Read ‘awl’ about it

The Lockdown Newsletter from

The Cannock Chase Shed

Issue No. 23

Submissions and suggestions to Bob Mason at:
shednewsletter@virginmedia.com

week ending Sat 17th April 2021

In This Issue….

Prince Philip 1921-2021

On 9th April, the royal family shared with the world the sad news that Prince Philip has died, aged 99. Buckingham Palace announced the news in a statement referring to the Duke of Edinburgh as the Queen's "beloved" husband.

Duke passed away 'gently' as if someone 'took him by the hand'

Despite the struggles of the past year, it seems that the Queen and Prince Philip were able to spend a happy and romantic final year together, in part thanks to the COVID-19 pandemic, enjoying daily walks and dinner together every evening.

Due to lockdown, Prince Philip and the Queen spent most of the past year together at Windsor Castle, which is also where the Duke of Edinburgh sadly died. This large amount of time spent with one another is thought to be unusual for the couple, who were married for 73 years, as they'd often been required to be apart due to work.

Prior to the pandemic, the couple had reportedly become accustomed to living miles apart, particularly after Prince Philip retired from public life in 2017 - and lockdown at Windsor Castle meant they were able to enjoy some valuable days together.

Sources close to the Queen and Prince Philip have reportedly said that they'd grown close again during lockdown, according to *Vanity Fair*, with friends saying that lockdown was a happy time for the couple.

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Back in November, Prince Philip purposely returned to Windsor Castle to spend the second lockdown with the Queen, ensuring they would be together on their 73rd wedding anniversary on 20 November, in a sweet romantic gesture.

The couple are also thought to have jokingly referred to their lockdown experience as 'HMS Bubble', and it seems that they certainly made the most of a difficult year.

Our thoughts are with the royal family during this very sad time.

Philip's funeral will take place next Saturday. in St George's Chapel at 3pm on Saturday 17th April and will be shown on TV

Shed News

Cannock Chase Shed Zoom Webchats

These are still taking place at **10.30 am each Monday**

Committee meetings are held on Tuesdays
(for committee members only)

If you'd like to drop in, please contact Barry
(barrykjames@yahoo.com)
who will help you to get set up, and send you an invitation to join the meeting.

Check our webpage…

...for information about our Shed, updates about reopening and back issues of the newsletter. https://cannockchaseshed.org.uk/

We are on Facebook...

Remember we have a Facebook page, where you can chat with friends, exchange ideas or ask for advice, as well as sharing your projects.

If you are having trouble finding the bits you need for your project, why not post a request? Another member may have just what you're looking for sitting unused in their garage, or they may know where you can get one.

If you have useful items that you are loath to throw away, why not put up a post, offering them to other members, before consigning them to the tip?

Why not post a message now?

Official Facebook page: Private Group
https://www.facebook.com/groups/cannockchaseshedders

Meet the Committee

Dave Shaw	**Chairman**
Leslie Jukes	**Deputy chairman**
Barry James	**Health & Safety**
Avril Green	**Fundraising/Secretary**
Graham Johnson	**Treasurer**
Tim Cutler	**Project Manager**

Shed Media

Peter Ross	**Website/Facebook Group**
Bob Mason	**Newsletter**

Could you...

- Sort through your photos and send me a picture and a few words? – your pet, garden, favourite holiday, your most useful tool, a current or past project, a cooking success (or disaster) or favourite recipe? – Pretty much anything you like.
- send me a suggestion of something you'd like to see included in the newsletter? – anything from just a broad idea, to a finished article.
- send in a 'reader's letter? Share an anecdote or treasured memory? Share your expertise with those who have less experience?
- Send in something else, or help in another way that I haven't even mentioned?

Or if your shy pass it to one of the committees!!!

Tips to protect yourself from scams

Scammers have become more sophisticated in their bid to part us from our cash. Protect yourself from being scammed by following our tips.

- **Tighten your social media privacy settings**

  Update your privacy settings so your profile and the things you post are only visible to your friends and family. You can choose settings that will stop strangers from sending you messages or friend requests. Ignore friend or connection requests from people you don't know in real life.

- **Use an email provider with strong spam filters**

  A good email provider filters out suspect emails and sends them straight to your junk mail so you shouldn't have to deal with them. We'd recommend using Gmail.

- **Use a call blocking service**

  Call blockers stop unsolicited calls. Register for the Telephone Register Service. It's free and if you're signed up, companies shouldn't call you. You can also cheaply buy phones that you can set up to only receive calls from known numbers, while blocking all other calls. Network providers also offer call blocking services, but some do charge a fee.

- **Change your contact details**

  Sadly, if you've been scammed once, you're more likely to be targeted again. It might be worth changing your number and/or email address if you're being bombarded by cold calls and spam.

- **Be protective of your private information**

  Anyone asking for your bank details over the phone, email or a message should raise suspicion, even if you're familiar with the organisation.

Avoid giving out your phone number, email address, postal address and payment details whenever possible. Unfortunately, the trading of personal information and identities online is also very profitable for criminals.

- **Keep your PIN number to yourself**

  Don't let anyone persuade you to hand over your PIN. Your bank will never ask for your PIN - they just don't need it to access your account information.

- **Pick tricky passwords**

  It's annoying remembering lots of passwords, but setting a different password for each of your important accounts is a good idea. If one password becomes compromised, scammers can't use it to access anything else. And the less sense the password makes, the better, so it's not easy to guess.

- **Keep an eye on your credit file**

  Credit scoring services like Experian and Credit Karma allow you to see the history of all the credit products you've signed up for. By regularly checking your credit file you'll pick up on any fraudulent applications that might have been made in your name.

