How to tie various knots

by **adaviel** on September 7, 2009

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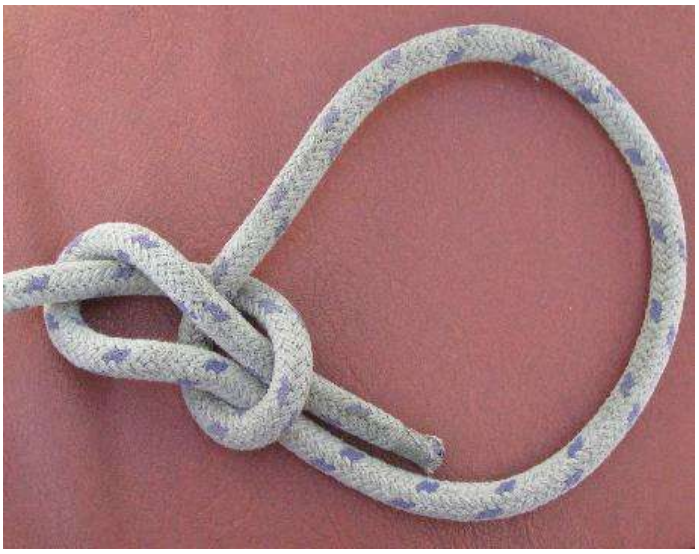
Intro: How to tie various knots

Knots, as a way of joining rope without special equipment, are useful in many situations. On a sailboat, knots are essential both for daily use and for emergency repairs. This instructable describes several different common knots:, e.g.

Sheet Bend - to tie two lines together
Bowline - to make a loop
Reef Knot - to fasten a bundle of material
Fishermans Bend - to secure a line to a post or ring

These knots are good for regular rope - braided or 3-strand polyester or natural fibre (hemp, sisal). Monofilament (fishing line) or steel cable performs better with different knots.

Knots are typically quite a lot weaker than straight rope - when rope goes around a tight radius, such as in a knot, the outside is under more tension than the inside. Splices (which require special tools, and are time-consuming to make) are stronger, so permanent fittings usually have eye-splices



Step 1: Sheet Bend

The sheet bend is used to tie two lines together. It is perhaps the most generally useful knot of all. When used to tie a line to itself, making a loop, it is called a bowline. The strain is taken on the ropes in the middle - not the one coming out the side.

How the knot is made is not critical - it is the final shape that is important. One can make the flat loop first, and work the other rope around it. Or one can make the crossed loop first - required when tying a bowline.

The two images show front and back views of the same knot

Advantages:
Easy to make
Easy to undo when tension is removed
Does not easily capsize

Disadvantages:
Hard to make under load
Dangerous to make under heavy load

Uses:
Joining two equally-sized ropes
Extending a towline or stern line

Method 1: the same as a bowline

Method 2: starting with the flat loop

Step 2: Double Sheet Bend

The double sheet bend is used to tie two lines of different thickness - but not too different. It is the same as a normal sheet bend, but with an extra turn of the thinner rope around the flat loop in the thicker.
The load goes on the line through the flat loop, not the one that comes out the side of the knot.

Uses:
Securing a heaving line to a tow line
Extending a stern line if you don't have enough line of one thickness

Step 3: Bowline

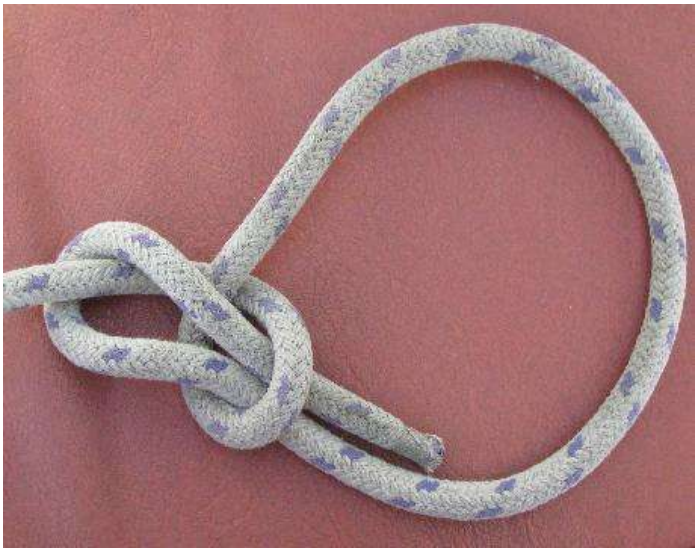
The bowline is really a special case of the sheet bend, but it it tied at the end of a rope to make a loop.

