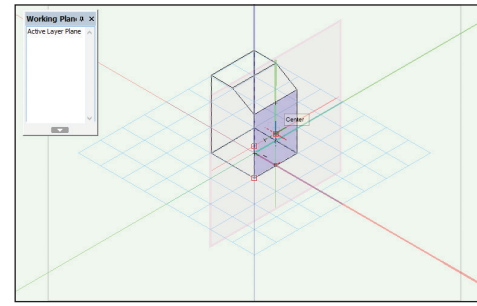
- Open the file **3D Model 1.sta** from the exercises folder.
- Go to the **3D Modeling** tool set.
- Select the **Set Working Plane** tool.
- Go to the **Tool bar**.
  Select the second mode.



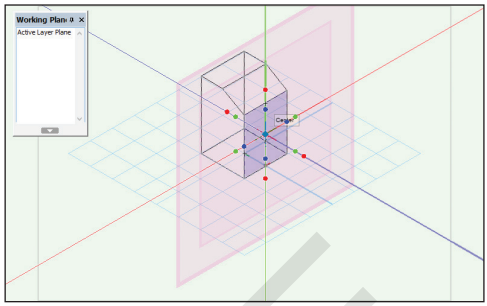
- Go to the **Menu bar**.
- Choose **Window > Palettes > Working Planes**. This opens a palette where you can save, edit, and recall working planes.



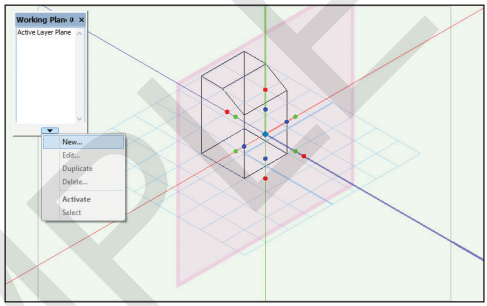
- Move the cursor to the face of the object. I've moved to the right side. Notice how the side of the object highlights.



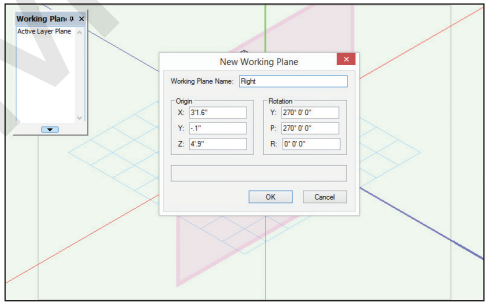
- Click once. This sets the working plane to the face of the object.



- Go to the Working Planes palette.
- Click on the **Utility** menu at the bottom of the palette.
- Choose **New...**

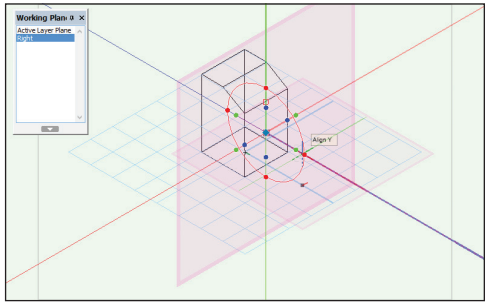


- Name the working plane. If you want to rotate the Working Plane, you can change the angle on this dialog box.
- Click on the **OK** button.

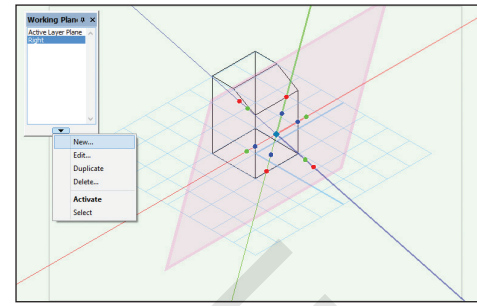


The working plane is added to the palette.