Dyson V10 'Loyalty Programme' emails

Whether you own a Dyson product or not, watch out for an email purporting to be from Dyson promising 'prizes' as part of a fake loyalty program. A recipient of this email became suspicious, believing that fraudsters had spoofed Dyson's official email address, so he reported it to Which?.

Here's what the email looked like and what Dyson had to say.

Dyson phishing email

Fake Clarks advert

Phoney adverts on Facebook promoting Clarks shoes are still lurking around. While Derek may have 'only' lost £29.93 to this con, all scams take their toll.

Here's more about his experience, how he recovered his money and advice on how you can claim back your funds if you end up falling for this type of con.

Derek's experience

'Are search engines failing to adequately protect people from scams? '

Fraudsters are being left to run riot online as search engines leave victims exposed to sophisticated scams that are costing them huge sums of money and often devastating their lives, a Which? investigation has revealed.

Which? analysis of Action Fraud figures suggests that **victims lost £1.7bn over 12 months.** And many scams will also have gone unreported during this period, meaning the true figure is likely to be much higher.

Here's a full report of our findings and advice on how to stay safe from online investment scams.

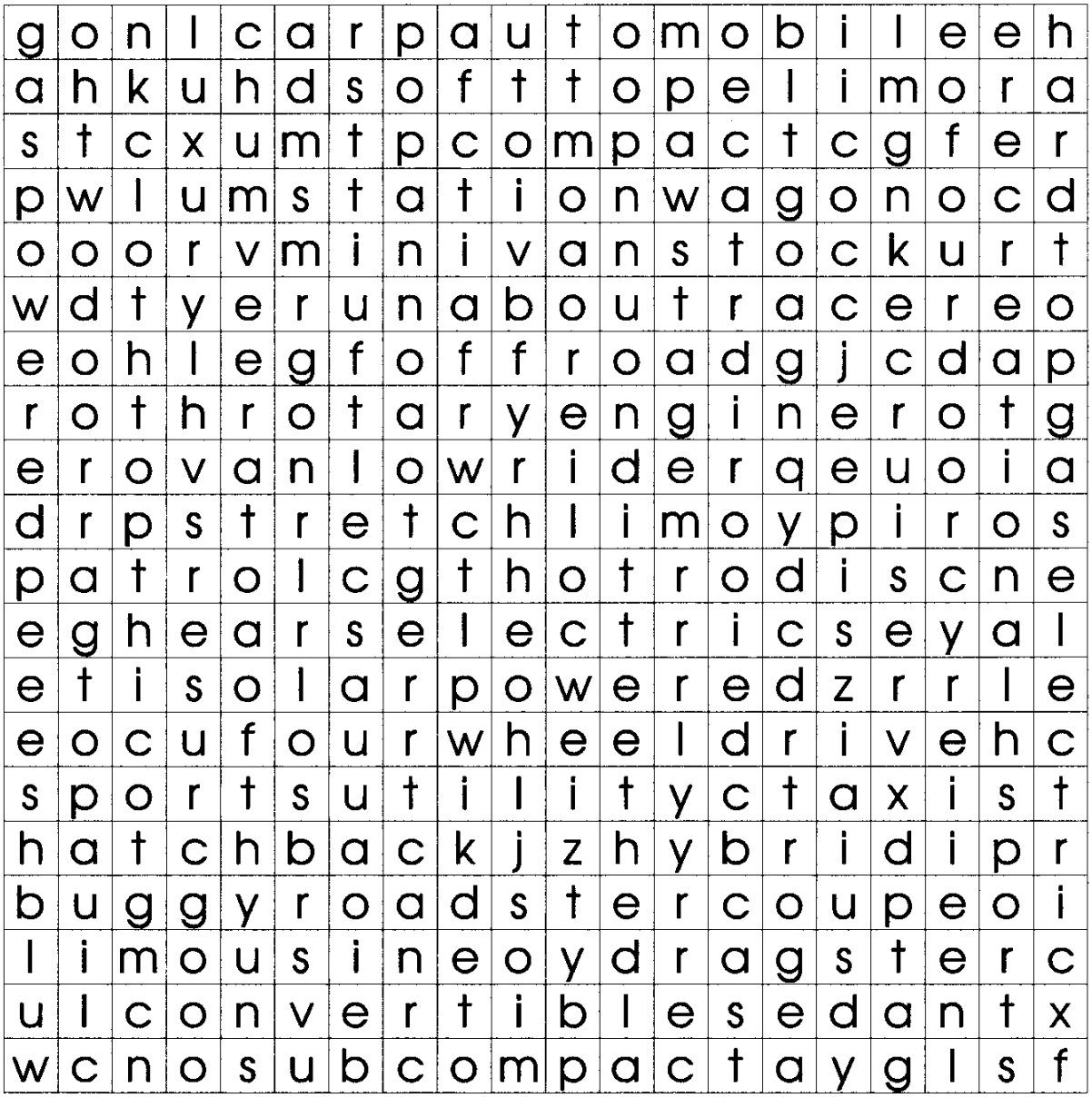
Investment scams on the rise

Protecting yourself against scams during a pandemic

As we're spending more time online, scammers have new and increased opportunities to prey on our reliance on the internet. Here, Citizens Advice joins us to spread awareness and explain more about its work on tackling scams, as well as its four top tips to spot online fraud.

Citizens Advice protection tips

Cars Puzzle – Answer at End



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automobile **buggy** **car** **clothtop**
compact **convertible** **coupe** **cruiser**
dragster **electric** **fourdoor** **fourwheeldrive**
gaspowered **gaselectric** **hardtop** **hatchback**
hearse **hotrod** **humvee** **hybrid**
jeep **limo** **limousine** **lowrider**
luxury **minivan** **offroad** **patrol**
race **ragtop** **roadster** **rotaryengine**
runabout **recreational** **sedan** **softtop**
solarpowered **sports** **sportsutility** **stationwagon**
stock **stretchlimo** **subcompacttaxi** **twodoor** **van**

Humour

There's a strange voice in my head saying: "Vacuum the floor, clean the house!"

