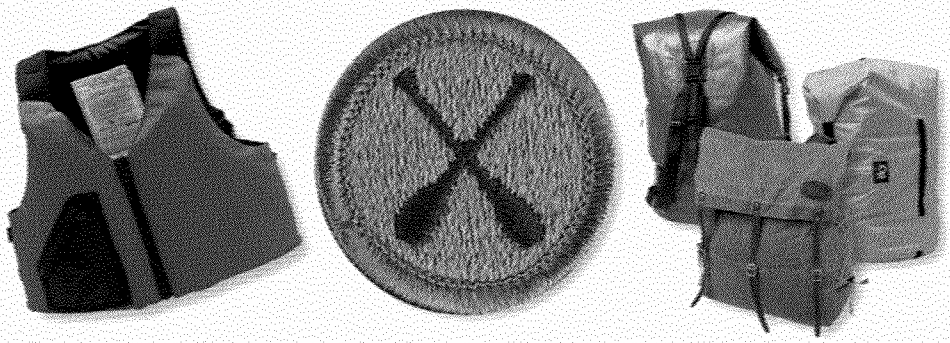
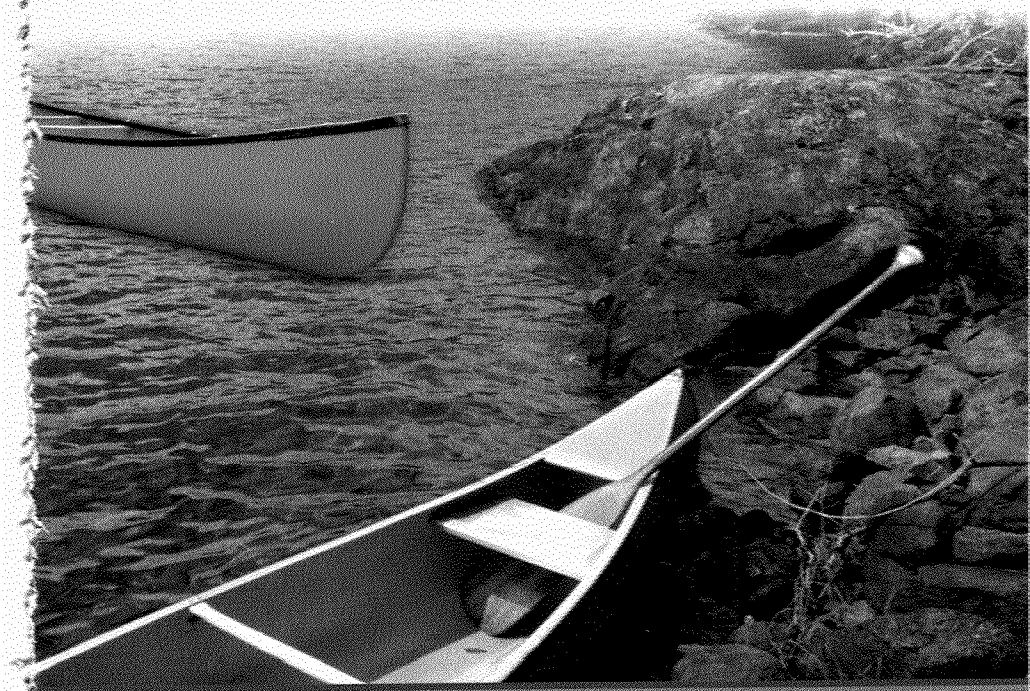
MERIT BADGE SERIES



CANOEING



BOY SCOUTS OF AMERICA®

How to Use This Pamphlet

The secret to successfully earning a merit badge is for you to use both the pamphlet and the suggestions of your counselor.

Your counselor can be as important to you as a coach is to an athlete. Use all of the resources your counselor can make available to you. This may be the best chance you will have to learn about this particular subject. Make it count.

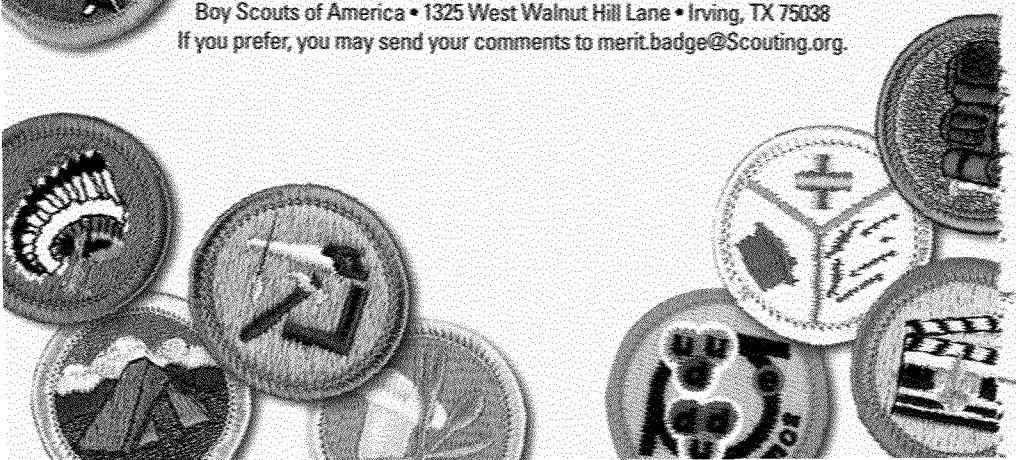
If you or your counselor feels that any information in this pamphlet is incorrect, please let us know. Please state your source of information.

Merit badge pamphlets are reprinted annually and requirements updated regularly. Your suggestions for improvement are welcome.

Who Pays for This Pamphlet?

This merit badge pamphlet is one in a series of more than 100 covering all kinds of hobby and career subjects. It is made available for you to buy as a service of the national and local councils, Boy Scouts of America. The costs of the development, writing, and editing of the merit badge pamphlets are paid for by the Boy Scouts of America in order to bring you the best book at a reasonable price.

Send comments along with a brief statement about yourself to
Pilots and Program Development, S272
Boy Scouts of America • 1325 West Walnut Hill Lane • Irving, TX 75038
If you prefer, you may send your comments to merit.badge@Scouting.org.



BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

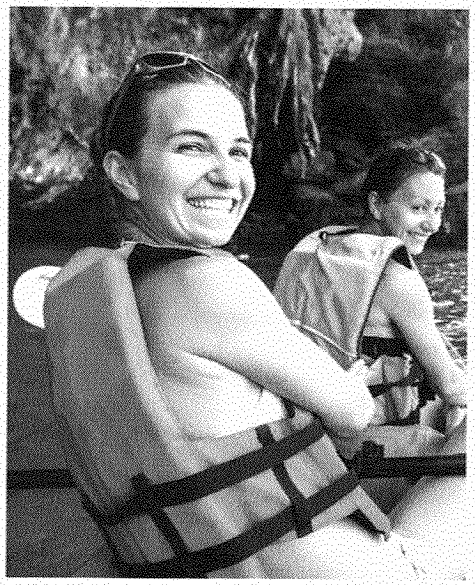
CANOEING

"Enhancing our youths' competitive edge through merit badges"

BOY SCOUTS OF AMERICA®

Note to the Counselor

Merit badge counselors are responsible for following the requirements, procedures, and techniques presented in this pamphlet and ensuring that each Scout earning the merit badge is able to demonstrate knowledge and skills at a level consistent with the requirements. In addition, counselors must ensure that all applicable BSA safety policies, including Safe Swim Defense and Safety Afloat, are followed during training, practice, and review.



Counselors for the Canoeing merit badge must be registered members of the Boy Scouts of America, have current training in both Safe Swim Defense and Safety Afloat, and be approved by the local council advancement committee. Councils with an aquatics committee should utilize that committee to coordinate with the advancement committee for approval of qualified counselors.

All counselors should have formal training in the knowledge and skills indicated by the requirements, experience in teaching such skills to youth, and experience in identifying and managing risks associated with the activities involved. For the Canoeing merit badge, appropriate credentials include: current or previous certification as Aquatics Instructor BSA, designation as an instructor or successful completion of council-sponsored or council-approved training courses in canoeing such as the BSA Paddle Craft Safety course, or current or previous certification as a level 1 instructor in canoeing by the American Canoe Association. The council advancement committee may approve counselors with similar experience and training in knowledge, skill, safety, and instruction.

35867
ISBN 978-0-8395-3305-4

2019 Printing

Requirements

1. Do the following:
   a. Explain to your counselor the most likely hazards you may encounter while participating in canoeing activities and what you should do to anticipate, help prevent, mitigate, and respond to these hazards.
   b. Review prevention, symptoms, and first-aid treatment for the following injuries or illnesses that could occur while canoeing: blisters, cold-water shock and hypothermia, dehydration, heat-related illnesses, sunburn, sprains, and strains.
   c. Discuss the BSA Safety Afloat policy. Tell how it applies to canoeing activities.
2. Before doing the following requirements, successfully complete the BSA swimmer test: Jump feetfirst into water over the head in depth. Level off and swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be completed in one swim without stops and must include at least one sharp turn. After completing the swim, rest by floating.
3. Do the following:
   a. Name and point out the major parts of a canoe.
   b. Describe how the length and shape of a canoe affect its performance.
   c. Discuss the advantages and disadvantages of the different materials used to make canoes.
4. Do the following:
   a. Name and point out the parts of a paddle. Explain the difference between a straight and bent-shaft paddle and when each is best used.
   b. Demonstrate how to size correctly a paddle for a paddler in a sitting position and a kneeling position.

5. Do the following:
   a. Discuss with your counselor the characteristics of life jackets most appropriate for canoeing and tell why a life jacket must always be worn while paddling.
   b. Demonstrate how to select and properly fit the correct size life jacket.
6. Discuss with your counselor the general care and maintenance of canoes, paddles, and other canoeing equipment.
7. Do the following:
   a. Discuss what personal and group equipment would be appropriate for a canoe camping trip. Describe how personal and group equipment can be packed and protected from water.
   b. Using the containers and packs from requirement 7a, demonstrate how to load and secure the containers and other equipment in the canoe.
   c. Using appropriate knots, including a trucker's hitch, tautline hitch, and bowline, demonstrate how to secure a canoe to a vehicle or a trailer, or if these are not available, a rack on land.
8. With a companion, use a properly equipped canoe to demonstrate the following:
   a. Safely carry and launch the canoe from a dock or shore (both, if possible).
   b. Safely land the canoe on a dock or shore (both, if possible) and return it to its proper storage location.
   c. Demonstrate kneeling and sitting positions in a canoe and explain the proper use for each position.
   d. Change places while afloat in the canoe.
9. With a companion, use a properly equipped canoe to demonstrate the following:
   a. In deep water, exit the canoe and get back in without capsizing.
   b. Safely perform a controlled capsize of the canoe and demonstrate how staying with a capsized canoe will support both paddlers.
   c. Swim, tow, or push a swamped canoe 50 feet to shallow water. In the shallow water, empty the swamped canoe and reenter it.

d. In deep water, rescue a swamped canoe and its paddlers by emptying the swamped canoe and helping the paddlers safely reenter their boat without capsizing.

10. With a companion, use a properly equipped canoe to demonstrate the following paddling strokes as both a bow and stern paddler:
    a. Forward stroke
    b. Backstroke
    c. Draw

    For stern paddling only:

    d. J-stroke
    e. Pushaway
    f. Forward sweep
    g. Reverse sweep
    h. Rudder stroke
    i. Stern pry

11. Using the strokes in requirement 10, and in an order determined by your counselor, use a properly equipped canoe to demonstrate the following tandem maneuvers while paddling on opposite sides and without changing sides. Each paddler must demonstrate these maneuvers in both the bow and stern and on opposite paddling sides:
    a. Pivot or spin the canoe in either direction.
    b. Move the canoe sideways or abeam in either direction.
    c. Stop the canoe.
    d. Move the canoe in a straight line for 50 yards.

12. Use a properly equipped canoe to demonstrate solo canoe handling:
    a. Launch from shore or a pier (both, if possible).
    b. Using a single-blade paddle and paddling only on one side, demonstrate proper form and use of the forward stroke, backstroke, draw stroke, pushaway stroke, forward sweep, reverse sweep, J-stroke, and rudder stroke. Repeat while paddling on the other side.
    c. Using a single-blade paddle and paddling only on one side, demonstrate proper form and use of a combination of a forward stroke, rudder stroke, and stern pry by canoeing to a target 50 yards away. Repeat while paddling on the other side.
    d. Make a proper landing at a dock or shore (both, if possible). Store canoe properly (with assistance, if needed).

13. Discuss the following types of canoeing:
    a. Olympic canoe sprint
    b. Flatwater and river touring
    c. Outrigger
    d. Marathon
    e. Freestyle
    f. Whitewater
    g. Canoe poling

Contents

Introduction

Earning the Canoeing merit badge will introduce you to the wonderful world of canoeing. The skills you learn will embark you on a lifetime of canoeing experiences.

