

Knot Craft

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Acknowledgements

The material in this document is from

1. Wikipedia: http://en.wikipedia.org/wiki/List_of_knots
2. Animated Knots by Grog: <http://www.animatedknots.com>
3. Notable Knot Index: http://www.geocities.com/roo_two/knotindex.html
4. *Ashley Book of Knots*, Clifford Ashley, Doubleday, 1944
5. AdriaSail <http://www.adriasail.com/sailing/knots/>
6. 4th Tyldesley Scouts http://www.4thtyldesley.co.uk/lashings/square_lashing.php
7. Troop 47, Moore, Oklahoma http://www.oktroop17.org/Knots_Home.html
8. Mountaineering in the Philippines, Ariel Geronimo
<http://www.geocities.com/TheTropics/1030/bmc/c8.htm>
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10. Boy Scout Handbook

How Cord Advancement Works

1. Earning the Cords:

A Scout earns the colored cords when he can tie all of the knots in the level.

- a. Tenderfoot Level (Purple and Black cords)
- b. Intermediate Level (Yellow and Green cords)
- c. Advanced Level (Red and Blue cords)
- d. Master Level (White Cord is added to the Red and Blue)

2. Who Awards Cords?

A Scout can be tested and awarded the next level by any other Scout who has already earned that level. For example, any Advanced Level Scout can test and award the Advanced Level to any Tenderfoot Level or Intermediate Level Scout.

3. Challenges:

Any Scout can challenge any other Scout at any time. If the Scout being challenged cannot tie a knot from their current level, they are demoted one level and must hand their cords back to the Scoutmaster. The Scout can re-earn their level back at any time by tying all of the knots required for that level.

4. Wearing the Cords:

The cords are worn on the Scout's belt. Any inappropriate use of the cords, for example, whipping, will result in a one level demotion. The Scout can re-earn their level back at any time by tying all of the knots required for that level.

Purple and Black Cords (Tenderfoot Level Knots)

Square (Reef) Knot



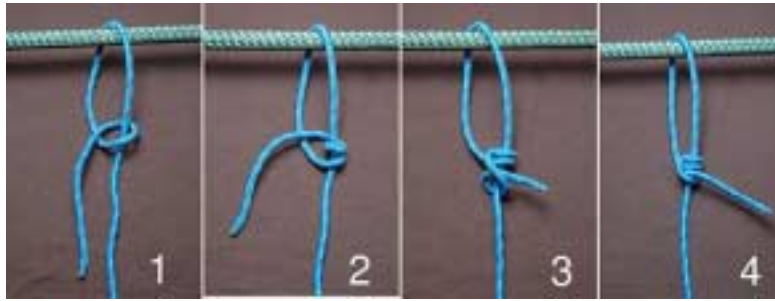
- Used to tie two ends of a single line together to secure something that is unlikely to move much. It lies flat when tied with cloth, and has been used for bandages for millennia. With both ends slipped it becomes a good way to tie shoelaces. It is also used decoratively and to tie the Obi (or belt) of a martial arts keikogi and it is quite handy for tying plastic garbage or trash bags, as the knot forms a handle when tied in two twisted "ears".
- This knot's name originates from its use to "reef" sails (tie part down to decrease effective surface area), where its easy-spilling behavior was very handy. A sailor could collapse it with a pull of one hand; the sail's weight would make the collapsed knot come apart.
- The International Guild of Knot Tyers warns that this knot should never be used to bend two ropes together. Some knotting guides claim that misused reef knots cause more deaths and injuries than all other knots combined. The sheet bend, and in some cases the fisherman's knot, are simple bends that can replace the reef knot.

Two Half Hitches



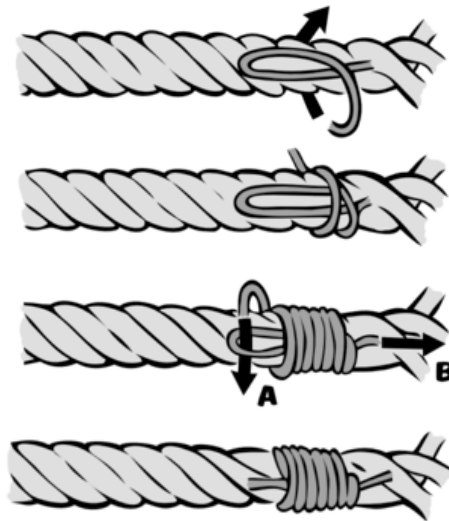
- Two half-hitches consists of an overhand knot tied around a post, followed by a half-hitch. Equivalently, it consists of a half-turn around a post followed by a clove hitch of the running end around the standing part.

