

Scout Skills

Simple Knots

info

Scout
Information
Centre

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INFORMATION SHEET

People have been tying knots for thousands of years. Today, despite technology, knots are still as necessary as ever. In sports such as sailing, climbing, caving and angling, and in work such as fire fighting, fishing, truck driving and even surgery, the ability to tie the right knot is essential.

All knots have a purpose and it is just as important to understand what that purpose is, and when the knot is used, as having the ability to tie it. The wrong knot at the wrong time can be dangerous.

In the Teach Yourself section, there are details of nine knots commonly used in Scouting. It explains what the knots are used for and how to tie them.

In order to help us with knotting, it is also useful to understand a little bit about ropes.

Types of rope

Laid ropes - These are ropes normally consisting of three strands which run over each other from left to right. Traditionally they are made from natural fibres, but nowadays they tend to be made from synthetic materials.

Braided ropes - These are ropes which consist of a strong core of synthetic fibres, covered by a plaited or braided sheath. (They are always made from synthetic materials.)

Natural ropes - These are relatively cheap and are made from such natural materials as hemp, sisal, manila and cotton which are easy and pleasant to knot. They have the disadvantage that they have a low point at which they can withstand stress before breaking, and other characteristics can be unpredictable because the

natural materials with which they are made may have flaws.

Synthetic ropes - These are relatively expensive but last a long time. They are superior in that they are generally lighter, stronger, less prone to rot, water resistant and better able to withstand difficult and extreme environments.

Wire ropes are available but are rarely used in Scouting.

How ropes are measured

Ropes are normally measured by their circumference. For example, a 75mm rope is approximately 25mm in diameter.

Parts of the rope

You won't need to be told that a piece of rope will have two ends! However, in order to work with ropes, it is useful to be able to refer to different parts. The main parts of a rope are called:

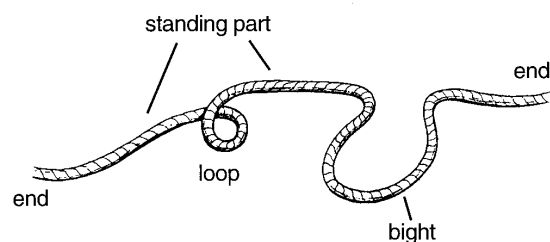
Working end - The end of the rope you are using to tie a knot;

Standing end - The end of the rope opposite to that being used to tie the knot;

Standing part - Any part between the two ends. It can be a part of the rope already used in the knot;

Loop - A loop made by turning the rope back on itself and crossing the standing part;

Bight - A loop made by turning the rope back on itself without crossing the standing part.



Some other useful definitions

A *bend* - This is a knot which is used for tying one rope to another.

A *hitch* - This is used for fastening a rope to another object such as a post, spar, pole, log and so on. It is tied without using a full knot, and makes use of the tension on the rope, the direction of the pull, or other nearby knots, to hold the hitch in place.

Further information and resources

There are plenty of publications available on knotting which will give you further ideas. Ask other experienced Leaders, they may well have some books or information which they can lend or recommend to you.

You may also wish to learn about how to care for ropes (it involves more than just throwing them in to the stores!) and the different types of rope available.

TEACH YOURSELF

Although there are many different kinds of knots, knowledge of the ones detailed in this sheet will enable you to undertake most pioneering projects and activities required in Scouting.

Time

This will vary from person to person. However, it is probably advisable to have a go at two or three at a time in short sessions of 15-30 minutes rather than trying to tackle them all at once.

Equipment

You will need a couple of lengths of rope about a metre long and of differing colours. This will help you see the knot as it forms. You will also need a free-standing pole or 'conventional' wooden chair back, or even a table leg for tying some knots to!

Learning all about it

Before having a go, you will need to read the Information Sheet, if you have not already done so, especially the section describing the parts of a rope.

The only way to learn how to tie knots is to practise. Have a go at tying a number of knots. If you are stuck on one, don't worry, move on to try another. Once you have mastered one type, you may then find others easier.

Follow these steps when learning to tie a knot from a drawing:

- Look at the drawing and trace the various twists, crosses and bends with your eye, from the standing part to the working end, to see how the knot is constructed.
- Now lay your rope on a flat surface and take hold of a point 30cm in from the working end.
- Make the first bend, turn or crossover in the rope and then move along to the next.
- Look at the diagrams of knots and compare your work with them.
- Try each knot using this sheet a few times and then try it from memory. Try again a couple of days later. When you can tie the

knot three times in a row you will probably remember, especially given occasional practice.

Hints and tips

- Keep the knot flat and the hands open as you tie the knot.
- If the knot involves two working ends, work them together from the standing parts to the working ends.
- Check the shape of the knot at each stage.
- Make sure you tighten the knot correctly so that it doesn't form the wrong shape at the last minute.
- With experience you will find that many knots are made up of combinations of simple knots. Tying more complex ones is just a matter of tying a series of simple ones!

