



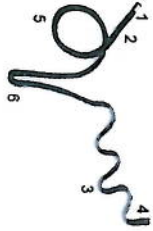
CADET INSTRUCTORS CADRE
LAND ENVIRONMENTAL TRAINING COURSE
ANNEX B



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EO 107.08 – KNOTS AND HITCHES



Pocket Guide to Knots and Splices, by Des Pawson, 1991
Diagram 1 Parts of a Rope

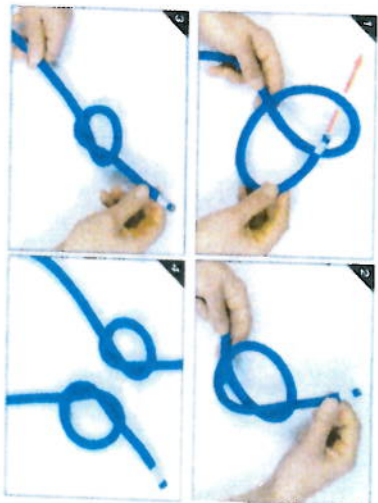
1. Working end (running end) – The very end of the rope that is used during the tying of the knot.
2. Working part (running part) – The short length of rope that is manipulated to make the knot.
3. Standing part – Part of the rope usually 'stands still' during the knot tying process. Often it is the longer end that leads away from the loop, bight or knot.
4. Standing end – The end of the rope not immediately being used in the tying of a knot.
5. Loop (crossing turn)
6. Bight – Middle part of a length of rope. This term also refers to a loop of rope that does not cross over itself.



These web pages have some excellent animated knots.
<http://www.mistral.co.uk/42bqch/uknois/42kmenu.html>
<http://www.korpegard.nu/knot>

THUMB KNOT

- Other names: Overhand knot, Simple knot.
- Uses: Keep the end of a rope from unravelling or to stop a rope from passing through an eye.
- Qualities: Easy to make, stays in place.
- Faults: It is difficult to untie. An overhand knot in the middle of a length of rope will reduce the strength of the rope by about half.
- Procedure: Form a loop with the working end passing under the standing part of the rope (Diagram 2, Figure 1). Tuck the working end down through the middle of the loop formed by the crossing turn and out of the loop (Diagram 2, Figure 2). Pull both ends to tighten the knot. As it is being tightened the position of the knot can be moved nearer the end if so required (Diagram 2, Figure 3).



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Diagram 2 Thumb Knot

- Other names: Square knot, Opposite knot.
- Uses: Joining two ropes of equal thickness. Also used in first aid for tying bandages.
- Qualities: Lies flat, holds well and is easily untied.
- Procedure: Take the running ends of two different ropes and place the left-hand working end across the right working end (Diagram 3, Figure 1). Tuck the left hand end under, and back up over the right end (Diagram 3, Figure 2). Bring the two ends together again and place the right hand end over the left hand one (Diagram 3, Figure 3). Tuck the right hand end under and back up over the left hand end (Diagram 3, Figure 4). Dress the knot by pulling on both ends (Diagram 3, Figure 5).

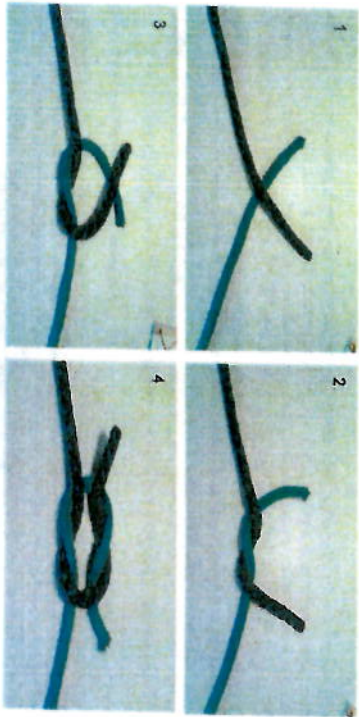


Diagram 3 Reef Knot

When done right, the running end and the standing end of one rope come out on the same side of the bight formed by the other rope. To tie this knot, a good trick is to say "left over right and right over left."

