



**SHOP TESTED:
EINHELL
DRILL/DRIVER**

p.8 **KNOW
YOUR
TOOLS:
SCREWS**

p.42 **REPLACE A
BROKEN
TILE**



p.32 **BUILD A
BOHO
TABLE**



CANADIAN Woodworking & HOME IMPROVEMENT

ISSUE #142
FEBRUARY/MARCH 2023

Shellac: The Ultimate Traditional Finish

TOP 10
Table Saw
Accessories
p.10

DIY SPECIAL: VANITIES

- Build a Floating Vanity p.24
- Vanity and Sink Styles p.20
- Design and Build Curvy Doors p.28



Advanced-Level Chair Repair p.38

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FEATURES

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This small but simple project can be customized to your bathroom.
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COVER STORY

Cover photo by Rob Brown

46 Shellac

Learn how to use this simple, beautiful and traditional finish to complete your next project. BY CARL DUGUAY



editor's letter

It's always a bit of a juggling act to fit all of the articles I'd like to into an issue. Our regular columns, such as "Canadian Quotes," "Top 10," "Beginner's Journey," "Shop Tested" and "Know Your Tools" get first dibs. We want to include great woodworking and furniture projects, too, so they're added in next. At this stage the issue is getting fairly full, but we haven't talked about techniques yet, so they often get brought into the mix. But wait, I haven't even included home improvement topics! Oh, the wild and crazy life of a woodworking magazine editor.

Home improvement topics are a growing trend, not only for our readership, but for the country in general. Housing is expensive and Canada is growing in population, so naturally home improvement is on many people's minds. This issue covers some serious ground. Bathrooms are always high on any reno list. One project that's well within the reach of almost all DIYers is vanity and sink replacement. If you have the tools and skills to work wood you have what it takes to make a custom vanity and install a new sink. This issue starts off with a primer on the types of sinks and vanities available. From there is an article on how to make a custom floating vanity, followed by a look at how I designed and made custom curvy vanity doors that act as a great focal point for a bathroom. If installing a sink isn't part of your reno plans, check out other helpful home improvement articles on our website.

One home improvement tool I've used and enjoyed recently was a cordless Ryobi brad nailer, which I review in our "Shop Tested" column. Carl Duguay, our digital editor, reviews the new Einhell 18V drill / driver kit, which any DIYer would benefit from owning. We also have a wide range of other home improvement tool reviews on our website, all free of charge to both subscribers and non-subscribers.

With all this talk about home improvement, don't worry; I didn't forget about woodworking. One aspect of woodworking that often gives people grief is wood finishing. In this issue we cover one of the most traditional, useful and beautiful finishes on the market – shellac. One of my go-to finishes, shellac has many pros. Having said that, like anything, it has some cons, too. Read about where it shines the strongest, when you should avoid it and how to go about applying it for best results. I also produced a video about how I use this great finish, which you can view on our website. There's so much to learn about woodworking and home improvement, I wish I had another dozen pages to tell you about it.

—Rob Brown, Editor



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Issue #142

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letters

Your weekly column

I just read your recent "From Rob's Bench" column, "The Ugliest Piece I Ever Made," and not only enjoyed it, but enjoyed reading the comments. If that were the ugliest piece I ever made I'd be quite pleased. But I agree, it's not great. I think the legs are too long for the overall height and the decoration on the side doesn't do much for the appearance. And I agree that an even number of drawers is not as pleasing as an odd number. The picture doesn't really show the depth, but I think it's too deep for the other dimensions. Great joinery, though. I don't agree with the comments that you were whaling (like fishing, only more so) for compliments.

Ian C.

Via email

Hi Ian,

That column sure solicited a lot of comments, both positive and negative. I think that's the definition of balanced feedback! I always enjoy hearing from our readers, whether they agree with what I have to say or not. Room for improvement is how I would describe that chest I made many years ago. I hope the owner still enjoys using it. You can read all of my past columns on our website. Click on the "Go To" then "Rob Brown's Weekly Blog" links. — Rob Brown, Editor



Thanks Canadian Woodworking & Home Improvement!

In one of our Grade 6 classes students are introduced to hand tools and light power tools. The kids select their projects, but we like to steer them towards something simple. We have stacks of old magazines with all kinds of projects. Some of these students already have a reasonable skill level in woodworking from home and may come up with a more advanced project. They take their projects home after they are finished.

We try to teach the students shop safety, techniques, organization and project planning. We really want them to enjoy working with wood. Most gladly sacrifice part of their lunch time to work on their project or finish it if it cannot be done within class time.

Students in Grades 6 to 8 have one hour per week of shop or home ec. We offer five credit courses in our

secondary program: two woodworking, two metal and one in design. Students in high school take on ambitious projects or they participate in our shed-building fund-raising program.

We hand out copies of your magazine to the students starting in Grade 6. We limit it to one copy per family. Your magazines are eagerly awaited and taken home. I'm sure that it's not only the students but also the parents who read it carefully. We keep a couple copies for our archives. Students use these for resources for assignments or the teachers use pictures, diagrams or feature articles as resources for the theory part of the courses. Your articles about how certain tools work are very helpful.

Martin V.

Shop teacher

Via email

shopnotes

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Tool Reviews

Frigidaire 3-in-1 portable room air conditioner

The Frigidaire 3-in-1 portable room air conditioner will not only cool a space up to 450 sq. ft., but during the winter months it will dehumidify the air, while the built-in ionizer will clean the air all year round.



Woodpeckers joint bridge clamping pads

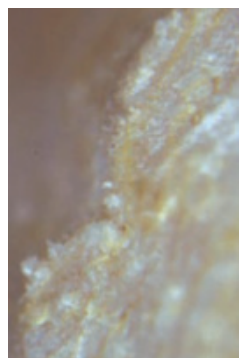
These clamping pads are an excellent alternative if you don't want to make your own alignment blocks.



Leatherman tool maintenance kit

A practical, convenient kit that contains everything you need to clean and maintain your multi-tools and everyday carry knives.

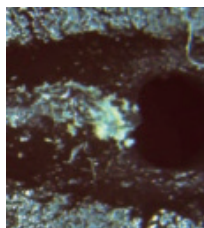
View these reviews and more at: canadianwoodworking.com/reviews



Micro Mystery

Can you guess this object commonly found in most shops? Follow us on Instagram to see regular "Micro Mystery" challenges. We will post the answer to this one in our Apr/May issue.

Previous issue:
Spray can
nozzle



Product Watch

Narex Richter Five-Piece Chisel Set

Imported from the Czech Republic, these chisels are made of chrome vanadium (Cr-V) steel and cryogenically heat-treated and tempered to a minimum hardness of 62 HRC. The chisels feature a 24° bevel and finely tapered sides that make them suitable for cutting dovetails and many other tasks. They can be quickly sharpened to a very keen edge and they retain their sharpness for a surprisingly long time. The boxed set of five chisels (1/4", 3/8", 1/2", 3/4" and 1") are competitively priced at \$250. northwestpassagetools.com



Readers' Gallery



Maker:
Donald Schwab
Location:
Claresholm, Alberta

My most challenging scroll saw project yet. Standing approximately 52" tall, this clock is made of oak and walnut. Each piece was dipped in lemon oil, glued together and finished with three coats of clear satin varnish.

Visit CanadianWoodworking.com/readers-photos/ to see other readers' projects and to submit your own.

Video Links

canadianwoodworking.com/videos

Canadian Quotes:
Vic Tesolin

How to apply a beautiful shellac finish





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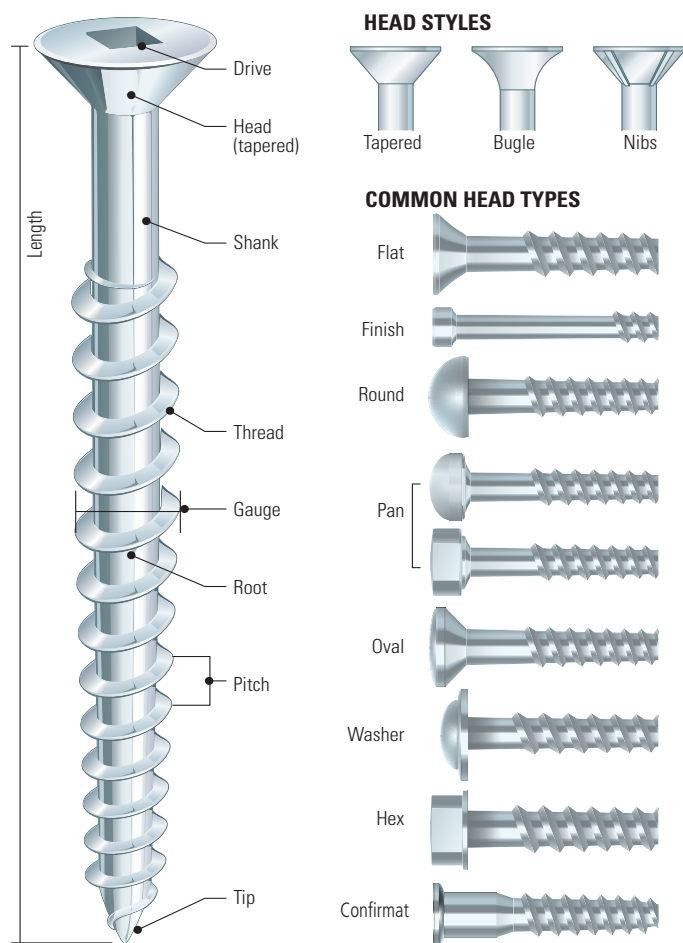
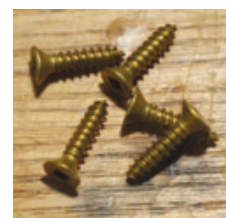


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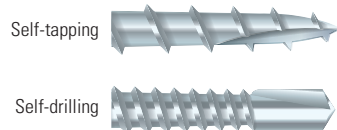
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Screws



OTHER TIP STYLES



Woodworking screws are available in hardened steel, stainless steel, solid brass or silicon bronze. Steel screws can be uncoated or have a protective coating applied, such as phosphate or zinc. For outdoor projects select hot-dip galvanized, stainless steel or a specialty outdoor screw.

Screws can be classified by head type and size. Screws with flat heads are the most commonly used in woodworking. The heads are tapered and some have nibs that help to countersink the head so it sits flush with the surface. Drywall screws, characterized by a bugle head, are made of more brittle steel, making them less useful for wood. Finish screws, ideal for trim work, have very small flat heads that are easily covered by filler or putty. Because of their greater compressive power, flat head pan screws and washer screws are used in pocket hole joinery. Confirmat screws, which have sharp angled threads designed to cut into MDF and other sheet goods, are used specifically in cabinet assembly.

The diameter of a screw, its gauge, is measured across the widest part of the thread. Screws in the #1 to #14 gauge size are most commonly used. If you drill a pilot hole it should be slightly narrower than the screw gauge. Screw length varies from 1/4" to 6". The widely used #8 screw, for example, is available in 5/8" to 4" lengths. The helical cutting edge of a screw is called the thread. The spacing between threads determines the screw's pitch and is measured by the number of threads per inch. Some screws are sold as "coarse" or "fine" thread. Coarse threads are better for use on softwoods and sheet goods. Use fine thread screws for harder woods and thinner stock.

Some screws feature a self-tapping or self-drilling tip. A self-tapping screw has a sharp-pointed tip that reduces the need for pre-drilling a clearance hole. A self-drilling screw has a set of opposing vertical cutting blades at the tip that serve to cut a pilot hole. They're best used on metal-to-metal or metal-to-wood projects.

Formats: Hardened steel (uncoated, coated), stainless steel, solid brass, silicon bronze

Gauge: #0 to #24 (most common are #4, #6, #8 and #10)

Lengths: 1/4" to 10" (most common are 1/2" to 4")

Get the Most Out of Your Screws

Pre-drill

To prevent splitting, pre-drill screw holes, especially if using hardwoods or installing screws near the ends of boards.

Make it look good

For a neat, clean look countersink screw holes before driving the screws home. Countersink the holes if you don't want the screws to show and then cover the holes with wooden plugs.

Wax the tip

If the screws you're using aren't dry lubricated, you'll find it easier to sink the screws if you dip the tips into a bit of wax before installing.

Ease up

To avoid over-sinking screws, use a torque setting on your drill driver that sets the screws flush with, or just below, the surface.

Sink to 2/3rds

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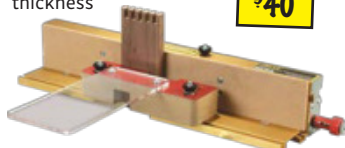
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Top 10 Table Saw Accessories

The heart of many woodworking shops, the table saw can do many things, but only if you have the right accessories.

BY ROB BROWN

1 A Good Blade Selection — Ripping and crosscutting solid wood require different things from a blade. Melamine, laminate and other man-made materials also present unique challenges when cutting. And a dado blade can assist with making dadoes, grooves or rabbets. One blade won't do everything.

