

Mountaineering Leadership II Knots Study Manual



Definitions:

Knot: A set of twist in a rope that can exist if the rope is let go and laid down

Hitch: A set of twist in a rope that sets it around another object, that once the object is removed, the hitch falls apart.

Bight: A bight is a U shaped pinch of rope.

Bend: A knot or knots that joins two ends of a rope

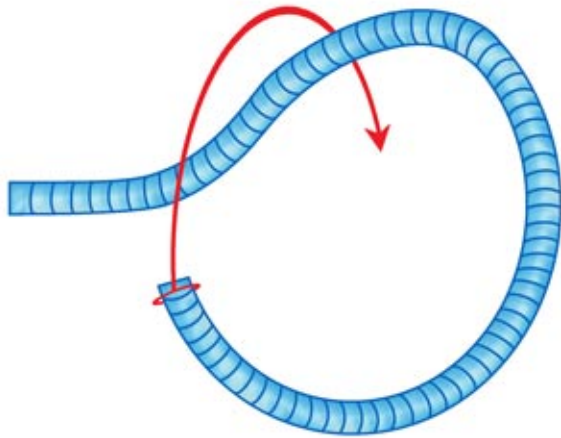
Standing end: The stack of rope not involved in a knot.

Running or Working end: The end or part of the rope that is involved in a knot or hitch.

Dressing: How tidy a knot is, neatness is important for ease of visual safety inspection, and for the flat overhand knot important for safety and integrity of that bend.

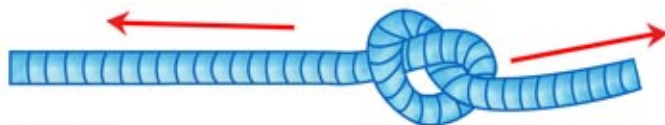
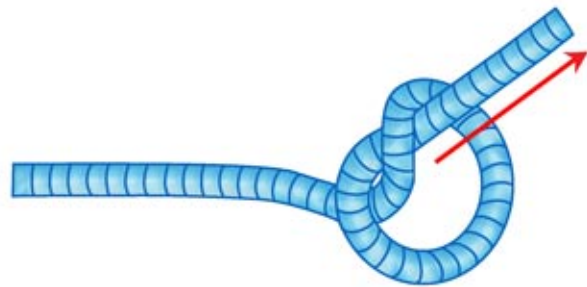
Tail: How much extra rope remains from the running end after the knot is tied. The tail must be 2 times the length of the knot itself. The flat overhand the tail must be over a foot.

Overhand Knot Instructions



1 Form a loop by passing the tag end over the standing part

2 Tuck it inside the loop and pull it out completely



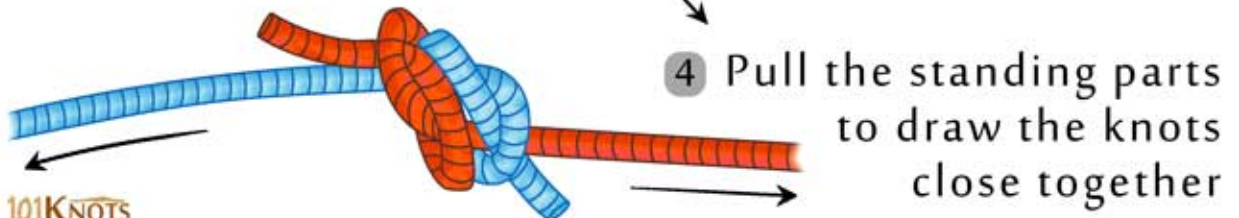
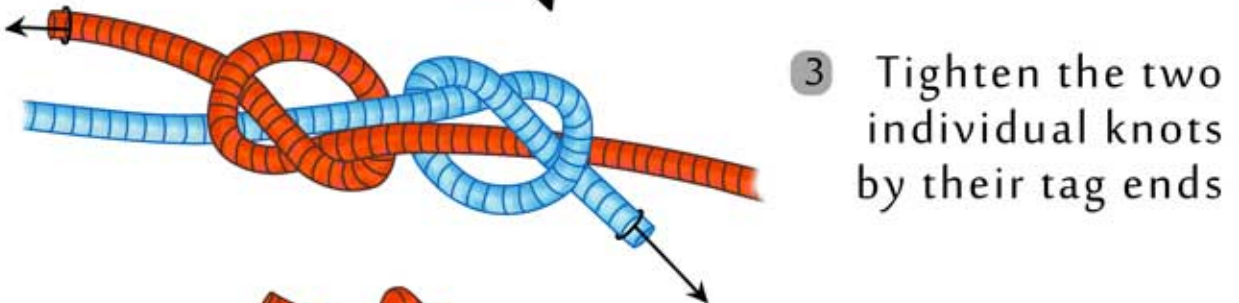
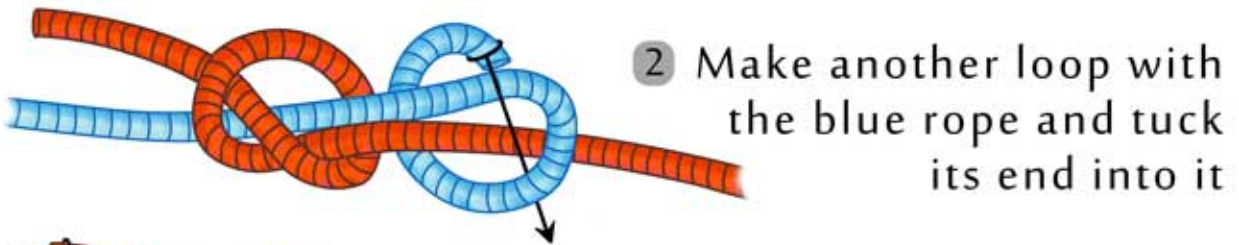
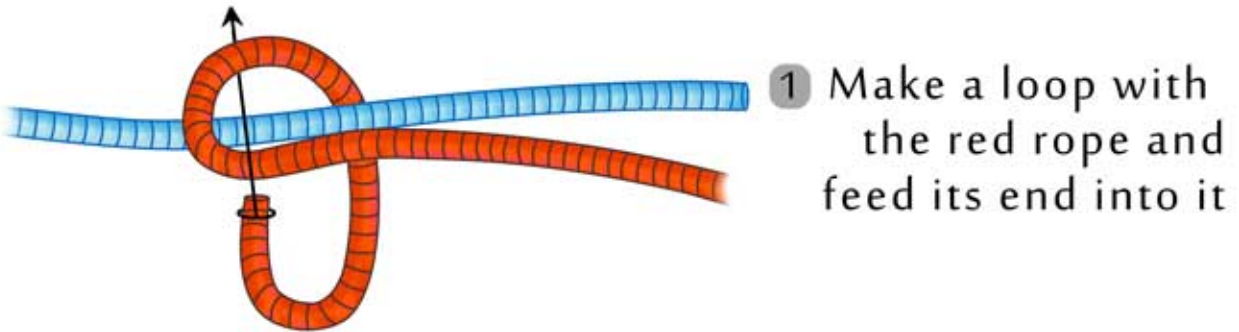
3 Pull both ends to tighten