Luckily, my mom always told me not to listen to strangers...

BENEFITS OF A GOOD VOCABULARY!

I recently called an old Engineering buddy of mine and asked what he was working on these days.

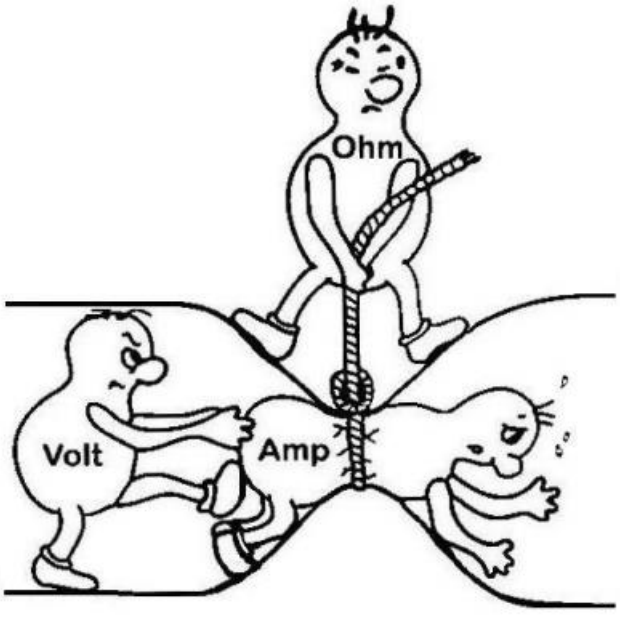
He replied that he was working on "Aqua-thermal treatment of ceramics, aluminum and steel under a constrained environment."

I was impressed until, upon further inquiry, I learned that he was washing dishes with hot water under his wife's supervision.

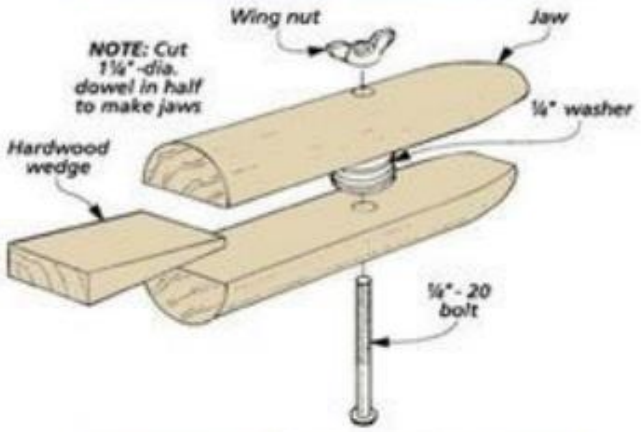
The strong young man at the construction site was bragging that he could outdo anyone in a feat of strength. He made fun of one of the older workmen. After several minutes, the older worker said. "Why don't you put your money where your mouth is," he said. "I will bet a week's wages that I can haul something in a wheelbarrow over to that outbuilding that you won't be able to wheel back."" You're on, the braggart replied. "Let's see what you got. "The old man reached out and grabbed the wheelbarrow by the handles. Then, nodding to the young man, he said: "All right. Get in".

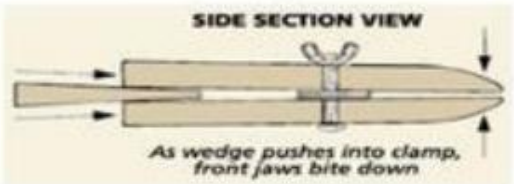
The bad news is,
I accidentally took the wrong medication today.

The good news is,
I'm now protected from heartworms and fleas for the next three months



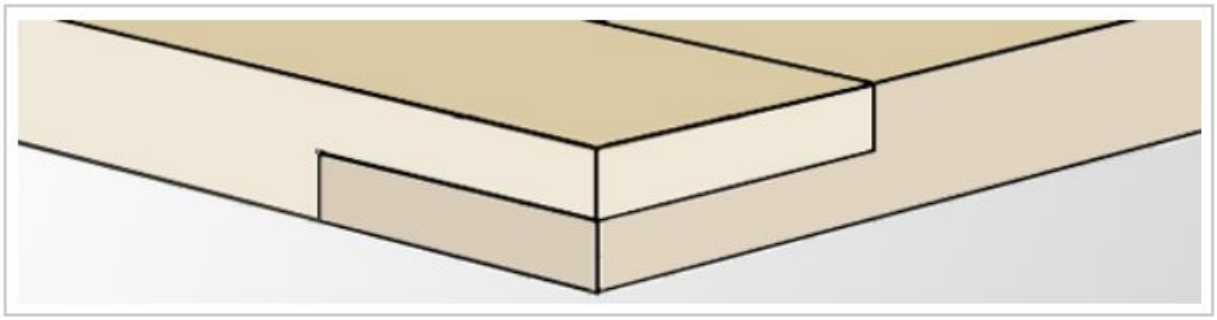
Blimey that's clever!





Blimey that's clever!

