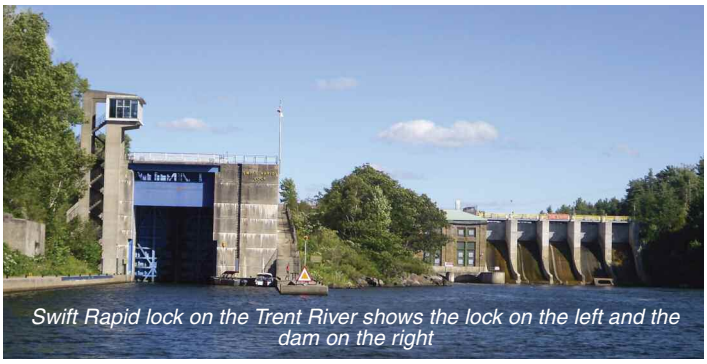
Navigating locks and bridges



Swift Rapid lock on the Trent River shows the lock on the left and the dam on the right

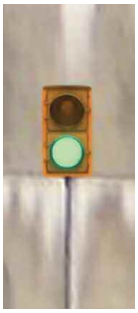
Water flows down hill and does not always allow for safe passage, so humans invented locks to traverse the different water elevations and obstacles. Locks are located where water falls and rapids may exist. They are gated at both ends. Opening one gate allows water to either flood or drain the lock chamber, allowing passage between two bodies of water with different elevations. When travelling on any river or canal system that uses locks visit www.pc.gc.ca to obtain the latest hours of operation and current water depths.

Tying up to the painted blue strip (blue line) indicates to the lockmaster your request to pass through the lock.

Approaching the lock

Obey all speed limits around and between locks. Keep your wake to a minimum. Watch for boats exiting the lock. Remember the rules of the road and pass port to port. When approaching a lock be prepared to deal with **strong currents** and winds. Stay clear of the gates and out of the way of exiting vessels. Sounding three long blasts (5s) signals to the lockmaster your intention to pass through the lock. Tying up to the painted blue strip (blue line) above and below the lock also indicates to the lockmaster your request to pass through the lock.

Entering a lock



Some locks use a traffic light to signal when to proceed into the lock. The lockmasters instructions must be followed precisely. They will decide who will enter the lock and when and where they will be moored (docked). As you approach an appropriate position inside the lock, post a crew member at the bow and stern ready to **loop lines** around the **black drop cables. DO NOT TIE VESSEL LINES TO THE DROP CABLES.** Wear a P.F.D. when locking. Unexpected movement of the vessel could cause you to fall overboard.

Inside the lock chamber

Never leave lines unattended you may experience turbulence as the water changes elevation, looping the line around a cleat will provide extra leverage.

Turn off the engine

A boat hook is good for grabbing drop lines

- Turn off all ignition switches (engine, generators etc.)
- Extinguish all open flames
- Do not smoke
- Turn on the exhaust blower for the entire duration
- **DO NOT TIE VESSEL LINES TO THE DROP CABLES.**

Exiting the lock

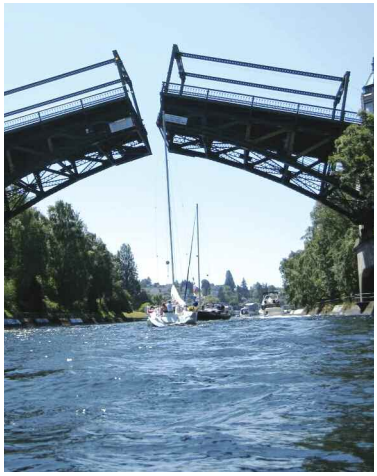
Follow the lockmaster's instructions and do not turn your engine on until instructed to do so. When exiting a lock be prepared to deal with **strong currents** and winds. Travel slowly, in single file, giving way to vessels travelling downstream.

