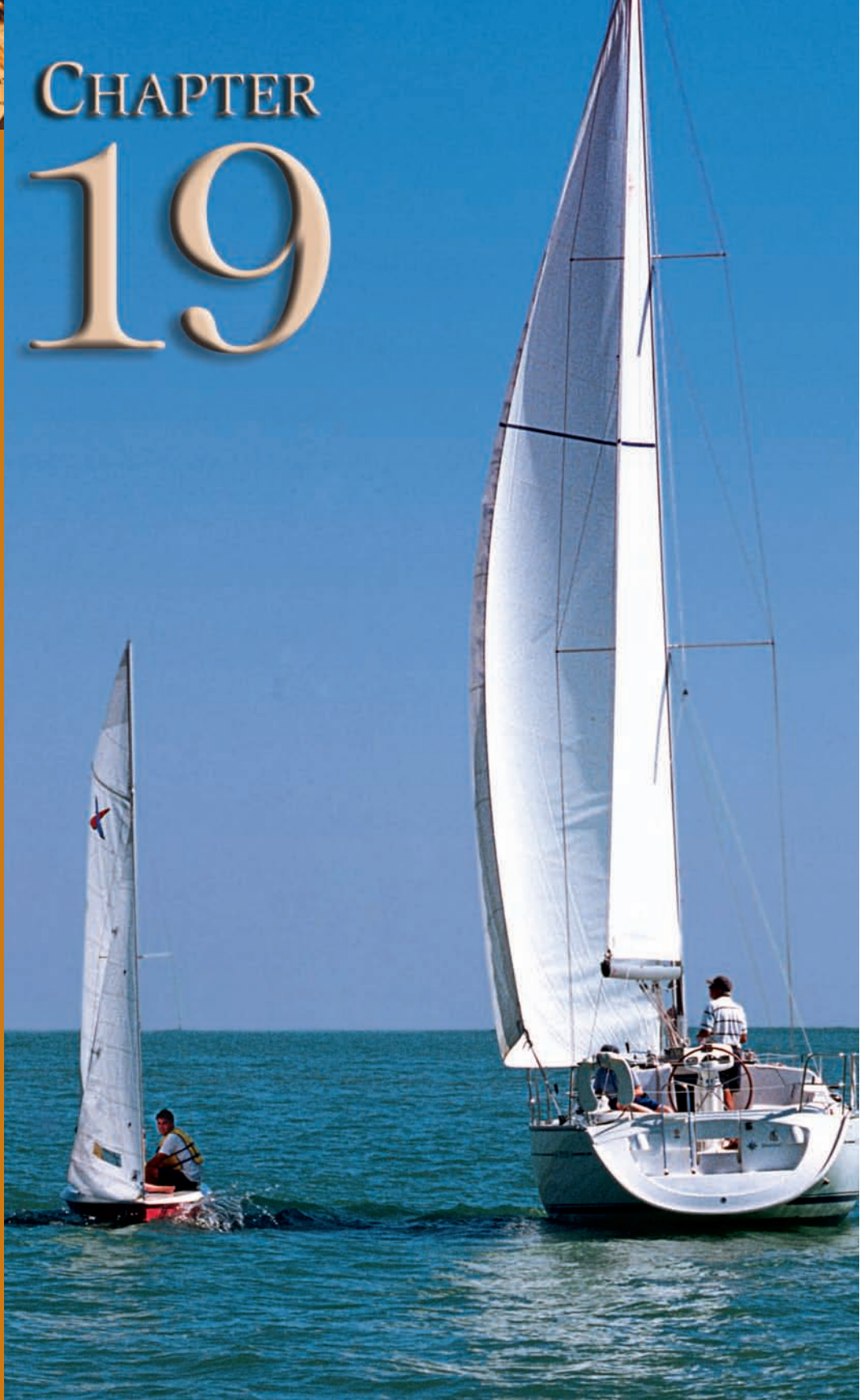
Chapter 19



Sailing

"Your reason and your passion are the rudder and sails of your seafaring soul. If either your sails or your rudder be broken, you can but toss and drift, or else be held at a standstill in midseas."