Easy Wood Joints – Pocket Holes & Sandwich Laps



The biggest challenge in building something with wood is figuring out how to make two boards come together. Of course, in woodworking terms, this is called a wood joint. Now there are a lot of different types of wood joints — some joints are fairly easy to make, while other joints are much more involved and complex. So how do we decide which type of joint to use? The best way to answer that question is to first think about:

1. What type of project you are building
2. The tools you own
3. The skills you have

First let's take a look at the type of project you might have in mind. For example, building fine furniture for the home, like a desk, a cabinet, or a bookcase — usually requires some fairly sophisticated wood joinery:

half lap joints
cross-lap joints
dados and grooves
rabbet joints
mortise and tenon joints
miters

Also, these kinds of wood joints require some fairly sophisticated shop tools:

Jointer
Table Saw
Dado Blade Set
Router
Router Table
Drill Press

Now as much as I admire the quality and craftsmanship that goes into building projects like this, I think this level of woodworking might be out of reach for a lot of people. The tools can get very expensive, and it takes some time to learn how to use them. That's why I'm always looking for alternative joints that can be

made with fewer (and less expensive) shop tools — and joints that don't require the skills of a master craftsman. Two of my favorite examples are:

Pocket Hole Joints
At first glance, a pocket hole joint resembles a simple butt joint – that is, two pieces of wood stuck together end to end. However, a butt joint by itself is relatively weak, and usually requires some complicated joinery or extra hardware to help hold the boards together. That's where pocket hole joints come to the rescue. Now to make a pocket hole joint, you'll need a pocket hole jig — a special tool that helps you drill a pilot hole (at 15 How to - Wood Joints - Pocket Hole & Sandwich Half Lapdegrees) for driving pocket hole screws into an adjoining board. This creates such a remarkably strong joint that in most cases, you won't even need to use glue.

Pocket hole joints are perfect for building things like:

Carcass (the inner skeleton of a cabinet)
Face frames (that you attach to a cabinet)
Solid Wood Box

The best part about pocket hole joints is that you can build fairly complex furniture without spending a fortune on tools. All you need are a circular saw, a combination drill & driver, a pocket hole jig, and few hand clamps from around your shop. And once you get the hang of making pocket hole joints, your project ideas are limited only by your imagination.

Sandwich Joints Now let's take a look at another type of simple and easy joinery that I call the "sandwich" joint. A sandwich joint very similar to a conventional half-lap joint, which is one of the most widely-used types of joinery in woodworking. And for good reason. Half lap joints are incredibly strong and durable. And that's because of the extra gluing surface it provides. Now remember that the more gluing surface in a joint, the stronger the bond.

The only problem with conventional half lap joints is that they require some of the more expensive woodworking tools I mentioned earlier; tools that might also be difficult for beginners to use. That's why I like the sandwich joint. It takes full advantage of the strength of a conventional half-lap, but is simpler, easier, and less expensive to make. The basic idea is to attach one board to the top of another, while leaving a wide overhang at the end. The overhang creates a "step" or a "lap" on to which another sandwiched board can be mounted. Bringing all four boards together in this fashion creates an incredibly strong joint, which can be just as strong as a conventional half-lap joint.

How it Works

1. Create the Lap
The first task at hand in setting up a sandwich half lap is to figure out where to attach board #1 to board #2 (see illustration). Keep in mind that the "lap" we're creating here should provide a perfectly-matched resting place for another "sandwiched" board that we'll be attaching later. That means the size of the gap should match the width of the boards we're using in the joint.

2. Make the Sandwich
Once you've determined where to position the boards on top of each other, it's time to make the sandwich. First I like to spread a thin layer of glue between the two adjoining boards, then secure them with a couple wood clamps or a few finish nails. If I'm using traditional woodworking glue (like Elmer's), I like to let things dry overnight before moving on to the next step.

3. Create the Joint

After the sandwiched boards are glued, dried and ready to go, it's time to create the joint itself. I like to start by doing what woodworkers call "a dry assembly" — which means before I bring out the glue and woodscrews, I place the boards together just to see how they fit. If everything looks good, I can proceed with completing the joint.

There are several ways to go about completing a joint like this. Some builders like to use woodscrews or nails exclusively, while others avoid fasteners entirely, bringing half-lap joints together with nothing more than a few clamps and some glue. However, keep in mind that the glue-and-clamp method (no fasteners) requires a nearly perfect mesh between the two boards for the joint to work. That means starting with a surface that is super flat, straight, and square. That's not so much a problem in a well-equipped woodworking shop, where less-than-perfect boards from a home center can be machined down to perfection with planers and jointers. For those of us who use boards as-is from the big-box store, we're better off using some type of fastener in the joint.

Common woodscrews seem to work really well with the sandwich half-lap joint I've been talking about here. Of course the size of screws you'll want to buy depends on the type of lumber you are using. You can download a free chart from my website that matches the correct size fastener to a particular board thickness. Get download here. The number of screws you'll need also depends on the size of board you are using. For example, when building projects with 1x lumber (1x6s, 1x10s, 1x12s), I try to space my fasteners about 4 inches apart. That usually means driving three screws along the edge of the board.

To make sure my woodscrews are spaced evenly, I like to use a pilot hole guide (template) to mark where I'll drill my pilot holes. This makes the whole process extremely quick and easy, and helps eliminate any chance of driving the woodscrews too close to the edge of a board.

Ideal Projects for Using Sandwich Half Laps

I've found the sandwich-half-lap method perfect for creating a basic frame (or "carcass") for any number of different projects, like cabinets, tables, and simple boxes. Sandwich half laps are especially useful for building a simple shop workbench. By doubling up 2x4s to serve as legs, rails, and stretchers, you can create an amazingly strong and durable bench that will last a lifetime. You can find out more about building a workbench like this here.

Lockdown Story

In June last year I ordered a Greenhouse and in September with Graham's help we put down a concrete base using scaffolding board for the shuttering, the photos and story for this are in Issue 15 so as I have now finished it I thought maybe you'd like to put it in the next issue of the Newsletter.

Before starting to build the greenhouse, I put a length of conduit below the soil for putting electrics in at a later date. The first job I had to do before starting the greenhouse was bolting together the aluminium base (recommended optional extra) and then screw it to the concrete.