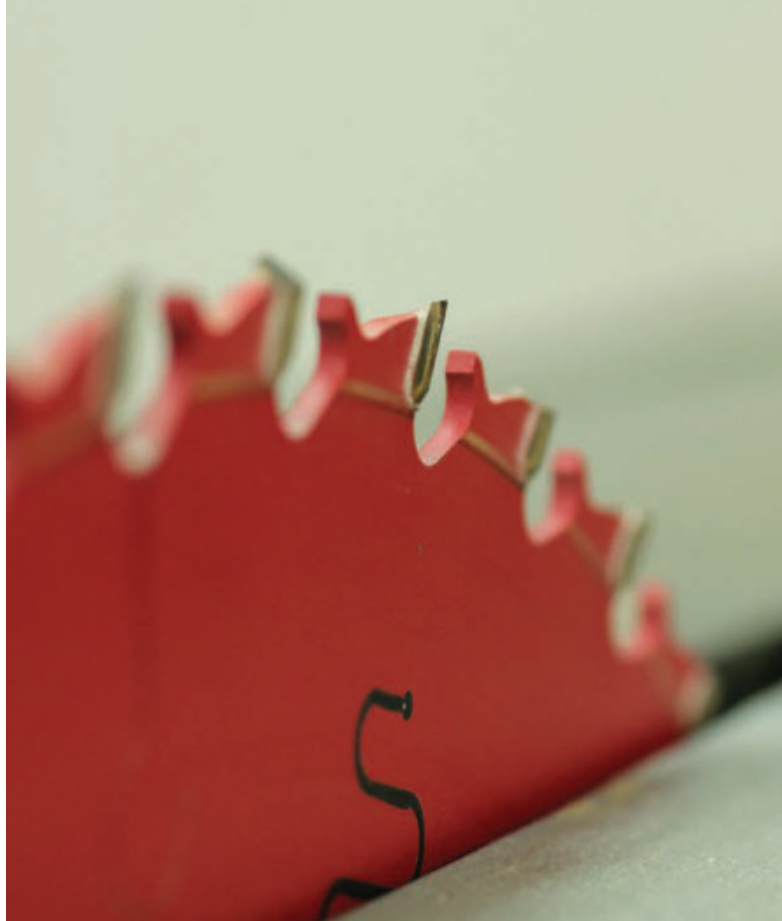
2 Somewhere to Store Blades — Blade teeth make clean, efficient cuts, but only if they're sharp and the blade is in good condition. Having a proper cabinet or case for your blades will go a long way to keeping them in good working condition. Even a few screws on the wall to hold the blades is better than nothing.

3 Crosscut Sled — Cutting workpieces at a 90° angle is an important part of woodworking. A dedicated crosscut sled will make cutting larger workpieces to length easier, safer and more accurate.

4 Mitre Gauge — Also on the theme of crosscutting workpieces: A table saw likely came with a mitre gauge, but an after-market version might go a long way to assisting you with making 90° and 45° cuts, not to mention any other angle you choose.

5 Mitre Sled — Although a mitre saw can make 45° cuts, I find mitring workpieces on a table saw with a proper mitre sled is more accurate and you end up with smoother cuts. A mitre sled is also easy to make.

6 Auxiliary Fence — A piece of 3/4" plywood ripped to 4" wide and cut the length of your rip fence is essentially all you need. Clamp it to your rip fence to assist with making rabbets, machining long bevels and doing all sorts of other fancy things on a table saw.



7 Push Sticks — The best push stick is your hand, but if a cut is too close for comfort, you need a push stick. It will grip and guide the workpiece as it's being cut, and will keep your hands a safe distance from the blade. There are lots of versions to accomplish many tasks, so do your research and then make a few. Many after-market versions are also available.

8 Featherboards — Featherboards can help make cuts smoother and reduce kickback. Although you can purchase them in a variety of shapes and styles, they're also easy to make.

9 A Few Clamps — I keep two 6" F-clamps and two 2-1/2" C-clamps at my table saw at all times. Whether it's securing my auxiliary fence, clamping stops or positioning my long featherboard, a few clamps are helpful to have nearby.

10 Outfeed Table — Having the ability to support long lengths of material is critical to safety. It also makes for better cuts. If space is really tight you can add a hinged outfeed table to your saw. Another simple option is to use a router table or other stable surface positioned behind your saw as an outfeed table.



ROB BROWN

rbrown@canadianwoodworking.com



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 **RUST-OLEUM**

Vic Tesolin

...on hand cutting dovetails, making maquettes and his understandable hatred for makore.

BY ROB BROWN



Guitar Cabinet – Vic built this cabinet as a student to house his guitar and various guitar paraphernalia. The holder is steam-bent cherry and the door is curved and veneered. (Photo by Ray Pilon)

How long have you been building furniture?
23 years.

In order, what are the three most important items in your shop apron?

Folding rule, pencil, and Matsui scribe gauge.

Do you prefer hand tools or power tools?

I have an affinity for hand tools, but I reach for the tool that will do the job best regardless of whether it has a cord.

Solid wood or veneer?

Yes to both!

Figured wood or straight grain?

Both where appropriate.

Inherited Vintage Stanley Sweetheart or fresh-out-of-the-box Veritas?

I enjoy working with both, but to be honest some of my favourite tools are the ones I've made myself.

Favourite wood?

Most North American woods. Most of the furniture I've made has been with walnut, maple and cherry.

Least favourite wood?

Makore, only because it tried to kill me once.



Photo by Andrea Starr

Vic Tesolin, 48, Vic Tesolin Woodworks,

victesolinwoodworks.com,

@vic_tesolin_woodworks

Location & size of studio — St. Catharines, Ontario; 270 sq. ft.

Education — Studied furniture making and design at Rosewood Studio, Perth, Ontario



Japanese Tool Chest – Vic built this project for a class he taught on its design and construction. He used lightweight pine, and according to Vic, "It should last longer than I do." (Photo by EK Bowel)

quotes

One of my favourite processes is hand cutting dovetails because there are so many skills that get practiced when cutting the joint. Everything needs to be spot on. Marking and measuring, sawing, chiselling, and fitting all get a good workout cutting this joint.



In terms of furniture design, after I've considered style, space and other constraints, I migrate to making maquettes or full-size mockups when designing a piece. This gets me further faster because I can see how various parts relate to the whole. I also get to test out joinery techniques along the way.



I'm not a fan of sanded or epoxied slabs with metal legs. I find the metal legs often miss the mark proportionally and they seem "slapped together." That being said, if this style of furniture gets a person into working with wood, then I'm all for it. It's just not my jam, personally.



I think we're in a sad but hopeful state when it comes to teaching young people about woodworking. My first exposure to woodworking was in Grade 8 and it has been with me ever since. We need to keep promoting trades and craftsmanship, and continue destigmatizing working with your hands by not calling it "lower-class" work.

When I was working by commission, one of the most misunderstood parts by some clients was that it's somehow less expensive to go directly to a woodworker to buy a piece. The truth is that commissioning a piece of furniture is one of the most expensive ways to buy furniture because it's not mass produced.



I feel that function needs to trump form when making furniture, otherwise it's an art piece that's better to look at than use. The way we interact with furniture is important. It needs to be functional and comfortable otherwise you've missed the mark. For example, I see many chairs that are cool to look at but are extremely uncomfortable to sit in. That's a miss in my book.



I'm not the best at sketching, and I've tried to use digital tools, but I find I struggle with them. You must dedicate a lot of time to learn to use them well, and that is time I don't wish to spend. I do use my iPad and an app called Procreate to help me create illustrations for student handouts, but I don't use it to design an entire piece.



I don't normally start with a measured drawing or design when I work. Once I'm making, and the overall size of the piece is settled, I switch to referential measurements. The drawer must fit into the space you've made for it, so the numbers you planned for on the page no longer mean anything.

I think that laying out and cutting joinery is the most fun for me. I must admit, I usually start to lose interest in a project by the time I get to applying finish.



In order to understand, you must do. Aspiring woodworkers need to be okay with making mistakes. Mistakes are a sign that you're doing something new and that's a good thing. I still make mistakes after over 20 years at it, so don't be too hard on yourself.



I think the most positive change I'm seeing in woodworking is the level of inclusivity. Woodworking has always been an older white-guy endeavor and thankfully that has started to change.



The piece I'm most proud of is the hall table I designed and built while I was a student at Rosewood. The walnut apron has a slight curve and the legs are octagonal and tapered. The floating top is veneered with big-leaf quilted maple. This award-winning piece represents a time in my learning that I was really pushing my skills.



I'm excited to see what the future brings for furniture making. With social media growing, the world is shrinking and we get to experience furniture from around the world. This global sharing of ideas is fantastic, and I'm inspired by it daily.



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VIDEOS: To view a slideshow of Tesolin's work visit the Videos section of our website.

Canadian National Wildfowl Carving and Wood Art Competition

The Canadian National Wildfowl Carving and Wood Art Competition took place June 1 to 3, 2022, at RIM Park in Waterloo, Ont. Carvers from across Canada and the U.S. entered about 530 carvings. This year's competition will be June 2 to 4 at the Grand Valley Woodcarvers Club. The show has many categories from youth and beginner up to master. Learn more about how to enter your carvings in the competition at **CanadianNationals.net**. Here's a collection of some of the winning carvings from the 2022 show.



Best of Show, 1st Place

Pat Godin
Paris, Ontario
Wood Duck Drake



Best of Show, 2nd Place

Al Jordan
Rochester, New York
Saw-whet Owl

Photos by Robert Zakarian



Best of Show, 3rd Place

Hal McGray
Waterdown, Ontario
**White-Winged
Crossbill**

Open Category, 1st Place

Jim Edsall
Dartmouth, Nova Scotia
**Semipalmated
Plover**

Canadian Master Category, 2nd Place (tie)

Joe Tambora
Terra Bonne, Quebec
Pie-Billed Grebe



Open Category, 3rd Place

Ray Tourangeau
Brockville, Ontario
Grey Jay

Canadian Master Category, 2nd Place (tie)

Dave Ricci
Dartmouth, Nova Scotia
Bahama Pintail Drake





Canuck Guns Category, 1st Place

Harold Hynscht
 Simcoe, Ontario
Three Duck Working Rig

**Open Category,
 1st Place (tie)**
 Patrick Chaumard
 St. Jerome, Quebec
Harlequin Drake



**Open
 Category,
 1st Place
 (tie)**
 Susan Cowtan
 Winnipeg, Manitoba
Wood Duck Drake





Pigment Figure in Wood

It's hard to imagine where the world of woodworking would be without figured wood. For thousands of years, exquisitely figured pieces of wood have inspired woodworkers from the Egyptians to the recent works of James Krenov and Michael Fortune.

BY PETER MAC SWEEN

This column is the first in a series exploring figure in wood. We'll look at the different types of figure, while also seeing how the anatomy and structure of the tree creates these visual effects. I'll also share some tips and techniques for working with these interesting figures.

Let's start with a definition and, as in previous articles, I turn again to R. Bruce Hoadley, author of *Understanding Wood*. He defines figure as "any distinctive appearance on a longitudinal wood surface resulting from anatomical structure, irregular

colouration or defects." It's a useful description that includes the obvious (colour, curl, etc.) and the not so obvious (on a longitudinal wood surface).

The surface the figure appears on is important because how the wood is sawn or sliced can either reveal or emphasize various figures. Quarter cutting white oak will reveal medullary rays yielding the ray fleck figure. Bird's-eye maple veneer is usually rotary sliced to produce similarly sized eyes that are uniformly distributed.

It's also important that the figure be distinct. That piece of flat sawn white ash with nested cathedrals may be beautiful, but it's not considered figured. It represents the norm and industry would call it plain sawn or, surprisingly, non-figured.

Two main categories

Some experts break the various figure types into two broad categories. The first category is called general figure. This is a bit of a catchall category, and it includes pigment figure, burls, crotch figure, ray fleck and a few others.

The second category is called specific figure. These figures derive from three circumstances: figure from spiral growth; figure from wavy growth; and figure from indented growth rings. Here we find the familiar figure types like block mottle, ribbon stripe, fiddle back, quilt and bird's-eye.

I often think there should be a third category reserved for figure produced by outside agents acting on the tree itself. This would include figure produced by animals such as birds and insects and



Brazilian Rosewood – These two goblets, made of Brazilian rosewood, show the rhythmic pattern of vertical dark black and lighter brown stripes that make for a very striking visual effect.



Zebrawood – Some species of wood look drastically different depending on whether they're flat cut or quarter cut. Here, zebrawood shows off its quarter cut pattern of dark and light stripes on the wider face, while showing a very bland surface on its flat cut edge. (Photo by Rob Brown)

their larvae. Fungi produce interesting visual figure as well, with English brown oak being a good example. One could, of course, include humans since we colour and physically manipulate wood.

So, let's start with the general figure category, focusing on pigment figure.

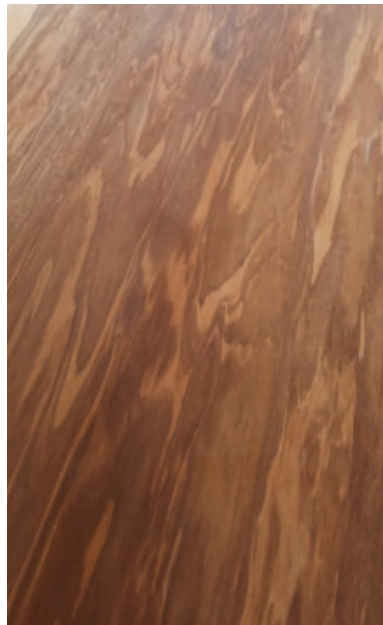
Pigment figure

As trees mature, sapwood in the trees transition to heartwood. This transition is accompanied by the deposition of chemicals called extractives into the cell walls of the heartwood. These chemicals are there to offer protection from fungal decay. The compounds are often coloured and they give the heartwood of many species a distinctive colour and pattern.

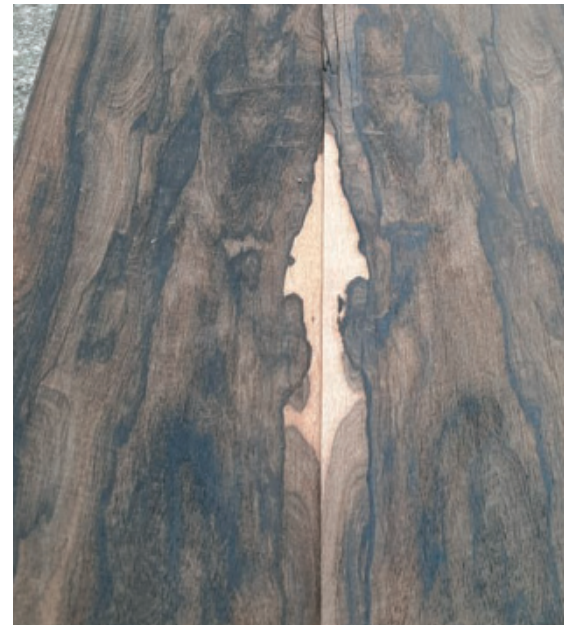
Pigment figure results when the extractive pigments yield random or regular patterns in the heartwood. The sapwood never sees



Macassar Ebony – Similar to zebrawood, these two pieces of quarter sawn macassar ebony show very straight grain with lots of colour variation between almost black and light beige.