—Kahlil Gibran (1883–1931), Lebanese novelist, poet, philosopher, and artist

A boat, the wind, open water. Nothing could be simpler, and yet no other three factors, when mixed in proper proportion, possess so much potential for adventure and delight. Cast off from a dock, hoist a sail, grasp the tiller or wheel, and you are embarking into a realm of motion, of closeness with nature, and of the pleasure of nonmotorized travel for which there simply is no comparison.

As a sailor, you can go where the wind lets you go, traveling on the wind's schedule rather than your own. While you can't force a boat to move, you can enjoy the constant adjustments of sails and rigging to take advantage of invisible vectors of sky and sea as you will your boat to cruise along a course you have plotted. With your weight to the windward, you can feel the sail pulling your boat through the water, the hull heeling to one side, water humming past the keel, the breeze a steady force in the rigging.

Sailing is one of humankind's oldest modes of travel, steeped in tradition and lore. The wisdom of sailing comes to modern sailors through thousands of years of experimentation, experience, and simple human intuition. While sailing might seem complicated to someone just starting out, it is, at its heart, the union of wind, water, and craft in constantly changing variations. You can learn the basics in an afternoon. You can spend the rest of your life striving to master them.

PERSONAL FLOTATION DEVICES

Cruising vessels greater than 20 feet in length must have at least one readily accessible Coast Guard–approved personal flotation device for each person on board. Anyone taking part in activities involving smaller watercraft (including rowboats, canoes, kayaks, rafts, and sailboats smaller than 20 feet in length) must wear a Coast Guard–approved personal flotation device.

First Things First

Whether you are sailing for the first time or are one with the wind and confident in your abilities to navigate open seas, safety always must be your highest priority. Knowing the safety rules, knowing your boat, knowing the weather and the body of water are all essential ingredients to a safe and rewarding sail. (Novices should sail only in the company of those whose experience is more than a match for the conditions and situation.)

In addition to ensuring that the boat is in top condition, look after your own comfort and safety by having the following items with you:

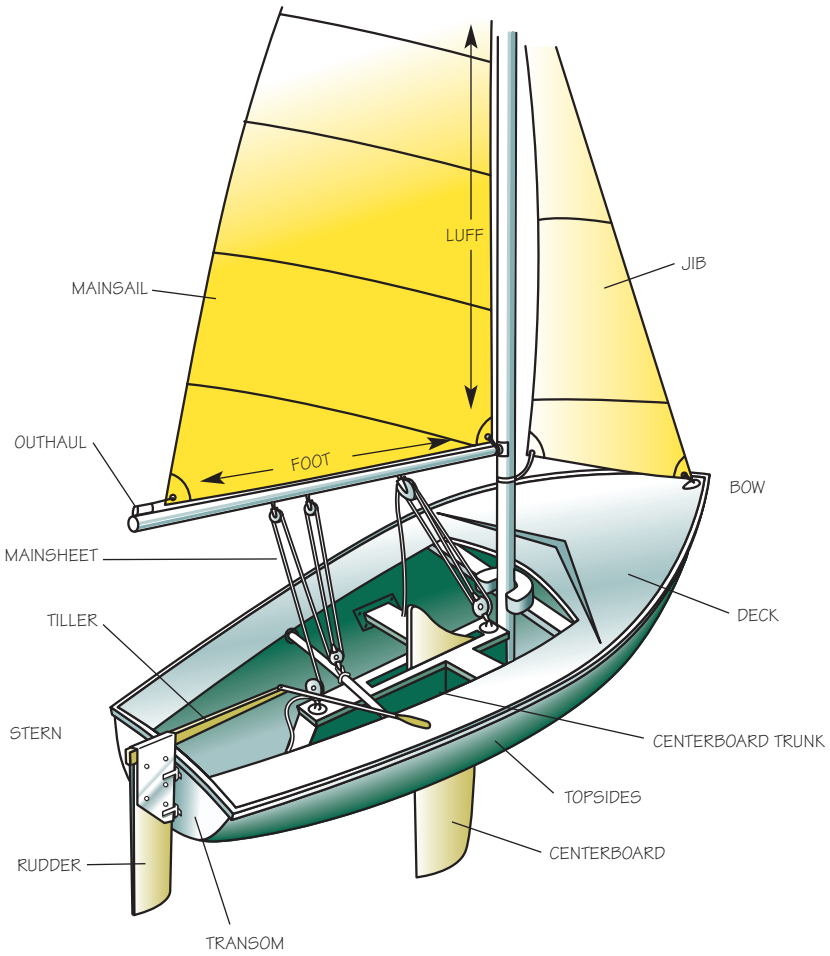
- U.S. Coast Guard–approved personal flotation device (PFD)
- Rubber-soled, nonskid shoes you won't mind getting wet
- Drinking water
- Food
- Sun protection and sunglasses
- Extra clothing
- Emergency communication and signaling equipment (radio, flares, etc.)

