AY Honors – Canoeing

Skill Level 2 – General Conference 1945

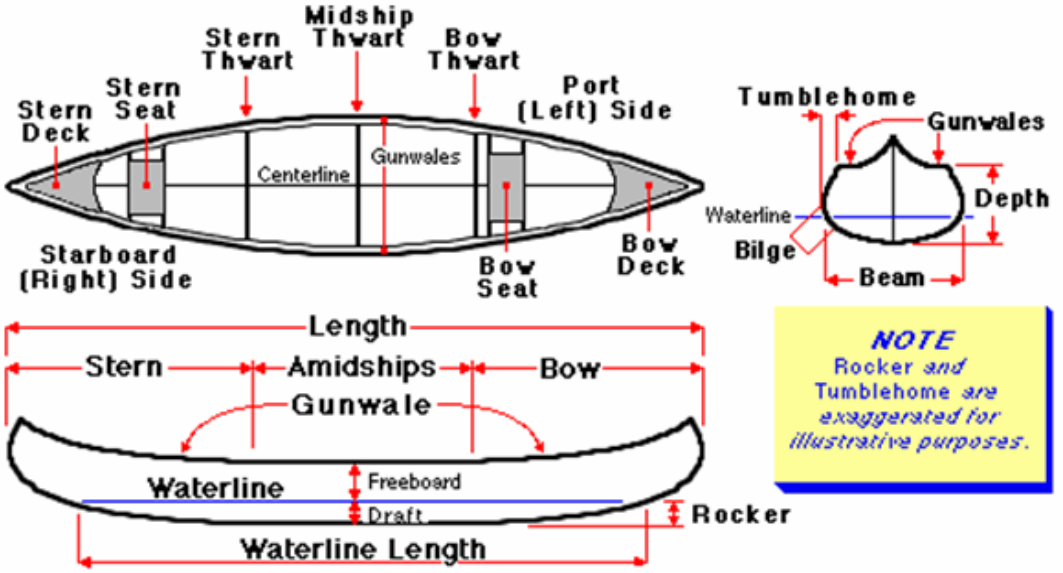
Introduction

A canoe is a relatively small boat, typically human-powered, but also commonly sailed. Canoes are pointed at both ends and usually open on top.

In its human-powered form, the canoe is propelled by the use of paddles, with the number of paddlers depending on the size of canoe. Paddlers face in the direction of travel, either seated on supports in the hull, or kneeling directly upon the hull. In this way paddling a canoe can be contrasted with rowing, where the rowers face away from the direction of travel. Paddles may be single-bladed or double-bladed.

Canoes have a reputation for instability, but this is not true if they are handled properly. For example, the occupants need to keep their center of gravity as low as possible. Canoes can navigate swift-moving water with careful scouting of rapids and good communication between the paddlers. When two people occupy a canoe, they paddle on opposite sides. For example, the person in the bow (the *bowman*) might hold the paddle on the *port side* (left side). Conversely, the person in the stern (the *sternman)* would paddle to *starboard* (right side).

The parts of a canoe



Some canoes, particularly those used for extended trips, are equipped with a yoke across the center of the boat. It is designed to allow one person to carry the canoe, and is sometimes molded to the shape of shoulders.

Canoe Safety

Not being prepared for your river trip can be the biggest danger. You should always prepare for just about any type of weather situation you can think of. If you are just planning a days outing make sure you bring a change of warm clothes or a first aid kit. Let people know where you are going and when you plan to return. Always practice common sense when traveling on the river.

Spending an afternoon canoeing can be a fun way to experience nature, get a great workout, and spend time with loved ones. It can also be a dangerous journey, if appropriate safety guidelines are overlooked.

Basic rules:

- You should have solid swimming skills (need to know the intermediate level of swimming honor) and that you should feel comfortable being underwater.
- The importance of wearing safety vests cannot be over-stressed. By law, canoeists must each possess one wearable flotation device. All devices must comply with Federal, State, and local regulations and standards. Life vests must be worn properly. You should wear a life jacket at all times. Be sure the jacket fits snugly and is a vest type.

- Know your skill level. Make sure your canoeing skills are such that you are not canoeing out of control. Know how to stop your canoe to stay out of danger. Although it's tempting to attempt to canoe fast moving waters beyond your ability, it's also dangerous. Never test your limits in unfamiliar waters.
- Make sure you research a river prior to running it. Scout the rapids and make sure you carry plenty of maps and know where possible pull out spots are.
- Wear appropriate clothing. Other canoe safe clothing includes hats, extra dry clothing, towels, and layered items which can easily be removed.
- Always wear shoes. Rocks, rough terrain and river bottoms present serious hazards to boaters without the proper attire. Nearly 90% of all boating injuries are attributed to lack of proper footwear.
- Know the weather forecast. Be a responsible boater by cluing in on the weather forecast. Note sky conditions, air and water temperature and anticipated precipitation. A knowledgeable boater is a safe boater.
- Familiarize yourself with the area. Before beginning to canoe in an unfamiliar area, it's important to familiarize yourself with your surroundings and the area you'll be covering. Maps are often available at county and state parks.

Before you get in the water

- Check out your canoe before you leave home. Check for cracks and wear from the last time you used the canoe. Check the bolts that hold the seats and thwarts into place. They have the tendency to rattle loose when you are transporting the canoe by car. Also remember to secure the canoe properly to your car or trailer.
- Make a checklist and go over it mentally before pushing your canoe to the water.
- Canoes should be equipped with at least two paddles.
- Every canoe should have two lines, a bow line and stern line.
- An extra throw rope (for emergencies) should be stored safely in each craft. Store any loose ropes safely. Loose ropes are deadly. Lines should be tied and wrapped before departing.
- Attach a whistle (or other attention getting device) to your life vest to signal for help.
- Carry a First Aid Kit inside the canoe. Store kits inside waterproof coverings.
- Take a repair kit with you. Include quick repair items like duct tape, sealant, waterproof tape and other materials.

Once you are in the water:

- Know where to sit. When canoeing, it's important to always remain in your seat or on the floor of the canoe. Never sit on the sides of a canoe or stand. Canoes easily tip over with only the slightest movement of weight.
- Never tied paddles. Some canoeists tie paddles to the boat to avoid losing them during a spill. Do not do this. Tied paddles become extremely dangerous if the canoe does tip.
- Strength in numbers. Even the most seasoned veterans never travel alone. Water safety specialists recommend traveling with at least three people in your party or two separate crafts. Also, be certain to let others staying behind know where you're going and when you're expected to return.

