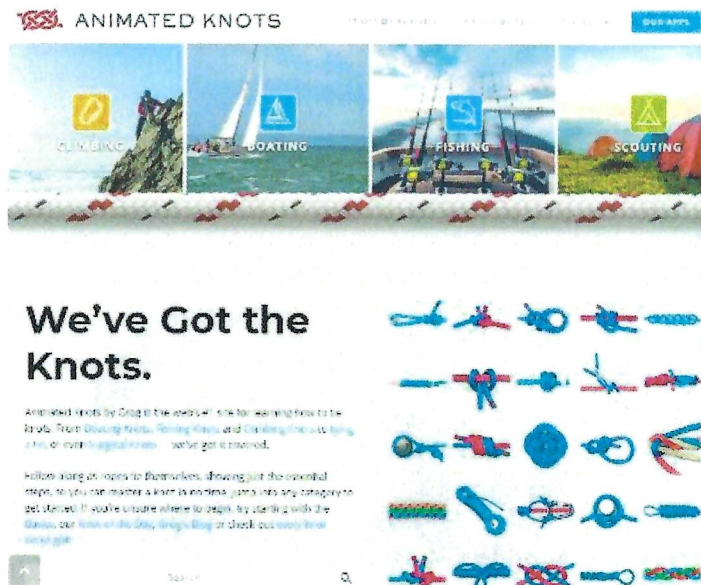


SIS Training Safe Participant - Base Module

Knots & How to Tie them

Recommended resource –
www.animatedknots.com



Knots required for SIS Training Safe Participant (SP)

- Figure 8
- Figure 8 Eye Knot (Fig 8 on the bight)
- Rethreaded Figure 8 Eye Knot
- Tape Knot
- Alpine Butterfly
- Double Fisherman's Bend
- Munter Hitch
- Prussik Hitch

Refer p31 for Trained Participant (TP) additional knots.

Note:

TP must be able to tie all knots listed in their workbook & be able to teach novices to tie the SP list of knots

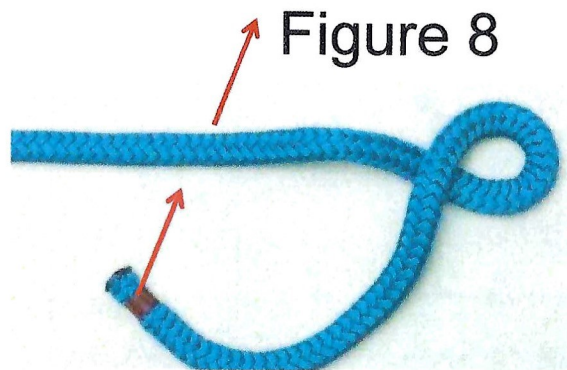
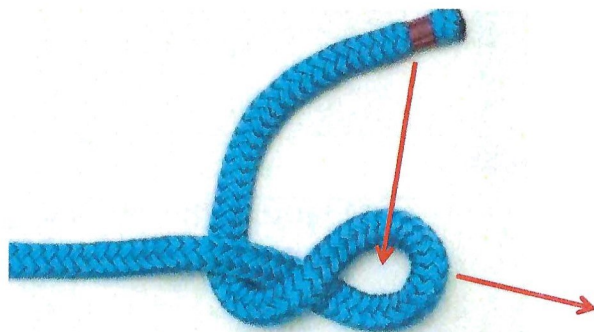


Figure 8

Figure 8 (Flemish) Knot Tying

Pass the tail over itself to form a loop. Continue under and around the standing end. Complete the knot by passing the tail down through the loop.



The knot when formed creates the shape of the numeral 8



Figure 8 Eye Knot – alt. on the bight




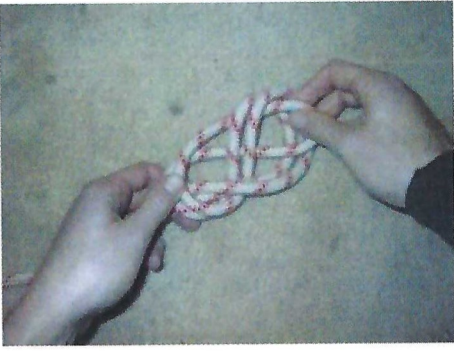

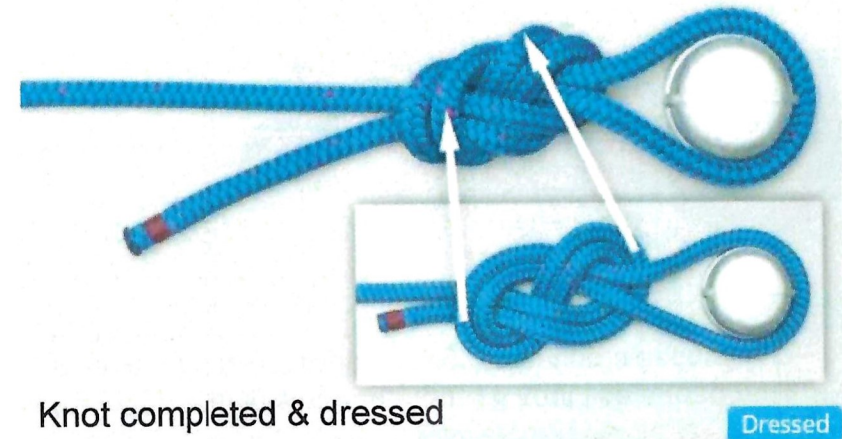
1	Start with a bight (loop) of rope in your hand.	
2	Pass the loop under itself	
3	Then back over itself	

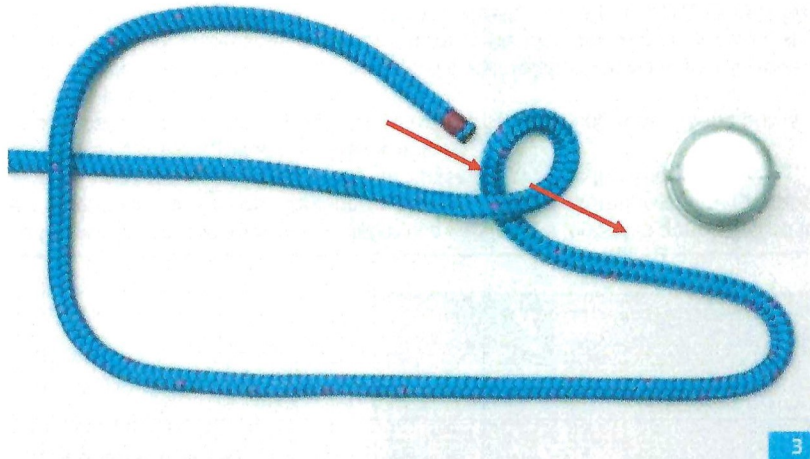
Figure 8 Eye Knot (cont.)

4	and finally through the loop formed from the bottom.	
5	Pull the knot tight and set. A good knot should look the same from both top and bottom i.e. be symmetrical.	
<p>The figure-of-eight eye knot or on a bight is a very useful loop. It is generally tied in the end of the rope, and can be clipped into anything to secure the end of the rope. It is often used to set up a single rope for abseiling, or to be the end of an individual's safety line (usually with a karabiner). It is also used if a climber is tying into the middle of a climbing rope, as the pull is still only in one direction.</p> <p>You should be aware that this knot can unroll under relatively low forces if loaded sideways from both directions i.e perpendicular to the loop direction, particularly if nothing has been clipped into the loop. In that situation, an alpine butterfly may be a better choice.</p>		

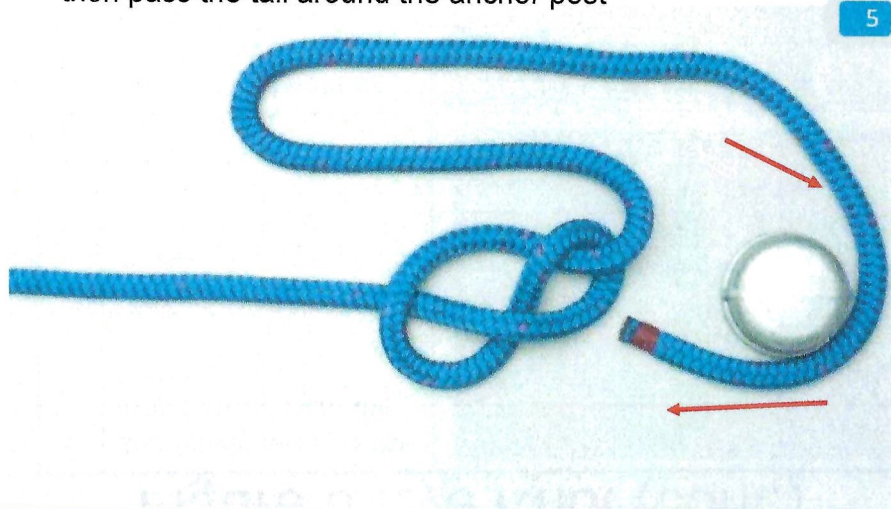
Rethreaded Figure 8 Eye Knot



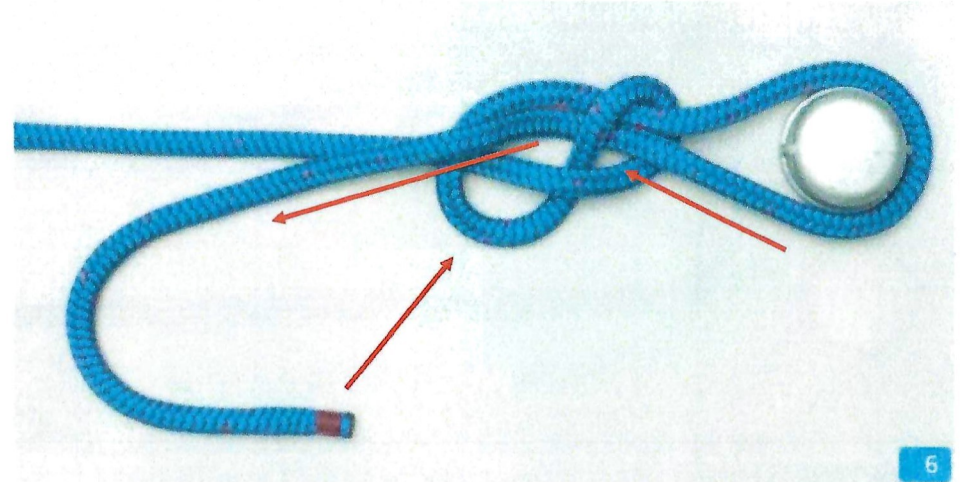
Rethreaded Figure 8 Eye Knot



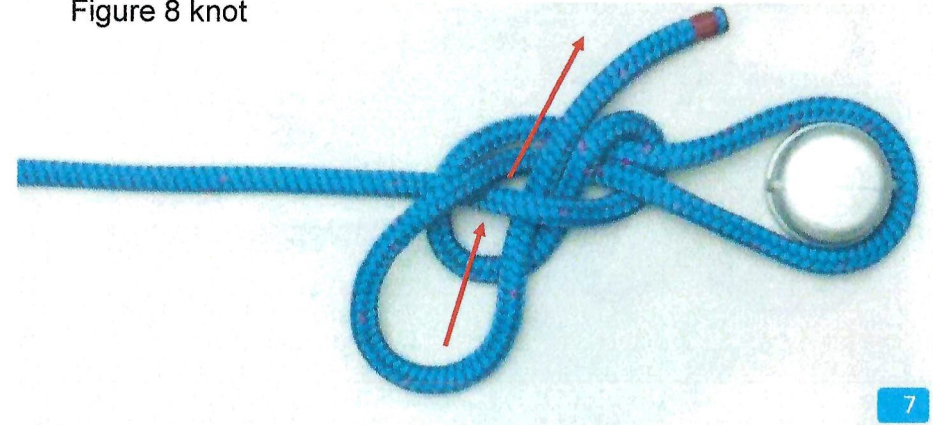
Tie a Figure 8 knot in the rope with a very long tail length, then pass the tail around the anchor post



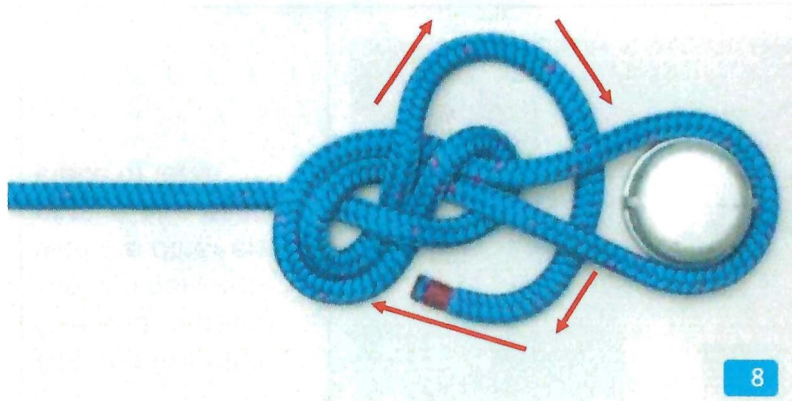
Rethreaded Figure 8 Eye Knot



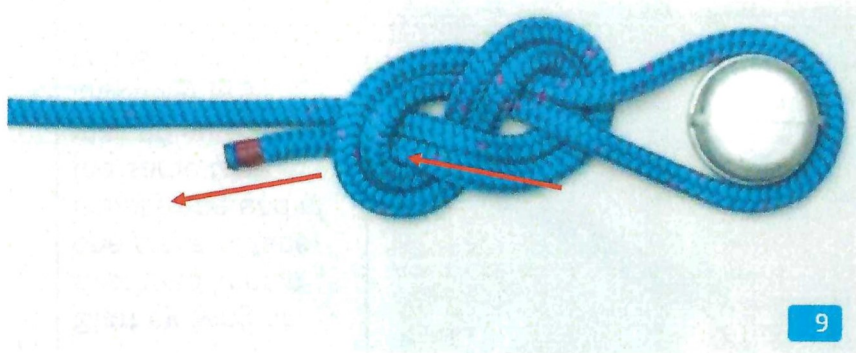
Use the original single strand Figure 8 knot like a road map to trace the long tail of rope through, creating a second Figure 8 knot



Rethreaded Figure 8 Eye Knot



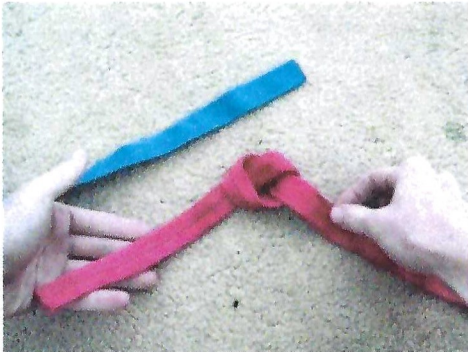

Knot completed & dressed




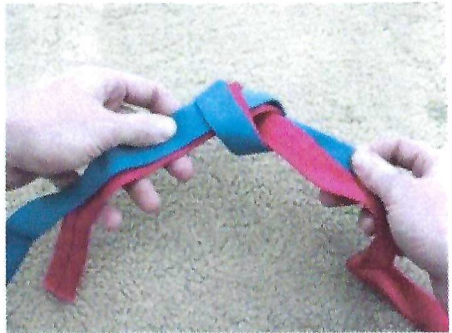
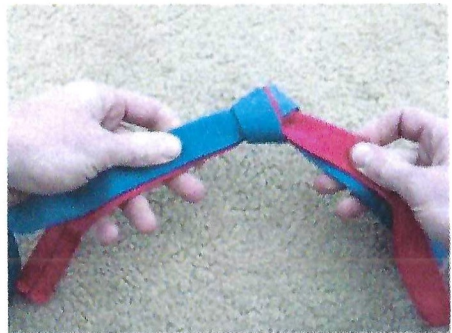
Rethreaded Figure 8 Eye Knot

	<p>The rethreaded figure-of-eight eye knot is an essential knot to know for a couple of applications. It is used around trees or columns in caves for setting up abseil anchors, and it is used by climbers to tie into the end of the rope.</p>		
<p>1 & 2</p>			
<p>3 & 4</p>			
<p>5 & 6</p>			







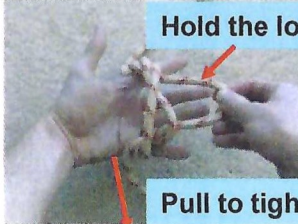
Tape Knot

1	<p>Start by tying an overhand knot in one piece of tape, usually one end of the same tape, making sure not to introduce any twists.</p>	
2	<p>Starting from the free end, retrace the original knot with the other end of tape or a second piece of tape.</p>	





Tape Knot (cont.)

3	<p>Continue retracing...</p>	
4	<p>...until you have retraced the entire knot.</p>	
5	<p>Pull tight and set the knot</p>	



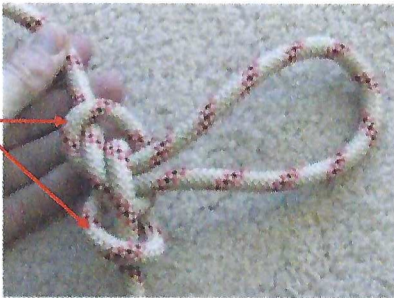
Alpine Butterfly

<p>The alpine butterfly is a useful knot as it enables a loop to be tied in the middle of the rope.</p> <p>Note: when tying this knot on an activity the end of the rope furthest from you will be anchored and by pulling the end closest to you both ends of the rope will tighten</p>	
	
	
	 <p>Hold the loop</p> <p>Pull to tighten</p>


Alpine Butterfly - 2

<p>1 Create a loop in the rope where you need to create a temporary connection loop</p>	
<p>2 Trest the RH end of loop away from yourself to create the '8' shape</p>	
<p>3 pass the RH end of the '8' back under the main line of the rope</p>	
<p>4 Take the LH end of the loop over the main line of the rope & insert it through the inner loop on the RH side of the main line of the rope</p>	

Alpine Butterfly – 2 cont.