You also might want to wear sailing gloves to protect your hands and improve your grip as you handle lines aboard a boat. Stow anything you want to keep dry in dry bags or sealed inside plastic bags. Stash the bags below decks or in some other boat storage compartment.

For more on issues of concern for sailors, see the chapters titled "Managing Risk" and "Watercraft Adventure Safety."

Sailboats

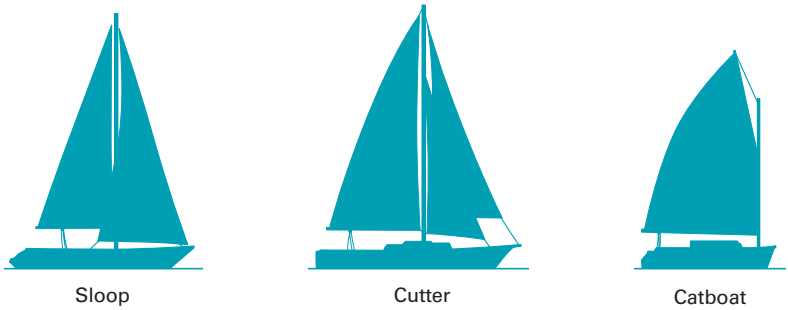
Boats designed for sailing feature either a *centerboard* or a *keel*. A centerboard is a movable plate of wood, metal, or fiberglass that can be raised and lowered through the bottom of the boat. (Variations of the centerboard are the *daggerboard* that can be removed from the hull, and the *leeboard* that pivots on a dinghy's gunwale.) A keel, on the other hand, typically is a portion of the hull and does not move. It extends beneath the boat in much the same manner as a centerboard and serves the same purposes of providing stability and lateral resistance. Keels (found on *keelboats*) are weighted with enough ballast to keep the boat upright despite the forces of water and wind.



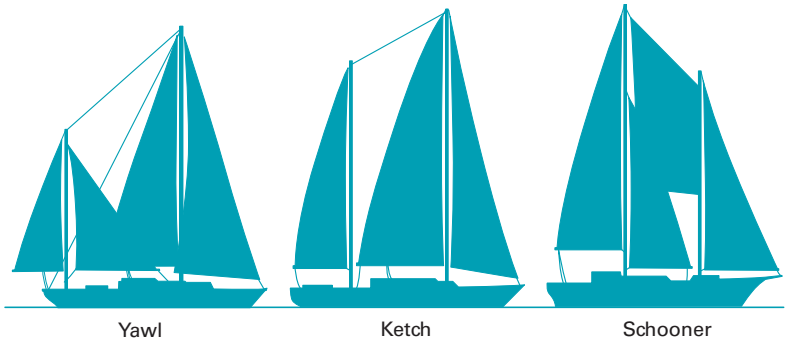
Typical sailboat with a centerboard

Beyond their classification based on keels or centerboards, boats come by their names based in part on the number and orientation of their masts and sails: One-masted boats include *sloops, cutters,* and *catboats*. Two-masted boats include *ketches, yawls*, and *schooners*.

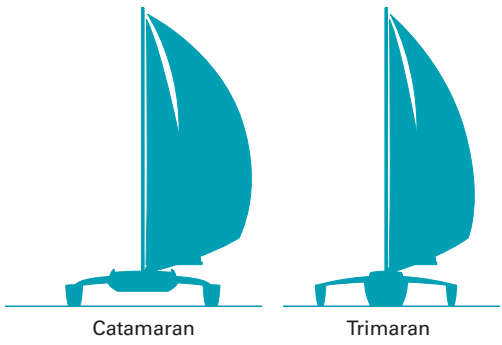
There also are boats with more than one hull. *Catamarans* feature two hulls, and *trimarans* have three.



