

# Woodworking, Computers and the Internet

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This document supports a presentation made to the [Eastern Massachusetts Guild of Woodworkers](#) regarding computer and internet based woodworking utilities and resources. An emphasis is placed on how to learn SketchUp. This document contains many links to active online resources. To get the most of this document, the reader is encouraged to work from a digital version while connected to the internet. Any text that is underlined and in blue is a link to a website of some type. Put the cursor over the blue text and left click the mouse. The site will open in your web browser.

## Today's Focus

Today we will discuss how the use of computers and the Internet can help expand your woodworking capabilities. We will focus on:

- Online woodworking research and learning opportunities
- Online software tools targeted at woodworking
- Optimization Software - a very specific tool to help minimize materials use
- Tutorials and resources to help you to learn SketchUp

## Computers + Internet for Woodworking

Many woodworkers think of Computer Aided Design (CAD) like SketchUp or AutoCad when the topic of computers comes up. CAD offers great benefits and opens up many creative opportunities, but it's just one of many ways in which computer technology can help the woodworker.

- Computer and internet based tools and sources to **research** and record design ideas
  - Google images
  - Museums - often with photo galleries and books
  - Massive store of free online books and articles ([Google Books Library Project](#) )
- Online woodworking **videos and courses**
- **Finding materials** and hardware
- Tools for two way **communications** with customers and fellow woodworkers
- **Drawing** and sketching
- Powerful **collaboration and communication** capabilities for spreadsheets, drawings, and documents
- Everything **available** on every platform - computer, iPad / Tablet, Smartphone

## Some Examples of What Can Be Found Online

The number of online opportunities for woodworkers is vast and growing. One of the key online skills for a woodworker is learning how to find them. Often, one site of interest will lead to another through an active link. Here are just a few of the online resources I find myself using all the time.

- [Amazon Books](#) - particularly for out of print books - Try "Frank Gottshall" as an example
- [YouTube](#) - some great, a lot OK, some just awful. For the great, try "Paul Sellers woodworking channel"
- [Google](#) Images - example type "Images of Federal Furniture" in a browser search bar
- [Stanley Weiss](#) - One of many antique dealers with rich web sites. This antique dealer has a great website and spectacular photos. An excellent source for design ideas.
- Free stuff is everywhere. -

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- For example, the ? spectacular book “John Townsend: Newport Cabinetmaker” is of great interest to anyone interested in American Period Furniture. There are two ways to get this wonderful book:
  - [Buy on Amazon for \\$150](#)
  - Download it for FREE from [Metropolitan Museum of Art](#).
- [Project Gutenberg](#)
- Almost free stuff - a good part of my woodworking library is made up of out of print books bought from Amazon Used Books for \$3.99 plus shipping.
- Blogs
  - [Pegs and 'Tails](#) - one of the best sources of information about period furniture construction and techniques. [An Example](#)
  - [Patrick Edwards](#) - good source of information about marquetry and liquid hide glue.
  - [WoodTreks](#) - woodworking videos on a variety of topics.
- Woodworking calculators and utilities for tasks such as: computing board feet, sizing drawer fronts, calculating shelf sag, determining the most appropriate woods for projects, and estimating wood shrinkage and moisture content. <http://www.woodbin.com/calcs/>
  - [Drawer Sizer](#) - Computes graduated drawer sizes using three different sizing methods. Generates a nifty graphic and a list of drawer heights.
  - [Footulator](#) - A simplified version of the Tabulator that only performs board foot calculations. (no materials list generation).
  - [Moistulator](#) - Computes equilibrium moisture content of wood given relative humidity and temperature.
  - [Sagulator](#) - Calculates shelf sag (deflection) given type of shelf material, shelf load, length, width, and thickness.
  - [Shrinkulator](#) - A calculator for estimating dimensional changes in wood, either shrinkage or expansion, based on changes in the wood's moisture content.
  - [Tabulator](#) - A board foot calculator and lumber material list generator. Provides options for resawing, a waste factor, lumber costs, and customization of output results.
  - [Wood Finish Selector](#) - A screening tool that helps you choose the best clear finish for your woodworking projects. Finishes are ranked based on 14 different properties that you select.
  - [Wood Picker](#) - A screening tool that allows you to identify woods based on up to 10 different criteria such as weight, hardness, and strength. The easy way to find just the right wood for that special project.