With the help of my son Robert, it then took two days to make up the framework and put the glass in. The greenhouse is fixed to the base using brackets that hook underneath the lip of the base and are then bolted to the greenhouse frame.

As the manhole cover pokes through into the greenhouse by about four inches, I used a lintel (which I purchased with the one I used in the concrete base) to support the slabs over the manhole cover and mortared both the lintel and slabs in place, including the row running the length of the greenhouse.

For the rest of the slabs, I put them on 10mm aggregate, the slabs are 400mm square and six were just the right amount for the length except for about one inch which I filled in with a bit of mortar. The row nearest to the concrete base I had to cut down by 100mm as I had offset the first row of slabs to give me more space on the right-hand side. Underneath the aggregate, I put down some weed suppressant material as I did on the right-hand side which I covered with aggregate as well, as I am using grow bags.

The next build was staging. for this I used the scaffolding board that was used for the concrete shuttering. I sanded the concrete from them, the boards were 7 inches wide so I cut them down to 3 inches then cut them down to length for the legs and shelves, making it 6 feet x 20 inches wide. I then painted them and used stainless steel bolts and screws to fix it together and fitted adjustable feet to the bottom of the legs in case it needed levelling up when in its final position. For the top I used decking board which I was going to paint green as well but three people said it would look better left natural and after completing it I have to admit it does look good. The last photo shows it finished and just waiting for plants which I have growing in the living room at the moment.

Dave

Drill bit

From Wikipedia, the free encyclopedia

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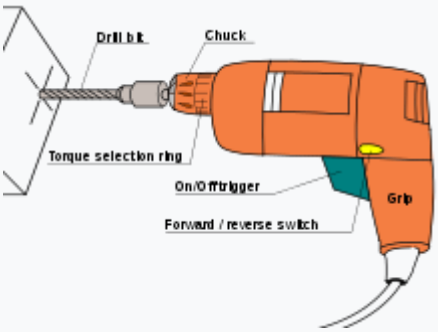
From top to bottom: Spade, lip and spur (brad point), masonry bit and twist drill bits



Drill bit (upper left), mounted on a pistol-grip corded drill.

A set of masonry drill bits

Drill bits are cutting tools used to remove material to create holes, almost always of circular cross-section. Drill bits come in many sizes and shapes and can create different kinds of holes in many different materials. In order to create holes drill bits are usually attached to a drill, which powers them to cut through the workpiece, typically by rotation. The drill will grasp the upper end of a bit called the *shank* in the chuck.

Drill bits come in standard sizes, described in the drill bit sizes article. A comprehensive drill bit and tap size chart lists metric and imperial sized drill bits alongside the required screw tap sizes. There are also certain specialized drill bits that can create holes with a non-circular cross-section.[1]

While the term *drill* may refer to either a drilling machine or a drill bit while in use in a drilling machine, in this article, for clarity, *drill bit* or *bit* is used throughout to refer to a bit for use in a drilling machine, and *drill* refers always to a drilling machine.

Characteristics

Drill bit geometry has several characteristics:

The **spiral** (or rate of twist) in the drill bit controls the rate of chip removal. A fast spiral (high twist rate or "compact flute") drill bit is used in high feed rate applications under low spindle speeds, where removal of a large volume of chips is required. Low spiral (low twist rate or "elongated flute") drill bits are used in cutting applications where high cutting speeds are traditionally used, and where the material has a tendency to gall on the bit or otherwise clog the hole, such as aluminum or copper.

The **point angle**, or the angle formed at the tip of the bit, is determined by the material the bit will be operating in. Harder materials require a larger point angle, and softer materials require a sharper angle. The correct point angle for the hardness of the material influences wandering, chatter, hole shape, and wear rate.

The **lip angle** determines the amount of support provided to the cutting edge. A greater lip angle will cause the bit to cut more aggressively under the same amount of point pressure as a bit with a smaller lip angle. Both conditions can cause binding, wear, and eventual catastrophic failure of the tool. The proper amount of lip clearance is determined by the point angle. A very acute point angle has more web surface area presented to the work at any one time, requiring an aggressive lip angle, where a flat bit is extremely sensitive to small changes in lip angle due to the small surface area supporting the cutting edges.

The **functional length** of a bit determines how deep a hole can be drilled, and also determines the stiffness of the bit and accuracy of the resultant hole. While longer bits can drill deeper holes, they are more flexible meaning that the holes they drill may have an inaccurate location or wander from the intended axis. Twist drill bits are available in standard lengths, referred to as Stub-length or Screw-Machine-length (short), the extremely common Jobber-length (medium), and Taper-length or Long-Series (long).

Most drill bits for consumer use have straight shanks. For heavy duty drilling in industry, bits with tapered shanks are sometimes used. Other types of shank used include hex-shaped, and various proprietary quick release systems.

The diameter-to-length ratio of the drill bit is usually between 1:1 and 1:10. Much higher ratios are possible (e.g., "aircraft-length" twist bits, pressured-oil gun drill bits, etc.), but the higher the ratio, the greater the technical challenge of producing good work.

The best geometry to use depends upon the properties of the material being drilled. The following table lists geometries recommended for some commonly drilled materials.

Tool geometry[2]

Workpiece material	Point angle	Helix angle	Lip relief angle
Aluminum	90 to 135	32 to 48	12 to 26
Brass	90 to 118	0 to 20	12 to 26
Cast iron	90 to 118	24 to 32	7 to 20
Mild steel	118 to 135	24 to 32	7 to 24
Stainless steel	118 to 135	24 to 32	7 to 24
Plastics	60 to 90	0 to 20	12 to 26

Materials

Titanium nitride coated twist bit

Many different materials are used for or on drill bits, depending on the required application. Many hard materials, such as carbides, are much more brittle than steel, and are far more subject to breaking, particularly if the drill is not held at a very constant angle to the workpiece; e.g., when hand-held.