The photos show the completed loop, and closeups of the front and back of the actual knot. Note that it is the same as the sheet bend - but it must be made the right way round. This loop does not tighten in use. The knot is quite easy to untie once the load is removed. With practice, it is very quick to tie.

Some uses:
Securing a dinghy line to a railing or stanchion
Securing an anchor line to an anchor
Tie a jib sheet to the sail
Tie a mooring line around a rock or tree
Tie a float to an anchor tripline
Use one in each line to tie two ropes of very different sizes - e.g. a throwing line to a large tow rope
Disadvantages: the knot must be completely made before it will take any strain - it is hard to tie if there is already a load on the rope

Linked bowlines:

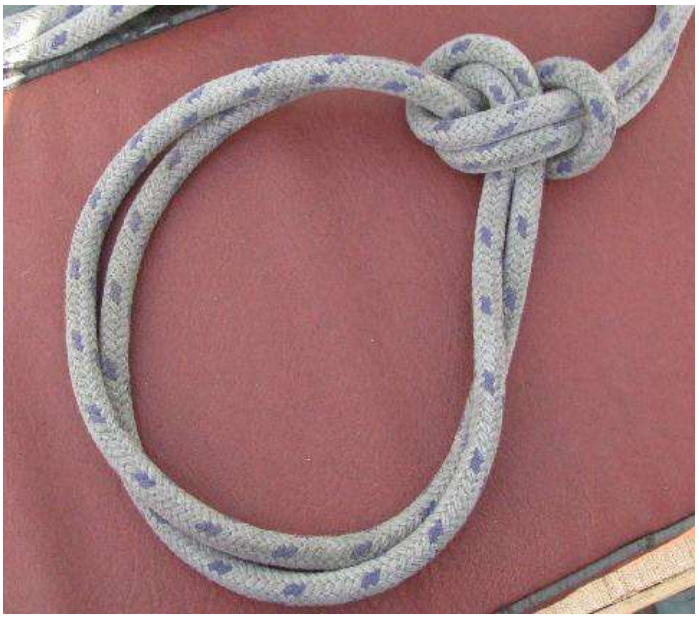
CLICK TO PLAY VIDEO



Step 4: Bowline on the Bight

A bowline "on the bight" is a bowline tied in a loop of rope (neither end is needed). The shape is the same as a bowline made with a double line, but the middle of the bight forms the loop around the standing part.

Uses:
An impromptu bosun's chair - to sit in while being transferred between two boats at sea



Step 5: Clove Hitch

The clove hitch can be made when you only have the bight (the middle) of a rope, not the ends.

Uses:
Securing a burgee pole to a burgee halyard (a continuous loop of thin line)
Securing a tiller from swinging

CLICK TO PLAY VIDEO

Step 6: Round Turn and Two Half-Hitches

This is a knot used to secure a line to a ring or bar. Wind a couple of turns around the bar, then secure the end with two hitches around the standing part (this looks like a clove hitch when done).