101KNOTS

1. Overhand - Not a particularly useful knot in itself but it begins the basis of many others.

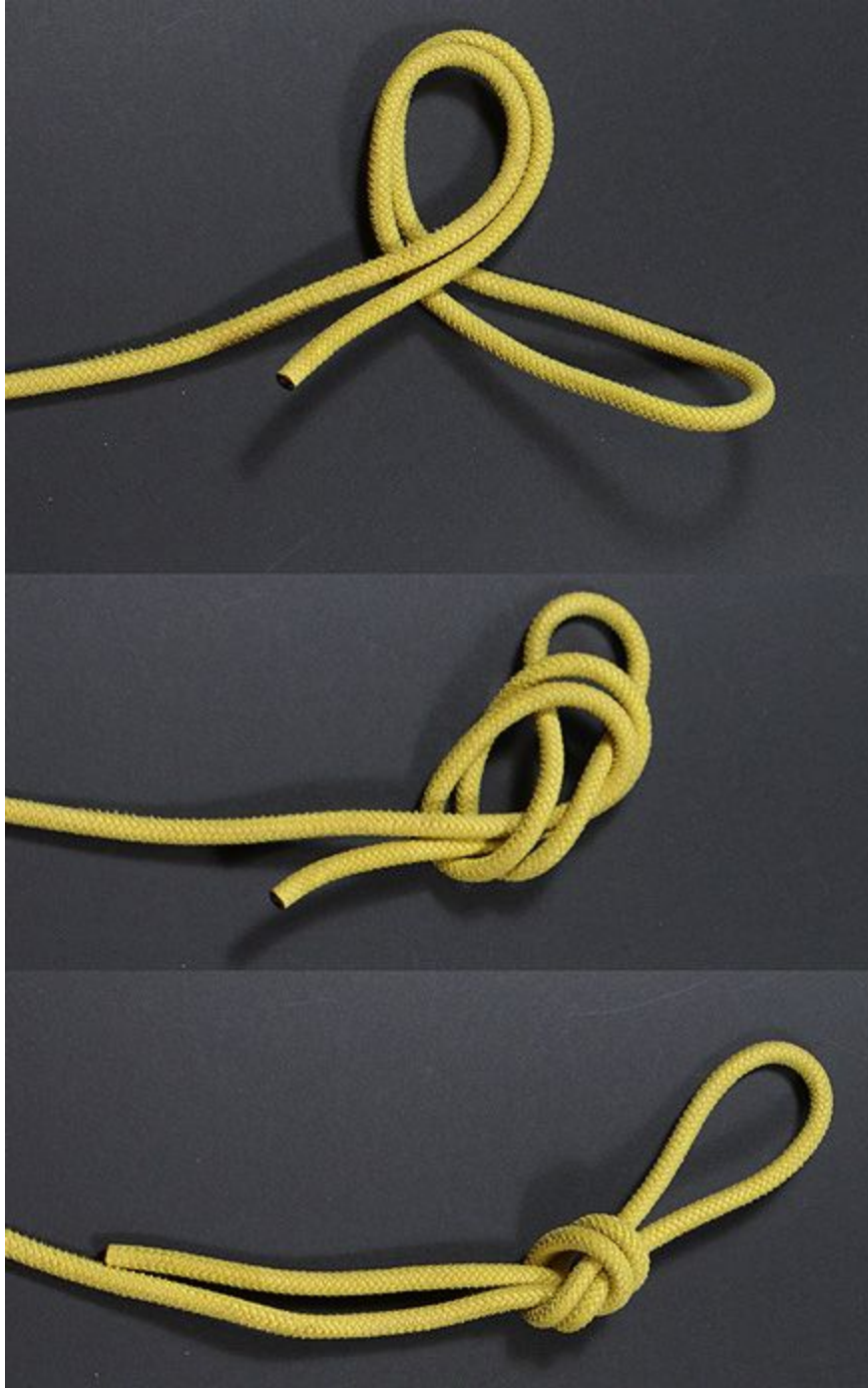
1a. Double Fishermans Knot (bend) - Used to join to ends of cord to make a loop for friction hitches and other purposes. A very difficult set of overhands. It is incredibly strong, and once set it with weight it “welds” and is essentially permanent. All of your shorter 24” and 48” cords should be tied this way. <https://www.youtube.com/watch?v=YHUv-oOMwRA>

