Knot Master

Contents

Introduction

Knots have been around since the dawn of man and have played a crucial role in the advancement of civilizations for centuries. Early ropes were made from the simplest things such as weeds, bark, sinew and other parts of animals. Over the years better and more resilient materials were discovered, and rope became stronger and stronger. As the rope became more advanced, so did the methods for which it was being used. Knots were created for special purposes and the knowledge of how to tie those knots were passed down from generation to generation. Knots in scouting have been a fundamental skill and requirement for rank advancement since its beginning over a hundred years ago. By each scout learning and mastering how to tie knots, they help keep an age-old art alive that has been developed over thousands of years.

From the BSA Handbook for Boys: "There are three qualities to a good knot: 1. Rapidity with which it can be tied. 2. It's ability to hold fast when pulled tight, and 3. The readiness with which it can be undone." A proper knot also has the quality of doing minimal damage to the rope or cable.

The "Troop 29 Knot Master Program" is designed to provide each scout an opportunity to learn essential knots, as well as the fun knots that you can use to amaze your friends. Upon completion of the first level, the scout will be awarded with a white monkey fist knot. This knot will be worn on the left shirt pocket when in Class A Uniform, or on the belt on a carabiner along with a section of rope to be used to tie the required knots for demonstration or challenge purposes, to be discussed in subsequent sections. The monkey fist knot may be worn as part of Class A and Blass B uniforms allowing the scout to wear the rope at all scout functions and displays his success in completing Level One and subsequent levels. After successful completion of each additional level of the Knot Master Program they will earn a new color monkey fist knot, exchanging it for the previous level's color. The scout can continue to progress through all 8 levels of the Knot Master Program receiving a different color monkey fist knot for each level. Only one monkey fist knot may be worn and it must be the highest color representing the highest level achieved. Monkey fist knots will be exchanged so that there will only be one monkey fist knot in each scout's possession at any given time. The monkey fist knots can be exchanged only by the adults designated to administer the program and or by the Troop Advancement Chair. Records of individual scouts and their achievement in this program will be documented.

Colors of the levels

The colors of the levels have also significant meaning and are taken from the Cherokee Indian's colors. These colors had sacred meaning to the Cherokee and the scout will learn the significance and meaning of each color as he progresses through the Knot Master Program. The levels of the program are:

Level 1 – White; denoted peace and happiness. White represents summer, a time of plenty. White is the color of south. These knots are Scout Rank through First Class

Level 2 – Yellow; this color represents Order, Joy, Wisdom, and Divinity. Yellow is the color of above.

Level 3 - Green; represents here and now. Green is the center.

Level 4 – Blue; symbolized sadness and defeat. Blue represents winter and its season of surviving and waiting. Blue is the color of North.

Level 5 – Brown; Symbolizes a world that is chaotic and crazy. Brown is the color of below.

Level 6 – Red; was symbolic of success. Red represents spring and its beginning of the cycle of life. Red is the color of East.

Level 7 – Knot Master - Black; was always typical of death. Black represented autumn and the passing of the final harvest, the end of a life cycle. Black is the color of West.

Level 8 – Knot Master Chief - Special Red, White and Blue; the colors of the Eagle Scout. It signifies mastery and the highest achievement of this program. A Knot Master Chief, either youth scout or adult scouter, helps administer the program.

Rules and Bylaws of the Program

There are several items on each level of the program. They may be knots, lashings, whippings, splices or specialty knots. As the levels go higher, the items become more difficult and require increased determination to complete.

How to Begin

To begin the scout must learn and become proficient with the knots of the Level One. He will have to tie all the knots and explain their purpose or use. When he is ready to be tested, a Knot Master Chief (an adult administrator) or a scout that has reached the Knot Master, Level – 7 or Knot Master Chief, Level – 8 will test him. Each knot will be judged for correctness and dress. If the knot is basically correct but tied sloppily, the scout will need to retie the knot again making sure it is neat and dressed correctly. He will be allowed 10 minutes to tie all the knots for the level he is testing for. He will only be allowed two attempts for any one knot. If he is unsuccessful in tying any single knot after his second attempt, we will not be successful for that level and will need to wait until the next meeting or 24 hours to try again.

Advancement

There are only 2 ways a scout can advance to the next level beyond Level 1 - White. It can be either by challenging another scout at the next-higher level or by testing.

Challenging

A scout of one level can be challenged by another scout of the immediate next lower level and challenges for any level are initiated by the scout of the lower level only. The challenge is for each scout to compete in the knot tying requirements of the higher level. For example, a Level 2 – Yellow Level, may challenge a Level 3 – a Green Level. The knots to be tied would then be the Level 3 knots, or the Green Level. In addition, a scout cannot skip levels, the challenge can only be to the immediate next level. For example, Level 4 can only challenge Level 5, etc. Challenges can only occur during reasonably “normal” active times of scout functions. They cannot be made during late evening quiet time or upon reveille at campouts, for example.

The challenger, upon challenging, will select the knot to be tied. Each party will then be required to tie that one knot of the level that is challenged. Using their own practice rope, each scout that has been challenged will get two attempts to tie the selected knot at that level correctly. The challenger must also be able to tie the knot he is challenging the other scout to tie. Once the challenged scout finishes his attempt, successful or not, the challenger must also tie the knot. However, the challenger will only get one attempt to tie the knot correctly. If he fails to tie the knot he has challenged the other scout to tie, he will drop back one level, *regardless if the first scout was successful or not*. If any scout, challenger or challeng-ee, fails to tie a knot that is part of the challenge, he will drop back one level and will have to trade-in the colored monkey fist knot for the new correct level. In the case of a tie – where both parties successfully tie the knot, the challenge is complete and ends in a draw. A scout can only be challenged once in a 24-hour period. In addition, the challenge must be moderated by a third party from a different patrol and be a senior scout (either rank or leadership role: Patrol Leader or above, First Class or above) who has at least the same level as the level being challenged.

For example, scout A is Level 1 – White. He challenges scout B, a Level 2- Yellow, to tie a Figure Eight knot. The contest is moderated by a Patrol Leader in an independent Patrol and he is a Level 3 – Green.

- Scout B ties the knot. Scout A then ties the knot. The Challenge is a draw and Scout B cannot be challenged again by anyone for 24 hours.

- Scout B does not tie the knot and Scout A successfully ties the knot. Scout A is now Level 2 – Yellow and trades his white Level 1 monkey fist knot with Scout B. The moderator and the winner of the challenge see the adult Advancement Chair and or an adult designated to oversee the program and reports the results of the challenge. Scout B cannot be challenged again by anyone for 24 hours.

- Scout B does not tie the knot and subsequently Scout A is also unsuccessful in tying the knot. Scout A is now Level 0 – they forfeit their Level 1 – White monkey fist knot to scout B who now drops to that level. Scout B's Level 2 – Yellow monkey fist knot is therefore forfeited to the moderator scout who turns it into the adult Advancement Chair and or an adult designated to oversee the program and reports the results of the challenge. Scout A nor scout B cannot be challenged again by anyone for 24 hours.

- Scout B ties the knot and subsequently scout A is unsuccessful in tying the knot. Scout A is now Level 0 – they forfeit their Level 1 – White monkey fist knot to the moderator scout who turns it into the adult Advancement Chair and or an adult designated to oversee the program and reports the results of the challenge. Scout A nor scout B cannot be challenged again by anyone for 24 hours.

If any special materials are needed for the challenge, like 2 wood staves for lashings, for example, the challenging scout is the responsible party to provide these additional materials at the time of challenging.

A scout is trustworthy. However, in the rare case of a dispute, an appeal to one (and only one) ASPL can be made by either party. If the matter is still not resolved, then a final appeal to the SPL can be made, or the SPL can decline to hear the petition and the decision of the ASPL is affirmed. For expediency, petitions to one

(and only one) acting ASPL or acting SPL may be made if expediency is necessary. Appeals must be made and completed to their ultimate conclusion THE SAME DAY as the challenge. If an adult is required to resolve the matter, both challenge scouts will be determined to have failed the challenge automatically by default and both will drop back one level.

Testing

Testing will only take place on troop outings and at scout meetings, as time allows. Individual Patrol outings or meetings (other than during a troop meeting) are not valid testing times. Testing will not be done at any other time other than the above.

- He will have to tie all the knots and explain their purpose or use. When he is ready to be tested, a Knot Master Chief (a Knot Master Chief (an adult administrator) or a scout that has reached the Knot Master, Level – 7 or Knot Master Chief, Level – 8 will test him). Each knot will be judged for correctness and dress. If the knot is basically correct but tied sloppy, the scout will need to retie the knot again making sure it is neat and dressed correctly. He will be allowed 10 minutes to tie all the knots for the level he is testing for. He will only be allowed two attempts for any one knot. If he is unsuccessful in tying any single knot after his second attempt, we will not be successful for that level and will need to wait until the next meeting to try again. Upon the successful completion of a test, the tested scout and the test oversight scout will seek the adult Advancement Chair and or an adult designated to oversee the program and report the results of the test. The scout that successfully passes a test cannot be challenged by anyone for 24 hours.

Practice Rope

A practice rope should always be carried by the scout who is participating in the Knot Master Program. It will be coiled neatly and carried on a carabineer on the right hip. The practice rope is important because if you are challenged and you do not have a rope, or cannot find one within one hour of challenging, you will be dropped back one level, automatically. The challenger must still demonstrate he ability to tie the knot he has challenged for in accordance with the requirements for Challenging described previously.

Exemption

Once a scout has reached the 7th level of the Knot Master Program and has earned his Black colored monkey fist knot (Knot Master), he is exempt from being challenged by other scouts that are not Knot Masters. A Knot Master can only be challenged by another Knot Master or a Knot Master Chief. Knot Masters and Knot Master Chiefs do not lose their level if they lose a challenge to each other.

Level One – WHITE

This level introduces the eight basic knots of scouting. These knots are the most common used throughout scouting and for the rest of your life. In addition, these are the basis for future knots and lashings. They are Square Knot, Two Half Hitches, Taut-Line Hitch, Basic Whipping, Sheet Bend, and Bowline.

Square Knot

The Square Knot is a common and simple binding knot. It is used to connect two ropes of equal size. You can loosen the square knot easily by either pushing the ends toward the knot or by "upsetting" the knot by pulling back on one end and pulling the other through the loops.

Two Half Hitches

This is a reliable and useful knot for attaching a rope to a pole or boat mooring. As its name suggests, it is two half hitches, one after the other. To finish, push them together and snug them by pulling on the standing part.

Taut-line Hitch

The Taut-line hitch is an adjustable loop knot for use on lines under tension. It is useful when the length of a line will need to be periodically adjusted in order to maintain tension. It is made by tying a Rolling hitch around the standing part after passing around an anchor object. Tension is maintained by sliding the hitch to adjust size of the loop, thus changing the effective length of the standing part without retying the knot. It is typically used for securing tent lines in outdoor activities involving camping.

Standard Whipping

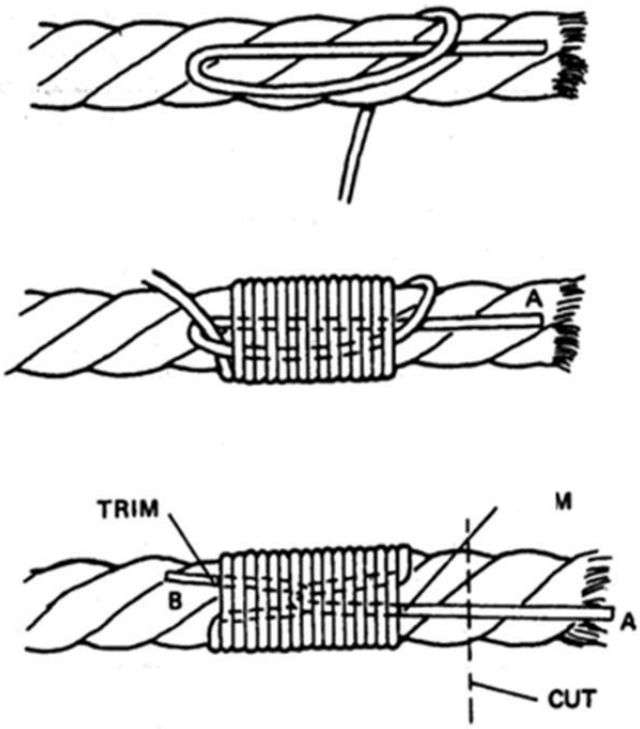


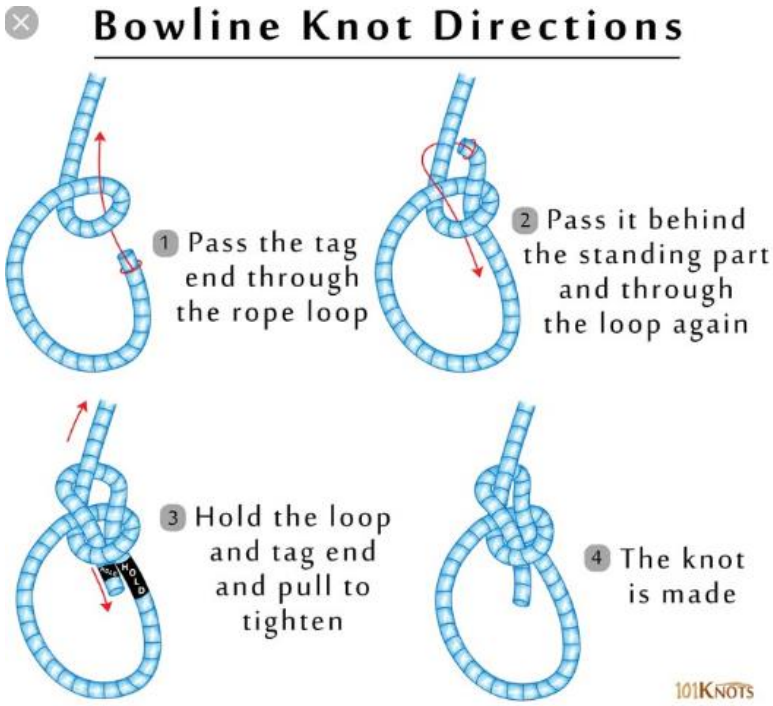
Figure 12. Ordinary whipping

Whipping is typically used for a natural fiber rope. Many synthetic ropes can be fused instead. The purpose is to prevent unravelling of the rope or cord over time.