Olivewood – The pigmented heart of this olivewood veneer is very rich and warm.



Ziricote – These two bookmatched pieces of ziricote veneer show how incredibly varied the grain of this species is. The darker, varied heartwood, mixed with the extremely pale sapwood, can create some bold effects.

the pigments and in hardwoods usually remains a pale white to tan colour. That board of purpleheart you have doesn't count as pigment figure since all boards of purpleheart are uniformly purple.

The rosewood family contains many species showing pigment-figured wood. Brazilian rosewood shows various patterns from spider webs to very abstract patterns. Other rosewoods, such as cocobolo, show broad washes of orange and red in the heartwood.

Zebrawood is another well-known wood with pigment figure. The flat sawn or sliced surface is rather nondescript, but the quartered or radial surface shows a vertical pattern of alternating bands of colour. Macassar ebony also reveals a similar pattern when quartered. The very best and rarest Macassar ebony shows a precise comb-like pattern of vertically alternating bands of black contrasting with a creamy or pale white.

Good examples of irregular pigment patterns are found in olive-wood, ziricote and red gum. Olivewood produces a pattern of wispy interwoven shades of colour. Ziricote is one of my favourites. Here the pigments produce a stunning pattern that resembles billowing clouds.

Manitoba maple is another wood with pigment figure that meanders through the heartwood. Once thought to be the result of a fungus, recent research has shown it to be a chemical produced by the tree when it is under insect attack.

Pigment figure can sometimes affect how a board is worked. Woods like red gum work easily by hand and machine. On occasion, extractives can be abrasive and can dull your tools quickly. Macassar ebony, already tough and dense to begin with, is

challenging to work once its abrasive extractives are included.

A genuine concern is how to preserve these beautiful colours. Exposure to air and light will cause all colours to fade. Any finish with UV inhibitors is best but will only delay the fading of colours. Over time, the linear patterns lose the contrast between the dark and light regions and the irregular patterns will see a loss of definition.

It's a good idea to use models and drawings when designing pieces with pigment figure patterns. Scale is important. A figure that works well in a small box may seem out of place when showcased in a cabinet on a stand. Take your time and have some fun with your chosen material as you build a working knowledge of various types of wood figure.

In my next column, I'll continue to examine woods with general figuring, taking a closer look at burls. Burls have a long pedigree in woodworking and I think may be the most beautiful of all figure types.



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Vanities and Sinks: Bathroom Makeover Made Easy

Installing a new vanity, sink and faucet can transform your dated bathroom without breaking the bank.

Illustrations by Len Churchill (Photo Lead by Adobe Stock)



Contemporary – A contemporary vanity has somewhat simple lines and a practical approach to drawers and door compartments. It has a similar construction and aesthetic to kitchen cabinets.



Modern – Modern vanities, like modern furniture, have sleek lines and, generally speaking, fewer design details.



Furniture – Often looking a bit more like a sideboard, a vanity of this style also likely has legs.

BY CARL DUGUAY

You don't need to undertake a full, costly renovation to transform your bathroom from banal to beautiful. Replacing an outdated or defective vanity and sink along with the faucet will do visual wonders.

Depending on your budget, skill level and the time you can allocate to the job, you can make the transition even more compelling by selectively adding a new toilet, medicine cabinet, light fixture and mirror, replacing the floor covering, or repainting the walls and ceiling.

And best of all, most of these jobs are well within the capability of a hobbyist woodworker or avid DIYer. The key here is careful planning, deciding on what tasks you can do yourself, and taking the time to do the work properly so you only have to do it once. Order all the materials you'll need before you begin the job and make sure to inspect everything to ensure it's what you ordered and in good condition.

If you decide to replace the floor covering or repaint the entire bathroom I recommend doing it before you install the new vanity. Repainting can be done before you remove the old vanity, though you may have to do a bit of touch-up work after the new vanity is installed. To protect the new flooring you can cover it with a fabric tarp or pieces of cardboard taped together. Remember that you can install glue-down planks under a vanity but not click-lock vinyl flooring (it needs to expand and contract with temperature changes). Unless you have a fair amount of experience, replacing a bathtub or tub surround, installing a new window, and any upgrades to wiring might be best left to the pros.

Vanity styles are endless

In many bathrooms it's the cabinet that serves as the focal point for the room. Whether you decide to make or buy your vanity cabinet, there is a range of styles to choose from, including contemporary, modern, furniture and farmhouse. A corner vanity is often smaller due to the small bathroom it's in. Designs within these broad styles are almost limitless – which, depending on your outlook, can make it either an arduous or enjoyable experience to choose the design that's right for you. Regardless of what designers may say, the best design isn't what is currently trendy, but what appeals to you aesthetically and emotionally.

If the cabinet box is in good condition, and you're content with its size, you can save money by simply replacing the doors and any drawer faces along with the cabinet top.

Vanity cabinets that extend to the floor will provide the most storage; vanities with legs will have somewhat less storage; while

Make it your own

Building a vanity cabinet can be a great learning project for a novice woodworker. The box and doors can be made of cabinet-grade plywood with a solid wood face frame and door trim, and assembled with dowel or pocket-hole joinery. The plywood can be painted or stained and finished with a clear topcoat. Any finish you use should stand up against water. A solid surface countertop and your choice of faucet and door handles seal the deal. If you plan to make your own vanity, we have a few project plans in our online back catalogue of projects to help get you started.



Farmhouse – Inspired by more rustic décor, farmhouse vanities may have a combination of reclaimed wood or hardware and have details reminiscent of farm gates.



Corner – Often used in a small bathroom in order to save space, a corner vanity can have any style.



Floating – The main thing separating a floating vanity from other types is the fact that it doesn't have a base of any kind and is attached securely to the wall. They're often small, but they don't have to be.

wall mounted (a.k.a. floating) vanities provide the least (and in some designs no) storage.

Floating vanities can have a cabinet underneath or a simple base that serves to cover the plumbing. Before installing a floating vanity or one with legs, check that the flooring under your existing vanity extends to the wall as most of the flooring will be visible. If not, you'll likely need to replace the floor covering. A floating vanity will also need to be braced to the wall, which involves more work and cost.

The size of your bathroom will obviously determine the overall size of your vanity and whether you have room enough for a single or double sink. If there's no floor covering under the existing vanity you'll want to ensure the new vanity is the same size, or larger, than the one it's replacing – otherwise replace the floor covering.

Sinks have changed

The three most popular styles of bathroom sinks are drop-in, undermount and solid surface (the cabinet top and sink bowl are seamlessly moulded from a polyester and/or acrylic resin compound – think Corian). Vessel or bowl sinks are becoming increasingly popular because of their sleek look. Essentially, they consist of a bowl that sits atop a cabinet. The bowls can be had in a range of shapes, colours and materials. If you choose a vessel sink you'll likely have to add a longer drain tailpiece.

In small bathrooms, or when you prefer to have a vanity without a cabinet, pedestal or wall mount sinks are viable options. Pedestal sinks are usually made of porcelain, and they can consist of a single moulded unit or a porcelain sink top-mounted on a single porcelain leg. Wall mount sinks can be made of a



Solid Surface – A solid surface sink is made from a synthetic material, and both the sink and countertop are formed from one piece of material.



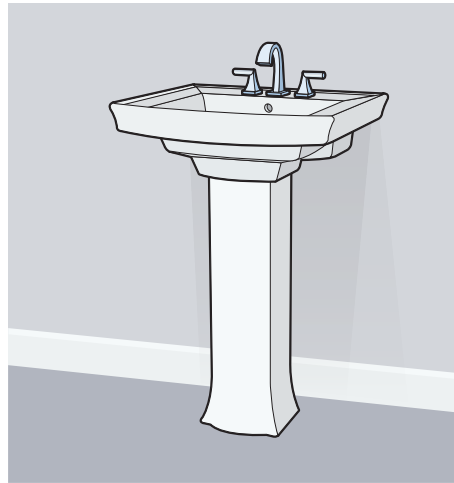
Drop-In – Likely the most common type of sink, a drop-in sink is inserted from above into a cavity cut into the countertop.



Undermount – Once a cavity is cut into the countertop, an undermount sink can be secured to the underside of the countertop. The countertop opening is slightly smaller than the sink opening, so the countertop overhangs the sink.



Vessel – Very similar to a floating sink, a vessel sink resembles a large bowl that sits on the vanity top.



Pedestal – A pedestal sink has no cabinet and, as the name implies, sits on top of an integral pedestal.



Wall Mount – More common in the past, a wall mount sink forgoes all potential storage below it and is attached directly to the wall.

variety of materials, including porcelain, solid surface, ceramic, glass and copper.

What to watch out for

Here are a few tips to help your installation go smoothly.

You'd be surprised at how often people forget the obvious. Before you start any work make sure you close the shutoff valves to the faucet and disconnect the plumbing under the sink. You can then remove the faucet, countertop, sink and vanity without any unpleasant surprises.

It's a good idea to replace old supply lines and the PVC piping, especially if the drain trap is cemented together. The coupling nut that secures the tailpiece to the trap can develop hairline cracks if it's been overtightened. Besides, a new kit isn't very expensive.

If there's caulking where the vanity top meets the wall use a sharp knife to cut through the caulk before removing the top, otherwise you run the risk of damaging the drywall.

Dry-fit everything to make sure it all goes together properly. This is especially important when replacing any of the plumbing pipes and fixtures.

It's a lot easier to attach the faucet to the vanity top before you install the top onto the cabinet. I always connect the supply lines to the faucet at this time. Then connect the supply lines to the shutoff valves after the cabinet is installed.

Before you get your drill/driver out, check to ensure that the top of the cabinet is level to the floor. Some cabinets have adjustable risers, otherwise you can shim the cabinet.

Make sure you attach the new vanity to studs in the back wall (not simply to the drywall) and to the sidewall (if there is one).



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BUILD A FLOATING VANITY



Vanities don't have to be overly complex. This continuous-grain floating vanity can be sized to fit your space, no matter how small it is.

Planning is probably the most critical stage of a project like this. A table can just be plunked down and used. A jewelry box that's slightly over- or under-sized will probably work out just fine. A vanity, on the other hand, is something that needs to be sized accurately and have the right details so that it can be installed so it functions well for years to come.

It needs to fit in the space. Whether that means it needs to fit through doors or be sized correctly to fit between trim and walls, both need to be considered. It also needs to be designed in a way that it can be scribed to the walls, many of which are either not square to each other or are wavy. Plumbing needs to be considered when positioning shelves and gables. Even the taps need to have somewhat specific clearances. Last but not least, the vessel sink you've chosen needs to be considered.

It's always recommended to get all your hardware before starting a woodworking or home renovation project, but that's even more true when building a vanity. A tap and sink are both mandatory to have on hand, or at the very least know what products you're going to buy so you can study their technical drawings.

Dimensions

The width of your vanity is going to be very specific to your bathroom situation. My vanity is 23" wide. The depth is a bit more standard, but still has a lot to do with the sink you select and how much room you have in your bathroom. I made my vanity 17" deep. The height is also highly variable and depends on how tall you are, how high your vessel sink is and personal preference. Because my vessel sink is 6" high and everyone in the household is on the shorter side, I made my vanity 24" tall. These dimensions also allowed me to get the four parts from one length of an 8' long sheet of plywood.

If you're unsure how high to make your floating vanity I would suggest mocking up some sort of surface in your bathroom at the approximate height you're considering and putting the vessel sink right on top of it to stand in front of and pretend to use. Maybe even compare it to other sinks you use to give you some context. There are no hard rules for vanity and vessel sink heights so use whatever feels comfortable for you and the people in your household.

Materials

Particleboard is a no-no for bathroom applications, as even the smallest amount of errant water can cause it to fall apart. Solid wood is an option, but I find plywood is more stable and easier to work with. It does mean you have to purchase an entire sheet, though. Solid edging will go a long way in protecting corners and edges from getting damaged.

Mating with the walls

Once in a while walls are straight and square with each other, but that's certainly not the rule. Like installing quarter round moulding where baseboards meet the floor, you could use a small moulding to cover up any undulating gaps, but I find that unattractive. It also provides more nooks and crannies for dust and dirt to get caught in.

I designed the vanity so the top would have a 1/4" scribe where the top met the side wall, as the walls didn't meet at 90°, nor was



Cutting Bevels – There are a number of ways to cut bevel joints in case parts. Brown's approach allowed all the bevel joints to be cut after one setup. See "Online Info" at the end of this article for where to find information on this setup.



Dealing With the Scribe – With the bevel joints cut, Brown turns his attention to the rabbit joints that secure the rest of the case. Here, he has the case bottom and top aligned with each other and is marking the location of the edge of the rabbit joint in the top, as extra material needs to be left on the top to form the scribe.

the side wall straight. I could have also done something similar to the joint between the back of the top and the wall, but it was straight enough that a small amount of dark brown caulking would easily fill any tiny gaps. Once everything was installed it turned out that no caulking was needed, thankfully.

This meant there would be a 1/4" gap between the outer face of the non-visible gable and the side wall, yet the top would extend all the way to the wall. Rather than shaping a 3/4" wide piece of plywood to fit the curves of the wall, I reduced the scribe to finish at 1/4" thick.

A full-sized drawing always helps me get the details right in my head before I start cutting into the material.