Fisherman's Knot Tying



101KNOTS

2. Overhand On A Bight

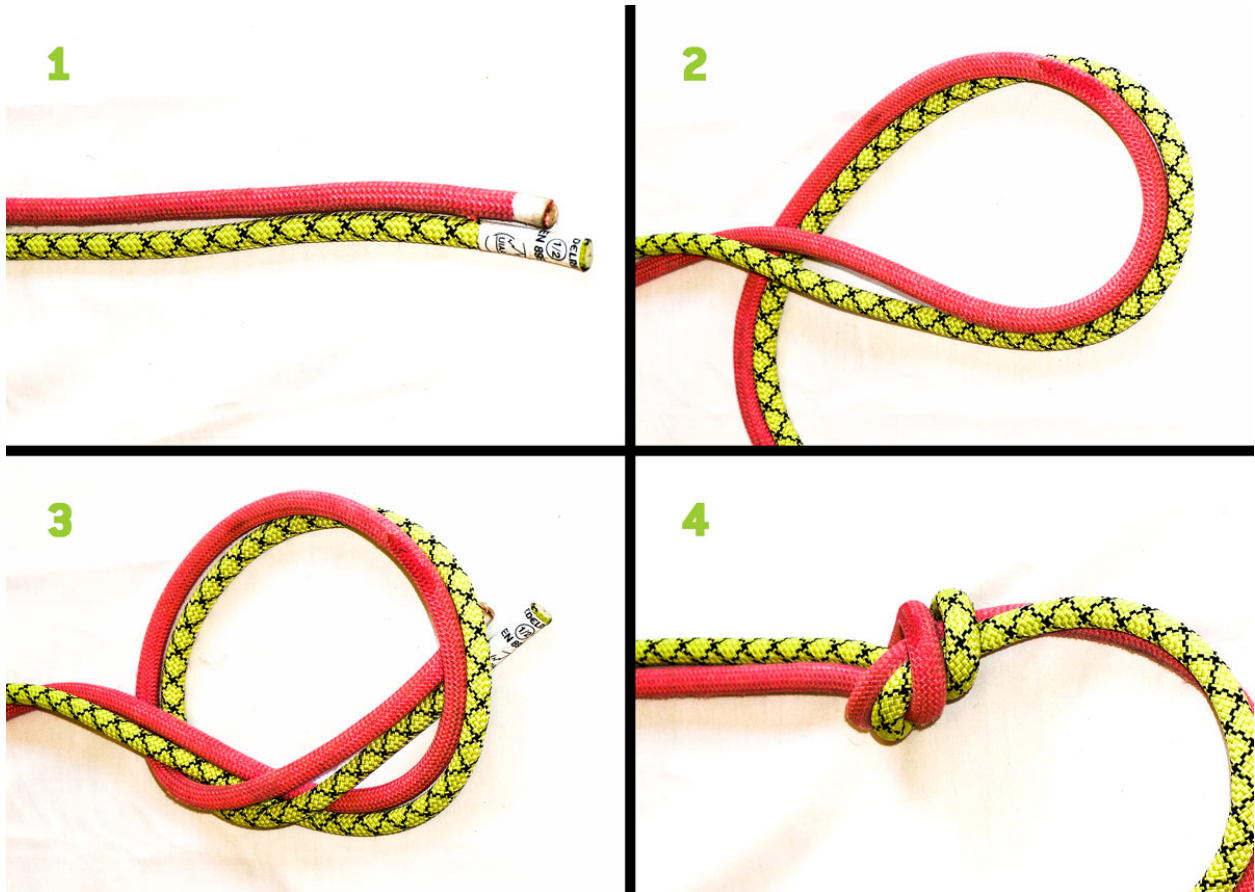


Often used for anchor building, or creating tie in points on a glacier travel rope.