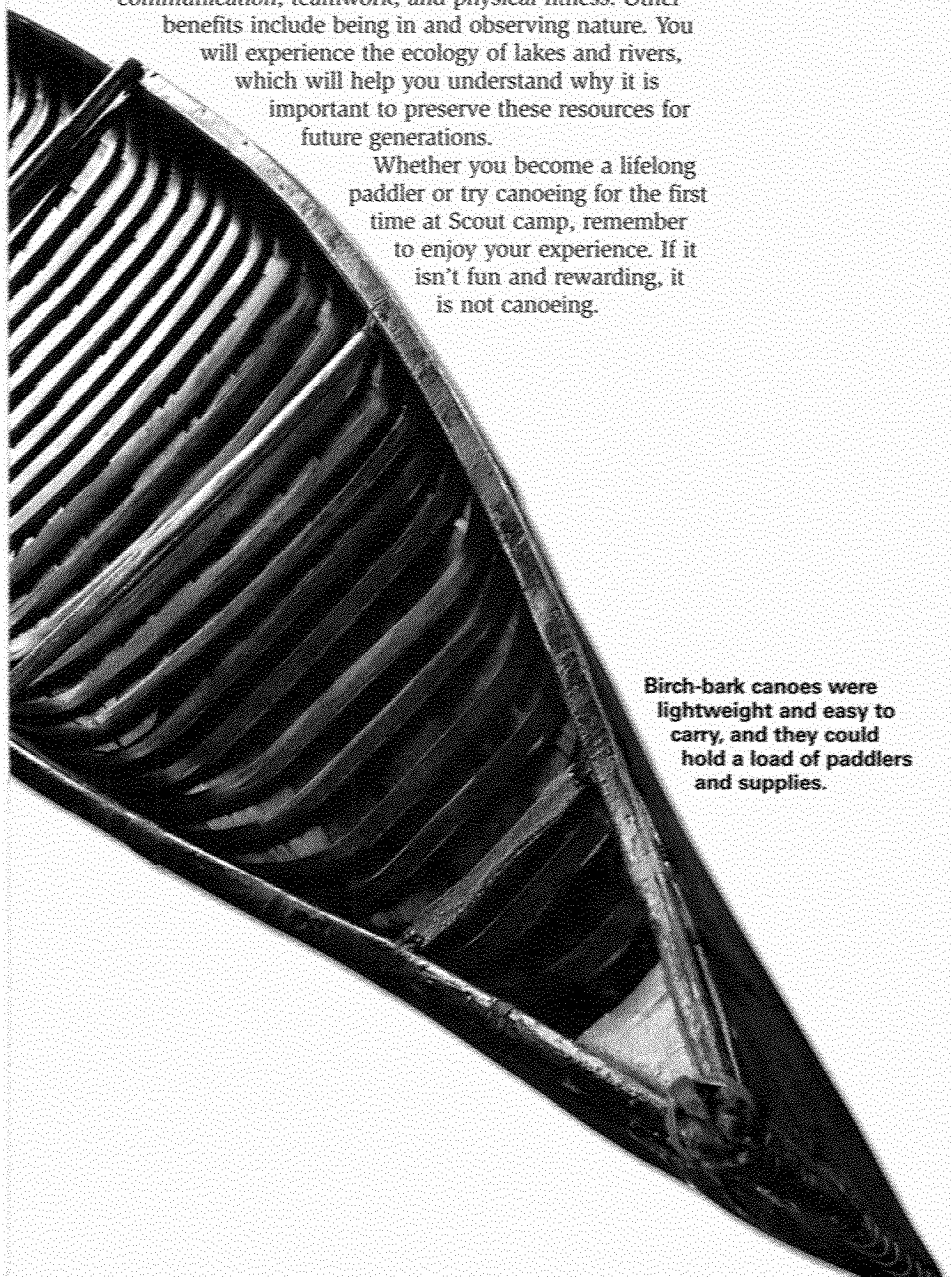
The word *canoe* originates with Christopher Columbus and his report that the Arawak Indians from the West Indies used a seagoing boat, or *kenu*, made from a hollowed-out tree trunk. The American Indians of the northeastern woodlands used the boats that we call *canoes*. The birch-bark canoe they perfected had a wood frame covered with sheets of birch bark that were sewn together with white pine root and sealed with pine or spruce resin.

When European explorers arrived in North America, they quickly adopted the birch-bark canoe as the best way to move people and goods. For several centuries, the canoe was a primary method of travel for explorers and settlers. During the 1880s, canoe companies in Old Town, Maine, began making canoes of wood and canvas. These boats became very popular, and canoeing became a fashionable weekend activity.

In the 20th century, canoes made of new materials in new shapes and designs replaced the wood-canvas canoe. Aluminum canoes appeared in large numbers after World War II, when several aircraft manufacturers retrofitted their production lines to build canoes from metal. Today, plastics and other advanced materials are used to make boats for many kinds of recreational and competitive paddling.

The benefits of earning the Canoeing merit badge will continue throughout your life. Canoeing in the Boy Scouts of America most commonly is a two-person activity, teaching communication, teamwork, and physical fitness. Other benefits include being in and observing nature. You will experience the ecology of lakes and rivers, which will help you understand why it is important to preserve these resources for future generations.

Whether you become a lifelong paddler or try canoeing for the first time at Scout camp, remember to enjoy your experience. If it isn't fun and rewarding, it is not canoeing.



Birch-bark canoes were lightweight and easy to carry, and they could hold a load of paddlers and supplies.

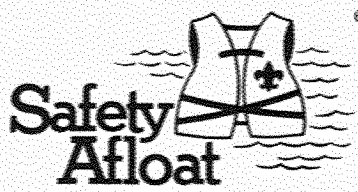
Safety and First Aid

When earning any of the aquatic merit badges, it is important to follow safety rules and use self-discipline and good judgment. Canoeing will be among the most memorable of your Scouting experiences if you understand and follow the nine points of Safety Afloat. These guidelines were developed to promote boating and boating safety and to set standards for safe unit activity afloat. They apply to all canoeing activities.

BSA Safety Afloat

The following version of the Safety Afloat policy has been modified for this merit badge. The complete version is found in the *Guide to Safe Scouting.*

1. Qualified Supervision. All canoeing activities must be supervised by a mature and conscientious adult age 21 or older who understands and knowingly accepts responsibility for the well-being and safety of those in his or her care and who is trained in and committed to compliance with the nine points of BSA Safety Afloat. That supervisor must be skilled in safe canoeing, knowledgeable in accident prevention, and prepared for emergency situations. If the adult with Safety Afloat training lacks the necessary canoe operating and safety skills, then he or she may serve as the supervisor only if assisted by other adults, camp staff personnel, or professional tour guides who have the appropriate skills.



Additional leadership is provided in ratios of one trained adult, staff member, or guide per 10 participants. At least one leader must be trained in first aid, including CPR. Any swimming done in conjunction with the activity afloat must be supervised in accordance with BSA Safe Swim Defense standards. It is strongly recommended that all units have at least one adult or older youth member currently trained in BSA Aquatics Supervision: Paddle Craft Safety to assist in the planning and conduct of all canoeing activities.

2. Personal Health Review. A complete health history is required of all participants as evidence of fitness for boating activities. Forms for minors must be signed by a parent or legal guardian. Participants should be asked to relate any recent incidents of illness or injury just prior to the activity. Supervision and protection should be adjusted to anticipate any potential risks associated with individual health conditions. For significant health conditions, the adult supervisor should require an examination by a physician and consult with parent, guardian, or caregiver for appropriate precautions.

3. Swimming Ability. Operation of any canoe is limited to youth and adults who have completed the BSA swimmer classification test: Jump feetfirst into water over the head in depth. Level off and swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be completed in one swim without stops and must include at least one sharp turn. After completing the swim, rest by floating.

Anyone not classified as a swimmer may paddle or ride in a canoe as a buddy with an adult swimmer skilled in that craft.

4. Life Jacket. Properly fitted, U.S. Coast Guard–approved life jackets must be worn by every person in a canoe. Type III life jackets are recommended for general recreational use.

5. Buddy System. All canoeing participants are paired as buddies who are always aware of each other's situation and prepared to sound an alarm and lend assistance immediately when needed.

When several canoes are used on a float trip, each canoe on the water should have a buddy boat. All buddy pairs must be accounted for at regular intervals during the activity and checked off the water by the qualified supervisor at the conclusion of the activity. Buddies either ride in the same canoe or stay near one another in single-person canoes.

6. Skill Proficiency. Everyone in a canoeing activity must have enough knowledge and skill to participate safely. Passengers should know how their movement affects the canoe's stability and should have a basic understanding of self-rescue. Paddlers must meet government requirements, be able to control the canoe, know how changes in the environment influence that control, and participate only in activities that are within their or their group's capabilities.

- Participants should be instructed in basic safety procedures prior to launch and allowed to proceed once they have demonstrated the ability to control the canoe adequately to return to shore.
- Before embarking on a long float trip or outing lasting more than four hours, paddlers should have either three hours of canoe training and supervised practice or should be able to successfully complete a 100-yard course and recover from a capsize.
- Unit trips on Class III whitewater must be done with either a professional guide in each canoe or after all participants have received American Canoe Association or equivalent training for the class of water and type of craft involved. Unit trips on Class IV whitewater are allowed only in rafts with a professionally trained guide in each raft. Trips above Class IV are not allowed.

7. Planning. Proper planning is necessary to ensure safe, enjoyable canoeing. All plans should include a scheduled itinerary, notification of appropriate parties, communication arrangements, contingencies in case of inclement weather or equipment failure, and options for emergency response.

Preparation. Any canoeing activity requires access to the proper equipment and transportation of gear and participants. Determine what state and local regulations are applicable. Get permission to use or cross private property. Determine whether personal resources will be used or whether outfitters will supply equipment, food, and shuttle services. Lists of group and personal equipment and supplies must be compiled and checked. Even short trips require selecting a route, checking water levels, and determining alternative pull-out locations. Changes in water level, especially on moving water, may pose significant, variable safety concerns. Obtain current charts and information about the waterway and consult those who have traveled the route recently.

Float Plan. Complete the preparation by writing a detailed float plan, noting put-in and pull-out locations and waypoints, along with the approximate time the group should arrive at each. Travel time should be estimated generously.

Notification. File the float plan with parents, the local council office if traveling on running water, and local authorities if appropriate. Assign a member of the unit committee to alert authorities if prearranged check-ins are overdue. Make sure everyone is promptly notified when the trip is concluded.

Weather. Check the weather forecast just before setting out, and keep an alert weather eye. Anticipate changes and bring all canoes ashore when rough weather threatens. Wait at least 30 minutes before resuming activities after the last incidence of thunder or lightning.

Contingencies. Planning must identify possible emergencies and other circumstances that could force a change of plans. Develop alternative plans for each situation. Identify local emergency resources such as EMS systems, sheriff departments, or ranger stations. Check your primary communication system, and identify backups, such as the nearest residence to a campsite. Cellphones and radios may lose coverage, run out of power, or suffer water damage.

8. Equipment. All canoes must be suitable for the activity and seaworthy, and must float if capsized. All canoes and equipment must meet regulatory standards, be properly sized, and be in good repair. Spares, repair materials and emergency gear must be carried as appropriate. Life jackets and paddles must be sized to the participants. Properly designed and fitted helmets must be worn when running rapids rated Class II and above. Emergency equipment such as throw bags, signal devices, flashlights, heat sources, first-aid kits, radios, and maps must be ready for use. Spare equipment, repair materials, extra food and water, and dry clothes should be appropriate for the activity. All gear should be stowed to prevent loss and water damage.

9. Discipline. Rules are effective only when followed. All participants should know, understand, and respect the rules and procedures for safe canoeing activities provided by Safety Afloat guidelines. Applicable rules should be discussed prior to the outing and reviewed for all participants near the boarding area just before the activity afloat begins. People are more likely to follow directions when they know the reasons for rules and procedures. Consistent, impartially applied rules supported by skill and good judgment provide steppingstones to a safe, enjoyable outing.

Prevention goes hand in hand with mitigation, which means "to lessen in force or intensity" and "to make less severe." By taking precautions to manage risk and the possibility of injury, you can be prepared to anticipate, help prevent, mitigate, and respond to just about any incident that might happen during canoeing activities.

First Aid

Following the nine points of Safety Afloat will mitigate any serious risks in canoeing, but some minor injuries still might occur during canoeing activity. Take appropriate precautions to be prepared for such occurrences.

Because canoeing is a physical activity that takes place in the outdoors, participants are at risk for a range of injuries.

There are two primary dangers from falling into cold water. In the first few minutes, a paddler can experience cold-water shock, even in water as warm as 69 to 77 degrees. The second danger is hypothermia, which is a gradual lowering of the body's core temperature caused by spending minutes to hours in water cooler than 80 degrees.