Sheet Bend

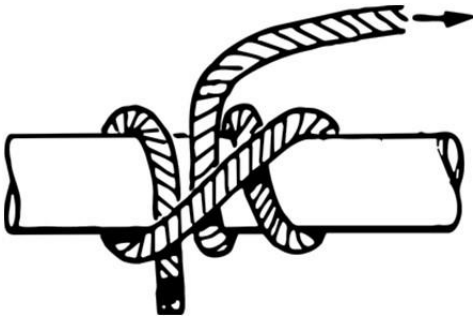
The sheet bend is the most important knot for joining two rope ends, especially if the ropes are of different sizes. Sailors named it in the days of sailing ships when they would "bend" (tie) the "sheets"(ropes attached to the clew of the sail). Begin with a bight in the larger rope. Then weave the end of the smaller rope through the eye, around the bight, and back under itself. Snug it carefully before applying any strain to the knot.

Bowline



The bowline has been called the king of knots. It will never slip or jam if properly made and, thus, is excellent for tying around a person in a rescue. Begin by formatting an overhand loop in the standing part. Then take the free end up through the eye, around the standing part and back where it came from.

Rolling Hitch



The rolling hitch (or Magnus hitch) is a knot used to attach a rope to a rod, pole, or other rope. A simple friction hitch, it is used for lengthwise pull along an object rather than at right angles. The rolling hitch is designed to resist lengthwise movement for only a single direction of pull. A common usage while sailing is for rigging a stopper to relax the tension on a sheet so that a jammed winch or block can be cleared.

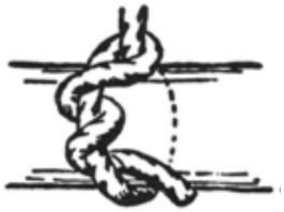
Level Two – YELLOW

Level two consist of a combination of six additional basic knots. In this level you will expand on tying additional knots that are very common and extremely useful. They include the Clove Hitch, Timber Hitch, Figure 8 knot, Thief Knot, Surgeon's Knot, and the Fisherman's Knot.

Clove Hitch

The clove hitch, along with the bowline and the sheet bend, is often considered one of the most essential knots. It consists of two identical half hitches made successively around an object. It is most effectively used as a crossing knot. Although it can be used as a binding knot, it is not particularly secure in that role. Because it passes around an object in only one direction, it puts very little strain on the rope fibers.

Timber Hitch



The timber hitch is a knot used to attach a single length of rope to a piece of wood. This is an important hitch, especially for dragging a heavy object like a log. It will hold firmly so long as there is a steady pull; slacking and jerking may loosen it. The timber hitch is also useful in pioneering when attaching two timbers together. When it is used for dragging, a simple hitch should be added near the front end of the object to guide it. To make the knot, pass the rope completely around the wood. Pass the running end around the standing part, then through the loop that you have just formed. Make three turns around the loop then pull on the standing part to tighten. Take care that you double the rope back on itself before making the three turns, or it won't hold. Three are recommended for natural rope such as jute, whereas five turns are needed on synthetic rope like nylon.

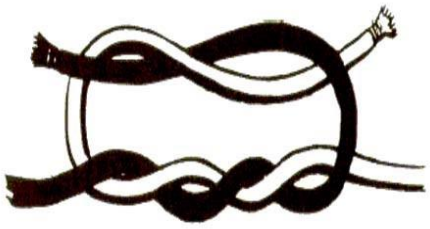
Figure Eight Knot

The figure-eight knot is very important in both sailing and rock climbing as a method of stopping ropes from running out of retaining devices.

Thief Knot

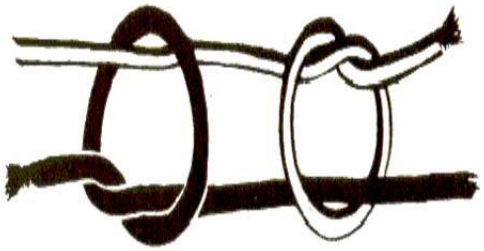
The Thief Knot is useful when you tie a bag of possessions closed but suspect someone might go into it. It looks to most people like a square knot. When the thief re-ties it, he almost certainly will use a square knot, letting you know someone was in your bag.

Surgeons Knot



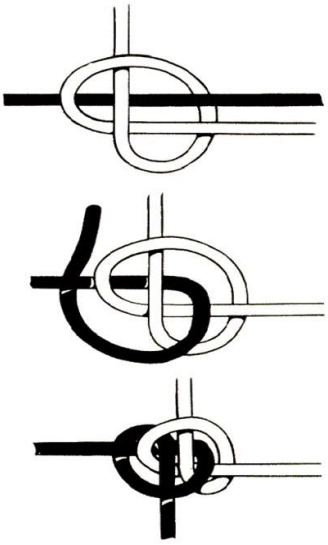
The surgeon's knot is a simple modification to the square knot. It adds an extra twist when tying the first throw, forming a double overhand knot, thus adding friction which makes the knot more secure. This knot is named for the fact that it is commonly used by surgeons in situations where it is important to maintain tension on a suture. Surgeon's knots are used in fly fishing as well as in tying packages.

Fisherman's Knot



The Fisherman's knot is a specialized bend. It consists of two overhand knots wrapped around each other. It requires little dexterity to tie, so is often used in stubborn materials. When tightened, it becomes compact.

Hunters Bend

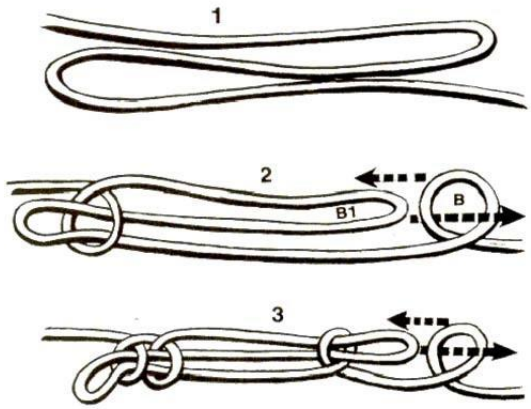


Hunter's Bend is used to join two ropes. It has a distinct shape, does not distort, and is very easily untied. It is an excellent knot for nylon rope. Nylon ropes need something extra in knots for safety, and the double lock of Hunter's Bend makes it ideal for this**.**

Level Three – GREEN

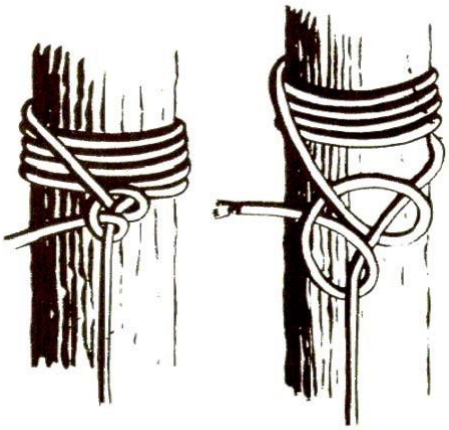
Level three consist of a combination of six utility knots. These knots are a bit more difficult but can prove to be useful in various situations. They include the Sheepshank, Lark's Head (Cow Hitch), Cinch Knot, Running Knot (Slipknot), Miller's Knot, and Trucker's Hitch.

Sheepshank



This knot is used to shorten a rope that is fastened at both ends. Take up the slack, then take an underhand loop and slide it over the blight and pull tight. Do the same to the other end to complete the knot. The sheepshank is only a temporary knot as it stands. But it can be made more permanent by adding a second half hitch to each end.

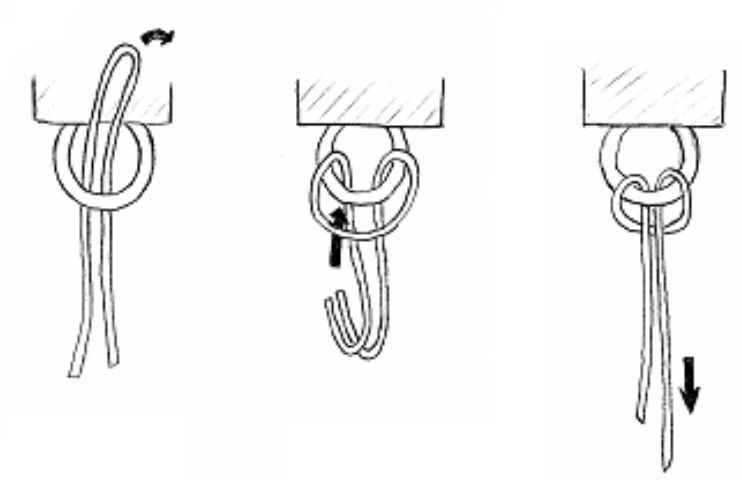
Pipe Hitch



The Pipe Hitch is useful for lifting a bar or post straight up, as in pulling it out of the ground. To tie it, take four or five turns around the post. Cross the end over and finish with two Half Hitches around the standing

part. An added hitch is usually taken higher on the post with the standing part to keep the post vertical when hauling upward.

Larks Head Knot (Cow Hitch)

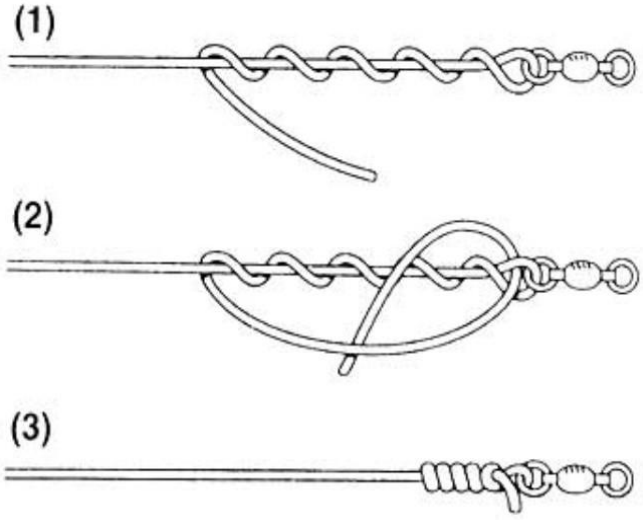


The cow hitch, also called the lark's head, is a hitch knot used to attach a rope to an object. The cow hitch comprises a pair of half-hitches tied in opposing directions, as compared to the clove hitch in which the half-hitches are tied in the same direction. Securely attaches a rope to a ring or pole.

Running Knot (Slip Knot)

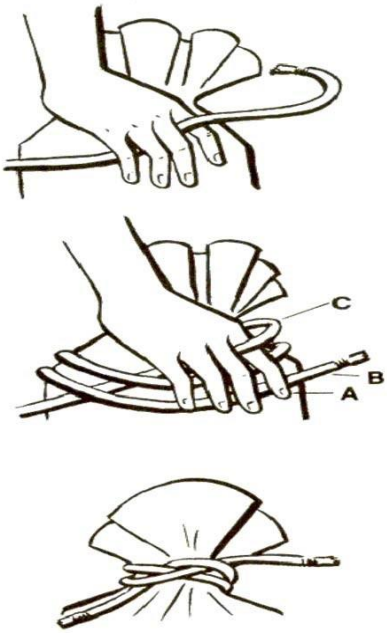
It's a Slip Knot. If tied around another line, it could be pulled or 'run' along it. But, pulling would also tighten it and sometimes there could be too much friction.