3. Flat Overhand w/ Tails (Euro death knot)

Not actually deadly. Must be dressed, must have over a foot of tails or it can possibly roll and

begin to undo itself under load. Ropes or cords joined in this way must be the same diameter or very close or the rolling can happen. Most often used to join two ropes for a dual rope rappel for its anti snag shape. It can also be used to hastily join two ends of cord to make a loop for anchor or rescue purposes.



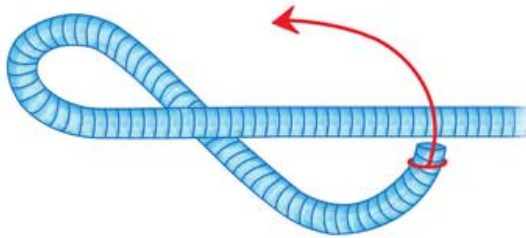
4. Water Knot (actually a bend) - Most often used to join two ends of cord to make a loop. Unlike its relative the flat overhand it needs less tail, the water knot is slower to tie and harder to

untie.

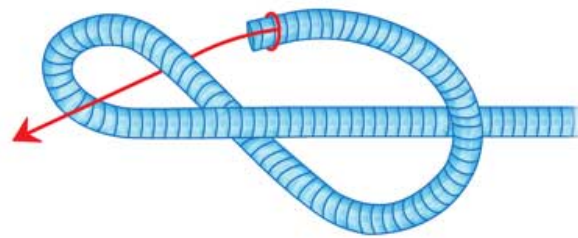


5. Figure 8 (skeleton 8) - The Figure 8 family is one of the most important knots in climbing. No actual purpose on its own but it will lend to many other knots in its family.

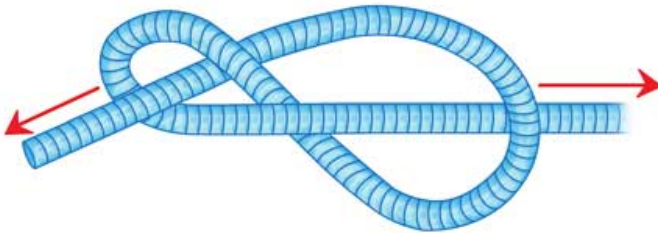
Figure 8 Knot Instructions



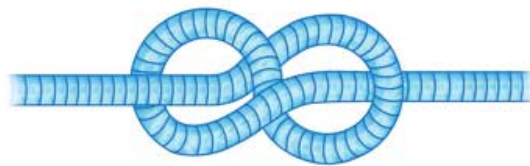
1 Make a loop with an end



2 Now pass the end through it

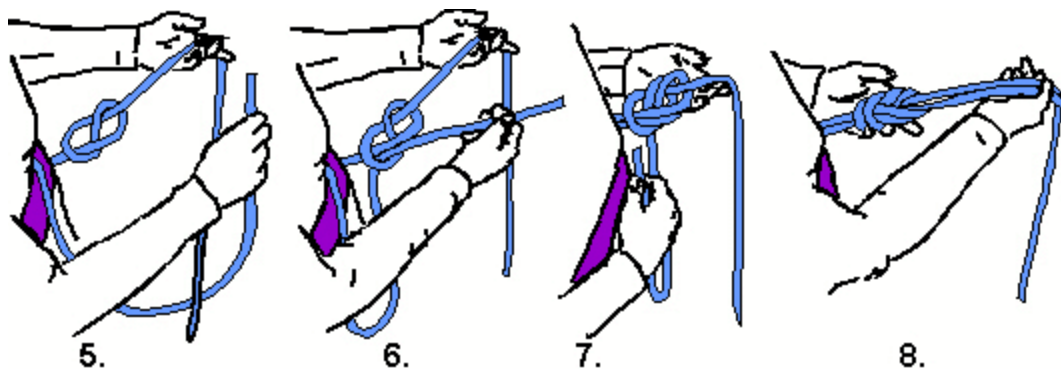


3 Pull both sides to adjust the knot



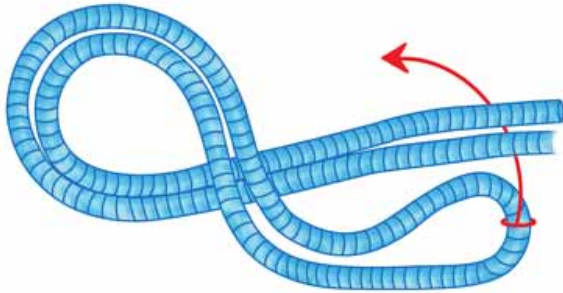
4 The finished knot resembles an "8"

6. **Figure 8 follow-thru** - Used to tie the rope into your harness for technical climbing (one of the most important knots in climbing) <https://www.youtube.com/watch?v=GFlwrvggas0>

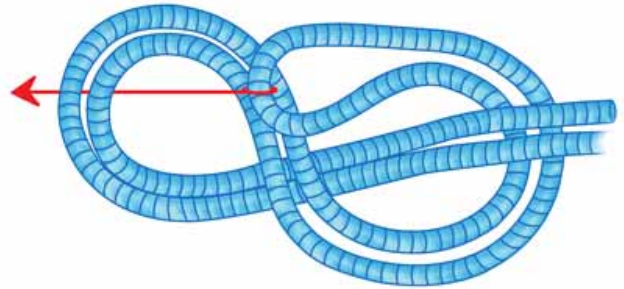


7. **Figure 8 On a Bight** - Used for anchor building, it is easier to untie than the overhand on a bight, and if you need to have a shorter anchor this knot can eat up a bit of extra rope.