Equipment to Bring when you canoe:

- Extra Paddle
- Life Vest - one per person
- Helmet - If you plan to run whitewater
- Swimsuit
- Dry Suit/ Wet Suit (depending on Water temp)
- Wet Shoes - Shoes or sneakers you do not mind getting wet
- Waterproof bags for clothes, matches, maps, first aid kits, wallets, and car keys.
- If you have to portage your canoe keep in mind what you have to carry and how you plan to carry it. A pack with shoulder straps can be helpful.
- Camping Gear

Know what to wear

- Having the right type of clothing can make your canoe trip very enjoyable. The weather can change quickly so it is important to be prepared. Clothing should be functional, not gaudy or loud. Your clothing must stand up to harsh winds, cold rain, voracious insects, and abrasive rocks - and still be comfortable in the sunshine.
- Mid-season (July & August) wear lightweight clothing i.e., a pair of light colored, fast-dry type shorts and light-colored T-shirts.
- Early or late season trips should emphasize warmer items. We recommend a pair of khaki type cotton/polyester blend or nylon long pants. Do not bring blue jeans or other all cotton pants because they dry slowly.
- Perhaps the most important reason to have a lightweight long sleeved shirt is for bug protection.
- It is best if your pants or shorts have deep pockets or pockets with Velcro or snap closures to avoid losing items. Wear shorts only in very warm weather; the extra skin exposure invites insect attack, sun burn and vegetation damage on portages. Convertible pants with zip-out legs to make shorts are nice.

Wilderness Washing Machine:
Fill double-bagged plastic 30 gallon trash bags with an appropriate amount of clothes and water, add a small amount of biodegradable soap and shake the bag to mix. Let stand about a half-hour, then agitate. Wring clothes into the bag and decant at least 150 feet in the woods. Return the clothes for a similar rinsing process.

Rainwear
Breathable rainwear is the best choice but unfortunately its high cost makes non-breathable rainwear a more common choice. It should have adequate ventilation to help rid body moisture from inside the garment. Rain pants should have cuff-zippered legs to make them easier to put on and take off. Quality rainwear is important. Do not use plastic rainwear. Avoid using ponchos because they restrict walking.

Footwear
It is difficult to avoid getting wet feet while embarking or disembarking the canoe, and in the event of a tip over is recommended to have some protection for your feet. Some rocks, roots or objects in the water can create cuts or bruises so we recommend that you wear old tennis shoes that you do not mind to get wet. Bring another pair to walk when you have landed and to let your feet dry.

Each person should have:
Two Full Sets of Clothes
Shorts and T- Shirts
Rain Jacket and Pants
Light Nylon Windbreaker
Bathing Suit (If you plan to swim)
Comfortable Shoes
Insect Repellent, Sunscreen, and Lip screen
Personal Hygiene Items
Brimmed Hat or Visor

Length of the paddle
The rule of the thumb is for you to stand up and bring the paddle in front of you and the paddle should reach to your nose.

1. You need to have the intermediate level swimming honor

2. Demonstrate, first alone and then with a companion, the proper method of:
a) Entering and launching a canoe:
- **From a beach,**
- **From a landing dock or pier**

b) Landing and leaving a canoe
- **On the Beach**
- **On a landing dock or pier**

To enter the canoe, follow these two rules:
First, **stay centered**. When entering or leaving a canoe, keep your weight as close to the centerline as possible. When getting in, put your foot down right over the keel, and bring the second foot beside it. When getting out, keep your trailing foot centered until your other foot is securely planted on the beach, dock, or bottom. And if you stand under way keep your belly-button right over your boat's centerline.
Second, **keep your weight low**. The lower your are, the better your ballast. So, when entering or leaving any canoe, keep your weight down. Plant one foot on the keel, next, reach across the boat with the corresponding hand, grab both gunwales, one in one hand, one in the other. Now swing the other foot in. Settle down in your seat, or drop down into a kneel.

Launching a canoe
From a beach, chose a convenient bank with no more than 12 inches deep, with the bow facing the river bend down and lower your canoe gently into the water, make sure the craft does not float away from the bank and out of reach. Where the bank slopes gently into the water, walk into the water with the canoe. The bow man should enter the canoe first and using his paddle will maintain the balance while the sternman.
From the dock/pier, with the bow facing upstream bend down and lower your canoe gently into the water, make sure the craft does not float away from the dock. The bow man should enter the canoe first and hold it in position while the sternman enters the canoe.
Tied your canoe when loading the gear or when is unattended.

Landing the Canoe
Shallow water landings: Be careful landing a canoe! Many tip-over occur then. It is best to land without bumping into the shoreline to avoid damaging the craft and making noise. The bow person hops out into the water to pull the canoe towards the shoreline, - do not drag the bow upland while the stern person is in the boat or the stern will become tipsy - the stern person should steady the boat with his paddle until the bow person has full control of the boat, with that person's legs straddled over the bow and hands gripping the forward gunwales. Dry foot believers: stern person and

passenger may have to "walk the gunwale"*, to get around packs and equipment in disembarking. The wet foot method, i.e. stepping into shallow water before the canoe has landed, has the advantage of being less noisy, gentler to the canoe, faster and it is easier to heft the packs out of the "higher" canoe as opposed to its relative height on dry land.
Dock landing: To land the canoe in the dock approach the dock and the bow man will exit the canoe first while the sternman will hold the canoe in position. Once the canoe is tied on both ends, the sternman will help to unload the canoe or exit the canoe.

3. Accompanied by examining instructor, demonstrate correctly the following strokes:
a) Bow , b) Diagonal Draw, c) Half Sweep, d) J-stroke, e) Reverse half sweep, f) push over, g) full sweep, h) Combination draw and J-stroke

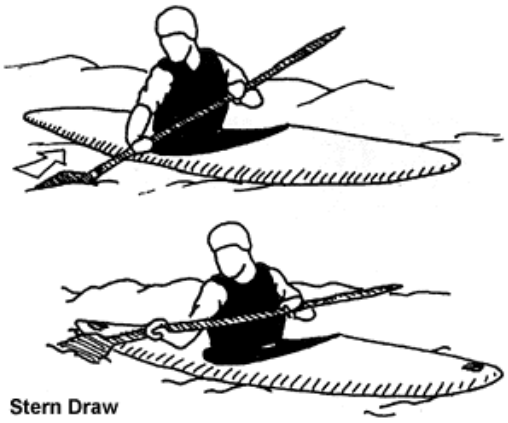
Basic River Strategy
The key is to determine where the momentum of the current is going and decide if that is where you want to go. That boils down to three things: Targeting, Turning and Acceleration. First determine where you want to go; in other words, target your goal. Once you see where you want to go, turn your bow and point it at your target. Then accelerate, keeping your vision on your target. You have to have all three components to successfully put your boat where you want.

River Reading
It refers to being able to look at the different features on a river such as waves, surface water characteristics, river bends, rocks, and current direction and be able to tell where to put your boat to have fun and be safe. It requires two types of vision.

First you want to **open up your vision** and take in the whole picture. Look downstream and upstream and get a feel for the river. Is it moving fast or slow? Are there bends in the river and if so which way? Are there any major hazards or obstructions like trees in the river, big rocks, bridges with pilings in the water? Develop a general plan of how you want to go downstream with these first observations and where you are going to end up at the furthest point you can see.

