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Date: January 2006	TOPIC TITLE:	Total # of Pages: 12
Section #: 1	CFD Specific Knots	Topic #: 3

Topic #2: CFD SPECIFIC KNOTS

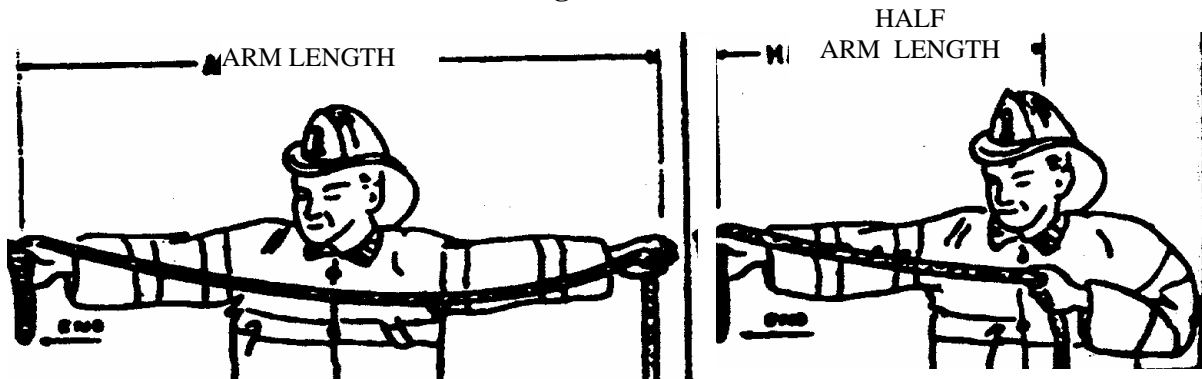
The following knots are referenced in this topic:

- Water Knot
- Handcuff Know
- Prusik Knot
- Figure 8 Knot
- Double Figure 8 Knot
- Half Hitch
- Clove Hitch – around an object
- Clove Hitch – Slip Over
- Bowline

MEASUREMENT


Measurement of rope required to form the various knots and hitches is made by stretching the arms out and holding the rope between the hands. The full distance measured is one arm length. A half arm length is measured by holding the rope in the left hand at the center of the chest and stretching the rope to the right. Note that approximately 6" is allowed to dangle from the right hand.

Figure 1



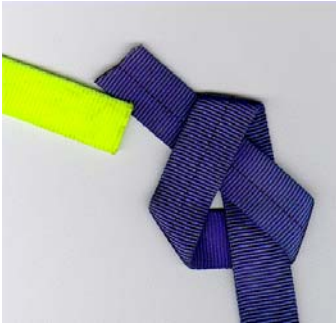
The rope measurement is useful in determining how much rope you will need in the NANCE – Fire Fighter Rescue Evolution.

(1) FULL ARM-LENGTH = TO YOUR BODY HEIGHT

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WATER KNOT

The water knot is used to join a piece of webbing.

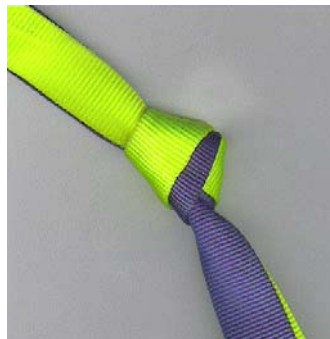



1. Make an overhand knot



2. Follow it back through from the other side.

3. Pull ends tight after following through, make sure finish is even and leave at least an inch of tail in the ends.

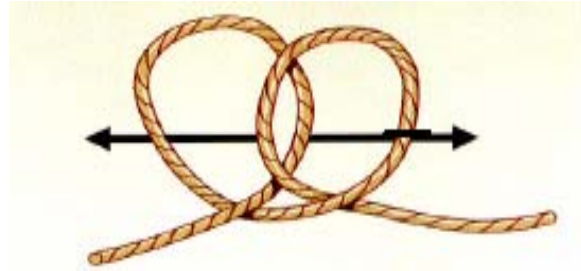


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HANDCUFF KNOT

Form two loops in the middle of the rope, as if to make a clove hitch. Place the right loop over the left loop

Pull the left side of the right loop down through the left loop while putting the right side of the left loop up through the right loop




Place the loops you have created in the above steps over the victim's wrists. Make sure you're above the wrist joint and below the elbow joint.