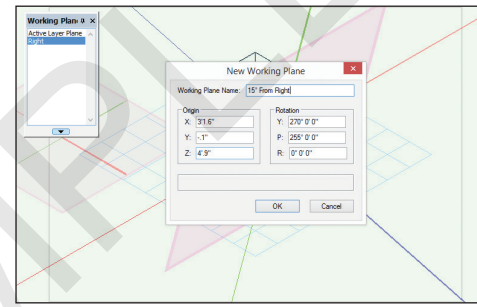
- Move your cursor to the red dot at the top of the working plane. These dots allow you to rotate the working plane. Each color rotates the working plane in a different direction. When you move to the dot, you will see an indication of the direction.



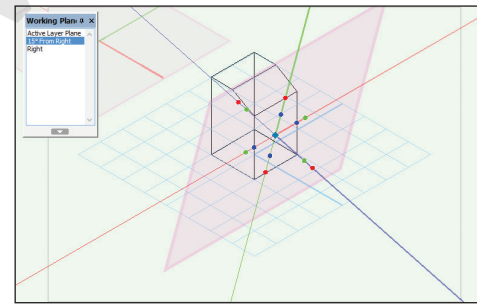
- Click once.
- Move your cursor to a new location. The Floating Data bar will tell you the offset angle. This is the angle from the working plane.
- Click once.
- Go to the Working Planes palette.
- Click on the **Utility** menu at the bottom of the palette.
- Choose **New...**



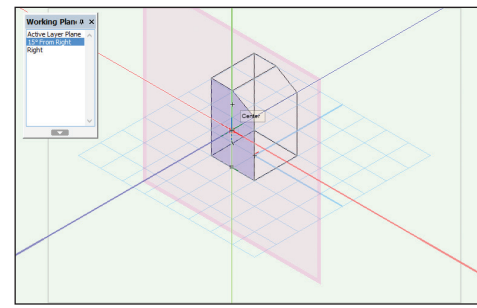
- Name the working plane.
- Click on the **OK** button.



The working plane is added to the palette.

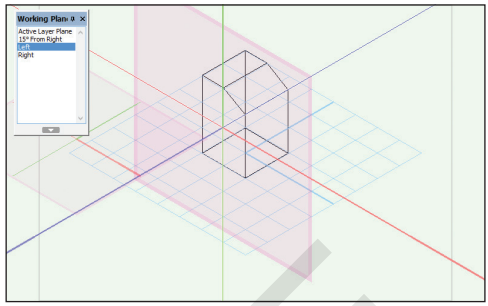


- Move to the next side of the object.
- Click once. This sets the working plane to the face of the object.
- Go to the Working Planes palette.
- Click on the **Utility** menu.
- Choose **New...**
- Name the working plane.
- Click on the **OK** button.

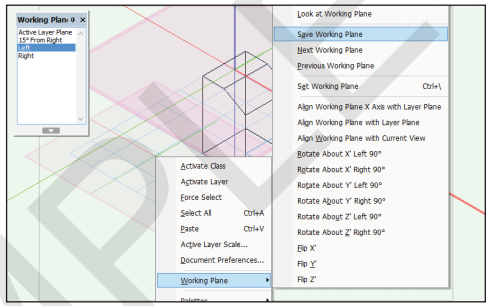


The working plane is added to the palette.

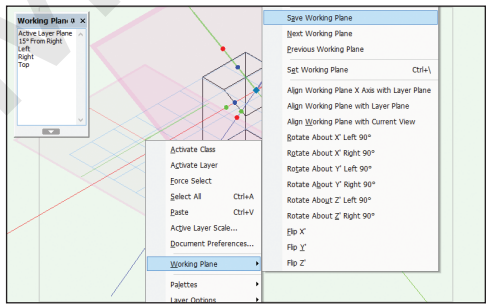
The Working Planes palette is not the only way to store and retrieve working planes.