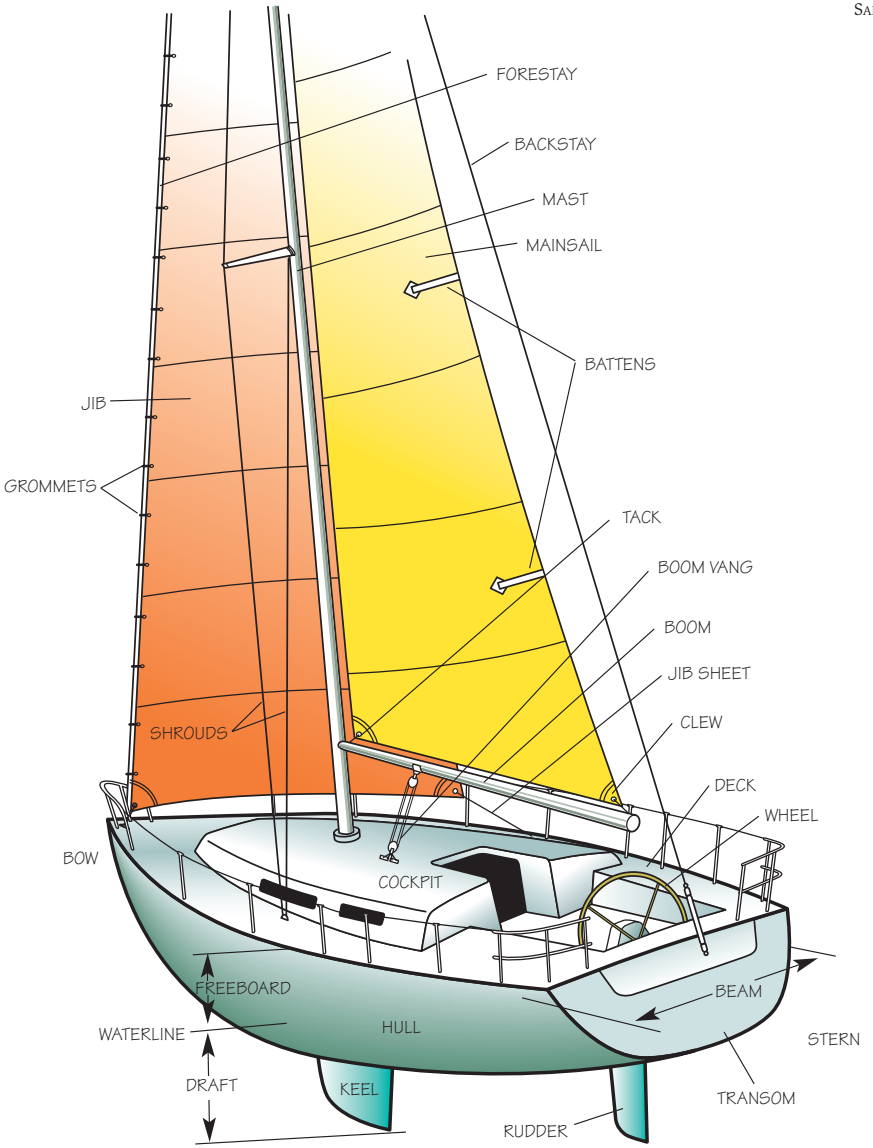
One-masted boats include the sloop, the cutter, and the catboat.



Two-masted boats include the yawl, the ketch, and the schooner.



A two-hulled boat is a catamaran. A trimaran has three hulls.



Typical sailboat with a keel

The Vocabulary of Sailing

Sailing has a vocabulary all its own. The words *starboard* (the right side of the boat as you face forward), *port* (the left side), *windward* (toward the wind), and *leeward* (away from the wind) give sailors clear spatial orientation as their boats move across the water. Speed across the water is measured in *knots,* each knot being *one nautical mile per hour.* A nautical mile is 1/60 degree (1 minute) of latitude, or 6,076 feet, whereas a *statute mile* used to measure distance on land is 5,280 feet. A boat traveling at 10 knots is moving at about 11.5 miles per hour.