Cinch Knot



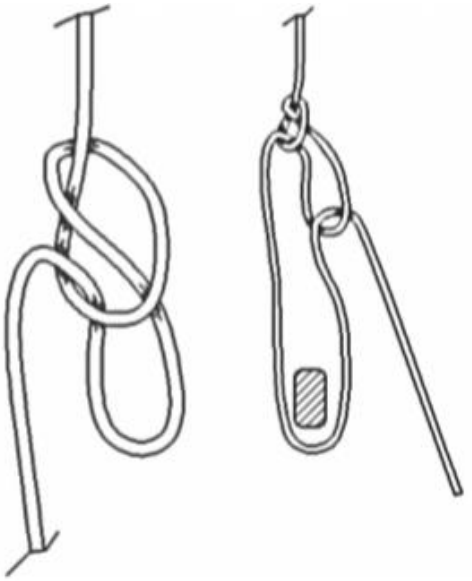
The Clinch knot provides one good method of securing fishing line to a hook, lure, or swivel. The "improved" version used here includes an extra tuck under the final turn. It is commonly used to fasten the leader to the fly. It is not recommended if you are using over 12lb test line. When tying it, it is important to wind the loops as a neat spiral round the standing line. Hold the loops under your fingers as you wind the line on.

Miller's Knot



This is a close relative of the Clove Hitch and is used in tying sacks with heavy string or cord. Note that the first turn around the sack leads over the forefinger and the others pass under all fingers. In the middle drawing, the forefinger A is about to draw the cord end B under C to complete the knot. The result is shown in the third drawing. Also known as a Bag Knot, it can be cropped very close to the knot.

Trucker's Hitch

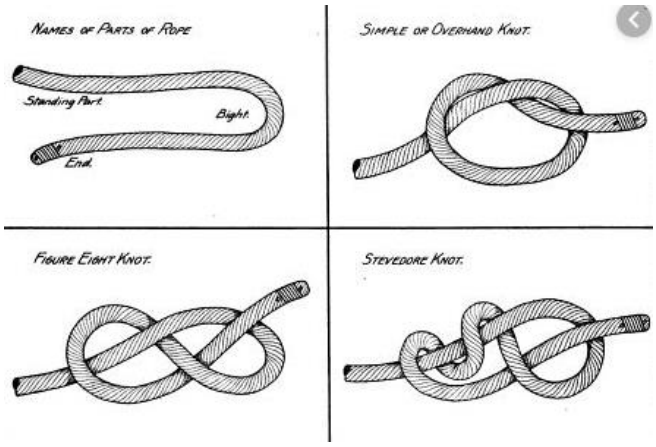


This compound knot is perfect for keeping a rope tight and can be used to secure loads on trucks among other things. The power to tighten comes from the crude block and tackle that the working end and loop makes. There's a theoretical advantage of 3-to-1, so make sure your rope is strong enough to take the strain. Since there is no moving wheel like in a real block and tackle, the rope can receive wear and tear if done over and over again. The loop can be made several ways: butterfly knot and slipped knot. To finish, tie off the end with two half hitches.

Level Four – BLUE

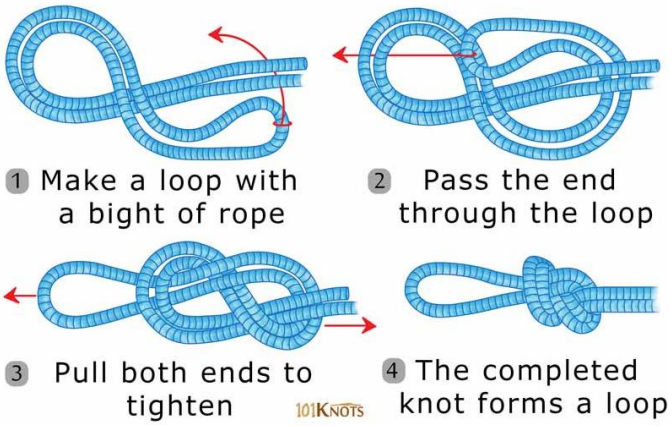
Level Four provides five additional utility knots with one specialty coil. They are the Stevedore Stopper, Figure 8 on a Bight, Running Bowline, Transom Knot, Quick Hitch (Arborist's Hitch), and the Chain Sinnet.

Stevedore Stopper



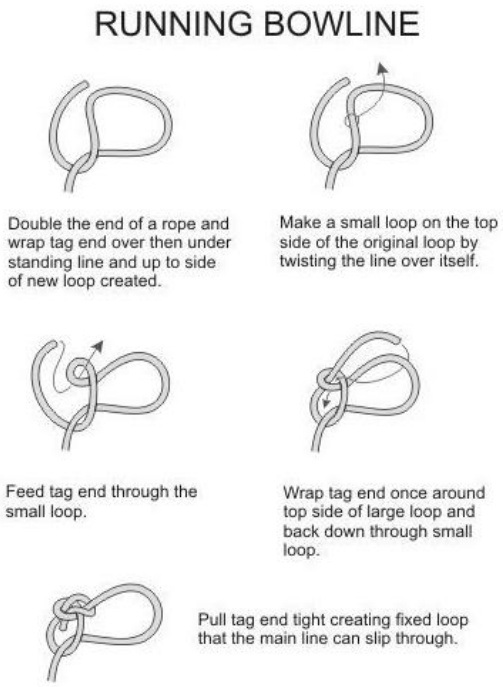
The Stevedore Stopper Knot is described as a single-strand stopper knot tied in the end of a rope to prevent unreeving. The Stevedore Stopper Knot is a reliable moderately bulky stopper knot. It is an excellent knot to use when setting a tarp – it can be used to secure an end that has been passed through a grommet.

Figure 8 on a Bight



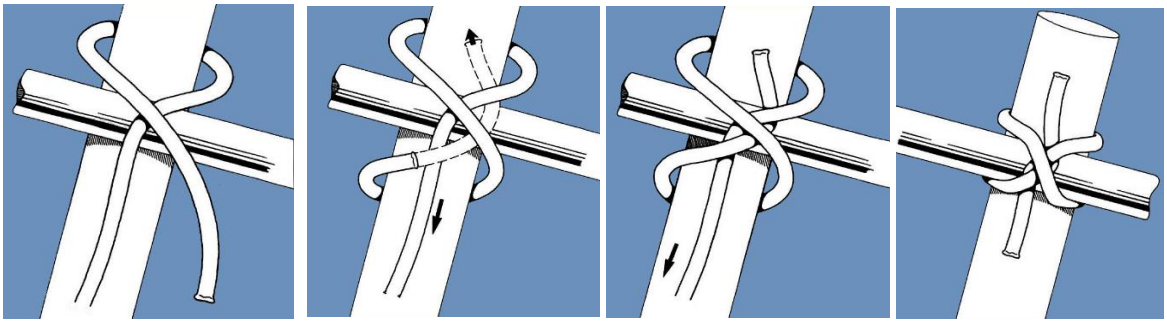
A figure-eight on a bight is used to secure a bight in the end of the rope. This knot is commonly used to "tie-in" to the rope. A figure-eight on a bight is a large knot with relatively gradual bends (as compared to an overhand), and is easily recognized by the tell-tale "8" shape. Makes a place to clip in in the middle of a line. Cannot be made when the line is in tension.

Running Bowline



This bowline is tied around its standing part. Use it to make any loop size you want. Unlike a regular bowline, it will slip and tighten down, so use it only for that purpose. It is a type of noose, but can easily be undone and won't bind. To make it, either tie the bowline around itself, or easier still, make a bowline and pull a bight through the finished loop.

Transom Knot

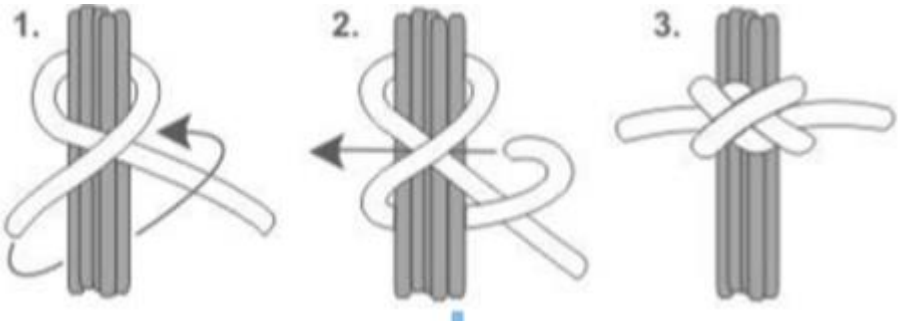


The Transom Knot is similar to a Constrictor Knot. It is used to fix together crossed pieces of rigid material and has a wide range of camping and outdoor uses, for example, to fasten tent poles together and kit to luggage racks. It holds tightly but is not bulky. It may be hard to release and need to be cut. If used as a permanent knot, the ends may be trimmed off for neatness. This is not a load bearing knot.

Quick Hitch (Arborist's Hitch)

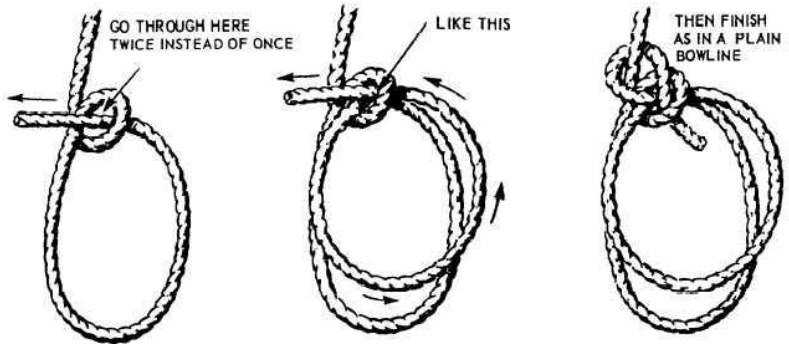
The Quick Hitch provides a convenient method for an arborist to pull up a second rope. It is quick to tie, and just as important, quick to release. There is probably no other application for this knot, but it serves this purpose excellently.

Constrictor Knot



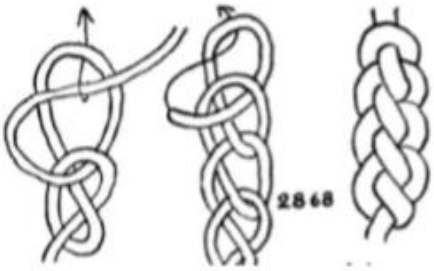
The constrictor knot deserves to be more widely known. It stays tight far better than a clove hitch. So good, in fact, you may have to cut it to release it. It is typically used in string and twine but can also be used in small cord. You can use it when starting or ending a lashing if the clove hitch (which it's based on) doesn't hold. Adding a "slip knot" to the final tuck will help to release it.

French Bowline



The French Bowline, also known as the Portuguese Bowline, is like the regular bowline but it has two loops. The two loops are adjustable in size. You can pull rope from one loop into the other, even when the knot is tight.

Specialty Knot: Chain Sinnet

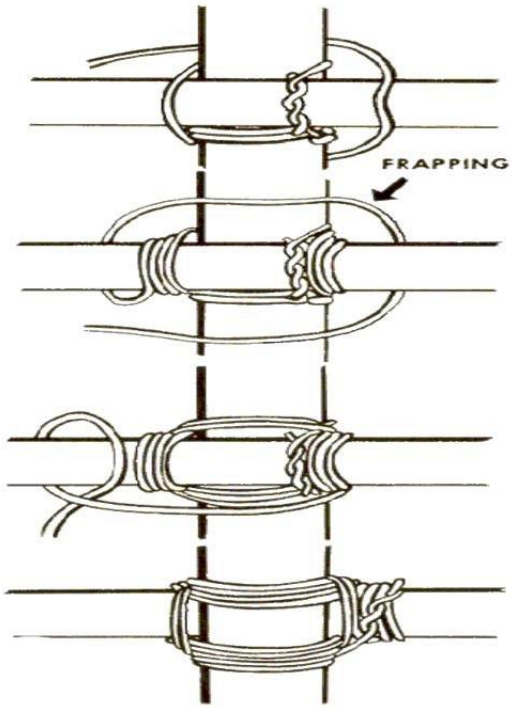


If you coil rope and it ends up all tangled when you uncoil it, then try the chain sinnet. It takes more time to make, but will save time when undoing. Make a slip knot in one end. Through the bight you just made, pull another bight through. Keep doing this until the end. Then when you're ready to use it, pull on the standing end and it easily comes undone.

Level Five – BROWN

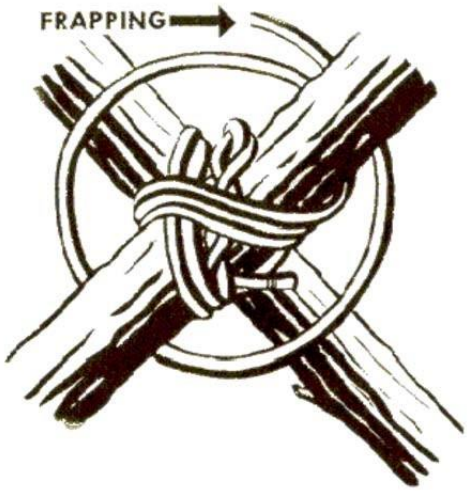
The extension of any knot is what is done with the rest of the rope between the ends. This level you master the art of lashing. The lashings are essential for pioneering activities to create camp gadgets, tripods, flag poles, towers, and bridges. Each of the lashings use knots from the previous level. A true Knot Master has a complete knowledge of how to use knots and rope, and this level will get you there.