5	Then pull the loop through to create the new temporary attachment loop	
6	While holding the small attachment loop you have created pull just the portion of the main rope line closest to you to tighten & complete the knot	
<p>Finished knot.</p> <p>Note: these outside loops are never loaded so knot very easy to undo. This is critical for a knot somewhere well away from either end of a rope.</p>		

Alpine Butterfly - 3

<p>Finished Knot</p> <p>Note: keep the loops around your hand rather loose or the attachment loop created by the knot will be too small to use</p>		
1 & 2	Pass rope over your hand	Repeat along side 1st pass
3 & 4	And again	Lift rope closest to thumb over other 2
5 & 6	Lift the new rope closest to thumb over other 2	And pass it back through the loops



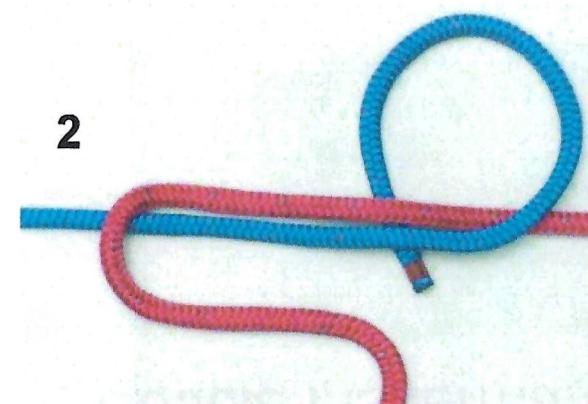
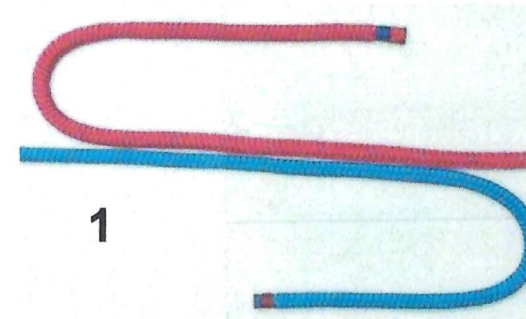
Alpine Butterfly – 3 cont.

7	Then pull the loop through to create the new temporary attachment loop	
8	While holding the small attachment loop you have created pull just the portion of the main rope line closest to you to tighten & complete the knot	
<p>Finished knot.</p> <p>Note: <i>these outside loops are never loaded so knot very easy to undo. This is critical for a knot somewhere well away from either end of a rope.</i></p>		

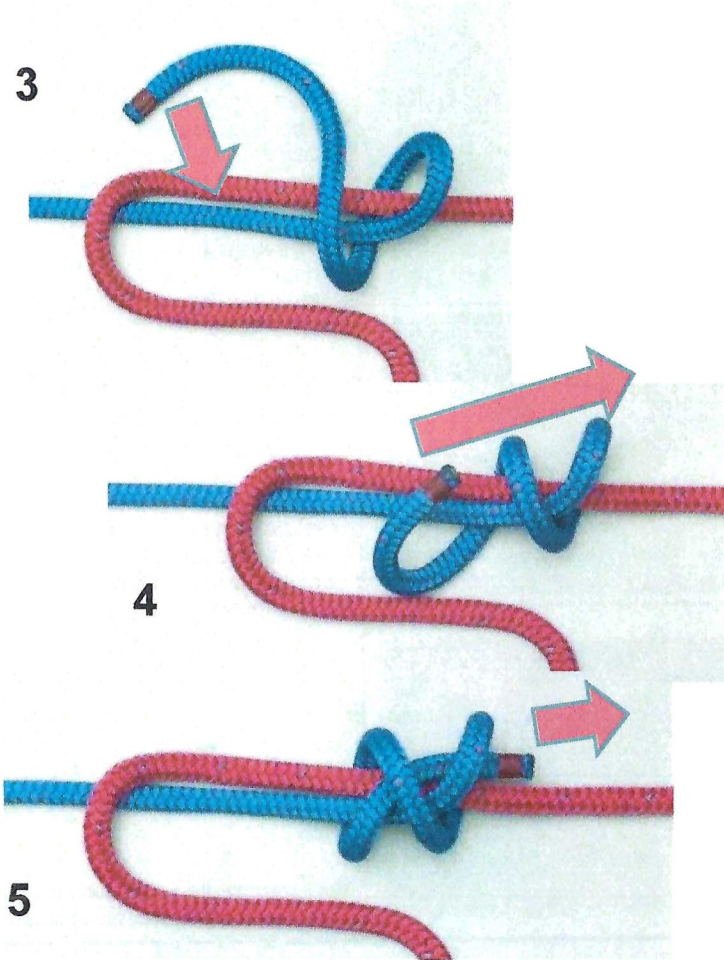
Double Fishermans



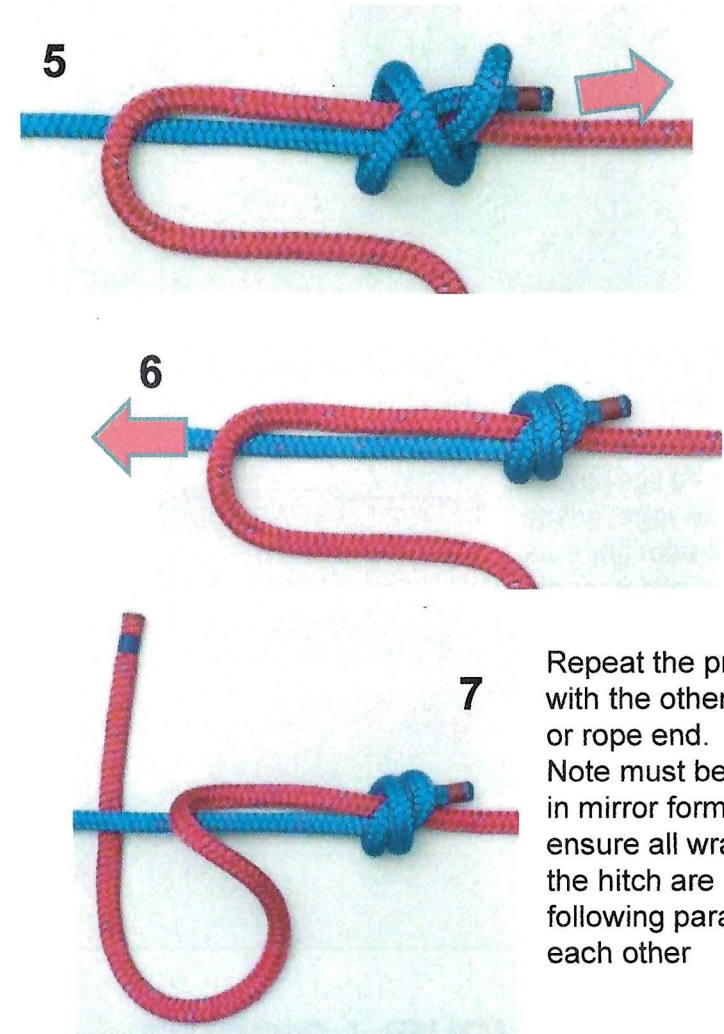
The Double Fisherman's (Grapevine Bend) is **the** way to join two ends of a line to form a [Prusik Loop](#) and is also an excellent and reliable way of joining two climbing ropes. It can be used for a full rope-length abseil; after which it should still be possible to retrieve the rope.



Double Fishermans

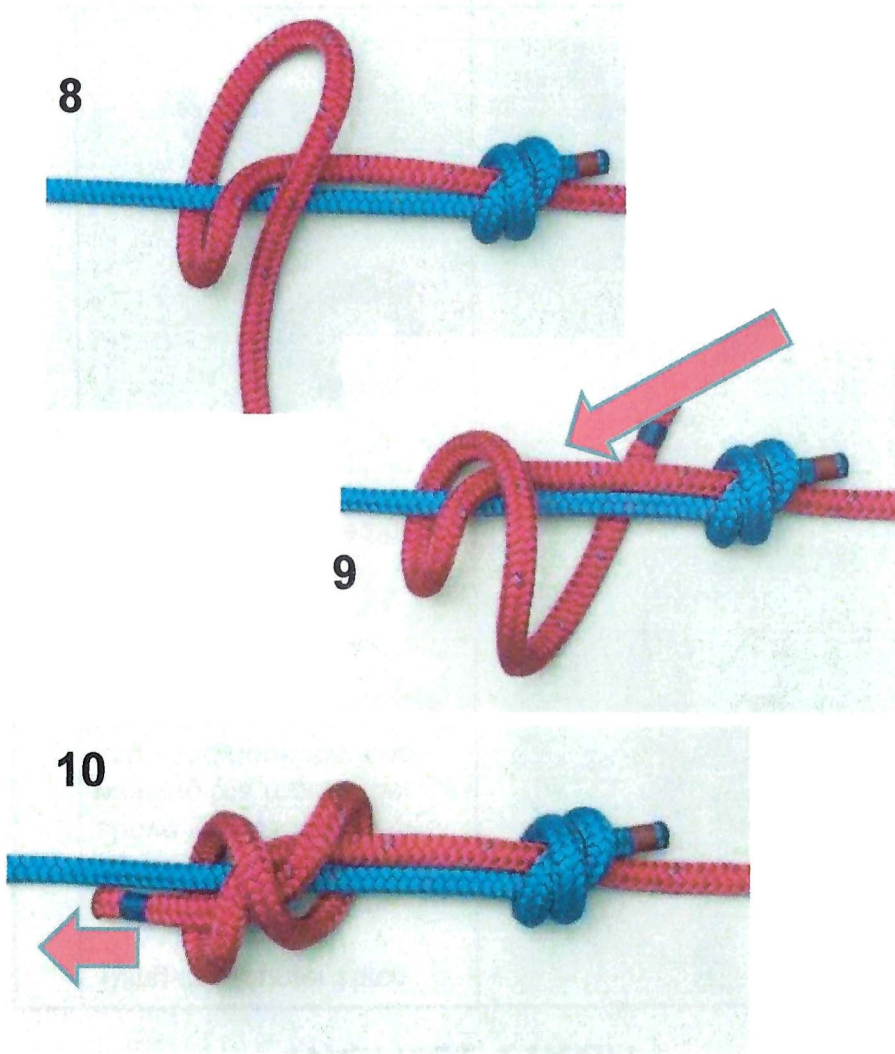


Double Fishermans

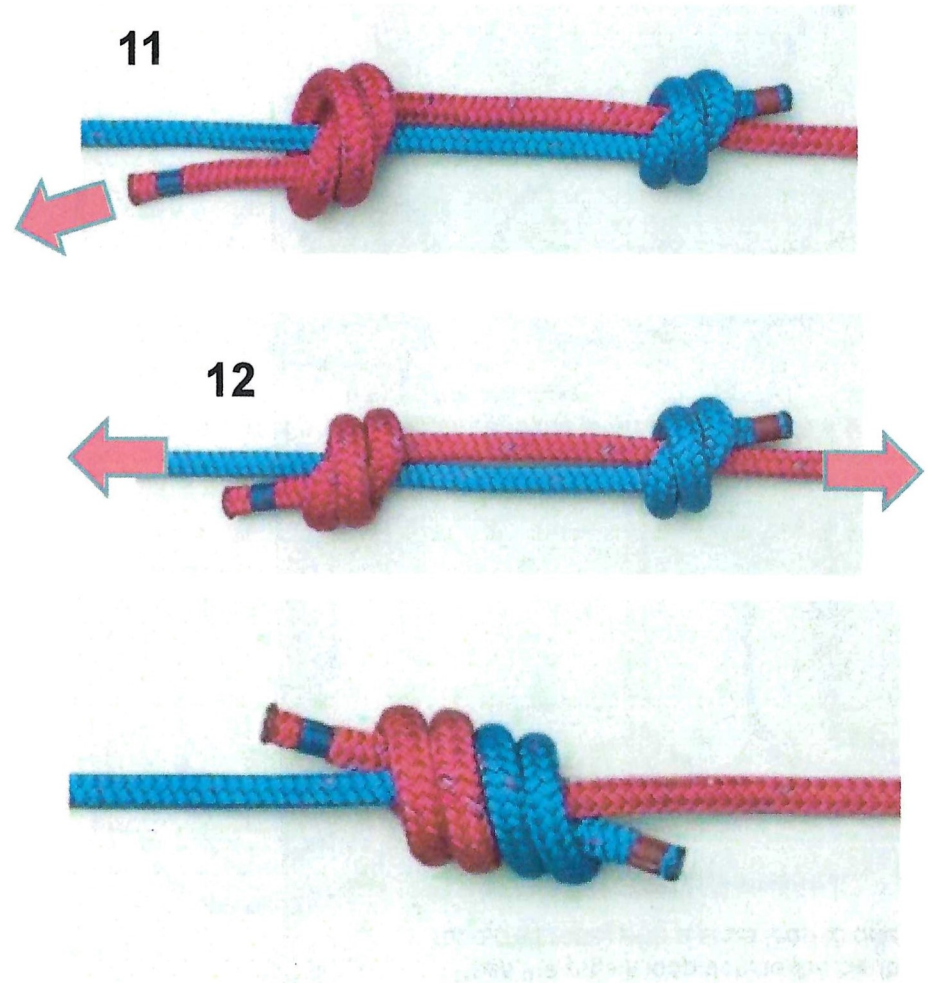


Repeat the process with the other rope or rope end. Note must be done in mirror format to ensure all wraps of the hitch are following parallel to each other


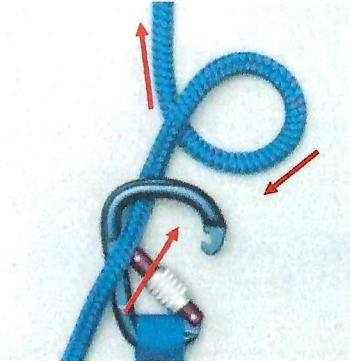
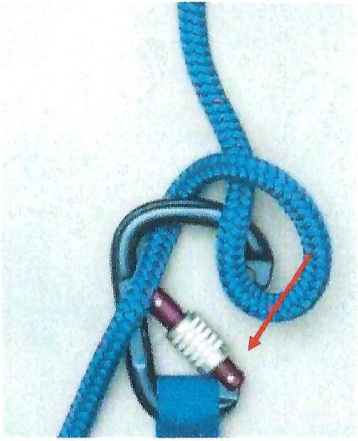
Double Fishermans



Double Fishermans

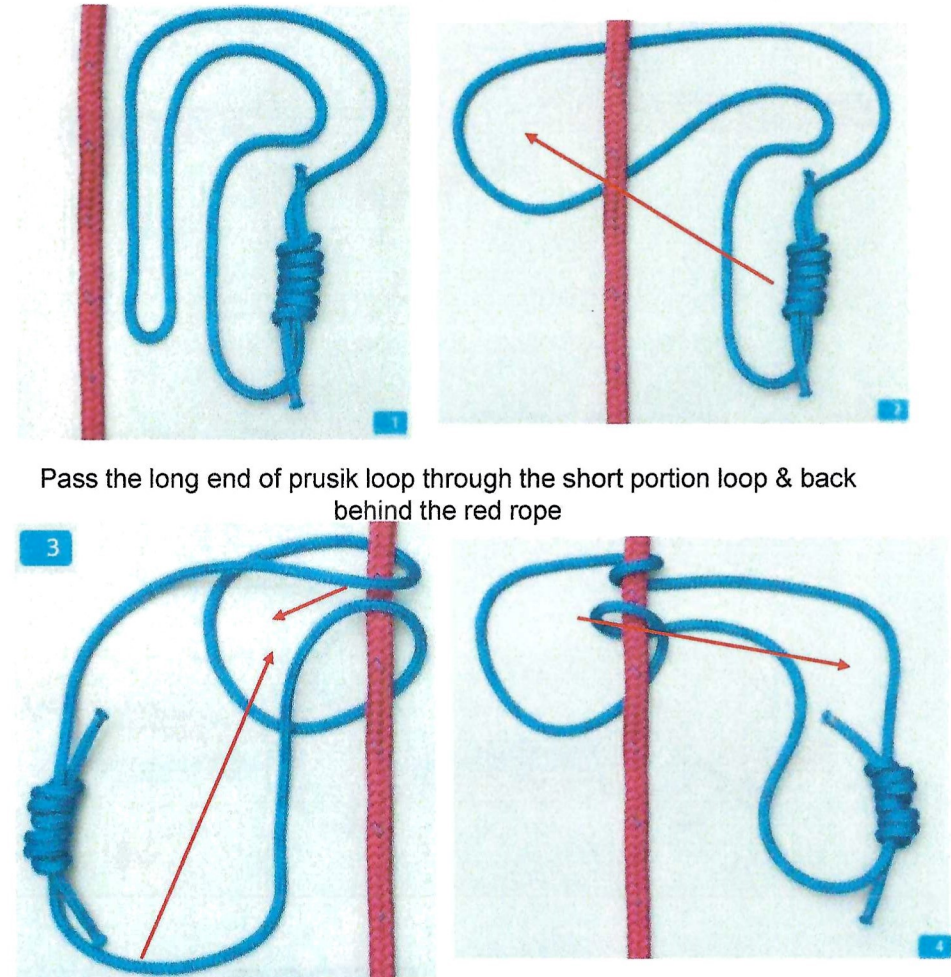


Munter Hitch

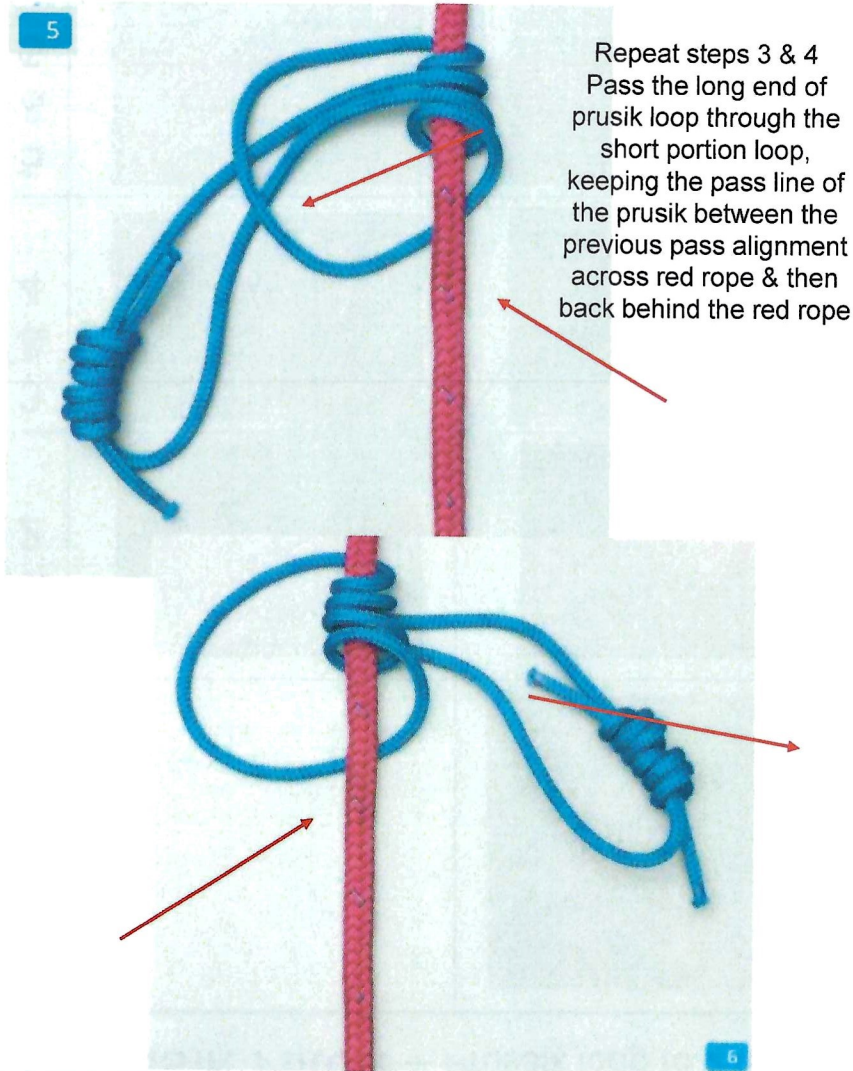
	<p>Tying the Munter Hitch</p> <p>Pass the rope into the karabiner. Twist the rope above into a loop by passing the rope under itself and hook the loop formed onto the karabiner to take the load.</p>	 <p>Completed hitch</p>
<p>1 & 2</p>		