## A Word of Caution regarding Blogs, Forums and YouTube

Blogs, Forums and YouTube videos can be found on many topics and, with some luck, information can be gathered to address the most arcane questions. The challenge is being able to distinguish the output of a gasbag from actual information. Growing up before the Internet, YouTube and Blogs, I got most of my information from books and libraries. While not all books are great, it does take reasonable effort and thought to put a book together and get it published. Most of the older books on woodworking were written by people who were well-established and formally educated in the field of woodworking, had many years of experience, and could survive the scrutiny of an editor. Today, anyone with an Internet

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connection and a keyboard can pose as an expert and pass on woodworking "wisdom".

For every excellent video by [Charles Neil](#), [Robert Millard](#) or [Phil Lowe](#), there are scores of vacuous "woodworking" videos and articles posted to an apparently endless stream of Blogs that are dedicated to showing the world what a completely inexperienced woodworker does when posing as an expert.

Forums can be a wonderful source of topical information when the participants are knowledgeable. Many different and useful ideas and recommendations can be exchanged. Unfortunately, Forums are sometimes haunted by the "Compulsive Responder". Some poor guy (we will call him "Poor Guy") goes onto a Forum to ask a legitimate question in the hopes of reaching out to a knowledgeable woodworker.

**Poor Guy** - posts a question to the forum. "Does anyone know how much camber to put on a smooth plane?"

**Compulsive Responder 1** - "Well I don't actually use hand planes but..." followed by an protracted elucidation of what he thinks he thought he heard someone else say about a guy who knew a guy who read about a guy who might have actually owned an apron plane at one time.

**Compulsive Responder 2** - "Speaking of apron planes, I have one of ....."

Two days later

**Compulsive Responder 87** - "I guess that says it all about apron planes. I wish I had an apron".

**Poor Guy** - "Thanks guys. Umm - I think I will just buy a belt sander".

## Cloud Services

One of the issues with using a PC for woodworking is that you need to get to your PC to make use of the files / documents. A cloud service can make your files available to you wherever you are and on whatever device you choose.

There are quite a few cloud services available offering very generous file quotas. The primary benefits of these services is that they

- Put your files in the cloud. This makes them available to all your PC's, Smartphones and Tablets over a wireless network
- Synchronize your files on all of your PC's. This means your files are wherever you are.
- Depending on how you configure it, a cloud service can be an very effective part of your PC backup solution.

### Popular Cloud Services are:

[Dropbox](#) - offers 2G free.

[OneDrive](#) - offers 7.5G free

[Google Drive](#) - offers 15G free

I keep all of my woodworking related files, drawings, documents, books, videos etc in OneDrive. I avoid putting unencrypted personal, legal or financial files in the cloud.

## Optimization Software

Optimization Software takes a parts list and finds the most cost effective way to cut those parts from sheet goods. It derives the minimum number of sheets required to build a project. There are Web based optimization tools and PC based optimization apps. The full optimization tools are normally quite expensive and intended for commercial use. Some suppliers offer free versions that are limited (“crippled”) in one way or another. Below are two that provide very useful free versions. Additionally, the functionalities that are “crippled” are either not very important to a small shop or are relatively easy to work around.

### [On Line Optimization](#)

Free online panel cut optimizer allows you to create, store and modify 2D cutting projects from any computer or tablet connected to Internet. You don’t need to install anything on your computer, and you can use any operating systems or web browser to access and run the cutting optimization.