Cold-water shock occurs when a paddler falls into very cold water, especially below 60 degrees. The colder the water, the more severe the effects. The first response will be the reflex to take a deep, gasping breath, which is dangerous if the paddler is underwater. Wearing a life jacket could save the paddler's life in this case. Next the paddler will start taking many quick, short breaths, as if panting for air. This can make the paddler light-headed and dizzy, unable to hold his or her breath. The paddler will also likely lose any sense of up and down, and his or her heart rate and blood pressure will go up. All of these effects can occur in about 60 seconds. It is important that you concentrate on self-rescue initially. If that is not possible, minimize your exposure to the water by using the HELP position (see sidebar) and wait for help.

For all activity afloat on cold water or in cold weather, appropriate clothing should be worn for warmth, with the life jacket worn at all times. A dry change of clothes should be available in case of a spill. Activity afloat should include procedures and equipment for warming anyone showing symptoms of chill.

If alone in cold water and more than a short distance from safety, you can reduce heat loss by avoiding movement, using clothing and the life jacket for insulation, keeping your head above water, and maintaining a tuck position. This is called the heat escape lessening posture (HELP).

The only treatment for cold-water shock is to get the paddler out of the water. He or she will likely need to be treated for hypothermia. Take care when paddling in cold waters. The best prevention for cold-water shock and related injuries is to dress appropriately for the weather and stay dry.

Hypothermia occurs when the body's core temperature falls below the normal range. Exposure to cold, or even cool, water can lower your core temperature dangerously. Early signs of heat loss include bluish lips and shivering. Further cooling will upset the ability to think clearly and to do simple tasks. Further chilling will lead to unconsciousness and, eventually, death.

Treatment for **hypothermia** involves carefully removing the person from the water, removing wet clothing, and drying him or her. Warm the person by putting warm, dry clothes on him or her and wrapping in blankets. Be sure to cover the head, as most heat loss occurs from the head. Warm the person's trunk first, not the hands and feet as this can cause shock. If using hot-water bottles or chemical hot packs, wrap them in cloth; don't apply them directly to the skin. Place the heating sources on the chest, neck, and groin. Avoid rough handling or jerking of the person, especially if the person is lethargic or unconscious. This may cause the heart to develop life-threatening irregular rhythms. If conscious, give the person a warm drink. Avoid caffeine or alcohol. Once the body temperature begins to rise, keep the person dry and wrapped in a warm blanket with the head and neck covered. Avoid rapid rewarming, as it can induce fatal heart rhythms.

Heat-related illnesses result when the body cannot keep itself cool enough. When the surrounding temperatures are above normal body temperature, the body will begin to absorb heat. An important way to cool the body is through sweating. If a person is dehydrated and cannot sweat, the risks of heat-related illnesses go up dramatically. For this reason, avoid exercising outdoors when the temperature and humidity are high.

Before setting out during hot weather, check with the National Weather Service to find out the predicted heat index. If the air temperature is 90 degrees and the relative humidity is 100 percent, the heat index—how hot it feels—is 132 degrees. Heat index values are calculated for shady conditions with a light wind; direct exposure to sunlight can increase heat index values by as much as 15 degrees. Strong winds, especially with very hot, dry air, can also be extremely hazardous.

Frightened or anxious victims might breathe too heavily or too deeply, which can result in hyperventilation. Calmly encourage the person to relax and breathe slowly.

A body temperature of 106 degrees or greater is a life-threatening medical condition and requires immediate medical treatment by health-care professionals.

If someone feels dizzy, faint, nauseated, or weak; develops a headache or muscle cramps; or looks pale and is sweating heavily, treat for **heat exhaustion.** Have the person rest in a cool, shady spot. Loosen or remove clothing to promote heat loss. Wet the skin with a damp cloth and then fan to promote cooling through evaporation. Have the victim sip water or a diluted sports drink. Gently massage and stretch cramped muscles. If the condition worsens, get medical help. Recovery should be rapid but may take up to 24 hours.

Heatstroke can be caused by dehydration (water loss), overexercising, or both when the heat index is high. The victim may be wet or dry but always will be flushed and hot. The pulse will be extremely rapid, and the person may be disoriented or unconscious. Cool the victim immediately by placing cold packs in the groin area and armpits. Increase the body's fluid level by having a conscious victim sip water. Seek emergency help immediately and treat for shock.

Sunburn is a familiar condition commonly associated with aquatic activity. Remember that sunlight reflected from the water surface can be as damaging as direct exposure. Cover up and use a waterproof sunscreen with a sun protection factor (SPF) of at least 15. Apply every two hours, and limit your exposure time. If your skin begins to redden or if you feel discomfort, get out of the sun or cover the area with clothing that will block the sun's rays.

OTHER MINOR INJURIES

A **blister** is a small pocket of fluid that forms when the skin is irritated. Blisters often occur when the paddle shaft rubs against the paddler's thumbs or the pads of the fingers. Help prevent blisters by keeping your hands and fingers as dry as possible. Wearing gloves designed for paddling will help. Protect a **hot spot** or blister with a piece of moleskin or molefoam and a waterproof bandage. Blisters are best left unbroken, but if a blister bursts, treat it as you would a minor cut or abrasion.

Losing more water than you take in can lead to **dehydration.** Symptoms of mild dehydration include increased thirst, dry lips, and dark yellow urine. Symptoms of moderate to severe dehydration include severe thirst, dry mouth with little saliva, dry skin, weakness, dizziness, confusion, nausea, cramping, loss of appetite, decreased sweating (even with exertion), decreased urine production, and dark brown urine.

For mild dehydration, drink one to two quarts of water or a sports drink over two to four hours. Rest for 24 hours and continue drinking fluids. See a physician for moderate dehydration; severe dehydration requires emergency care. Prevent dehydration by drinking plenty of fluids while you are canoeing, both in hot and cold weather. Drink enough so that your urine stays clear.

A **sprain** usually indicates that a ligament was overstretched or possibly torn, such as when the joint is put in an unnatural position and force is suddenly applied to the joint. For canoeists, sprains are more likely to affect the arm and shoulder joints.

A **strain** can happen when muscles are made to work extra hard or are overused. Because a canoeist uses the same muscles repeatedly, the muscles and tendons can become strained.

Pain, swelling, and spasms often accompany sprains and strains. The pain from a joint sprain is immediate. Muscle strains may not be painful until the day after a muscle is used over and over. The muscle/tendon or ligament will then begin to swell. Once pain and swelling occur, the muscles surrounding the injured area often will begin to contract and tighten (spasm).

Treating Sprains and Strains

The treatment of sprains and strains involves rest, immobilization, cold therapy, and elevation, or RICE therapy.

R = Rest. Avoid any movements or activities that cause pain.

I = Immobilize. Stabilize the injured area in the position that it was found or that is most comfortable. If the person must be moved, a splint and/or sling may be needed.

C = Cold. Use a cold pack or crushed ice wrapped in a thin towel to reduce pain and swelling. Apply to the injured area for no more than 20 minutes to avoid ice burn or frostbite. Remove the pack for 40 to 60 minutes before repeating.

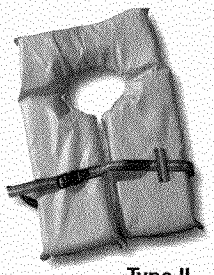
E = Elevate. If possible, hold the injured area above the level of the heart to reduce swelling.

Life Jackets

A life jacket should be worn properly every time you paddle a canoe, whether on a peaceful lake, a slow-moving stream, or a whitewater river. The following are brief descriptions of the five types of U.S. Coast Guard–approved life jackets. For recreational canoeing, Type III life jackets generally are worn.

Type I

Offshore Life Jacket (Type I). Designed to turn most unconscious victims faceup in rough, open water, most Type I life jackets have a lot of flotation in the chest, shoulders, and upper back areas. They are not designed for recreational paddling but for passengers on cruising vessels, such as ferries on large bodies of water.



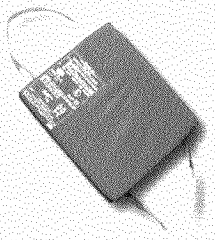
Type II

Near-Shore Buoyant Vest (Type II). Designed to turn an unconscious victim faceup in calmer, inland waters, Type II life jackets are shaped like a horse collar and are not as bulky as Type I life jackets. They come in four sizes ranging from infant to adult and are inexpensive. Their design places all the flotation in the front and around the neck, which makes them uncomfortable for paddling trips but adequate for short periods of recreational boating and instruction.

Type III

Flotation Aid (Type III). Designed to keep a conscious person floating in a vertical position, but may not prevent an unconscious person from floating facedown. Type III life jackets most often are used for water sports such as waterskiing, fishing, kayaking, and canoeing. They are available in many styles, are comfortable to wear, and have the same buoyancy as Type II life jackets. Generally, a Type III will have a zipper or buckle closure and adjustable side straps.

Throwable Device (Type IV). Designed to be tossed to a nearby person in the water, Type IV life jackets are ring buoys and seat cushions with straps used for throwing. They should never be used in place of life jacket devices.



Type IV

Special Use (Type V). These life jackets have special characteristics and limitations. For example, some Type V life jackets, like the swift-water rescue vest, should not be purchased unless the paddler has had special training to use it.

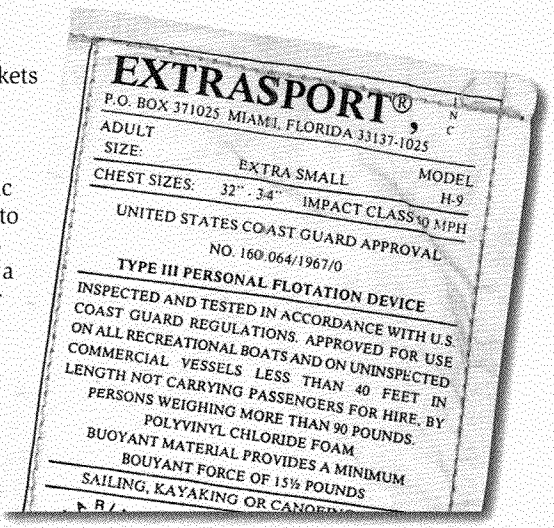
Type V

SIZING A LIFE JACKET

To be effective, a life jacket must be fitted and worn properly. Make sure that all side straps are adjusted to fit snugly, all ties are appropriately tied, all zippers are zipped, and all buckles are fastened. To check the fit, perform the shoulder strap test with a partner: Stand behind your partner and firmly pull up both shoulder straps. If you can pull the shoulder straps up to ear level, your partner should readjust the life jacket or try a different style or size. In calm, shallow water, test the fit of your life jacket by relaxing your body and tilting your head back. A properly fitted and sized life jacket will keep your chin well above water. If this does not occur, readjust your life jacket or try one with a higher buoyancy rating (found on the label).

LIFE JACKET CARE AND MAINTENANCE

Proper care and storage of life jackets is essential. Allow your life jacket to drip dry, and store it in a well-ventilated place away from direct sunlight. Sunlight causes the fabric to fade and the flotation material to weaken. Never use a life jacket as a kneeling pad or seat cushion in a canoe, and never cut or alter your life jacket. This includes gluing or sewing patches on the fabric that covers the flotation material. Finally, do not repair tears or holes in the material. If the fabric is ripped or if buckles are missing, replace the life jacket.



Before you put on a life jacket, check that there is a U.S. Coast Guard approval number on it.

Common Paddling Hazards

Safe canoeing includes being aware of potential weather and water-related hazards such as storms, wind, and waves. Always be prepared for unexpected weather and water conditions. Check weather advisories before starting, and know what to do when hazardous conditions occur.

STORMS

Depending on the area and the time of year, storms can be predicted with some regularity. However, storms can develop at any time and with a speed that surprises even the National Weather Service.

Once you notice an approaching storm, get off the water as quickly as possible. Carry the canoes onto shore and use ropes to secure them from blowing winds and large waves. If caught in a storm, stay low and get to shore. Be prepared to bail water out of the canoe if the rain is heavy.

If you see lightning, keep a low profile in the canoe until you reach shore. During a lightning storm, get off and stay off the water and away from open or exposed shorelines. On shore, stay away from tall geographical features such as trees. Remove your life jacket, place it on the ground, and squat on it.

Knowing the local weather patterns, such as the direction from which storms come during certain times of the year, will help you spot a storm before it is upon you.

WIND AND WAVES

Wind and the waves it creates have the potential to give you a thrilling ride or to swamp your boat. Learning about wind and waves and the hazards they create is an essential part of canoeing.

Near an ocean or a large body of water, winds blow toward the land during the day and toward the water at night.

Wind is created when air moves from a high-pressure area to a low-pressure area. Usually absent in the early morning, wind increases as the rising sun heats the ground and air throughout the late morning and early afternoon. Winds often reach maximum strength by midafternoon. By sundown, they usually subside to an occasional breeze.