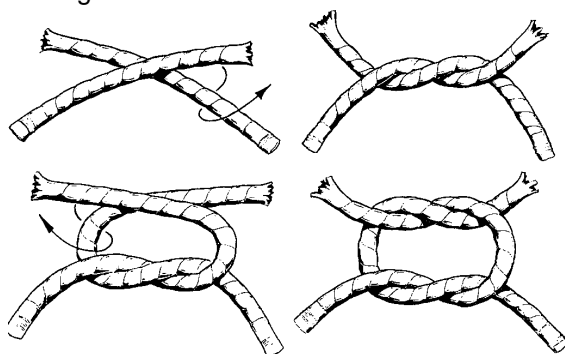
COMMON KNOTS

Reef knot

This most common knot is used to tie together two working ends of the same material and size.

- Take an end of rope in each hand and lay the left hand end over the right.
- Then, using your right hand, take the end from the left down behind the other rope and up to the front again.
- Point the ends inwards again, this time the right hand one over the other one, then take it down behind it and up to the front through the loop which has now been formed.
- Pull the knot tight.

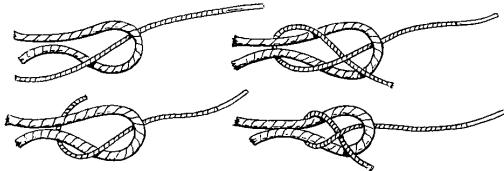
This knot is often remembered by, 'left over right and right over left'.



Sheet bend

The 'sheet' is the sailor's name for a rope. The sheet bend is used to tie together two ropes of different types or unequal thicknesses.

- Form a bight in the working end of the thicker rope. Take the working end of the thinner rope and pass it up through the bight.
- Take the thinner rope round the back of the bight and trap it under itself. Remember not to take the working end back down the bight in the first rope.
- Pull tight by holding the bight in one hand and pulling the standing part of the second rope with the other.



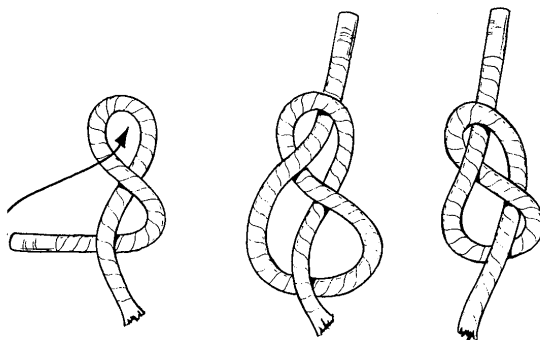
Make sure the two ends are on the same side of the knot. If the ropes are of very different thickness, take the working end round the bight and under itself twice to form a double sheet bend.

Figure of eight

This is a 'stopper knot' that is unlikely to jam or pull loose. It is also used, when doubled, to tie a loop in a rope.

- Form a loop in the end of a rope.
- Take the working end behind the standing part and back over itself into the open loop.
- Finish by pulling both sides of the knot tight.

If the knot is correct, it will look like a 'figure of eight'.

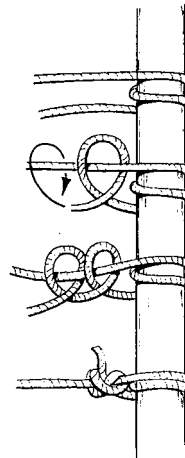


Round turn and two half-hitches

This is a long name for a simple hitch used to attach a rope to a post, spar, tree, and so on. It is a composite knot formed from two simple knots.

- Form a round turn by turning the working end twice around the post.

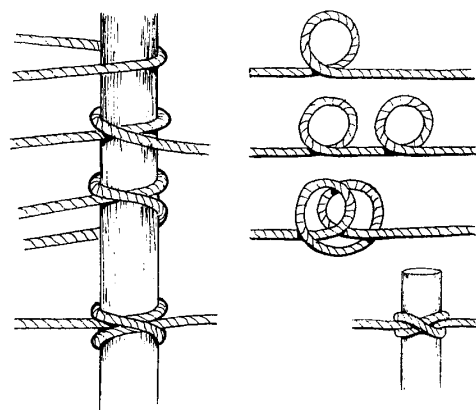
- Then form a half-hitch by taking the working end around the standing part forming a crossed loop.
- Repeat to form a second half-hitch. These should be tied in the same direction and tightened up against the post to ensure that the round turn doesn't slip.



Clove hitch

The clove hitch is another method of 'hitching' a rope to a post. Not as secure as the round turn and two half-hitches, it is often used to begin other hitches and lashings. There are many ways to tie a clove hitch. However, the one that everyone should know is:

- Pass the working end over and under a rail.
- Run it across the standing part at the front.
- Continue round the rail again and bring the working end back to trap it under the diagonal.