Pull the slack out the knot.



The knot is most commonly used with the "Nance FF Rescue Drill". However it can be used in any instance to secure the hands of a person. (ie: riding in a stokes basket, restraining a combative person, etc.). On Fire Fighters, the ideal placement is just above the reflective striping on the PPE coat (towards the wrist)

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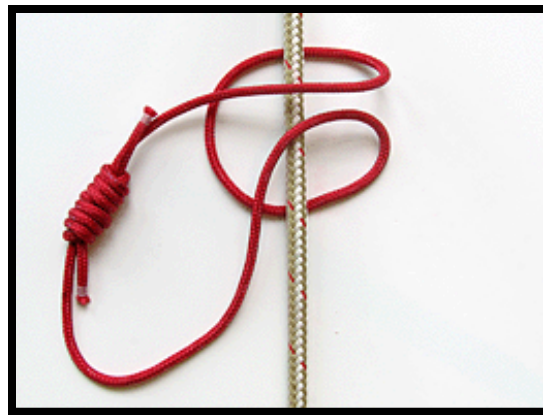
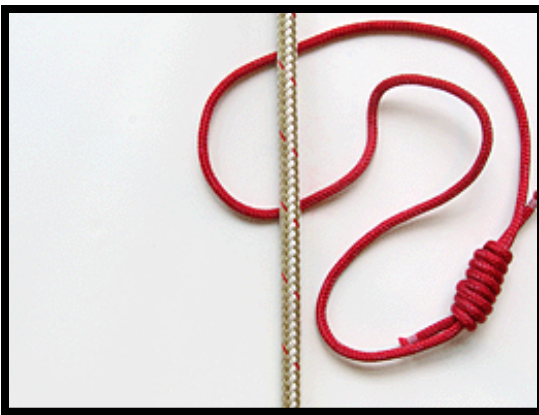
PRUSIK KNOT

The Prusik Knot will be used in pairs as a safety when lowering a victim using the Life Safety rope and the rack. This knot is designed to grab and stop the rope in the event the operator cannot control a lowering or belay system.

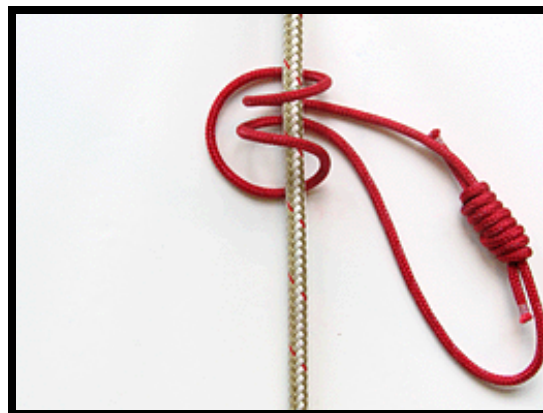
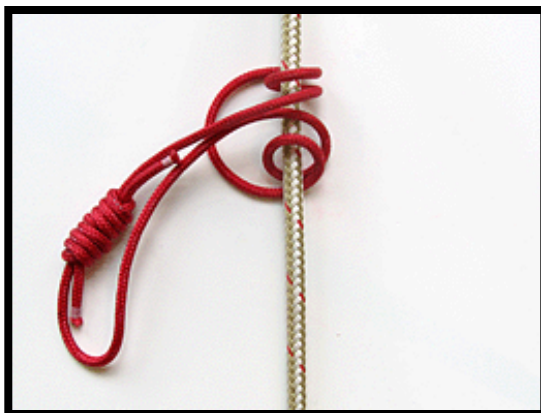
TYING THE PRUSIK KNOT


Tie the Prusik knot in the following manner:

Place a bight of the loop behind the climbing rope

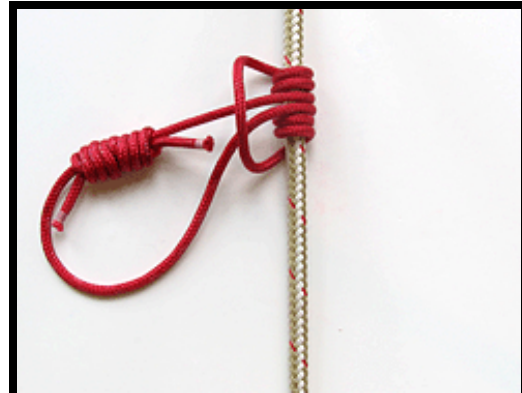
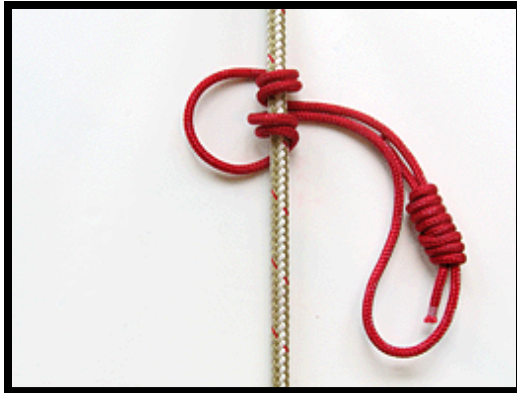


Wrap the loop across the rescue rope and through the bight.

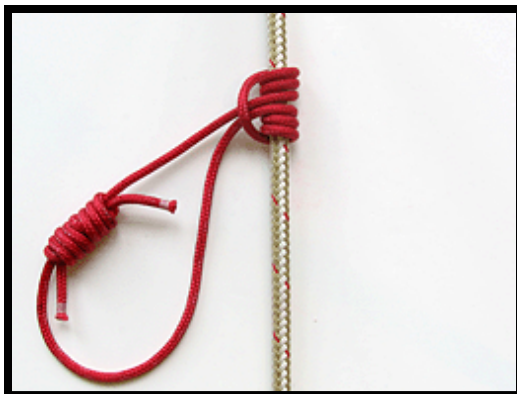


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Continue wrapping the loop around the rescue rope.




Wrap it behind the rescue rope again and through the bight.



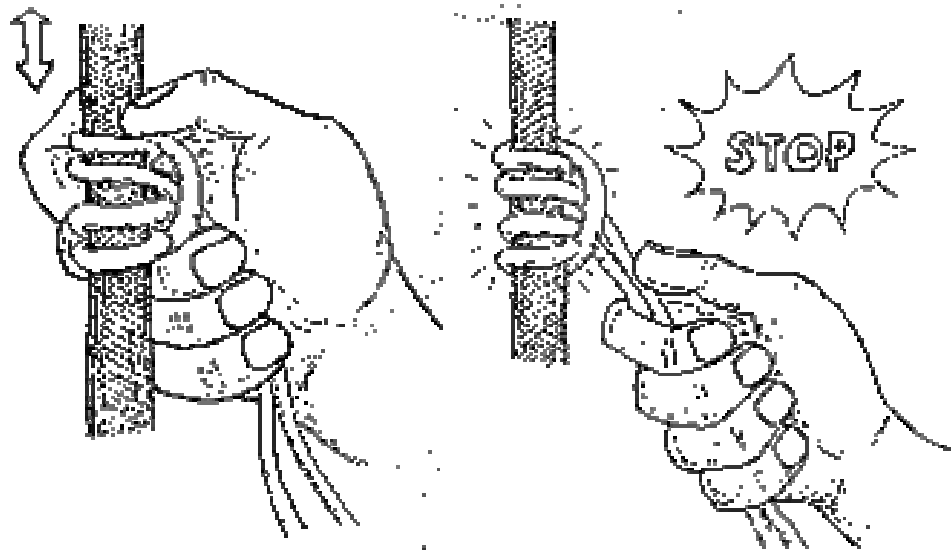
Continue to loop the rope in this fashion till you have three wraps around the rescue rope.

Dress and set the knot. It is important to keep this knot neat while tightening. **It must look like the last picture in order to operate properly.**

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Operation of the Prusik Knot

The Prusik knot will need to be tended by a rescuer during operation of the rack or rope lowering system. The knot should be held in place allowing the rope to slide through the knot and keeping it from locking up. In the event of an emergency, such as loss of control of the rope, the Prusik should be released allowing it to grab the rope, bringing it to a stop. When hard locking off the rack, the Prusik should be allowed to grab on the rope providing a backup.




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FIGURE 8 KNOTS

The primary knots used in rescue is the figure-8 tied in various configurations. The most common Figure 8 knots used are the “Standard Figure-8, Figure-8 on a Bight and Figure-8 Follow-Through”.

Standard Figure-8

Form a loop at the running end of the rope (Figure 1). Place the running end over the standing part (Figure 2). Then pass the running end through the loop (Figure 3).