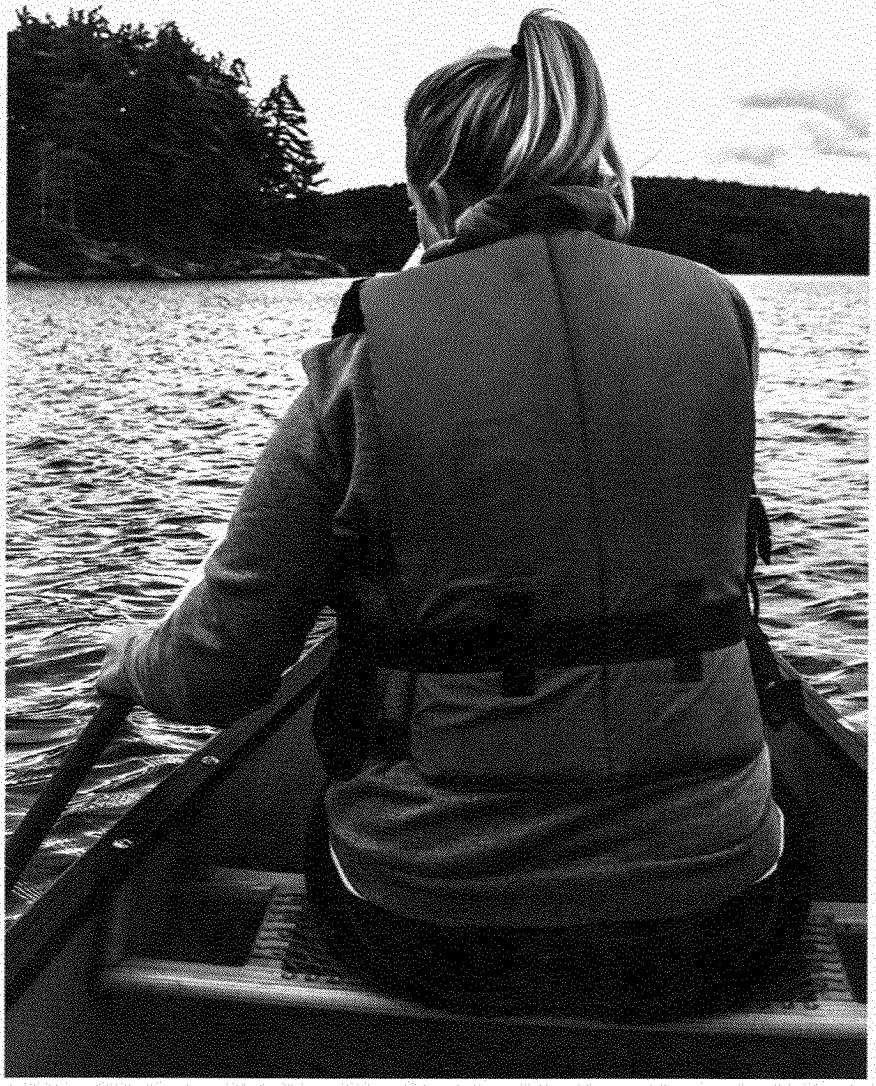
Waves result when wind collides with the water. A keen eye will see the ripple effect on the water surface as a gentle wind moves across it. As the wind increases, so will the size of the waves until they become frothy whitecaps. Waves can become so big that they can easily swamp a canoe.

Always anticipate wind as part of any canoeing activity. If you are on a canoe trip, start before the winds increase and land before midafternoon to avoid the peak wind periods. Paddle along the shoreline to minimize the effects of wind and waves. Whether paddling with or against the wind, it is wise to work your way gradually to the downwind side of an island or point of land. If strong winds make paddling difficult, go ashore and take a break until the winds die down enough to make paddling safe and fun again.

When the wind starts really blowing and waves begin to build, kneel in the canoe to keep your center of gravity low and reduce the chances of the boat capsizing.

Do not attempt to paddle across a large lake when strong winds are likely.

Storms result when air masses of different barometric pressures meet. When cold, dry air meets warm, moist air, the cold air wedges under the warm air and cools it. As the warm, moist air cools, it condenses into rain.



Canoes

The canoes you learn to paddle are likely to be whatever boats are handy—at a camp or local watercraft organization, or boats available to your family or neighbors. As you move beyond the basics, you might want to find a canoe that better matches your activities on the water.

Types of Canoes

Wood and wood-canvas canoes are works of art made by skilled craftsmen. They can be built from a variety of wood, such as cedar, birch, or ash, and they can be relatively lightweight. Some have a protective fiberglass outer layer. Wood-canvas canoes have a wooden frame overlaid with canvas that has been sealed with a resin. While easy to repair, they require a lot of care and maintenance, including careful storage.

Aluminum canoes withstand hard use and are the only canoes that can be stored outdoors for long periods without suffering damage from weather or ultraviolet light.

Aluminum canoes are durable and relatively inexpensive, factors that make them common at many summer camps. They can be noisy on the water and can get hung up on rocks in shallow passages, but they are extremely durable.

Aluminum canoe

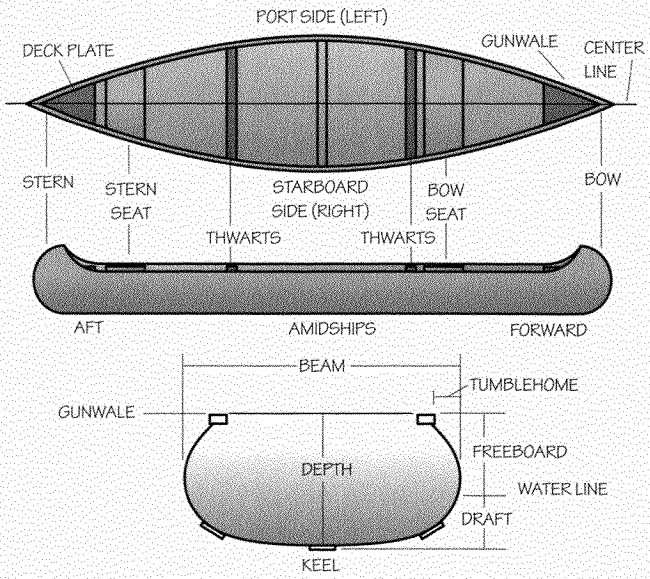
Fiberglass canoe

Fiberglass canoes also are sturdy, but they vary widely in weight, quality, and price. Fiberglass can be formed into many different hull shapes, and boat designers have created fiberglass canoes for different kinds of canoeing activities. Fiberglass canoes also are easy to repair and glide over rocks easily.

Kevlar® canoes are constructed from a very strong, lightweight material also used in making bulletproof vests. These canoes are easy to repair, but they are expensive. Kevlar® canoes often are finished with a low-maintenance fiberglass skin.

Polyethylene canoes are tough, inexpensive, and reliable, but usually are reinforced with aluminum tubing to prevent the hull from flexing too much. Polyethylene canoes return to their original shape when banged or dented, but tears or holes in the material are tough to repair. However, they are heavier than canoes made from other plastics.

Royalex® canoes are made of acrylonitrile butadiene styrene, a tough, rigid plastic that is stronger and more flexible than aluminum, fiberglass, or polyethylene. These boats are nearly indestructible and return to their original shape if bent or dented. Repairs are seldom needed, but when they are, they can be difficult to do. Royalex® canoes are the choice of many experienced paddlers for running rapids and embarking on extended expeditions.



Parts of a Canoe

The body of the canoe is the **hull.** The front end is called the **bow,** and the back end is called the **stern.** Each end is covered with a triangular reinforcement called a *deck plate.* Ropes attached to the bow and stern are called *painters.*

Amidships is the midsection of the canoe. The length of a canoe spans from the tip of the bow to the tip of the stern, and the width of the canoe at amidships is its *beam.* The length of the hull that comes in contact with the water is the *waterline.*

Gunwales (pronounced "gunnels") are rails that run along the top edge of both sides of the canoe. Gunwales add strength to the hull and help it keep its shape. Braces, called *thwarts* (pronounced "thorts"), span the width of the canoe and provide rigidity and support. Some canoes also have a *keel,* a ridge that runs the length of the bottom of the canoe along its center line. A keel improves a canoe's ability to travel in a straight line but hinders its ability to turn.

In this pamphlet, the first mention of terms found in the glossary is shown in *italics.*

When you are facing forward in your canoe, *ahead* is the direction in front of the bow, and *astern* is the direction behind the boat.

A *portage yoke* allows you to carry a canoe upside down on your shoulders. It can be built into the canoe and serve as an additional thwart, or it can be detachable.

Canoe Shape and Performance

It is acceptable for Scouts to use an outrigger canoe to fulfill the Canoeing merit badge requirements.

A canoe's dimensions affect how the canoe will perform on water. For example, a longer waterline enhances speed and improves *tracking*, the ability to go straight. A keel further improves a canoe's tracking ability.

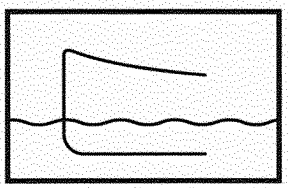
Recreational canoes range in length from 9 feet for a solo boat to 18 feet for a tandem boat. For most Scouts, a 15- to 17-foot canoe is about right.

LENGTH

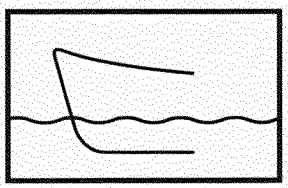
A longer canoe glides farther with each stroke and can carry a heavier load than a shorter boat. Thus, a 17-foot canoe on flat water would hold more cargo and go straighter and faster than a 13-foot canoe.

The shorter a canoe's waterline, the easier it is to turn. The waterline can vary depending on the length of the hull, the shape of the canoe's ends, or the curve of the bow and stern sections out of the water. The contour of the ends of a canoe as seen from the side is called the *stem.*

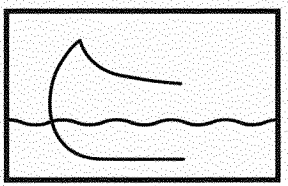
The curve of the hull from bow to stern is the *rocker,* like the bottom of a rocking chair. The more curve in the rocker, the shorter the waterline. A canoe with a lot of rocker can turn and spin easily and is suited for whitewater paddling, which involves quick navigation.



The canoe with the longest waterline length will have a *plumb,* or straight, stem and will track better and go faster.



A *raked,* or slanted, stem prevents waves from splashing into the canoe.



A *recurved* stem, or one that curves inward, gives the canoe its traditional shape.

WIDTH

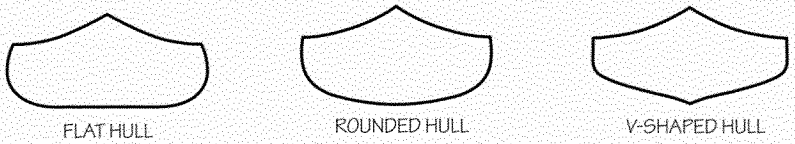
The width of a canoe, or its *beam,* mainly affects stability. Wider canoes can carry bigger loads and are less likely to tip over. The width of the bow also is a factor in a canoe's performance. A narrow, pointed bow cuts through the water like a knife. A wider, blunt bow more easily navigates waves and deflects rocks. A bow that is longer and narrower than the stern—asymmetrical, or irregular in shape—will slice through the water better than a symmetrical one, increasing the speed of the canoe.

DEPTH

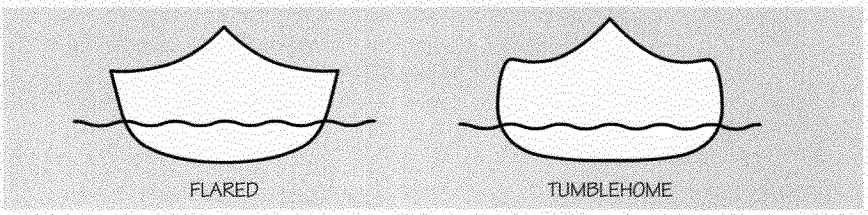
The taller the sides of the canoe, the more equipment and weight the boat can carry. More depth also prevents waves from washing into the canoe. But taller sides mean the canoe is more vulnerable to wind. A canoe of lesser depth resists the wind, but it is more likely to take on water on a windy day when the waves are choppy.

HULL SHAPE

Canoes with flat bottoms are easy to turn, allow for better sideways movement, and feel more stable. Canoes with rounded bottoms are easy to lean to one side and lean back up again, but they can feel easy to tip over. Shallow V-shaped hulls have some characteristics of each type.