Square Lashing



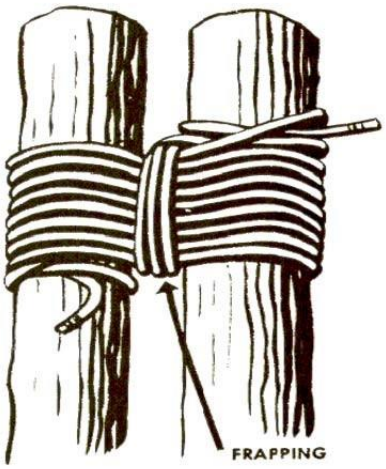
A Square Lashing is used to hold two poles that cross each other (usually at a 90-degree angle although not necessarily).

Diagonal Lashing



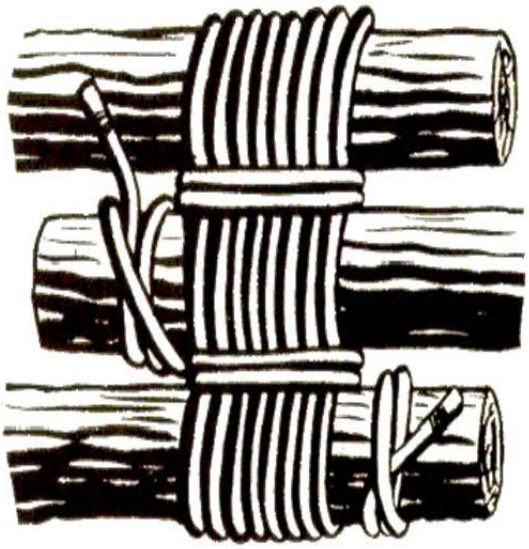
A Diagonal Lashing is used to bind two poles together that cross each other but do not touch (or are likely to be pulled apart) when their ends are lashed in place in a structure. Often used for securing diagonal braces used to hold a structure rigid.

Shear Lashing



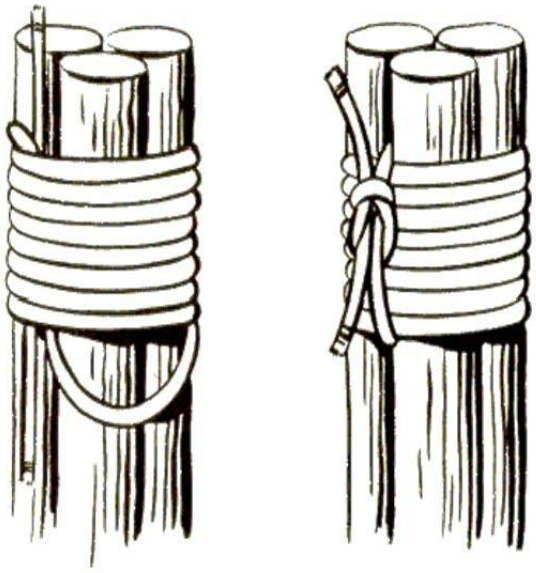
A shear lashing is often used to bind adjacent poles together. It is also a good way to reinforce a broken or weak pole. The frapping turns are used to tighten the lashing. A loose Sheer Lashing made around the ends of two poles will allow the poles to be opened out and used as an A-frame.

Tripod Lashing



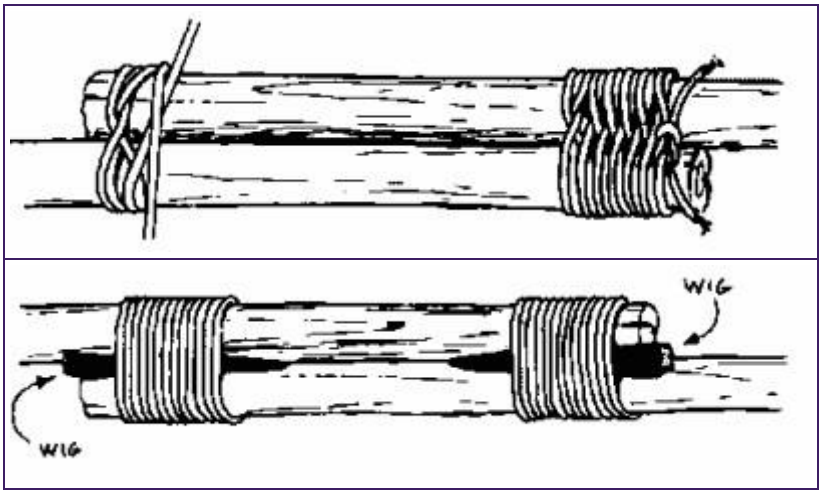
The tripod lashing is a shear lashing that binds three poles together at the same point. The tripod lashing gets its name from the fact that its most common use is the construction of a tripod. The tripod lashing can be used just about anywhere in a structure that three poles cross each other at the same point and the same time in the sequence of construction. Tripod lashing takes two main forms; with racked wrapping turns (the rope is woven between the poles) and with plain wrapping turns (the rope is wrapped around the poles without weaving the rope between the poles). When the lashing is made with racking turns the rope contacts each pole around its entire circumference; this contact makes the tripod lashing with racking turns the most secure form of tripod lashing: therefore, tripod lashing with racking turns should be used when safety is important. However, for light structures where there would be no danger if the lashing slipped, the faster to tie tripod lashing with plain wrapping turns may be used.

Tripod Lashing for Light Structures



Hold spars as in drawing. Place rope end in groove between spars. Wrap lightly a few times around spars and bring rope end up in groove. Finish with Square Knot and open tripod.

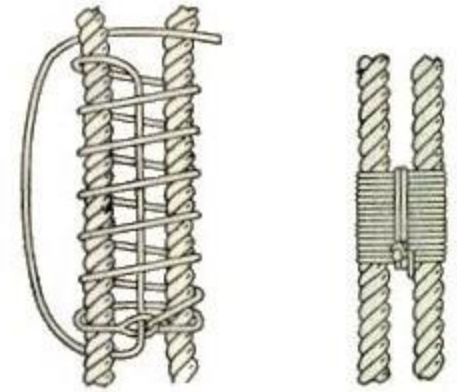
Round Lashing



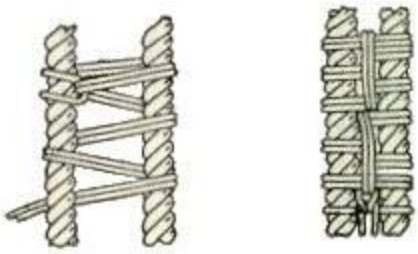
- Used to lash two poles together (constructing a flagpole).
- Tie a clove hitch round the bottom pole.
- Wind the rope around both six or seven times.
- Finish with two half hitches round both poles.
- The lashing can be tightened by driving a small wooden peg between the poles.

- If possible, force a wedge under the lashings to make them really tight. If the spars are vertical, bang the wedge in downwards.

Specialty Knot: Round Seizing Knot



Specialty Knot: Rack Seizing Knot



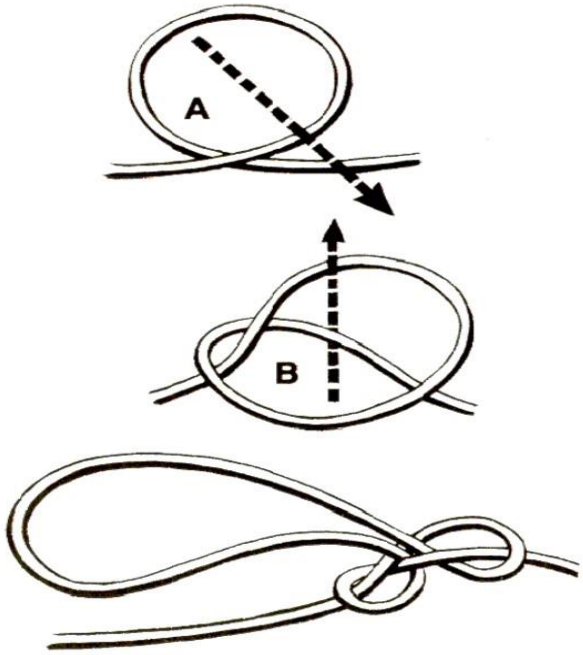
Level Six – RED

Climbing is a great sport and very satisfying when done in a safe environment. Similarly, there is tremendous satisfaction in completing the construction of a Monkey Bridge or other pioneering works. NOTE: DO NOT use these knots for climbing, rappelling or construction of pioneering structures until taught by a qualified instructor and with the appropriate equipment and supervision. Serious injury or death could result.

Water/Bow Knot

This knot is known as a Water Knot to the climbing folk and as a Retrace Overhand because of how it is tied. It is often used for tying flat webbing into a continuous loop to make a runner (which can be tricky) It is quite strong but can be very difficult to untie. That is actually a good thing when you're hanging off a rock on one!

Man-Harness Knot

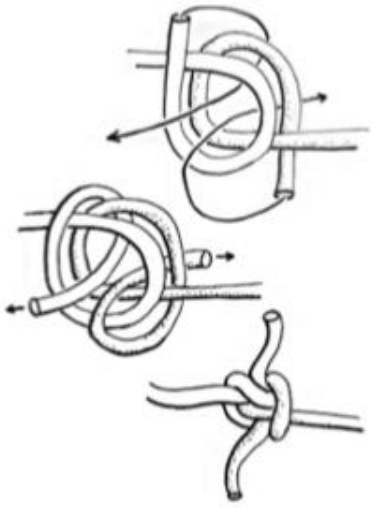


Artilleryman's Loop and the Man-Harness Knot is an easy to tie knot that that dates back to the days of manhandling artillery guns and horses in the battlefield. The loops that are formed were used as hand-holds or, when made large, shoulder-holds for hauling the guns into position and assisting horses uphill and out of muddy, difficult situations. Because the loop is formed on the bight of a rope multiple loops can be formed along a length of rope. However, tension should be maintained on the loop to prevent the knot from slipping, contracting or losing its shape.

The Artillery Loop can be a useful knot for camping, boating, ranch, horse and livestock work. A similar knot, the Alpine Butterfly Knot is considered superior and more safe for critical applications, but the Artillery Loop is faster to tie and untie.

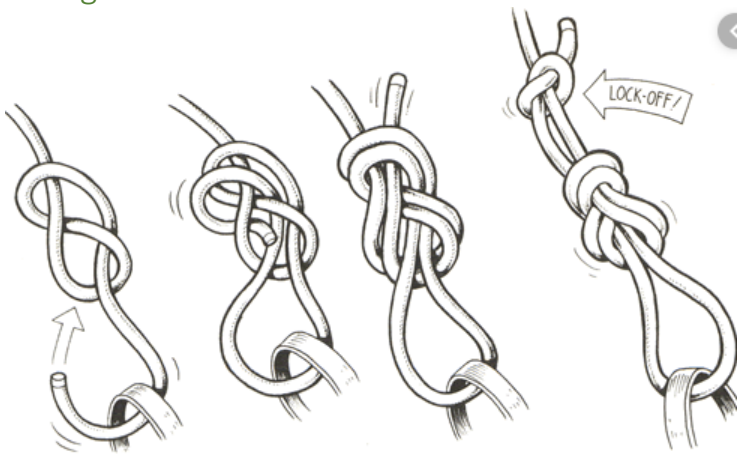
The principal use of this knot is to make a loop in the middle of a rope that is being used for hauling or climbing. A man can then use the loop as a harness over his shoulder so he can put his full weight to its best use. Form an underhand loop as shown at top. Grasp the loop at (A) and lay it over the part of rope shown by the arrow. The result will be shown in the middle drawing. Now grasp the rope at (B) and draw it up under and over as shown at bottom. This forms the bight which becomes the loop for your shoulder. Draw the knot tight before using it.