Advantages:
Can be made under load - it is easy to take turns around the bar while maintaining tension on the rope
Strong - provided the bar is thicker than the rope, the rope is not weakened by sharp bends.
Disadvantages:
The end tends to work loose

Uses:
Securing a line to a mooring ring or samson post

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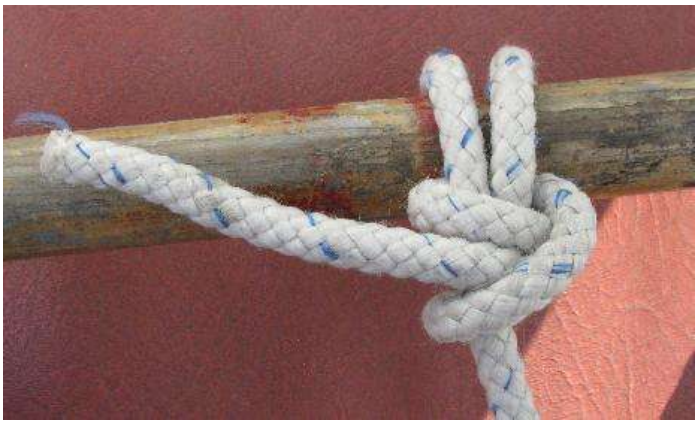
Step 7: Fishermans Bend

The fishermans bend is the same as the round turn and two half hitches, except that the first hitch is looped under the round turn. This uses the tension on the rope to secure the end from working loose.

Advantages:
Secure against working loose

Disadvantages:
Hard to make under tension
Hard to undo under tension
May seize up under load when wet, making it hard to undo

Uses:
Securing mooring line to ring
Securing fender lines to rail



Step 8: Studsail Bend

The studsail bend is like the fishermans bend, but the second hitch is also secured under the round turn, making it even more secure against working loose when under tension

Advantages:
Very secure against working loose
Disadvantages:
Hard to make under tension
Hard to undo under tension

Step 9: Figure-8 Knot

The figure-eight knot is used to prevent an end of rope from passing through a block (pulley). Sometimes called a "stopper knot".

The double figure-8 knot is used in rock climbing, as an alternative to a bowline, to secure a climbing harness to the end of a safety rope. The double knot is made by making a single knot, then tracing back around the knot with the free end after passing it around the harness loop.

Advantages:
Easy to verify by inspection
Not prone to work loose

Disadvantages:
Slow to make and undo
Cannot be made under load

Step 10: Prussic Knot

The prussic knot may be used as a climbing ascender - when made around a vertical rope as shown, downwards tension on the ends locks the knot, while release of tension allows it to be slid up the rope. A pair of prussic knots on foot loops may be used in tandem to climb a rope.

Uses:
Climbing a rope
Taking up tension to free a riding turn on a winch

Step 11: Reef Knot

The reef knot, or square knot, is used to tie a bundle of material together. It must be made around something - it should not be used to tie two free ropes together, because it can easily capsize.
It should not be used to make a loop, unless it can be tensioned around a solid object. It should not be used around a person - use a bowline instead. A capsized reef knot will slip easily and could constrict and cause severe injury.

Uses:
Reefing a sail (tying the unused portion around a spar)
Securing a furled sail to a spar (sail ties)
Wrapping a parcel
Tying shoelaces

Advantages:
May be made under moderate load

Disadvantages:
Capsizes (works free) if used improperly
Can seize up under load when wet

Tying the knot:

Capsizing a reef knot:

Step 12: Cleats

This is not a knot, but is very common on boats.
The first picture shows a rope cleated normally. The second shows one with a final locking turn - the last turn is twisted before placing over the cleat so that the tension on the rope helps secure the free end.

When working with ropes under tension, take a turn or two around a winch or cleat before trying to secure the end with a knot. The load on the free end falls exponentially with each turn taken. Severe injury can result if a finger or other body part is caught in a loop of rope, or between a rope and another object.

Step 13: Practice them!

It is sometimes useful to be able to tie knots in the dark, or as in this video, behind your back

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Comments

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big al psyches1048 says: Sep 11, 2009. 7:13 PM **REPLY**

when i clicked onto this comment site, i got the *we have a 'be nice' comment policy* statement so i'm going to slip and slide on the side of political correctness.