Steels

Soft **low-carbon steel** bits are inexpensive, but do not hold an edge well and require frequent sharpening. They are used only for drilling wood; even working with hardwoods rather than softwoods can noticeably shorten their lifespan.

Bits made from **high-carbon steel** are more durable than low-carbon steel bits due to the properties conferred by hardening and tempering the material. If they are overheated (e.g., by frictional heating while drilling) they lose their temper, resulting in a soft cutting edge. These bits can be used on wood or metal.

High-speed steel (HSS) is a form of tool steel; HSS bits are hard and much more resistant to heat than high-carbon steel. They can be used to drill metal, hardwood, and most other materials at greater cutting speeds than carbon-steel bits, and have largely replaced carbon steels.

Cobalt steel alloys are variations on high-speed steel that contain more cobalt. They hold their hardness at much higher temperatures and are used to drill stainless steel and other hard materials. The main disadvantage of cobalt steels is that they are more brittle than standard HSS.

Others[edit]

Tungsten carbide and other carbides are extremely hard and can drill virtually all materials, while holding an edge longer than other bits. The material is expensive and much more brittle than steels; consequently they are mainly used for drill-bit tips, small pieces of hard material fixed or brazed onto the tip of a bit made of less hard metal. However, it is becoming common in job shops to use solid carbide bits. In very small sizes it is difficult to fit carbide tips; in some industries, most notably printed circuit board manufacturing, requiring many holes with diameters less than 1 mm, solid carbide bits are used.

Polycrystalline diamond (PCD) is among the hardest of all tool materials and is therefore extremely resistant to wear. It consists of a layer of diamond particles, typically about 0.5 mm (0.020 in) thick, bonded as a sintered mass to a tungsten-carbide support. Bits are fabricated using this material by either brazing small segments to the tip of the tool to form the cutting edges or by sintering PCD into a vein in the tungsten-carbide "nib". The nib can later be brazed to a carbide shaft; it can then be ground to complex geometries that would otherwise cause braze failure in the smaller "segments". PCD bits are typically used in the automotive, aerospace, and other industries to drill abrasive aluminum alloys, carbon-fiber reinforced plastics, and other abrasive materials, and in applications where machine downtime to replace or sharpen worn bits is exceptionally costly. PCD is not used on ferrous metals due to excess wear resulting from a reaction between the carbon in the PCD and the iron in the metal.

Coatings

Diamond-coated 2 mm bits, used for drilling materials such as glass

Black oxide is an inexpensive black coating. A black oxide coating provides heat resistance and lubricity, as well as corrosion resistance. The coating increases the life of high-speed steel bits.

Titanium nitride (TiN) is a very hard ceramic material that can be used to coat a high-speed steel bit (usually a twist bit), extending the cutting life by three or more times. Even after sharpening, the leading edge of coating still provides improved cutting and lifetime.

Titanium aluminum nitride (TiAlN) is a similar coating that can extend tool life five or more times.

Titanium carbon nitride (TiCN) is another coating also superior to TiN.

Diamond powder is used as an abrasive, most often for cutting tile, stone, and other very hard materials. Large amounts of heat are generated by friction, and diamond-coated bits often have to be water-cooled to prevent damage to the bit or the workpiece.

Zirconium nitride has been used as a drill-bit coating for some tools under the Craftsman brand name.

Al-Chrome Silicon Nitride (AlCrSi/Ti)N is a multilayer coating made of alternating nanolayer, developed using chemical vapor deposition technique, is used in drilling carbon fiber reinforced polymer (CFRP) and CFRP-Ti stack. (AlCrSi/Ti)N is a superhard ceramic coating, which performs better than other coated and uncoated drill.[3][4]

BAM coating is Boron-Aluminum-Magnesium BAlMgB14 is a superhard ceramic coating also used in composite drilling.[3][5]

Universal bits

General-purpose drill bits can be used in wood, metal, plastic, and most other materials.

Twist drill bits

The twist drill bit is the type produced in largest quantity today. It comprises a cutting point at the tip of a cylindrical shaft with helical flutes; the flutes act as an Archimedean screw and lift swarf out of the hole.

The twist drill bit was invented by Steven A. Morse of East Bridgewater, Massachusetts in 1861.[6][7] The original method of manufacture was to cut two grooves in opposite sides of a round bar, then to twist the bar (giving the tool its name) to produce the helical flutes. Nowadays, the drill bit is usually made by rotating the bar while moving it past a grinding wheel to cut the flutes in the same manner as cutting helical gears.

Twist drill bits range in diameter from 0.002 to 3.5 in (0.051 to 88.900 mm)[8] and can be as long as 25.5 in (650 mm).[9]

The geometry and sharpening of the cutting edges is crucial to the performance of the bit. Small bits that become blunt are often discarded because sharpening them correctly is difficult and they are cheap to replace. For larger bits, special grinding jigs are available. A special tool grinder is available for sharpening or reshaping cutting surfaces on twist drill bits in order to optimize the bit for a particular material.

Manufacturers can produce special versions of the twist drill bit, varying the geometry and the materials used, to suit particular machinery and particular materials to be cut. Twist drill bits are available in the widest choice of tooling materials. However, even for industrial users, most holes are drilled with standard high speed steel bits.

A 5 mm carbide bit displaying shallow point angle.

The most common twist drill bit (sold in general hardware stores) has a point angle of 118 degrees, acceptable for use in wood, metal, plastic, and most other materials, although it does not perform as well as using the optimum angle for each material. In most materials it does not tend to wander or dig in.

A more aggressive angle, such as 90 degrees, is suited for very soft plastics and other materials; it would wear rapidly in hard materials. Such a bit is generally self-starting and can cut very quickly. A shallower angle, such as 150 degrees, is suited for drilling steels and other tougher materials. This style of bit requires a starter hole, but does not bind or suffer premature wear so long as a suitable feed rate is used.

