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STUDENT OUTLINE

KNOTS AND ROPE MANAGEMENT

HIET002

INDIVIDUAL TRAINING COURSE

M03KZ4K

REVISED 6/27/2013

APPROVED BY _____ **DATE** _____

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LEARNING OBJECTIVES

1. **TERMINAL LEARNING OBJECTIVE**. Without the aid of references, given a twelve foot length of rope, a standing line, two steel locking carabiners, and an anchor point, tie knots, by tying each knot within their prescribed time. (MSOF-HIET-1001)

2. **ENABLING LEARNING OBJECTIVES**

a. Without the aid of references, given a twelve foot length of rope and a standing line, tie a square knot with two overhand knots, having pigtails longer than 6 inches and within 30 seconds. (MSOF-HIET-1001a)

b. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a round turn with two half hitches, having a pigtail longer than 6 inches and within 45 seconds. (MSOF-HIET-1001b)

c. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a bowline with a loop larger than 4 inches and less than 10 inches secured with an overhand knot, having pigtail no longer than 6 inches within 45 seconds. (MSOF-HIET-1001c)

d. Without the aid of references, given a twelve foot length of rope, a standing line, two steel locking carabiners, and an anchor point, tie an around the body bowline with figure eight loop, within 60 seconds. (MSOF-HIET-1001d)

e. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a figure eight loop, within 45 seconds. (MSOF-HIET-1001e)

f. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a clove hitch, within 30 seconds. (MSOF-HIET-1001f)

g. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a water tape knot, having pigtails no longer than 6 inches within 30 seconds. (MSOF-HIET-1001g)

h. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a directional figure eight, within 30 seconds. (MSOF-HIET-1001h)

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i. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie an end of the line Prusik secured by a bowline, having pigtail no longer than 6 inches within 90 seconds. (MSOF-HIET-1001i)

j. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie an around the object bowline secured with an overhand knot, having pigtail no longer than 6 inches within 30 seconds. (MSOF-HIET-1001j)

k. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a double fisherman's knot, having pigtails no longer than 6 inches within 30 seconds. (MSOF-HIET-1001k)

l. Without the aid of references, given a rope corral, a twelve foot length of rope and two steel locking carabiners, tie a military rappel seat, within 2 minutes. (MSOF-HIET-1001l)

m. Without the aid of references, given a twelve foot length of rope, a standing line and an anchor point, tie a double sheet bend, having pigtails no longer than 6 inches within 45 seconds. (MSOF-HIET-1001m)

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1. **TERMS USED IN ROPE WORK**

a. **Bight**. A simple bend in the rope in which the rope does not cross itself.

b. **Loop**. A simple bend in the rope in which the rope does cross itself. The standard for loop size is bigger than a fist and smaller than a head.

c. **Half-Hitch**. A loop which runs around an object in such a manner as to bind on itself.

d. **Running End**. The free end of the rope which can be used.

e. **Standing End**. The anchored or fixed end of the rope.

f. **Lay**. The same as the twist of the rope.

g. **Pigtail**. The short length left at the end of a rope after tying a knot or coiling a rope. It may or may not be tied off in a secondary knot, depending on the circumstances. The standard for pigtail length is greater than six inches.

2. **FOUR CLASSES OF KNOTS**. Knots are broken down into four classes. To ensure proper and speedy means of identification and uses of knots we must be familiar with the following categories and the time required to tie each knot.

a. **Class I - End of the Rope Knots**

(1) Square Knot - 30 seconds

(2) Water/Tape Knot - 30 seconds

(3) Double Fisherman - 30 seconds

(4) Double Sheet Bend - 30 seconds

b. **Class II - Anchor Knots**

(1) Round Turn With 2 Half Hitches - 45 seconds

(2) Bowline - 45 seconds

(3) Clove Hitch - 30 seconds

(4) Around the Object Bowline - 30 seconds

c. **Class III - Middle of the Rope Knots**

(1) Figure of Eight Loop - 45 seconds

d. **Class IV - Special Knots**

(1) Directional Figure 8 - 30 seconds

(2) End of the Line Prusik Secured With a Bowline - 90 seconds

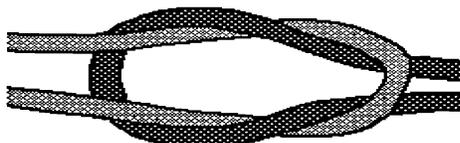
(3) Round-the-Chest Bowline With a Figure Eight Loop - 60 seconds