When a rope has a splice formed at its end, again stronger and more permanent than a loop or bight, that is called an 'eye splice' !

when two ropes are joined making an open splice, and used to apply equal 'sideways' pressure from the directions of the newly formed ropes 'new ends' the pull exerted 'closes' the splice against the bullard,pin,spike,or cleat
-- said splice is technically called a c*nt splice, and was listed along with
instructions to make it in both the midshipmans manuals, and blue jackets
manuals,at least until just before WW 1 ! !

RabidAlien says: Jun 14, 2011. 2:38 PM **REPLY**

Good info on splices! One trick I picked up as a lifeguard in the Boy Scouts (aeons ago, now) was to take a two-foot length of three-strand hemp rope (or something thereabouts, just not too short and not plastic), put about six or eight inches of end-splice on one end for a handle. On the other end, start the same thing, but after tying the crown knot to hold the un-twisted ends in place, leave the three strands free and start to untwist the individual strands until you have a nice fuzzy "mess" hanging. Grab the spliced handle, and the fluffy part makes for a very excellent fly-swatter, an essential tool for anyone sitting still for hours on end in horsefly country. Everyone had one, and everyone loved em...until some idiot tried to cat-o-nine tail the wrong person with it, and ended up in the deep end. The individual threads on the fly end are strong enough to stand up to several weeks' worth of fairly frequent use, yet limber enough that you don't feel like your whacking yourself with heavy-gage wire.

durgledoggy says: Mar 27, 2011. 1:26 PM **REPLY**

This needs a video methinks. I could do it, but my method is still a bit sloppy and "not pretty".

sellulose says: May 23, 2010. 3:53 AM **REPLY**

Please could you post a video for this one and for all the other knots without videos. Its will make it so easy to learn.

I totally did not understand this one.

ibcallus says: Apr 30, 2010. 1:25 AM **REPLY**

Very well explained thank you very much,
ibcallus

rspetersga says: Apr 19, 2010. 8:21 AM **REPLY**

I'm not understanding how to tie this knot from the pictures.....

paulzer02 says: Apr 26, 2010. 3:09 AM **REPLY**

The looped end of the rope is passed through the double loop far enough to open it up enough to pass the whole of the rest of the knot back through it, which effectively puts it on the other side of the free ends of the rope. It is then pulled back through the double loop to tighten the knot.

rspetersga says: Apr 26, 2010. 6:49 AM **REPLY**

(dope slap to forehead) I call myself trying that and it not working, but tried again with your instructions and it did.

Thanks for pointing out the obvious!

cbrown222 says: Sep 20, 2009. 1:23 PM **REPLY**

sheet bends are for joining two ropes of different thicknesses

mystikmunkee says: Apr 18, 2010. 9:12 PM **REPLY**

That they are, and reef knots are for tying ropes of equal thicknesses. Great Instructable though !

pmartel says: Apr 19, 2010. 7:11 PM **REPLY**

Well, the sheet bend *can* be used for rope of the same thickness. The reef knot can come apart (capsize) under tension and so should **not** be used, for instance, to tie together two ropes you are planning to climb.

rspetersga says: Apr 19, 2010. 7:42 AM **REPLY**

This knot (at least used to be) taught in the boy scouts, to be used for rescuing people - the rope goes around the waist and the knot tied in front. This knot is good for this application since the knot doesn't travel (and therefore the loop won't tighten around the person) and the knot gets more secure with tension.

rabidpotatochip says: Apr 19, 2010. 6:38 AM **REPLY**

Great instructable! It coincides nicely with my new ropework hobby. Your pictures look a lot better than the ones from the 1800's manual I've been working with. hehe

Nathan_ says: Apr 18, 2010. 8:19 AM **REPLY**

Bends connect two ropes. Isn't this a hitch?

GeeDeeKay says: Apr 18, 2010. 6:13 PM **REPLY**

[Respectfully] A hitch is used to attach a rope to a fixed object, a bend is used to join two lines, and a knot is a general term used to describe some sort of line or cord bound into some sort of configuration. Bends and hitches are both knots. Stoppers are knots. A tangled mass of line is a knot. All bends, hitches and stoppers are knots, but not all knots are bends, hitches or stoppers.