Second, you want to **narrow your vision down and get more specific**. Can you find eddies to stop in that will break the section of river into a series of smaller sections? Now check out the first section; what specific features can you see in between your first two eddies and so on down to the last eddy.
If you just paddle downstream without having a plan, it would be like driving out of your garage blind folded. And if at any time you are unsure of what's downstream, heed the popular saying, "When in doubt, scout." Get out of your boat and walk downstream to scout for possible dangers or obstructions.

Strokes, strategy and paddling basics.
Many paddlers allow their arms to get out of position when paddling. This leads to one of the most common injuries - a dislocated shoulder. With a paddle in your hand, you can create a lot of leverage on your shoulder joint, should you flip over and your hands get out of position. The weakest position for your shoulder is when your hand moves away from your body with your thumb pointing back and your hand moving behind the plane of your shoulders — the hitchhiker's stance. Put your hand in this position while looking forward and you will immediately feel the strain on your shoulder.


Stern Draw

Keep your hand in this position and imagine a steel rod running horizontally through your shoulders. Now turn your head toward your hand and look at it. This brings your hand back in line with the steel bar running through your shoulders. You are much safer now. Another way to think about it is to imagine a box in front of you, its boundaries formed along imaginary lines coming straight out from your shoulders and hips. To keep your shoulder in a safe position, always **"box in,"** i.e. keep your hands inside this box.

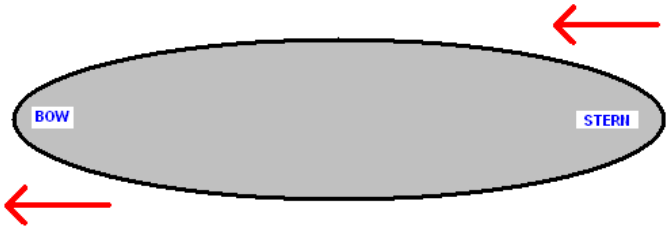
Teach your body to do this, watch the hand or the paddle blade that is doing the work. This requires a lot of flexibility - All the more reason to work on stretching and flexibility. It's necessary to use your upper body when you paddle; compared to the torso muscles, arm muscles are very inefficient. When you paddle, it should feel like you are propelling your boat over the water rather than pushing or pulling water past your boat.

Steering
The paddling action of two paddlers will tend to turn the canoe toward the opposite side that on which the sternman is paddling. Thus, steering is particularly important, particularly because canoes have flat-bottomed hulls and are very responsive to turning actions. Steering techniques vary widely, but the sternman is primarily responsible for steering the canoe, with the exception of two cases. The bowman will steer when avoiding rocks and other obstacles that the sternman cannot see. Also, in the case of back ferrying, the bowman is responsible for steering the canoe using small correctional strokes while back paddling with the sternman.

Among less-experienced canoeists, the canoe is typically steered from the bow. The advantage of steering in the bow is that the bowman can change sides more easily than the sternman. Steering in the bow is initially more intuitive than steering in the stern, because to steer to starboard, the stern must actually move to port. On the other hand, the paddler who does not steer usually produces the most forward power or thrust, and the greater source of thrust should be placed in the bow for greater steering stability.

Paddle strokes

A) Bow stroke - Stroke that exerts the same vector of force as the forward stroke but is done in opposite side of the side that the sternman is paddling. This stroke if done correctly will maintain the canoe moving in straight line.



B) Diagonal (cross) Draw

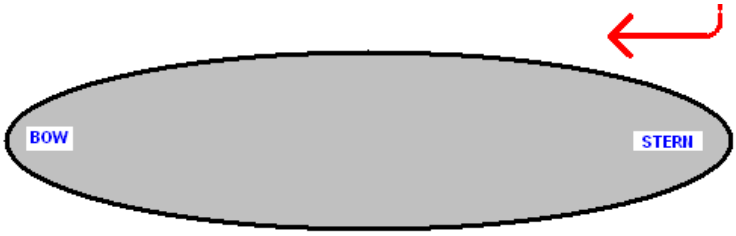
The cross draw seems to be one of the most confusing for people, basically because it feels quite awkward to complete three-quarters the way through. The stroke, which is usually done in the bow but can still be used by the stern paddler, is chosen when the canoeist wants to draw on the opposite side they are paddling on without switching hands.

First, position yourself as if your about to complete a draw. Now, by pivoting at the waist, bring the paddle over to the other side of the canoe without changing the way you are gripping the shaft. Then draw the water towards you. At first you may think it would be easier and quicker to just switch hands and do a draw on the other side of the canoe. But the cross-draw, when done right, is a far better option.

C) Forward –half- Sweep - The forward sweep is used to initiate a turn while maintaining momentum.

The forward sweep turns the canoe away from your paddling side. Place the paddle blade alongside the canoe, as if your about to complete a forward stroke. Now sweep the blade wide in an arc, forming a giant "C" in the water. The more forward you begin the sweep and the further you end it will determine the turning ability of the stroke.

D) J-stroke, Advocates of steering in the stern often use the J-stroke which is so named because, when done on the port side, it resembles the letter *J*. It begins like a standard stroke, but towards the end, the paddle is rotated and pushed away from the canoe with the power face of the paddle remaining the same throughout the stroke. This conveniently counteracts the natural tendency of the canoe to steer away from the side of the stern man's paddle.

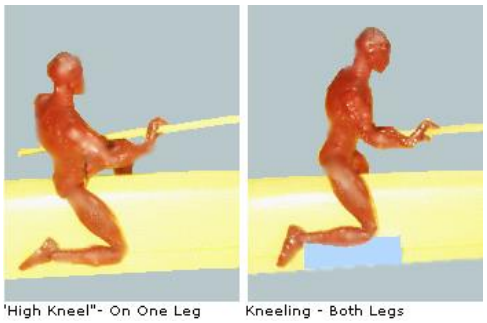


E) Reverse –backward- sweep is the exact opposite direction of the forward sweep and will propel the canoe in the opposite direction. This stroke slows speed and reduces maneuverability, yet in certain situations can be quite handy, especially when you get spun upstream by a wave or eddy line and want to turn your boat back around to avoid going backwards. The starting position is the same as the finished position for the forward sweep or stern draw. So, if the bow person does a forward sweep and the stern person completes a back sweep, the canoe will go in circles. The same goes by combining other strokes to move the canoe side to side, like a draw at the bow and a pry at the stern or a cross-draw at the bow and a draw at the stern.

F) The pry (push over) stroke is similar to the draw, except instead of pulling the paddle blade toward the canoe you pry it away. It also forces the canoe in the opposite direction. So, if you pry on the right side of the canoe, it will go left. Therefore, by combining draws and prys you can move quite effectively without switching sides.

H) Draw Stroke - This stroke slides the boat sideways. It is very convenient for moving over in an eddy or to position your boat for a ferry or peel out. The advantage of the draw stroke is to be able to move your canoe effectively sideways and away from approaching obstacles. It is therefore no surprise that the bow person must become proficient with this stroke more than the stern paddler. To produce a proper draw place the paddle on the side you want to travel, with the blade facing to the canoe. By reaching outwards, plunge the blade into the water and push or "draw" the water towards you. If you are drawing on the right side of the canoe, the canoe will ultimately go right. Once you become an expert with this stroke, you can then advance by keeping the blade in the water after it had reached the canoe, turn it perpendicular, and knife it through the water to repeat your draw.