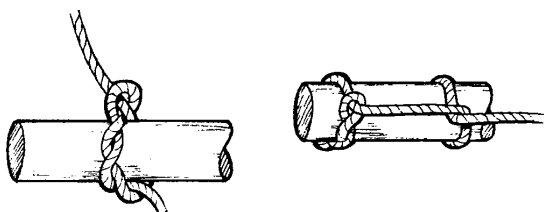


Thus the two ends of the rope should be laid next to each other under the diagonal but running in opposite directions. The clove hitch looks like a 'N'.

Timber hitch

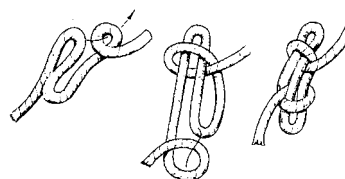
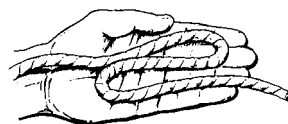
The timber hitch is a temporary knot used to drag, tow or lift a log or pole.

- Turn the working end round the standing part and then wrap it around itself at least four or five times.
- A half-hitch can be tied in the standing part further up the log or pole to add some security.
- The log is dragged by pulling the standing end.



be tied in the middle of the rope without needing the ends.

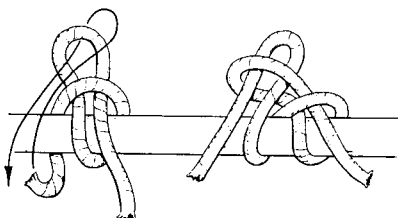
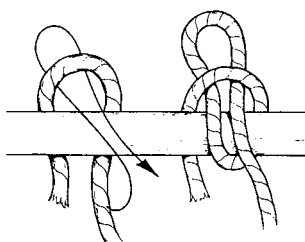
- Form the rope into a 'S', that is two opposing bights.
- In each free end form a half-hitch.
- Pass the adjacent bight through the halfhitch.
- Pull the two free ends tight at the same time.



Highwayman's hitch

This hitch is a 'slip hitch'. Pulled on the standing end it holds fast. Pulled on the working end it comes free. Thus it is used to tie a boat to a mooring ring or an animal to a rail or post.

- Start by passing a bight behind the rail.
- Take another bight in the standing part and pass it in front of the rail and through the first bight.
- Pull tight on the working end.
- Then take a third in the working end and pass it in front of the rail- and through the second bight.
- Pull tight on the standing part.



If being used to bridge a damaged portion of rope, make sure the damaged part goes through both half-hitches. That is, the damaged portion should be the centre of the 'S'. The sheepshank should be kept in tension. If loosened it may well come undone.

Bowline (pronounced 'bo-lin')

The bowline is used to form a non-slip loop in the end of a rope. It was traditionally the climbers' waist knot before harnesses were used.

- Form a loop by passing the working end over the standing part.
- Pass the working end back up through the loop from behind and around the back of the standing part.
- Pass the working end back down the loop and pull tight.
- If using synthetic rope, the working end should be locked off against the adjacent standing part with a half-hitch.

The bowline is invaluable in rescue situations but might have to be tied blind. Once you are comfortable with tying the knot, practise it with your eyes closed. It can sometimes be remembered by 'the rabbit comes out of its hole, round the tree, and down the hole again!'

Can you do it?

When you feel confident about tying these knots, check how you are doing and see which of the following you can tick off:

Sheepshank

This knot is used to shorten a rope, or to bridge a damaged length, without cutting the rope. It can

	Tie with instructions	Tie without instructions	Identify knot and state use
Reef knot			
Sheet bend			
Figure of eight			
Round turn and two half-hitches			
Clove hitch			
Timber hitch			
Highwayman's hitch			
Sheepshank			
Bowline			

So you want more?

When you have learnt these knots why not have a go at:

- Making a rope.
- Caring for rope - check it for damage, hank it and store it.
- Whipping and splicing the ends of laid rope.
- Tying decorative knots.
- Tying lashings as used in pioneering projects (see Lashings in this series).
- Finding out about the breaking strengths of different ropes and the safety factors to be considered for different activities.

HOW TO TEACH OTHERS

This section is designed to give some practical ideas about how you can help other people to learn how to tie some simple knots and about their usage. This might be Leaders or Scouts - either in an informal way on a Troop night or more formally on a skills workshop, training course or something similar.

Objectives

By the end of the session, participants will be able to:

- I. Demonstrate how to tie at least four of the following knots:
 - Reef knot
 - Sheet bend
 - Figure of eight
 - Round turn and two half-hitches
 - Clove hitch
 - Timber hitch
 - Highwayman's hitch
 - Sheep shank
 - Bowline
- II. Explain the use of the above knots.