Prusik Hitch

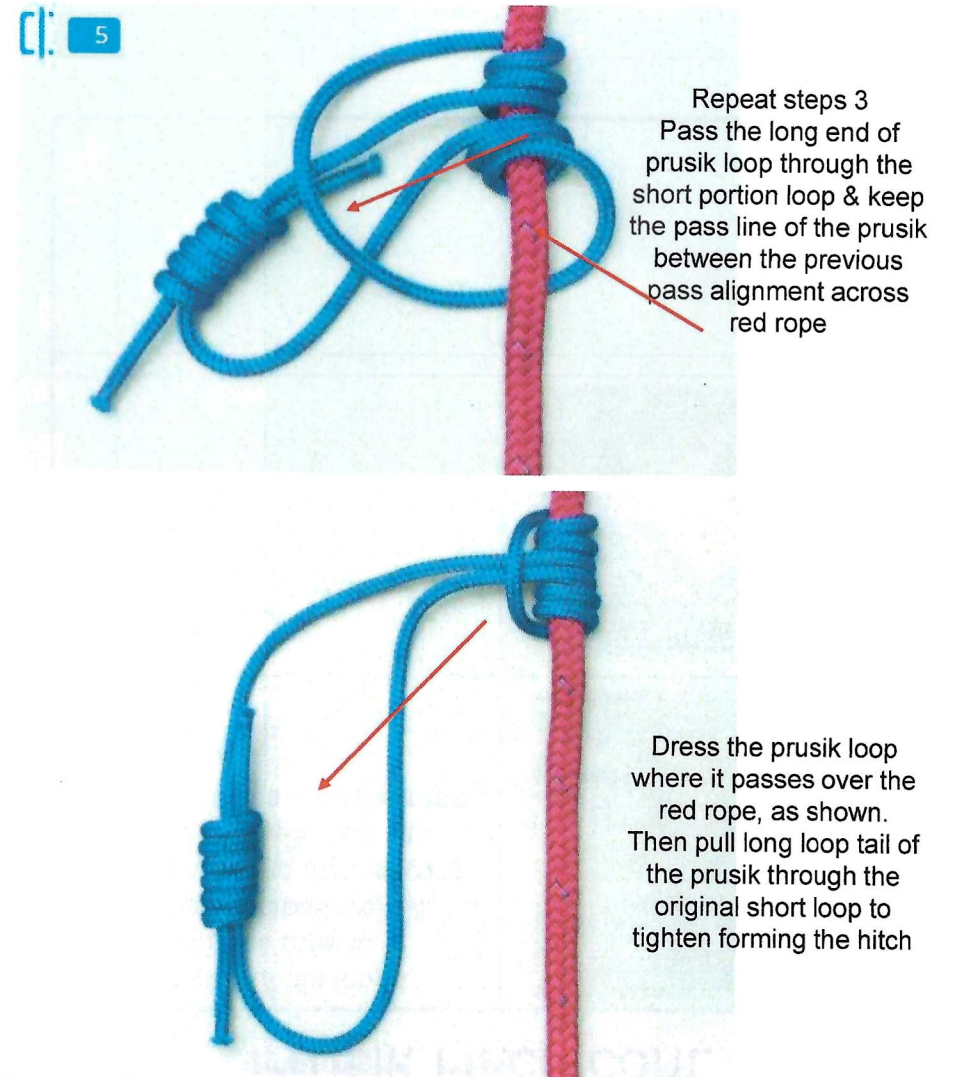
Pass the prusik loop behind the climbing rope (red rope) with a short loop to one side










Prusik Hitch



Prusik Hitch





Prusik Hitch – Prussik loop to a rope

		
1 & 2		
3 & 4		
5 & 6		








Keep the double fisherman's knot away from the prussik knot

Prusik Hitch cont.






7	Manipulate the loops around the rope to eliminate crossovers & twists so the thinner cord of the Prusik loop sits neatly/bites onto the rope.	
8	Completed knot	



Prusik Hitch 2

	Start by placing the Prusik Loop over the main rope, not under.	
1 & 2		
3 & 4		
5 & 6		

Prusik Knot 2 cont.

7		
8		
9	Completed knot	

SIS Training Trained Participant - Extension Module

Additional Knots required for SIS Trained Participant/ Assistant Guide

- Autoblock or French Prussik
- Klemheist
- EDK (Overhand knot - joining 2 ropes)
- EDK (Overhand 1.5 lock)
- VT Prusik
- Clove Hitch
- Munter Hitch with Mule & O'hand lock

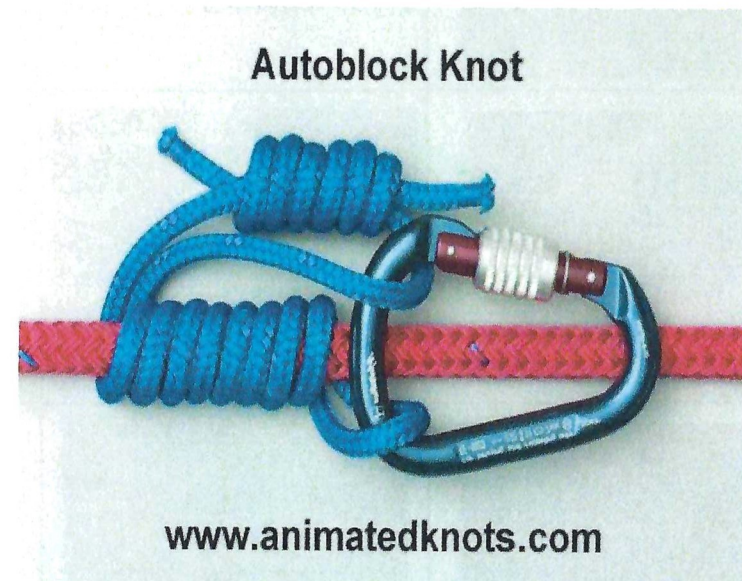
*Additional knots that may be of interest/ useful –
outside scope of the mandatory skills req'd:*

- Alpine Butterfly Bend (joining 2 ropes easy release)
- Double Figure 8 Eye Knot
- Load Release Hitch or Radium Release Hitch
- Rosendahl Bend or Zeppelin Hitch
- Double Overhand Noose
- Tensionless Hitch

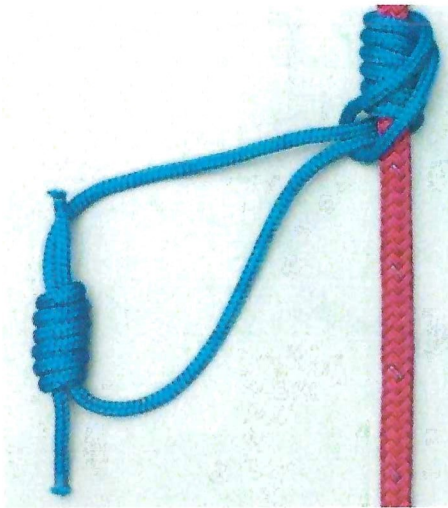
• Autoblock of French Prusik

Difference between Autoblock & Klemheist:

- Autoblock (or French Prusik) captures and connects both ends of the prusik cord in the carabina
- Klemheist connects with the prusik cord via only one end of cord loop (the longer end), after it has been passed through the other end of the cord loop to form the knot.

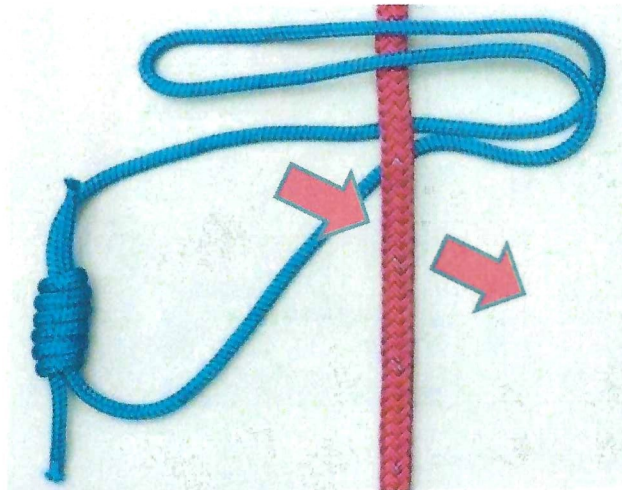


- **Klemheist**

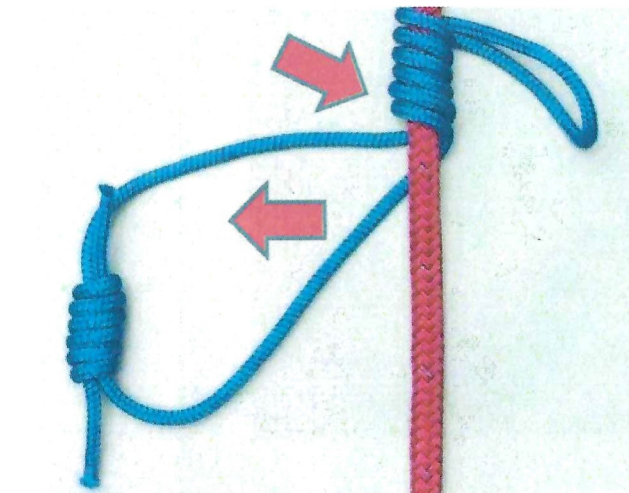
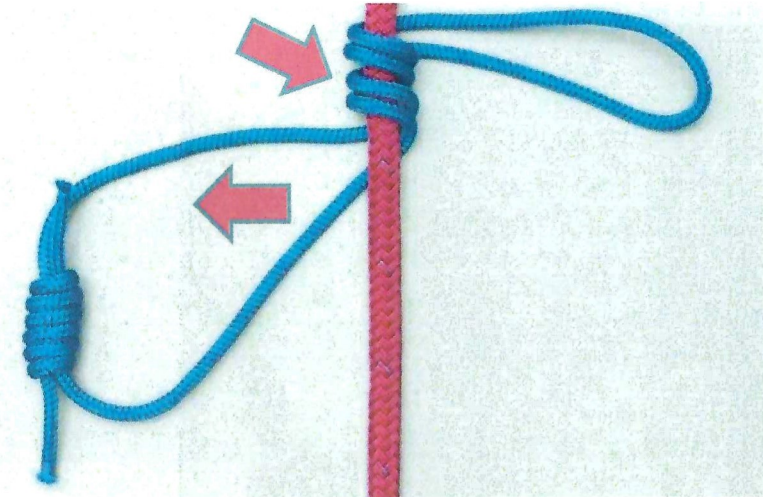


Klemheist (Machard, Knot also called French Prusik in some knotting manuals)

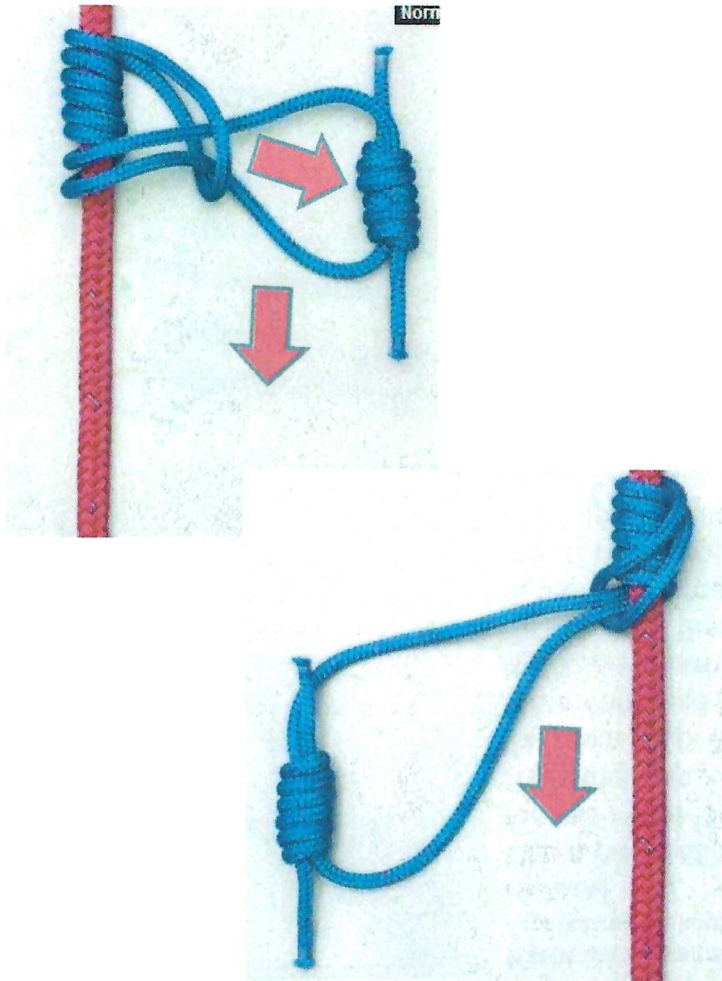
Use a piece of cord formed into a loop. Pass the loop around the main rope. Make three complete turns, laying each turn on neatly. Pass the rest of the cord through the loop and pull it back down in the direction of the expected load.



- **French Prusik**



• French Prusik



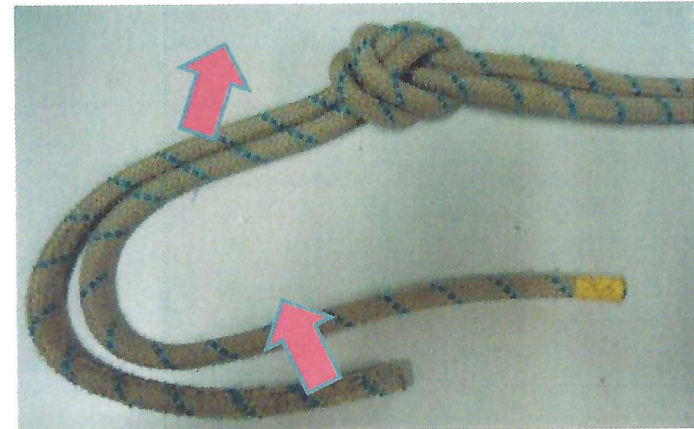
• EDK (European Overhand Knot)



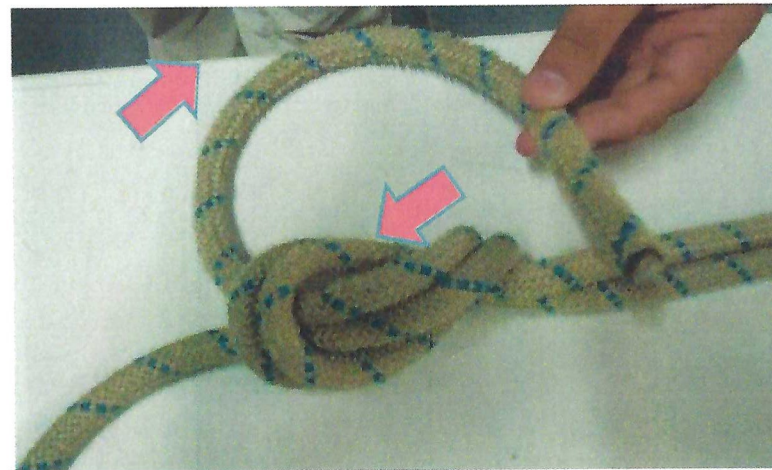
- **EDK Overhand 1.5 (European Overhand Knot)**



- **EDK Overhand 1.5 (European Overhand Knot)**



After tying the EDK, take one of the end pieces and rethread it through the overhand knot

