



# Rescue Knots, Bends, Hitches & Stoppers

## Simple Family

___ <b>Simple Knot</b> (Overhand Knot, Safety Knot) (50% <small>Capsize</small> )	Used to “safety” other rescue knots. Reduces primary knot failure by 50%
___ <b>Double Overhand Knot</b> (Stopper) (60% <small>Break</small> )	Used to close out the open end of a system or used to keep a rope from traveling through an object, such as a pulley (2 wraps)
___ <b>Barrel Knot</b> (55% <small>Break</small> )	Used to close out the open end of a system or used to keep a rope from traveling through an object, such as a pulley (3 wraps)
___ <b>Scaffold Knot</b> (Poacher’s knot) (81% <small>Break</small> )	Used to cinch into the saddle of a carabiner or to bunk into the bucket of a pulley or on a rigging plate (2 wraps)
___ <b>Flat Overhand</b> (European Death Knot – EDK) (59% <small>Capsize</small> )	The preferred methodology for tying ½” Kernmantle rope together that will roll over an edge. Rappelling knot – Leave 1 foot of tail for safety. Interchangeable with the Butterfly on a Bend. (Safety with EDK)
___ <b>Simple Knot on a bight</b> (Overhand Loop) (65% <small>Break</small> )	Used to tie a loop in webbing. This knot is most commonly mis-tied as a Figure 8 on a bight in rope.
___ <b>Water Knot</b> (Tape Knot, Ring Bend) (64% <small>Break</small> )	The preferred methodology for tying the ends of webbing together
___ <b>Simple Knot Follow Through</b> (65% <small>Break</small> )	Used to tie a loop directly around an object with webbing. Commonly mis-tied as a Figure 8 Follow Through
___ <b>Double Simple knot on a Bight</b> (65% <small>Break</small> )	Used to tie two loops at the end of webbing. Commonly mis-tied as a double figure 8 on a bight with rope
___ <b>Double Fisherman’s Bend</b> (Grapevine Bend) (79% <small>Break</small> )	The preferred methodology for tying 7mm, 8mm, or 9mm accessory cord (Prusik Cord) for making endless sling configurations (2 wraps on each side)

## 8 Family

___ <b>Simple Figure 8</b> (Stopper Knot) (50% <small>Capsize</small> )	Used to close out the open end of a system or used to keep a rope from traveling through an object, such as a pulley.
___ <b>Flat 8</b> (Offset figure 8 on a Bend) (500-1000lbs <small>Capsize</small> )	Used to tie the ends of 2 ropes together. (Will roll over an edge) May capsize under shock load – often mis-tied as an EDK
___ <b>Figure 8 Follow Through</b> (Threaded Eight) (80% <small>Break</small> )	Used to tie a loop directly around an object with rope. Commonly mis-tied as a Simple knot Follow Through
___ <b>Figure 8 on a Bend</b> (Flemish Bend) (81% <small>Break</small> )	The preferred methodology to tie the ends of 2 ½ Kernmantle ropes together
___ <b>Figure 8 on a Bight</b> (80% <small>Break</small> )	Single person traveling anchor used to tie a loop at the end of a rope
___ <b>In-Line 8</b> (Directional 8) (73% <small>LTE Break</small> 51% <small>ETE Break</small> )	Single person, traveling anchor, used for a midline directional pull on a rope (if loaded oppositionally, this knot will capsize)
___ <b>Double Figure 8 on a Bight</b> (82% <small>Break</small> )	Two-person, traveling anchor used to tie 2 loops at the end of a rope (primary knot for lowering at the yolk)
___ <b>Figure 9 on a Bight</b> (90% <small>Break</small> )	Single personal, traveling anchor used to tie a loop at the end of a rope (Used for extremely heavy loads – easy to untie)