FIGURE 1

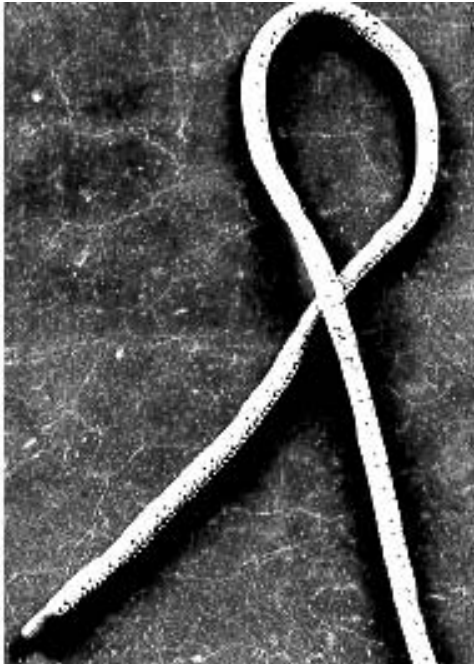


FIGURE 2



FIGURE 3




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Figure 8 on a Bight

Form a loop at the running end of the rope (Figure 4). Place the bight end over the standing part (Figure 5). Then pass the bight loop end through the loop just created (Figure 6).

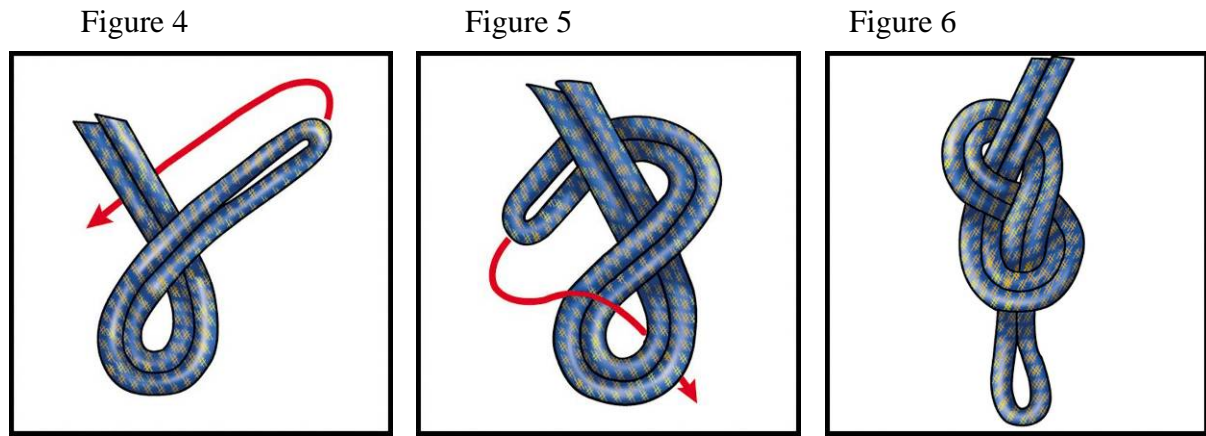
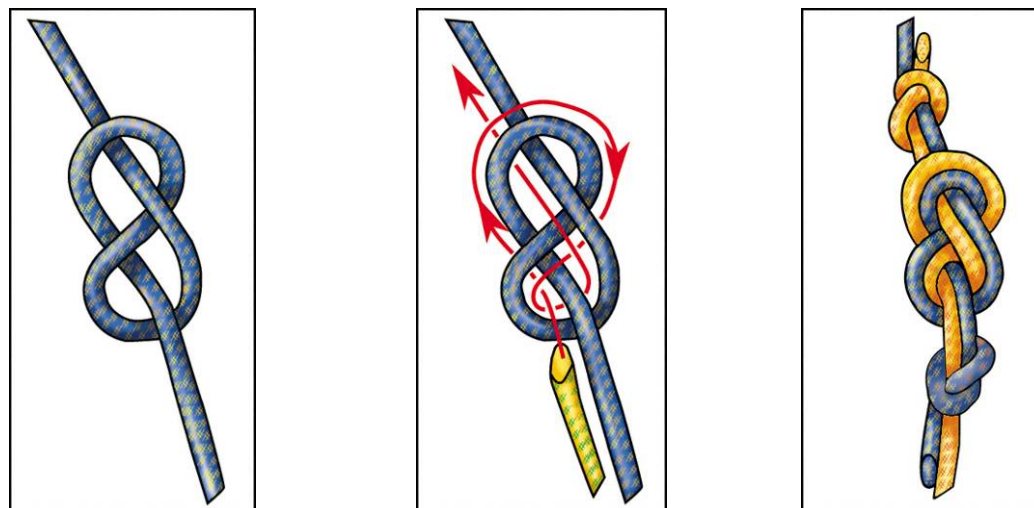