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. 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, for creating adjustable moorings in tidal areas, and to secure loads on vehicles. A versatile knot, the Taut-line hitch was even used by astronauts during the second Space Shuttle mission to repair the Hubble Space Telescope.

Whipping



- A whipping knot or whipping is a binding of twine around the end of a rope to prevent the fibers of the rope from unraveling. When a rope is cut, there is a natural tendency for the cut end to fray. A whipping is one way to try to prevent this, by applying multiple turns of twine (sometimes called small stuff) tightly around the rope very near the cut end.
- The whipping can be made neat and permanent by tying it off or sewing the ends of the twine through the rope.
- When doing this to thick sailing-ship-type rope, the "small stuff" used was sometimes whipcord, hence the name "whipping".

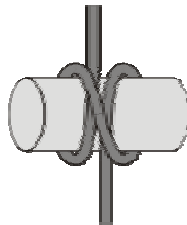
Yellow and Green Cords (Intermediate Level Knots)

Bowline



- The bowline is an ancient knot used to form a fixed (non-slipping) loop at the end of a rope. The name "bowline" is derived from the nautical term "bow line" which was a line that held the edge of a square sail towards the bow and into the wind,
- Tie the bowline by imagining the end of the rope as a rabbit, and where the knot will begin on the standing part, a tree trunk. First a loop is made near the end of the rope, which will act as the rabbit's hole. Then the "rabbit" comes up the hole, around and under the tree, and then back down the hole.
- The structure of the bowline is identical to that of the sheet bend, except in the bowline the end and the standing part are used to form the knot rather than two ends, as in the sheet bend.

Clove Hitch



- The clove hitch makes a convenient start for a lashing- it leaves an end free to tie the final knot. It is also used in the theatre for easily adjusting the height of curtains
- It does have two major failings: it slips and, paradoxically, can also bind. Used as a traditional hitch, i.e., loading only one end, the clove hitch is liable to slip. It requires a load in each direction in order to be effective.

Timber Hitch

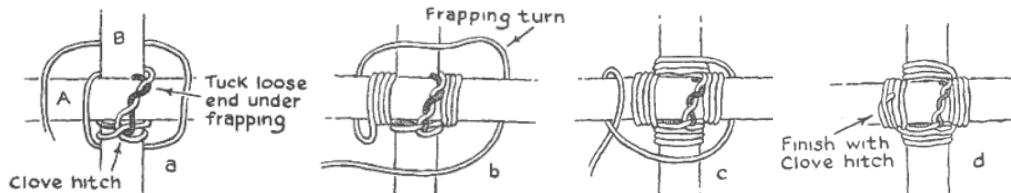


- The timber hitch is used for handling cargo and logs, for which it is very convenient, since it practically falls apart when pull ceases. It is also useful when

towing a spar or log either afloat or on land. When towing a log or spar, the timber hitch is often placed near the center of the spar and a separate half-hitch is dropped over the end of the spar to act as a guide.

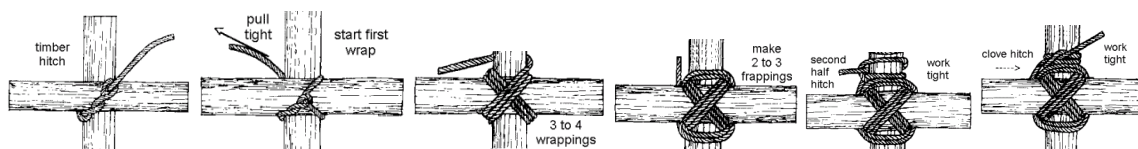
- To tie, the end of the line is passed once around the spar and then round the standing end before being wrapped three times round itself. When correctly tied and tightened, these three turns should all be tightly pinched against the spar or log.