Nathan_ says: Apr 18, 2010. 8:07 PM **REPLY**

So yes, it is a hitch and not a bend?

GeeDeeKay says: Apr 19, 2010. 4:35 AM **REPLY**

Technically, yes, although it seems to be known as the fisherman's bend. This knot might have had another life in the past, attaching a fishing line to another line or leader. The name could also refer to the part of the knot that differentiates it from a round turn & 2 half hitches.

The term bend can also refer to a part of a knot. For example, a bowline is made up of a loop and a bend. A bend in this case is a turn in a piece of line that doesn't cross over itself, whereas a loop crosses over itself.

The arcana of knot lore hides a lot of the details of why knots got the names they have...

draghi says: Apr 19, 2010. 3:29 AM **REPLY**

A lot of these knots have to be learned by scouts (I'm not talking about "boy scouts" because I'm Australian ergo i don't know what they need to learn)! BTW Great instructable.

MowinTheLawn says: Apr 18, 2010. 6:32 AM **REPLY**

Truckie's Hitch? Australian term...
I think that's also what jlhuge is referring to... It's a great knot, I have never had the chance to learn it though!

greatpanda says: Apr 18, 2010. 8:36 AM **REPLY**

You're probably looking for what's actually a "bell-ringer's hitch" formed in the bight and used as a tackle. It's 1/2 of a sheepshank, if that helps. Also known as a trucker's hitch (there's an ible for it), taut-line hitch, or lorry knot it's most often used with a loop knot in the middle of a rope being used to bind a load. Unfortunately, if a loop knot is tied, as previously mentioned the rope is weakened at that point, and the end of the rope must be fed through (reeved) the loop- tedious with long rope. The sheepshank version (couldn't find a decent link, sorry) allows you to make a trucker's hitch in the middle of the rope.

MowinTheLawn says: Apr 18, 2010. 3:25 PM **REPLY**

Thank you so much! =]
It's nice for someone to bring it all together!
and I'll now go searching, armed with the keywords you've given.
Thanks s much once again. =D

Technologic says: Sep 14, 2009. 12:29 PM **REPLY**

Those are great, but can you teach me how to tie my shoes?

cateddy says: Apr 18, 2010. 10:35 AM **REPLY**

http://video.search.yahoo.com/search/video;_ylt=ArC8uWTdZC3JO3Z9lx6uRcibvZx4?p=how+to+tie+shoes&toggle=1&cop=mss&ei=UTF-8&fr=yfp-t-892

Tech. Maybe this link will help with you. It show you how to tie shoes. Chuck

solo.card says: Apr 18, 2010. 10:29 AM **REPLY**

Bowline and Figure 8 can also be used for tying in to a harness, for climbing purposed,

:)

ndinitz says: Apr 18, 2010. 7:49 AM **REPLY**

Another useful knot is the Fisherman's knot.

It joins two pieces of fishing line in a low profile knot which is very secure.

androcinco says: Oct 26, 2009. 7:30 PM **REPLY**

very usefull!!

sukinmaru says: Oct 11, 2009. 8:47 PM **REPLY**

how about a noose? :D

attilas says: Sep 22, 2009. 12:08 PM **REPLY**

bravo ! i nodi soni cose molto e sempre utili , perche' non ne fanno materia anche per le scuole ?

seamountie says: Sep 18, 2009. 8:51 AM **REPLY**

Sorry Adaveil, but you have laid up the Carrick Bend incorrectly. Have a look at the photo here (http://www.uspowerboating.com/images-knots/carrick-bend.jpg) for the what a Carrick looks like before you pull it to.

adaviel says: Sep 18, 2009. 10:30 AM **REPLY**

Thanks for pointing this out. I have deleted the step. It's not one I use much and I mis-copied it.

