



International  
Association  
of Fire Chiefs



National  
Fire Protection  
Association

# Fundamentals of Fire Fighter Skills

## Chapter 9

Ropes and  
Knots

Skill Drills

### Objectives (1 of 2)

- Place a life safety rope into a rope bag.
- Tie the following knots:
  - Safety (overhand)
  - Half hitch
  - Clove hitch
  - Figure eight
  - Figure eight on a bight
  - Figure eight with a follow-through
  - Bowline
  - Sheet bend or Becket bend

### Objectives (2 of 2)

- Hoist the following tools using the correct knots:
  - Axe
  - Pike pole
  - Ladder
  - Charged hose line
  - Uncharged hose line
  - Exhaust fan

## Skill Drill 9-1

### Placing a Life Safety Rope into a Rope Bag



Step 1: Tie a figure eight knot on a bight in the first end of the rope to go into the bag.



Step 2: Load the rope into the bag.

## Skill Drill 9-1

### Placing a Life Safety Rope into a Rope Bag

Step 3: Do not coil the rope in the bag.



### Skill Drill 9-2 Safety Knot



Step 1: Take the loose end of the rope, beyond the knot, and form a loop around the standing part of the rope.



Step 2: Pass the loose end of the rope through the loop.

### Skill Drill 9-2 Safety Knot

Step 3: Tighten the safety knot by pulling on both ends at the same time.



### Skill Drill 9-3 Half Hitch



Step 1: Make a round turn in the rope around the object.



Step 2: Pass the standing end of the rope under the round turn on the opposite side from the direction of the pull.



## Skill Drill 9-3

### Half Hitch

Step 3: Finished half-hitch knot.



### Skill Drill 9-4 Clove Hitch Tied in the Open



Step 1: Make a loop using your left hand, with the running part of the rope over the working part of the rope.



Step 2: Make a second loop using your right hand, with the running part of the rope under the working part of the rope.

## Skill Drill 9-4

### Clove Hitch Tied in the Open



Step 3: Bring the right-hand loop on top of the left-hand loop.



Step 4: Slide both loops over the object.

## Skill Drill 9-4

### Clove Hitch Tied in the Open



Step 5: Pull in opposite directions to tighten the clove hitch. Tie a safety knot in the working end of the rope.

### Skill Drill 9-5 Clove Hitch Tied Around an Object



Step 1: Make a complete loop around the object, working end down.



Step 2: Make a second loop around the object a short distance above the first loop.

### Skill Drill 9-5 Clove Hitch Tied Around an Object



Step 3: Now pass the working end of the rope under the second loop, above the point where the second loop crosses over the first loop.



Step 4: Tighten the knot and secure it by pulling on both ends.

# Skill Drill 9-5

## Clove Hitch Tied Around an Object

Step 5: Tie a safety knot in the working end of the rope.



### Skill Drill 9-6 Figure Eight Knot



Step 1: Form a bight in the rope.



Step 2: Loop the working end of the rope completely around the standing part of the rope.



### Skill Drill 9-6 Figure Eight Knot



Step 3: Thread the working end back through the bight.



Step 4: Tighten the knot by pulling on both ends simultaneously.

### Skill Drill 9-7 Figure Eight on a Bight



Step 1: Form a bight and identify the end of the bight as the working end.



Step 2: Holding both sides of the bight together, form a loop.

## Skill Drill 9-7

### Figure Eight on a Bight



Step 3: Feed the working end of the bight back through the loop.



Step 4: Pull the knot tight.

# Skill Drill 9-7

## Figure Eight on a Bight

Step 5: Secure the loose end of the rope with a safety knot.



### Skill Drill 9-8

#### Figure Eight with a Follow-Through

Step 1: Tie a regular figure eight leaving approximately 2' of rope at the working end.

Step 2: Loop the working end around or through the object to be secured. Thread the working end back through the original figure eight in the opposite direction.

Step 3: Pull the knot tight.

Step 4: Tie a safety knot in the working end.

### Skill Drill 9-9 Bowline



Step 1: Make the desired size loop and bring the working end back to the standing part.



Step 2: Form another small loop in the standing part of the rope with the section closest to the working end on top.

### Skill Drill 9-9 Bowline



**Step 3:** Thread the working end up through this loop from the bottom.



**Step 4:** Pass the working end over the loop, around and under the standing part, and back down through the same opening.

### Skill Drill 9-9 Bowline



Step 5: Tighten the knot by holding the working end and pulling the standing part of the rope backward.



Step 6: Tie a safety knot in the working end of the rope.



### Skill Drill 9-10 Sheet or Becket Bend



Step 1: Using your left hand, form a bight at the working end of the first (larger) rope.