Zeppelin Bend



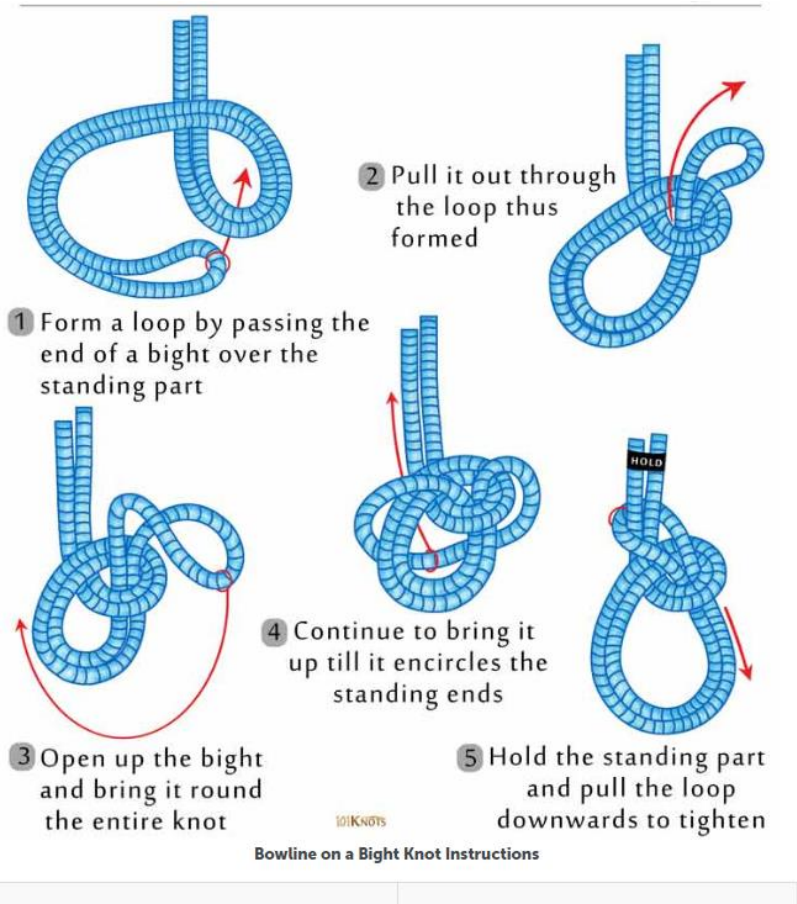
With so many bends out there, why is the Zeppelin Bend in this Knotmaster Program? When you want to join two ropes of similar diameter, you want it to be easy to remember how to make it, you want it to hold, not jam, and be easy to untie. The Zeppelin bend is all of those things. Plus it has a distinctive look and holds its shape under load or not. Other famous bends like Ashley and Hunter's consistently jam tight and may have to be cut when loosened. Unless you're climbing, the Zeppelin Bend is the way to go. The easiest way to remember how to tie it is the "b/q" or "6/9" method as shown.

Figure 8 Follow Through



The Figure Eight on a Bight is useful if the loop can be clipped onto. If you need to make the loop around an object, and you can't pass the finished loop over on end of the object, this "follow through" is the one to use. Simply create a figure 8 knot, wrap the working end around the object, and then follow the figure 8 around with the working end.

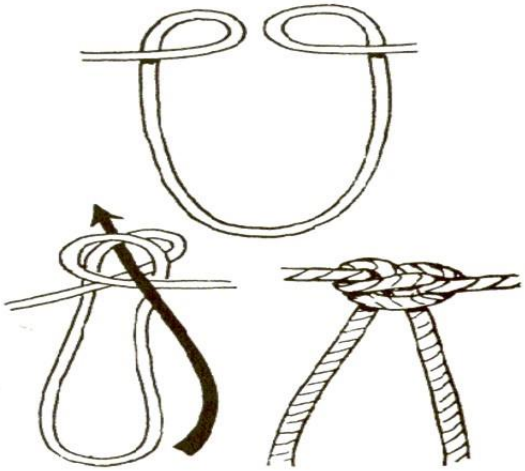
Bowline on a bight



Bowline on a Bight Knot Instructions

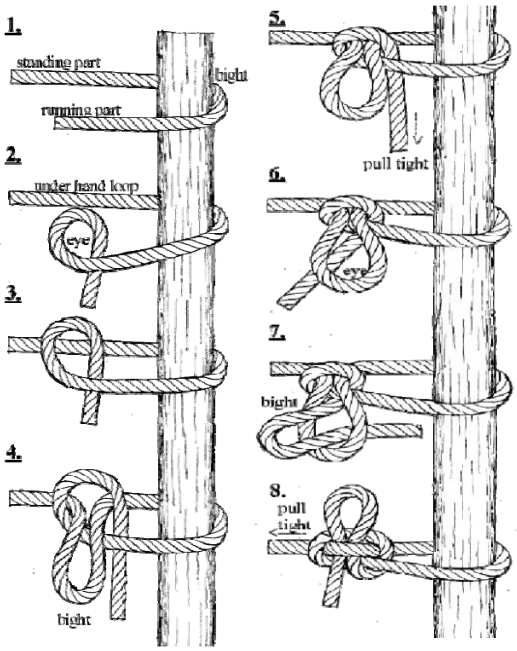
When you need a secure loop in the middle of the rope, this knot will do the trick. You can use this as a foot step in a rope or as a seat to be hoisted up in. Double the rope up and begin to make a bowline. But after the "rabbit" goes through the whole, take the bight and pass it around the loop and back up to the standing ends. When finished, you'll have two loops to use either as a hoist or an anchor point.

Alpine Butterfly



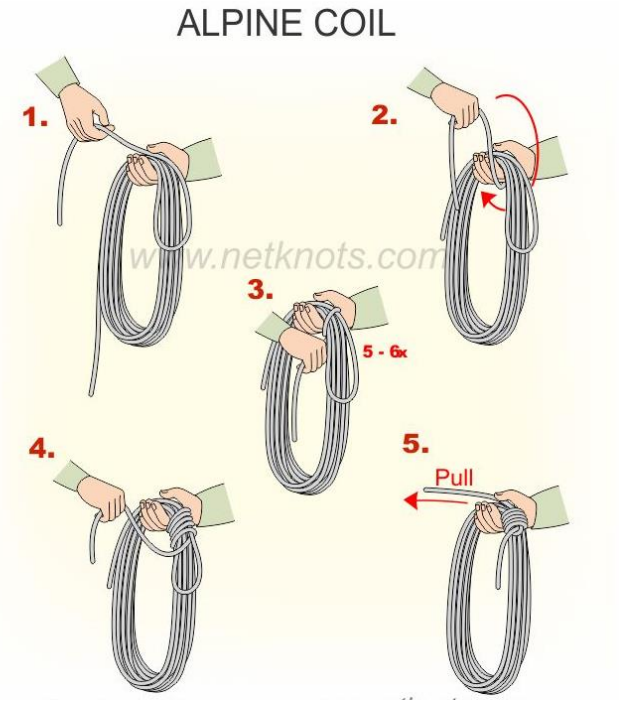
This is the best knot for making a nonslip loop in the bight of a rope. Simply make a bight of the required size with two small overhand loops turned inward at the top. Overlap the loops and bring the bight up and through from front to back. Adjust as necessary. The Alpine Butterfly Loop is useful anytime a secure loop is required in the middle of a rope. A good example is when a line of hikers wish to hook on along the length of a shared rope or as a possible option for the first part of a Trucker's Hitch. Also, if a length of rope is damaged, it is a wonderful way to isolate the damaged section so that the rope may still be used – far safer than The Sheep Shank.

Mooring Hitch



An underhand loop toggled to the standing part with a bight made in the running end. Used to securely tie off a rope so that it can be quickly untied, especially a small boat to a dock or piling. A secure knot that is easily tied or untied in wet or dry rope; when properly tied a non-closing loop is formed, this allows the hitch to move up or down a piling as the water level changes. (1) Take a bight around an object. (2) Form an underhand loop in the running part. (3) Place the eye of the underhand loop over the standing part. (4) Pull a bight of the standing part through the eye of the underhand loop. (5) Pull the underhand loop tight around the bight. (6) Place the running part under the eye of the bight that was pulled through the underhand loop. (7) Pull a bight of the running part through the eye of the standing part bight. (8) Pull on the standing part to tighten the standing part bight around the running part bight.

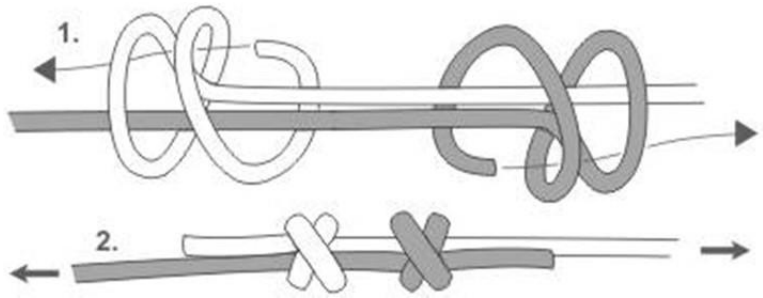
Specialty Knot: Alpine Coil



Level Seven – BLACK (KNOT MASTER)

These End Knots and Splices are a must to be able to keep you wrapped ropes in order. The skills you will master at this level will let you tackle any job and will amaze your fellow scouts, giving you the workings of becoming a true Knot Master.

Double Fisherman's Knot

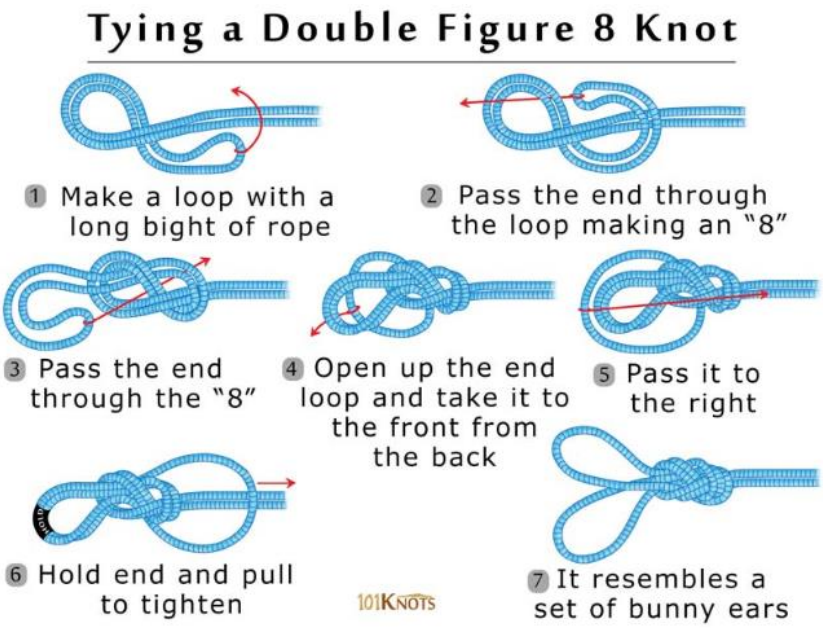


The Double Fisherman's Knot is the traditional knot to tie two ropes together for rappelling but has generally fallen out of favor for other knots like the double figure-8 knot. It can be difficult to check visually and is often difficult to untie after being weighted, particularly if the ropes are wet. This knot is best used for tying thin pieces of accessory cord like Spectra together for anchors or slinging nuts like Hexentrics. It's also called the grapevine knot.

Double Sheet Bend

When lines are of unequal diameter or rigidity it is necessary for security to "double" the sheet bend by making an additional round turn below the first and again bringing the working end back under itself. The free ends should end up on the same side of the knot for maximum strength.

Double Figure 8 Knot

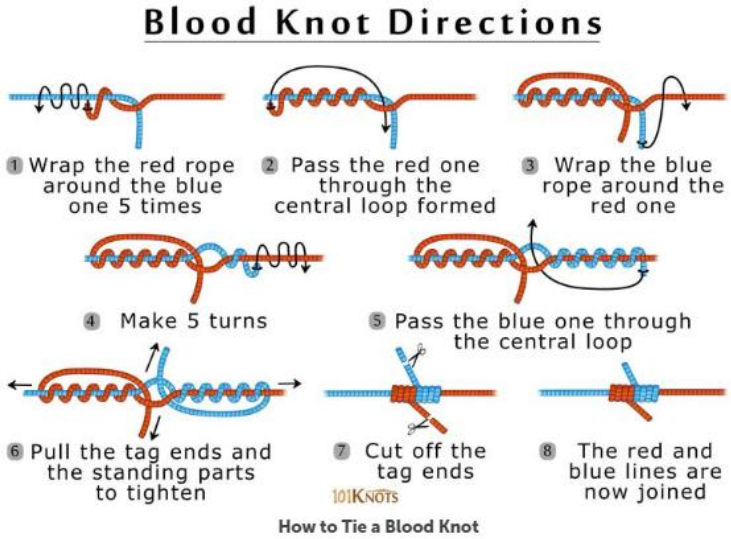


The double figure 8 loop is based on the figure 8 knot. Also known as bunny ears, it forms a couple of loops that mainly distinguishes it from the similar figure 8 on a bight and figure 8 follow through (both forming a figure 8 loop) that contain a single loop in their structures. It is unlikely to slip such that one loop gets larger than the other making the double figure of eight loop knot stable.