Start cutting

Plan the cuts so you can keep the grain continuous when it wraps around visible beveled corners. For my vanity there was only one



Finished Rabbet and Scribe – This is the upper joint that will butt against the wall, viewed from the back of the cabinet. The gable fits into the rabbet joint while the extra 1/4" x 1/4" scribe will be shaped to fit the curves of the wall.

of these corners, though if your vanity didn't abut a wall on one of its sides you would have two joints to consider. I was able to get all four case parts from one length of a sheet.

Next, some planning so you can cut the gables, top and bottom to length. This is where you have to determine what joints to use at each corner. Bevel joints will include the nice visual of continuous grain. Rabbet joints are great for joints that aren't visible. There are other options, too. I used bevel joints at the upper left and lower left corners, though I could have gotten away with a rabbet in the lower left corner. Rabbet joints were used at the other two corners.

I always cut bevel joints with one setup on the table saw. First, cut the joints to be beveled square. This means a part with a bevel joint on both ends will get cut to finished length, while a part with a bevel joint on only one end will get squared up on that end, but the other end will be a bit long. Next, set up the table saw to make the bevel cuts. Finally, make all your bevel cuts. Check out the link at the end of this article to read about how to set up the saw to make these cuts.

Remember the scribe

The upper joint that would go against the wall was unique, as it needed to accept the 3/4" thick gable, but leave the outer face of the gable 1/4" away from the wall. I cut a 1/4" deep rabbet 1" wide, then added a 1/2" deep rabbet 1/4" wide. The first rabbet would



Add Edging – Masking tape keeps the solid wood edging from moving until you get a few cauls and clamps on the joints.

It's a Wrap – Brown applies masking tape across the bevel joints and then wraps the parts together to assemble the vanity.



accept the gable, while the second rabbet would leave a 1/4" thick by 1/4" wide bit of material that would allow me to scribe the cabinet to the side wall of the bathroom.

Machine any other rabbet joints at this time and cut the rest of the parts to finished length.

Do you want a back?

I didn't add a full back, as that would take up a bit of extra room in an otherwise small vanity and it would add material cost to this small project. I also didn't think a back for added strength and rigidity was necessary. However, I wanted to add a hanging strip to the upper section of the vanity, as this would add some rigidity to the case and give me something solid for securing the vanity to the wall. I'd eventually use a few L-brackets under the bottom to further secure the vanity to the wall.

I machined 1/4" deep x 3/4" wide stopped rabbets in the upper 5" or so of the gables and a full-length rabbet of the same width and depth in the underside of the top.

Assembly time

A dry assembly is next. Sand the inside faces of the parts. Apply ample masking tape across any beveled corners. Wrap the bevel joints together and insert the other pieces. Measure the opening for the hanging rail, then cut and test fit it. Disassemble everything, add glue to the bevel joints, wrap the parts together for the last time and add glue as well to the final few parts. Add the hanging strip, clamp the case and check for square before letting the glue cure.

Solid wood edging

I machined four strips of solid wood to cover the front edges of the case. Three were ripped 7/8" wide, while the strip that was going to butt up against the wall needed to be 1/4" wider to account for the additional 1/4" gap between the case and the wall.

One-by-one, I mitred their ends, then glued and taped them in place before adding a few clamps to each strip. The joints near the wall were slightly different, as the upper horizontal strip ended 1/4" before the scribe did, yet the lower horizontal strip ended at the edge of the cabinet. The strip against the wall was cut and installed



Tricky Trimming – This is the lower joint that will butt against the wall. The horizontal edge glued to the case bottom (on the left side of this image) is flushed on both sides, but the solid wood edge that will butt against the wall (on the right side of this image) needs to be left 1/4" proud of the gable. After flush routing most of the edges off, Brown needs to use a flush cut saw to trim the lower edge of the wall edging. He does this to the upper edge of the wall edging, too.

so it overhung the wall gable by just over 1/4". A block plane would fine tune this strip during the installation process.

When the parts were dry I used a router and flush trim bit to flush all the edges except the one that would butt up against the wall. A belt sander and hand sanding block further smoothed the joints and sanded the solid wood edging.

Shelves and trays

What you do with the interior of your vanity is up to you. I opted for a shelf near the middle and a pullout tray at the bottom. Because this vanity is fairly small I thought the pullout tray would allow me to more easily access the contents. The middle shelf was going to be disrupted by the water pipes within the vanity, so I decided to leave cutting it to size until after installation.

The pullout tray could be made now, though. Because the doors would sit just inside the gables when hung I needed to make a few drawer strips to bring the tray and slides away from the doors. These are just 3/4" thick plywood with a solid edge on their top edges. They got screwed to the gables and then I made a simple tray to go between them, using standard full extension slides to fix it in place.

Finish line

Being a vanity, water was going to be a major consideration when it came to choosing a finish. I selected a polyurethane, as water would have little to no effect on it. And because this was a small project, using an aerosol spray can was a good option. I chose Varathane Professional oil-based polyurethane. I sprayed on a few coats, sanding between coats.

Installation time

I brought the vanity into the bathroom and marked and cut the holes for the water supply and drainage. With the help of a few supports, I positioned the vanity in place, checked for square and marked a pencil line across the top scribe and the solid wood edge that butted against the wall. A belt sander, block plane and sanding



Pullout Tray – Once the pullout tray (viewed from the back) is machined to width, Brown installed it, marked where it needed to be trimmed to depth and cut it. He added a small strip of solid wood across the tops of the 3/4" thick solid wood tray edges to keep items from falling off the back of the tray.

block took care of the waste. A few more back-and-forths to get a good fit and it was time to install the unit.

I put fillers in between the wall gable and the wall about the same thickness as the scribe in that area. This was so the screws didn't flex the vanity or wall. A few screws through the hanging strip and wall gable, all into studs, secured the vanity in place. For added strength I added L-brackets to the underside of the vanity. Although the fit between the scribes and the wall wasn't perfect, it was very close. Though technically recommended, I thought a bit of caulking that may keep a drop or two of water out of any tiny gaps now and then would also be an eyesore. I opted to leave it as-is. This will be a judgment call on your part.

At this point it was time to cut the shelf to size, apply a finish to it and install it with L-brackets and screws.

Doors

I opted to make the doors after installing the vanity, as I thought there was a chance the cabinet could be installed even slightly out of square, causing the doors to be misaligned. Plywood slab doors would be perfectly in keeping with the design of this vanity, but I chose solid wood doors and added some flair to them.

In short, I made a solid wood slab the exact size of the opening, drew some curves on the slab, cut the curves, shaped some of the parts with power carving equipment, painted some of the edges with blue milk paint then reassembled the panels to form two doors. For a detailed description of how I made the doors, see page 28 of this issue or search for "Curvy Doors" on our website.

The plumber eventually drilled a relatively small hole for the drain to fit through, installed the sink, water supply and drain, and it was ready for action.



ROB BROWN

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Design and Build **Curvy Doors**

Photos by Rob Brown

Doors are a blank canvas, just waiting to be sculpted, carved, shaped or curved. The technique described here can be used on just about any door, so let your creativity run wild.

BY ROB BROWN

In its simplest form, a door is made from a piece of material cut to fit a cabinet opening and hinged so it can be opened. To me, a door always seems like a blank canvas, waiting to be designed and made in a creative way. The vanity I made for our small bathroom (see “Build a Floating Vanity” on page 24) was quite simple; no exposed joinery, very clean lines and fairly small, but I wanted to add some visual interest with the two doors. Doors like this might be a bit much for a kitchen, but a smaller vanity was the perfect opportunity.

A big blank

Rather than come up with a design beforehand, I broke out a large solid wood blank to fit snugly into the opening of the cabinet. The extra bit of material in both width and height would allow me to trim the doors to fit nicely towards the end of the process. Designing a piece of furniture before breaking out material is usually the best approach, but in this case, I knew the overall dimensions I needed and drawing the curves directly on the door blank allowed me to clearly see the design full-sized.

I drew the curves on the blank with a piece of chalk. I tried five curves, but that seemed too busy for such a small cabinet. After playing around with different options and taking photos so I could look at the options I came up with, I settled on a design with three curves.

Cut the curves

Gentle curves like these are best cut on a bandsaw, but I wanted to ensure I'd remove the least amount of wood possible with the cuts. A scroll saw was the best option to reduce the kerf, even if it doesn't do as good of a job at cutting even curves. The reason I wanted to reduce the kerf was because the cut edges would eventually be glued back together again, and the less waste I removed, the better that glue joint would be.

While cutting the curves on the scroll saw, it was less important that I stayed on the lines, than making sure the resulting curve was even. These were supposed to be very fluid, smooth curves, and the fact that I was at times straying up to 1/4" from the lines wouldn't be a problem.

Sand, shave or power carve

The next step was to create a surface with different heights, sort of like ocean waves rolling into shore. Because this vanity would be seen only from the left, I opted to reduce the



Full-Sized Plans – Once the door blank was glued up, Brown was able to draw the pattern right on it. He played around with different designs, some of which included five curved lines, as opposed to the three he ended up settling on.



Nice, Thin Kerf – A bandsaw can cut the curves, but it leaves a wider kerf, causing the curved joint not to fit back together as well as it would with a narrower kerf. Instead, Brown used a scroll saw to separate the parts.



A Routed Rabbet – Brown machined a small rabbet on one edge of the curved sections to guide him while power carving the face of each section.



Smooth the Transition – Brown power carved the curved sections to slope down to the routed rabbet, but hand tools and sanders would also work.

thickness of the right sides of a few of the curved door parts, as this would allow the user to see the narrow blue edge of some of these parts. If I added the curves the opposite way the blue edges would never be seen.

To guide me as I reduced the thickness of some of the door panels, I first used a rabbet bit in my router to add a curved rabbet to the edges, setting the bit to cut to a depth of about 3/16".

Next, I removed some material from the faces of these panels to create an even transition down to the rabbet. I was careful not to remove too much material at the rabbet edge, as that would make for a weaker joint once the curved sections were glued back together. I was aiming to finish with a 1/4" high visible edge that would eventually be painted blue. I did this with power carving equipment, but some hand tools to even the faces and an aggressive sander with coarse grit sandpaper would also work well.

After power carving I sanded the rough surfaces smooth.



Sand the Curved Surfaces – A power sander will make quick work of the sloped surfaces. They need to be sanded so they're ready for a finish before the curved sections are glued back together.



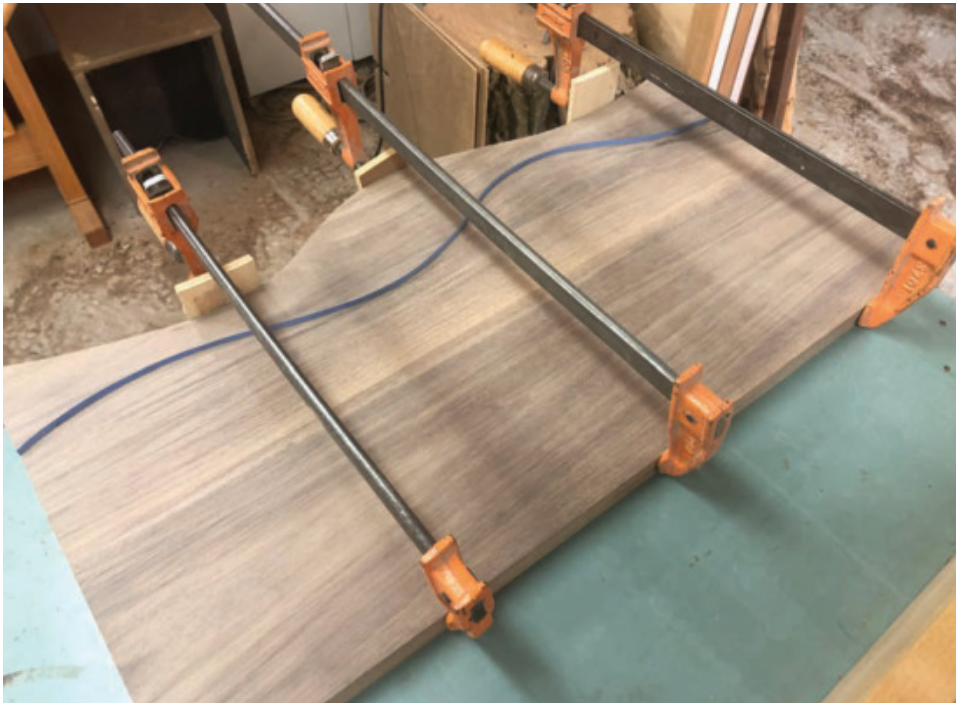
Add Some Paint – Here, the door edges in the gap are painted.



Paint the Visible Edge – The portion of the curved edge that will be visible once the curved sections are glued back together gets painted now. If you add paint to the entire edge, the glue will not adhere properly and the parts will likely come apart down the road.



Small V-Groove – This edge will get glued to another edge that has had its outer 1/4" painted. To stop the glue from squeezing out, Brown added a small V-groove on its edge, close to the face of the doors, to capture any glue before it made a mess on the visible surface of the doors.



Glue Them Up – Brown uses a few clamps to bring the mating parts back together to make one of the two doors. You can easily see the 1/4" edge that was painted blue here. The V-groove Brown added is on the mating part.

Add some colour

My scroll saw left a very smooth edge, so I didn't sand it much at all. A few passes with a fine grit paper was all that was needed. If the edge you end up with is rougher, you might want to sand it a bit more heavily, but just be sure to not take off so much material that it will stop the mating curved sections from being glued back together properly.

I aligned the curved sections face up, side-by-side, on a flat surface and traced a faint line onto the mating parts where the

reduced thickness edges lined up with their neighbours. This line gave me something to work towards while brushing milk paint onto the edges. As long as the wood was covered up to, and slightly beyond, that line the visible portion of it would be all painted. Keep in mind that painting much beyond the pencil line will cause problems with glue adhesion while laminating these curved sections back together.

The centre edge, which wouldn't be glued to the mating piece, gets painted on its entire edge.

Sand and prep

Both the slightly curved and flat faces of these curved sections need to be sanded before glue-up.