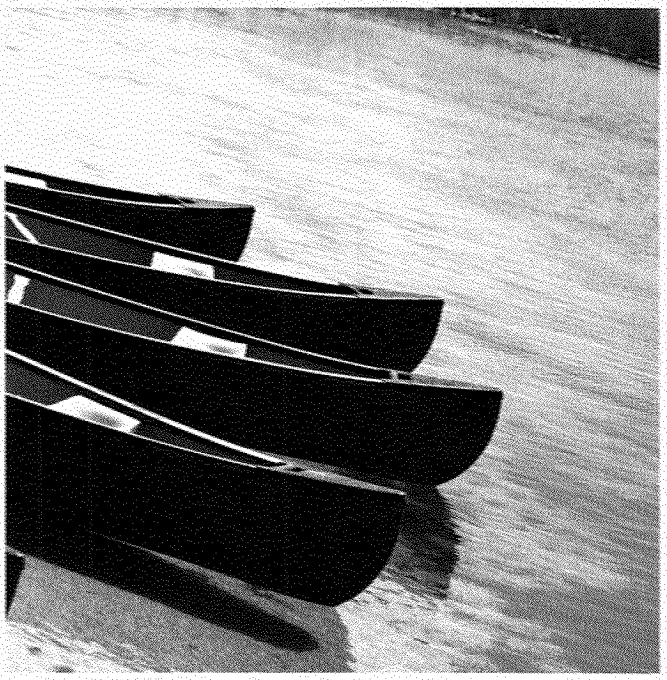


Flared sides curve outward to deflect waves. Whitewater canoes often have flared sides. Inwardly curved sides, or *tumblehome,* decrease the distance between the gunwales, making it easier to paddle efficiently.



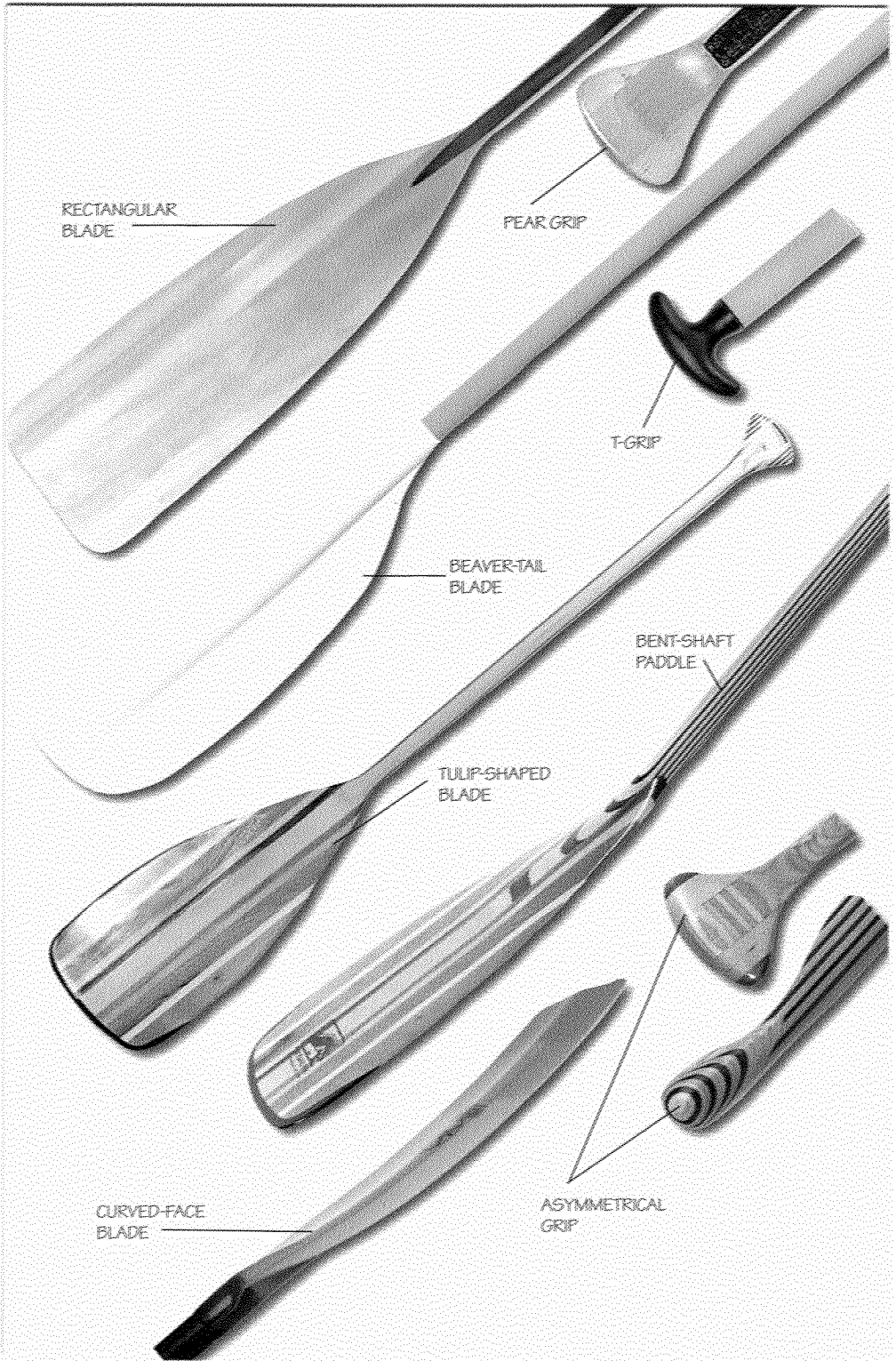
Canoe Care and Maintenance

Store canoes out of the water and upside down in a covered area away from direct sunlight and extreme heat or cold. Do not store canoes with wooden gunwales on the ground. To prevent damage, do not drag a canoe across the ground or run it up onto the shore or into trees or rocks. Make sure to wipe sand, mud, and other debris out of the canoe after each trip, and make repairs as needed. Oil wooden gunwales, seats, and thwarts of a canoe at least twice a year.



The point of the hull where the bottom curves into the side of the canoe is the *bilge.* A *chine* in boating refers to the angle between the side and the bottom of the hull.

A canoe with straight sides and a flat bottom has a hard chine with almost a 90-degree angle where the side and bottom meet. This canoe has *primary stability;* that is, it does not easily tip and will stay upright if leaned over quite far, but past a certain point it is almost impossible to keep upright and will flip easily. Aluminum canoes are a good example of boats that have primary stability. A canoe with a soft chine is rounded where the side and bottom meet and might feel unstable. This is called *secondary stability.* A canoe with a soft chine and good secondary stability is easy to lean over but can be quickly leaned back to an upright position. Whitewater boats and canoes used in freestyle paddling have good secondary stability.


RECTANGULAR BLADE
PEAR GRIP
T-GRIP
BEAVER-TAIL BLADE
BENT-SHAFT PADDLE
TULIP-SHAPED BLADE
CURVED-FACE BLADE
ASYMMETRICAL GRIP

Paddles

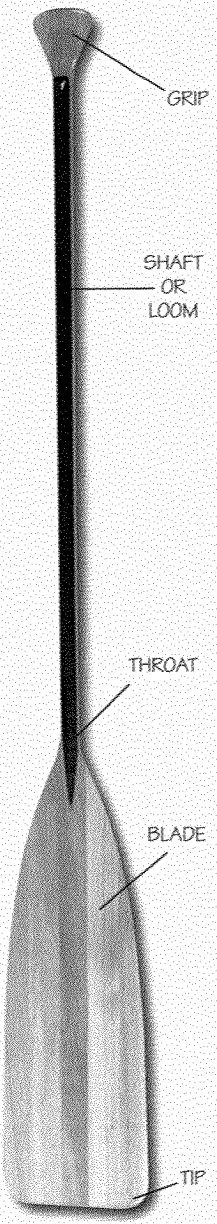
On even the shortest canoe journey, you will lift your paddle thousands of times, making a lightweight paddle worth plenty. Canoe paddles are made of wood, fiberglass, metal, plastic, or combinations of these. Shorter blades are best for shallow rivers, while blades that are long and narrow can be quieter and more manageable. A blade width of 7 to 8 inches is good for beginners.

The top of the paddle, where one hand is placed, is called the *grip*. The grip of your paddle should fit your hand smoothly and comfortably.

The other hand should be comfortably placed along the **shaft** of the paddle, but above the gunwale of the canoe. The **blade** is the wide part of the paddle that is placed into the water. The end of the blade is called the **tip.** The **throat** is where the shaft and blade join.

The tip of a paddle is easy to damage. To prevent damage to the tip, never rest the paddle on its tip on the ground or use the tip to push away from the shore or rocks. Also, avoid throwing paddles into a vehicle or trailer.

The T-grip runs parallel to the blade (forming a T shape), giving the paddler precise control over the angle of the blade in the water. Paddlers who do a lot of turning, especially white-water paddlers, prefer the T-grip. The pear grip looks like an upside-down pear on the end of the paddle. It is larger than a T-grip and allows for different hand placements. Symmetrical (looks the same on both sides) pear grips can be flipped over so that either side of the paddle blade can be used. Asymmetrical (each side looks different) pear grips are molded to fit the curve of the palm to improve comfort and help reduce fatigue. Flatwater paddlers usually prefer a pear grip.



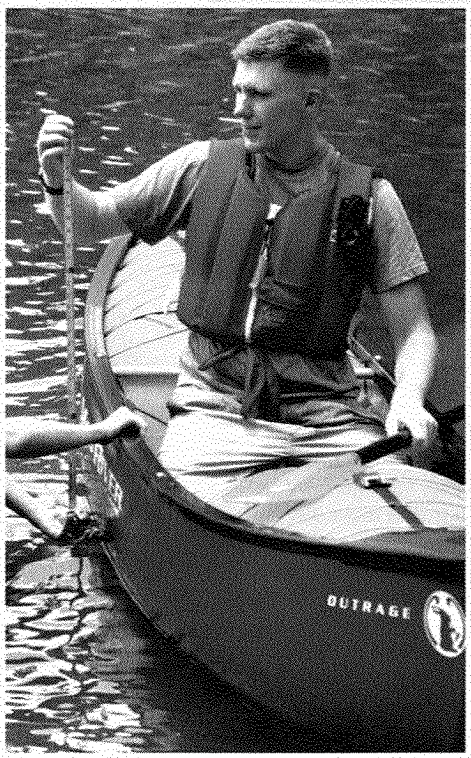
When not in use, hang paddles away from direct sunlight and extreme heat or cold. Make sure they have been wiped clean.

Sizing a Paddle

The length of the paddle you need depends in large part on the kind of canoeing you will be doing, whether you will be sitting or kneeling in your canoe, and whether the paddle is straight or bent. If you can, size your paddle while you are in the canoe in paddling position, either sitting or kneeling. Sitting or kneeling makes a difference because it changes the height of your torso above the waterline, and thus the length of the paddle shaft.

Place the blade in the water up to the throat. Keep the paddle vertical in the water while you do this. The grip should be between your shoulder and your chin for a proper fit.

To size a paddle while you are on land, crouch about the height you would be above the water if you were kneeling or sitting in the canoe. Put the grip on the ground. The throat of the paddle should be between your shoulder and nose.



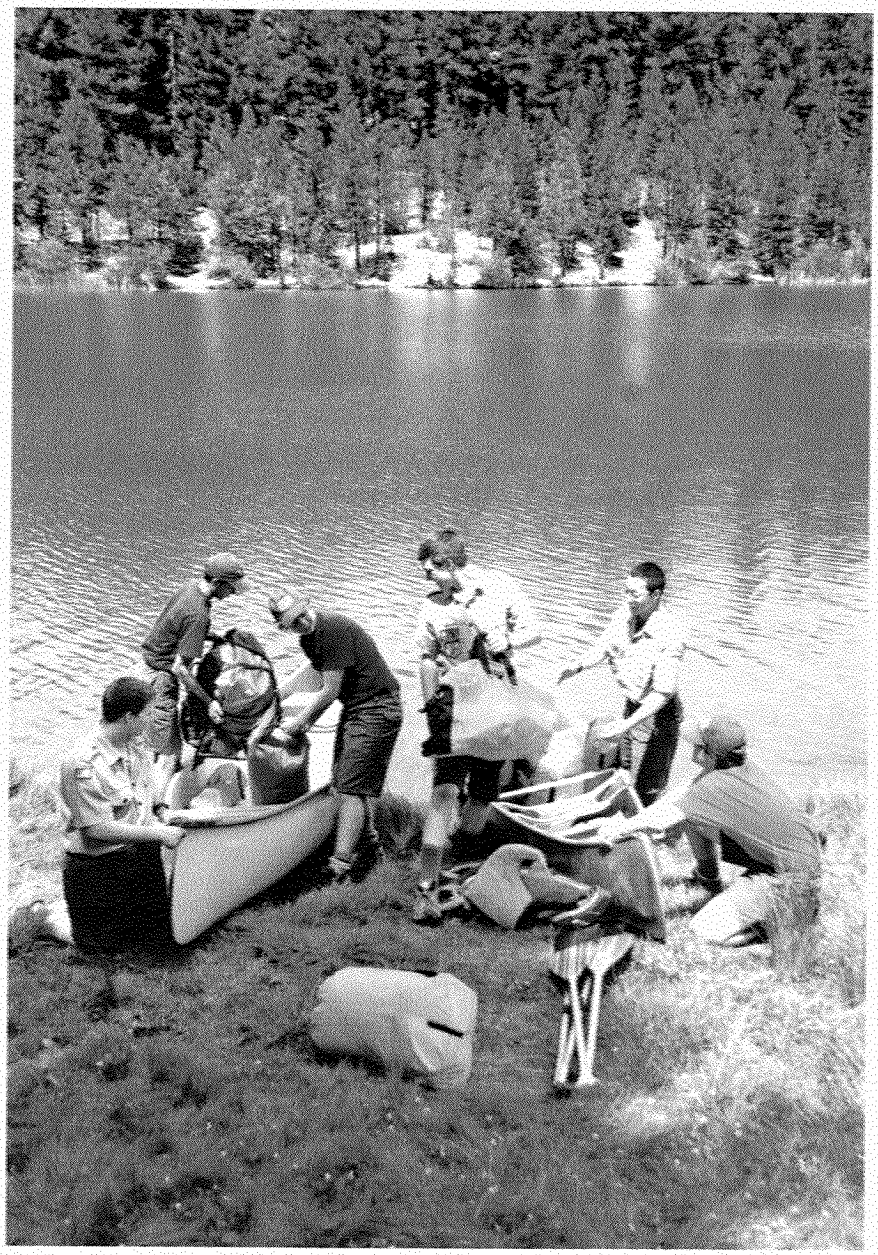
Economy paddles come in standard sizes from 4 to 5½ feet in ½-foot increments. More expensive paddles come in finer increments. Proper paddle length is a matter of preference and feel rather than a precise measurement. As long as your paddle is within a few inches of the suggested guidelines, you will be able to learn the strokes properly. Before you buy a paddle, try out a range of sizes to see which best suits your paddling style.