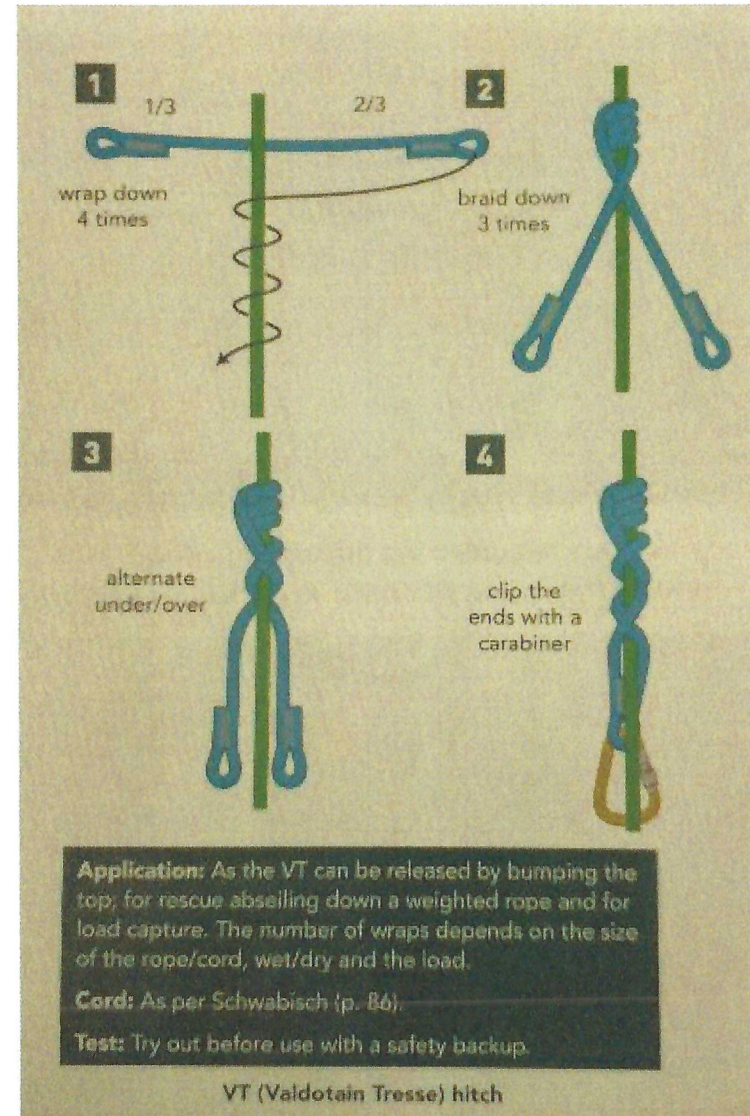


- EDK Overhand 1.5 (European Overhand Knot)



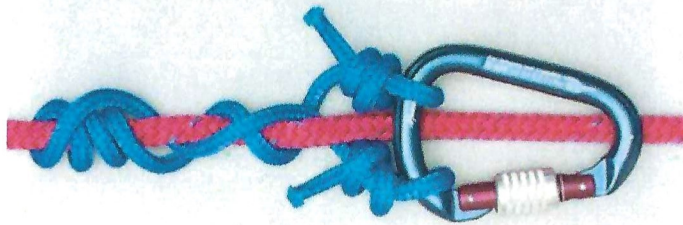
Pull end through the knot and dress to achieve full contact of the strands of rope, then pull tight

- VT Prusik (Valdotain Tresse)



- **VT Prusik**

Valdotain Tresse

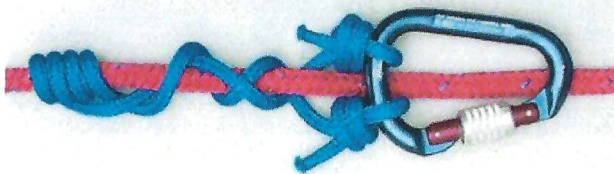


The **Valdotain Tresse** starts with several turns at the top followed by a lacing or braid below (tresse is French for 'braid').

There are several variations depending on the number of turns at the top and the number of lacing turns.

The **Valdotain Tresse XT** is similar to the Valdotain Tresse but after the turns at the top, the two ends cross over each other ("X") to reverse direction.

Valdotain Tresse XT



- **Similar to VT Prussic – form of French Prussic**

Hitches

1 1/3 2/3
wrap down 5 times

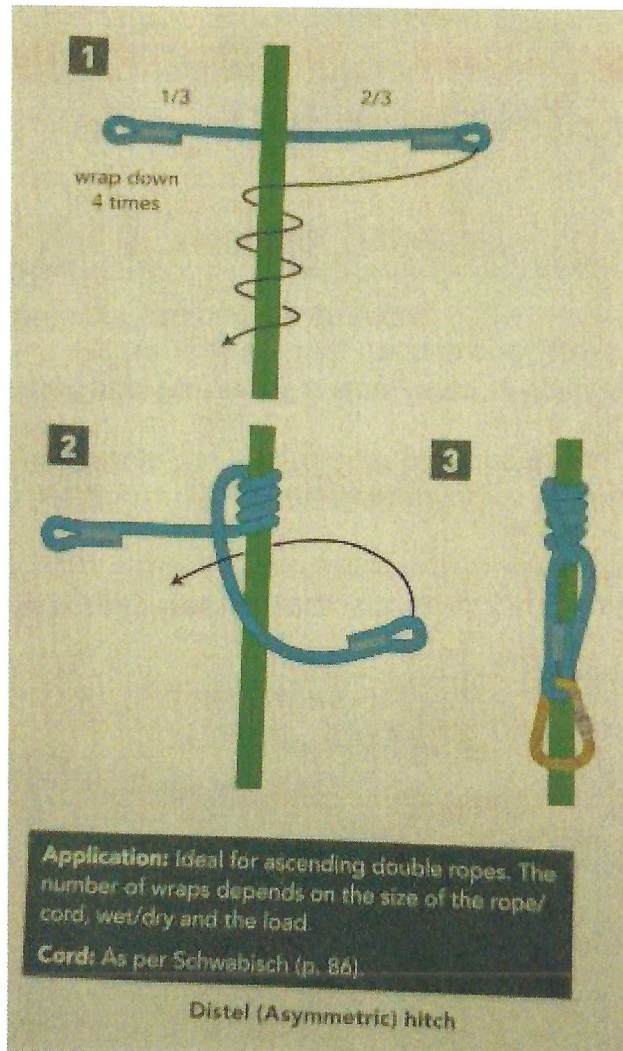
2 **3**

Application: Can be used to ascend a rope and for use with a Prusik Minding Pulley as a load capture in a pulley system. The number of wraps depends on the size of the rope/cord, wet/dry and the load.

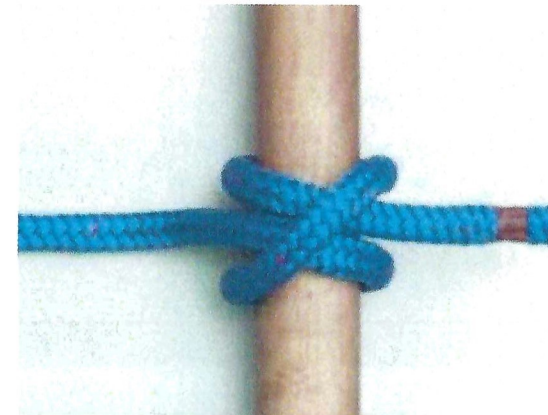
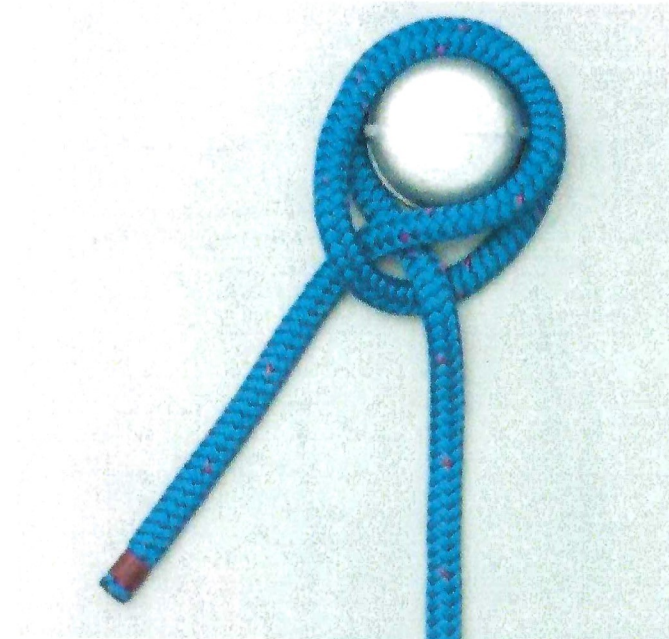
Cord: Either flexible accessory cord, 75-80cm long end to end when tied with overhands (p. 79), or purchase 8mm heat resistant cord with sewn eyes.