Figure 8 Follow Through

Primary used to allow creation of an anchor point or to wrap rope around an object without the availability of webbing or carabineers. Create a Figure 8 knot as described above with enough running end left to place around an object. Then wrap the loop around an object and follow through the original figure 8 as shown below.

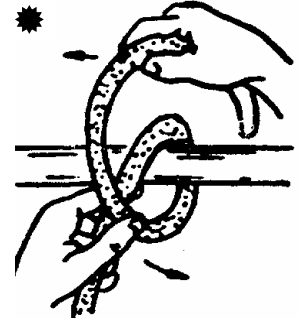
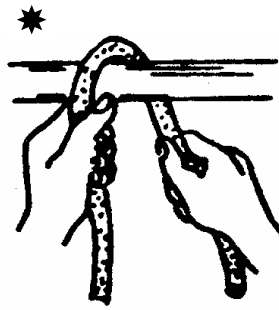
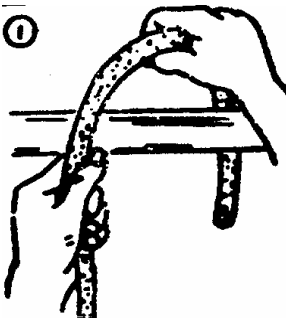


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OTHER KNOTS AND HITCHES

Knots and hitches are shown tied loosely to demonstrate the proper method. In method practice knots and hitches shall be made up securely.

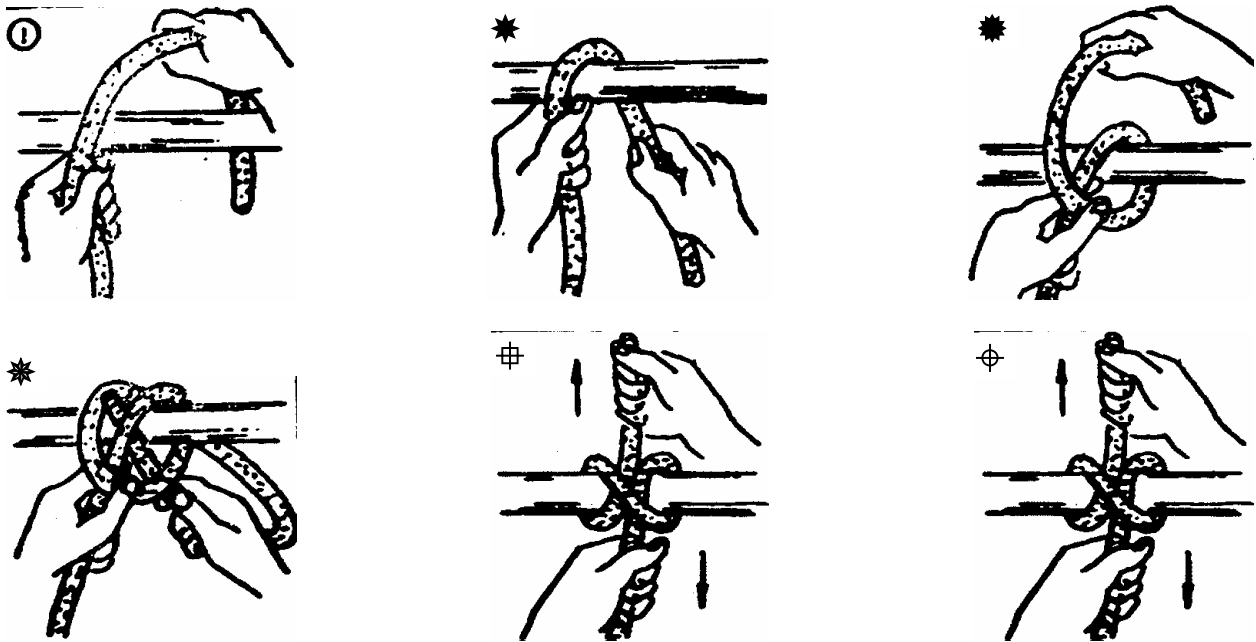
HALF HITCH



The half hitch is used when hoisting or lowering tools and equipment. It is also used as a binder to secure knots.