Square Lashing



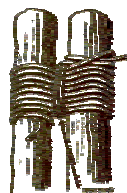
- Square lashing is a type of lashing knot used to bind poles together. Square lashing generally used on load bearing members, and is stronger than diagonal lashing.
- When the turns are taken around the vertical pole they should be inside the previous turns. The ones around the cross pole should be on the outside of the previous turns. This makes sure that the turns remain parallel and hence the maximum contact between the rope and wood is maintained. Strength is improved if care is taken to lay the rope wraps and fraps in parallel with a minimum of crossing.
- An alternative method is known as the Japanese square lashing. The Japanese square lashing is similar to the standard square lashing in appearance, but is much faster and easier to use. One drawback to consider is that it is difficult to estimate how much rope is needed, which can lead to needlessly long working ends.

Diagonal Lashing



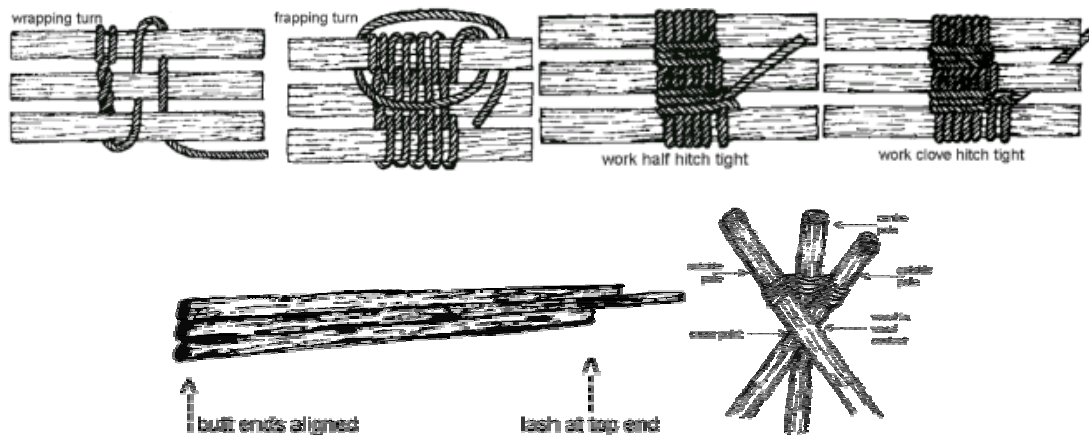
- Diagonal lashing is a type of lashing used to bind spars or poles together to prevent racking. It is usually applied to cross-bracing where the poles do not initially touch, but may be used on any poles that cross each other at a 45° to 90° angle.

Shear Lashing



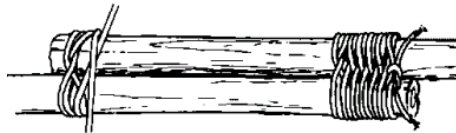
- A sheer lashing is used to bind adjacent poles together.

Tripod Lashing



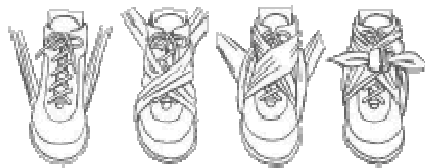
- The practice of laying the center pole in the opposite direction to the outside poles creates several problems. When the poles are laid in opposite directions the wrappings must be put on loosely so that when the center pole is rotated to its proper position the lashing is tightened around the poles. If the wrappings are put on too tight, the rope is stretched causing damage to the rope fibers, therefore weakening the lashing. On the other hand, if the rope is wrapped too loosely, the lashing will not tighten enough when the center pole is rotated and the lashing will be able to slip along the length of the pole. Either way, the rope too loose or the rope too tight, a dangerous situation is created.

Round Lashing



- A round lashing is used to lash two poles together, e.g., constructing a flagpole.

Sprained Ankle Bandage



Head Injuries Bandage



Upper Arm Bandage

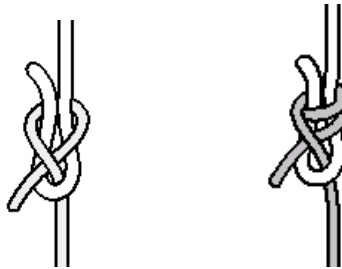


Collarbone Bandage



- This bandage immobilized the arm in case of a collarbone injury.