(4) Military Rappel Seat - 2 minutes

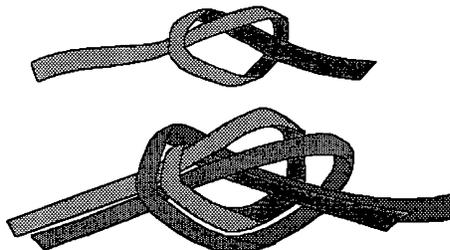
3. **KNOTS AND THEIR USES**

a. **End of the Rope Knots**

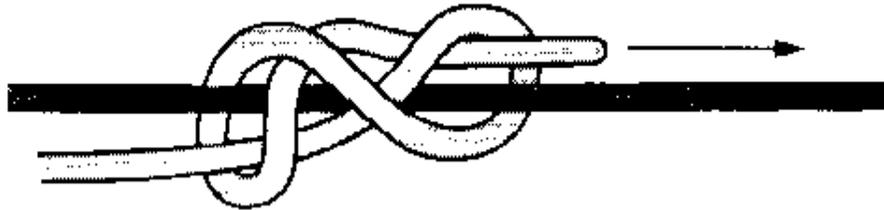
(1) Square Knot. This knot is used to tie two ropes of equal diameter together. It is secured with two overhand knots on both sides.



(2) Water/Tape Knot. This knot is commonly used to secure a complete loop with tubular nylon for anchor points and hasty rappel seats. This knot is also known as a tape knot.



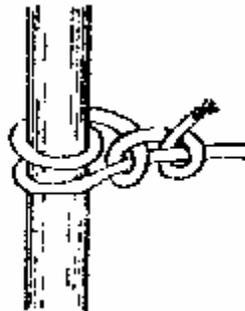
(3) Double Fisherman's Knot. This knot is used to tie the ends of two ropes of equal diameter together.



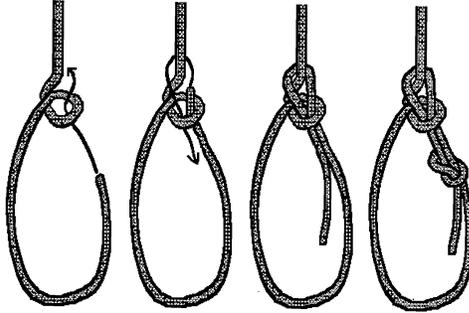
(4) Double Sheet Bend Knot. This knot is used to tie the ends of two of equal or unequal diameter ropes together. It can also be used to tie the ends of several ropes to the end of one rope. When a single rope is tied to more than one rope, the bight is formed with the multiple ropes.

b. Anchor Knots

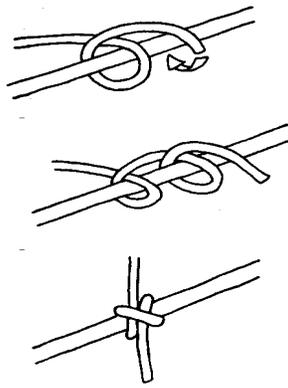
(1) Round Turn With Two Half Hitches. This knot has a loop which runs around an object in such a manner as to provide a 360 degree contact and may be used to distribute the load over a small diameter anchor. It will be secured with two half hitches.



(2) Bowline. This knot is used to tie a fixed loop in the end of a rope as an anchor. This knot must be finished with an overhand knot.



(3) Clove Hitch. Constant tension must be maintained on this knot to prevent slipping. When this knot is tied there will be no loose ends remaining.