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CLOVE HITCH

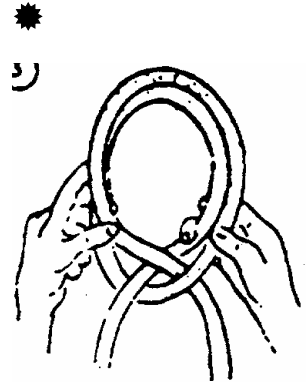
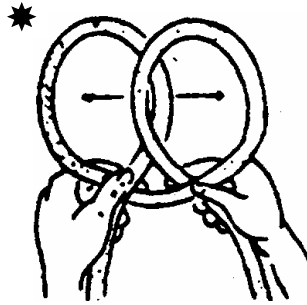
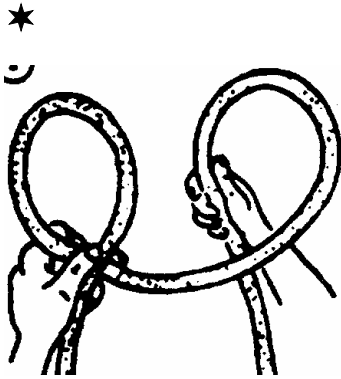


Making two half hitches forms the clove hitch. It is used in the hoisting and lowering of tools and equipment, in the hoisting of hose lines, when drafting water and various other operations.


When making a clove hitch for the hoisting of tools and equipment, the pull on the rope may be from the upper or lower hitch depending on how the hitch was started or if the slip-over hitch was used.

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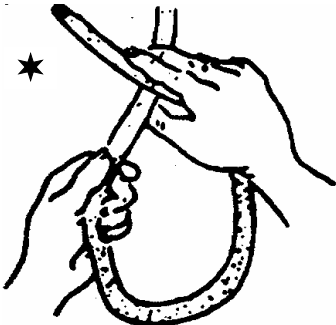
SLIP-OVER CLOVE HITCH



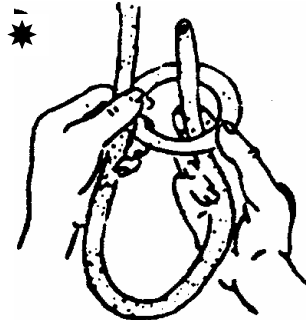
The slip-over clove hitch is made by forming two half hitches in the hand. It may be used to advantage by slipping the completed clove hitch over the end of the object, as in hoisting the hook, halligan tool or extinguisher .

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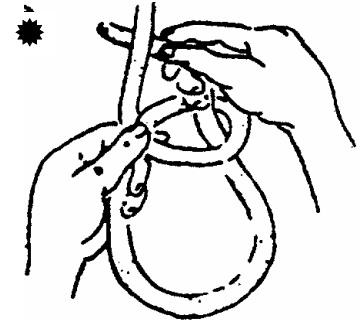
THE BOWLINE KNOT



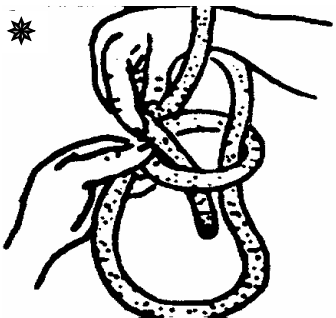
With rope held in this position, press down with fingers and up with thumb of right hand and forming loop in rope.



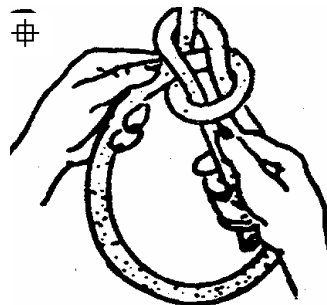
Loop is held in position with left hand until knot is completed.



End of rope brought up through loop with right hand, taken around in back of rope held in left hand.



Continue to bring rope around until end is placed down into loop held with left hand.



Take hold of rope end coming down through loop with right hand and pull tight to complete knot.

The bowline knot will not slip nor tighten under tension and is easily untied. It is primarily used in hoisting and lowering ladders. The bowline is useful where a loop is needed that will not slip.