Optimization uses the guillotine cutting method when all cuts are done from one side of a panel completely to another side. Some cutting machines require simple cutting operation with only one sheet rotation; other machines are more sophisticated and can cut complex layouts. Online cut optimizer takes these restrictions in account during the optimization. There are five levels of the cutting complexity: 2 (XY), 3 (Two-Stage XY), 4 (XYZ), 5 (XYZW) and 6 (Standard).

This online tool is straightforward to use.

### [Go Nest 2D](#)

GoNest 2D is a nesting software for generating optimized layouts and reducing scrap generated by 2 Dimensional Rectangular cutting (Guillotine cutting or nested) processes. The layout software requires just one mouse click to arrange the parts on appropriate stocks. It requires minimum skill and effort from the operator for generating the optimized layouts.

Although the free version disables printing the layouts and limits the reporting to 1 page, it provides full functionality on the PC screen. For individuals who absolutely insist on paper, it is a simple matter to print the screen image using any one of a variety of screen capture / screen print tools. My preference is to capture a screen image and send it to my iPad. This software in a PC application rather than a Web application. Even with this limitation, it is my preferred optimization tool.

Why do I like Go Nest 2D?

- It has an excellent optimization algorithm
- It allows the user to define which type of sheet to use for each part
- It allows for the use of partial sheets

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- It allows the user to save sheet lists and parts lists
- Parts can be imported from a spreadsheet (Sketchup CutList Plugin can export parts to a spreadsheet)

What don't I like about Go Nest 2D?

- It is a PC app and not a Web app (not a big deal)
- The interface is a little cludgie. It looks and feels like an old DOS application.
- It is not particularly intuitive. The help file is absolutely necessary but has its limitations.

Bottom line: Go Nest takes a bit to figure it out but once you do, it is a gem.

## How To Use SketchUp for Woodworking

I use SketchUp for woodworking in three phases

- Visualize
- Design
- Construct

Depending on the complexity of the project and your familiarity with the details of the item being built, you can stop at any of the phases. It is not necessary to go to the “construct” SketchUp phase for all projects.

- **Visualize** - the purpose of visualization is to achieve an overall size and shape of the project. It is important not to waste time on details that don't relate to the big picture
  - General overall shape
  - Position in infrastructure
  - Scale and proportion of major segments
  - Few if any details
  - No joinery
- **Design** - the purpose of “design” is to achieve a detailed view of the outside skin of the project and get a clear picture of what it looks like.
  - Add size and shape of parts making the overall shape
  - Make all parts 2D components
  - Make and select parts shape options
  - Front and side view with dimensions
- **Construct** - the purpose of the “construct” phase in SketchUp is to build the project exactly as it will be built in the shop. Find the mistakes here and not in the shop.
  - Break all parts into components
  - Add joints to each component
  - Assign materials to parts
  - Make detailed template views of shaped parts
  - Make cut list

## How to Learn SketchUp

[SketchUp](#) (formerly **Google Sketchup**) is a 3D modeling computer program for a wide range of drawing applications such as architectural, interior design, civil and mechanical engineering, film, and video game design—and available in a freeware version, **SketchUp Make**, and a paid version with additional functionality, **SketchUp Pro**.

### SketchUp vs CAD

- SketchUp costs a lot less, and we have a free Make version for hobbyists
- It takes less time to use, and to start using SketchUp (better usability)
- It is a powerful and accurate program
- It plays well with others and supports many extensions
- Active community and support.

### Sketchup for Woodworkers

- Open architecture enables a never ending expansion and specialization of functionality. An extensive number of free “extensions” are available that provide tools that are very useful to woodworkers.
- Free tutorials targeted at learning SketchUp in general or learning a specific SketchUp tool are available from many sources.
- Free tutorials targeted specifically at learning Sketchup for woodworking applications are available from several sources.