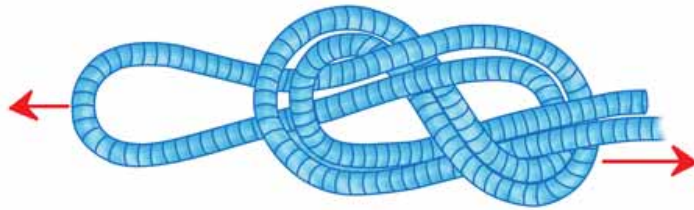
Figure 8 on a Bight Instructions



1 Make a loop with a bight of rope



2 Pass the end through the loop



3 Pull both ends to tighten

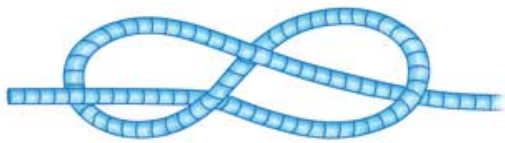


4 The completed knot forms a loop

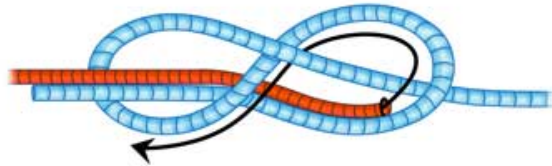
8. Flemish Bend - One of the strongest ways to join two cords to make a loop. It is like a figure 8 follow thru except with two separate ends of rope or cord rather than a bight.

<https://www.youtube.com/watch?v=3baSM1JPbUQ>

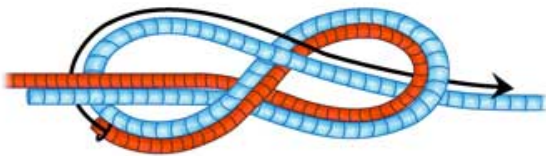
Figure 8 Bend Instructions



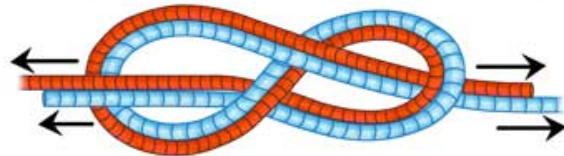
- 1 Make an "8" with the blue rope



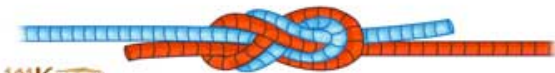
- 2 Introduce and pass the red rope through the blue loops



- 3 Continue making an "8" with the red rope next to the blue one



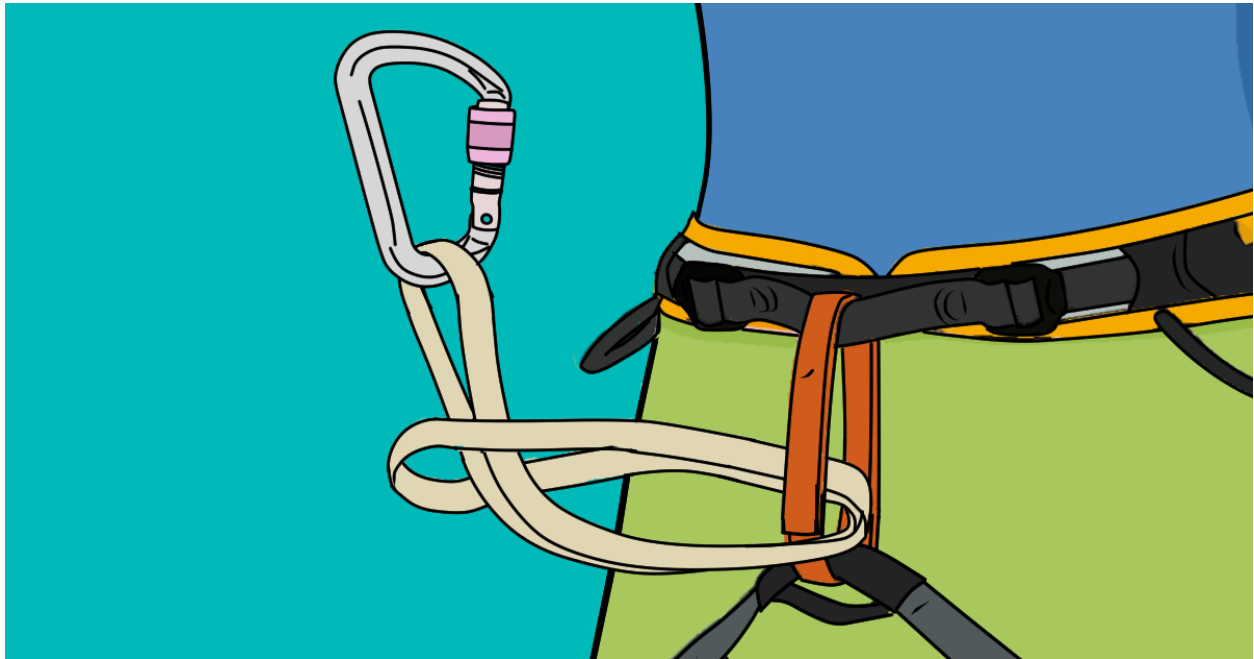
- 4 Tighten both the ropes at each side to finish the knot