I didn't want any glue squeeze-out to get on the painted edges, so I added a small V-groove on the slightly narrower edges, as close as possible to the front face of the edges. For me, only two V-grooves were needed. This small groove would trap any glue that would otherwise squeeze out onto the painted edges during glue-up.

Do a test fit to ensure the parts line up nicely. If they don't, removing a very small amount of material is likely all that will be needed. Chances are everything will line up fine, though. Evenly apply a small amount of glue to the mating surfaces, then bring the parts together and apply clamps. I used a few curved cauls along the curved edge, but it's easy to also cut a few curved pieces of solid wood to protect the curved edges of the doors. Ensure the back faces, as well as the ends, of the parts are aligned as closely as possible before setting the panels aside to dry.

At this stage you can treat the panels like typical doors. I hung the doors, trimmed them so the gaps were even, took them back to the shop to apply a finish and then installed a pair of magnetic push latches so the doors could easily be opened.



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BUILD A BOHO TABLE

This table can be quickly and easily disassembled so it can travel with you. If you like the look of the table, but don't need it to be portable, that's an easy fix.

BY ETHAN KROETSCH

This project all started when a wonderful client asked me to make a low feasting table, sometimes called a “boho table.” People sit on the ground while enjoying a picnic-style meal at the table. The design process began with identifying and analyzing the constraints of the piece, such as form, function and the dimensions outlined by the client. I was able to create a design that takes inspiration from mid-century, modern-style furniture. At the request of the client, the table was designed so the legs can be easily detached using no tools. The table also folds in half for easy storage

with a minimal footprint. I chose ash due to its attractive appearance, durability and pleasurable working properties.

If you like the look of this table, but don't want to make it foldable, that's an easy adjustment. Leg and apron joinery can remain the same, or you can use alternative joinery, such as a mortise and tenon joint, to fix these parts together. The top and long aprons are the same except they aren't cut in half and there's no reason to include the middle stretchers or wedges.

The table construction utilizes a variety of woodworking techniques including several easy-to-make jigs. Follow along as I take you through the steps to build this low feasting table.

Lumber selection

One of the most important parts of any project is lumber selection. Before selecting your lumber, try to visualize how your project will look in the end. Ask yourself some basic questions to help you select boards that best suit your idea.

For example, will you incorporate contrasting wood, such as a lighter wood for the top and a darker wood for the base? Do you want the skirting to be continuous grain across the side? Is there a preference to laminate thinner pieces of material together or select thicker stock for certain components? These are examples of questions that will guide you in selecting lumber. Make sure to bring a tape measure and a detailed cut list when going to choose your lumber.

Machining the top

Making the tabletop is fairly straightforward. Begin with selecting the boards that you want as the top face of the table. Next, arrange the boards in a manner that's visually appealing and glue them together. You may have to glue some boards together in individual sections depending on the width of your thickness planer. If you have several sections of glue-ups that need to be joined together to make up the final width, you'll want to plane these sections to 1/16" thicker than the final thickness. Biscuits or dowels can help with alignment and ensure a final flat panel glue-up.

After the final glue-up has been completed, the next step is to rip the assembled panel to the finished width. As for the length, trim one end and then make a cut at the other end at 28" (half the overall length of the tabletop, which is 56"). If you want the top to have a continual grain pattern, pay close attention to make sure the cut you're making is on the correct end.

With the two halves of the tabletop cut, the next step is to add a steep bevel. For this, a jig will need to be constructed. The jig is made of 3/4" plywood and assembled using glue and screws. The jig holds one of the tabletop halves at 90° vertical to the table, and rides along the fence of the table saw. Tilt the table saw blade at the desired angle and cut along the length of the tabletop. I tilted my blade to a 35° angle. Using the same jig with additional clamps, the piece is then rotated, and the same bevel is cut across the grain at one end of the tabletop. An alternative approach would be to add a 45° chamfer using a router with a chamfering bit or a steep angled router bit.

Leg construction

Once you have your leg blanks cut to rough size, the next step is to crosscut them to final length of 14-5/8" with an angle of 20° on both ends. When completed, add the taper. To achieve the taper, I utilized a method adapted from Michael Fortune. The method involves a shop-made jig that first uses a bandsaw to cut the taper and then the taper is refined using the same jig at the thickness planer. The taper is cut on the inside of each leg. This means when it comes to cutting the aprons to join the legs the angle on the end of the apron will be over 20°, but we'll get to that later.

After the taper has been cut, the inside of the top of the table leg is chamfered by using a 45° chamfering bit in a router cut 2" from the top of the inside of each leg. Be careful to note there are two left and two right legs, and the chamfers must be cut according to where the legs will be located in the final assembly.

After the chamfer is cut, mark the centre of the chamfer 1" away



Steep Bevel – Kroetsch made a dedicated jig to secure and control the large top during the cut. If you have a steady hand and experience using a table saw, you may be able to make this cut without a jig. Notice he has to move his rip fence to the left side of the blade, as he has a right-tilt table saw.

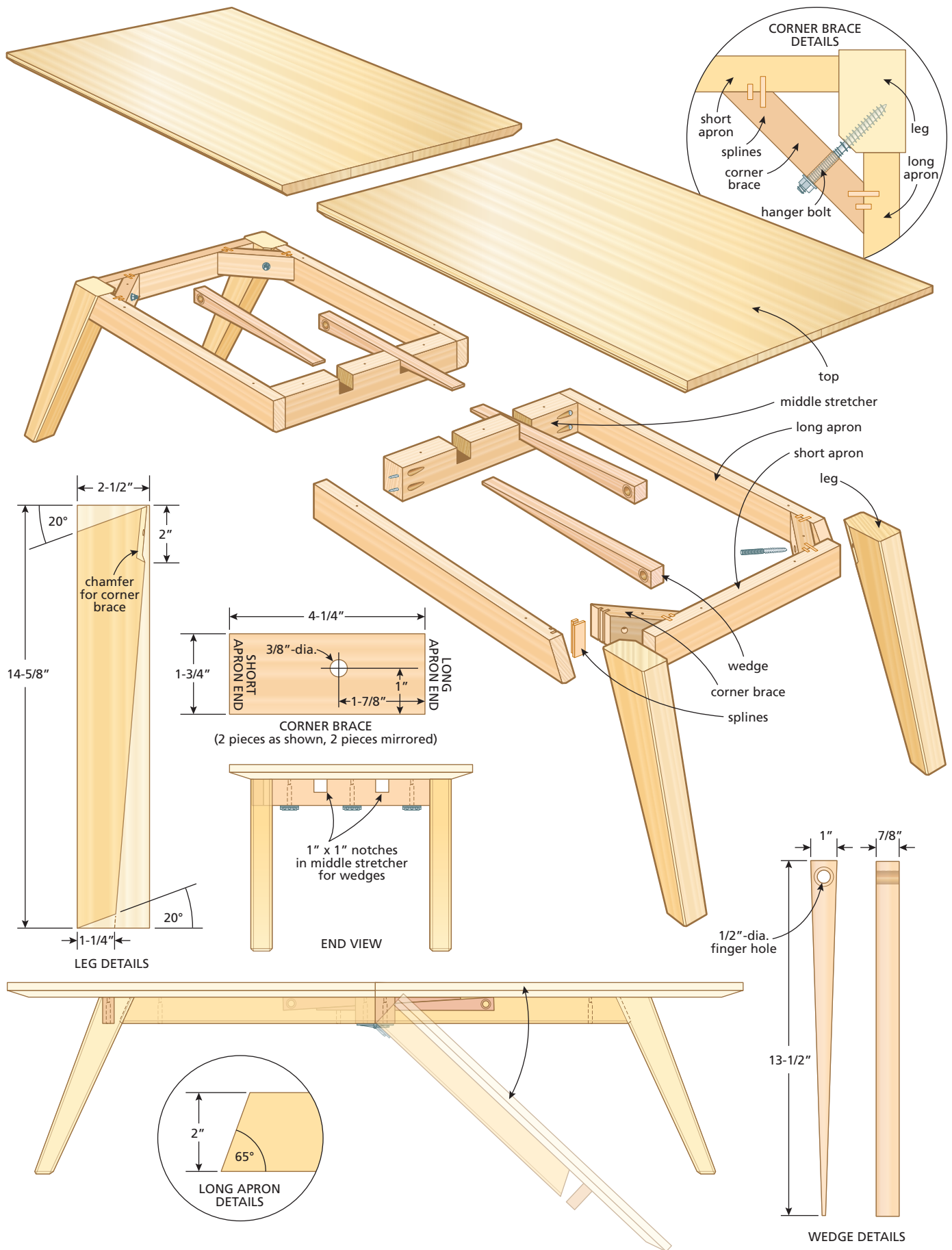


Time to Taper – Using a simple tapering jig, Kroetsch marks where the taper needs to be, then trims most of the waste on his bandsaw.



Plane It to Perfection – The same taper jig used on the bandsaw holds the legs while being fed through the thickness planer. Ensure the legs travel in the correct direction or tear-out will occur.

from the top of the leg where the chamfer was just cut. This is where the pilot hole for the hanger bolt will be drilled. Tilt your drill press table to 20° and use a 45° cradling jig to drill a pilot hole for a 5/16"×3" hanger bolt.

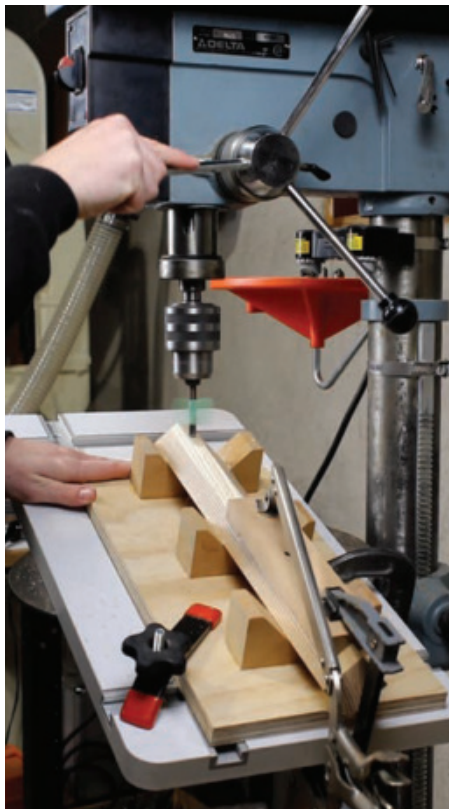


Materials List

Part	Qty	T	W	L	Material
Top	1	1-1/4	18-1/2	56	Ash
Legs (leg tapers from 2-1/2" to 1-1/4")	4	1-5/8	2-1/2	14-5/8	Ash
Long Aprons	2	7/8	2	39	Ash
Short Aprons	2	7/8	2	12	Ash
Middle Stretchers	2	1-1/2	2	13-5/16	Ash
Wedges (tapers from 1" to 1/8")	4	7/8	1	13-1/2	Ash
Corner Braces	4	7/8	1-3/4	4-1/4	Ash
Splines	8	To Fit Kerf	3/8	1-3/4	Ash
Splines	8	To Fit Kerf	3/4	1-3/4	Ash

Hardware List

Name	Qty	Size	Supplier
Hanger Bolts	4	5/16" x 3"	Misc Hardware Store
Washers	4	5/16"	Misc Hardware Store
Double Locking Hinges	3	2-9/16" long, 2-3/8" wide	Lee Valley
#8 Pan Head screws	22	1-1/4" long	Misc Hardware Store
Wing Nut	4	5/16"	Misc Hardware Store



Angled Holes – In order to bore a pilot hole at the correct angle, Kroetsch sets up his drill press by angling the table and using support blocks to hold the workpiece at a 45° angle.

Sand the legs using a proper grit progression. Using a sharp block plane, add a chamfer to the outside edges of the legs and bottom where the leg will be in contact with the floor.

The final step is to drive the hanger bolt into the pilot hole. I added some epoxy to the bolt prior to driving it into the hole for additional strength.

Cut the aprons

When cutting the aprons, begin by machining them to finished width and thickness, but keep the length oversized. I cut the aprons for the sides first. The length you cut the aprons will determine the distance of the overhang at the ends of the table. Place the top of the leg (near where the bolt is located) on a flat surface. Using a bevel gauge, determine the angle of the inside of the tapered leg. Transfer that angle to your workpiece and crosscut the aprons at that angle. After that angle is cut, you can crosscut the other end of the apron at 90° to give you its final length. If you wish to have continuous grain on the aprons, keep in mind that you'll now have to cut that angle, but in the opposite direction, on the far end of the off-cut piece.

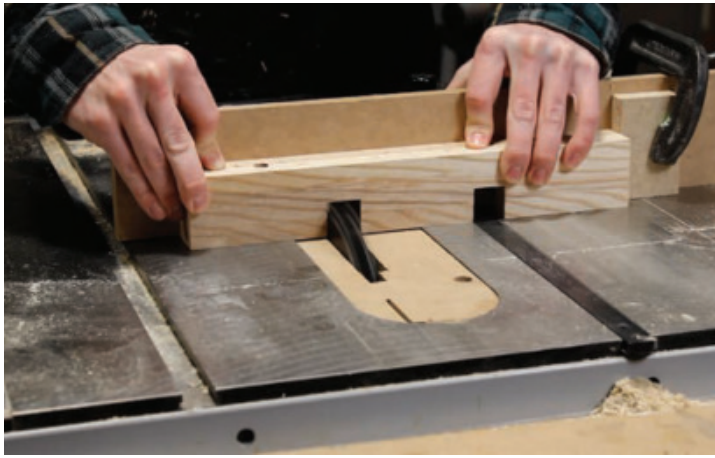


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Two Stretchers – A stop block on a mitre gauge will help create two stretchers that are exactly the same. These notches will accept the wedges positioned to keep the table in an upright and usable position.

After the skirting is cut to final size, the next step is to counter bore the aprons so you can attach them to the tabletop. I used 12 counter bores (two per piece of skirting) for 1-1/4" #8 pan head screws.