Laws around locks and bridges

- No excessive noise between 11 p.m. and 6 a.m.
- No fishing within 10 m (32'10") of a lock or approach wharf or from a bridge that passes over a navigation channel.
- No diving, jumping, scuba diving or swimming in a navigation channel or within 40 m (131') of a lock gate or a dam.
- No water-skiing or other towing activities while in a navigation channel or within 100 m (328'1") of a lock structure.
- No mooring a vessel to a navigation aid.

Bridges

Travelling on the water, you are bound to come upon a bridge sooner or later that will need to be opened before you can safely pass. Check the chart for bridge clearance it should also be posted on approach to the bridge. Know the boat's bridge clearance, before requesting the bridge to be opened. Sounding three long blasts (5s) signals your request for the bridge to be raised or swung.

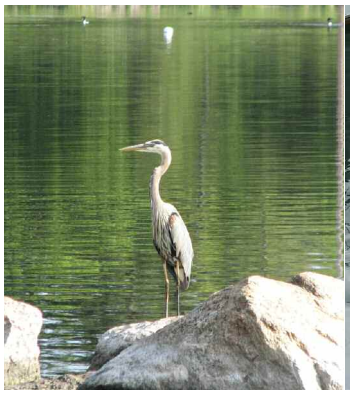


Safety around dams

The current from a dam can drown you stay well clear!

Be very careful near canal dams and waste weirs where currents and undertows can be very dangerous. It is against the law to jump, dive, scuba dive, swim or bathe within 40 m (131') of a dam. Dams are built to hold back water for a variety of reasons. They are hazardous both above and below the dam. Water flowing over a dam creates a **hydraulic suction** that can and will trap a person at the base of a dam. Low-head dams are especially dangerous. Getting too close to a dam, a person or boat may be drawn or sucked into the backwash current. The backwash current will carry the victim to the base of the dam, where they will be sucked under water perhaps being dragged along the face of the dam and struck by debris coming over the dam. The person will then be pushed away by the water current only to resurface, starting the cycle over again. Obey all posted warning signs and barriers surrounding dams.

Respecting the environment



Remember the phrase ***"Give a Hoot, Don't Pollute"***
Under the regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals, it is against the law to pollute the water with things like fuel, oil, oily mixtures, fishing nets, plastics and any noxious liquid substance such as hydrocarbons and untreated sewage in inland waters. **Blackwater** is a term used to describe waste water from toilets, and can be called brown water or sewage. **Greywater** is a term used to describe waste water from showers and sinks. The regulations prohibit the use of freestanding portable toilets. They also require that boats fitted with toilets be equipped with either a holding tank or a marine sanitation device. If your boat was built before May 3, 2007, you must comply with these regulations by May 3, 2012. Boats built on or after May 3, 2007, must comply immediately. **Untreated human waste may not be dumped overboard** in specifically listed waters of Manitoba and British Columbia and never in any Ontario waterways. When boating on costal waters, sewage may be pumped overboard provided it has been macerated to less than 2.5cm (.9 inches) and the vessel is more than 3 nautical miles (5 km) from shore.

Holding tanks and marine sanitation devices

In some provinces, if your boat has sleeping accommodations (berth) it must also have a marine toilet (head). A holding tank is only used to collect and store sewage or sewage sludge and must be emptied at approved pump-out facilities. A marine sanitation device is designed to receive and treat sewage on board. Only sewage treated with a marine sanitation device that meets the standards set out in the regulations may be discharged in inland waters. Most marinas have pump-out stations and it's not a bad idea to pump-out before or after refuelling.

Leaky or Cracked Hoses

Leaky or cracked hoses, broken or loose clamps and other fittings can result in oil, fuel, anti-freeze and transmission fluids entering the bilge area and accidentally being pumped overboard. To prevent this from happening always perform regular maintenance checks before heading out on the water. To remove any of the above from the bilge use absorbent bilge cloths, they are made to repel water and absorb contaminates. Always dispose of used towels or bilge cloths in an approved garbage container.