The blade of a paddle might be in line with its shaft or it might be bent at an angle of up to 15 degrees. Bent-shaft paddles prolong the time that the blade is vertical in the water, which improves efficiency at the end of the stroke. However, it is more difficult to make turning strokes with a bent-shaft paddle.

There are different paddle blades for different types of paddling. For deepwater paddling, a blade can be long and narrow, like a beaver-tail paddle, or tulip-shaped. Whitewater paddlers often use rectangular blades. Another important feature of a paddle blade is its edges. A paddle with thin, sharp edges will slice through the water much easier than one with thick edges.

Bent-shaft paddles often have asymmetrical pear grips because usually only one side of the blade is used.

Experienced paddlers who want to take a bigger bite of the water might use a paddle with a curved face.



Packing for a Canoe Trip

Canoe camping is a lot of fun and gives you an opportunity to use your paddling skills. Even though the capacity of a canoe allows you to carry plenty of cargo, pack light and tight.

Outfitting Your Canoe

Whether you are setting out for an hour of paddling or a week of wilderness exploration, your canoe must first be outfitted with essentials to propel it and to protect its passengers.

LIFE JACKETS

A life jacket for each person is the most important piece of gear you have on the water, perhaps even more vital than the canoe itself. Life jackets work only if they are worn and if they fit well. For guidelines on selecting, fitting, and caring for life jackets, see the chapter titled "Safety and First Aid."

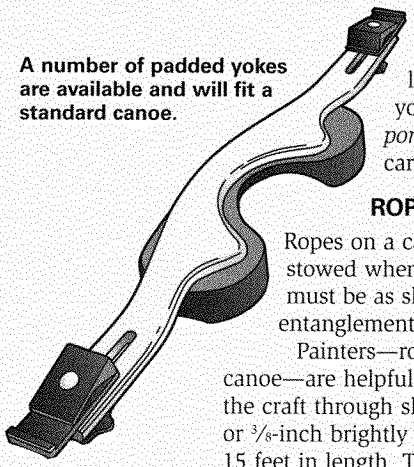
WATERPROOF CONTAINERS

Watertight or waterproof containers keep food, sleeping bags, and other items dry. Dry bags are extremely durable. They are made from a heavy plastic and generally have a roll-up watertight closure and shoulder straps and hip belts for portaging. A Duluth pack is made from water-resistant fabric but does not have the watertight seal of a dry bag.

Waterproof containers such as dry bags, Duluth bags, plastic buckets, and plastic bags are essential for keeping canoeists' gear and food dry.

Other good waterproof containers include 5-gallon resealable buckets and waterproof map cases. Simple plastic bags such as resealable freezer bags and heavy-duty garbage bags work well, too. When using garbage bags, double-bag all items and close the bags with a thick rubber band. Then place the garbage bags in a duffel bag, stuff sack, or other container to protect the bag from being punctured or torn.

When packing your canoe, place everything that must stay dry in a waterproof container. Secure all items to the canoe so that nothing will fall out. Try to fit dry bags or Duluth packs under the thwarts and clip the straps to them. Use cam straps, bungee cords, and pieces of rope to secure items. Secure your equipment so that if the canoe were to capsize the equipment would not fall out past the gunwales.



A number of padded yokes are available and will fit a standard canoe.

PORTAGE YOKE

When you pick up a canoe and carry it over land from one lake or stream to another, you are *portaging.* The trail you follow is the *portage.* Canoe yokes come in handy when carrying the canoe on your shoulders.

ROPES

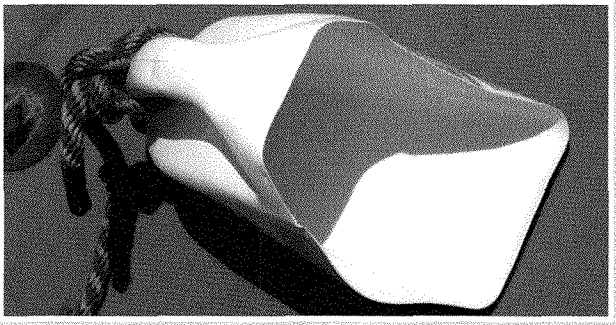
Ropes on a canoe should float and should be securely stowed when not in use. Those used for tethering gear must be as short as possible so that they do not become entanglement hazards.

Painters—ropes attached to the bow and stern of a canoe—are helpful for tying up ashore or for maneuvering the craft through shallow or dangerous waters. Use ¼-inch or ⅜-inch brightly colored polypropylene lines that are about 15 feet in length. To keep the painters out of the way, coil or loop them and slide them under a shock cord attached to the deck plate.

Also have about 60 feet of brightly colored ¾- to ⅜-inch polypropylene rope to use for rescues. Polypropylene rope is waterproof and floats. Practice using the throw rope before you need to use it. A throw bag, with flotation in one end and polypropylene rope stuffed inside, also can be used for rescues.

BAILER AND SPONGE

Canoes are bound to take on some water no matter how calm a lake or stream. A large sponge secured to a thwart with a very short bungee cord is handy for sopping up puddles and wiping out the inside of the canoe when it gets dirty.



You can make a *bailer* for emptying water from your canoe by cutting the bottom off of a 1-gallon plastic jug. Secure the bailer to your canoe with a short piece of line, leaving no slack.

KNEE PADS

Have something comfortable on which to kneel because you never know when you will paddle from this position. Knee pads can be purchased at sporting goods stores. A piece of closed-cell foam also will work. The pad should be ¼ inch thick, between 6 and 8 inches wide, and about 3 feet long.

Packing a Canoe

How much a canoe can hold is based on its length, height, and width. The U.S. Coast Guard measures capacity by loading a boat until it has 6 inches of *freeboard*—the distance between the water surface and the gunwales. A canoe should never be loaded so heavy that less than 6 inches of freeboard remains or loaded beyond the manufacturer's suggested weight limit.

If a canoe is balanced in the water from end to end and side to side, it is said to be *trim*. If your canoe is not trim, it will be unstable and difficult to maneuver. A good way to judge the trim of your canoe is to take a step back and look at the loaded canoe from the front and side. Make adjustments as necessary to ensure that your canoe is trim.

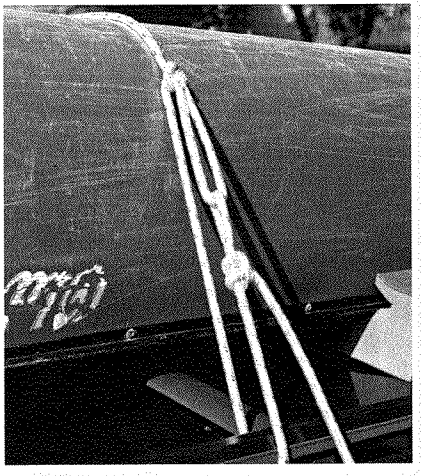
Look for a U.S. Coast Guard–approved capacity plate that gives a canoe's maximum total weight of passengers and gear.

Securing a Canoe to a Rack or Trailer

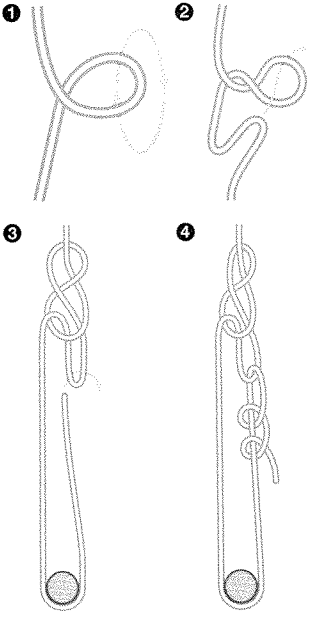
To safely transport a canoe by vehicle, it must be secured to a rack on top of a car or a rack on a canoe trailer. When tying a canoe on top of a vehicle, always remember to attach it at four different places: at two points on the rack and to the front and rear bumpers. Center the boat on the rack so that it is balanced between the front and back crossbars. Use ropes, straps with metal cam buckles, or ratchet straps with a ratchet buckle to secure the boat across the hull to a rack. The straps should be 1 to 1½ inches wide and 12 to 16 feet long depending on the size of the canoe and the rack. Be careful not to overtighten the strap and damage the boat.

Secure the bow and stern of the canoe to the bumpers with two lines each. Try to find a place on the frame or underneath the bumper, or use the towing loop if the car has one. Do not tie the rope where there is a sharp edge that could cut the rope or to mechanical parts such as shock absorbers.

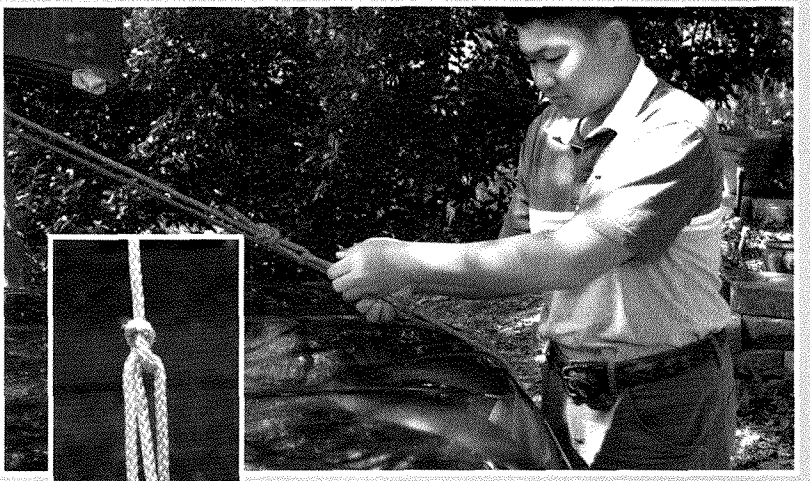
Bungee cords or rubber cords should never be used to secure a canoe to a trailer or car rack. These devices can stretch or break and cannot be tightened after they are applied.



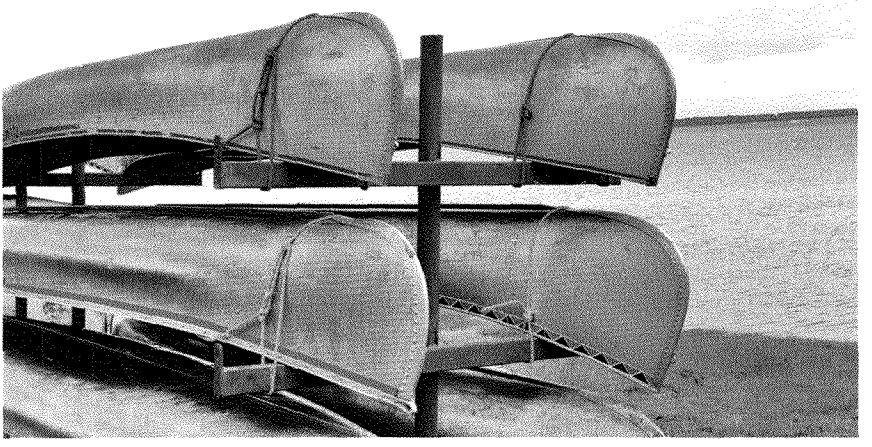
Ropes also work well to tie a boat to a rack. Instead of having a buckle or cam to secure the hull, use a bowline or a trucker's (or traveler's) hitch.



Tying a trucker's (or traveler's) hitch



Use a bowline knot to attach a rope to the bow and stern of the canoe, and use a trucker's hitch *(shown here)* to secure the rope to the bumpers.



A trailer is the most efficient method for transporting multiple canoes. Two lines or straps and the trucker's (or traveler's) hitch will secure the midsections of the canoes, and you can safely secure the ends of the boats with the bow and stern painters. Tie them to the center of the trailer using two half hitches.