Time

Knotting can be taught in a number of short (15-30 minute) sessions, however it is important that no more than two or three knots are taught at one time. Some people pick up knots very quickly, others take much longer. However, everyone requires plenty of practice to retain what they have learnt.

Therefore, at a later date, follow up sessions and experience of using the knots are essential.

Equipment

Lengths of different coloured rope, each approximately one metre long.

Samples of ropes made with different materials, and of different sizes and thicknesses. Selection of short rods, rails, or 'conventional' wooden chairs (for using the backs of for hitches and so on).

A thicker rod, or short log (for the Timber hitch).

Triangular bandages (for the Reef knot).
Equipment as required for training activities (see overleap).

Training methods

All the information required for this session can be found in the Information Sheet and Teach Yourself sections.

Knotting is obviously a practical subject and no amount of theory will ever allow people to learn knotting, so it is important to get on with the practical work as soon as possible. It may be appropriate to outline a few general facts first, for example, the parts of a rope, different types of rope, that all knots have a purpose and so on. This can be done with all participants together before working in, perhaps, small groups or pairs, and then individually having a go.

As already stated, whilst knots can be taught in this session and reinforced with the activities, it is important to follow them up regularly with further practise and experience. This can be in the form of questions, quizzes, games or 'incidents' that require participants to recall what they have learnt.

General Points

Whenever possible, knots are best and most interestingly taught when being used for their real purposes (such as the Highwayman's hitch to moor a boat).

People learn at different rates. Therefore, ideally, there should be one instructor to one or two participants. The participants can sit beside the instructor who should go through each stage of the knot slowly, with the participants copying.

Once a participant has followed the instructor twice, ask them to try it on their own. The instructor should then compare it with the correct one to see if there are any errors which need to be corrected.

Participants should be given the opportunity to practise the knots in their own time. Games and activities will provide further opportunities for practice and feedback but will rarely offer the means to learn a knot from scratch.

Training activities

1. Run a quiz, with participants in teams or small groups, having to name the correct knots used for a given purpose.
2. Alternatively, given the knots, they have to define their uses.
3. Run a game where teams or individuals have to name knots or partly finished knots, drawn on cards. Some cards can depict types and parts of rope, the test being to name them.
4. Knotting relay - with participants in teams or small groups, specify some knots that will need to be tied during the game. Give the teams time to practise the knots. Set up the same number of chairs as there are teams. The first member of the team is called forward and asked to tie a certain knot on the back of the chair. They are given an amount of time to complete the knot and if they do not succeed then they can be helped by another team member. The first team to complete all the knots is the winner. A variation of this relay can be attempted in semi or complete darkness and also by the participants tying the knots behind them, with their backs to the chair.
5. Each participant is given a rope and asked to name the different parts.
6. Challenge four participants to tie any four knots in the quickest time.
7. Invite each team or small group to make up a knotting board. This is a piece of wood or board showing the common knots. It can also have a permanently attached piece of rope sufficient in length to enable participants to have a go at a knot or two when they have some spare time.
8. Set up a 'mini' incident hike or a series of bases where groups or teams visit and have to solve a problem or two. The solutions should include the need to tie some knots. For example:
 - a) a person has injured their arm which requires to be put in a sling, tied with a reef knot,
 - b) a log or post has to be moved from 'A to B',
 - c) a rope already in position across a 'river' is too long, it needs to be shortened.
9. Try tying knots with different types of rope. Compare and discuss the suitability of different ropes for different purposes and different knots.

Hints and tips

- Use two different coloured ropes to tie a knot.
- Point out the shape of the knot at each stage. Compare with a drawing if it would help.
- Keep the knot flat and the hands open as you demonstrate tying knots to others.
- Show participants how to check for damaged ropes that will be used to take a strain.
- Give each participant a couple of pieces of rope to practise tying knots on their own.
- When participants have mastered how to tie a specific knot, get them to try tying it behind their backs or blindfolded.
- If you are left-handed try to demonstrate to someone who is also left-handed and vice versa. It is difficult to follow someone tying a knot who is differently handed to yourself.
- To help participants see what they are doing, colour or paint an inch or so of the working end of a rope.

Checking their progress

Ask participants whether they feel happy with their ability to:

Tie and explain the use for a ...

Reef knot

Sheet bend

Figure of eight

Round turn and two half-hitches

Clove hitch

Timber hitch

Highwayman's hitch

Sheep shank

Bowline

So they want to know more?

Investigate other types of knots and their uses.

Make a rope.

Care and look after rope - check it for damage, hank it and store it.

Whip and splice the ends of laid rope.

Tie decorative knots.

Tie lashings as used in pioneering projects.

Your notes on this session