FIGURE OF EIGHT KNOT

- **Uses:** Keep the end of a rope from unravelling or to stop a rope from passing through an eye.
- **Qualities:** Same uses as the thumb knot but bulkier and easier to undo.
- **Procedure:** Start by forming a loop with the running end passing under the standing end, and then make a bight in the running end (Diagram 4, Figure 1). Pass the running end in front of the standing end then thread it through the loop from the back (Diagram 4, Figure 2). The knot should now have the figure eight, which gives it its name (Diagram 4, Figure 3).



Diagram 4 Figure of Eight Knot

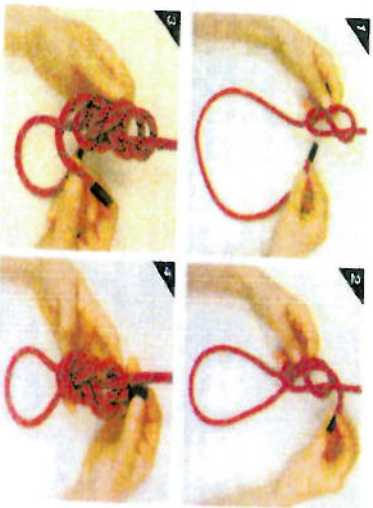
DOUBLE FIGURE OF EIGHT

- **Other name:** Figure-of-eight loop.
- **Uses:** To anchor a rope around a tree trunk, pole or such item.
- **Qualities:** Will not slip and is easy to undo.
- **Procedure:** There are two methods to do this knot. However, the first one is the one to use to anchor the rope to a tall or wide pole or trunk (Diagram 5).



Diagram 5 Double Figure of Eight Knot

The steps for method #1 are: Begin with a loose figure of eight knot (Diagram 6, Figure 1). Guide the running end back up through the loop it just came down through (Diagram 6, Figure 2). Have the running end trace alongside the rope in the original figure of eight under the standing end. Have the running end follow the original figure of eight under the double rope (Diagram 6, Figure 3). The running end follows the original figure of eight (Diagram 6, Figure 4). Pull tight, dress knot by flattening it and making sure the ropes are side by side.



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Diagram 6 Double Figure of Eight Knot, Method #1

The steps for method #2 are: Double the rope and follow the steps to make a figure of eight knot. (See Diagram 7.)



Diagram 7 Double Figure of Eight Knot, Method #2

FISHERMAN'S KNOT

- **Uses:** Join two thin lines and ropes.
- **Procedure:** Lay the running ends of two lines side by side so they point in opposite directions. With the running ends of one line, start the first of the overhand knots by taking a turn around the second line (Diagram 8, Figure 1). Complete the first overhand knot around the second line and work it fairly tight, while keeping enough slack for the second line to slide through (Diagram 8, Figure 2). Start making an overhand knot in the running end of the second rope around the standing part of the first rope. Make sure the running end crosses over in front of the first line. Take the running end completely around the first line and back through the loop to form the second of the overhand knots (Diagram 8, Figure 3). Complete the knot so that the running ends point in the opposite direction to that of the first knot, pull both knots snug up against each other (Diagram 8, Figure 5). To avoid that the ropes slip or be snagged, the ends of both ropes can be taped (Diagram 8, Figure 6).



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Diagram 8 Fisherman's Knot

DOUBLE FISHERMAN'S KNOT

- **Other names:** Grapevine knot, Barrel knot.
- **Uses:** Same as Fisherman's knot.
- **Qualities:** Ideal for slippery line.
- **Procedure:** With the first rope make a double overhand knot around the body of the second rope (Diagram 9, Figure 1). Make a double overhand knot around the body of the first rope, pull tight and slide together (Diagram 9, Figure 2).



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Diagram 9 Double Fisherman's Knot

BOWLINE KNOT

- **Other names:** Rescue Knot.
- **Uses:** To tie around yourself or throw to someone who needs a lifeline (or to tie the bow of a ship).
- **Qualities:** Simple loop that does not slip.
- **Faults:** Difficult to undo after it has been under strain.
- **Procedure:** Make a loop with the running end passing over the standing end and turn the end back towards the loop (looks like a number 6) (Diagram 11, Figure 1). Pass the running end through the loop from the back, then pull the running end through the loop and turn it behind the standing end (Diagram 11, Figure 2). Bring the running end around and back to the front loop, thread the running end through the front of the loop (Diagram 11, Figure 3). With the running end through the loop, hold the running end against the inside of the right side of the thigh and pull on the standing end (Diagram 16, Figure 4).