For more on latitude, see the chapter titled "Navigation."

Getting Aboard

The smaller the boat, the more care you'll need while boarding, since your weight can upset a small craft. Hold the mast or the rigging securing the mast, then step into the center of the boat. Larger boats often can be boarded by stepping from the dock to the deck, again grasping lines for balance.

Rigging the Boat

Preparing small boats for sailing can include raising, or *stepping*, the mast and securing the standing rigging that holds it in place. For almost all boats, it will require getting sails out of storage and attaching them to the mast so that they are in position to be hoisted. There are many variations on the ways in which sails are matched to boats. Your best bet in learning to rig a particular boat is to work alongside sailors experienced with that craft. With their guidance, you can complete some or all of the following steps:

COILING LINES

Keeping lines coiled and neatly stowed are matters both of sailing safety and of pride in seamanship.

1. Slide fiberglass or wooden *battens* into pockets on the trailing edge of the mainsail. The battens will stiffen the sail and help it maintain the optimum shape for taking advantage of the wind.

2. Slide the foot of the mainsail into the *boom*—the horizontal arm of the mast. Attachments made of plastic or metal, or a rope sewn onto the sail's lower edge, are designed to slip into a groove in the boom. Once the foot is in place, secure the corners with the *tack*—a fitting near the mast—and the *clew*—a fitting at the far end of the boom. The final corner of the sail is attached to the *halyard*—the line used to hoist the sail.

3. Rig the *jib*—the sail ahead of the mast—if the boat has one. Jib design varies every bit as much as does that of mainsails; follow the lead of those who have rigged the boat before.

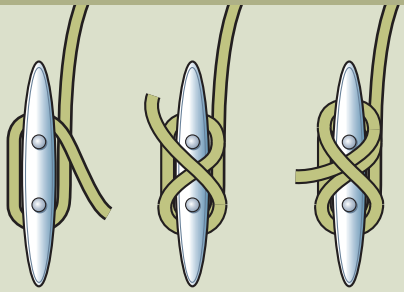
Rigging a boat also involves checking all the lines to ensure they are correctly positioned and ready for use. If the boat is equipped with a centerboard, it must be lowered and locked into position. Any loose objects should be stowed away. Everyone going on the trip must be on board, wearing a PFD, and ready to carry out any responsibilities he or she will have while the boat is under way.

Raising the Sails

Before raising the sails, turn the bow of the boat into the wind. That way you can get the sails fully hoisted before the wind begins to fill them.

Sails are raised by hauling the *halyard*—a line running through a block at the top of the mast and fastened at one end to the sail's upper corner. The halyard can be hauled by hand or, on larger boats, by winding it on a winch. The leading edge of the mainsail might have a rope sewn into it that must be fed into a groove in the mast as the sail is being raised.

Securing a Line to a Cleat



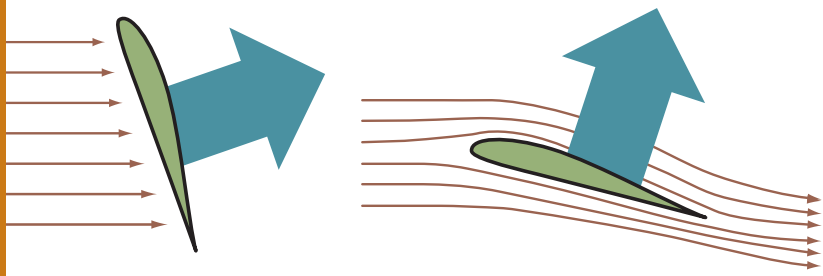
Lines that control sails must be secured in such a way that they will hold under great tension, but can be released quickly. The simplest means of achieving that goal is to use a cleat. Bring the line around the horns of the cleat, then wrap it several times in a figure-eight fashion. The turns of the line against itself will create enough friction to prevent the line from loosening. A final half hitch thrown around one of the horns will secure the running end of the line. Loosening the line is simply a matter of undoing the half hitch and releasing only enough of the loops to allow the line to run out in a controlled manner.

Some boats also have *jammers* or *rope clutches* to secure lines, particularly if the sails are large and the rigging is complicated.