### [Highland Woodworking View of Sketchup](#)

#### Made for Woodworking

While it was not designed specifically for woodworking, I don't think SketchUp could have been made more perfectly for woodworkers. The way that you build things in SketchUp is very similar to the way that you manipulate materials in woodworking. The program has a tangible feel that allows you to translate your woodworking experience to the computer.



## SketchUp and SketchUp Related Software

### [SketchUp Viewer](#)

Anyone can use the free SketchUp Viewer to view and print models created in SketchUp. Your clients can use the SketchUp Viewer to review designs that you send via email or upload to a shared location on the internet.

Because it does not include tools for editing models, the SketchUp Viewer is much easier to use for people who are unfamiliar with SketchUp. Models viewed with the SketchUp Viewer are also protected from unintentional alteration, ensuring that your audience sees exactly what you intend for them to see.

Woodworkers be aware that the Viewer will not permit them to edit or modify any of the views.

[SketchUp Make](#) is the current free version of Sketchup and is the version I recommend for woodworkers.

[SketchUp Pro](#) costs a fair amount to buy and requires an additional annual maintenance subscription. SketchUp Pro does provide a robust set of tools for making paper outputs, presentations and full scale drawings.

### Plugins / Extensions

SketchUp has an open architecture and allows third party “additions” referred to as Plugins or Extensions. There are a variety of places to go for plugins. Two important ones are:

[Plugin Store](#)

[Extension Warehouse](#)

There are some plugins that are very helpful to woodworkers but those new to SketchUp should master the native SketchUp tools before adding a lot of extensions. This is another area where anyone can make a plugin and get it added to a cloud service. Not all plugins are created equally. Not all plugins are free. Choose wisely Grasshopper.

One of my favorite woodworking Plugin is “CutList”. When added to SketchUp, it will figure out and present a cutlist of all the parts (if your model is properly constructed). This is a very handy and amazing plugin. It is free.

**Rendering Software** - third party applications that convert SketchUp drawings into photo quality renderings. Most are not free. I don't have a lot of experience with these types of applications as I have no use for them.

## Learning SketchUp

SketchUp has a broad set of tools that enables it to be used for a wide variety of applications. Woodworkers only need a limited set of these tools. Before going through the detailed tutorials, it may be beneficial to look at one or two videos that provide an overview of how to use SketchUp in woodworking. Here are a few of those woodworking overviews.

### [DCB Newbie](#)

A Newbie video by Dave Richards. This particular video provides a good woodworking overview. Dave is an EXCELLENT source of Sketchup for Woodworking how-to. If you have an online subscription to Fine Woodworking, he is one of the two main contributors to their Design-Click-Build blog. All of his videos are worth watching. Many of his videos are finding their way onto YouTube and other video streaming services but the main body of work is in Design-Click-Build.

### [SketchUp for Woodworkers: Getting Started by Popular Woodworking](#)

Woodworkers overview of SketchUp by Robert Lang of Popular Woodworking. Does not show how to use SketchUp. Shows WHY a woodworker would find it valuable.

He and Popular Woodworking offer an online course (Subscription). I have not reviewed this course as I use a variety of online free SketchUp tutorials. His article, [10 Things I Wish I Had Known About SketchUp](#) is pretty useful after viewing the overview videos.

## SketchUp Tutorials

A variety of video tutorials can be found on the Internet. Some of these tutorials target specific SketchUp tools. Others provide a series of tutorials targeted at the woodworker.

### [Sketchup for Woodworkers Tutorial Series by Rob Cameron](#)

This is a YouTube Playlist of a set of tutorials by Rob Cameron. Excellent for beginners. Caution - this author uses Groups rather than Components. I recommend that everywhere he makes a Group, you should use a Component. Components work much better for woodworkers.