Sheet Bend and Double Sheet Bend



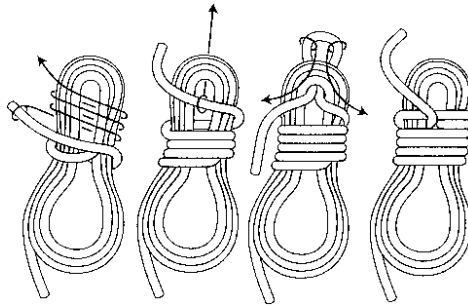
- The Sheet Bend is a general utility bend valued for its simplicity and ease of untying yet avoided for important or severe work due to its lack of security.
- The Double Sheet Bend is an effort to make the Sheet Bend more secure. However, if security is important, it's probably prudent to use a Zeppelin Bend instead.

Prusik Knot a.k.a. Triple Sliding Hitch



- A Prusik is a friction hitch used in climbing, rope rescue and by arborists to grab a rope (sometimes referred to as a rope-grab). The term Prusik is used both for the knot, for the loops of cord, and for the action (to prusik). The Prusik hitch is named for its inventor, Austrian mountaineer Dr. Karl Prusik.
- A Prusik does little or no damage to the rope to which it is attached or hitched..

Buntline or Gasket Coil

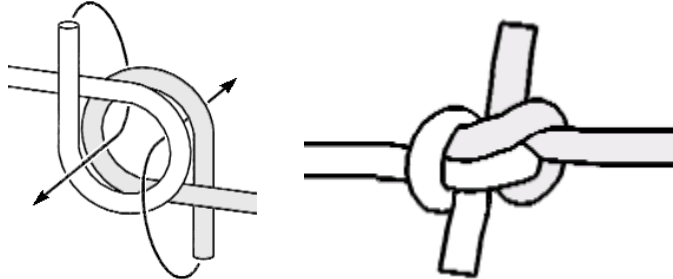


- A quick way to keep a coil tight with a half hitch

Red and Blue Cords (Advanced Level Knots)

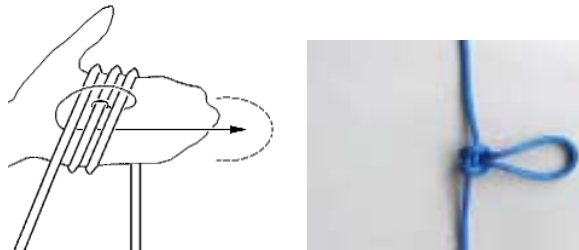
Earned after the following can be tied

Zeppelin Bend



- Also known as the Rosendahl Bend, it's perhaps the best way to connect two ropes that there is. It's exceptionally secure and jerk-resistant in all materials and is perfectly symmetric. It's also remarkably easy to untie after heavy strain, even when wet.
- If you're trying to learn it, think "b" and "q" with reference to the starting shapes of the ropes.

Alpine Butterfly a.k.a. Lineman's Loop



- The Alpine Butterfly, or Lineman's Loop, provides a secure loop in the middle of a piece of rope. Load can be safely applied from any direction. It's secure, strong, approximately symmetrical, easy to tie, and usually resists jamming. It is more stable than either the Bowline on a Bight or the Figure of Eight Loop - both of which may roll over.
- A good example is when a line of hikers wish to hook on along the length of a shared rope.
- It is sometimes used as a method to temporarily isolate a worn or damaged part of the rope, or just to take up slack.
- There are actually two good ways to tie the Alpine Butterfly; the easier way was shown first. The other way shown below works better when you don't have as much slack to work with. You should use this loop often, so learn both methods

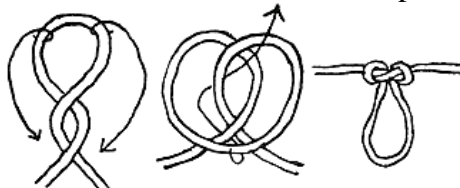


Figure-8 Stopper, Figure-8 Loop (a.k.a. Flemish loop), Figure-8 Bend (a.k.a. Flemish bend)