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## Bowline Family

___ <b>Bowline Knot</b> (Inside) (73% - $\angle < 90^\circ$ Spill)	Single person, static anchor – used to tie a loop directly around an object
___ <b>Long Tail Bowline</b> (Outside) (73% - $\angle > 90^\circ$ Break)	Used to tie a Yoke (at the basket or for an adjunct). The long tail(s) are used to tie into other objects
___ <b>Bowline with a Yosemite Finish</b> (74% - $\angle < 90^\circ$ Break)	The preferred methodology to safety the inside Bowline
___ Portuguese Bowline Knot (77% Spill)	Two-person, traveling anchor, used to tie 2 adjustable loops around an object (Load Sharing Anchor)
___ Double Bowline Knot (75% Spill)	Single Person, traveling anchor, used to tie a loop around an object. Interchangeable with a <b>Figure 8 Follow Through</b>
___ Bowline on a Bight (75% Break)	Two-person, traveling anchor, used to tie 2 loops at the end of a rope or in the middle of the rope. Interchangeable with a <b>Double Figure 8 on a Bight</b>
___ Double Bowline on a Bite (Triple Bowline) (75% Break)	Two-person, traveling anchor, used to tie 3 loops at the end of a rope (Load Sharing/Load Distributing Anchor)
___ Water Bowline (77% - $\angle < 90^\circ$ Spill)	Two-person, traveling anchor, used to tie a loop around an object in wet or moist conditions
___ Perfection Knot (Western Bowline Knot, Anglers Loop) (50% Break)	Used to tie a “Quick” loop in a rope to hold a tensioned load
___ Sheep Shank (N/A Spill)	Used to shorten or remove slack from a rope or bypasses a frayed section of rope <b>**NO LIVE LOADS**</b>

## Butterfly Family

___ <b>Butterfly Knot</b> (Alpine or Alpine Butterfly) (77% <sup>LTE</sup> Break 66% <sup>ETE</sup> Break)	Single-Person, Traveling Anchor used to tie a loop in the middle of a rope when the ends are not free
___ <b>Double Butterfly Knot</b> (77% <sup>LTE</sup> Break 66% <sup>ETE</sup> Break)	Two-Person, Traveling Anchor used to tie 2 loops in the middle of a rope when the ends are not free
___ Static Butterfly (77% <sup>LTE</sup> Break 66% <sup>ETE</sup> Break)	Used to tie a loop around a <i>perpendicular</i> object in the middle of a rope. (One end must be free)
___ Butterfly Follow Through (Threaded Butterfly) (77% <sup>LTE</sup> Break 66% <sup>ETE</sup> Break)	Used to tie a loop around an object in the middle of a rope. (One end must be free)
___ Butterfly on a Bend (66% Break)	Asymmetrical knot used to tie the ends of 1/2" Kernmantle rope together. (Will roll over an edge). Interchangeable with the <b>Flat Overhand</b> .
___ Butterfly on a Bite (77% <sup>LTE</sup> Break 66% <sup>ETE</sup> Break)	Used for easily organizing smaller workstations and creating multi-anchor systems
___ Double Butterfly on a Bite (77% <sup>LTE</sup> Break 66% <sup>ETE</sup> Break)	Used for easily organizing larger workstations and creating multi-anchor systems

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## Reef Family

___ <b>Square Knot</b> (Reef Knot) (50% <sup>Spill</sup> )	Insecure binding knot for joining the ends of rope or webbing wrapped around an object (used to complete victim packaging with webbing on the back board)
___ <b>Surgeon's Knot</b> (60% <sup>Spill</sup> )	Binding knot, used for joining the ends of rope or webbing together (used to complete victim packaging with webbing on the back board for bariatric victims, large rescue packages, or when there is not enough tail to safety a square knot)
___ Thief's Knot (N/A <sup>Spill</sup> )	Commonly mistaken (by looks) for a square knot. <b>(Identification only)</b> Will fail with minimal hand tension
___ Sheet Bend (Becket Bend) (50% <sup>Spill</sup> )	Used to tie the ends of 2 non-congruent ropes together. (Example: ½" Kernmantle to 8mm Prusik/Accessory Cord)
___ Double Sheet Bend (58% <sup>Spill</sup> )	Used to tie the ends of 2 non-congruent ropes or webbing together
___ Double Sided Sheet Bend (N/A <sup>Spill</sup> )	Used to change the run(s) of the ropes while making fixed or positioned anchors