Double Carrick Bend

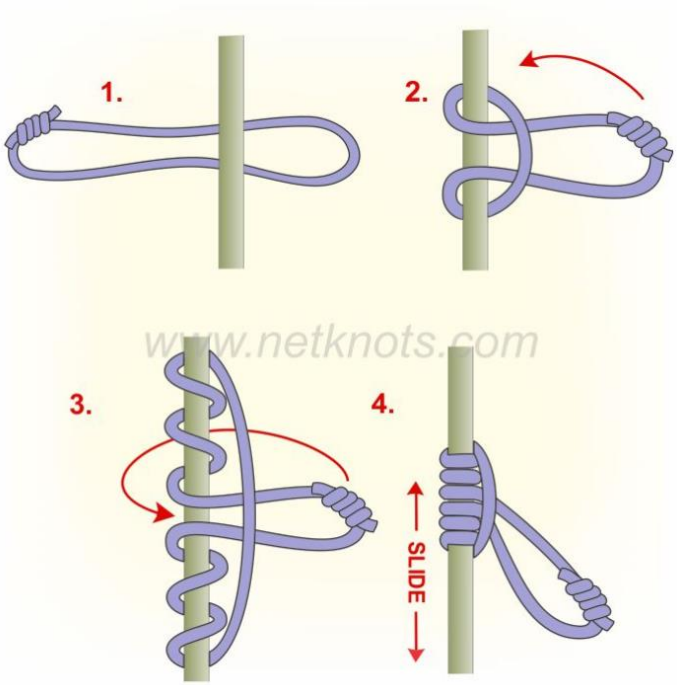
The Double Carrick bend is a knot used for joining two lines. It is particularly appropriate for very heavy rope or cable that is too large and stiff to easily be formed into other common bends. It will not jam even after carrying a significant load or being soaked with water.

Blood Knot



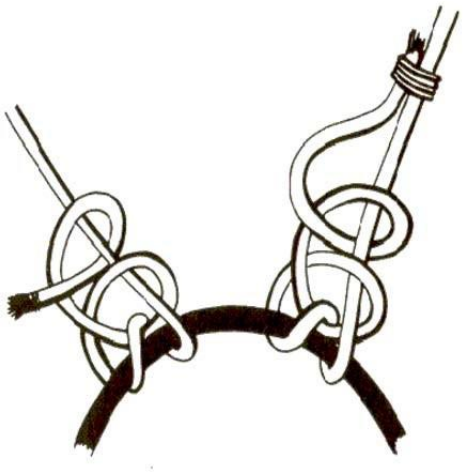
The Blood Knot is a favorite knot for fly fisherman. It is primarily used to join two lines of similar size, e.g., when joining sections of leader or tippet, and is one of the best knots for this purpose. The strength of the Blood Knot depends on making at least five, and up to seven, turns on each side of the center. Pulling the Knot Tight: When lubricated and pulled tight, the Blood Knot changes its structure. Pulling on each line forces the wrapped turns to redistribute the twists so that the inner strand becomes an outer wrap. There are several methods of tying it. One method is to just overlap the two ends and twist them together for about ten to fourteen turns. Then go to the center of the twists and create a hole. Pass the two ends the opposite way through the hole. Whichever method is used, the Blood Knot is usually symmetrical about the middle. Although the twists usually continue in the same direction either side of the center as shown, it can be tied so that the wraps are mirror images of each other. The Blood knot is a simple, easily learned and very effective way of joining two similar sized lines.

Prusik Knot



Use the Prusik Hitch to secure a loop to a tight line. It slides when not weighted along a tight rope but jams solidly upon loading. Mountaineers use this knot to form footholds to help them climb a vertical rope and also for belay systems. Many climbers believe that the Prusik Knot has more "give" resulting in a reduced force applied to the system in the case of a shock load (a fall), as opposed to a similar purpose knot such as the Klemheist. Because the knot is tied in smaller diameter cordage a little give or slippage in the knot may be better than a knot that holds tighter, which in the case of a belay system taking a shock load might increase your chance of a catastrophic-system-failure. The loop needs to be made in rope or cord that is at most half the diameter of the main line. It is often made by tying the ends of cord with a Double Fisherman's Knot.

Fisherman's Bend

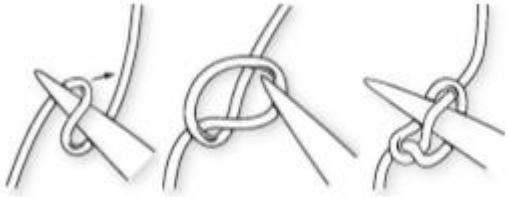


Fisherman's bend, which is also called the Anchor Bend, is one of the strongest hitches. Begin by taking two turns around the post or ring. Then bring the end over the standing part and through the loop. Finish as in two half hitches. This can be made more secure by seizing the ends of the rope.

Level Eight – RED/WHITE/BLUE (KNOT MASTER CHIEF)

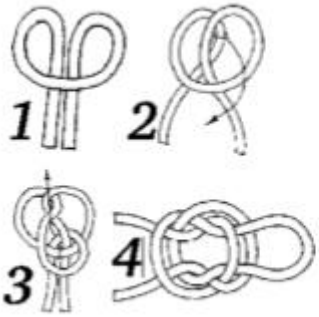
These Bends and Bights are advanced knots, but they are still very common in the overall family of knots. The advanced Scout should be able to use these knots at will for everything from setting up camp to First Aid techniques. The Advanced Knot Master at this level is becoming the authority on knots and can assist any level of scout with the correct knot for a particular use.

Marlinspike Hitch

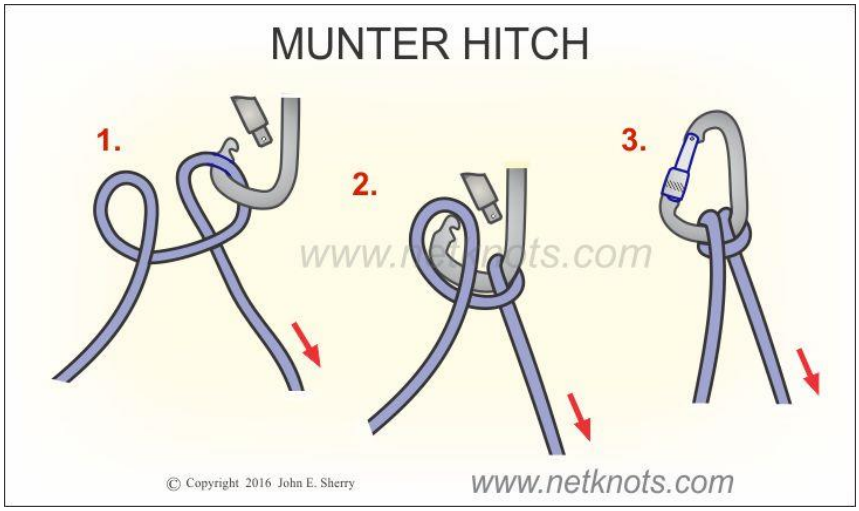


A Marlinespike is a small metal tool used to tie and untie knots. But you can use any strong tool like a wrench or screwdriver or even a dowel. When you want to pull on a twine or small cord to tighten it but can't get a good grip, this hitch is quick to make After forming the hitch, pull on both ends to tighten. Don't load the working end or it will capsize and jam.

Bottle Carrier



Munter Hitch

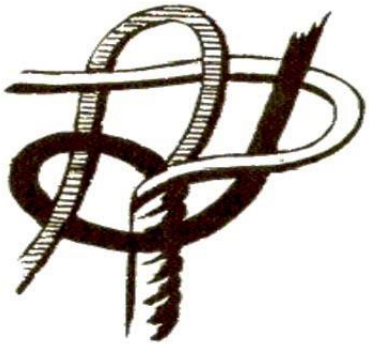


The Munter Hitch provides a method for belaying and rappelling without a belay/rappel device. This is an important knot for climbers to know. It works best in large pear-shaped carabiners and should only be used with a locking carabiner. When belaying with the Munter Hitch be sure that the strand of rope carrying the load is next to the spine of the carabiner. Set this knot up correctly, because someone's life is on the other end of the rope! This knot can cause kinks or twists in the rope.

Level Eight – Appendix A – Splicing

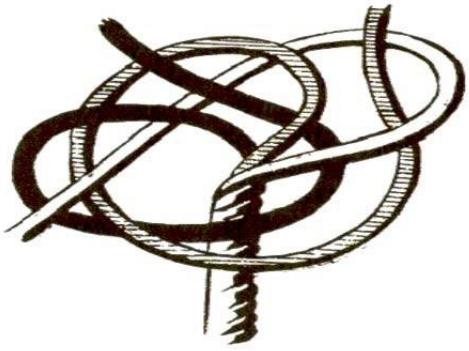
In today's world, synthetic ropes are commonplace as they are relatively inexpensive and longer-lasting. There are synthetic ropes that are constructed with multiple strands, so these techniques may be applied to them. Care should be exercised, however, as synthetic ropes tend to be slicker and the friction required to construct stable splices may not be attainable. Rope friction exhibited by natural fiber ropes is one advantage they have over synthetic ropes. Synthetic ropes, however are not susceptible to rot over the long term. There will be times when you will have the opportunity to work with natural fiber ropes and may need to utilize the following splices.

Wall Knot



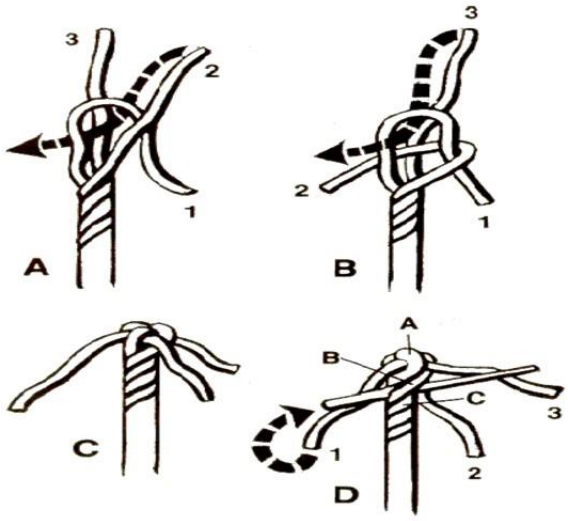
This knot is a firm, round, semi-permanent "stopper" knot tied with the end strands of a rope. Snug it carefully so that strands tighten evenly. You can trim the ends or twist them together again and whip the end.

Matthew Walker Knot



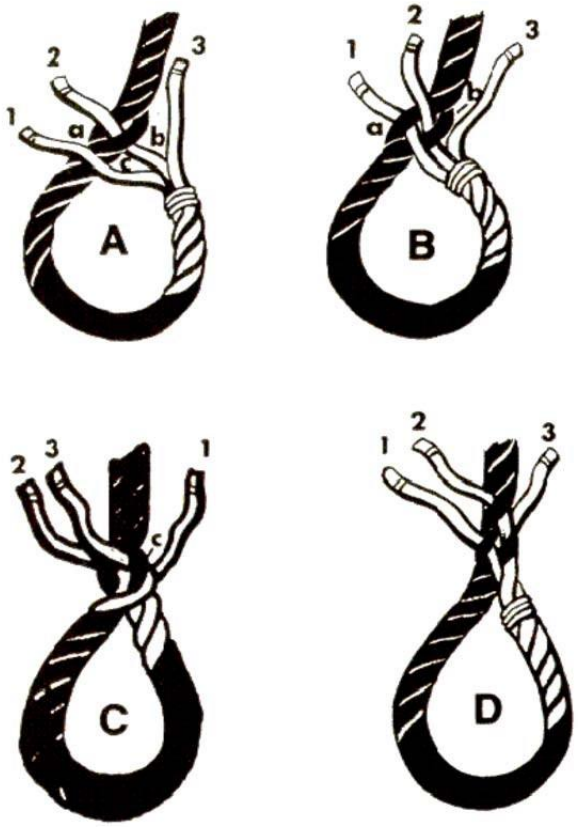
The Matthew Walker Knot is a decorative knot that is used to keep the end of the rope from fraying. It is tied by unraveling the strands of a twisted rope, knotting the strands together, and then laying up the strands together again. To tie the knot the tier takes each strand and forms a loop around the rest of the bundle, then passes the end through the newly formed loop to form an overhand knot. You then move the next strand over, moving around the bundle in the direction he passes the loops. Tying the first strand around the bundle is straightforward, but each subsequent end must be passed through the previously formed loops in order to contain all the other strands in its loop. When tightening, it may help to roll the knot along the bundle, especially when using only two strands. The final effect is a spiral knot vaguely resembling a section of a barber's pole.

Back splice



The Back splice is a method of preventing fraying or raveling in the end of a rope. It is more durable and permanent than whipping. Begin by un-laying the rope and making a crown knot as shown in drawings A, B, C. The ends are then tucked with the over-and under movement. See drawing D. Finish by trimming the ends and smoothing the splice by rolling it on the floor with your foot

Eye Splice



The Eye Splice is the strongest type of rope loop. Like the Short Splice, it is woven "one over, one under." Strands may be loosened for tucking by twisting the rope in the direction opposite the lay. Begin by laying the end four or five turns.