How a Boat Sails

If there is no wind, you aren't sailing—you're just floating. Sailing is much more fun than floating, especially when you understand the physics of how moving air affects the sails. Whether that motion is graceful, awkward, or counterproductive often depends upon sailors' understanding of the forces coming to bear on a boat, and a crew's ability to adjust to changing circumstances.

A sail mounted on a mast can catch breezes and move a boat in the same direction the wind is blowing. However, when the sail curves into the shape of an airfoil similar to the profile of an aircraft wing, wind flowing



past creates an area of low pressure in front of the fabric and an area of high pressure behind it. The sail is pushed from high pressure toward low pressure, carrying the boat with it. That allows the boat to move with greater efficiency at angles to the wind than otherwise possible with a flat sail.

A *rudder* at or near the stern of a boat sets the direction the craft will go. A keel or a centerboard extending downward from the center of the hull serves as an underwater wing preventing the boat from being blown sideways by the wind. The rudders of smaller boats are controlled with a *tiller*—a lever providing direct response to the rudder. Larger boats have rudders managed by wheels; sailors make directional changes as they would with the steering wheel of an automobile.

Two Kinds of Wind

True wind—the wind you experience while standing still and having your hair blown by a breeze.

Apparent wind—air motion you experience while moving forward, even on a windless day. If you are riding a bicycle, for example, the movement of the bike causes your hair to blow with the oncoming breeze. This wind created by the bicycle's motion, along with any true wind, is known as *apparent wind*.

Practice your sailing skills in the clear, aquamarine waters of the Florida Keys at the Florida National High Adventure Sea Base. Located in Islamorada, Florida, the BSA's high-adventure facility offers a variety of aquatics programs for older Boy Scouts, Varsity Scouts, Sea Scouts, and Venturers.

Sailing Maneuvers

Manage a sailboat well and you can travel in any direction you wish—your *points of sail*—with one exception. You cannot sail directly into the wind. Turning the bow of the boat into this *no-sail zone* is a no-go proposition. The wind will work contrary to your wishes, causing the sails to flutter uselessly, or *luff*, and gradually pushing the boat backward.

While sailing directly into the no-sail zone is impossible, sailing at an angle to the wind can be extremely fast. You can make headway by setting the sails in various ways. Adjusting the rudder and, on smaller boats, the positioning of the weight of the crew will further influence the heading and speed of a boat.

Depending on the course you wish to travel in relation to the wind, the basic maneuvers of sailing are *running*, *reaching*, and *beating*. The primary means of changing directions are *tacking* (coming about) and *jibing*.