Drill bits with no point angle are used in situations where a blind, flat-bottomed hole is required. These bits are very sensitive to changes in lip angle, and even a slight change can result in an inappropriately fast cutting drill bit that will suffer premature wear.

Long series drill bits are unusually long twist drill bits. However, they are not the best tool for routinely drilling deep holes, as they require frequent withdrawal to clear the flutes of swarf and to prevent breakage of the bit. Instead, gun drill bits are preferred for deep hole drilling.

Twist drill bit cutting edges

Twist drill bit with Morse taper shank

11⁄32 in (8.7313 mm) drill bits - long-series morse, plain morse, jobber

Step drill bits

A **step drill bit** is a drill bit that has the tip ground down to a different diameter. The transition between this ground diameter and the original diameter is either straight, to form a counterbore, or angled, to form a countersink. The advantage to this style is that both diameters have the same flute characteristics, which keeps the bit from clogging when drilling in softer materials, such as aluminum; in contrast, a drill bit with a slip-on collar does not have the same benefit. Most of these bits are custom-made for each application, which makes them more expensive.[10]

Unibit

A pair of unibits.

A **unibit** (often called a step drill bit) is a roughly conical bit with a stairstep profile.[10] Due to its design, a single bit can be used for drilling a wide range of hole sizes. Some bits come to a point and are thus self-starting. The larger-size bits have blunt tips and are used for hole enlarging.

Unibits are commonly used on sheet metal[10] and in general construction. One drill bit can drill the entire range of holes necessary on a countertop, speeding up installation of fixtures. They are often used on softer materials, such as plywood, particle board, drywall, acrylic, and laminate. They can be used on very thin sheet metal, but metals tend to cause premature bit wear and dulling.

Unibits are ideal for use in electrical work where thin steel, aluminum or plastic boxes and chassis are encountered. The short length of the unibit and ability to vary the diameter of the finished hole is an advantage in chassis or front panel work. The finished hole can often be made quite smooth and burr-free, especially in plastic.

An additional use of unibits is deburring holes left by other bits, as the sharp increase to the next step size allows the cutting edge to scrape burrs off the entry surface of the workpiece. However, the straight flute is poor at chip ejection, and can cause a burr to be formed on the exit side of the hole, more so than a spiral twist drill bit turning at high speed.

The unibit was invented by Harry C. Oakes and patented in 1973.[11] It was sold only by the Unibit Corporation in the 1980s until the patent expired, and was later sold by other companies. Unibit is a trademark of Irwin Industrial Tools.

Although it is claimed that the stepped drill was invented by Harry C. Oakes it was in fact first produced by Bradley Engineering, Wandsworth, London in the 1960s and named the Bradrad. It was marketed under this name until the patent was sold to Halls Ltd.uk by whom it is still produced.

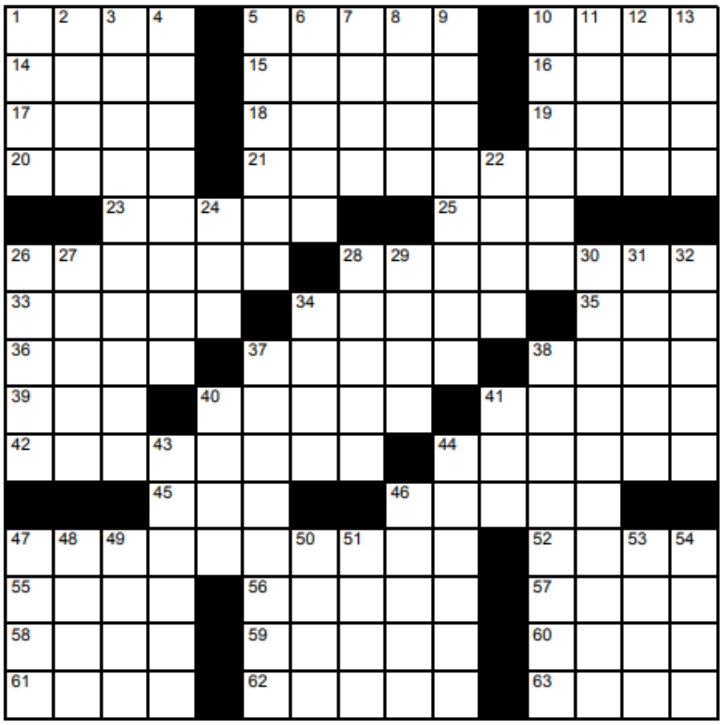
Hole saw

Main article: Hole saw

1.25 in (32 mm) hole saw bit.

Hole saws take the form of a short open cylinder with saw-teeth on the open edge, used for making relatively large holes in thin material. They remove material only from the edge of the hole, cutting out an intact disc of material, unlike many drills which remove all material in the interior of the hole. They can be used to make large holes in wood, sheet metal and other materials.