Middle stretcher

The middle stretcher is simply two pieces of ash laminated together, and then cut and planed to size. Drill and counter sink for three screws so the middle stretcher can be attached to the underside of the tabletop. The tabletop will move slightly with the seasons, but screws will allow for a small amount of movement, and since these middle stretchers aren't overly long this will be fine. The holes are located so that once the locking hinges are installed, they will be covered up. For additional holding strength, I added pocket holes on each end of the middle stretcher so the middle stretcher could be fastened to the side aprons.

After all the holes had been drilled, the next step was to dado out an area 1" wide by 1" tall at the bottom of the middle stretcher. These dados are where the wedges will be slid into.



Mating Slots – The angled ends of the aprons also need slots. It's critical for the slots to mate with the corner blocks.



Cut Slots – Using a 45° attachment fixed to his mitre gauge, Kroetsch machines the slots in the corner blocks. Notice the slot closest to the ends of the workpiece isn't cut as deep as the other slot.

Corner blocks

To make the corner blocks, start by machining a length of ash to 1-3/4" wide by 7/8" thick. Cut 45° angles on the ends of each 4-1/4" long corner block. Be cautious when drilling the 3/8" diameter centre holes, as they need to be drilled in pairs as the angle of the leg dictates. The hole is offset from the middle. The hole on two of the blocks will be closer to the left side and the other two will have the hole closer to the right side.

Slots to attach corner blocks

Next, cut mating slots in the mitred corner blocks to accept the splines. The slots nearest the ends of the corner blocks should be cut shallower, as there's not as much material towards the ends of these workpieces. You don't need to cut either of these slots overly deep. Cut matching slots on the inside faces of the aprons so the splines can attach the corner blocks to the aprons.

Finally, drill a counterbore in the centre of the edge of the corner block so it can be fastened to the underside of the tabletop.

Support wedges

The purpose of these wedges is to support the middle of the table from sagging at the point of folding once they're all pressed into place. The support wedge construction is very similar to how the



Assembled Joint – After the glue dries the splines can be trimmed flush with the underside of the aprons.



The Inner Workings – Once the hinges have been installed and the wedges have been pressed into place, the table can be flipped upright and used.



All Apart – Disassembling the table is fast and easy, and can be transported like this.

legs were made. The first step is to prepare your rough stock. For this I used a 13" x 5" x 1" off-cut of ash. I then made a jig similar to the one used for tapering the legs and followed similar steps. First, rip one of the tapers at the bandsaw, then rotate the piece 180° and repeat. I then took all four wedges to the planer with the jig to clean up the rough edge left by the bandsaw cut. The next step is to drill a 1/2" through hole at the thicker part of taper and then counter sink both sides using the drill press.

Assembly prior to finishing

Prior to finishing, glue up the left and right aprons. The glue-up consists of attaching the corner blocks to the aprons using the splines. To do this, I dry assembled the entire project and screwed the aprons to the tabletop in their final positions. I then placed the corner blocks in their designated locations and glued the splines into their corresponding slots, permanently attaching the corner blocks to the aprons. To ensure a tight glue-up, place the leg bolt through the hole in the corner block and tighten the nut and washer to the bolt attached to the leg. After the glue has cured, you can flush cut and trim the splines to the corner blocks and sand, utilizing proper grit progression.

Finishing

I chose an oil-based urethane topcoat for finishing. It produces a durable, smooth and appealing finish. I started by disassembling



Apply a Finish – A durable, weather-proof finish will work best for this intrepid table.

the project and sanding all the individual pieces using proper sanding grit progression up to 220 grit. Using a raking light after sanding all of the components, I inspected the table components more closely, carefully circling areas that required additional sanding or fixing with chalk. For my first coat, I made sure to apply the finish in a circular motion, working the finish into the grain. Once I applied finish to the entire surface, I carefully dipped my rag into the finish so there was only a small amount on it. Then, using long, straight strokes, I wiped with the grain. I let the finish cure for the recommended time and then lightly sanded down the entire project using a grey Scotch-Brite pad after the finish had cured.

After all the dust was removed, the components were ready for their second coat. I applied the finish the same way as I did the first coat by applying the finish in a circular motion to start and then finishing off by wiping with the grain. Again, I let my finish fully cure before sanding using a white Scotch-Brite pad. For the final coat, I applied a coat of finish by just wiping with the grain, ensuring that I got an even coat and avoiding any streaking that may occur if too much pressure is applied while wiping on the final coat.

Assembly after finishing

After all the parts are finished, assemble the left and right apron sub-assemblies to the underside of the tabletop using screws. Next, attach the middle stretchers by screwing them to the edge of the tabletops. Also, screw the middle stretcher to the aprons using the pre-drilled pocket holes.

The next step is to attach the three hinges to the middle stretchers, joining the two halves. In addition, attach the legs to their corresponding location. Use a washer and wing nut to do so and tighten. The final step is to insert the support wedges from opposite ends of the middle stretchers until tight.



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ADVANCED-LEVEL CHAIR REPAIR

If you have moderate woodworking skills, you have the necessary skills to repair broken furniture.

BY SCOTT BENNETT

I've found repairing chairs rewarding and challenging work, and more enjoyable than designing and building custom furniture. I've also found it to be a more profitable business model. In my previous two articles, I described how to repair a chair with loose joints and how to repair broken furniture parts. This article builds on those skills and is what I call "Level 3 Woodworking Repair." I'll describe how to diagnose the situation, remake furniture parts and stain them to disguise the repair before reassembling everything.

Diagnose the problems

Every repair starts with the same step: determining the root cause of the problem so you can correct it. This chair was previously repaired, but the repair failed. As these parts have broken across the grain, there would be no strength if they were glued together again.

To restore this chair to a working piece of furniture, I needed to make new parts to replace the broken ones. This chair was part of a set of four I was repairing.

Duplicate parts

To reduce how noticeable the repair would be, I decided to spread the repair across two chairs. I made slats for a chair where all the other parts were in good shape. I took a few slats from that chair and used them on the chair with the broken back posts. Having said that, you don't need multiple chairs to make a solid repair that will be undetected.

I started by making the new back posts. After selecting some straight-grain oak, I mortised slots in the blank to fit the crest rail. I then added a dab of glue on some sacrificial tenons and inserted them in the mortises to prevent tear-out when I turned them on the lathe.

Once the turnings were complete, I started the finishing process while the back posts could still be mounted on the lathe. The first step in my process to mimic vintage oak is to paint the parts with black acrylic paint and then sand off the surface. I'll share more of these finishing details later.

After I cut off the top of the back posts, I moved over to the shave horse I designed for my workbench. It's a compact holding tool that allows me to use my foot to apply clamping pressure while I use both hands to use the spokeshave and drawknife. I duplicated the dome shape from the broken back posts and applied a coat of paint for the finishing process.

I used the benchtop shave horse again to recreate the back slats. I found this to be a relaxing task, using hand tools to quietly shape the oak slats. It made me wonder what the original craftsman who made this chair was like. Did they work fast and furious or purposeful and efficient? Did they have decades of experience or was it an apprentice knocking out these parts?



Snapped Off – Many of the back slats and both of the main back posts were broken. Simply gluing them back together wouldn't work, as end grain-to-end grain joints are inherently weak. The broken slats and posts needed to be removed, new ones made and finished before the chair could be reassembled.



Turn Other Posts – Using the existing post as a guide, Bennett turns two matching posts on his lathe. He machines the mortises while the blank is still square, then fills the mortise with a piece of scrap, held in place with a small amount of glue, while he turns. The mortise filler can be removed by driving a screw into the filler and pulling it out when the turning is complete.



Black Paint Darkens the Pores – In order to match the finish on this chair, Bennett wiped on black acrylic paint, then sanded it off. The result is darker pores.



Round Tops – Bennett uses his shave horse to hold the posts while he rounds over the tops of the posts.



Different Stages – Here are the different stages of the posts as they get completed, from left to right: a rough blank; a partially turned post; the turned post with black paint; the paint mostly sanded off; and the post ready for final assembly.



Simple Finishing Jig – A simple jig to hold the parts while finishing is easy to make.



Make Some Wedges – A wedge helps secure the through tenons on the end of the posts. It's driven into the end grain of the posts once they're seated properly in the mortises.

As I made each part, I test fit it to ensure the connection was snug without needing to force the joinery together. This ensures I will have a smooth process when I'm gluing up the chair because all the pieces will come together well at that critical point in time.

Matching stain and finish

One of the more challenging skills for me to learn when repairing furniture was how to match the stain and finish. I learned how to use acrylic stains from a furniture finishing mentor who taught me how to “set the grain” first, then apply the stain. I use black acrylic paint – the kind found in a craft store – to set the grain. After sanding the surface of the oak, the open pores retain the black paint.

The next step is to apply the acrylic stain. I use Saman stain, which is made in Quebec. I love this new generation of stain because I'm not exposing myself to harsh chemicals in my workshop and it washes up with soap and water. I was able to colour-match the new parts with the other chairs in this set.

I find the stain changes colour as it dries, but not in a bad way. When it's wet, it looks like it will after a clear coat is applied. This

is helpful as it allows me to dial in the colour I'm mixing using various stains.

This chair was originally finished with polyurethane, so I applied several coats of polyurethane to the new parts. This brings up the colour of the dried stain and gives the parts the same level of sheen as the rest of the chair.

Reassemble

The last stage was putting it all back together again. This is where some knowledge of chair making is important. The chair back posts are held in place with “wedged through mortises.” As you can see in the photo of the old back post I pulled out, there is a slot cut in the tenon. The chair post is held in place by inserting the tenon in the mortise (hole) that goes through the seat, then driving a wedge into the slot. This expands the tenon and applies pressure that prevents the tenon from pulling out.

For a wedged tenon to work properly, the wedge can't be parallel to the grain in the chair seat or it would risk splitting the wood. The wedge needs to be located perpendicular to the grain in the seat so



Tap It In – Oriented perpendicular to the grain as to not split the solid wood seat apart, the wedge is tapped into the slot on the end of the post. Glue will help keep the joint strong for years to come.



As Good as New – The completed chair, with all its newly made and finished parts reassembled into a solid seat for the customer.

the pressure is applied to the end grain.

I used a dovetail saw to cut a slot in the tenon. To make the wedges I used a simple jig I made that holds a small piece of wood in place on an angle. This allows me to plane it down to create the right size wedge.

The last step before the glue-up is to test-assemble all the parts to ensure they fit properly. I then applied hide glue to both the mortises and tenons with an artist brush and connected all the joinery. I then flipped the chair upside down so I had access to the split tenons in the back posts. I added a clamp to hold the back tight to the seat. I then added glue to one side of the wedge and taped it in while holding the post with my hand to ensure I didn't knock the post out of the mortise in the seat.

The finished repair

The reward for completing a project like this is a sense of accomplishment and pride. The added bonus is seeing the reaction of my customer when their furniture is rock solid and beautiful again.

Scott shares his skills on his "Fixing Furniture" YouTube channel. You can watch this repair project and 75 other videos to learn about furniture restoration or visit his website at WoodenItBeNice.ca



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HOW TO REPLACE A BROKEN FLOOR TILE

If a tile breaks it will need to be repaired. With the right tools and a bit of know-how, this is a project that won't take long.

Illustrations by Len Churchill
Lead photo by Adobe Stock

BY ALLAN BRITNELL

Accidents will happen. If, for theoretical example, you happened to have dropped an empty wine bottle onto the floor while you were taking out the recycling and it left a crack in a tile, that blunder will haunt you every time you walk through the room. Cracks can also allow moisture to seep into the subfloor, so you'll want to repair the damage as soon as possible. Luckily, replacing a cracked tile is something any reasonably handy DIYer can tackle.

That said, if there are several tiles cracked in the same area you might have a structural or installation issue that you should investigate first.

Tools for the task

For starters, you'll need a replacement tile. Hopefully, your contractor left you with a few extras for just this purpose. If not, you'll have to hope the supplier you bought the tiles from still stocks that particular style or try to find a close approximation.

To remove the grout you'll need a manual grout saw or a powered rotary tool or multi-tool, and a cold chisel or power scraper to remove the old mortar.

For the installation you'll need a notched trowel, a grout float and a grout sponge. You may also want to pick up some plastic spacers so you don't install the tile crooked. They're available in increments of 1/16", so measure the existing grout lines accurately to determine the size you'll need.

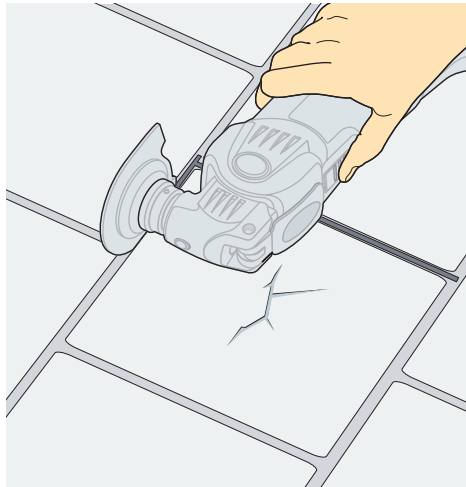
Finally, you'll need thinset mortar and grout that colour-matches the existing material.

Out with the old

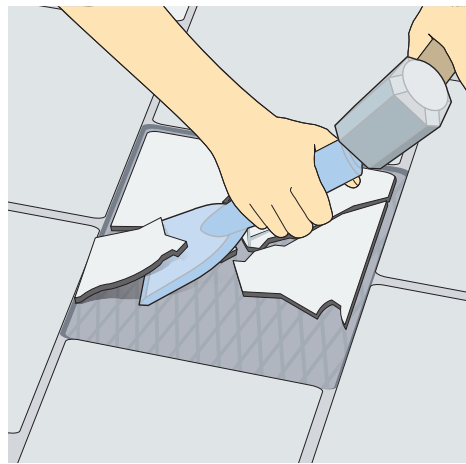
The first step will be to remove the old tile without damaging the tiles around it. If the tile is at the edge of a wall, you'll have to remove the trim first.