4. Alone and with a companion in both the bowman and sternman, a straight course for 100 yard. Turn right about, and left about. The paddle should be kept always on the same side of the canoe.
Demonstrate two kneeling positions for paddling


'High Kneel"- On One Leg Kneeling - Both Legs

5. Demonstrate with a canoe the rescue of a companion who has capsized his canoe offshore by:
a.) emptying the swamped canoe of water by driving it upside down the gunwales of the rescue canoe.
b.) launch the rescue canoe again
c.) Steady the canoe while companion climbs aboard.

Canoe Rescue
If the canoe capsizes, stay with it (it floats!) and capture any floating items. Either stay in the swamped canoe and paddle it to shore or swim along side the craft and push it in.
When you are able to touch bottom turn the canoe over and lift it out of the water. Exception: in icy water when help is not imminent, leave the canoe and swim to shore, if the shore is nearby (death can occur in 15 minutes in 32 degree water).

If the craft flips too far from shore to make the occupants self rescue impractical then perform a canoe-to-canoe lift.

- Transfer the packs and paddles into a rescue canoe(s).
- The submerged canoe is turned “belly side up” and perpendicular to the rescue canoe, bow first.
- While a second rescue canoe hand attaches gunwale-to-gunwale with the first rescue canoe for more stability,
- One former occupant, already in the water, pushes down on the submerged craft's stern as one strong person in the rescue craft lifts its bow and drags the waterlogged craft over the top of the two (preferably) locked together rescue canoes.

- After the water has drained from the rescued craft flip it and return it to the water. Again lock gunwale-to-gunwale with it and the rescue canoe.
- Assist the dunked paddlers reoccupation. Sometimes is easier to move the canoes together and while one person in the water holding the canoe the other jump inside, then that person can assist the other person in the water to get back in the canoe.

- Once they are in the canoe, give them their gear and the paddles, assist them if necessary to get to shore.
- If they had a cut or bruises provide them with first aid.
- Because such mishaps can occur at any time always wear your life jacket while on the water and strap the packs in.

6. Jump out a canoe in deep water and get back in again in the proper form without shipping water.
If the canoe is empty, grip the left gunwale with the left hand, and the opposite gunwale with the right hand, then lean the canoe towards you. Throw your body weight into the canoe and in the same time give a strong scissor kick with your legs and then lie forward along the deck. Slide into your seat and resume normal paddling position.

7. With clothes on a) Capsize a canoe in deep water. b) Right canoe and stow paddles and kneeling pad. c) Get in canoe filled with water and paddle with hands or paddle for 25 yards. d) Disrobe, stow clothes and paddle, go overboard, hold on to bow of canoe with one hand, swim and tow swamped canoe to shore. e) Empty canoe properly and land it.

8. Fully satisfy the examiner of a thorough knowledge of safety rules which will make the candidate a safe canoeist and compete to take others out in a canoe. Promise to observe these rules at all the times.

9. Explain how to do the following emergency repair work:
A) Repairing a one-inch hole in fiberglass, canvas and aluminum canoe.
B) Repairing a broken paddle shaft.
No matter what material your canoe is constructed from, some day it will need of repair. Every canoeist should carry a repair kit to suite the material of his canoe.

Field repairs

1. Locate the hole. If it isn't obvious, dry off the canoe bottom, put water in the canoe and watch to see where the water escapes.
2. Small holes can be temporarily patched with duct tape. For the best adhesion, make sure the repair area and the tape are warm.
3. For a leaky seam, try a favorite old-timer's trick: Using a small stick, apply pine pitch along the leak. Pine pitch, the sticky gum found on pine trees, is extremely durable and waterproof.

Permanent repairs

Dry the canoe thoroughly. Remove any dents around the damaged area if possible. Dents in plastic or aluminum canoes are sometimes pushed out from the inside.
For Fiberglass canoes

1. Using a pair of scissors cut a piece of fiberglass cloth slightly larger than the repair area.
2. Mix fiberglass resin and hardener in a paper cup according to the manufacturer's directions. Stir well with a wood strip such as an ice-pop stick.
3. Coat the repair area with the resin mixture. Place the fiberglass cloth over the repair area. Saturate the cloth with the mixture. Smooth the cloth with a wood strip to remove any air bubbles caught underneath it.
4. Watch for the resin mixture to become firm. Be prepared to trim any excess cloth or mixture with a sharp knife before the repair is fully hardened.

5. Smooth the repair with sandpaper once the mixture has hardened completely. Start with 100-grit paper to remove the roughest sections, then use 220-grit and finally finish with 400-grit.

For Canvas (or vinyl) canoes

1. Using a pair of scissors cut a piece of canvas cloth slightly larger than the repair area
2. Apply adhesive to the canoe and then the patch material,
3. Allow to dry before pressing the patch into position.
4. A ply canoe may require a patch placed inside the canoe as well as an external one.

For Aluminum canoes

1. Use a hammer to try to close the hole
2. Use a torch and welding material to repair
3. In most cases you have to re weld the area
4. Sand the area

Broken paddle shaft

1. Remove the shaft from the grip neck. Be careful not to remove any carbon material from the grip neck.
2. Remove old glue by sanding or by filing.
3. Lightly sand the inside of the shaft reaching down about 1-2 inches. Taper the inside top of the shaft in a flannel-like fashion, so the shaft is thinnest closest to your cut edge.
4. Clean the sanded material out of the shaft.
5. Cover the portion of the grip that will be inserted in the shaft with an epoxy glue. Devcon 5-minute epoxy works well. Insert the grip into the shaft and push it in firmly.
6. Wipe off excess glue. Line the grip up with the blade.
7. Allow the glue to dry before using it.

Additional Information

How to Choose Canoes

Canoes offer an easy, traditional way of experiencing the outdoors. Although designs and materials have been refined over the years, modern canoes still evoke memories of the functional boats used by Native Americans and early wilderness explorers. If you want to glide swiftly across a quiet lake or float slowly down a lazy river, try a canoe. The following clinic will familiarize you with the basics of canoe design. Once you're familiar with shapes and materials, it will be easy to choose just the right canoe for you.

First, Consider Your Paddling Plans

Keep the following questions in mind when choosing a boat:
What kind of paddling do you have in mind — general recreation, flat water touring, river touring or whitewater paddling?
What kind of trips do you want to take — day trips, weekend tours or weeklong excursions?
How many people do you paddle with?
How much gear do you want to bring along?
Choose a Canoe Type
Recreational Canoes
Fun and easy to paddle, recreational canoes are perfect for flat water paddling. Stable, easy to control and tough to flip over, they're ideal for birding, photography, fishing and general paddling. Because they are so stable, they aren't as agile as other canoe styles.