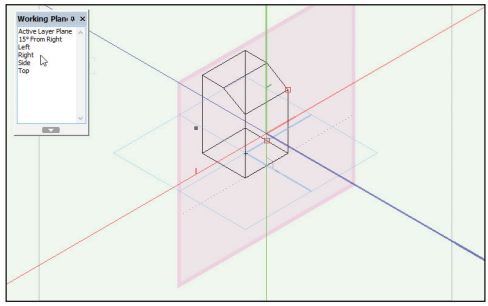
- Move to the top of the object.
- Click once. This sets the working plane to the face of the object.
- Right-click in empty space (away from everything).
- Choose **Working Plane > Save Working Plane**.
- Name the working plane.
- Click on the **OK** button.



- Move to the cut side of the object.
- Click once.
- Right-click in empty space (away from everything).
- Choose **Working Plane > Save Working Plane**.
- Name the working plane.
- Click on the **OK** button.

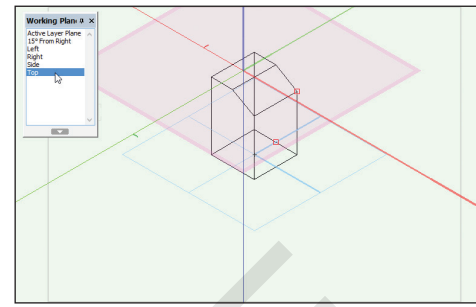


The working planes are added to the palette.

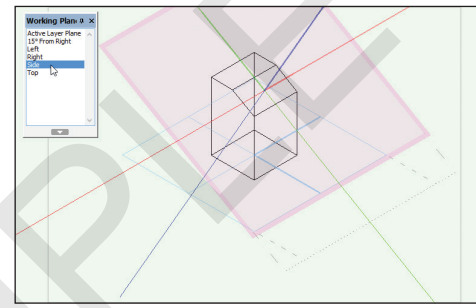


- Go to the Basic tool palette.
- Choose the **Selection** Tool.
- Go to the Working Planes palette.
- Double-click on the **Right** working plane.
- Vectorworks moves the working plane to the right side of the object.

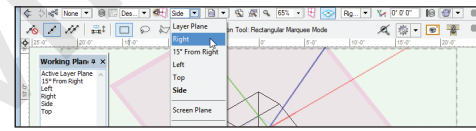
- Go to the Working Planes palette.
- Double-click on the **Top** working plane.
- Vectorworks moves the working plane to the top face.



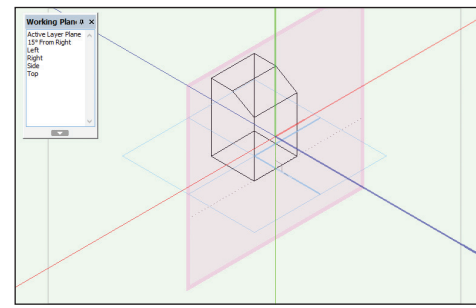
- Go to the Working Planes palette.
- Double-click on the **Side** working plane.
- Vectorworks moves the working plane to the cut face.



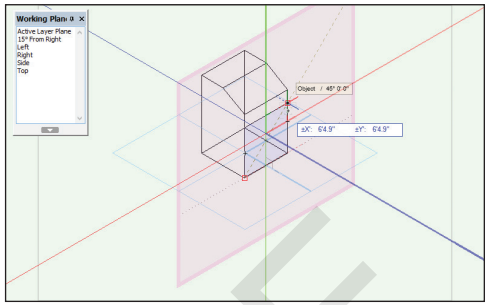
- Click on the **Working Planes** pop-up menu on the **View** bar.
- Choose **Right**.



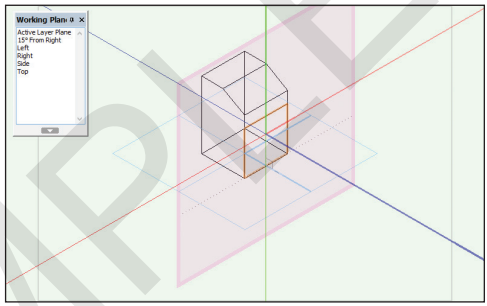
Vectorworks moves the working plane to the right face.



- Go to the **Basic** tool palette.
- Choose the **Rectangle** tool.
- Draw a rectangle on the working plane.