5 on 1 Schwabisch (Asymmetric) hitch

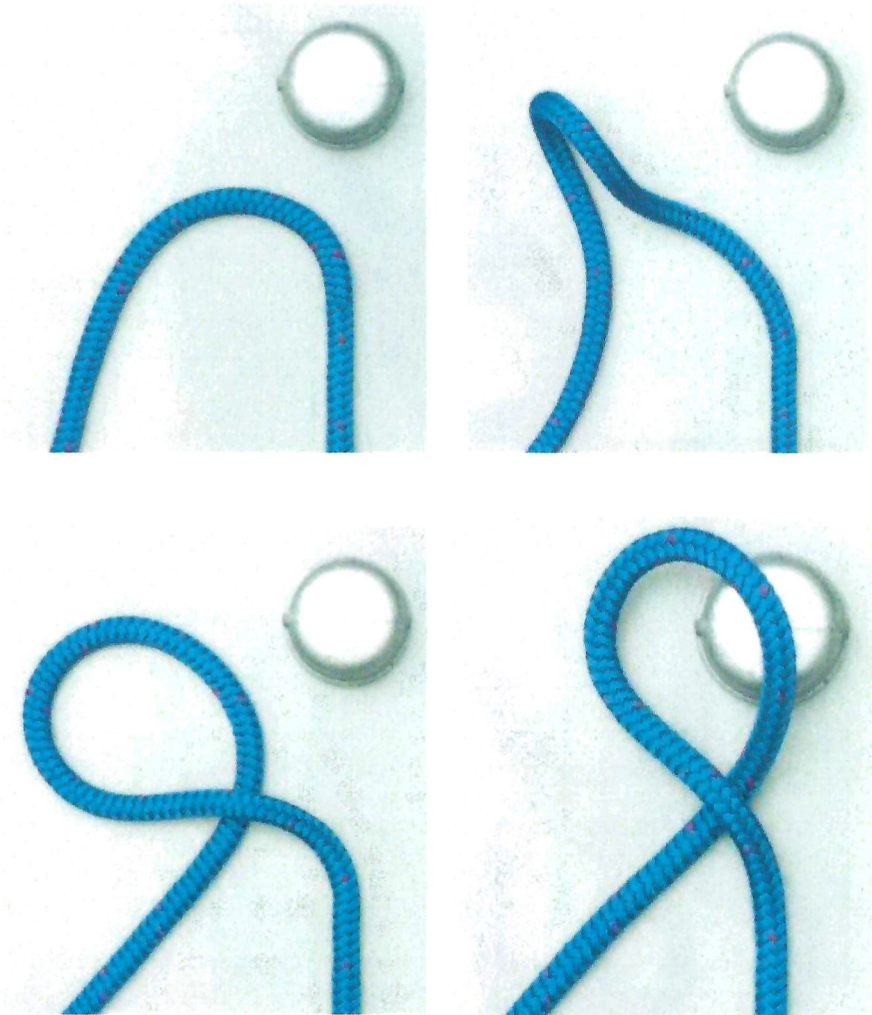
- **Distel (Asymmetric) Hitch**



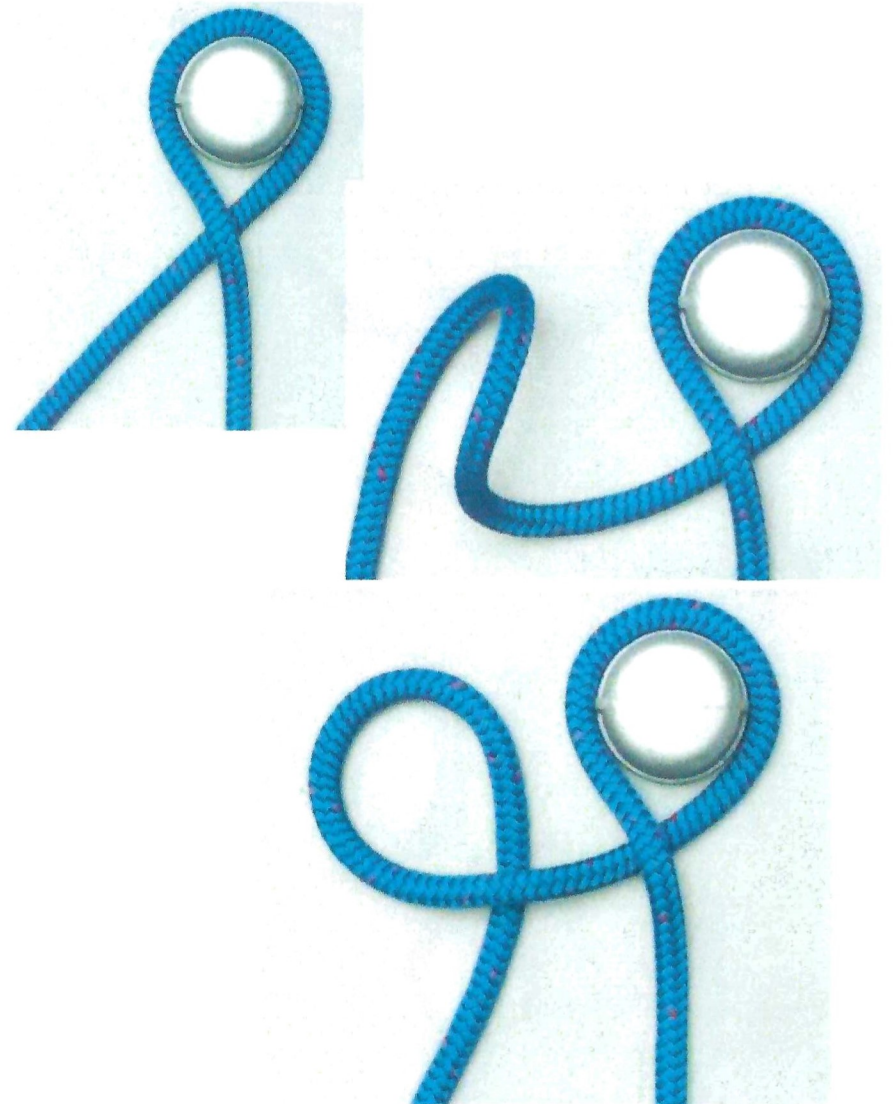
- **Clove Hitch**



• Clove Hitch



• Clove Hitch

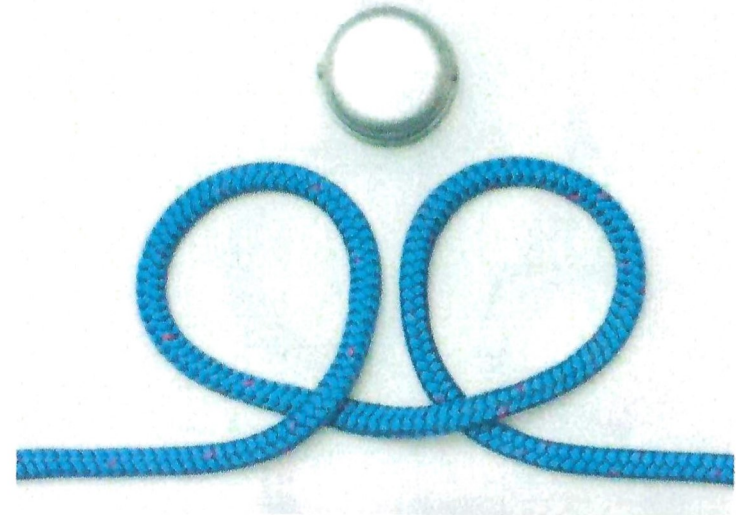


• Clove Hitch



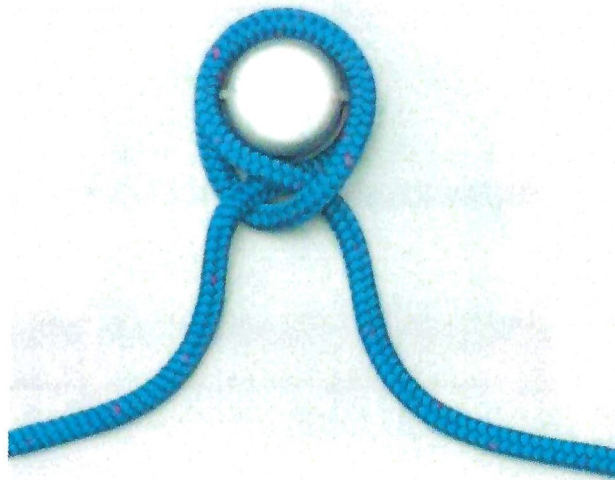
• Clove Hitch

Alternate method



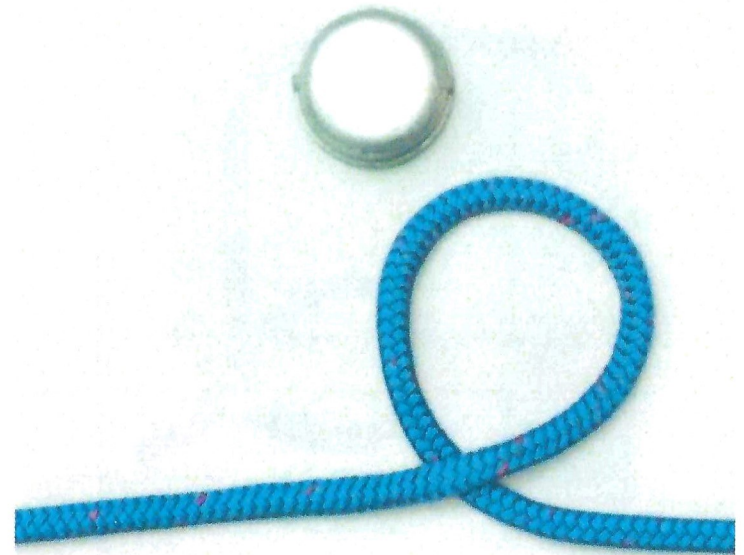
• Clove Hitch

Alternate method



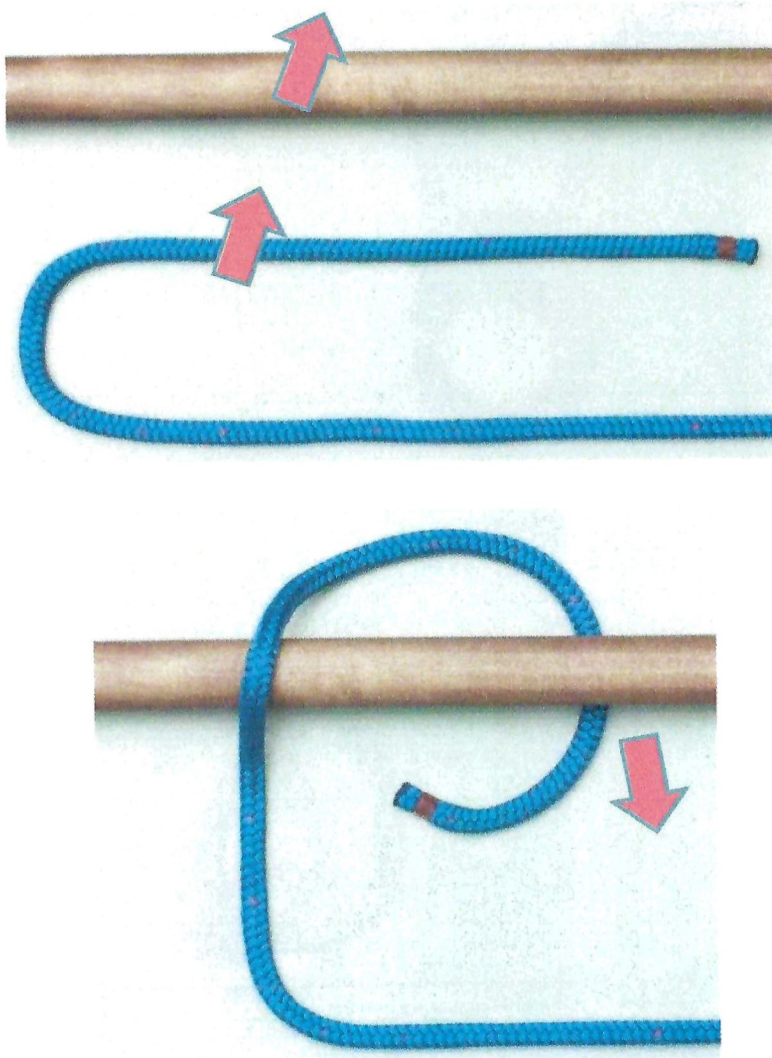
• Clove Hitch

Alternate method



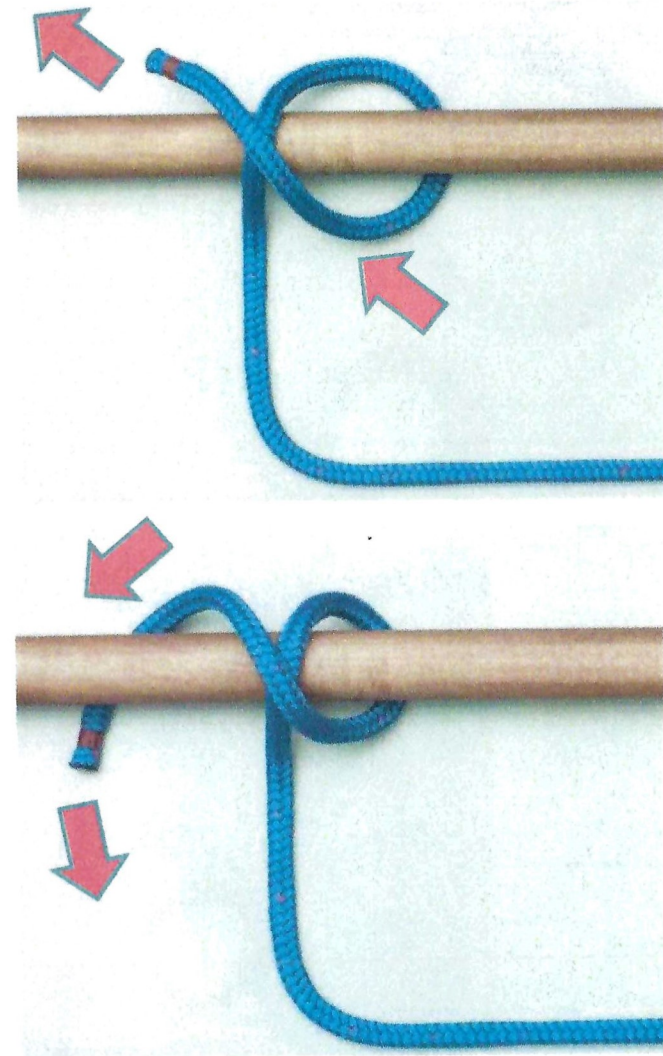
• Clove Hitch

Alternate method

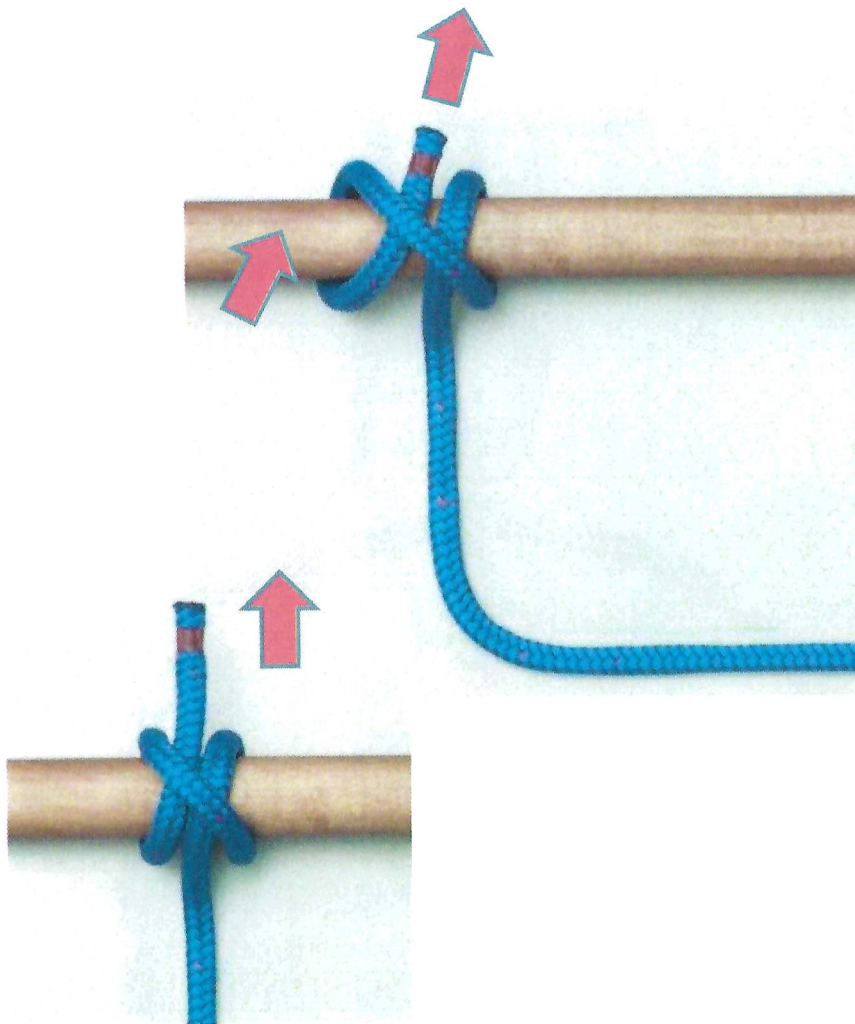


• Clove Hitch

Alternate method



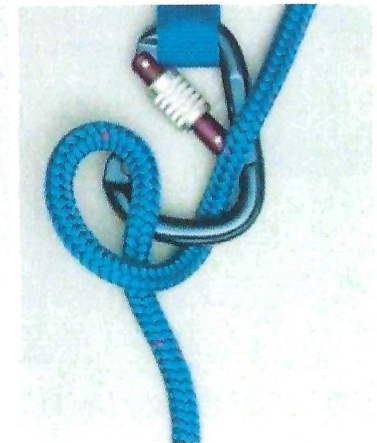
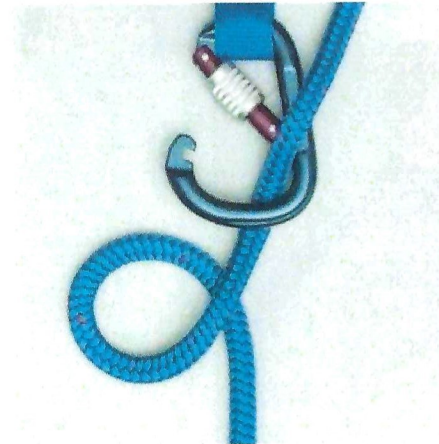
- **Clove Hitch** **Alternate method**



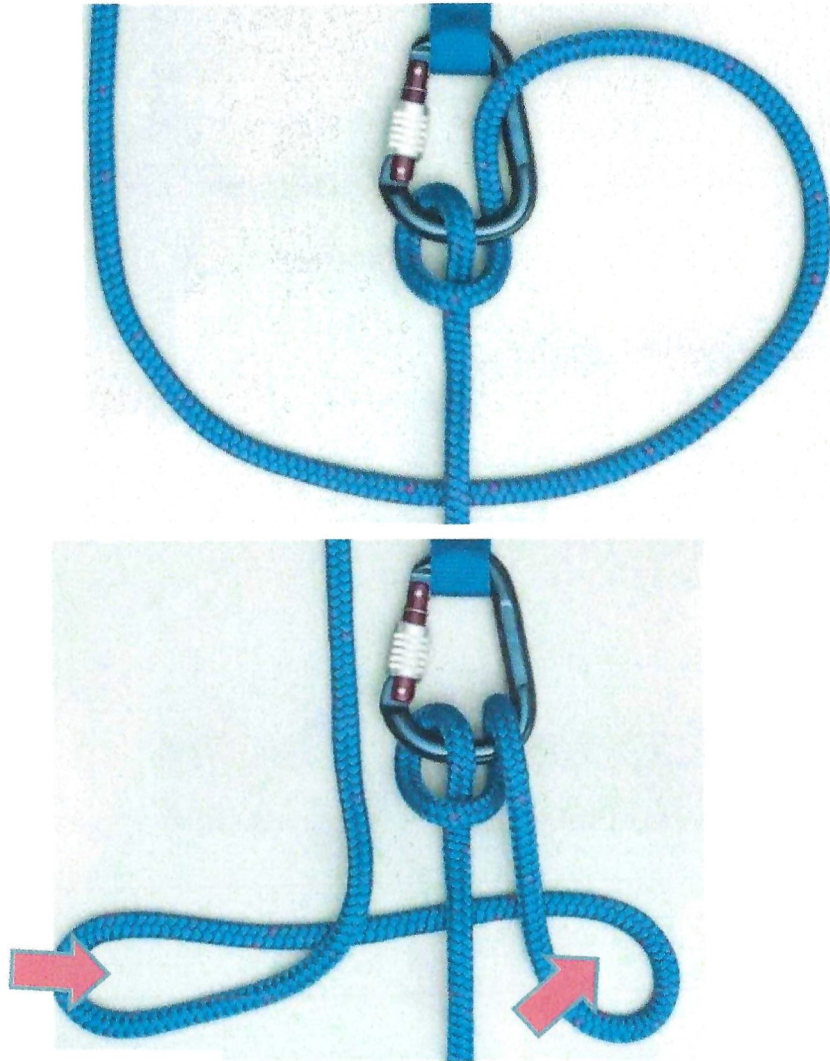
- **Munter Hitch (repeat from SP Knot section)**



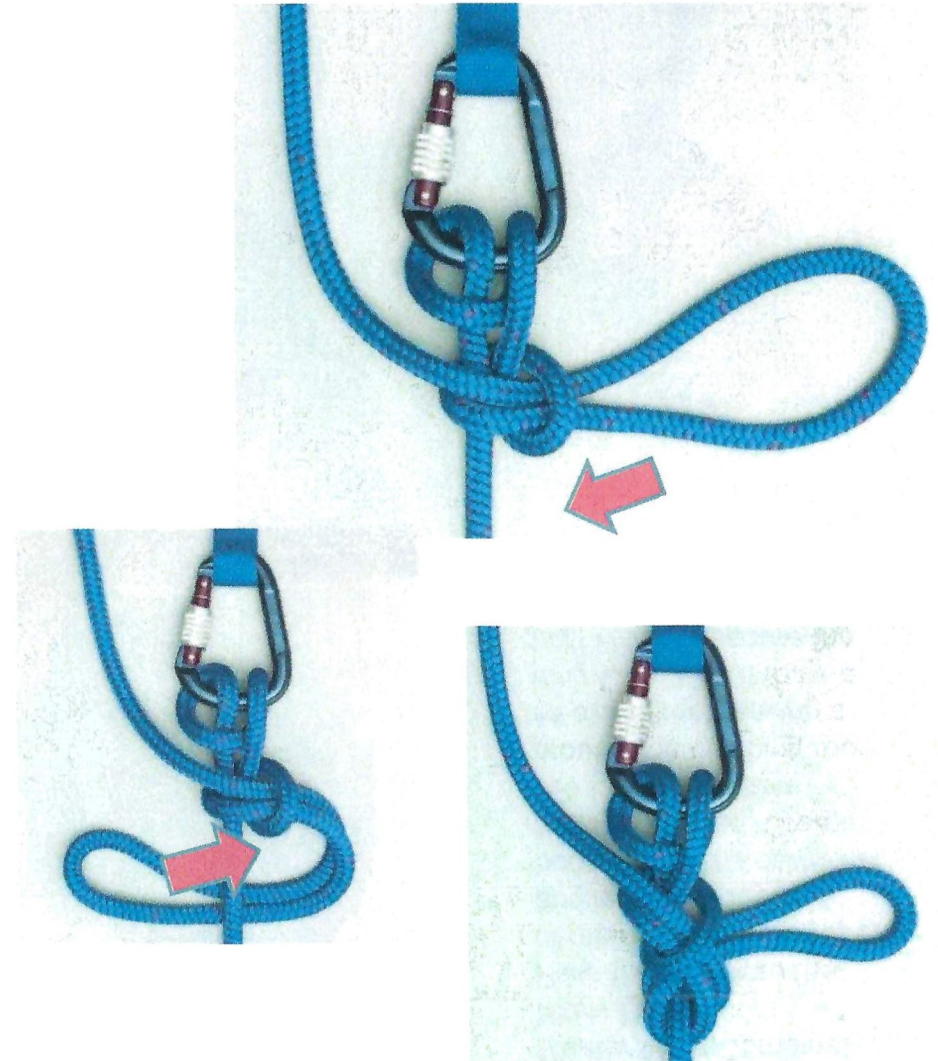
Munter Mule Combination Hitch Tying
Pass the rope into the carabiner. Twist the rope above into a loop and hook it onto the carabiner to take the load. Create two loops and then, around the climbing rope, tie a slip knot leaving a long loop. Use it to tie a Half Hitch to secure the knot.



- Munter Hitch plus Mule & overhand (tie-off)



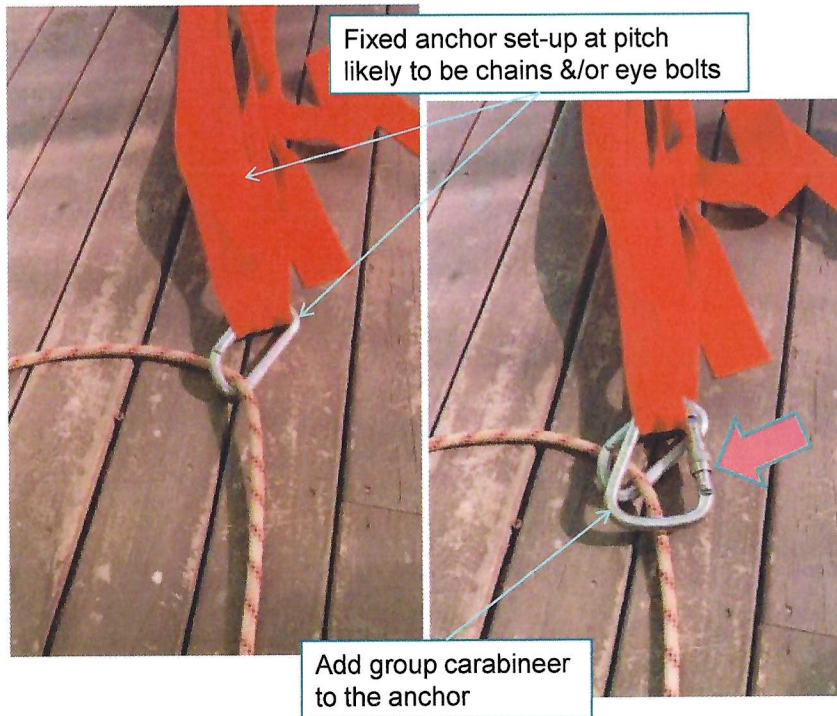
- Munter Hitch plus Mule & overhand (tie-off)



- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

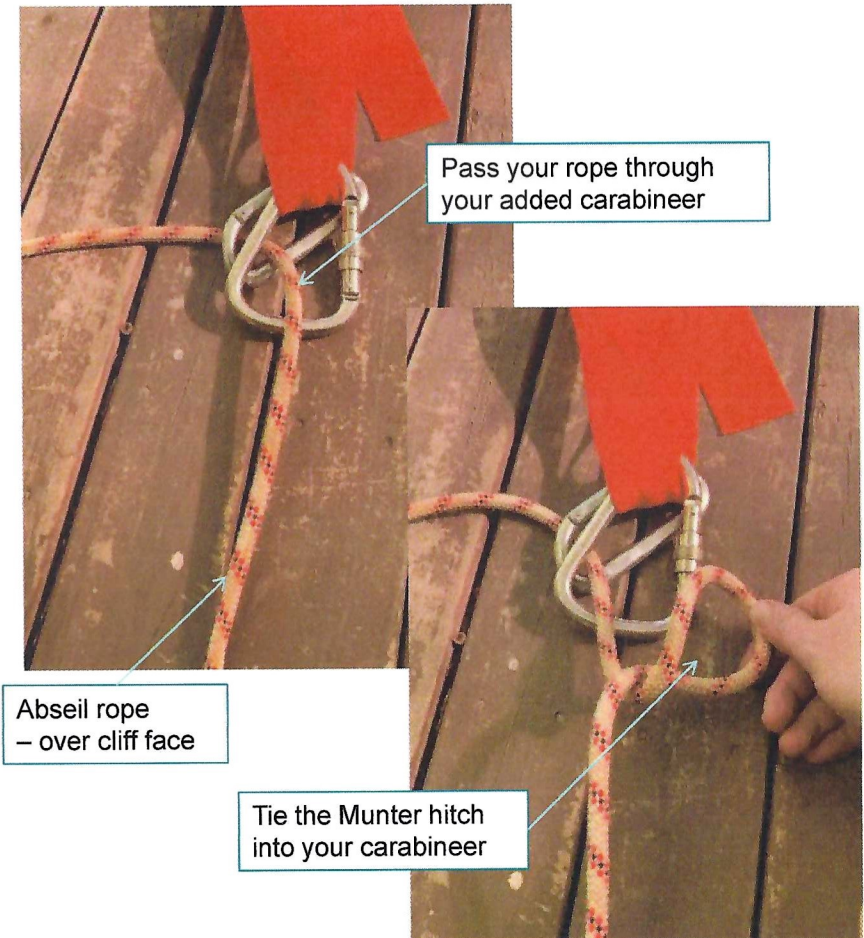
1. Tie the Munter hitch
2. Tie the mule to lock the Munter
3. Add the overhand knot as safety back-up to prevent mule accidentally coming undone + anchor tail of overhand loop to prevent it being caught up in other activity at the anchor point



- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

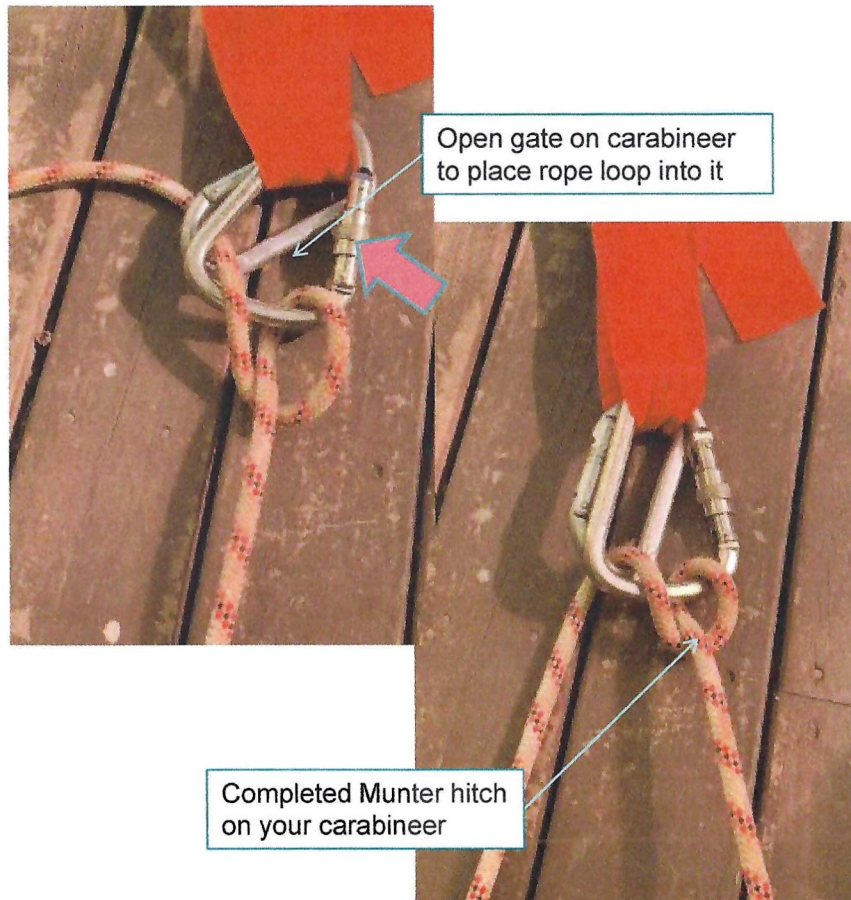
1. Tie the Munter hitch



- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

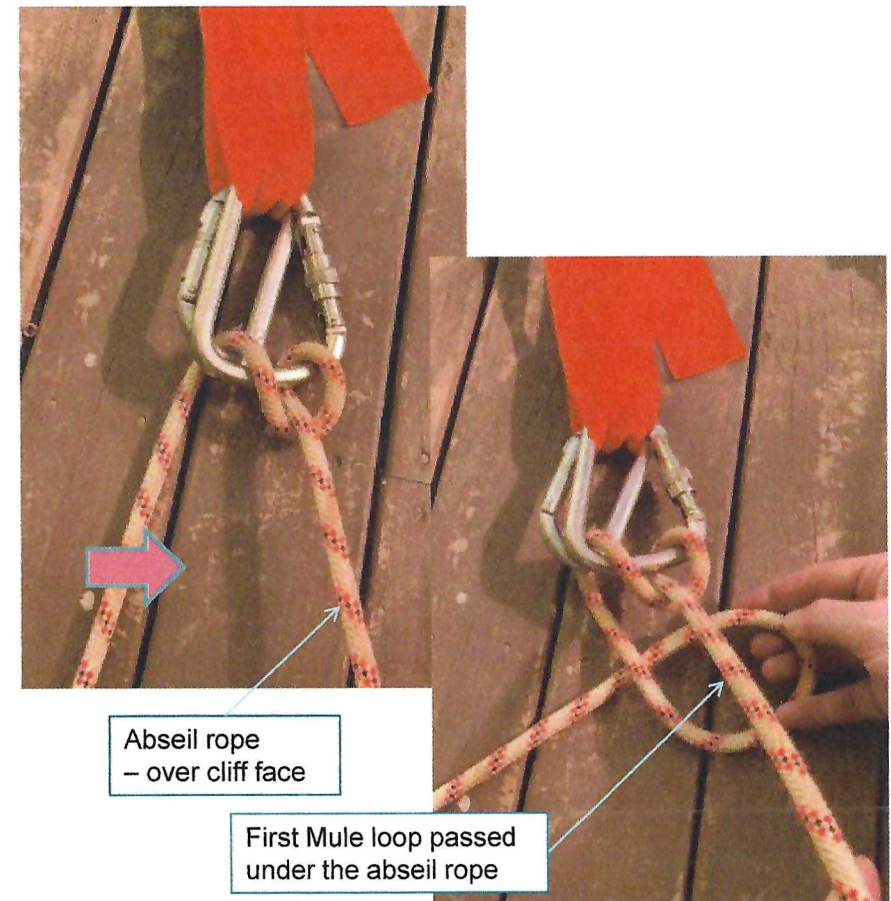
1. Tie the Munter hitch



- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

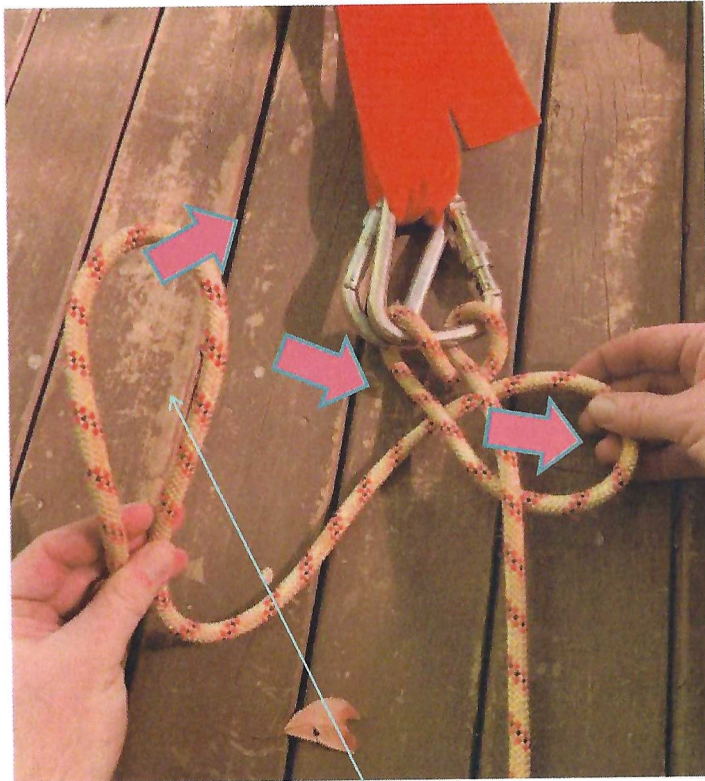
2. Tie the mule to lock the Munter



- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

2. Tie the mule to lock the Munter

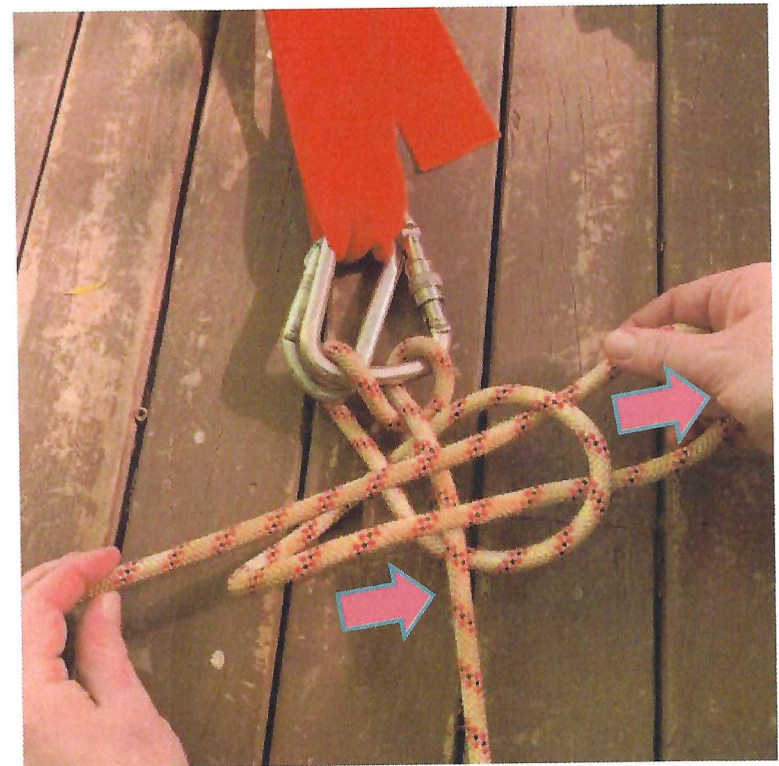


Form 2nd mule loop in rope tail to pass over abseil rope & through the 1st Mule loop

- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

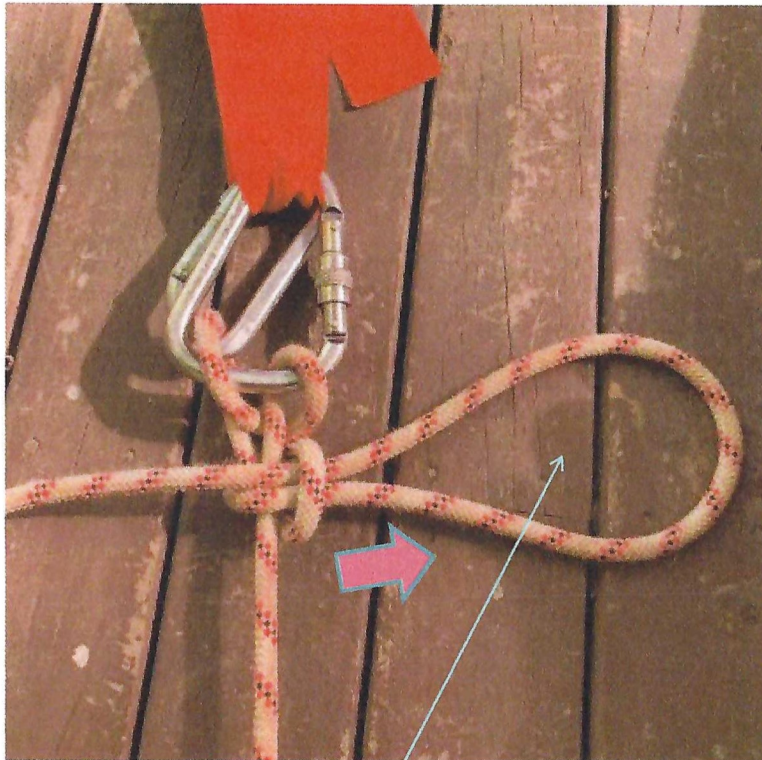
2. Tie the mule to lock the Munter



- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

2. Tie the mule to lock the Munter

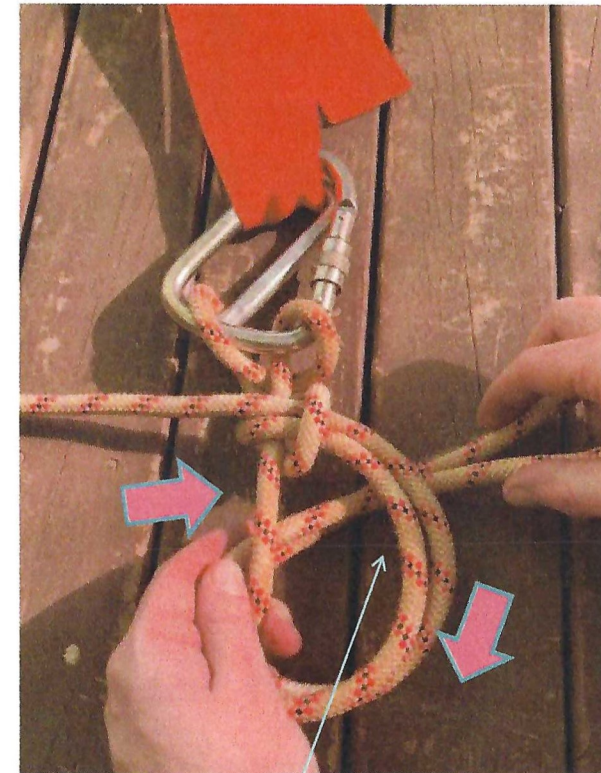


Pull 2nd loop through until tight & pack close onto the carabiner. Need a reasonable tail length to tie the locking overhand knot

- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

3. Add the overhand knot as safety back-up to prevent mule accidentally coming undone

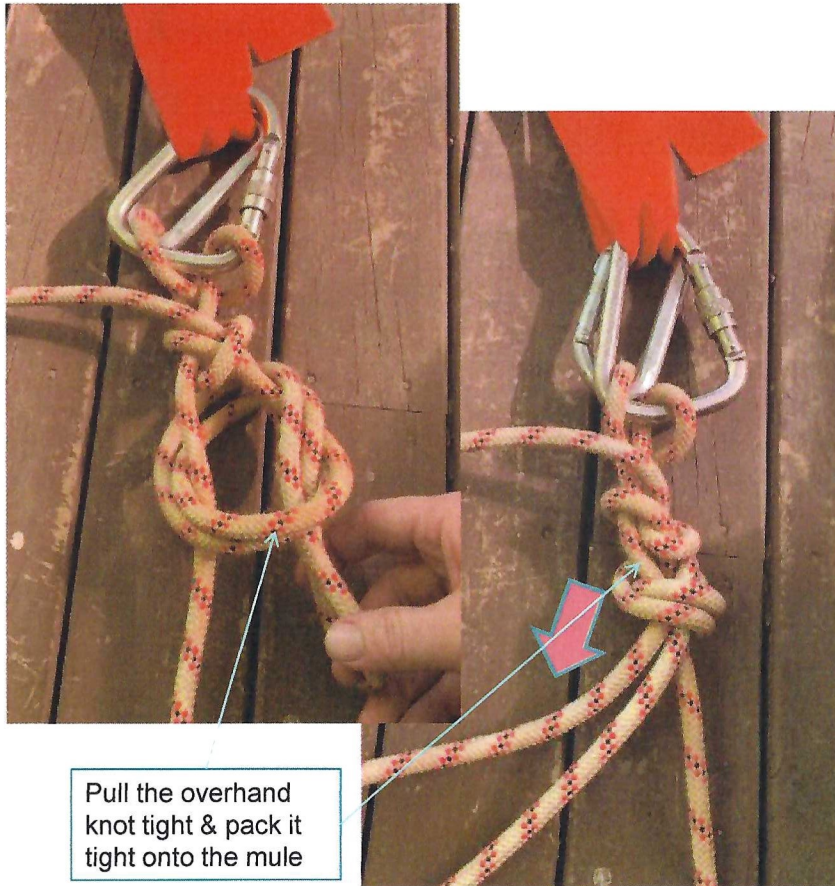


Use the 2nd loop tail to tie an overhand knot on the abseil rope

- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

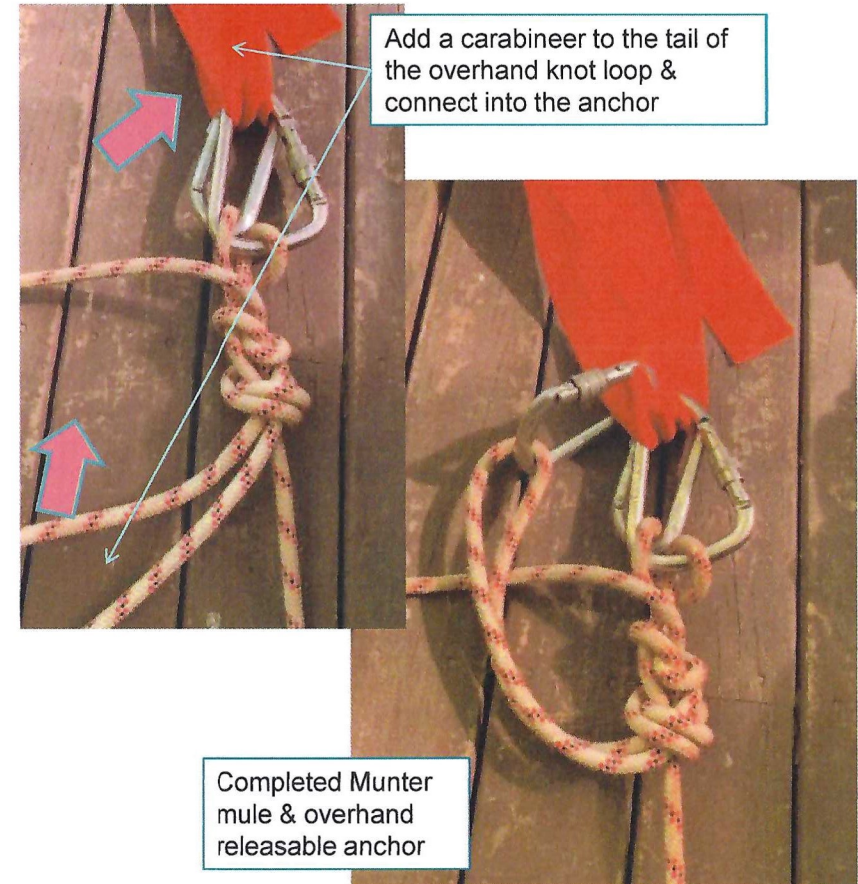
3. Add the overhand knot as safety back-up to prevent mule accidentally coming undone