Versatile/Multi-Purpose Canoes
Canoes in this category are built to handle everything from calm lakes to whitewater rivers. In general, they offer greater maneuverability and more capacity than recreational boats. Included here are high-volume "tripping" canoes, designed to handle big gear loads and extended trips.

River Canoes
River canoes are designed specifically for paddlers who love the challenge of running rapids and negotiating rivers. They're impact- and abrasion-resistant, with high sides to deflect splashes. Lots of rocker (end-to-end curvature) enhances maneuverability.
Size
Length, width and depth have the most effect on a canoe's overall performance. These 3 measurements help determine the best use and the carrying capacity of a particular canoe.

Length
Once you get them up to speed, longer canoes are easier to paddle over long distances. They also stay on course better and hold more gear.

Shorter boats weigh less, are less affected by winds and are easier to maneuver and transport. They can take you places larger boats don't fit, such as narrow streams and inlets. Canoes in the 16 foot to 17 foot range are among the most popular. They offer a great combination of speed, manageability and carrying capacity. For long touring trips, consider a boat at least 17 feet long for greater stability.

Width (Beam)
In general, the wider the boat, the more stable. The narrower the boat, the more efficient and easier the paddling. Narrow boats are slightly more "tippy", but they tend to be lighter and easier to keep on a steady track.

Depth
Depth is the distance between a canoe's gunwales (side rails) and the bottom of the boat. Deep boats have tall sides, which help keep water out while increasing carrying capacity. The taller the sides, though, the more the canoe will be affected by wind. Shallow canoes are less susceptible to wind, but are more apt to let water in.
Other Design Features
The shape of the hull and other design features can affect the stability and maneuverability of a boat in the water. Stability is divided into 2 types. "Initial stability" means the boat is stable when resting flat on the water. "Secondary stability" means the boat resists tipping in rough water.

Hull Shape
There are 4 general hull shapes to consider, but the differences can be subtle, so it's often hard to categorize a boat.
Flat canoe bottoms provide excellent initial stability. They're perfect for flatwater paddling and general canoeing fun. Flat-bottom boats tend to turn easily (since very little of the hull is below the water line), but they can be slow when fully loaded with gear.
Canoes with rounded bottoms provide little initial stability, but they offer excellent secondary stability. They're slow to tip over in rough conditions. Rounded hulls are designed for speed and efficiency through the water. They are usually found on specialized, high-performance canoes.
Shallow-arch bottoms provide a compromise between flat and rounded bottoms. They offer decent initial stability and very good secondary stability. They're more efficient through the water than flat-bottom boats, and they stay on track better.
V-bottom hulls have a slightly more pronounced centerline or "keel" than shallow-arch hulls. They provide a good mix of initial and secondary stability, with even better tracking and maneuverability than shallow-arch boats.

Rocker
The amount of upward curve in the hull of a boat from end to end is called the rocker. The shape is best compared to the rails of a rocking chair. Canoes with a lot of rocker are easier to turn and maneuver, but harder to keep on track when paddling in a straight line. Canoes with little or no rocker track better and move faster through the water. Most canoes fall somewhere in between.

Side Shape
Canoe sides that flare out shed waves and enhance stability when paddling with heavy loads. Inward curving "tumblehome" sides make it easier to reach the water, but they can let water in when paddling in rough waves. Canoes with a lot of tumblehome have less secondary stability. Straight canoe sides offer a compromise between these two styles.

Freeboard
Freeboard is the distance between a canoe's gunwales (side rails) and the water line. A higher freeboard keeps you drier in wind and waves, but makes you more vulnerable to side winds. Lower freeboard has the opposite effect.

Entry Line
The shape of a canoe's hull where it cuts through the water is called its entry line. Sharp entry lines slice through the water efficiently for better speed and easier paddling. Blunt bows ride up slightly on incoming waves to keep water from slipping over the gunwales — perfect for rough-water paddling.
Consider the Materials
The best materials offer a balanced combination of weight, strength and cost. The lighter the weight, the easier the canoe is to transport and maneuver. The more durable the boat, however, the heavier it is. Think about what's most important to you. If you're constantly portaging, weight should be a big consideration. If you're parking next to the put-in, weight's not a big factor. See below for general characteristics of several canoe materials.

CrossLink3™
Designed exclusively for Old Town Canoe's Discovery™ series boats, this ultra-durable, ultra-springy material bounces back from impacts. Strong, resilient CrossLink3 is made from a layer of closed-cell foam sandwiched between 2 layers of high-density polyethylene. It has so much inherent flotation that Discovery canoes float even when full of water.

PolyLink3™
Another Old Town Canoe exclusive, PolyLink3 is durable, affordable and exceptionally stiff (the stiffer a hull, the more efficient it is through the water and the less additional structural support it needs). Made of a foam core sandwiched between 2 layers of rotomolded linear polyethylene, PolyLink3 is lightweight and responsive.

Fiberglass
Fiberglass canoes are known for their stiffness and their sharp entry/exit lines, which offer excellent efficiency in the water. Fiberglass construction involves layers of woven fabric bonded together with polyester resin. An outer gel coat is typically applied to fiberglass boats to enhance abrasion resistance.

Kevlar®
Kevlar canoes are stronger than fiberglass, and about 25% lighter. This can make a big difference on long trips and long portages, but you'll pay for it! Kevlar canoes are among the priciest available. Built like fiberglass hulls, layers of woven Kevlar fabric are bonded together with special resin.

Royalex®
Royalex is an exceptionally abrasion- and impact-resistant material that springs back from hard collisions. It provides excellent insulation from cold water, and is quiet to paddle. Royalex consists of a closed-cell foam core sandwiched between layers of ABS plastic, then topped off with a tough, vinyl skin.

Royalex® Lightweight (R-Light)
This substance offers a balance between light weight and durability. It can shave up to 10 lbs. off the weight of a canoe! Manufactured with the same materials as Rolayex, this weight-saving version differs in the placement and amount of reinforcing materials.
Don't Forget the Extras
Number/Position of Seats — Most canoes have 2 seats, although some solo models have just 1. Seats should sit low enough in the boat for stability, but high enough for comfortable kneeling.
Type of Seats — Woven cane seats are tough and durable, plus they let water drain to keep you dry and comfortable. Woven plastic seats work the same way, but require less upkeep than cane. Solid plastic seats are more durable, but they don't allow air to circulate, so water won't evaporate as quickly. If you prefer plastic, molded models offer more comfort than flat benches.
Thwarts — Thwarts are the wood, fiberglass or aluminum struts that brace the sides of the canoe and provide support, stability and shape. If you plan on portaging your canoe, look for a center thwart shaped for comfortable carrying. Also, make sure it's positioned so the canoe is easy to balance.
Gunwales — Gunwales (pronounced "gunnels") are the side rails running along the top edges of the canoe that reinforce it and provide a convenient place to grab hold. Gunwales should be strong because they take a lot of abuse. Look for smooth edges to protect your hands and paddles from wear.