Basic Essentials

- ☐ Pocketknife
- ☐ First-aid kit
- ☐ Extra clothing
- ☐ Rain gear
- ☐ Water bottle
- ☐ Flashlight
- ☐ Trail food
- ☐ Matches and fire starters
- ☐ Sun protection
- ☐ Map and compass

Ponchos, a longtime favorite of backpackers, are a poor choice for canoeing. If your canoe were to capsize, it would be very difficult to swim in a poncho. A quality rain suit (hooded jacket and pants) will keep you dry.

Personal Overnight Camping Gear

Here are some suggested items for your personal camping gear; some items are strictly optional.* Lighten your load by taking only those items you cannot live without. As you plan your packing list, consider how long your trip will be, the weather conditions and time of year, and the activities your group has planned.

- ☐ Long synthetic-blend or wool pants (no cotton jeans or sweatpants)
- ☐ T-shirts
- ☐ Long-sleeved shirt
- ☐ Underwear
- ☐ Socks (medium-weight wool or thin polypropylene ones)
- ☐ Warm wool or fleece pullover or jacket (no cotton sweatshirts)
- ☐ Rain gear with hooded jacket
- ☐ Hooded parka or coat
- ☐ Gloves
- ☐ Shoes with nonslip tread that can get wet and will dry quickly
- ☐ Sneakers or light running shoes to wear in camp
- ☐ Hat with a brim in summer; woolen cap for cold weather
- ☐ Swimsuit*
- ☐ Personal toiletries (comb, lip balm, toothbrush, toothpaste, metal mirror, medications)
- ☐ Small towel and washcloth
- ☐ Insect repellent
- ☐ Mesh head net to ward off insects from your face
- ☐ Sunglasses with eyeglass strap

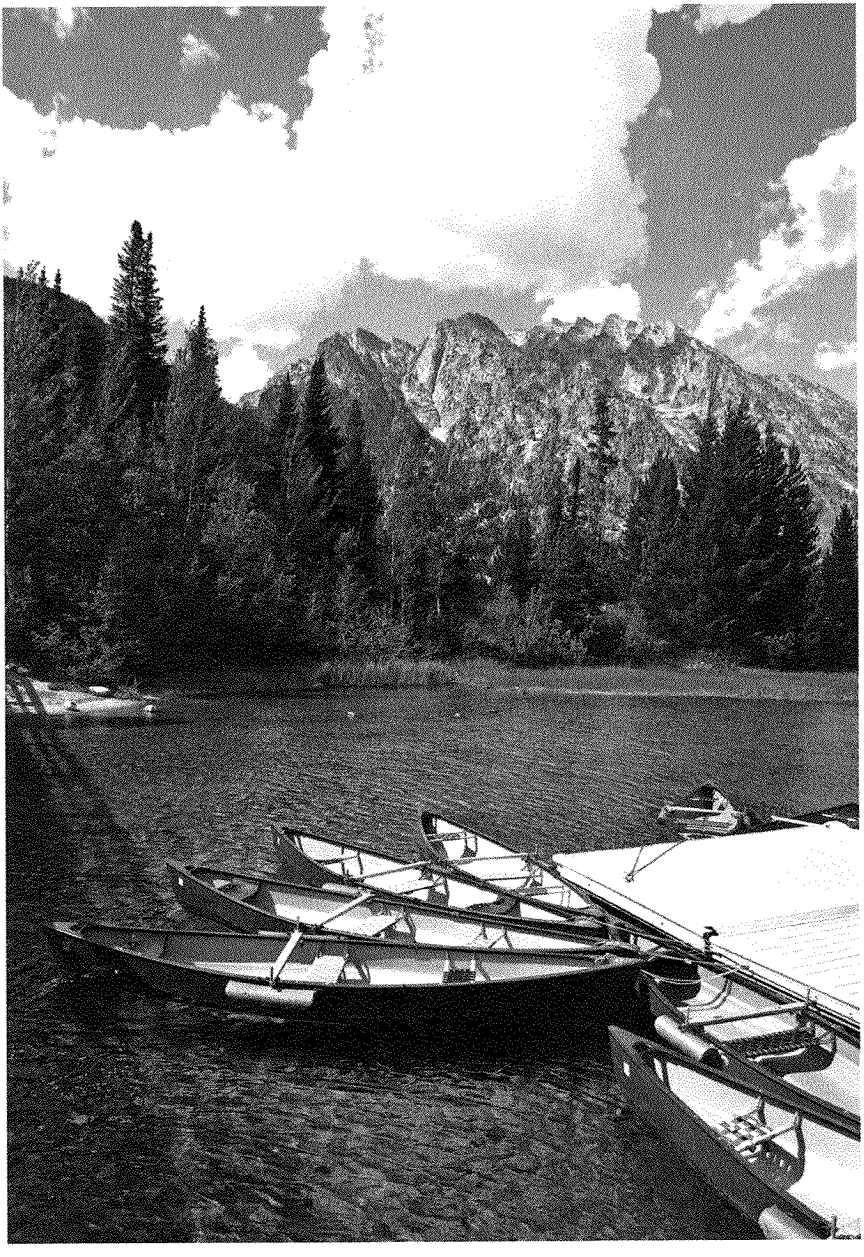
- ☐ Personal utensils (bowl, plate, cup, spoon)
- ☐ Sleeping bag or bedroll in waterproof stuff bag
- ☐ Ground cloth
- ☐ Sleeping pad
- ☐ Water bottle
- ☐ Water treatment tablets or filter system
- ☐ Biodegradable soap
- ☐ Flashlight with extra batteries and bulb
- ☐ Water-resistant watch
- ☐ Whistle
- ☐ Butane lighter or matches stored in a waterproof container
- ☐ Fire starters
- ☐ Paper and pen or pencil
- ☐ Emergency cash
- ☐ Camera*

Don't forget to pack at least one extra paddle. In bear country, a bear-proof container would be a necessity.

Group Equipment

Group equipment should be evenly distributed among all the canoes. Here is a general list of equipment.

- ☐ Tents with poles, ground cloths, lines, and stakes
- ☐ Dining fly with lines and stakes
- ☐ Nylon cord (50 feet)
- ☐ Butane lighter or matches stored in waterproof container
- ☐ Toilet paper
- ☐ Backpacking stoves and fuel
- ☐ Cook kit (pots, pans, spatula, large spoon, ladle, plastic sheets)
- ☐ Cleanup kit (biodegradable soap, sanitizing rinse agent such as bleach, scouring pads, trash can liners, toilet paper in plastic bag)
- ☐ Repair kit (duct tape, thread, needles, safety pins)
- ☐ Group extras (tongs, camp shovel, saw or ax, collapsible water container, grill, lantern)



Launching and Landing

Before launching a canoe, put on your life jacket and shoes that you won't mind getting wet. Team up with another person to carry the canoe to the water.

Moving the Canoe From Rack or Trailer

Step 1—Face your paddling partner on opposite ends of the upside-down canoe. Place your top hand on the keel and your bottom hand on the deck plate. If the rack is permanent and has one level, turn the boat over and rest it on the rack before removing it. If the rack is on a trailer, lift the canoe up and move it clear of the rack.

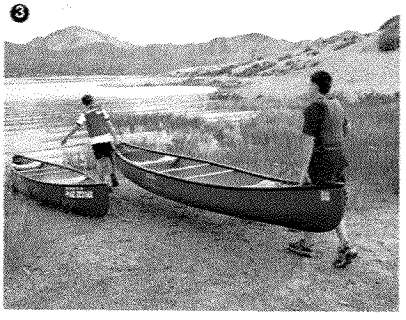
Step 2—Decide in advance which way you will turn the canoe, then turn it over while holding on to it and without letting it touch the ground. If the canoe is too heavy to turn safely in the air, set it on the ground upside down and turn it over.

Step 3—From opposite sides, carry the canoe by the deck plates or handles.

❶

❷

❸



Launching a Canoe

Canoes are creatures of the water. Get them on land or in the transition zone between land and water, and they can be awkward to handle and prone to damage. For this reason, you should enter and exit the canoe only when it is completely in the water. Never **bridge** a canoe by resting one end above the water on the shore or dock with the other end floating. Stepping into a bridged canoe is unstable and can result in injury or damage to the boat.

When entering, exiting, or moving about the canoe, always keep three points of contact with the boat. Keep both hands on the gunwales while moving one foot at a time, or keep your feet in one place while moving your hands. Never stand up and walk about the canoe without three-point contact. Stay low in the canoe as you move about, keeping your center of gravity low and helping prevent loss of balance as you move around in the canoe.

Enter, exit, or move about the canoe only when both hands are free of equipment or gear.

Never launch while the canoe is grounded or land by running the canoe up onto the shore. Contact between the bottom of the canoe and rocks, gravel, and sand can quickly wear away the bottom of any canoe.

Tandem Perpendicular Launch

On a sloping shore, the easiest and most stable way to launch the canoe is stern first at a right angle, or perpendicular, to the shore.

Start by getting the canoe to the water. With your paddling partner, carefully set down the canoe at the water's edge. Walk to the middle of the canoe and pick it up by the gunwales. You and your paddling partner will be facing each other.

Holding on to the gunwales amidships, place the canoe stern first into the water by moving hand-over-hand until the canoe floats free. Before anyone enters the canoe, the tip of the bow must be at the edge of the water.

When paddling tandem, only one paddler moves at a time. Having one paddler stabilize the canoe while the other moves is an easy way to prevent accidents. Once in the canoe, one paddler can use a paddle to keep the boat steady while the other paddler enters, exits, or moves about the canoe.

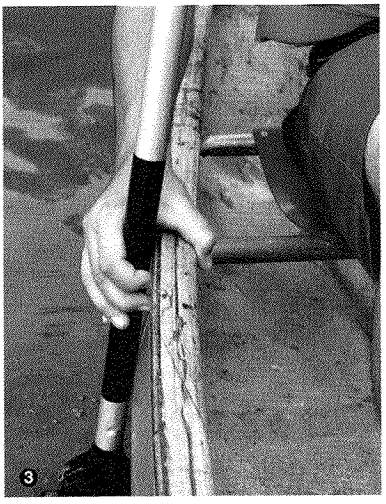
Step 1—The bow paddler steadies the bow with his or her knees while holding on to the bow deck plate.

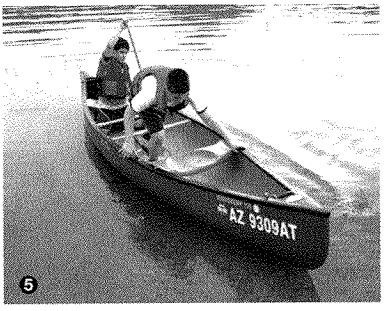
Step 2—With his or her paddle already in the canoe, the stern paddler steps into the boat on the center line, facing the bow, then backs up to the stern and sits or kneels, keeping three points of contact.

Step 3—To steady the boat, the stern paddler places his or her paddle in the water up to the throat and holds the paddle shaft against the side of the canoe, locking the thumb of the shaft hand over the gunwale. The paddle blade should be parallel to the side of the boat to reduce side-to-side movement of the boat.

Step 4—The bow paddler places his or her paddle in the bottom of the boat and enters the canoe as the stern paddler did.

Step 5—As the bow floats free, the stern paddler backstrokes to move the canoe away from the shoreline and the bow paddler moves forward to his or her paddling position.





If you are launching into a current or wind, or if a turn would be difficult after launch, a bow-first launch might be appropriate. The same procedure as with the stern-first launch is followed, except that the bow paddler enters the boat first, facing the bow. Once the bow paddler is settled, the stern paddler enters from the water's edge and moves amidships, allowing the stern to float free of the shore. After the bow paddler has moved the canoe forward a few feet, the stern paddler can back up to paddling position.

Tandem Parallel Launch

When launching from a dock, riverbank, or lakeshore with a sharp drop, or when entering a canoe from shallow water, the canoe should be parallel instead of perpendicular to the launch site.

If standing on a dock or riverbank, place the canoe in the water just as you would for a stern-first launch. Standing amidships and facing your paddling partner, pass the canoe hand-over-hand into the water. If entering the canoe from shallow water, walk the canoe into the water until the canoe is fully afloat.

Bring the canoe parallel to the dock or shore and place the paddles and equipment in the boat. While the bow paddler holds the bow (kneeling or sitting if launching from a dock or shore), the stern paddler enters the boat at amidships.

If the middle of the canoe is loaded with gear, then the stern paddler enters at the stern. With one hand on each gunwale and one foot in the boat over the center line, the stern paddler steps into the boat by shifting weight to the foot that is in the center of the canoe.