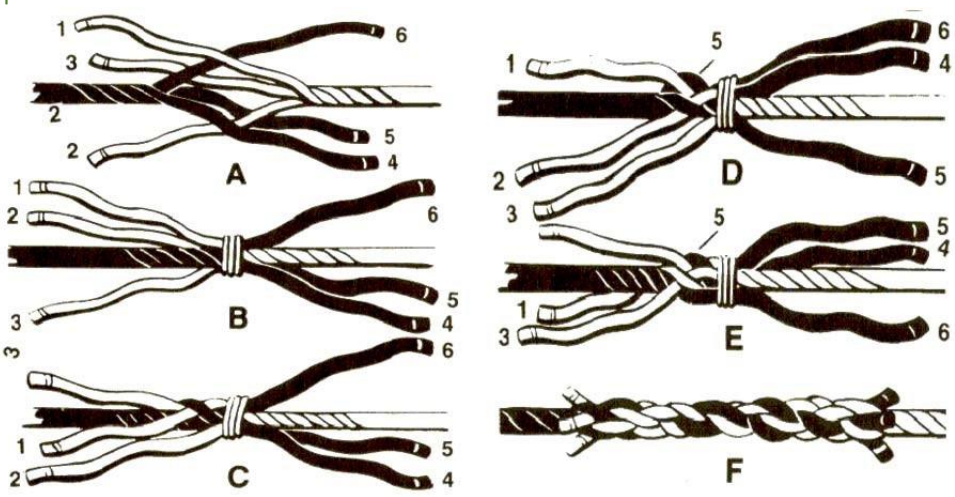
A. Tuck strand 2 over strand c, under b, and then out between strands a and b.

B. Tuck strand 1 once over strand b and under a.

C. Turn rope over and tuck strand 3 under strand c and over next strand.

D. Tuck each strand in turn over and under for several tucks

Short Splice



Begin by un-laying (untwisting) the ropes a few turns. If the rope is large, make temporary whippings on the ends of the strands. A. Alternate the strands of the two ropes.

B. Tie strands down to prevent more un-laying.

C. Tuck strand 1 over an opposing strand and under the next strand.

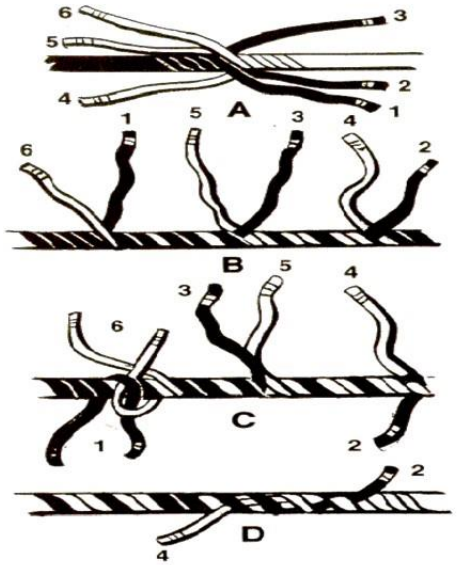
D. Tuck of strand 2 goes over strand 5, under the second, and out between the second and third.

E. Repeat operation with strands 1 and 3 from same rope end.

F. Remove tie and repeat operation on other rope end. Make two or more tucks for each strand. Then roll the tucks and cut off ends.

You can smooth the splice by rolling it under your foot on the floor

Long Splice



A splice used to join two rope ends forming one rope the length of the total of the two ropes. The long splice, unlike most splice types, results in a splice that is only very slightly thicker than the rope without the splice but sacrifices some of the strength of the short splice. It does this by replacing two of the strands of each rope end with those from the other and cutting off some of the extra strands that result. The long splice allows the spliced rope to still fit through the same pulleys, which is necessary in some applications.

A. Un-lay each rope and about 15 turns. Place the two rope ends together, alternating strands of each end.

B. Using opposite pairs, un-lay one end 4 and fill its place with the "partner" strand 2. Repeat operation exactly with another pair of strands 1 and 6 in opposite direction.

C. Trim the longer strand 4 and tie each pair of opposing strands 2 and 4 with an overhand knot, tucking each strand twice. The tuck goes over one strand, under the second, and out between the second and third. Strands 3 and 5 are simply tied with an overhand knot. Strands 1 and 6 are halved, and opposite strands tied with an overhand before tucking.

D. Roll and pound all tucks into the rope and then clip the individual strand ends.

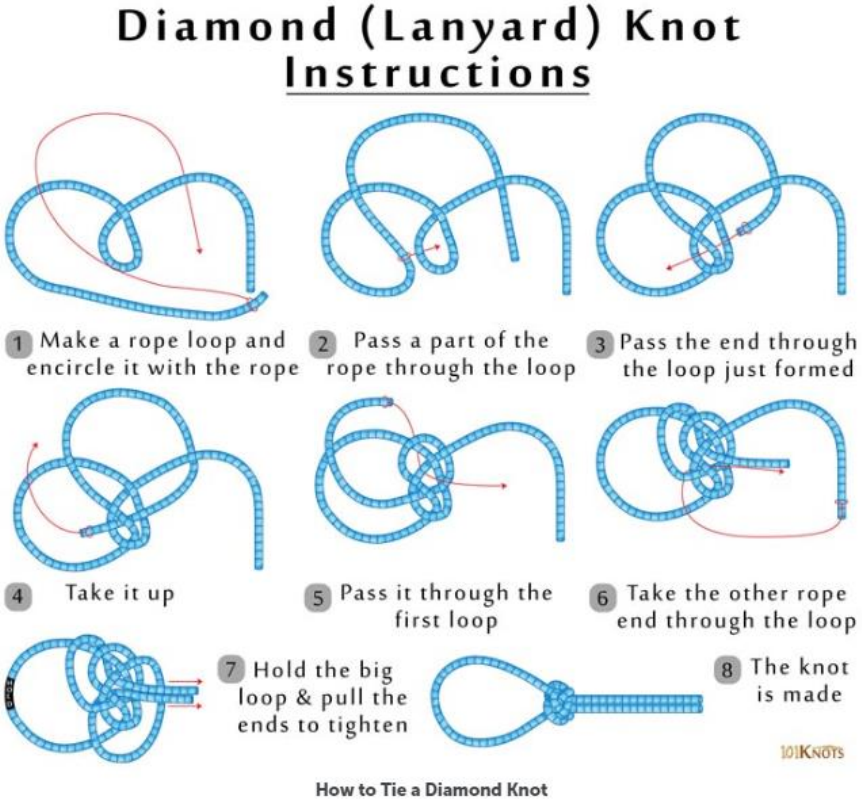
Cut Splice

Splicing two ropes with the "Cut Splice." The Cut Splice is made just as an eye splice or short splice, but instead of splicing two ropes together end to end, or splicing an end into a standing part, the ends are lapped and each is spliced into the standing part of the other, thus forming a loop or eye in the center of a rope.

Level Eight – Appendix B – Specialty Knots

The knots below are specialty knots. Have fun perfecting their construction. You can spend hours do so!

Diamond Knot (Knife Lanyard / Friendship Knot)



How to Tie a Diamond Knot

The Diamond Knot (or knife lanyard knot or friendship knot) is used as a decoration and joining knot in a cord with a loop such as a Whistle lanyard. This knot is well known to Scout Leaders who have taken the wood badge course as it is traditionally tied to the beaded thong given to acknowledge the training received. Step 1 the diamond knot begins as a carrick bend with the ends exiting diagonally opposite each other. Step 2 each working end is then passed over the other ropes standing part. Step 3 Then the ends are passed up through the center of the carrick bend from below. The knot is then gently rearranged and tightened so that the ends emerge from the knot parallel and opposite their standing part.

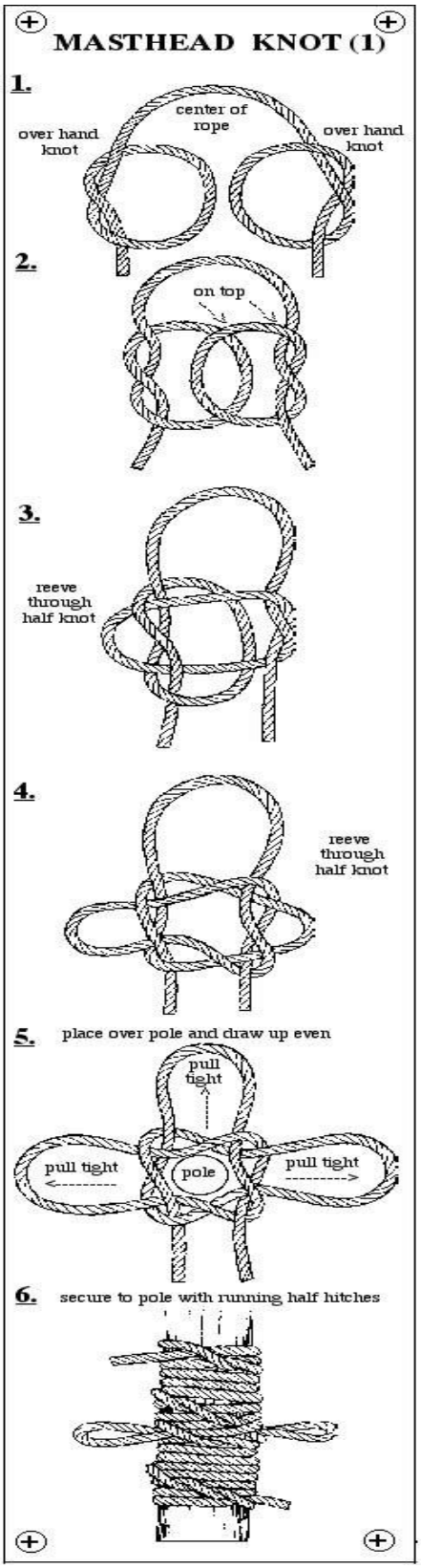
Masthead Knot

A multiple loop knot formed by reeving the loosely made loops of two over hand knots through each other and then securing the knot to a mast (pole).

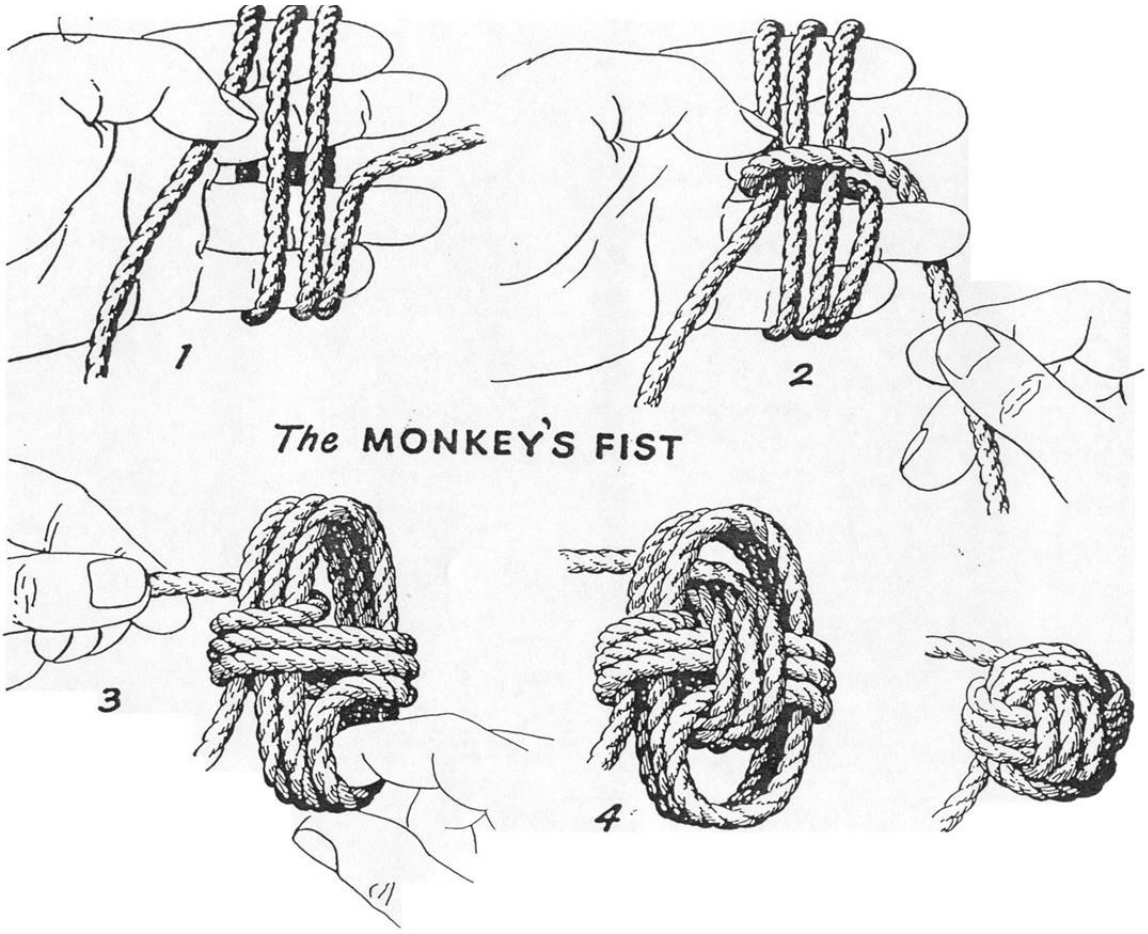
On board ship, a masthead knot was used to rig a temporary mast if the mast was lost in battle or during a storm. On land a masthead knot can be used to rig a gin pole or a flagpole.