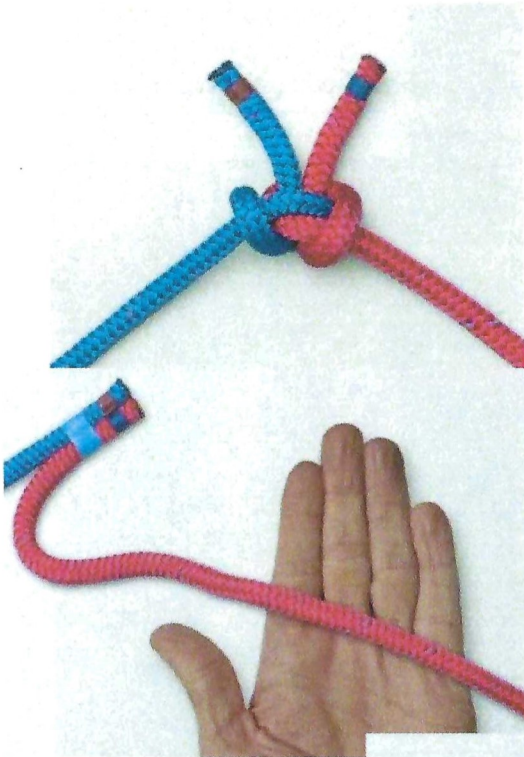
- **Munter Hitch plus Mule & overhand (tie-off)
In an abseil set-up**

This is a 3 step process:

3. + anchor tail of overhand loop to prevent it being caught up in other activity at the anchor point



- Alpine Butterfly Bend - as 2 rope connection



Alpine Butterfly Bend Tying

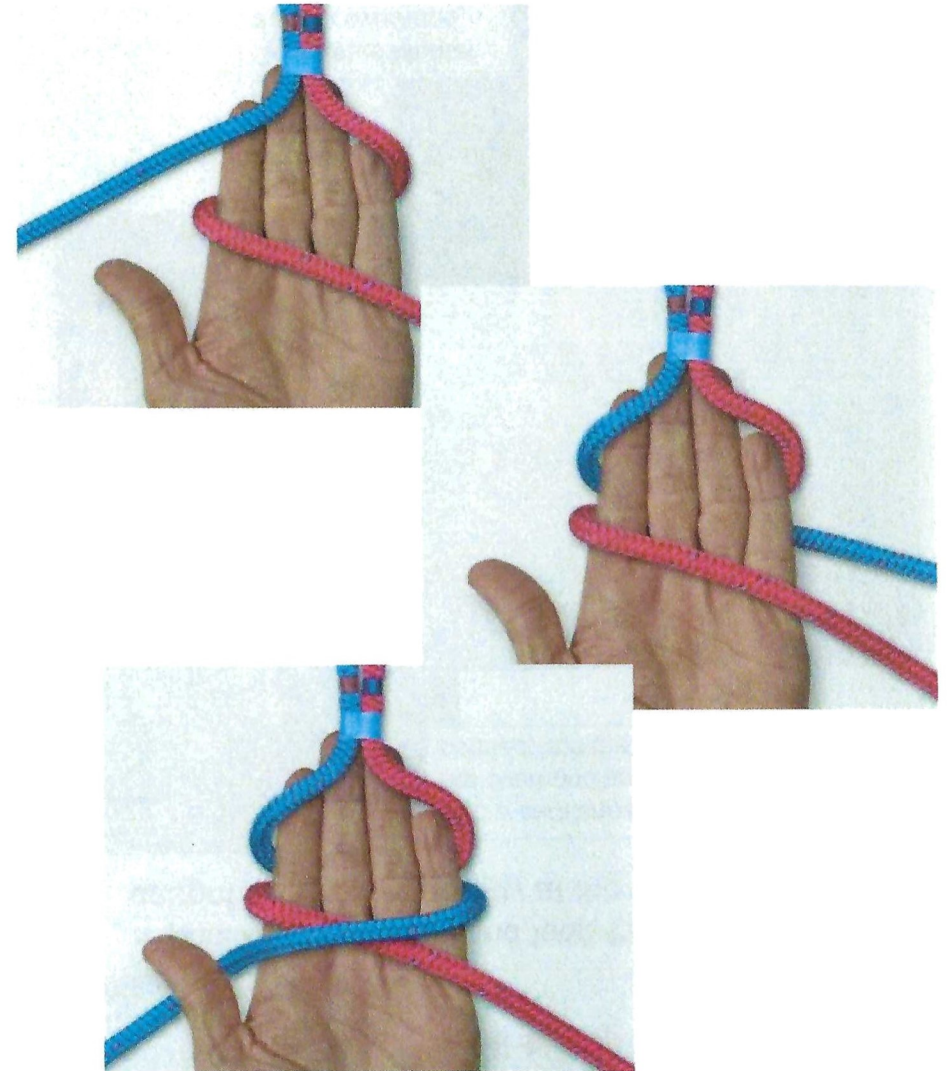
Join the two ends temporarily. Wind the rope around your hand so that the join is by your finger tips. Go around again. Fold the join back and then up under the other ropes. Push the knot off your hand and tighten to see the appearance of the Alpine Butterfly. Finally, release the temporary join.

Alpine Butterfly Bend Tying

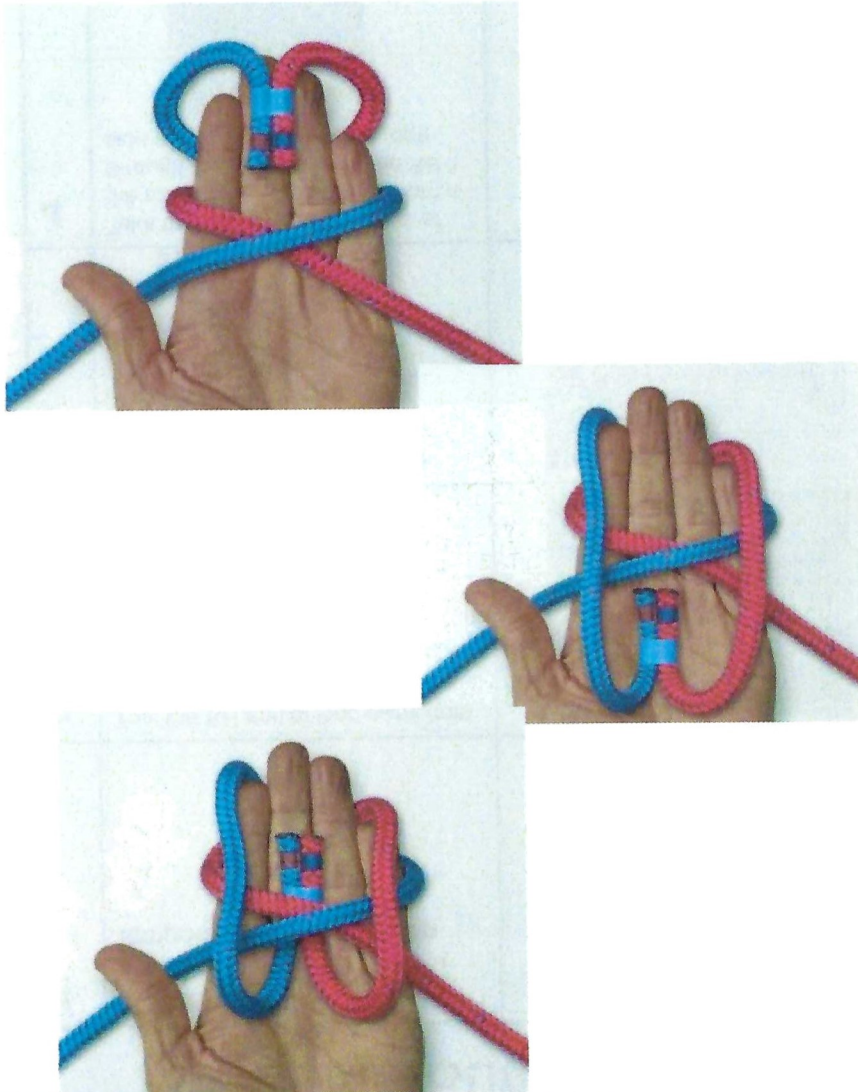
This knot can also be tied using Alpine Butterfly method 2 - after connecting the 2 rope ends with a band or using a reef knot as temporary joining.



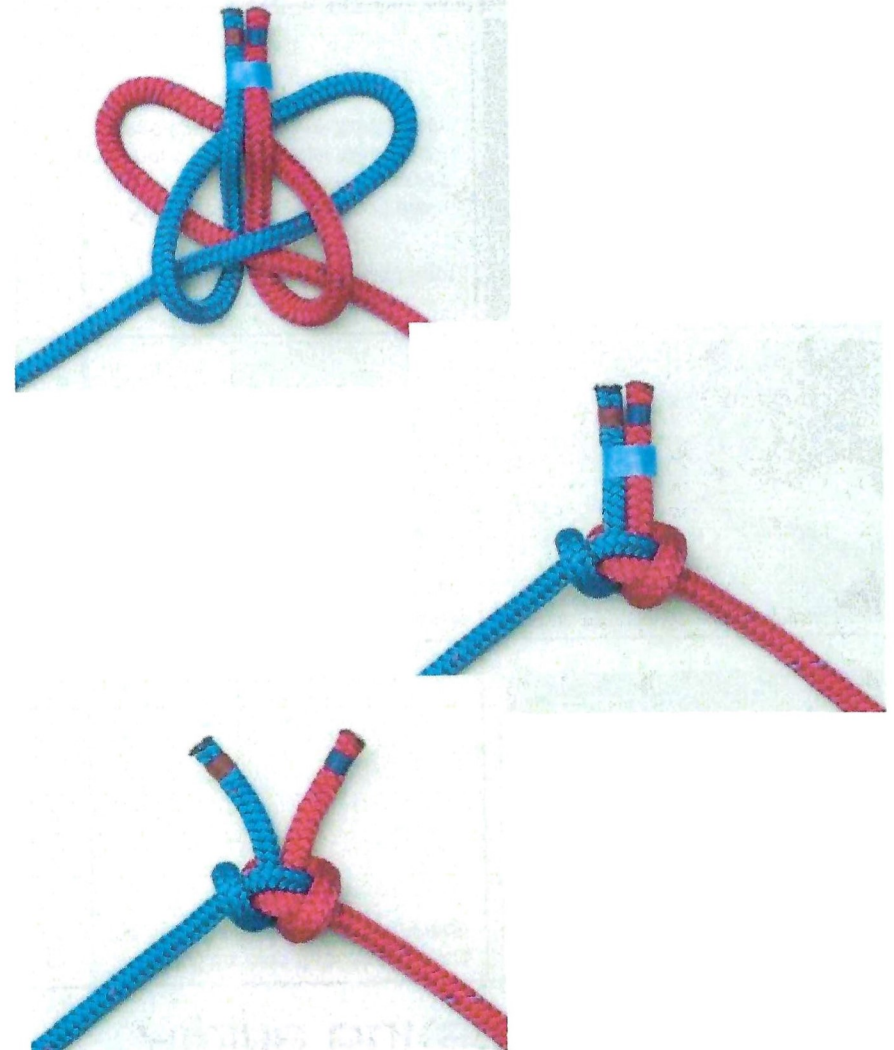
- Alpine Butterfly Bend - as 2 rope connection










- **Alpine Butterfly Bend - as 2 rope connection**






- **Alpine Butterfly Bend - as 2 rope connection**



Alpine Butterfly - 2

1	Create a loop in the rope where you need to create a temporary connection loop	
2	Trist the RH end of loop away from yourself to create the '8' shape 	
3	pass the RH end of the '8' back under the main line of the rope 	
4	Take the LH end of the loop over the main line of the rope & insert it through the inner loop on the RH side of the main line of the rope 	

Alpine Butterfly – 2 cont.

5	Then pull the loop through to create the new temporary attachment loop	
6	While holding the small attachment loop you have created pull just the portion of the main rope line closest to you to tighten & complete the knot	
<p>Finished knot.</p> <p>Note: <i>these outside loops are never loaded so knot very easy to undo. This is critical for a knot somewhere well away from either end of a rope.</i></p>		

- **Double Fig. 8 Eye Knot**

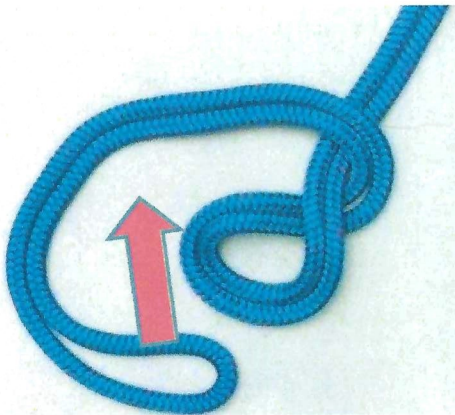


Structure: The Double Figure 8 Loop

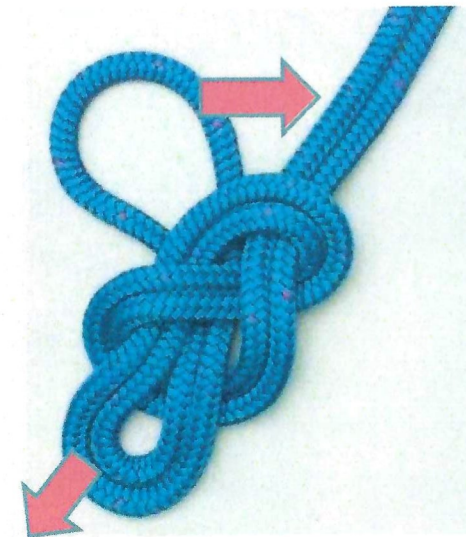
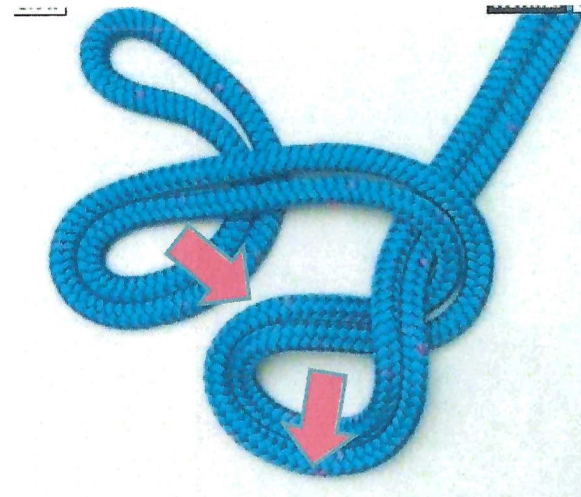
In the pictures the two loops have been made small. In practice they are usually much larger.

Uses: The two loops are useful for equalizing the load on two anchors. In one top-roping technique, the loops are made very unequal. The much larger one is passed around both anchor points. The centre of this loop is then secured with a karabiner to the small loop. During rappelling, this ensures a more even distribution of load between the two anchor points.

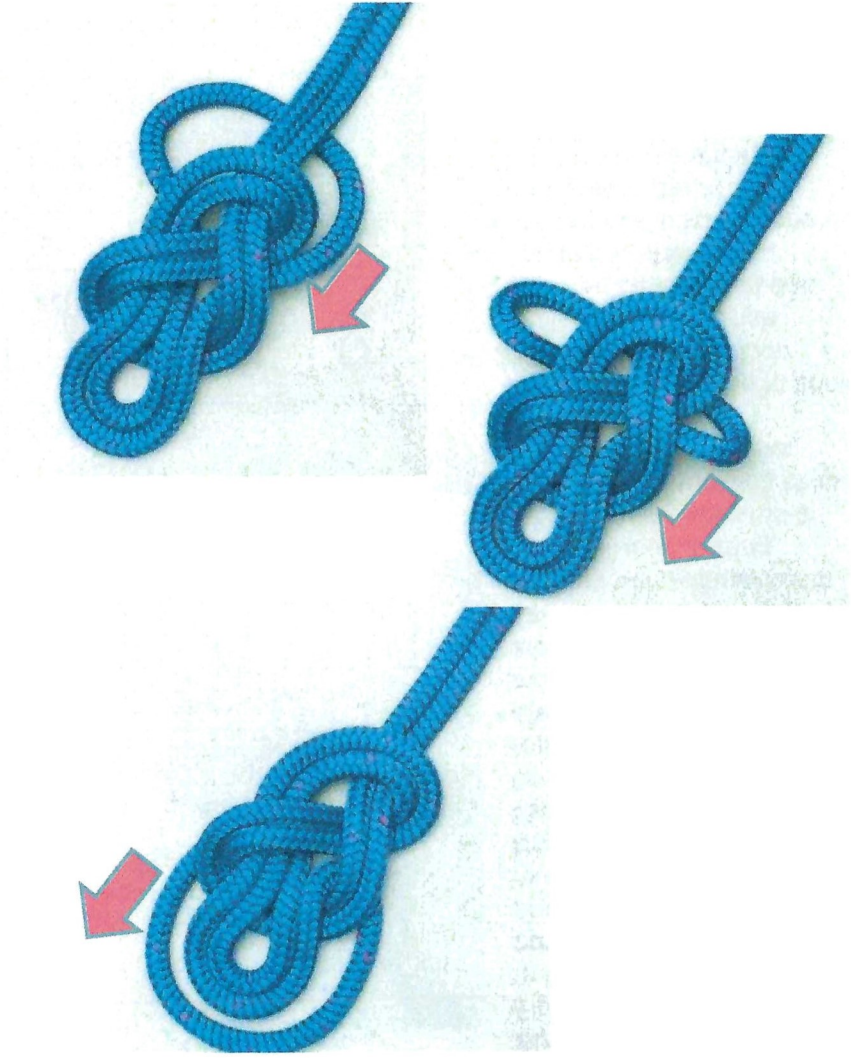
Stability: Compared to some of the other double loop knots, e.g., the French Bowline, the Double Loop Figure 8 is stable. It is unlikely to slip so that one loop gets larger at the expense of the other loop.