101KNOTS

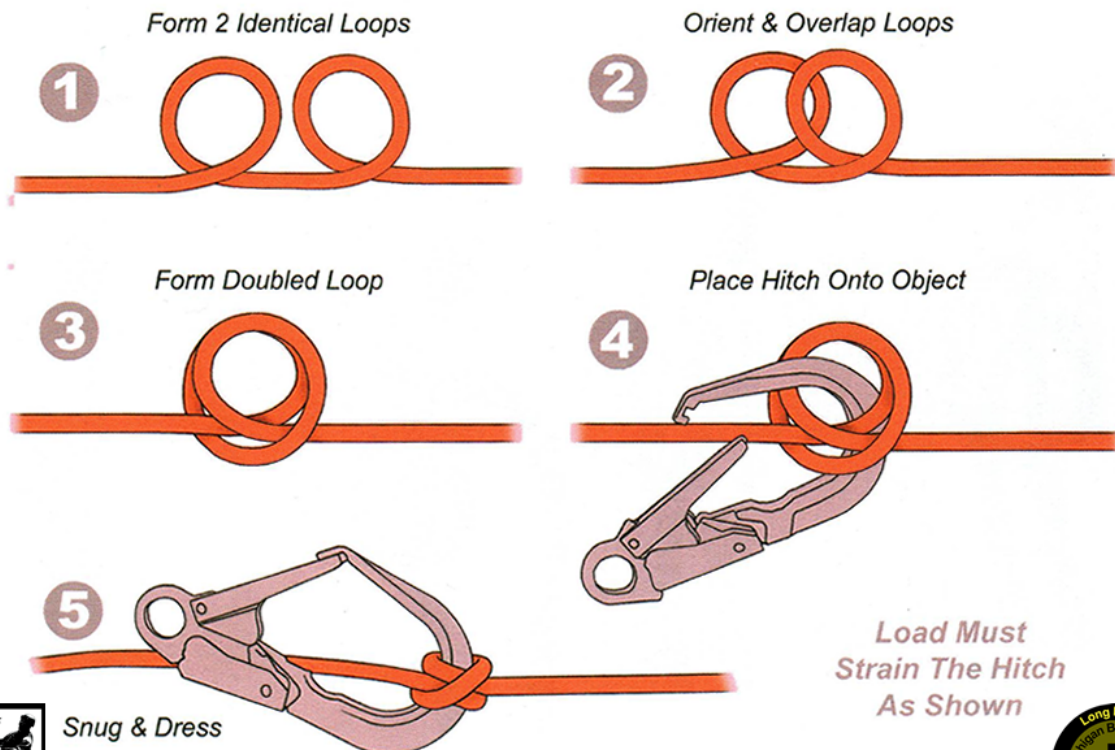
- 5 You may trim the tag ends to keep them 3-4" long

9. Girth Hitch - The “luggage tag hitch”. This hitch is very strong and easy to attach. It can be used alone to attach a leash to your harness, or as the beginning stages of a prusik hitch.



10. Clove Hitch - incredibly useful if not one of the most used hitches, strong and adjustable. Often used to secure a section of rope to a biner, aka leashing yourself into a section of rope with a carabiner, it is also used for anchoring purposes.