Note:
As little as 250 ml of oil can pollute 2000 sq metres.

Repairs

After completing repairs to a boat or trailer, thoroughly wash them down with environmentally friendly cleaners . This will prevent paint, paint scrapings, fiberglass, grease or harsh toxic chemicals from entering and harming the water.

Controlling litter

On hiking trails the rule is ***"you packed it in, you pack it out"!***

It's no different on the water, no one wants fishing line or nets to get caught up on the propeller hub and possibly wear out the seals. Paper towels and plastic bags can cover the cooling water intake for the motor which can result in an overheated engine. Plastic rings from pop cans and other beverages are a hazard to ducks, seagulls and other aquatic birds. Cigarette butts and empty packages are just plain disgusting on the water. You took it out there, bring it back and dispose of it properly.

Stop the spread of invasive species

Zebra mussels about the size of a dime

Trailering a boat from one body of water to another increases the chances of spreading invading species such as zebra mussel, round goby and sea lamprey. These little aquatic hitch hikers are capable of altering the natural food chain. Recreational boating is not the only reason they spread from one body of water to another. Ballast water from foreign ships has also contributed to the introduction of invading species.

Preventing the spread of invading species

Run your boat through the water to dislodge zebra mussels and malicious life from the hull. This will also prevent any new mussels from attaching to your boat, **empty live wells and bilges.** Remove any plant life that is clinging to the hull of the boat. **Scrape the zebra mussels from the hull** using a non abrasive tool with a flat, wide blade. Wash the boat with hot (40C), soapy water. Use a hose with a powerful spray or put your boat on a trailer and run it through a car wash to remove any remaining zebra mussels and residue. Leave your boat out of the water and in the sun to thoroughly dry. Zebra mussels need water or humid air to live.

Green boating tips:

The following list of natural cleaning products is from the Safe Boating Guide. There are other natural cleaning products available, Google search “natural cleaning products for boats”.

ALL-PURPOSE CLEANSER
Mix 30 ml of baking soda or borax, 30 ml of tea tree essential oil, 125 ml of vinegar, 15 ml of biodegradable dish soap and 2 litres of hot water. Spray on the surfaces to be cleaned.
CHROME
Rub with baking soda. Rinse and polish with vinegar in hot water.
DECK AND FLOOR
One cup (250 ml) vinegar in 4 litres of water
DRAIN
Pour 60 ml of baking soda in the drain, followed by 60 ml of vinegar. Let it rest for 15 minutes. Then pour in a full kettle of boiling water.
MOULD
Add 60 ml of borax and 30 ml of vinegar to 500 ml of hot water. Spray the mixture to eliminate germs.
STAINLESS STEELE
Rub with baking soda, and then use vinegar to remove spots
TOILET (head)
Pour 125 ml of baking soda and 125 ml of vinegar into the toilet bowl. The foaming reaction cleans and deodorizes. Brush and flush.
WOOD (POLISH)
Mix 30 ml of edible linseed oil, 30 ml of vinegar and 60 ml of lemon juice in a glass pitcher. Rub the solution into the wood with a soft rag until it is clean. To store the solution, add a few drops of vitamin E from a capsule and cover.
- Make sure your engine is well maintained to reduce air pollution.

Note:
As little as 250 ml of oil can pollute 2000 sq metres.

For better fuel economy:
- **keep the boat clean and waxed it will increase your speed!**
- **Keep the motor properly maintained (Tuned)**
- **loaded it evenly and low**
- **run at 3/4 throttle once up on plain**
- **when equipped with lower all canvas and windscreens**

If you accidentally pollute the water or you witness or see the result of someone else polluting, report it to a Government of Canada pollution prevention officer or call one of the following telephone numbers right away.
- British Columbia and Yukon - 1-800-889-8852
- Alberta, Saskatchewan, Manitoba, Ontario, Northwest Territories and Nunavut - 1-800-265-0237
- Quebec - 1-800-363-4735
- New Brunswick, Prince Edward Island and Nova Scotia 1-800-565-1633
- Newfoundland and Labrador - 1-800-563-9089

Remember it is your responsibility to make sure you know and obey the laws wherever you go boating.