Crossword #1



Across

1. Peter I, for one
5. Border plant
10. Call to a mate
14. Altar locale
15. Gibson garnish
16. Ice cream treat
17. Quarterback's option
18. Girder material
19. Comedienne Imogene
20. "Halt!"
21. Verse of four measures
23. Show fear
25. Dead letters?
26. Kind of cord
28. Chill out
33. Unrefined
34. Energize (with "up")
35. Block
36. Hourly charge
37. Stake
38. Look after
39. Chowed down
40. Neglected boy
41. Abstain
42. From the age of chivalry
44. Plow's trail
45. "Gosh!"
46. Heart line
47. Smelly pranks
52. Desire
55. Fashion designer Chanel
56. Circa
57. Showy flower
58. Unpleasant emanation
59. Hangman's knot
60. Air show stunt
61. Strengthen, with "up"
62. Dissuade
63. Kitty starter

Down

1. Last call?
2. Cross words
3. Kind of press
4. Answer
5. Inexpensive lodging
6. Script direction
7. South Beach, for one
8. Suffix with theater
9. Darkroom apparatus
10. Click the OK button
11. Knee-slapper
12. Enough, for some
13. Academic period
22. Personal air
24. Is no longer
26. "Beat it!"
27. Go on and on
28. Watch
29. Square
30. Mental lapse
31. Ballroom dance
32. Fund
34. Buddhist leader
37. Range of frequencies
38. Tex-Mex staple
40. Nerdy one
41. PETA peeve
43. Slight, in a way
44. Encourage
46. Bullying, e.g.
47. Kilt wearer
48. Type of list
49. Desktop feature
50. Double-reed instrument
51. Kind of court
53. Congeal
54. Hoopla

Answer at End

Sudoku 1

	8		5				4	3
		5	3	6				
			4	9	7		1	
						4		
5	4			7			3	
7							6	1
					1		8	
1			2					4
		2	9		5			

Sudoku 2

9	8				2			
	2			9		6		
						3		
6			7	5			8	
5	4		3					
					4		6	
7	1	2						
						7		5
	3		6		9		4	

Sudoku 3

	4	1			6	8		5
				8				1
		2			7			4
	9	3		6				
						3		8
	7		1		9			
1	8	7		4				
		9				6	4	
5				9				3

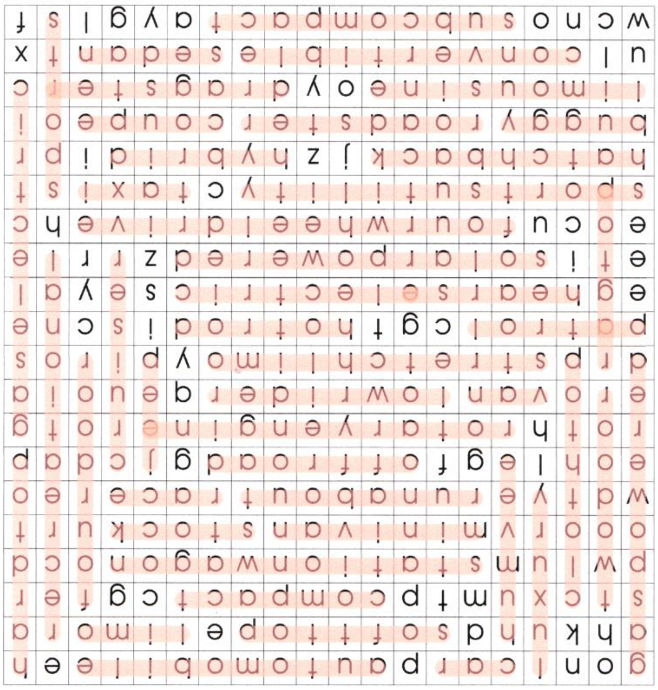
Sudoku 4

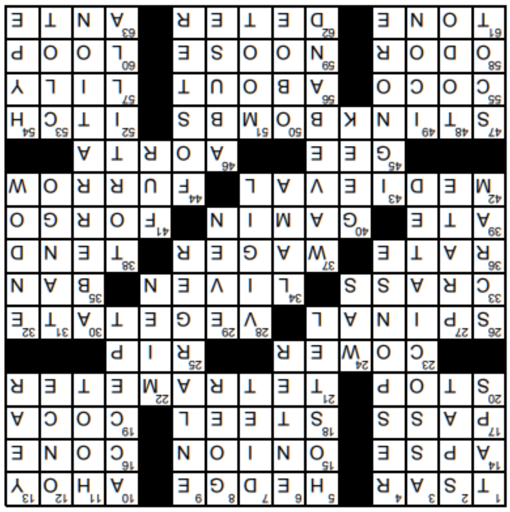
			1		8			4
	7						1	
5		8			4		3	9
8	2		7					
9		4				8		
				4	5		6	
		9			6			
2								3
7			4	5		2		

Answers at End

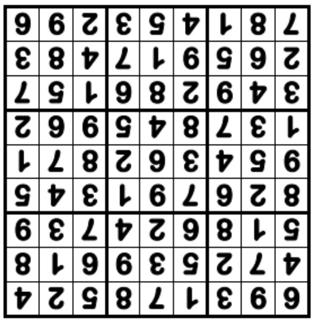
Answers to puzzles

No cheating

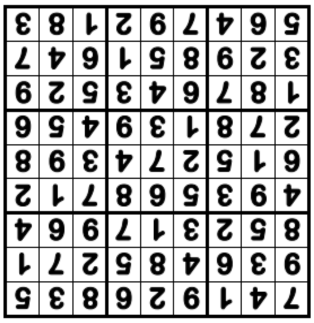




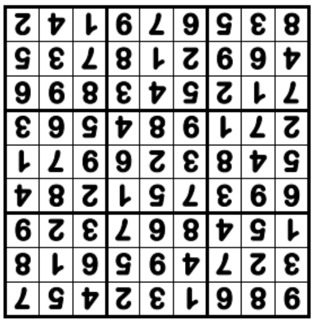
Solution for Crossword #1



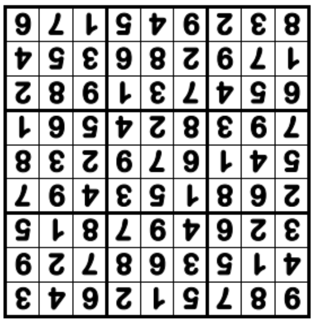
Sudoku 4 Solution



Sudoku 3 Solution



Sudoku 2 Solution



Sudoku 1 Solution