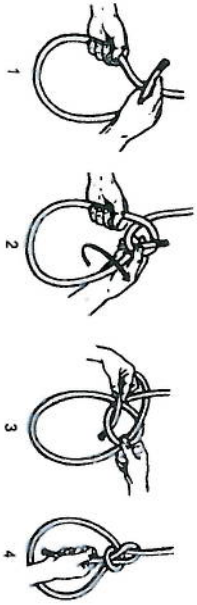


Diagram 10 Bowline Knot

A saying that helps with this knot is "a rabbit comes out of his hole, goes around the tree and back down into the same hole that he came out of." The rabbit is at the end of the rope, the hole is the loop, and the tree is the remainder of the rope sticking up.

HALF HITCH

- **Uses:** Make other knots stronger. Hang, tie or hook objects.
- **Quality:** Easy to make.
- **Fault:** Cannot support a lot of strain.
- **Procedure:** Pass the rope around the pole and then behind the standing part and into the eye of the loop.



Diagram 11 Half Hitch

CLOVE HITCH

- **Uses:** To finish off knots like the round turn and two half hitches and the various types of lashings. To secure a rope to a spar, rail or similar fitting.
 - **Qualities:** Quick and easy to tie. Can be made with the end or with the bight of the rope.
 - **Procedure:** There are two methods to tie a clove hitch; one using the end and the other using the bight.
- The steps for tying a clove hitch using the end of the rope are: Pass the running end of rope over the rail from front towards the back. Bring the running end under the rail and over the standing end towards the left. Bring the running end over spar to the left. Bring the running end out under the rail and thread it up under the rope on the rail by the crossover. Work the hitch tight with the running end and the standing end sung against each other. Be sure to leave enough rope on the end so that it does not unravel.



Diagram 12 Clove Hitch

The steps for tying a clove hitch using the bight are: in the middle of the rope, make a crossing turn or half hitch, with the rope that comes from the left being on top (Diagram 14, Figure 1). To the right of the first crossing turn, make a half hitch with exactly the same configuration (Diagram 14, Figure 2). Put the right-hand half hitch on top of the left-hand half hitch (Diagram 14, Figure 3). The pair of hitches are now slipped over the top of the post (Diagram 14, Figure 4).

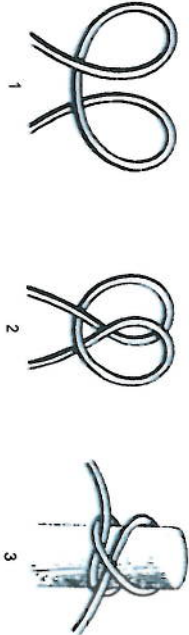


Diagram 13 Clove Hitch



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EO 107.08 – GLOSSARY

Bight	Middle part of a length of rope. This term also refers to a loop of rope that does not cross over itself.
Chafe	Wear caused by abrasion
Coil	Rope made up in neat series of circles usually for storage purposes.
Cordage	General term to cover all sorts and sizes of rope.
Crossing turn	A circle of rope made with the rope crossing over itself.
Eye	The hole inside a circle of rope: a permanent loop made at the end of a rope.
Mildew	Any fungus that attacks ropes when exposed to damp, resulting in a thin, furry, whitish coating or discoloration.
Mooring	The lines, cables, etc., by which a ship is held to a pier or special buoy.
Standing end	The end of the rope not immediately being used in the tying of a knot.
Standing part	Part of the rope that usually 'stands still' during the knot tying process. Often it is the longer end that leads away from the loop, bight or knot.
To tar	To cover a rope with a thick, sticky, brown to black liquid with a pungent odor, obtained by the destructive distillation of wood, coal, peat, shale, etc., to extend its life.
Whipping	A permanent finish to the end of a piece of rope made with very fine twine.
Working end	The very end of the rope that is used during the tying of the knot. Also called "running end."
Working part	The short length of rope that is manipulated to make the knot. Also called "running part."