Anchoring

Awww Kurplunk! There it goes. Before lowering the anchor securely **tie one end of the anchor line (rode) to the anchor and the other end of the rode to the boat.** Keep your feet and legs clear of the anchor line when lowering the anchor. Consider anchoring in a sheltered bay or behind an island when severe weather threatens or in the event of mechanical breakdown. Remember you must carry 15 m of anchor line on board.

An anchor is device used to prevent the boat from moving from a designated position. Any object can be used as an anchor such as a cement block, a large rock or a bucket full of concrete. What makes a good anchor is **design and weight.**

There are three different uses for anchors:

- Main anchor is used when wanting to stay in one location
- Storm anchoring is when you drag the anchor behind the boat to slow it down
- Kedge anchoring is when the anchor is used to move around in tight spots or if you run aground it can be used to pull you off the obstruction

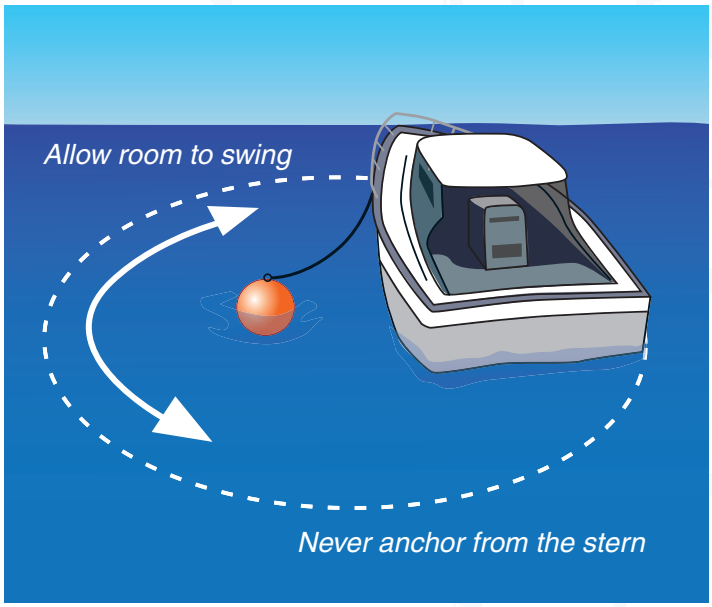
Danforth anchor

Mushroom anchor

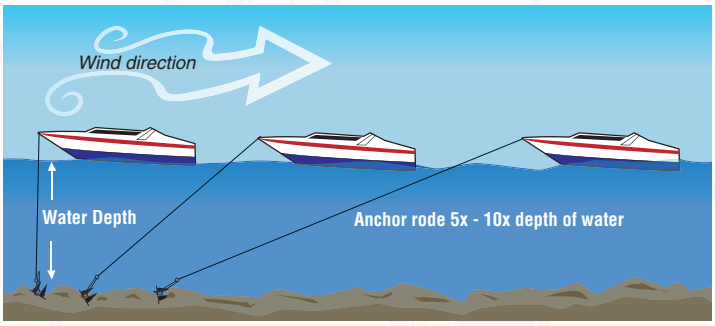
There are many **types of anchors** on the market. The reason is simple there are **many different types of bottoms (sea beds).** There are grassy bottoms, rocky bottoms, muddy bottoms, sandy bottoms even clay bottoms. Deciding which **type of anchor to use** is made easy by the use of nautical charts or asking the locals in the area what the seabed conditions are in the area. Charts (see charts) show the location of navigational aids as well as water depth, and the type **sea bed** conditions. Some popular types of anchors are the Danforth, Fisherman, Plough and Mushroom anchor. The Danforth anchor is good in sand, gravel and mud. Danforth anchors may slip in rocky, clay or grassy bottoms better to use a Plough anchor in these conditions

The **Danforth and Plough anchors have flukes** (pointy ends) that help them **dig into the sea bed**, and when a chain is added to prevent the rode from chafing makes them a very effective anchor.