There are several forms of the Masthead Knot. This form of the Masthead Knot was chosen for its symmetry and the ease of transition to the running half hitches used to secure it to the pole.

(1) Loosely tie two over hand knots. (2) Place the loop of one overhand knot on top of the loop of the loop of the other over hand knot. (3&4) Reeve the loops of the overhand knot through the half knot part of the opposite overhand knot. (5) Place over a pole and draw the three loops up even. (6) Secure to the pole with a series of running half hitches above and below the mast head knot.

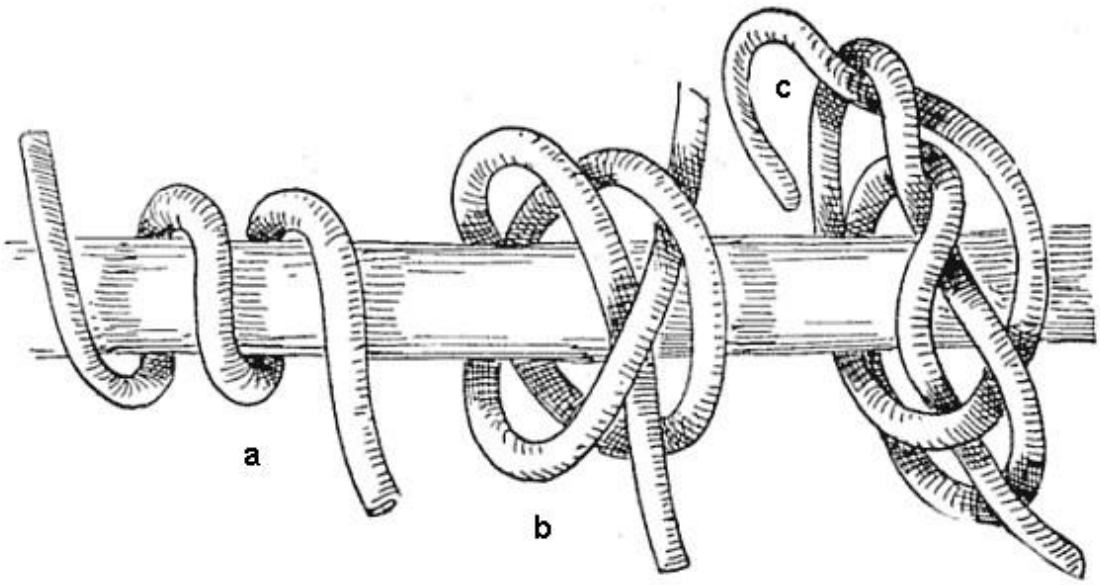


Monkey Fist Knot



The Monkey Knot is typically tied at the end of a rope to serve as a weight or an anchor. The knot is usually tied around a small weight, such as a stone, marble, tight fold of paper or a piece of wood. A thicker line will require a larger object in the center to hold the shape of the knot. Step 1 Place the rope in your hand and leave about 3 inches below the bottom of your hand to tighten the rope. Step 2 wrap the rope around your four fingers vertically three times. Keep the rope you are wrapping in your hand. Keep the rope tight over your fingers. Step 3 Separate your fingers and pass the end of the rope between the fingers in the middle. Horizontally wrap the end of the rope down and around the wrapped ropes two times and then wrap the end of the rope around just one side of the ropes once. Step 4 Slide the rope off your Fingers and hold the bottom of the loop between your forefinger and thumb. Vertically wrap the end of the rope around inside pieces three times. Step 5Wrap the rope inside the vertical loop across the horizontal loop and loop around three times. Step 6 Pull the two ends to the knot tight. This makes the sturdy and gives it weight. Step 7 Tie the loose end of the rope to hold the knot in place.

Turks Head Knot



A Turks head Knot is a decorative knot with variable number of interwoven strands, forming a closed loop. The name is used to describe the general family of all such knots rather than one individual knot. While generally seen made around a cylinder, the knot can be deformed into a flat mat-like shape. The Turks head is used as a woggle by Scouts Leaders who complete their training course were thus awarded with the Wood Badge insignia.

Each type of Turk's head knot is classified according to the number of leads and bights and method of construction. The number of bights is the number of crossings it makes as it goes around the circumference of the cylinder. The number of leads is the number of strands around the circumference of the cylinder, before doubling, tripling, etc. Depending on the number of bights and leads, a Turk's head may be tied using a single strand or multiple stands.

Swiss Seat

The Swiss Seat is also often referred to as a rappel seat, as its purpose is to serve as an emergency rappelling harness. Many survival and E&E kits contain a carabiner and a 12 ft. section of rope just for this purpose. Not to sound overly dramatic, but in an emergency, just these two items could mean the difference between life and death. A Swiss Seat can also be used to transport an injured victim to safety if no rappelling harness is available to them. We highly recommend that before carrying a 12 ft. section of rope for a Swiss Seat, you see if it's the right amount of rope for you. IMPORTANT: The carabiner MUST be load-rated and applicable for the task demanded of it. The rope material for the swiss seat MUST be sturdy, low yield strain, and suitable for the task demanded of it. Selection of these materials MUST be made by those qualified to do so, otherwise serious injury or death may result.

Make sure you have enough rope left over to properly back up the square knot tied in the Swiss Seat.

1. Find the center of the rope
2. Hold the bight of the center against your left hip if right handed or right hip if left handed
3. *The reason for this is that when tying the final square knot, you want it opposite from your rappelling brake hand*
4. Drop the bight and wrap the rope around your waist
5. If wrapped correctly you should now have one end that is longer than the other
6. Make one overhand knot and a consecutive second wrap (it doesn't matter which side)
7. Allow the running ends to hang down
8. Pull the running ends through your legs and around your backside, squatting to tighten
9. Feed each side up and behind the waist wrap creating a half hitch to lock
10. Tie a square knot off to the side of your body you originally started on

11. Backup the square knot with an overhand knot in each working end
12. If you have excess rope, consider carrying less or simply tucking it into a pocket
13. Attach a locking carabiner through the initial wrapped portion of the Swiss Seat as well as the wrap with the square knot
14. Ensure the gate is facing you to avoid it rubbing on the rope, and “screw down so you don’t screw up!”

Z-Drag 3:1 System

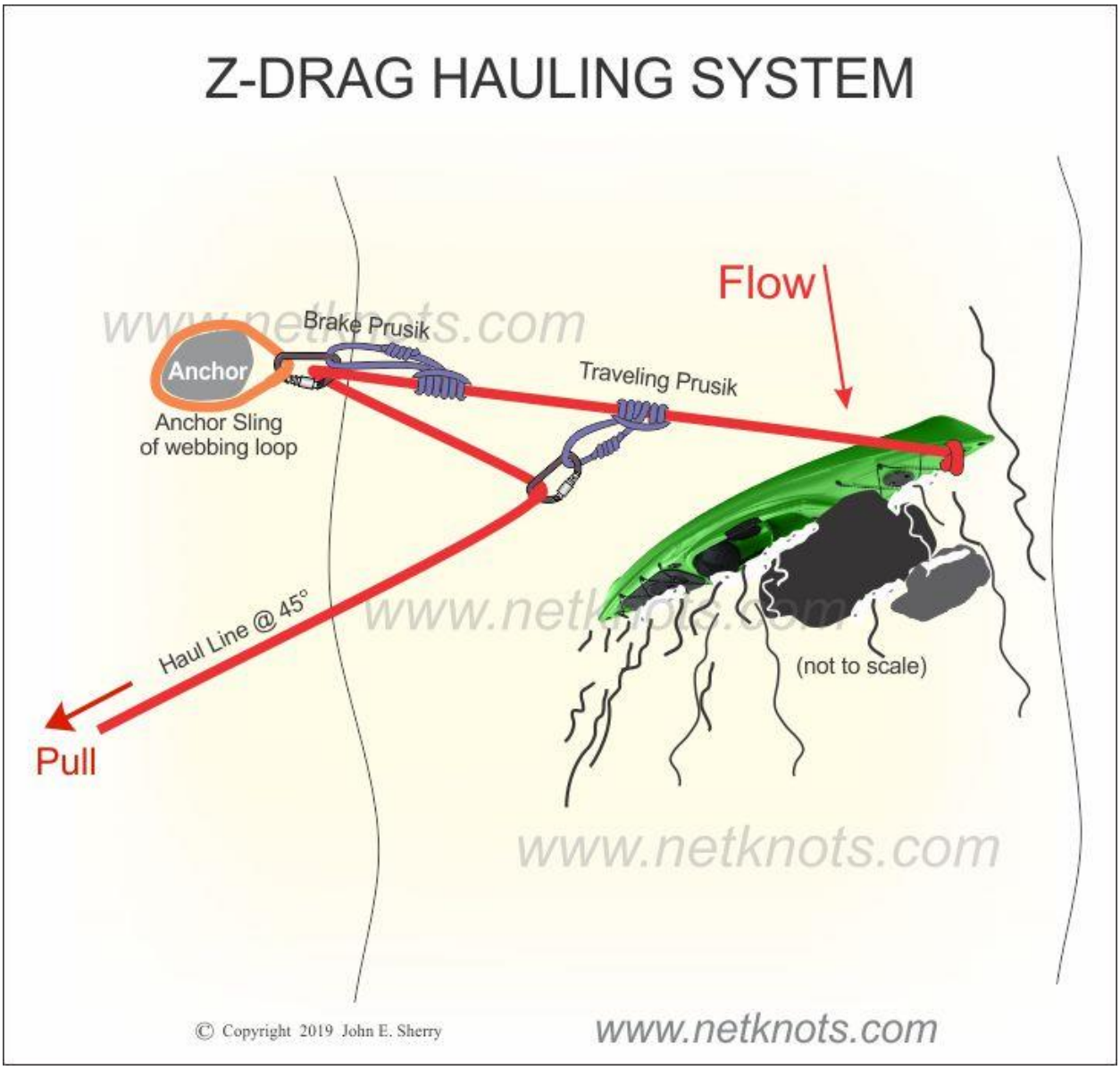
How to set up a Z-Drag hauling system. The "Z-Drag" creates a three-to-one mechanical advantage hauling system which multiplies the pulling force on the hauling rope by a factor of three. This is accomplished with the use of carabiners which act as pulleys and allows for a person to pull a much heavier load than with a rope tied directly to an object.

The Z Drag needs to be set up and "manned" carefully. Everyone should leave their helmets and PFDs on for protection if working to free a boat on a river. The Z-Drag, although originated for rescue of boats pinned in a river, can be used to help you lift anything heavy. A person can be hauled up a cliff face, a snowmobile or ATV can be un-stuck or heavy items such as large game can be hoisted into the air from a tree for butchering. Learning to set up a Z-Drag correctly can help you lift anything heavy, with only a minimal amount of equipment.

The system starts with a good anchor point. A large well-set boulder or tree trunk can work well as can a car bumper or other sturdy, fixed object. The items then needed to build the system are quite simple and include the following: about 75-100 feet of good haul rope, about 12 feet of smaller diameter cordage (5-10mm is good) to be cut in two for making "Prusiks" (see below), a rope or webbing loop/sling for encircling the anchor point, and two strong carabiners (suitable for climbing).

Note that the mechanical advantage of the Z-Drag System can exert tremendous force. Pay special attention to the attachment point to the boat. The hauling force involved can easily rip out seats and other points of contact not meant for handling such force. Strong carabiners, preferably locking style (screw-down) should be used. If locking carabiners are not available, double up and use two at the same location, with the gates facing in opposite directions.

Once you have everything organized and ready follow the instructions below to rig the system.



Z Drag Setup Instructions

1. Secure a sling of rope or webbing around the anchor point. If making a sling from rope, tie the ends together with a Double Fisherman's Knot. If making a sling from webbing, tie the ends together using a Water Knot. Leave a little bit of slack to attach the first carabiner. This is anchor carabiner.

2. Secure one end of your haul rope to the load. If freeing a pinned boat, tie onto the far end of the boat if possible. Run the working end of the rope through the anchor carabiner.

3. Wrap your first Prusik Loop (click for instructions to tie a Prusik Loop) as far down the rope toward the load as possible. Clip the second carabiner through the prusik and run the working end of the rope through the carabiner. This is the traveling prusik.

4. Tie a second prusik loop on the haul line near the anchor carabiner and clip the loop into the carabiner. This is your brake prusik. As the haul rope is pulled keep the brake prusik in front of the

brake carabiner. Anytime a rest is needed or if the haul rope is let go of, the brake prusik serves to maintain tension on the rope so no progress is lost. As the haul line is pulled in, advance the brake prusik.

5. Eventually the traveling prusik will reach the brake prusik. Maintain tension with the brake and slide the traveling prusik back out toward the load as far as possible. Resume pulling until the objective is reached.