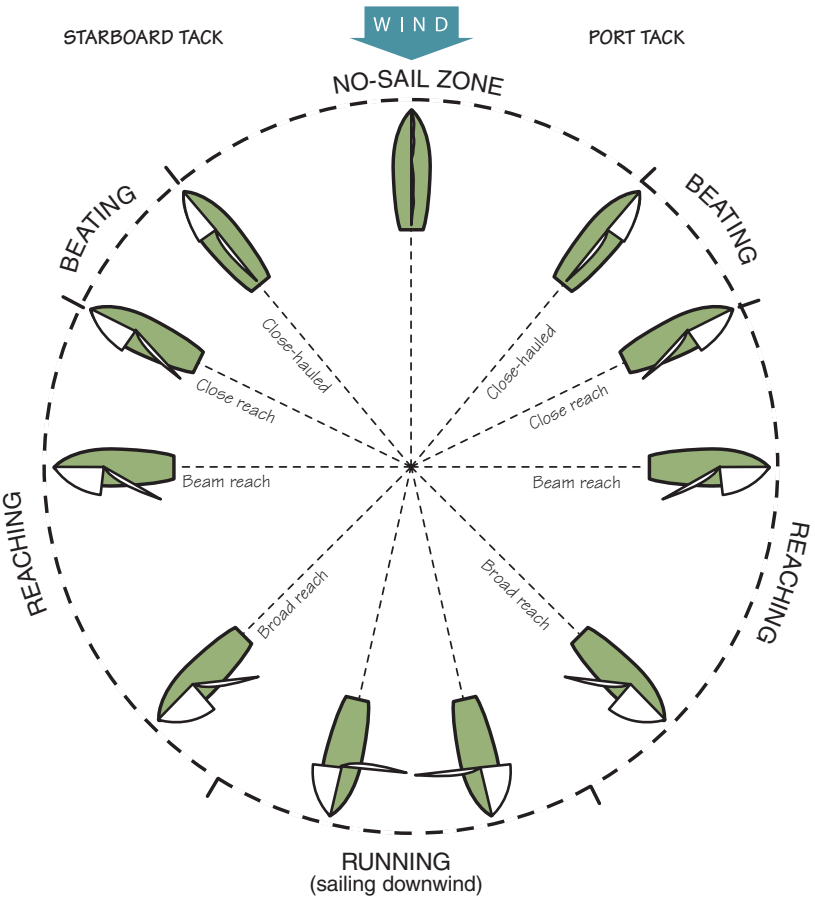
Running

Sailing a boat downwind, or *running*, requires close attention, but setting the sails is easy. Simply let out the sails so that they gather in the wind and carry the boat forward. Since the wind is coming over the stern of the boat rather than over a side, the boat will stay level rather than heel over.

Reaching

As the bow of a boat begins turning away from a run and toward the wind, the sails no longer will be positioned to act simply as wind collectors. You can take advantage of the fact that the sails now form airfoils that help pull the boat forward. Sailing at an intermediate angle to the wind is called *reaching*.

Reaching can occur whenever a boat is on points of sail between running and beating—from about 7:00 to 10:00 on the *starboard* (right) side, and 2:00 to 5:00 on the *port* (left) side. A boat on a beam reach travels faster than it can with sails set for any other bearings.



Beating

Beating makes it possible for a boat to sail as close as possible to the no-sail zone—points of sail with bearings at about 10:30 starboard and 1:30 port. If the sails begin to lose their airfoil shape even though they are trimmed as much as possible, the boat must turn a little more away from the direction of the wind in order for the sails to fill.

Trimming the Sails

Adjusting the sails, known as *trimming*, will position them for maximum efficiency for the bearing you are following. Sails that are too loose will flutter, or *luff*, along the leading edge. Pull in the lines controlling the set of the sails until the luff disappears and the sails are taut and full.

Overtrimming the sails by setting them too tightly also can diminish their airfoil effect and rob the boat of speed. To determine if that is the case, let out on the lines until the sails begin to luff, then haul them in just until the luffing disappears. That should be the perfect amount of trim for your current heading.

Of course, wind direction will continually change and your heading might not long remain the same. Trimming the sails will be an ongoing part of sailing, requiring your focused attention throughout a journey under sail.

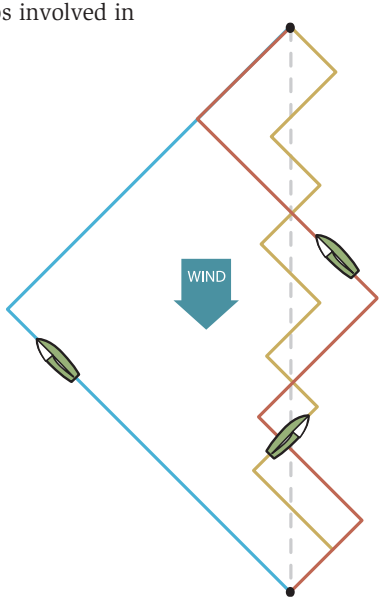
Tacking (Coming About)

A boat cannot sail directly into the wind. However, you can make headway toward the wind by *tacking*—beating in one direction, then turning the bow through the no-sail zone and beating in another direction. The boat can zigzag to a destination upwind either by using one tack with legs long enough to make the distance, or by making a series of short tacks that gradually work the boat close to its goal.

Tacking requires cooperation of everyone on a boat's crew, both to reset the sails for the new bearing and to be alert as the boom swings over the deck. On smaller boats, crew members also might need to shift their weight to the windward side of the craft to help prevent it from capsizing.

If you are the boat's captain, the steps involved in tacking are these:

1. Announce "Ready about!" and then give your crew the time they need to position themselves for the maneuver.
2. When you are certain all is in readiness, shout "Tacking!"
3. If the boat has a jib, release tension on the lines controlling it.
4. Instruct crew members to switch sides on the boat.
5. Move the tiller or turn the wheel *toward* the boom to turn the bow of the boat through the no-sail zone. Crew members must be alert to avoid the boom as it swings over the cockpit.
6. Trim the sails and set out on the new heading.