Use a grout saw, rotary tool or multi-tool to remove the grout around the tile. If you're using a power tool, be careful not to nick the adjacent tiles. If you don't have any of the aforementioned tools, you can slowly scrape away the grout with your utility knife and replace the blade when you're done.

To remove the old tile, try prying it up with a cold chisel. If that doesn't work, lightly tap



Start with the Grout – Removing the grout surrounding the broken tile is a good place to start. Whatever tool or method you use, be careful not to damage any of the surrounding tiles.



Break and Remove – You can use a combination of tools to break up and remove the damaged tile. A cold chisel and hammer will likely do most of the work.

the tile with a hammer to break it into pieces, again being careful to not to damage any neighbouring tiles.

Cover the area with a towel to catch debris and wear eye protection and work gloves so you don't cut yourself when removing the sharp-edged shards.

With the old tile out of the way, use a hammer and chisel or a power scraper to remove the old mortar, being careful to not go too deep and damage the subfloor. Vacuum the work area thoroughly before you move on to the next step.

In with the new

You'll be using thinset mortar to secure the tile in place. You can buy it as a

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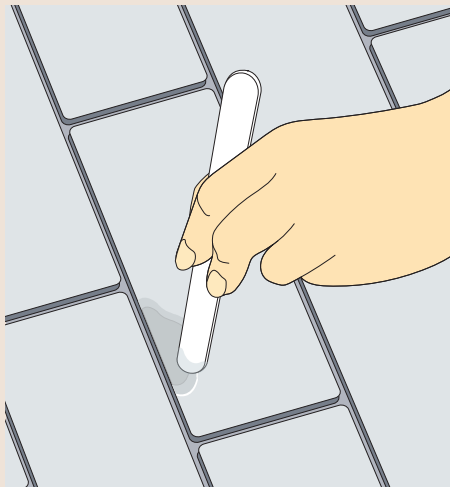
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Minor Chips

If a tile has a minor chip in the surface, you can fill it with epoxy and then channel your inner Vincent van Gogh and paint over the epoxy in a shade that blends in with the rest of the tile. After it's thoroughly dried, apply a tile sealer to prevent the paint from chipping.



powder or in premixed containers. Premix is handy, but powder is cheaper and will store for the long-term in a cool, dry location. Once opened, a premixed container will eventually dry out and harden.

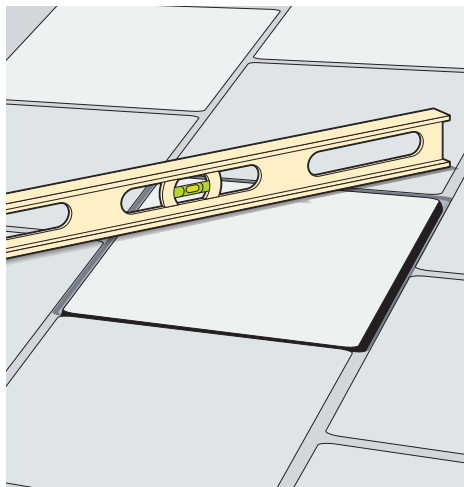
Before you lay down the thinset, dry fit your tile in place to make sure it sits evenly in the opening. At this point, the top surface should be slightly lower than the tiles around it. Use a notched trowel to spread the adhesive evenly across the entire opening. Try to lay the tile as flat as possible when putting it into place and use your spacers – two per side on all four sides – to make sure it's centred.

Use a level to make sure the new tile isn't sitting proud of the ones around it. If so, you'll have to pull the tile out and remove some of the thinset.

About 30 minutes after you've set the tile in place, remove the spacers, being careful that you don't shift the tile. Let the thinset set for at least 24 hours before you move on to grouting.

The finishing touch

Hopefully, you have some leftover dry grout powder from the original installation. If not, you'll have to try to find colour-matched



Ensure It's Level – Once you have the broken tile removed, and the cavity where the new tile will go cleaned up, insert the new tile, check for level and adjust if necessary. Also ensure the new tile sits below the existing tiles, as once you apply thinset to the floor the new tile will sit higher. You don't want the new tile to sit proud of the existing floor.

material. If you're replacing only one tile you'll need only a small amount of grout.

Mix the grout according to the instructions on the package. You'll want it to be roughly the thickness of peanut butter or toothpaste. When in doubt, it's better to have the grout a little drier than too wet.

Use a rubber-bottomed float to apply the grout. Apply it at an angle, using enough pressure to push the grout all the way into the gaps around the tile. If you hold your float parallel to the grout lines, you'll end up scooping out the material you've just laid down.

Once the grout is in place, hold the float at about a 60° angle and use it to scoop up as much excess grout as you can.

Next, soak a grout sponge in clean water and thoroughly squeeze it out. Again, working at an angle to the tile, wipe the surface of the tiles once. Flip the sponge to do a second pass and then rinse the sponge and repeat until the tiles are cleaned. Give one final rinse with clean water. Once the grout has set, remove any hazy residue with a damp cloth.

Avoid stepping on the new tile and those adjacent to it for 24 hours – and dropping heavy objects on it after that.

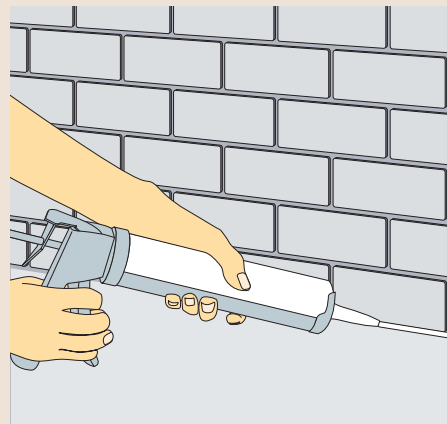
ALLAN BRITNELL
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At an Angle – Apply grout to the area around the open joints and work it into the narrow gap. Use a rubber-bottomed float at an angle to the gaps to work the grout into the joint.

Counter Measures

If you're installing a tile backsplash, instead of grout, use caulking to seal the bottom row where the tile meets the counter. This will prevent grout from cracking if the counter flexes. If the existing grout is starting to chip, remove it all (as described above) and replace it with colour-matched caulking.



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2022 Tool of the Year Award Winners



Woodworkers and DIYers from across Canada have chosen the best tools of 2022.

We are very pleased to announce the winners of our 7th Annual *Canadian Woodworking & Home Improvement* Tool of the Year Awards. The awards recognize the best woodworking products released during the year. Winning products were voted on by woodworkers and DIYers from across Canada, from a list of up to 10 candidates pre-selected by our contributing editors. You can learn more about each of these great new products by visiting: canadianwoodworking.com/tools/toy2022/
Congratulations to all the winners and runners-up, and all the best for a great 2023.



Winner:
SawStop Compact 10"
Table Saw CTS



Runner-Up:
Bosch PROFACTOR
18V Surgeon 12"
Dual-Bevel Miter Saw



Runner-Up: Oneida V-System 3000
SMART Boost Dust Collector



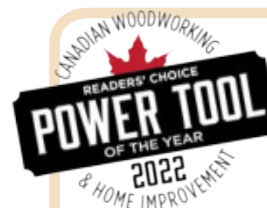
Runner-Up:
Blue Spruce
Card Scrapers &
Burnisher



Runner-Up: Bessey
Telescopic drywall
support STE



Winner:
Set of 3 Veritas
Imperial Pocket
Layout Squares



Winner:
Festool TS 55 F
track saw

Runner-Up:
Milwaukee
M18 FUEL
6-1/2" Plunge
Track Saw



Runner-Up: DeWALT
Cordless Biscuit Joiner



Runner-Up: Oneida
Dust Deputy 2.5
Deluxe Cyclone
Separator Kit



Winner:
M-POWER SBS
Sharpening
System



Runner-Up:
Woodpecker Auto-
Line Drill Guide

SHELLAC: A NO-FUSS FINISH



Photos by Carl Duguay (Photo Lead by Rob Brown)

Easy to use, clean up and repair, it's also fast drying, versatile and leaves an exceptionally deep luster finish. What's not to like about shellac?

BY CARL DUGUAY

Shellac is a wonderful finish that highlights wood figure and enhances colour as well as – many would say better – than any other topcoat. It's a film finish, meaning it builds up a thin layer, or film, on top of the wood's surface. It's one of the most uncomplicated finishes to apply and probably the fastest drying. On top of that, it's likely the easiest finish on the market to repair. Because it dries so quickly there's much less chance of dust contaminating the finish.

When cured, a shellac finish offers decent wear resistance and excellent protection from moisture transfer. Another great feature of shellac is that you can apply just about any kind of film finish on top of a cured coat of shellac, including waterborne finishes like polyurethane.

Because there is virtually no odour after it cures, I like to use it inside drawers, cabinets and small boxes. You can also use it on items that aren't handled on a daily basis, such as display cases, keepsake boxes, carvings, turnings, picture frames, trimwork and the like.

Furniture refinishers sometimes use shellac as a base coat for their work. Shellac will go a long way in sealing in a piece of furniture and creating a barrier between the newly stripped wood and the rest of the finish that will be applied on top of it. This helps seal in any pitch, wax, stains, odours and other contaminants that may be present that could negatively affect the new finish that will be applied. When painting wood, mainly in home improvement situations, a coat of shellac-based primer will eliminate the knot bleed-through that happens when you paint over a knot. This is especially helpful when painting pine, spruce and other knotty woods a lighter colour, as the pitch that bleeds through will otherwise become very obvious after a few weeks.

What is shellac?

The lac insect is found mainly in Thailand and India. They spend their lives in trees, ingesting sap, then secreting a tunnel-like structure that sticks to the bark of the tree as the lac insect moves around. Shellac is made by mixing the secretions from female lac insects with denatured alcohol or another appropriate solvent.

In addition to being a great finish for woodworkers and DIYers, shellac is also edible, and sometimes used to coat pills, candy and even fruits in the produce aisle. Next time you buy chocolate-covered almonds take a close look at their surface; the light layer of shellac reduces the likelihood the chocolate will smear in transit or melt on touch.

Different tints

Shellac flakes are available in different tints, ranging from a light blonde to a rich amber colour. What tint you select for your next



Different Tints – Garnet shellac flakes (left) are a lot darker than blonde shellac flakes (right). There are a few different tints between these two, as well as super blonde, which is almost colourless.



Different Tints, Different Looks – Here are two samples of walnut and white ash. The panel on the left of both of the samples is raw wood. The centre panel has been finished with blonde shellac. The panel on the right is garnet shellac. The darker garnet shellac causes the lighter white ash sample to look muddy.



Mix, Then Let Sit – Mix the flakes and alcohol together in a glass container, then wait. The flakes dissolve relatively slowly. Mixing or shaking the jar from time to time can speed the process.

Ounces of alcohol to use	Ounces of flakes to use		
	1 pound cut	2 pound cut	3 pound cut
8	1	2	3
16	2	4	6
32	4	8	12
64	8	16	24

project depends on two considerations. The first regards the tone of the wood you're finishing. While it's somewhat common to use a light blonde shellac on a dark wood, lighter shellac is often used on lighter woods, like maple and ash. Darker shellac is often used on darker, richer woods such as walnut and mahogany. If a dark shellac is used on a light wood the result often looks muddy and unpleasant. The second consideration is personal preference. If you like the look of a specific shellac on a specific wood, then you should use it. As always, test out the finish on a sample before committing to an entire project.



Six Hours Later – After six hours the flakes have almost fully dissolved in the alcohol. Another stir and a bit more time and the shellac is ready to use.



Make a Pad – Wad up a piece of cloth then wrap it with another piece, ensuring the outer surface of the pad is smooth. (Photo by Rob Brown)

Waxed vs. de-waxed

Shellac, both flakes and premixed versions, naturally has wax in it, but can be purchased in standard waxed or de-waxed versions. If the can, jar or bag doesn't state whether it's de-waxed or not, it very likely hasn't been de-waxed. Often the wax won't cause any problems, but there are other times when using de-waxed shellac is strongly encouraged. It all depends on how you're using the shellac and what your expectations of the finish are.

The benefits of using a shellac that has wax in it is that it's slightly easier to sand and it's likely cheaper. I've heard some say wax will help a heavy application of shellac level off while it's still wet, but I can't speak to this. It also might have a slightly better sheen, though this is personal preference, and the sheen of the cured shellac finish can be adjusted by using steel wool and wax.

There are a few downsides to using a shellac with wax. The cured finish is slightly less water resistant and transparent, but likely the biggest downside is that coats of finish applied on top of a waxed

shellac won't adhere to the shellac well. This is more of a problem if you're using shellac as a sealer while refinishing furniture.

It's quick to make

To make your own shellac finish all you need are some shellac flakes (use dewaxed if you plan to use the shellac as a sealer under another finish), denatured alcohol (I use 99% isopropyl alcohol, available from most pharmacies) and a glass bottle. The ratio of shellac flakes to alcohol is called the "cut." Slightly more or less of each component doesn't matter. Technically speaking, a 1-pound cut includes 1 pound of shellac flakes in a gallon of denatured alcohol. I almost always use a 2-pound cut. Add the components to the bottle and wait overnight for the flakes to dissolve. You can speed things up by shaking the bottle or stirring the contents every few hours.

If the idea of working with ratios and exact quantities turns you off, don't worry. Many people add some shellac flakes to a glass jar, pour in some alcohol, mix and wait until the shellac flakes are dissolved. With a bit of practice, you'll be able to quickly figure out a mixture that's close enough to what you want.

Depending on the grade you purchase, it may be worth your time to strain the shellac after the flakes have dissolved. This helps remove any impurities from the manufacturing process.