Wood gunwales are attractive, easy on the hands and quieter than other materials. They're also tough, flexible and repairable, but they do require regular maintenance. Vinyl gunwales are less expensive and more durable than wood gunwales, and they don't require special care. Aluminum gunwales are also tough and maintenance-free, but they can be loud when you hit them with your paddle. They're also difficult to repair if damaged.
Take a Test Drive
If possible, after you've narrowed your choice down to 2 or 3 models, take them for a test drive. It's the best way to choose a canoe. Check out your local REI store — some of them let members demo boats for free. You could also borrow from a friend or attend a symposium where manufacturers let you test gear. Local paddling clubs are a good source of information for these types of events.
How to Choose a Canoe Paddle
Dreaming of exploring a series of lakes in the Boundary Waters Wilderness? Or is a fast-moving, heart-racing run down whitewater rapids more your style? Either way, if you want the perfect adventure, you'll need the right paddle! Don't know what's right for you? REI can help you choose. With the proper paddle, you'll canoe more efficiently and tire less easily, making your time on the water more enjoyable.
First, Determine the Proper Length
Contrary to what you may have heard, standing height is not an accurate way to size a canoe paddle. Since you sit while boating, the best way to choose a paddle length is to sit — either in a canoe or on the floor. Most flatwater and whitewater canoeists will require a paddle in the 52" to 60" range, but lengths vary to fit paddlers of all sizes. Bent-shaft paddles are shorter overall, with common lengths of 48" to 54". There are several ways to determine which length is right for you.

At Home
Kneel down with your seat about 6 inches off the floor, as if sitting in a canoe. Measure from the floor to your nose. Add this measurement to the blade length (included in our online specification chart). The total is the correct overall length for your paddle.

In the Store
Kneel down with your seat about 6" off the floor, as if sitting in a canoe. Hold the paddle upside down, with the grip on the floor. If the paddle length is correct, the blade should start right about even with your nose.

On the Water
Sit in your canoe and measure the vertical distance from your nose to the water. Add blade length to get the correct overall paddle length for you.

Fine-Tuning Fit
If purchasing a bent-shaft paddle, follow the above instructions, but deduct 2" to 4" from the length.

Canoe width affects length. In a wide canoe, a longer paddle allows you to reach the water without stretching or straining. A paddle that's too short requires extra effort to get the whole blade in the water, making it difficult to propel the boat.
If you're buying for a child, consider a paddle made especially for children. Besides having shorter lengths, they're built with narrower shafts and T-grips, which are easier for little hands to control.
Choose a Material
The less a paddle weighs, the less fatigue you'll feel during a long day of canoeing. But don't choose a paddle based on weight alone — the best paddles offer a good balance of light weight, strength and flexibility. For whitewater canoeing, a strong, stiff paddle will hold up to the rigors of the river and provide a quick response in rapids. For flatwater canoeing, a flexible paddle helps absorb shock with every stroke.

Wood
Wood is by far the most popular material for canoe paddles. It transmits the feel of the water well, and it flexes slightly to absorb shock. It also retains warmth, so hands stay comfortable in cold conditions. Many wood paddles have a layer of fiberglass over the blade for added strength and/or have a tip guard to improve durability and help resist abrasion. Some upkeep, such as sanding and varnishing, is required to maintain its appearance. Hardwoods (such as ash and maple) and laminates that include hard and soft woods are more durable (and more expensive) than those made only from soft woods.

Fiberglass
Lightweight, durable and virtually maintenance-free, fiberglass paddles can be more expensive than those made of other materials. The nature of fiberglass allows manufacturers to design and build paddles with precision, adding specific amounts of flex or creating complex blade shapes for casual or competitive use. Whitewater canoe paddles are often made of fiberglass.

Aluminum Shaft/Polyethylene Blade
Durable and economical, paddles with aluminum shafts and plastic blades are heavier than paddles made from other materials. Aluminum shafts can feel cold in cool weather, and often feature a vinyl or foam pad where your hand grips the paddle. They make great spare paddles, and can be a good choice for beginners. Blades are made from a variety of plastics, including polyethylene, polypropylene, thermoplastic and ABS.
Blades
Blades vary in width and length. A large, wide blade will power you through the water quickly, but each stroke requires a lot of energy. A small, narrow blade is easy to paddle and more efficient over a period of time, but your stroke will not be as powerful. Some specialized paddles designed for flatwater cruising feature long, narrow blades, which offer a fairly good balance of power and efficiency for this type of canoeing. Not sure what size to get? Paddle blades measuring 8" x 20" are most common and are a great choice for most canoeists.

Something else to consider: Square-tipped blades can catch in the water and throw a paddler off balance. Beginners may want to consider rounded blades, which are more forgiving.
Grip Shape
The 2 most common shapes on canoe paddles are the palm/pear shape and the T.
Many flatwater paddlers will choose a pear grip for comfort and control. The shape fits naturally into the palm of your hand and is comfortable for long hours on the water.
The T-grip is the preferred shape for whitewater paddlers and some flatwater paddlers. It allows for more control over the angle of the paddle blade and it's easy to hang onto in rough water. Children's paddles usually feature a T-grip because it's easier for small hands to hold.
Don't Forget the Shaft
Shafts are available in 2 styles: bent or straight.

Straight
Traditional canoe paddles have straight shafts. These are a great choice for all-around paddling. Whitewater canoeists almost always prefer them, as they allow a variety of maneuvering and bracing strokes. This is important when you need to steer around rocks or plow through rapids on a river.

Bent
Bent shafts help position the blade for maximum efficiency on flat water. The bend in the shaft helps the blade remain vertical in the water during the most powerful part of your stroke. It also helps the paddle enter and exit the water smoothly. Angles range from about 7 to 14 degrees. Smaller angles are not as efficient for long-term paddling, but they allow a greater variety of strokes. For multi-day tours of continuous paddling, consider a larger angle.

Shape
Shafts can be round or oval in shape. Oval shafts offer a more comfortable grip than the traditional round shape. Some round shafts feature an oval section for better grip. This is called oval indexing.
Carry a Spare
If you lost your paddle on day 3 of a 5-day canoe trip, what would you do? What if it broke in the middle of a whitewater run? Without a spare, you might literally find yourself up a creek without a paddle. An aluminum-and-plastic paddle makes an inexpensive spare that could save you a lot of time and grief should the unexpected happen, even if you're only out for a day trip.
Try Them Out

The best way to choose a paddle is to try one out. Check out your local REI store — some of them let members demo boats and paddles for free. You could also borrow from a friend or check with a local paddling club about renting. After you purchase a paddle, try a dry run. Kneel on the floor and practice paddling. Is the paddle long enough? Is it light enough for extended use? Is the grip comfortable in your hands? If so, you're ready to hit the water. Have fun!

How to Choose Storage Bags

Ever eaten a soggy sandwich or put on a pair of damp sneakers after a day of paddling? Chances are, you didn't have your gear properly stowed. Water can work its way into your canoe or kayak via rain, waves, paddle drips or capsizes. To keep gear dry, it should be stuffed in a waterproof bag or container before it's stowed on your boat.