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## Hitches

<p>___ <b>Prusik Knot</b> (Triple Sliding Hitch) (1,200lb<sup>creep</sup> 3,400<sup>slip</sup>)</p>	<p>Used for hauling, ascending and/or self-rescue, as a jumper or bypass, a progress capture, or oppositionally when applying 8mm Accessory cord on ½ inch Kernmantle rope.</p>
<p>___ Asymmetrical (3-On-2) Prusik Hitch (1,000lb<sup>creep</sup> 3,300<sup>slip</sup>)</p>	<p>Used for self-rescue or as a rope grab. Designed to be used in one direction.</p>
<p>___ Purcell Prusik (1,000lb<sup>creepage</sup> 3,300<sup>slip</sup>)</p>	<p>Used for rescue adjuncts or litter attendants, foot stirrup or uplift bridals and for edge restraint.</p>
<p>___ Klemheist (Machard) (1,000lb<sup>creep</sup> 3,300<sup>slip</sup>)</p>	<p>Alternative to the Prusik when you need to use 1 inch tubular webbing instead of 8mm Accessory cord on ½ inch Kernmantle rope. Also used as a “third hand” behind a passive descent control device or when repelling.</p>
<p>___ <b>Tensionless Anchor Hitch</b> (No-Knot, High-Strength Tie-Off) (100%<sup>Break</sup>)</p>	<p>An anchor knot used for repelling or rope rescue. The most efficient knot to tie. Holds a suspended or tensioned load. The anchor diameter should be at least 8x the rope diameter.</p>
<p>___ <b>Clove Hitch</b> (60%<sup>Spill</sup>)</p>	<p>To secure tensioned lines, belaying, starts lashings, and a weak-binding hitch (<b>Static Anchor</b>)</p>
<p>___ <b>Munter Hitch</b> (Italian Rolling Hitch) (300lb<sup>Load Capacity Spill</sup>)</p>	<p>Used to lower equipment no more than 300lbs and no further than 25', single-person safety belay line</p>
<p>___ Super Munter Hitch (600lb<sup>Load Capacity Spill</sup>)</p>	<p>Used to lower equipment no more than 600lbs and no further than 25', two-person safety belay line</p>
<p>___ <b>Girth Hitch</b> (Lark's Head, Cow Hitch) (70%<sup>Symmetrical tension needed Break</sup>)</p>	<p>Gives 2 working ends of the rope or webbing horizontally (<b>Static Anchor</b>). Used to start the webbing on the backboards.</p>
<p>___ Double Girth Hitch (70%<sup>Symmetrical tension needed Break</sup>)</p>	<p>Binding static anchor, gives 2 working ends of the rope/webbing vertically</p>
<p>___ Daisy Chain (Back looping) (N/A)</p>	<p>Used to shorten and store webbing or rope, <i>less</i> than 30'.</p>
<p>___ Lobster Tail (N/A)</p>	<p>Used to shorten and store webbing or rope, <i>greater</i> than 30'.</p>
<p>___ Hand Cuffs (victim Restraint, Fireman's Chair) (300lb<sup>Load Capacity Spill</sup>)</p>	<p>Used to position a victim's hands or restrain a combative victim, also used as wristlets or anklets where there is no other way of rescuing someone who is trapped. (Cannot apply victim harness) <b>**SHOULD BE AVOIDED** - Due to potential damage to victim**</b></p>
<p>___ Victim Harness (Full Body) (300lb<sup>Load Capacity</sup>)</p>	<p>Used to make a victim harness if needed</p>
<p>___ Hasty Harness (Swiss Seat) (300lb<sup>Load Capacity</sup>)</p>	<p>Used to make a seat harness if needed</p>
<p>___ Mariner's Knot (600lb<sup>Load Capacity</sup>)</p>	<p>Load release hitch used to release or transfer a load without “shock”</p>

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