Mushroom and Fisherman (navy) anchors are very **dependent on their weight** to be effective.



Anchors can be attached to the anchor rode directly or using a shackle and chain, put it all together and it is called ground tackle. Using a shackle and chain with the anchor does two things. One is it helps prevent the rode from chafing (wearing out) and second it adds weight. They can be used to keep a boat stationary, or dislodge one that has run aground. Dropping anchor is easy, getting it to hold (set) can be a different story. The trick to getting the anchor to set is choosing the right type of anchor for the sea bed conditions and letting (paying out) out enough rode, for the anchor to set. Pay out between 5 and 10 times the water depth (scope). The more rode you pay out the more holding power the anchor will have. Choose a location where the wind and water currents are minimal. Keep in mind the boat may swing, so will other boats in the area. The right of swing is given to the first boat anchored, which has right of swing.



Never anchor over the side or the stern of small boat. Wakes or waves may come over the stern swamping or capsizing the vessel.

5.16

To set anchor pass the intended anchor location. Stand clear of the rode, slowly lower; never throw the anchor over the bow. Once it reaches bottom slowly go astern paying out the rode, lightly holding the rode, you will feel when the anchor has set, stop when sufficient rode has been payed out then tie it off to the bow, take two bearings. Periodically check your bearings to see if your position has changed. Turn on the all round light when anchoring over night or in conditions of poor visibility. **You may need to use a larger or sometimes even a second anchor tied to the bow when anchoring in poor weather conditions.**

Retrieving an anchor can be done a couple of ways. One is to slowly haul on the line until the anchor rode is vertical, and then lift the anchor and wash it off, hang the rode to dry before stowing. Another way is to slowly move the boat ahead while hauling in the rode so as not to foul up in the propeller, until the anchor rode is vertical, and then lift the anchor and wash it off, hang the rode to dry before stowing. **If your boat is equipped with an anchor locking device ensure the shackle pin is properly inserted into the anchor locking device.**

Sometimes the anchor will become fouled (get hung up) under a rock, log or some other obstruction refusing to pull free. To retrieve a fouled anchor, pull on the rode, once it is vertical tie it off to a bow cleat, using the boats weight slowly move ahead to free the anchor. Never hold onto the rode using this method as the rode may break, pulling you into the water.

The following information is meant only as a guide when purchasing anchor rope.
*****These are average approximations only, when in doubt use the next size up******

AVERAGE tensile strength of NEW Double Braid Nylon Rope

Rope diameter	Holding strength
3/8 (12mm)	5,000 lbs (2268kg)
1/2 (13mm)	8,000 lbs (36287kg)
5/8 (15mm)	14,000 lbs (6350kg)
3/4 (18mm)	20,000 lbs (9071kg)

The following information is only a guide when purchasing Slip Ring Danforth anchor.

Anchor size	Boat length
6lb (2.7kg)	may hold up to 15' (4.6)
9lb (4.8kg)	may hold up to 20' (6M)
13lb (5.9kg)	may hold up to 25' (6-7.5M)
19lb (8.6kg)	may hold up to 30' (9M)

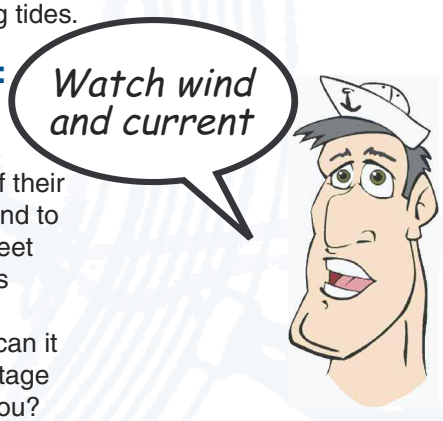
The above anchor and anchor line sizes are guidelines only and are dependent on weight & size of the boat, boat displacement & WEATHER CONDITIONS. Remember the heavier the anchor the more holding power it will provide.