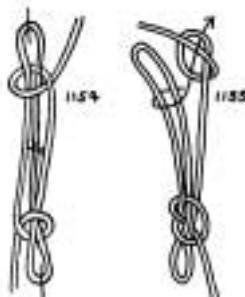
- The figure-of-eight knot is very important in both sailing and rock climbing as a method of stopping ropes from running out of retaining devices.
- Although secure and simple to tie in the manner shown above, the Figure 8 Loop is one loop that is probably used too often. It tends to jam when seriously strained, consumes a great length of rope, and is exceedingly difficult to adjust its size, position, and excess.
- The Figure Eight Bend or double figure eight bend, is a knot for joining two ropes of roughly similar size. Be sure to dress the knot neatly - the two strands should not cross each other. Although fairly secure, it is susceptible to jamming

Figure of 8 Coil



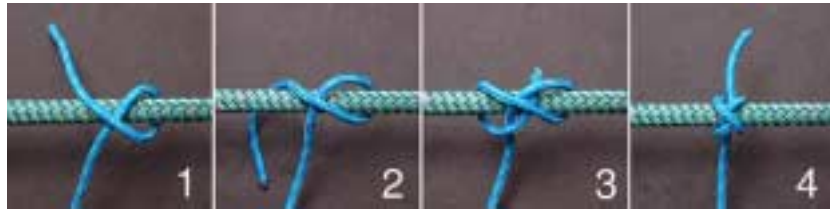
- Start by grasping both ends together and coil up the doubled-up rope around your arm until you get to the bighted middle of the rope. Then, take this leftover bight and wrap it around the coil to make an eye and push it through the resulting eye of the coil as shown. If you prefer, you can start coiling at the middle of the rope.
- You can use the loop to hang the coil.

Sheepshank with Marlingspike Knots



- The Sheepshank on the left is the classic version, but it should never be used. The Sheepshank fails under load, especially with modern synthetic materials which are more flexible and slippery.
- The Sheepshank with Marlingspike hitches (slip knots) shown on the right is the safest version of the Sheepshank.

Constrictor Knot



- The Constrictor Knot is an excellent way to securely tie the neck of a sack or bag or a quick temporary whipping for a fraying rope's end. It can be tied quickly and if pulled tight it binds so that it can be almost impossible to untie.
- The only place it fails is when tied against a flat surface - it requires a curved surface so that the binding turn can grip the half hitch.

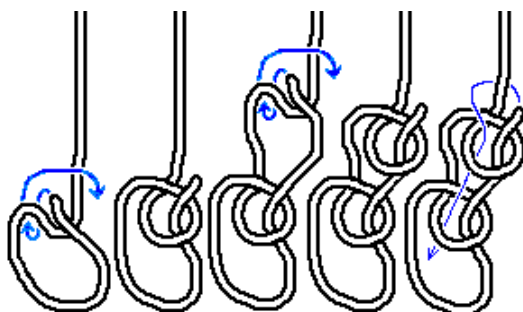
White Cord (Master Level Knots)

The White Cord is added to the Red and Blue cords of the advanced level after the following can be tied:

One-handed Bowline

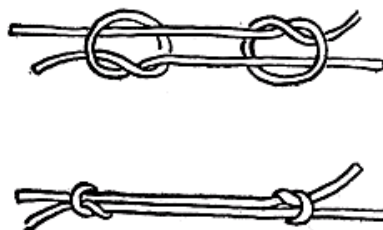
Tie a bowline using only one hand

Water Bowline



- The water bowline is a type of knot designed for use in wet conditions where other knots may slip or jam. The additional friction from the two half hitches increases the security of this knot. This knot is very secure and does not jam, even when wet.