static says: Sep 17, 2009. 12:06 PM **REPLY**

Oddly enough most of the knots shown here can be found illustrated in my Websters print dictionary under knot. On the web somewhere there is an animated knots page, where you can slow down the animation speed to suite yourself.

adaviel says: Sep 17, 2009. 4:23 PM **REPLY**

I confess I didn't check what other material was already out there - I had some time to kill while sailing home, with a camcorder and lots of rope lying around. I had someone shoot over my shoulder so the camera would see my hands the same way round as I did.

berky93 says: Sep 13, 2009. 9:48 PM **REPLY**

I like the idea of that prussic knot. Ill have to try climbing something (small, with a harness) sometime. I know I have some climbing rope around here somewhere...

Gage987 says: Sep 12, 2009. 8:41 PM **REPLY**

Noose

pancho del rancho says: Sep 8, 2009. 9:50 PM **REPLY**

now we can hang stuff(like um sesame street that bid bird gets on my nerves)foo

harley_rly says: Sep 12, 2009. 11:43 AM **REPLY**

with a noose, which is relatively easy to make(my older brother taught me how to make one when i was 6 lol...and still havent forgot, and its been 8 years)

greeenpro says: Sep 12, 2009. 5:02 AM **REPLY**

Thanks for a great reference guide here. I will be using the info. in this!

JohnnyPgood says: Sep 11, 2009. 2:44 PM **REPLY**
Great ible! I was just surfing wikipedia the other day learning some of these! :thumbsup:

tsaylor says: Sep 11, 2009. 8:48 AM **REPLY**
Splices require special tools? I haven't done many but I've never used a tool for it. The Boy Scout Handbook gives some instructions for eye splices, end splices, and short splices.

adaviel says: Sep 11, 2009. 12:43 PM **REPLY**
A fid is handy, or marlinspike. There's one in my sailing knife. I guess you can open 3-strand with just your fingers though.

NotOurKing says: Sep 11, 2009. 6:49 AM **REPLY**
I like that you have a behind the back example. When I was learning knots in school we all had to learn to tie every knot behind our backs. For an added challenge we also had to work in pairs, each using only one hand.

adaviel says: Sep 11, 2009. 12:39 PM **REPLY**
Notice I fluffed it at first .. I had a bit of "caterpillar syndrome" - mostly in outtakes, but thinking about how to do it made it harder. The only one I can do dead-on every time is the figure-8.

ventifact says: Sep 11, 2009. 8:11 AM **REPLY**
The Carrick Bend's strength is in bending dissimilar lines but instead of keeping its pretty layout you can let it collapse, the lines can be loosened easily.

Metalcaster14 says: Sep 11, 2009. 6:09 AM **REPLY**
yeah the second video method is the one I'm used to tying

Cactopus says: Sep 9, 2009. 12:59 PM **REPLY**
I need a knot that connects a rope to a fixed loop of metal or hook, and does three things: #1: When it's tied, it designed to tie down tight, leaving no slack in the load-bearing portion of rope. #2: It unties quickly and easily. Anyone know a knot like that?

fredob1 says: Sep 11, 2009. 5:53 AM **REPLY**
Try looking up "Highwayman's Hitch"

15zhangfra says: Sep 9, 2009. 1:11 PM **REPLY**
how about the slipped Lapp knot? in war slingers would have the cord ends tied around their waist , and would need to untie them quickly, give it a try

thepelton says: Sep 11, 2009. 10:54 AM **REPLY**
I am a Navy veteran. If you tie a knot on a bight (by doubleing the rope over and using twice as much rope to make the knot) it will stay tight until you pull one of the rope ends out without touching the other, at which point it will disappear.

15zhangfra says: Sep 11, 2009. 1:45 PM **REPLY**
good idea...

papa-g says: Sep 10, 2009. 6:07 PM **REPLY**
This is a great introduction to many key knots. I'm a knot lover, and if you are serious about learning this old art, I'd recommend the "Ashley Book of Knots" by Clifford Ashley. It is the encyclopedia of knot know-how.

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