Clove Hitch

(4) Around the Object Bowline

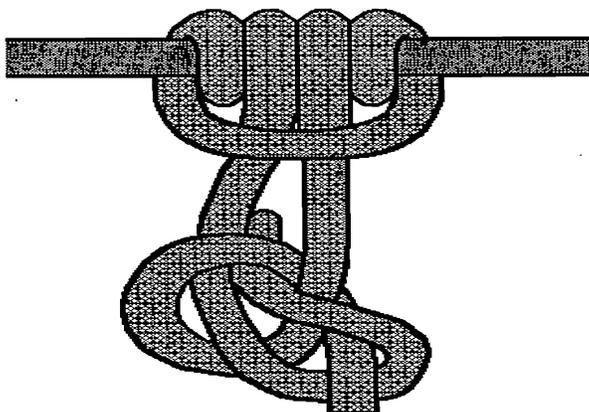
c. **Middle Of The Rope Knots**

(1) Figure 8 Loop. This knot is used to tie a one loop knot at the end of a rope to act as an anchor. It is also used to take up slack in a rope.



d. **Specialty Knots**

(1) End Of The Line Prusik. This knot is secured with a bowline tied with a short rope around a longer rope. For example: A sling rope around a climbing rope, in such a manner that the short rope will slide along the longer rope if no tension is applied; and likewise it will hold if tension is applied to the short rope. The Prusik may be tied with a bight or from the end of the rope, but if tied from the end, the knot must be secured with a bowline. The rope used to tie the Prusik should be of smaller diameter than the climbing rope. Also, if the standard Prusik is slipping due to icing, etc. Extra wraps may be used to form a more secure Prusik.



(2) Directional Figure 8. This knot is commonly used for anchor in rappelling systems.



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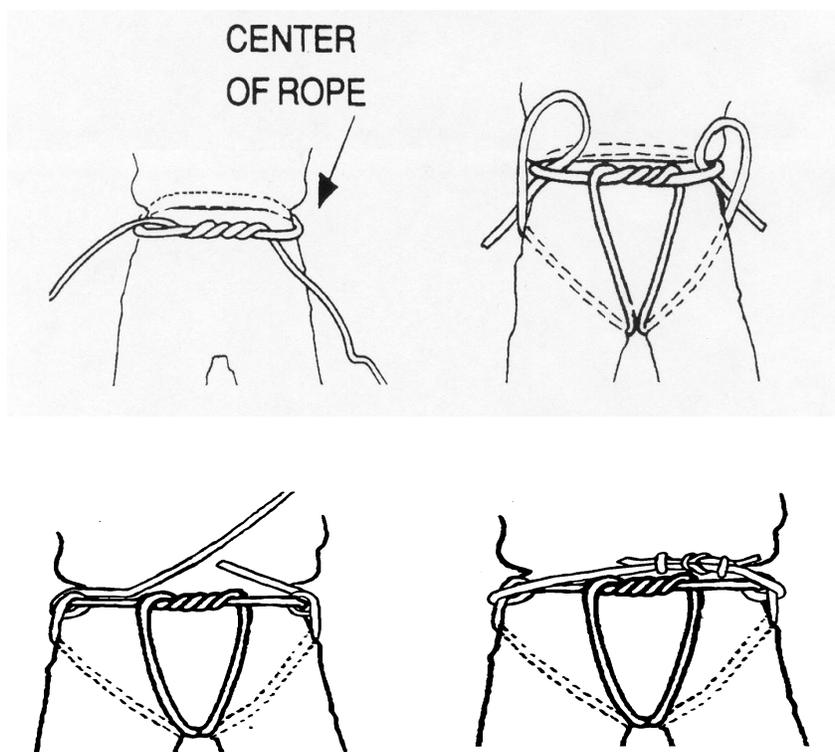
(3) Around-The-Body Bowline With Figure Eight. Used when some means of danger is present to ensure Marines are not lost due to negligence. This knot is used most commonly during stream crossings, HRST operations and SPIE operations.



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(4) Military Rappel Seat. Used when prefabricated rappelling seats are not available. This knot is tied with a 14' sling rope.



REFERENCES

Helicopter Rope Suspension Techniques (HRST) Operations,
MCRP 3-11.4A
Ranger Handbook, SH 21-76