Docking 5.31

The wind, boom, bang, screeetch, thump. Docking a boat sure can test one's nerves. The key to docking is being prepared for the effects of the wind and water currents. Knowing how your boat reacts to the wind and currents is something you will need to learn by trial and error, away from other boats. A key factor to docking is maintaining control of the boat at all times. Keep in mind that the height, draft and weight of the boat will play a role in the manoeuvrability of the boat. Height allows the wind to push you around, the draft of the boat exposes the boat to currents and the weight will effect how fast the boat stops and turns. Some marinas are busier than a shopping mall parking lot; pay extra attention for boats going astern (reversing) from a slip.

When heaving lines to a person on the dock, have them hold one arm out, then throw the line over their arm. Secure (make fast) the bow line first. Sometimes the stern line will need to be tied first, particularly if you are alone on the boat and the wind is gusting. When in tidal areas always leave enough line for changing tides.

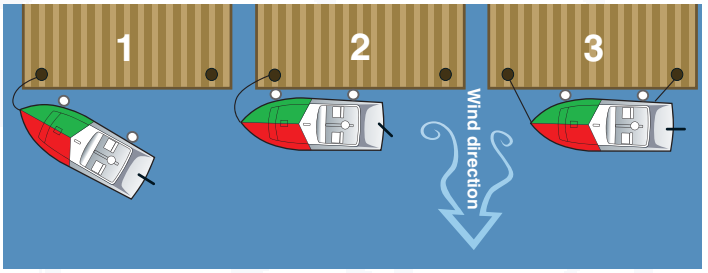
Docking checklist :



- Lines ready
- Fenders hung
- Inform crew (guests) of their roles (handling lines) and to keep their hands and feet inside the boat until it is secured
- Check wind direction, can it be used to your advantage or will it be opposing you?
- Check the water current, will it work for or against you?
- Use steering and throttle to ease up to the dock
- Remember boats do not steer like cars, they have a pivot point; it is helpful to shift to neutral then turn the wheel, before using short bursts of thrust to swing the stern around
- Make fast
- Turn off the engine
- Stow all gear and dispose of trash appropriately
- Close up and secure the boat as if you expect a hurricane, you never know when the uexpected will keep you from returning to the boat
- Close out sail plan if applicable
- Pull aluminium boats and canoes up on shore, this will prevent them from filling with water and possibly sinking after a heavy rain fall

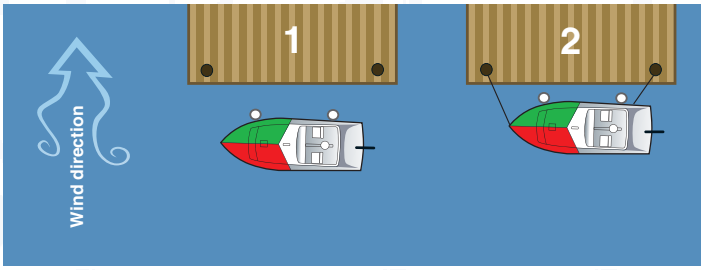
Docking scenarios

Wind is off the dock



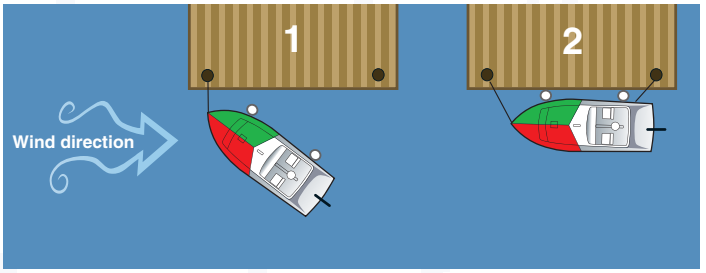
Approach the dock at a slight angle, 25 to 30 degrees. Secure bow line, short bursts of power may be needed to push the stern onto the dock. Note the rudder position in picture # 2

Wind is on the dock



Approach parallel to the dock, use a short burst of reverse to stop and let the wind do the rest.