Knot Tying **How to tie the clove hitch, mid-rope**



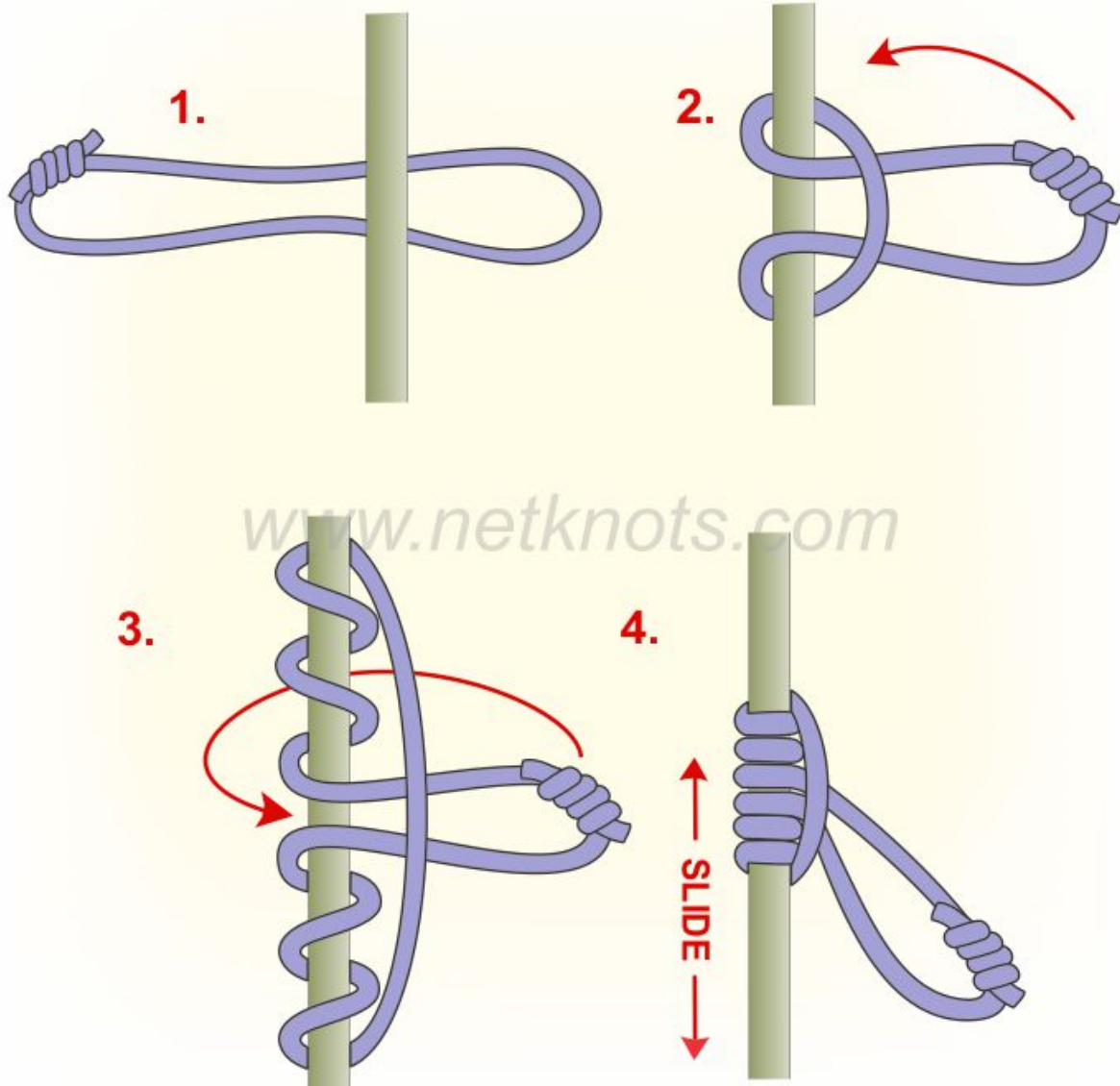
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www.MibSAR.com
The Spec Ops Blog

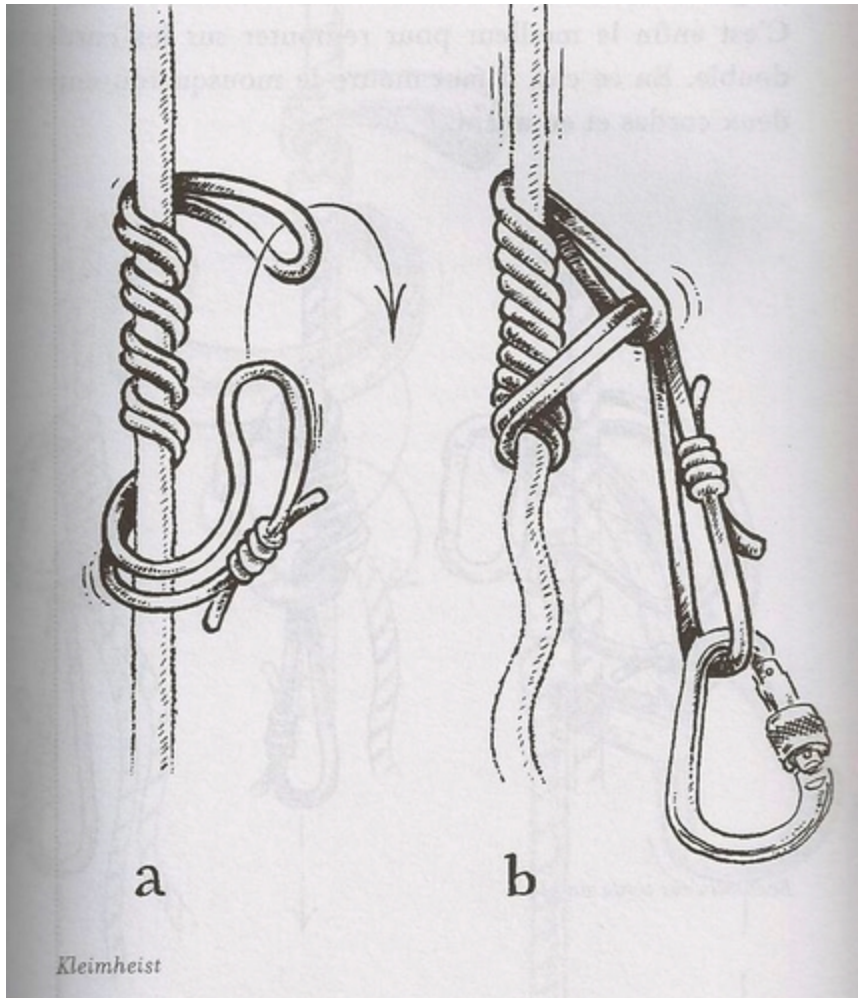


11. Prusik Hitch. A friction hitch, is a piece of cord or rope hitched onto another piece of cord or rope that locks down under load but can be moved when not under load. The prusik is the strongest and hardest biting of the friction hitches. I honestly use it the least because of its complexity to tie and remove. Still worth knowing how to do especially with wet and frozen ropes. Its essentially a well dressed girth hitch, in which you wrap towards the center. It will not function if not well dressed. Be sure to keep the double fisherman's knot out of the way. It works best with 3 wraps.