Basic Storage Options

On day trips or quick overnights in warm, dry weather, consider the following basic storage options:

Rucksacks, Day Packs and Duffel Bags

Almost any general equipment bag can be used to store and haul gear. Bags made of water-resistant materials should be lined with plastic trash bags for added protection.

Shoulder straps on packs and duffels leave hands free during portages so you can carry more gear and make fewer trips. Pockets and compartments help keep small items organized, but are harder to line with plastic bags. Very large bags may not fit inside your boat, especially if you're paddling a kayak, so test the fit before you leave home.

Nylon Stuff Sacks

Basic nylon stuff sacks keep gear and clothing safe from occasional splashes and drips. They also help organize small items such as clothing, food and camping gear inside larger packs or dry bags. Nylon mesh bags are great for storing wet gear.

Plastic Bags

Plastic bags form the backbone of most short-trip storage systems. They're lightweight, versatile and inexpensive — and they come in a variety of styles.

- Resealable bags — Zip-top plastic bags are indispensable to paddlers. They're watertight, come in a variety of sizes, and are easy to open and close. Keep a supply on hand, especially the tough, freezer bag variety, for everything from food to socks.
- Basic trash bag liners — Common kitchen trash bags are useful for bigger waterproofing jobs — like lining non-waterproof day packs or duffel bags.
- Heavy-duty plastic bags — Thick, durable and tear-resistant, these bags withstand heavy abuse. Included here are trash compactor bags, asbestos-removal bags and plastic liners designed specifically for paddling. They turn almost any durable container into a temporary dry bag.

Waterproof Storage

In cold, wet weather or on longer overnight trips, it's even more important that your gear stays dry.

Dry Boxes

These hard-shell cases keep equipment safe from impacts and come in a variety of shapes and sizes to fit everything from sunglasses to cameras to cell phones. Some feature foam padding for added protection. O-rings provide a waterproof seal.

Dry Bags

Dry bags are tough, waterproof storage sacks made of coated nylon or PVC (a durable, rubberized fabric). They come in a number of different styles and sizes, from large backpack-sized models with built-in shoulder straps to simple, clear-plastic sacks designed to keep small items dry.

Most dry bags are sealed by rolling the collar of the bag down upon itself (as many times as possible), then buckling it closed to seal out water.

Cases and Pouches

Mini cases, chart holders and inflatable bags protect wallets, maps and other valuables from water. Some are designed to float in case they go overboard. Many of these are small enough to stash in a larger waterproof or water-resistant bag.

Kayak and Canoe Bags and Packs

Whether you paddle a canoe or kayak, there are storage containers designed specifically to fit your boat.

For Canoes

Duluth Packs are tough, heavyweight canvas bags designed to fit inside canoe hulls. These highly water-resistant, soft-walled packs (they have no internal frame) feature roomy, top-loading storage compartments that swallow lots of gear, plus convenient shoulder straps for easy carrying during portages. Duluth packs come in a variety of styles and sizes. Most canoeists line their packs with plastic liners for added water protection.

Modern soft packs/portage packs combine the best features of traditional Duluth-style packs with improvements such as waterproof fabrics, reliable closures and comfortable suspension systems. Some have built-in frames. Most are top-loaders, with single storage compartments designed to hold lots of gear. They are conveniently shaped to fit inside your canoe.

Thwart and seat packs are small- to mid-size storage bags that attach directly to the thwarts or seat braces in your canoe. They're designed to keep small essentials such as maps, compasses, sunscreen and water close at hand and off the floor of the canoe.

For Kayaks

Deck bags attach to the deck of a sea kayak. They allow easy access to lip balm, maps and other gear you want to access while on the water.

Choosing the Right Storage Options

When deciding what kind of storage containers you need, consider the following:

Packing your gear into a number of smaller bags (instead of a few large ones) will make finding specific items much easier. It will also help you distribute weight more easily throughout your boat.

Packing your gear in a few large bags means less carrying during portaging.

Make sure the bags or box will fit into your kayak or canoe. Long, narrow dry bags will fit in the narrow bow and stern sections of a kayak.

Be sure important items like clothing, sleeping bags and food are protected from water in reliable, watertight storage bags.

Packed dry bags and boxes can replace float bags in your kayak only if they are airtight, and only if the items they're filled with don't weigh more than the water each bag displaces. In other words, keep it light!

Paddling Safety and Rescue Gear

Whether you paddle for relaxation or adrenaline rushes, the ultimate goal is to have fun. Being prepared allows you to deal quickly and effectively with an unexpected emergency and continue to enjoy your trip. The same circumstances just might ruin an unprepared paddler's day.

The minimum paddling safety gear includes personal flotation devices and flotation bags for kayaks and canoes.

Gear for self- and assisted rescues, including tow lines, paddle floats, pumps and bailers should always be on board.

In all but the calmest conditions or near shore, paddlers should also carry communication equipment such as radios, horns and flares

Basic Safety Gear It's simple: Paddlers equipped with protective gear face less danger if they capsize than those who go without it. The bare minimum of safety gear for paddlers includes:

PFDs

Personal Flotation Devices (PFDs) are essential paddling safety items. They provide buoyancy to keep your head above water if you capsize. They can also make bracing, rolling and rescues easier by adding extra upward force when your upper body is in the water. In cold conditions, PFDs also provide an extra layer of insulation.

The United States Coast Guard requires that every boater carry an approved PFD. Make sure you wear yours at all times while paddling. They can be extremely difficult to put on after you capsize, especially if conditions are rough and you're already occupied trying to hold on to your boat and paddle.

Flotation Bags

Flotation bags minimize the amount of water that collects in canoes and kayaks, preventing them from sinking if capsized. The bags are more commonly used in whitewater kayaks; sea kayaks usually have built-in bulkheads that trap air at the bow and stern. Attached at bow and stern and sometimes in the center of canoes, the air-filled bags keep boats riding high over rocks and prevent swamping. Some bags are split in design, meaning that two bags fit lengthwise on either side of the bow or stern, allowing other gear bags to fit in between.

Sea Socks

Sea socks are waterproof cockpit liners used on boats with open cockpits, (in other words, without bulkheads.) Attached to the inside of the cockpit coaming, the sea sock creates a sort of bulkhead in the front and rear of the cockpit. It limits the amount of water that can enter your kayak if it capsizes. Sea socks, however, can get uncomfortably warm in warm-weather conditions.

Sponsons

Sponsons are inflatable flotation devices that attach to the outside of a canoe or kayak. They are typically used in pairs, one on either side of the boat.

Spray Skirts

Spray skirts are waterproof barriers that keep waves, rain and spray from entering a kayak. They cover the area between your waist and the kayak's cockpit coaming or rim. In all but the calmest, warmest conditions, you should wear a spray skirt. Water in your boat (whether from rain, waves or drips from your paddle) can soak your clothing, ruin your lunch and even make you unstable. Spray covers are removable waterproof barriers designed to keep water out of canoes in rough or rainy conditions. These covers, which snap or hook onto the edges of the canoe and stretch across the open hull, help keep the paddler and equipment dry and help keep the boat floating higher in the water. Spray covers come in a variety of styles and are considered optional equipment by most canoe campers. On adventurous journeys in rough conditions or wet weather, however, they should be considered basic safety equipment.