Easy to use

Shellac can be sprayed, brushed or wiped on. Most of the time I apply it with a cloth, somewhat similar to the pad used in French polishing. For very large surfaces, such as the inside of a large cabinet, I'll use a brush. To wipe it on, ball up a piece of lint-free cotton or linen cloth and pour some shellac onto the cloth or dip the cloth into the shellac. Apply the shellac in a sweeping motion across the wood surface using light pressure. A small brush comes in handy for getting the shellac into tight areas and corners.

Shellac dries very quickly so you'll need to constantly recharge the cloth. You can apply a few quick coats then let them dry. You'll quickly get the feel for how fast you can apply a few coats. Often waiting 10 or 15 seconds is enough to apply another coat, but this

Where to get flakes

Wood Essence (WoodEssence.com) has the widest selection of high-quality, wax-free shellac flakes, but companies like Lee Valley and many others carry shellac in both flake and premixed versions. There are seven shades to choose from, including ultra-blonde or super-blonde, the clearest and lightest shellac, good for use on light-toned woods. Dark garnet is excellent for highlighting dark-coloured woods like mahogany, sapele and walnut.

You can create custom colours by adding aniline dyes or universal tinting colours (UTCs) to shellac. The flakes are available in 1/4-to-3-pound sizes. **WoodEssence.com/Shellac/Dry-Shellac**





Apply It – Duguay prefers applying shellac with a lint-free cloth padded up into a ball. He recharges the pad regularly.



Water Damage – Shellac doesn't stand up well to water, discolouring after a relatively short period of time. The white spots here appeared after about 30 minutes.

depends on how strong of a cut you're using. A 1-pound cut will dry faster than a 3-pound cut because there's more shellac and less alcohol in a 3-pound cut. Having said that, you should only apply a few coats at a time, then put the project aside and let it dry thoroughly.

Don't worry if you miss spots. Wait an hour or so and lay on another coat or two. Each coat will dissolve into the previous one and there's no need to sand between coats.

You can lay down as many coats as you want. For a 2-pound cut I lay on five to six coats. Generally speaking, stop once the look and feel of the finish is to your liking. To repair a shellac finish use steel wool or a synthetic abrasive pad and alcohol to remove the damaged finish and reapply as described above.

Keep it glossy or reduce the sheen

Regardless of the colour of flakes you use, all shellac finishes produce a gloss sheen. If you prefer a satin sheen just rub the finish lightly with #0000 steel wool. Do so after the finish has fully cured – at least a week after your last coat. Two or three weeks is even better. If you notice any flat spots on the surface, apply another

French polishing

You've likely heard the term "French polishing" in relation to shellac. While shellac is a finishing product, French polishing is a technique you use to obtain a very high gloss finish that has exceptional colour and luster. It's a lengthy, repetitive process in which you use a cloth pad dampened with shellac and a small amount of oil to apply the shellac. If you'd like to give it a try read the article online called "French Polishing."

coat or two of shellac again, wait for the finish to cure and rebuff. I like to topcoat with a paste wax, which gives a wonderfully silky-smooth feel to the finish.

Some limitations

Like any finish, shellac has its drawbacks. Because it dries very quickly there can be no dallying around when applying it, especially if you're brushing it on, as it tends to ridge at the edge of brush strokes.

It's not as durable as modern film finishes, nor is it heat- or water-resistant. Water left standing on a shellac surface will leave white spots while alkalis like lye and ammonia, and of course alcohol, will damage the finish. Don't use shellac on coffee tables, kitchen tables, countertops or islands, or anything in the bathroom.

If you're finishing a project with a lot of flat surfaces and few inner corners or joints, shellac can easily be applied. If there are a lot of inner adjoining surfaces, like the inside of a box or the kumiko gridwork of a shoji screen, wiping or brushing on shellac might cause challenges. It's easier to spray projects like this. It truly depends on your level of skill when it comes to applying a coat of finish.

When stored properly, shellac flakes should last about three years. However, after the flakes have been dissolved in alcohol the finish has only an eight- or nine-month shelf life. Oxygen, heat and moisture all play a role in degrading the finish, making it less likely to harden and lowering its resistance to water. It's good practice to make only enough finish to use on the project at hand.

Pre-mixed shellac is a bit trickier, as you don't necessarily know when the mixture was made. One way to test out a premixed shellac before applying it to a project is to put a few drops on a piece of wood and let it dry overnight. If it hardens properly it's likely safe to use. A common-sense approach is needed, though. If you bought the premixed shellac 10 years ago, I wouldn't risk using it, even if a few drops of it does harden overnight.



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VIDEOS: Visit our website to watch a video on shellac and how to apply it, hosted by Rob Brown, *Canadian Woodworking & Home Improvement* Editor.

Reviews

Our experts review new tools and products especially suited to the woodworker and DIYer.

Ryobi P322 HP Airstrike 18 GA Brad Nailer
Untethered Nailing Performance

Einhell 18V Cordless Drill/Driver Kit
New Market Brand Offers Value

Ryobi P322 HP Airstrike 18 GA Brad Nailer

BY ROB BROWN

Pneumatic nail guns are great. Having the ability to quickly and accurately drive a pin or brad nail into material is incredibly handy. From making shop jigs and installing residential trim, to securing backs and drawer bottoms and assembling kitchen cabinets, a nail gun is mandatory. There's one downside to a nail gun, though – the dreaded hose.

There are many types of hoses on the market, but all are far from perfect. They trail all over the shop or jobsite tripping people, they get caught on all sorts of things, they add weight to the nail gun and they're sometimes not long enough. Don't get me wrong. In the right situation a pneumatic nail gun is great to have around, but like any tool, it has limitations.

In a world where virtually every handheld power tool has the potential to be battery powered, it only makes sense brad nail guns would go this route, too. Battery-powered brad guns have been around for a while, but the prices are now coming down to

make it possible for regular DIYers to see the value in pulling the trigger on one of these workshop guns.

When I had a large trim job looming it was a great excuse to check out one of the models on the market. I don't do a lot of trim work and I already have an air compressor and two pneumatic nail guns so I didn't feel the need to spend wildly on another gun. I also knew many woodworkers and DIYers have to consider cost and value when making purchases for the woodworking and home improvement projects they do. The Ryobi P322 HP Airstrike 18 GA Brad Nailer caught my eye.



Photo this page by Ryobi; photos opposite page by Rob Brown

Just Out of Sight – The easy-to-adjust depth of drive level will allow you to sink brads just below the surface with ease.



Shed Some Light – Brown found the handle quite comfortable to use. An LED trigger next to the main trigger can be pulled if you're working in a dark area.



At first grasp, I found the Ryobi P322 heavier than what I was used to. Having said that, it felt nicely balanced in my hand. After charging the battery I used it on a few 2x4s in my shop to see how it worked and to test out a few options it had. It will use brads between 5/8" and 2-1/8". Not surprisingly, it worked well. To the house to install some trim.

While installing some crown, the first few pins I drove finished proud of the crown's surface. Not to worry, as I turned up the depth of drive adjustment. From then on, the brad heads

finished slightly below the surface of the crown.

As I mentioned, it's heavier than the pneumatic 16ga and 23ga nailers I have, but it wasn't so heavy to be problematic. I'm not the biggest or strongest guy around, but I could still easily manipulate the nailer over my head to sink nails at any angle or location. It was comfortable to use with its moulded grip. It also has an LED that's easily triggered by a finger when in use, which sheds light right where needed.

I found I could easily drive the brads with precision, as the nose (Ryobi calls it the AccuDrive nose) didn't interfere with my line of sight and within a few pulls of the trigger I was used to where the nail was driven.

Over the next day or so I proceeded to install about 75' of crown moulding and 150' of baseboard. The battery held up nicely and is still going strong on its first charge well after my trim job was completed. The brushless motor the battery powers is efficient.

Though I didn't have the need to use it, this brad nailer comes equipped with a tool-free, jam-release latch. I could find a use for this nailer in my workshop, even with two pneumatic nailers hanging on my wall. Having the ability to quickly fire brads of almost any size is incredibly handy, and this is especially true when your nailer isn't tethered to a compressor.

Ryobi P322 HP Airstrike 18 GA Brad Nailer

MSRP: \$249

Website: RyobiTools.ca

Tester: Rob Brown

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Einhell 18V Cordless Drill/Driver Kit

BY CARL DUGUAY

Cordless drill/drivers are perhaps the most commonly purchased hand-used power tool on the market, which is likely why there are dozens of models to choose from in a wide range of configurations. Over the past few months I've had the opportunity to shop test an Einhell drill/driver, a brand that's new to the Canadian market. Based in Bavaria, Germany, Einhell is a leading manufacturer of state-of-the-art tools and equipment for the European DIY market. King Canada is their Canadian distributor for the product line.

The kit I tested consists of an 18V drill/driver, two 2.0Ah batteries, a 30-minute charger and a practical hard-shell storage case. The drill/driver weighs in at 1.87 kg / 4.1 lbs. with battery installed. The 1/2" single sleeve chuck allows you to use the full array of 1/4" to 1/2" shanked drill bits and you can tighten the chuck with one hand.

The Einhell drill/driver has a brushed motor that features two speed settings - 0 to 400RPM for driving and fastening tasks and 0 to 1500RPM for drilling. You get 20 torque settings with a maximum torque of 354 in-lbs. While the top speed and max torque levels are somewhat lower than I prefer, this drill can still handle just about any job on a furniture maker's, renovator's or avid DIYer's to-do list.

For intermittent light-duty work in my shop, a single 2.0Ah 36Wh battery gave a full day's runtime. For heavy-duty work you've got a second battery to rely on. And, if you're working full tilt the 30-minute charger will eliminate any down time. The batteries are part of Einhell's Power X-Change series, which means you can use any Einhell power tool with any Einhell battery. This allows you to expand your collection of Einhell power tools without having to buy a different battery or charger. The Power X-Change series also has 4.0Ah, 5.2Ah and 6Ah batteries if you're looking for longer run times.

I tested the Einhell with a range of drilling tasks on dimensional lumber and 3/4" plywood using a 2-1/2" hole saw and 1-1/2" spade bit, and driving tasks using standard #8 1-1/2" screws, #10 2-1/2" decking screws and 3/8" x 6" lag screws. I predrilled with the appropriately sized pilot holes (15/64"). Overall, I found that the Einhell had sufficient power for all these tasks. The drill has a comfortable grip, good balance and feels very solid in the hand. The reasonably compact 8" long head means you can work in fairly tight quarters while the bright LED light is angled upwards and does a good job of illuminating the area around the chuck. It includes a reversible belt hook that comes in handy when you're climbing a ladder or need two hands free to move material around.

At just under \$130 the Einhell gives superb bang for your buck in a top-end, consumer-grade drill/driver.



Speed and Torque – Low- and high-speed settings, as well as 20 torque settings, will help you dial in the right RPM and torque for the task at hand.



Power Indicator – With the press of a button, you'll know how much power is left in the battery.

Einhell 18V Cordless Drill/Driver Kit (Model #4513979)
MSRP: \$129.99
Website: Einhell.ca
Tester: Carl Duguay

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Giving Permission to Let Go

We all love our well-equipped workshops, but that may pose challenges to our loved ones in the future.

BY JAMES JACKSON

A few months ago I came across a newspaper article that changed the way I look at my workshop. The story was about the enormous burden that can sometimes come with the death of a loved one when their middle-aged kids or widow must begin the task of sorting through a lifetime of accumulated belongings.

I think the photo that stood out most in my mind was a man, maybe 10 years older than I am, looking totally overwhelmed as he stood in his father's workshop that was packed to the rafters with old tools, piles of wood and jars of old nails. Not only had he just lost his father, but he now had to sift and sort through his stuff and decide what to keep and what to throw away.

It made me think about the legacy I'll leave behind when I'm gone and my loved ones have to sort through my increasingly untidy workshop. Will they resent me for it? Will it tarnish their memory of their dad? If they enjoy woodworking, they might be able to use the tools, but what if they don't take it up?

We don't like to think about it, but the time will come when you no longer need those tools that are hanging in your shop. And that pile of beautiful hardwood you meant to turn into a coffee table or jewelry box will possibly just become firewood.

To avoid some of that resentment I've started to change the way I deal with my workshop and the piles of things that inevitably get left sitting around or stuffed in a drawer. What should they sell? What should they throw away?

First, I'm going to make a list of my tools and determine which ones would be worth the effort to sell, which ones can be given away or are worth donating to a local high school woodshop program, and which ones aren't worth the effort and can probably just be thrown in a dumpster.

Let's face it - if someone isn't deep into the craft, they might see a wall covered in a thousand dollars' worth of clamps and think they're worthless. Or they'll post a used table saw online for twice

what it's worth and wonder why no one is inquiring about it.

Knowledge is key, so pass it along in the form of a list, and update that list whenever new tools are added to (or subtracted from) the shop.

Another tip that's somewhat connected to the first would be to try to keep the workspace clean. This will serve multiple purposes. First, you'll be more efficient in your daily woodworking tasks if your workbench isn't always covered in clutter and if you're not always tripping over power cords and wood cutoffs laying at your feet.

The second benefit, though, is it's easier for an outsider to come in and make sense of the space if it's somewhat tidy and well organized every time you leave.

The final tip - and this one is probably the most important and the inspiration for this article - is to give your spouse or other family members permission to just let it all go.

What do I mean by letting it go? Well, let's put it this way - the overwhelming burden of having to sort through a drawer full of tools and other knickknacks can be compounded by the worry of how the departed would respond to knowing their favourite hammer was bound for the dumpster.

You, the woodworker, should write a letter or leave some other note relieving your loved ones of that pressure. Tell them it's ok. They can get rid of whatever they want in whatever way they want. There is no pressure to keep something just because they worry you might be upset.

Give them permission to just let it all go.

I hope these tidbits of advice were as helpful to you as they were to me. It gave me a new perspective on what really matters, and what little gifts we can leave behind for our loved ones after we're gone.

JAMES JACKSON
james.d.e.jackson@gmail.com



Illustration by Mike Del Rizzo





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