Step 2: Thread the working end of the second (smaller) rope up through the bight.

### Skill Drill 9-10 Sheet or Becket Bend



Step 3: Loop the second (smaller) rope completely around both sides of the bight.



Step 4: Pass the working end of the second (smaller) rope between the original bight and under the second rope.

## Skill Drill 9-10

### Sheet or Becket Bend



Step 5: Tighten the knot.



Step 6: Tie a safety knot in the working end of each rope.

### Skill Drill 9-11 Hoisting an Axe



Step 1: The team that needs the axe should lower a rope with enough extra rope to tie the required knot around the axe.



Step 2: Tie a figure eight on a bight to make a small loop.

### Skill Drill 9-11 Hoisting an Axe



Step 3: Place the loop over the axe handle near the head.



Step 4: Pass the standing part of the rope around the head of the axe.

### Skill Drill 9-11 Hoisting an Axe



Step 5: Place the standing part of the rope parallel to the axe handle.



Step 6: Tie one or two half hitches along the axe handle.

# Skill Drill 9-11

## Hoisting an Axe

Step 7: Prepare to raise the  
axe.



### Skill Drill 9-12 Hoisting a Pike Pole



**Step 1:** The team that needs the pike pole should lower a rope with enough extra rope available for the required knot and the tag line.



**Step 2:** Tie a clove hitch in the open and slip it over the handle. Secure it near the head.



### Skill Drill 9-12 Hoisting a Pike Pole



Step 3: Place a half hitch around the handle below the clove hitch.



Step 4: Place a second clove hitch around the handle near bottom of the pike pole.

## Skill Drill 9-12

### Hoisting a Pike Pole

Step 5: Prepare to raise the pike pole.



### Skill Drill 9-13 Hoisting a Ladder



Step 1: The team that needs the ladder should lower a rope with enough extra rope available to tie onto the ladder.



Step 2: Tie a figure eight on a bight to make a loop 3' or 4' in diameter.

### Skill Drill 9-13 Hoisting a Ladder



Step 3: Pass the rope between the rungs of the ladder, three or four rungs from the top. Pull the loop under the rungs toward the top of the ladder.



Step 4: Place the loop around the top of the ladder

### Skill Drill 9-13 Hoisting a Ladder



Step 5: Remove the slack from the rope and allow the loop to slide down the ladder.



Step 6: Attach a tag line from below to control the ladder as it is hoisted.

# Skill Drill 9-13

## Hoisting a Ladder

Step 7: Prepare to raise the ladder.



### Skill Drill 9-14 Hoisting a Charged Hose Line



Step 1: The team that needs the hose should lower a rope with enough extra rope available to tie onto the hose.



Step 2: Make sure that the nozzle is completely closed and secure.

### Skill Drill 9-14 Hoisting a Charged Hose Line



Step 3: Tie a clove hitch around the hose, 1' or 2' behind the nozzle.



Step 4: Make a bight in the rope.



### Skill Drill 9-14 Hoisting a Charged Hose Line

Step 5: Pass the bight through the nozzle handle (bale) and slip the bight over the nozzle tip. This creates a half hitch that will help keep the nozzle closed while the hose is being raised.



# Skill Drill 9-14

## Hoisting a Charged Hose Line

Step 6: Prepare to hoist the hose.



### Skill Drill 9-15 Hoisting an Uncharged Hose Line



Step 1: The team that needs the hose should lower enough rope so the ground crew can tie on the hose.



Step 2: Fold about 3' of hose back on itself and place the nozzle on top of the hose.

### Skill Drill 9-15 Hoisting an Uncharged Hose Line



Step 3: Tie a half hitch and slip it over the nozzle. Move the half hitch along the hose and secure it about 6" from the fold.



Step 4: Tie a clove hitch near the end of the rope, wrapping the rope around both the nozzle and the hose.

### Skill Drill 9-15 Hoisting an Uncharged Hose Line

Step 5: Prepare to hoist the hose line with the fold at the top and the nozzle pointing down.



### Skill Drill 9-16 Hoisting an Exhaust Fan



Step 1: The team that needs the equipment should lower enough rope so the ground crew can tie on the exhaust fan.



Step 2: Tie a figure eight knot in the rope about 3' from the working end of the rope.

### Skill Drill 9-16 Hoisting an Exhaust Fan



Step 3: Loop the working end of the rope around the fan handle and back to the figure eight knot.



Step 4: Secure the rope by tying a figure eight with a follow through. Thread the working end back through the first figure eight in the opposite direction.

### Skill Drill 9-16 Hoisting an Exhaust Fan



Step 5: Attach a tag line to the fan for better control.



Step 6: Prepare to hoist the fan.