Helmets

Helmets are essential safety gear for whitewater kayakers and surf kayakers who may be suddenly thrown out of their boats in shallow water or in rocky areas. They should fit comfortably and fasten securely under the chin. Some styles, typically used for whitewater tricks, feature the extra protection of a face mask.

First-Aid Kits

Of course, every paddling group should carry a first-aid kit. Paddling-specific kits are available, but your own homemade kit with the proper contents can be used as well.

Store your paddling first-aid kit in a clearly marked, waterproof bag (or box) in an easy-to-access spot in your boat. Medical emergencies demand quick responses; you don't want to have to dig through gear to find your first-aid supplies.

Rescue Gear

Even the most prepared paddlers encounter unfavorable conditions that can result in mishaps. Knowing how to rescue yourself and other capsized paddlers is essential to safe boating. Wise paddlers carry and know how to use the following rescue gear:

Paddle Floats

After a capsize, a kayaker can reenter the boat either with the assistance of another paddler or, if no one is close enough, by performing a self-rescue. A paddle float is the swimmer's best means of getting back into the boat alone.

Attached to the blade of the kayak paddle, the paddle float creates an outrigger to stabilize the kayak for re-entry. The swimmer puts the float over one blade (inflating it first, if bladder style). He or she then slides the other blade underneath the deck bungies (heavy elastic cords) behind the cockpit. Using the now-floating paddle blade for support, the kayaker hoists him- or herself onto the kayak deck and slides into the cockpit. There are two basic styles of paddle floats available to kayakers.

Foam—These paddle floats are constructed of a block of closed-cell foam covered with nylon. The paddle blade is inserted into an outer sleeve, and the paddle is secured at the shaft with a nylon strap. Because of their quick assembly and possibly shorter time spent in the water, some paddlers prefer to use foam floats.

Inflatable—Inflatable paddle floats are typically made of urethane-coated nylon. The paddler blows up an air bladder with a few puffs of air through a one-way valve, then proceeds with attaching it to the paddle as described above. Inflatable paddle floats offer better flotation than foam floats, making them a better choice for larger paddlers, but they require more time spent in the water to set up.

Along with a paddle float, some kayakers choose to have the assistance of a stirrup—a length of webbing tied in a loop and fastened around the cockpit coaming. It's fashioned long enough to serve as a step up into the kayak. Stirrups can be made out of climbing webbing.

Bilge Pumps

After a paddler has reentered the boat, the water collected inside must be emptied. A means of removing water is essential safety equipment for paddlers. For canoeing, a bailer (which can be as simple as a milk jug with the top cut off) is standard gear. For sea kayaking, it's a bilge pump.

The most popular type is the inexpensive hand pump. This short tube with pump handle pulls water up and overboard with very little effort. It features a foam collar to prevent it from sinking if dropped overboard. Electric and foot-operated bilge pumps can also be installed in most kayaks, though they are far more expensive than simple hand pumps.

The most popular type of bailer is the simple sponge. Sponges are easy to use, cheap, and they can be stored just about anywhere. Plus, they're great for sopping up small pools of water that other bailing devices cannot collect.

Tow Lines

Tow lines assist paddlers who are tired or injured. One end is attached to either the cockpit coaming (rim) or the waist of the towing paddler, and the other is clipped to the boat being towed. Some tow lines are also equipped with bags that allow them to be thrown to a capsized paddler.

Throw bags

Throw bags are more typically used in whitewater or moving water situations, but sea kayakers carry them as well. If a boater capsizes, those on shore or in another boat can throw the bag (containing its coil of floating polypropylene or Spectra® rope) for the swimmer to catch. They can then pull him or her to safety.

Paddle Leashes

A paddle leash prevents your paddle from getting away from the boat—particularly important if you capsize. Leashes are typically made of elastic cord and attach to the boat in front of the cockpit. On sea kayaks, they are usually long enough to allow the paddle to be used as an outrigger with a paddle float.

Knives

Knives are necessary for cutting lines or straps. They are especially important in river rescues where a paddler can become entrapped in debris by the force of the current. The best have corrosion-resistant, stainless-steel blades. Blunt-tipped blades allow prying and prevent accidental punctures of inflatable kayaks or rafts. Knives with sheaths are easily attached to your PFD for quick access.

Communication Equipment

Communication equipment includes any gear used to make contact with other paddlers or vessels. It typically consists of radios and signaling devices.

Radios

Paddlers carry radios primarily to stay informed about the weather. When exploring the wilderness for days (or even weeks) at a time, weather patterns can change quickly. It is important to have a way to keep up with approaching conditions.

A number of compact, durable, weatherproof radio receivers are designed specifically to pick up around-the-clock weather updates.

Other types of paddling radios include two-way VHF transceivers, which can be used to pick up weather reports and talk to other marine vessels, and EPIRBs (Emergency Position Indicating Radio Beacons).Once activated, EPIRBs send out emergency signals to monitoring agencies like the Coast Guard. These radios are more expensive than basic receivers and are more suited to paddling expeditions than short trips.

Signaling Devices

Signaling devices are items used to attract the attention of individuals who are too far away for voice communication. Your signaling equipment should reflect the specifics of your trip. For example, a loud voice, a brightly-colored PFD and a few pre-determined hand signals will take care of most short inland trips. But you may need a larger collection of signaling devices for long voyages, large bodies of water or challenging paddling conditions.

Because there's always the chance of becoming separated from your boat, it's good practice to carry a signaling device clipped to your PFD.

Basic Signaling Options

Hand Signals—Hand signals can be used any time paddlers are within sight of one another. A basic system of three or four messages ("need assistance," "gather up," "emergency") will take care of most communication needs.

Whistles and Horns—These are useful when paddlers are within sight but not near enough for voice communication. They're inexpensive, easy to carry and use—and they're effective both day and night. Many paddlers consider whistles and horns to be standard paddling gear.

Flashlights and Strobes—Flashlights and strobes can be used to attract the attention of other paddlers and other vessels, especially in low-light situations. They can also be used to send specific messages (Morse code).

Signal Mirrors—Signal mirrors are best for situations when assistance is needed from farther away. They are easy to carry and easy to use, but are effective only during the day when the weather is clear.

Flares—Signal flares are among the most effective and most commonly used "long-distance" signaling devices. Easy to use and carry, they can be used to attract attention across a wide area. They're effective both night and day, even in adverse weather.

Dye Markers—Dye markers are designed primarily to draw the attention of airborne searchers. They're effective only during daylight hours, and they can be difficult to see from the water's surface. Dye trails are also extremely vulnerable to rough water conditions.

Emergency Flags—Brightly colored emergency flags are designed to draw the attention of nearby paddlers or vessels. They are compact and easy to use, but they are effective only during daylight hours when conditions and visibility are good.