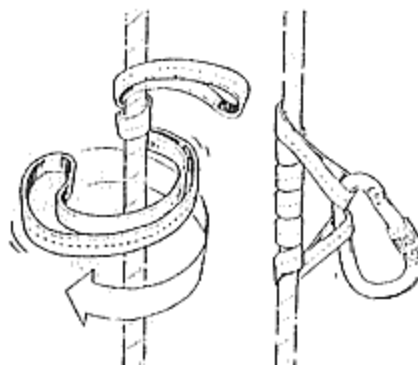
PRUSIK KNOT



12. Kleimheist - The second strongest friction hitch but also one of the fastest to tie, especially with gloves on and in adverse conditions. I use this in most cases that a prusik would be used by others. I use it often with crevasses rescue systems, line ascension, If the kleimheist does not bite add in an extra wrap. I start with 3 wraps and work up from there.



13. Autobloc - One of the fastest friction hitches to tie but it bites the weakest. I use it the most for making "third hand" type back ups on my rapels and lowers. I start with 3 wraps and add more if it does not bite. Again like all friction hitches they work best when well dressed.

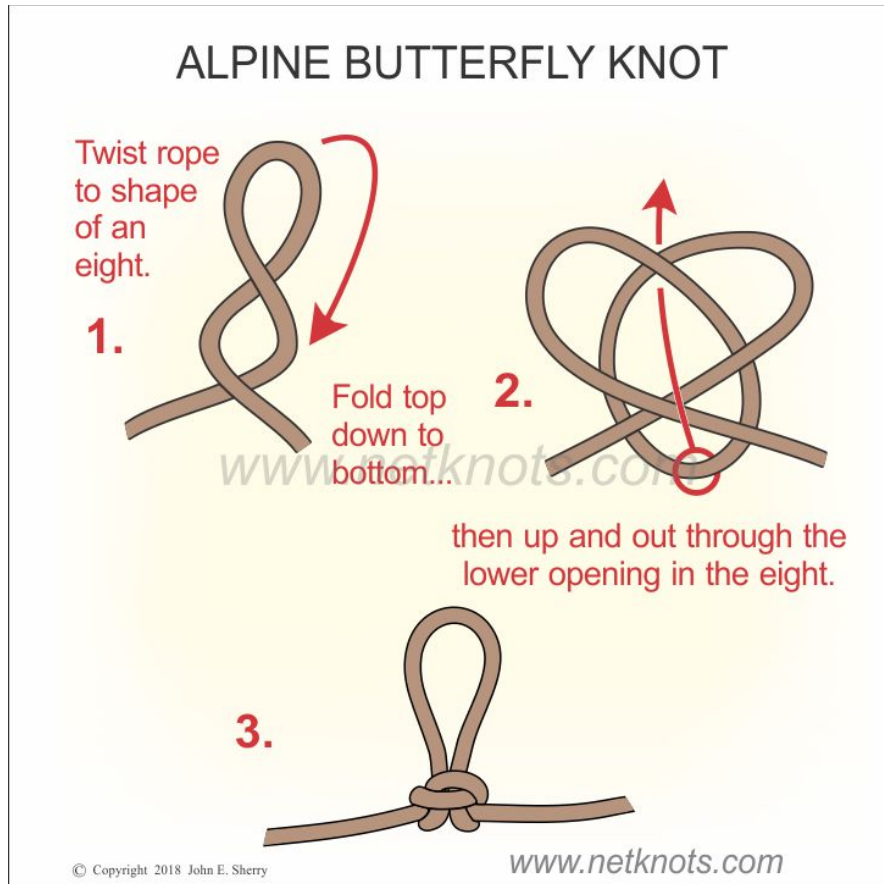


14. Munter hitch - This hitch is similar to the clove hitch but instead of locking down a segment of rope or cord, this hitch is a belay hitch that can serve the purposes of an ATC or other belay device. With just a Munter you can belay, lower, and rapel. The disadvantage is that the rope will become somewhat curled and pig tailed afterwards. It will need to be restacked and stretched out to return to normal.

<https://www.youtube.com/watch?v=6HNCXTWojnI>

15. Alpine Butterfly - This knot is used to create clip in points on your glacier travel rope. Many alpine butterflies can also be tied along the glacier rope between a small team traveling over weak snow bridges. The alpine butterflies bite into the snow in the event of a fall and help catch the weight of the victim.

<https://www.youtube.com/watch?v=YkW0-bubjv0>



There will be a quick review and quiz on these knots once ML2 gets to camp.