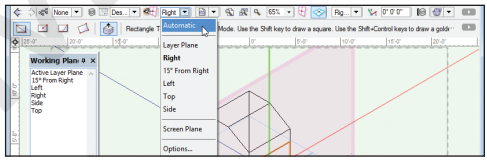


These objects projected on your model are called **planar objects**.

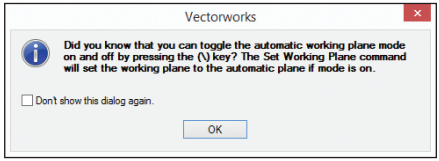


Vectorworks has the ability to detect the plane of the object and move the working plane to the face.

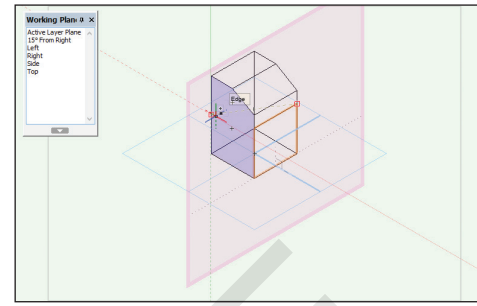
- Click on the **Working Planes** pop-up menu on the **View** bar.
- Choose **Automatic**.



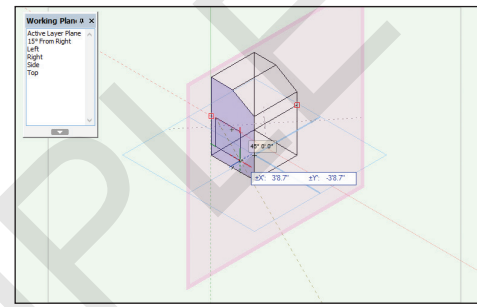
- You will get this dialog box telling you about the keyboard shortcut.
- Click on the **OK** button.



- When you move near the object, Vectorworks highlights the plane of the object.
- Click once to start drawing on the plane.

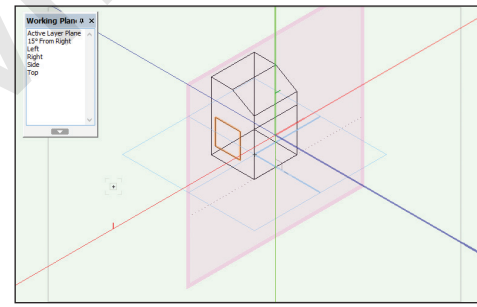


- Click once to finish.



- The new rectangle is drawn on the face of the object.

Using Automatic Working Planes will really speed you up.



Jonathan Pickup | seventh edition

3D MODELING with Vectorworks

written with version 2015

ABOUT THE AUTHOR

Jonathan Pickup is an architect trained in New Zealand and in the United Kingdom with more than 25 years of experience. He received his Bachelor of Architecture (BArch) degree from the University of Auckland in New Zealand. He later spent more than eight years in England where he learned to use several CAD packages, including MiniCad, and began teaching this forerunner of Vectorworks. Upon returning to New Zealand in 1997, he established archoncad, a Vectorworks training and consulting company. He has written several Vectorworks training manuals for architects, landscape architects, educators, and design students. He organizes the New Zealand Vectorworks User Group and provides its main direction.

THE SEVENTH EDITION Vectorworks 3D Modeling Tutorial manual is a must-have workbook for anyone seeking to learn how to free-form model with Vectorworks. Exercises aimed at building a foundation of 3D Vectorworks skills include creating 3D forms through the use of extrudes, sweeps, solids, NURBS, loft surfaces, and 3D primitives. This manual will bring you to a competent level of 3D capability.

ABOUT THE COVER

This manual contains instructions on how to create a model of this scale, along with it's accompanying plans, sections, and elevations. Pickup created the image while writing the architectural modeling portion of this manual. He strongly believes that using Vectorworks eliminates the need to employ additional modeling software at the conceptual stage of any project's evolution.

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Cover imagery courtesy of Jonathan Pickup