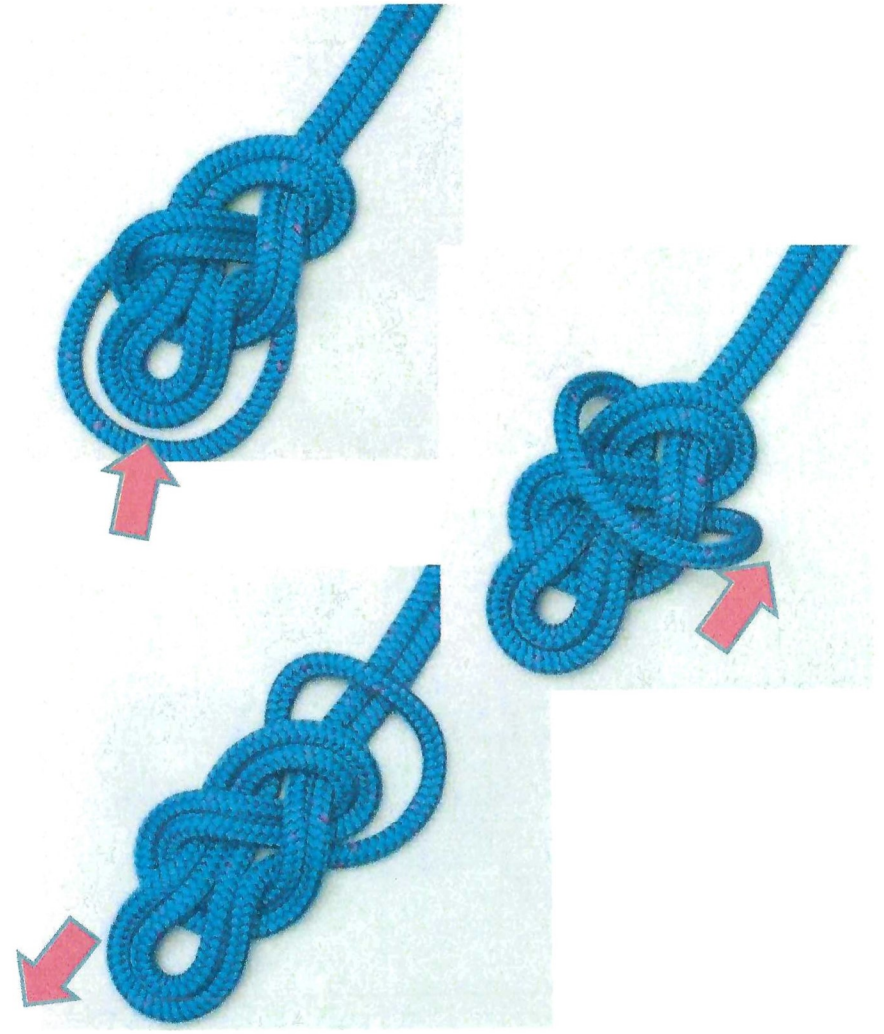
- **Double Fig. 8 Eye Knot**



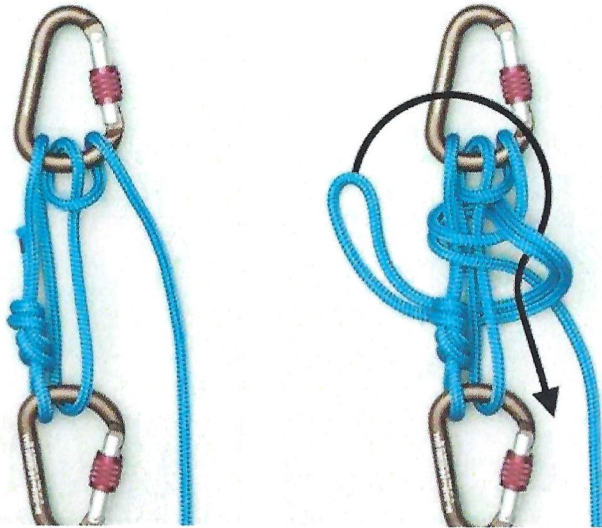
• Double Fig. 8 Eye Knot



• Double Fig. 8 Eye Knot



- Load Releasing Hitch



Radium Release Hitch Tying

Tie a Figure 8 Loop Knot in the end and hook it into the lower carabiner. Pass a loop through the top carabiner and then through the lower one. Tie a Munter Hitch in the top carabiner. Use a bight to tie a Half Hitch and then an Overhand Knot. Untie these knots to lower the load.

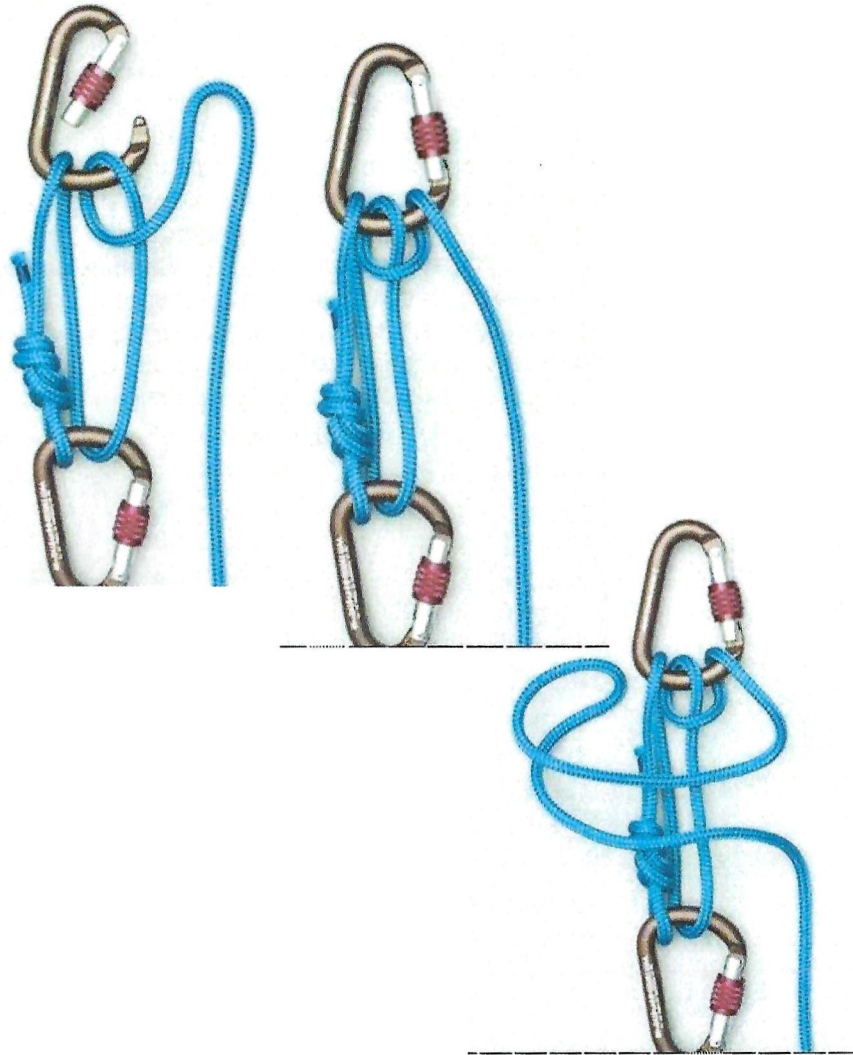
Radium Release Hitch is a load-releasing hitch used in a two-rope technical rescue system.

Uses: - The Radium Release Hitch allows a load to be transferred from one rope to another if, for example, a Prusik Knot jams or a belay line's auto-stop engages. It is commonly rigged prior to the operation by a Search and Rescue team on the belay line anchor. The primary function of this hitch is to transfer load back to the main load line if the belay line's auto-stop becomes engaged. The resulting stoppage of the belay line can be due to a variety of causes including: main line load being lowered too quickly for the belay line operator to keep up or actual main line failure.

- Load Releasing Hitch



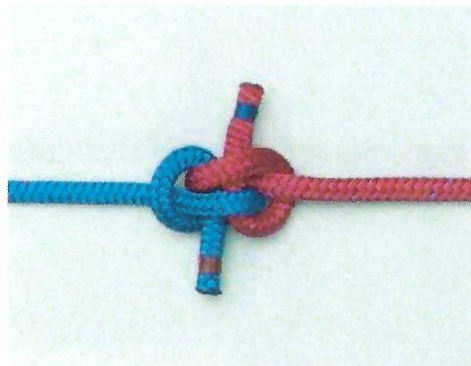
• Load Releasing Hitch



• Load Releasing Hitch

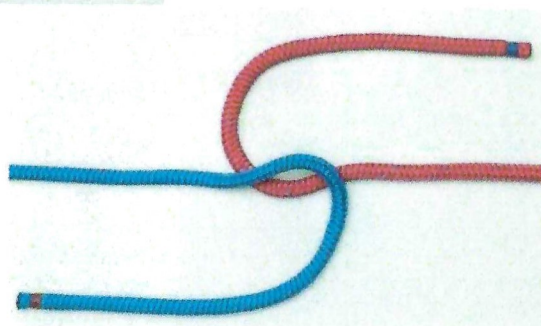
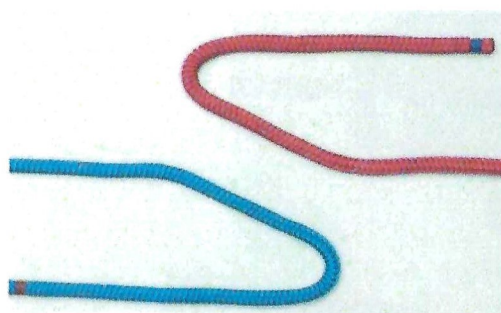


- Zeppelin or Rosendahl Bend

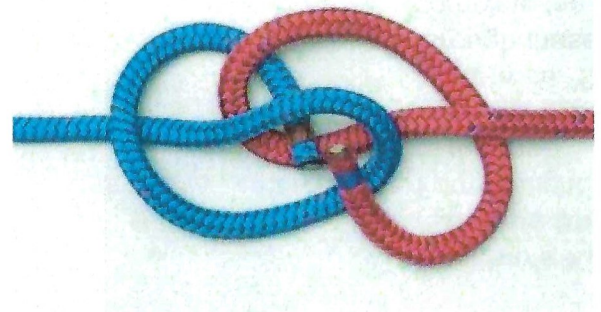
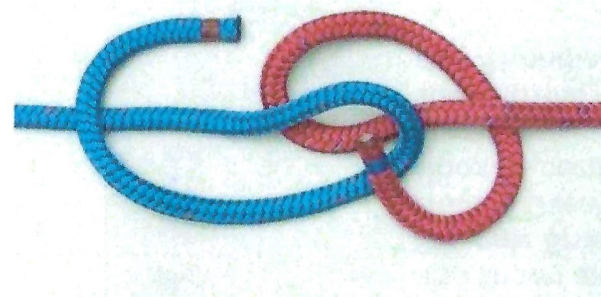
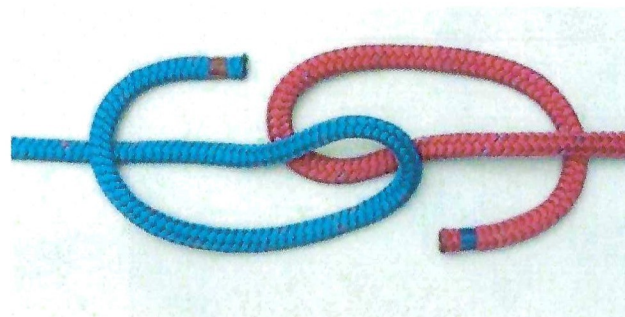


Zeppelin Bend Details

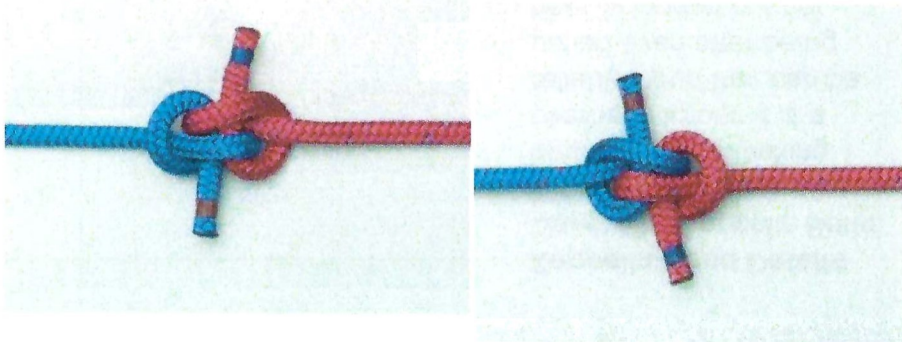
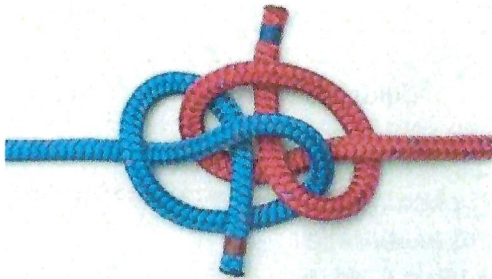
Uses: The Zeppelin Bend is one of the bends employing interlocking overhand knots. It is a reliable bend that can be untied even after being heavily loaded but not, however, while still under load. It is an excellent alternative to the more widely used [Double Fisherman's](#) because it eliminates the risk of jamming.



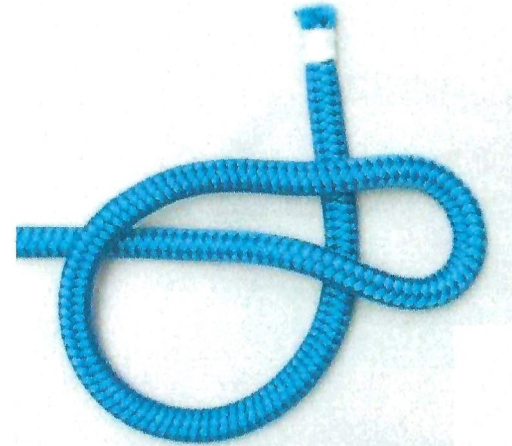
- Zeppelin or Rosendahl Bend



- Zeppelin or Rosendahl Bend



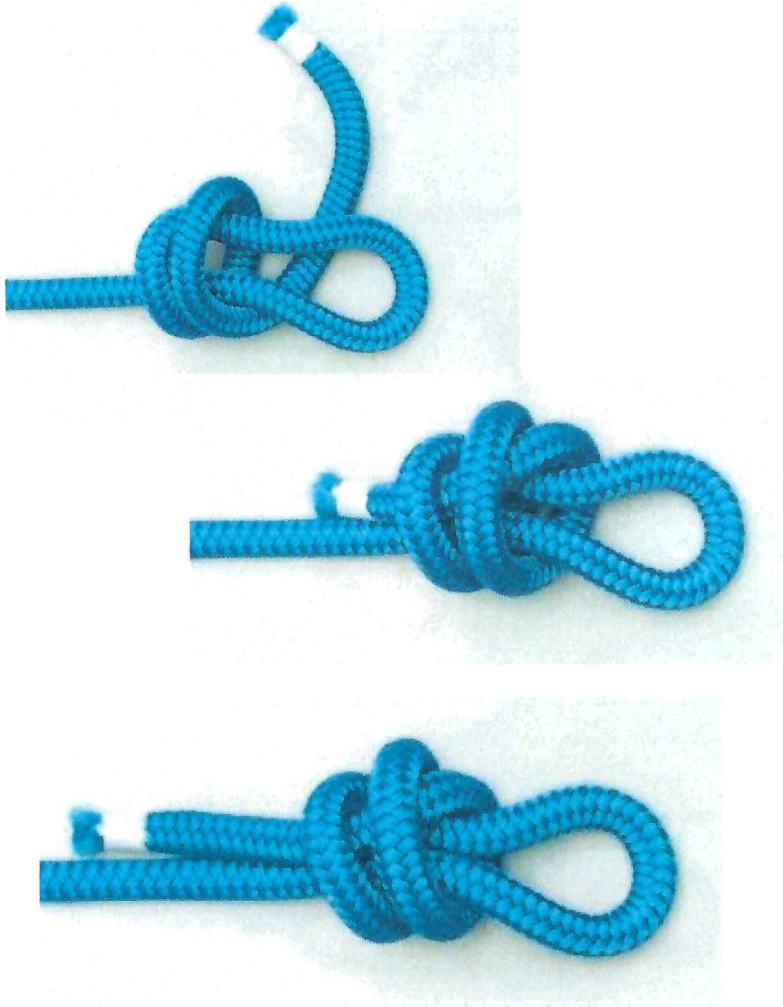
- Double Overhand Noose or Poacher's Knot



Poacher's Knot (Strangle Snare) Tying
Form a bight in the end of the rope. Loosely wrap the end around the bight twice. Tuck the end through these turns to complete the knot. Pull tight. The Poacher's is also known as a **Strangle Snare** and a **Double Overhand Noose** – because the knot tied round the standing end is known as a **Strangle Knot**



- **Double Overhand Knot or Poacher's Knot**



- **Tensionless Hitch**



Tensionless Hitch Tying

Prepare sufficient rope to make 3 or 4 turns around the post. Make a Figure 8 Loop in the end and attach a karabiner. Wrap the rope around the post. Make sure there is sufficient slack and clip the karabiner to the standing end. A kink in the standing end is an error.

- **Tensionless Hitch**