Tacking patterns

Caught in Irons

A boat beating too close to the no-sail zone, or one moving too slowly through that zone while tacking, might stall as the wind comes directly over the bow and renders the sails useless for making forward progress. This situation, known by the traditional sailing term *caught in irons*, can be frustrating, to say the least.

To get out of irons, loosen the mainsail and, if you have one, extend the jib to one side or the other. The wind will push the bow toward the side on which the jib is set. Once the bow clears the no-sail zone, trim the mainsail and continue on your way. If the boat has no jib, loosen the mainsail, then move the tiller or turn the wheel hard to one side and wait for the wind to push the bow out of the no-sail zone.

Jibing

Tacking involves turning *into* the wind. *Jibing* is a maneuver that changes the boat's heading from starboard to port as the boat is running (sailing downwind). The boom will be extended far out from the boat, and can swing back and across the deck with a suddenness that sailors must anticipate in order to keep themselves out of harm's way.

1. If not already on a run, gradually adjust the bearing of the boat until the wind is almost directly behind it.
2. Shout the command "Prepare to jibe!" Anticipate the maneuver so that your crew will have time to get themselves ready to do whatever needs to be done.
3. Shout "Jibing!" and move the tiller or turn the wheel *away* from the boom to turn the boat toward the new bearing.
4. Shorten the line attached to the boom to move it toward the deck as wind pressure on the sail lessens, then ease the line out as the boom swings over the cockpit and the sail begins to refill.
5. Trim the sails for the new bearing. In smaller boats, crew members should move to the other side to improve the balance of the craft.

Righting a Small Sailboat

Many sailboats are small enough and light enough to capsize on occasion, especially as you are learning sailing maneuvers. Be prepared for this by practicing the following steps:

1. Loosen the sheet to free the mainsail, then climb or swim around the hull so that you can put your weight on the centerboard.
2. As you grasp lines or the edge of the deck, gently push down on the centerboard with your feet.
3. Pull the boat upright.
4. Get yourself and everyone else back on board before turning your attention to bailing out the boat and resetting the sail.

Leadership and Sailing

A crew on a sailboat must carry out many tasks that require cooperative effort. The responsibilities of each crew member often are obvious, though at times someone must call for quick action. The most experienced sailor often serves as a boat's captain, exercising authority when decisions must be made. In some cases, though, a person with outstanding leadership skills may guide the crew with the support and advice from crew members with more seamanship experience. Likewise, a crew member learning to sail might serve as a boat's captain, mentored by an experienced sailor prepared to step in and take command if situations arise that are beyond the skill of the novice.

Human waste and litter should be properly disposed of at the next port in facilities designed for that purpose, never tossed overboard. Leave No Trace applies to sailing similarly to other outdoor activities.

Even when a crew is composed of no more than two or three people, leadership can become a critical issue. A chain of command should be worked out before a crew leaves dry land.

For more on responsibilities of crew members and leaders, see the chapters titled "Organizing for Adventures" and "Outdoor Leadership."

Several knots familiar to Scouting take their name from sailing terms, such as the *bowline,* which is named after the front end *(bow)* of the boat, and the *sheet bend,* which comes to us from both the bend formed in one of the ropes and from *sheet,* a nautical term for a line used to haul a sail.

Setting a Lifelong Course

The way to become proficient at sailing is to go sailing. Have fun, learn from your mistakes, and seek out opportunities to learn from others.

Sea Scout units provide terrific opportunities for mastering the basics of sailing and enjoying plenty of time on the water. (See the *Sea Scout Manual.)* Many Venturing crews also specialize in sailing as one of their primary activities. Sailing clubs, community colleges, and universities around the country offer courses in sailing and opportunities for young people to join sailing crews.

"You'll need a modicum of sailing aptitude, some grasp of mechanical concepts, and a willingness to pitch in and work. Most veteran world sailors fall into the classification of restless adventurers who are always looking at distant horizons."

—Hal Roth (writer, photographer, and worldwide sailor), *After 50,000 Miles,* 1977