Single, Double, and Triple Fisherman's Bend



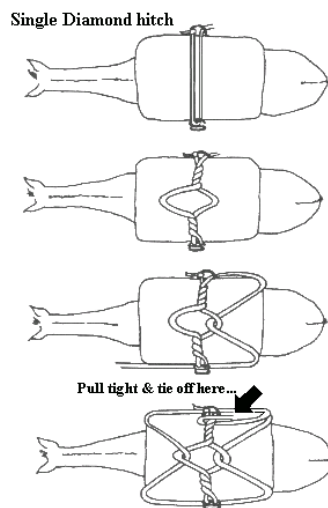
- The Fisherman's Knot is simply made up of two overhand knots. It is a very simple knot but quite effective nonetheless. It is most used with two lines of roughly equal thickness and can be difficult to tie with thick ropes. The Fisherman's Knot is used quite often by anglers and climbers.
- The Double Fisherman's Bend consists of two double overhand knots, each tied round the other standing end.
- For safety, climbers use a "triple" version

Trucker's Hitch



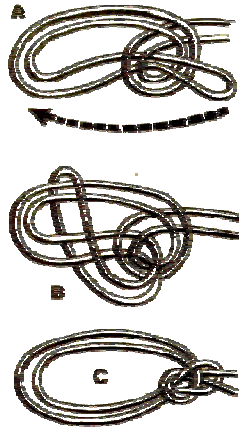
- The trucker's hitch, also known as the power cinch, is a self-binding knot commonly used for securing loads or tarps on trucks or trailers.
- There are several variations of the knot, all of which use a loop in the standing part of the rope as a make-shift pulley in order to obtain a 3 to 1 mechanical advantage. The version depicted here has the advantage that it can be tied anywhere in the rope (without access to an end). Once tight, the knot is secured with a half hitch, usually slipped for easy releasing.

Diamond Hitch



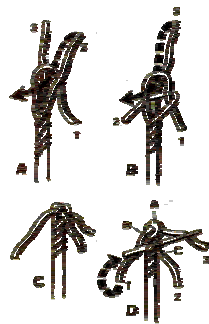
- For centuries, this classic hitch has been used by prospectors, fur traders and trappers to secure gear on pack animals. Use the diamond hitch to tie a load onto a car top or trailer: all you need is one long rope. The real value of the diamond hitch is that strain on one part of the rope is taken up elsewhere in the hitch, which causes the line to tighten. The "six-point" diamond suspension provides security even when the load shifts.

Bowline on a Bight



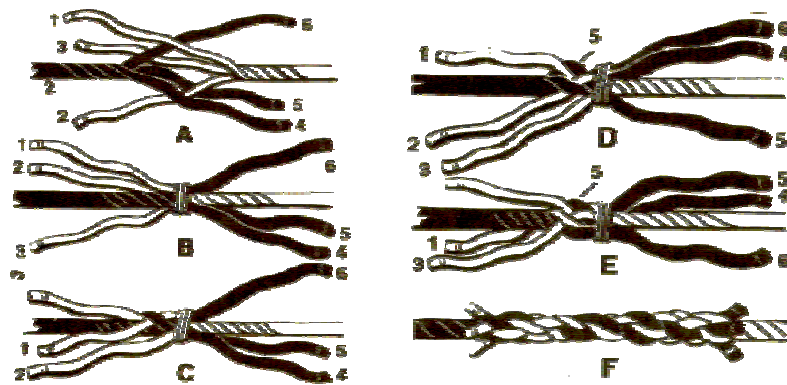
- The Bowline on a Bight forms two loops, but they must be of the same size.
- Set the knot securely before putting weight on it

End Splice or Back Splice



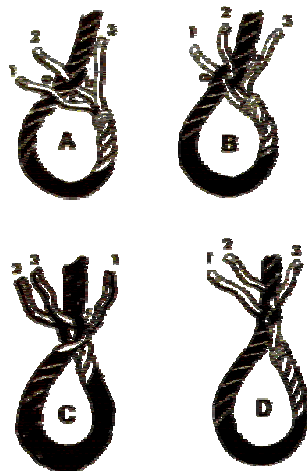
- The Back Splice is a method of preventing fraying or raveling in the end of a rope. It is more durable and permanent than whipping.
- Begin by unlaying the rope and making a crown knot as shown in drawings A, B, C. The ends are then tucked with the over-and-under movement. See drawing D.
- Finish by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

Short Splice



- A Short Splice joins the ends of two pieces of rope.
- A). Alternate the strands of the two ropes.
- B). Tie strands down to prevent more unlaying.
- 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.
- Smooth the splice by rolling it under your foot on the floor.

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.