Wind is parallel to the dock



Secure the bow line and let the wind do the rest. Boaters are friendly and will gladly help you when docking without asking. Jumping off a boat while docking will only push the boat away from the dock.

Note: be mindful of prop walk when going astern.

Dock line size and strength

Boat size	line size
up to 20' (6M)	3/8 (9mm)
20-30' (6-9M)	1/2 (12mm)
30-35' (9-10.5M)	1/2 (12mm)
35-40' (10.5M-12M)	5/8 (15mm)
40-50' (12-15.5)	3/4 (18mm)

Length of Dock Lines--Stern & Bow Lines equal length of boat or 1.5 to 2.5 x the Beam

Note: the above are general guidelines only and are dependent on the boat's manufacturer, weight, height & its displacement.

Low tide

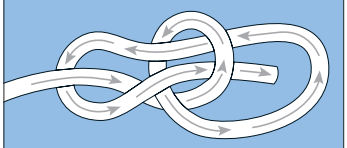
High tide

Tides are the horizontal movement of water caused by the gravitational pull of the sun and moon. This pull causes water to rise and fall. In some areas like the Bay of Fundy the tide change is 15.24 meters (50 ft).

Knot Knowing

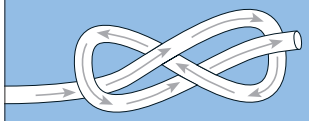
For convenience at the dock standardized knots are used for boating.

Bowline



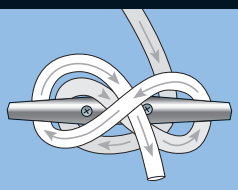
For an easy, secure noose. Probably one of the most common knots on board a vessel.

Figure of Eight



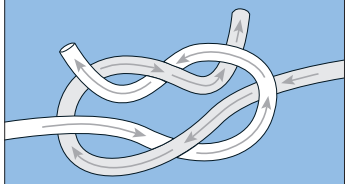
A good stopper knot to keep lines from running blocks or grommets.

Cleat Hitch

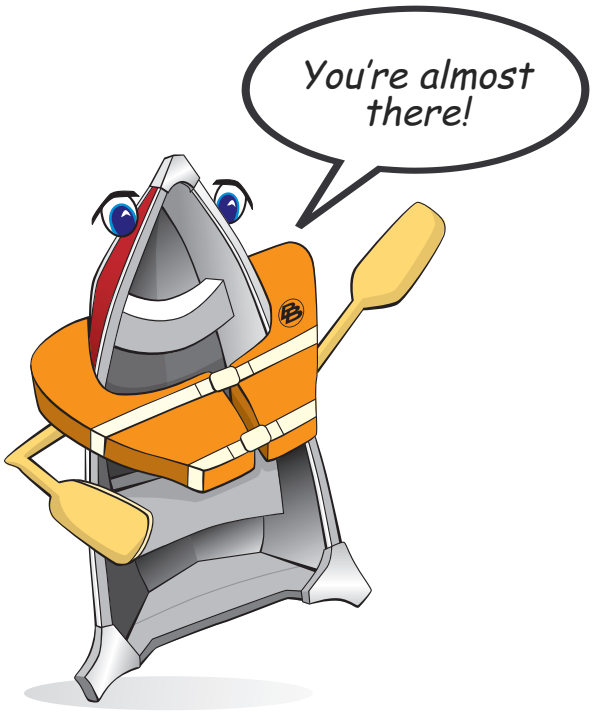


For securing rope to a cleat. Very strong yet easy to undo.

Reef Knot / Square Knot



For connecting two lines together.


You're almost there!