### [Joe Zeh - Tutorial Series and Many Topical Tutorials - Chief Woodworker](#)

This is the motherload of SketchUp videos for woodworking. He started publishing tutorials on his own website [Swamp Road Woodworking](#). A while back, he went over the American Woodworker and started charging for some of the videos that were on his web site free. Normally, I would have not liked that but his videos are so good, I always felt that he should be charging something for them. Now he is working and offering classes for Popular Woodworking. [Joe Zeh on Popular Woodworking](#). Although he is still charging for some tutorials (they are worth it), there are dozens of "how to" Sketchup videos for free. Check out his "Designing Furniture from Scratch using Sketchup" series.

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Caution - this author uses Groups rather than Components in his very early videos. He has since moved over to recommending the use of Components rather than Groups. I recommend that everywhere he makes a Group, you should use a Component. Components work much better for woodworkers.

A good starting point would be [Installing and Setting up SketchUp](#) followed by [Tools, Components & Dialog Boxes](#). This one explains why components are better than groups.

## [YouTube Playlist of a group of Tutorials by WorkshopAddict](#)

List of tutorials for woodworking applications by the “WorkshopAddict”. The author is a little wordy but the tutorials provide the basics for a woodworker. Caution - this author uses Groups rather than Components. I recommend that everywhere he makes a Group, you should use a Component. Components work much better for woodworkers.

<https://www.youtube.com/watch?v=BK0NOO7xybE>

Tutorial Number One is a decent explanation of basic drawing. Wordy. Caution - this author uses Groups rather than Components. I recommend that everywhere he makes a Group, you should use a Component. Components work much better for woodworkers.

## SketchUp Books

In addition to the extensive online learning tools, books are available and can be quite useful. These are two I am personally familiar with and found useful. If you really like books, go onto Amazon Books and put SketchUp in the search bar. You will have hours of culling in front of you.

### [SketchUp Guide for Woodworkers \(eBook\) by Tim Killen](#)

“*SketchUp Guide for Woodworkers* is a comprehensive step-by-step manual to help furniture makers master Google's powerful 3-D computer-based drawing program. It's an essential guide for woodworkers who are new to SketchUp or users who want to improve their skills and results.” This is an eBook (pdf).

Tim Killen is one of the two main contributors to Fine Woodworking's Design-Click-Build blog. Unlike Dave Richards, Tim does not provide videos. His Blog contributions are text.

### [SketchUp 2014 For Dummies](#)

A little dated but a good overall explanation of how to use Sketchup. Focuses on drawing architectural stuff but is easy to apply to woodworking needs.

## Online Resources for SketchUp Users

Online resources are too numerous to list. Here are a few that are popular and well regarded. Google “Sketchup” (without the quotes) and the response list will keep you busy for quite a while. .

### [SketchUp.Com](#)

This is the home of SketchUp. [SketchUp Make](#) is the current free version of Sketchup and is the version I recommend for woodworkers. [SketchUp Pro](#) costs a fair amount to buy and requires an additional annual maintenance subscription.

In addition to being the download site for the SketchUp software, this site also provides an extensive set of learning tools.

### [3D Warehouse](#)

The 3D Warehouse is a repository of bazillions of SketchUp drawings available for download. This can be a good starting place for those who don't want to start a project from scratch. It is easy to find something similar to what you want and modify it on your PC. Many furniture and cabinet manufacturers put their products in the 3D Warehouse. Warning: anyone can upload a model to the 3D Warehouse so not all models are well done.

### [Sketchup Learn](#)

Learning tools and support by the providers of SketchUp. Go to this site and click on the LEARN tab to see all their categories of learning support.

### [Sketchucation - lots of sketchup related resources](#)

Web meeting place for SketchUp users. Tutorials, Woodworking Special Interest Forum, Plugins etc.

You need to register to get much out of it. Registration is free.

### [YouTube](#)

An amazing inventory of tutorials for the individual capable of filtering a search. Go to YouTube and enter SketchUp in the search bar. It won't take long to figure out how to filter the search to find the type of thing you are looking for.