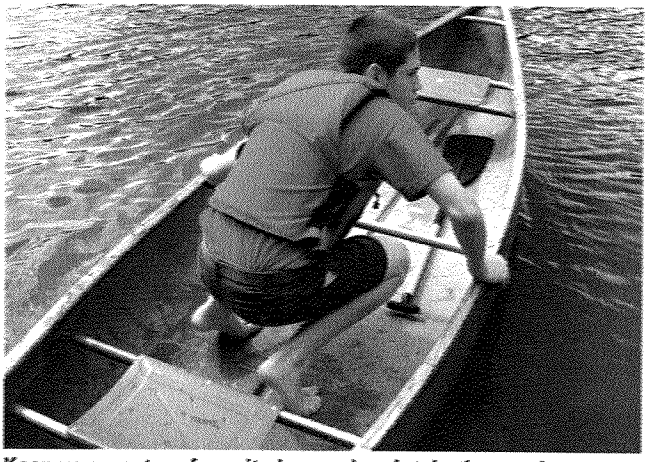
Once in position, the stern paddler can steady the canoe for the bow paddler by placing a paddle in the water. The shaft should be vertical, with the blade parallel. The shaft is held against the side of the canoe with the thumb of the shaft hand locked over the gunwale.

Then the stern paddler backs up to the stern, settles into position, and steadies the boat for the bow paddler by holding on to the dock or bank or by placing a paddle in the water as in step 3 of the tandem perpendicular launch.

Solo Perpendicular Launch

Solo paddlers can launch a canoe perpendicular to the shore, stern or bow first.

If launching stern first, have someone help you place the canoe in the water just as you would for a stern-first tandem launch. Then, when you are ready to enter the canoe, face the stern, place a hand on each gunwale, and place one foot in the boat over the center line.



Keep your center of gravity low and maintain three-point contact as you move into paddling position.

Step into the boat by shifting weight to the foot that is in the center of the canoe. Using three-point contact, keep your center of gravity low and move toward the stern. Take one more step toward the stern when the bow floats free to carry the boat away from shore. Then, carefully turn around and settle into paddling position.

If launching bow first, the procedure is the same as for the stern-first launch. Except, because you already are facing the bow, you need only back up a step to settle into paddling position as the canoe floats away from shore.

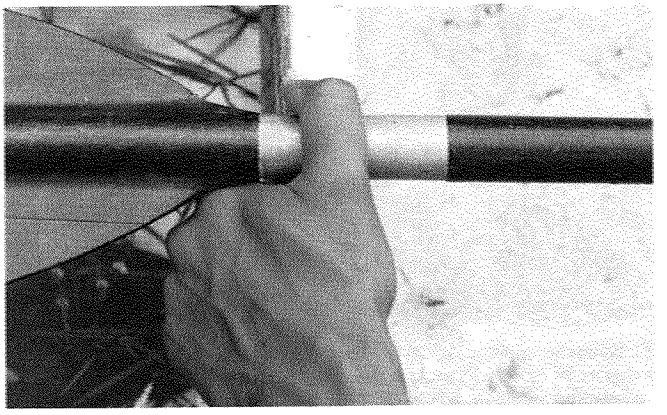
Do not push off from shore using a paddle or step into the boat with one foot and push off from the shore with the other.

Solo Parallel Launch

A parallel launch from a dock or bank or in shallow water often is the easiest type of launch. To begin, have someone help you place the canoe in the water just as you would for a tandem parallel launch.

If launching from a dock or bank, bring the canoe parallel to the dock or shore and load your equipment in the boat. If launching from shallow water, load your equipment in the boat and then walk the canoe into the water until it is fully afloat.

Enter amidships, but be more careful when boarding if you have no one to steady the boat for you. With one hand on each gunwale and one foot in the boat over the center line, step into the boat by shifting your weight to the foot in the center of the canoe. Settle into paddling position.



When launching from a dock or bank, place each hand on top of the paddle shaft where it touches each gunwale. Lock your thumbs around the paddle shaft and hold onto the gunwales with your fingers.

If launching from a dock or bank, you can place your paddle across the gunwales with the paddle blade on the dock or bank to stabilize the boat. Facing the bow, place either hand on top of the paddle shaft where it touches each gunwale. Lock your thumbs around the paddle shaft, holding onto the gunwales with your fingers. Lean the boat toward the dock or bank so you can brace against it with the paddle. Step onto the center line of the boat at the position from which you will paddle, keeping your weight on the land-side foot. Shift your weight to the foot in the center of the boat.

Landing a Canoe

Land a canoe by reversing the steps you took to launch it.

Tandem Perpendicular Landing

Bring the canoe perpendicular to the shore and step out while the boat is still fully afloat. The bow paddler should exit first and stabilize the boat while the stern paddler stows his or her paddle in the bottom of the canoe, moves to the bow, and steps onto the shore. Remove paddles and gear before carrying the canoe onto land. Together, lift the bow of the canoe and pull it ashore just until the stern reaches the water's edge.

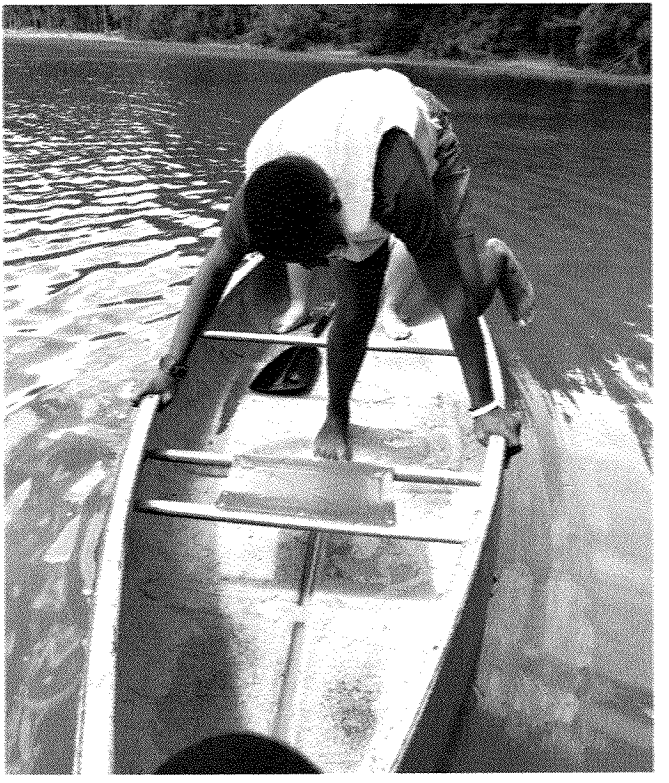
When landing, do not drive the canoe up onto shore. Instead, drift up like a feather until you touch bottom.

Tandem Parallel Landing

When landing a canoe against a dock or a bank, or in shallow water, bring the canoe parallel to the shore. Use a combination of draws and pushaways to move next to the landing site. The stern paddler stabilizes the boat by holding on to the dock or bank, or by keeping the paddle in a locked vertical position.

The bow paddler stows his or her paddle and backs up to amidships. Holding on to the gunwales, the paddler puts one foot ashore or into shallow water and exits by shifting weight to the landed foot. Once out of the boat, the bow paddler turns to steady the gunwales for the stern paddler.

The stern paddler stows his or her paddle, moves amidships, and exits just as the bow paddler did. Both paddlers can lift out the boat by the gunwales or turn it so it is perpendicular and lift it out as though they had landed on the shore.



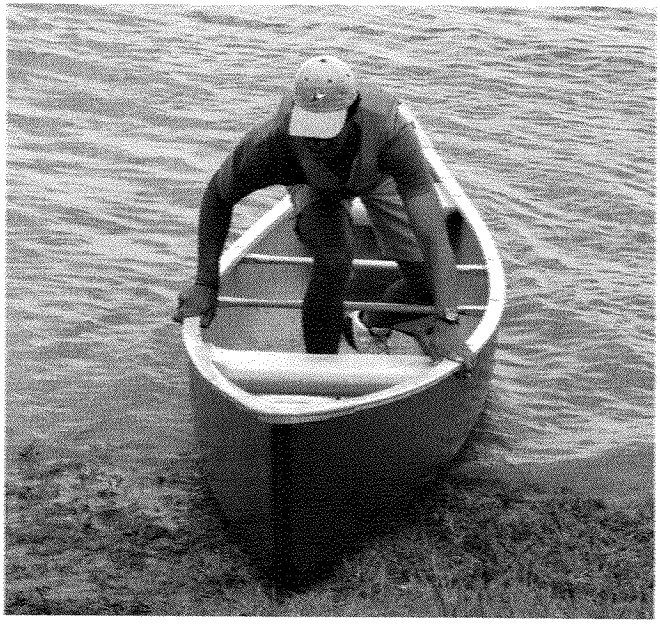
Solo Landings

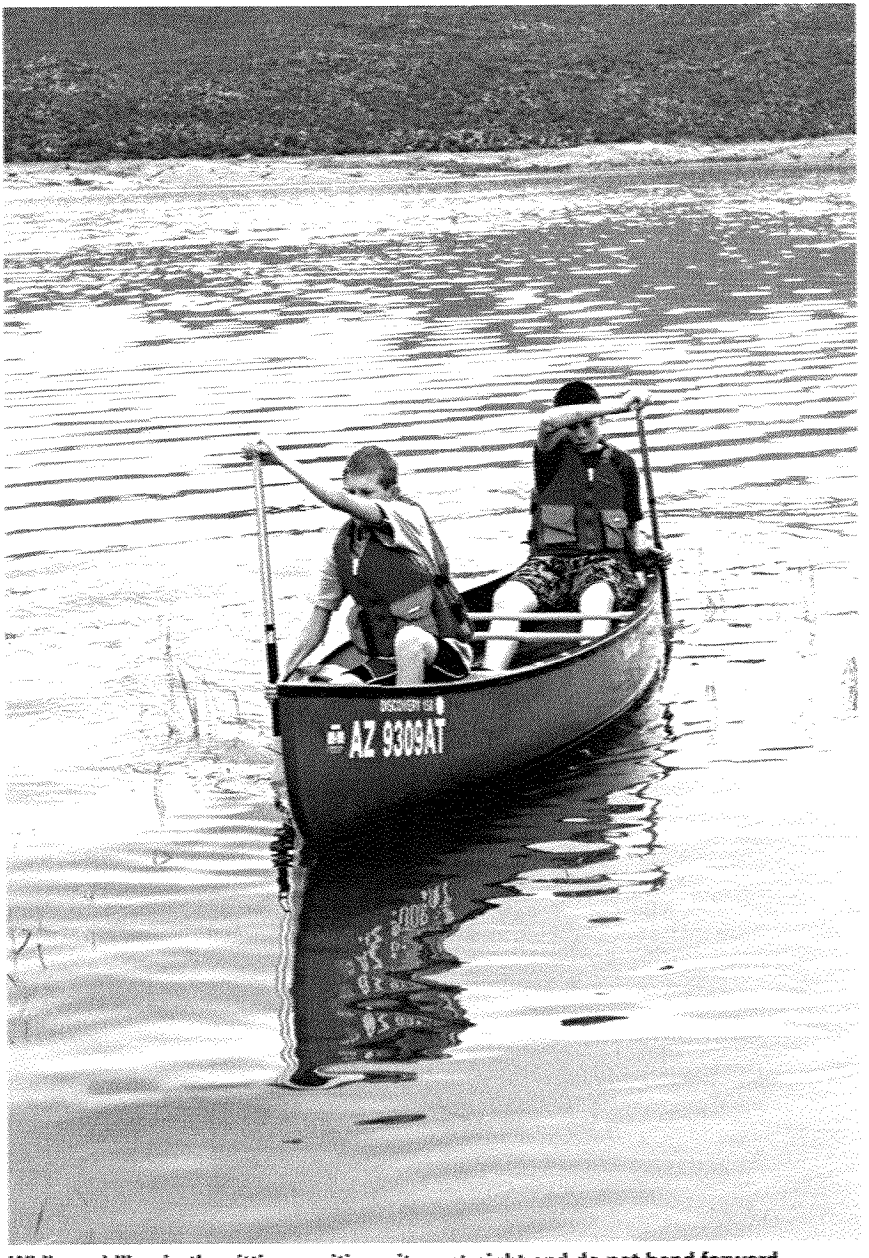
For a perpendicular landing, approach the shore slowly until the bow barely touches the water's edge. Avoid bridging the canoe. Stow your paddle and, using three points of contact, move toward the bow. Step out at the end of the boat. After exiting, lift the canoe by the bow deck plate and pull it forward until the stern catches the shore.

For a parallel landing against a dock or bank, or in shallow water, bring the canoe parallel to the shoreline and use a combination of draws and pushaways to move your canoe next to shore.

If exiting in shallow water, stow your paddle. While holding on to the gunwales, keep one foot in the boat on the center line and put the other foot ashore. Shift your weight ashore and step out of the boat. Have someone help you bring the boat ashore.

If landing at a dock or bank, you can stabilize the boat by placing your paddle across the gunwales with the blade extended onto the dock. With your hands on the paddle shaft where it crosses the gunwales and your thumbs locked around the shaft, step out of the canoe.





While paddling in the sitting position, sit up straight and do not bend forward.

Paddling a Canoe

Good position and body mechanics lead to effective paddling.

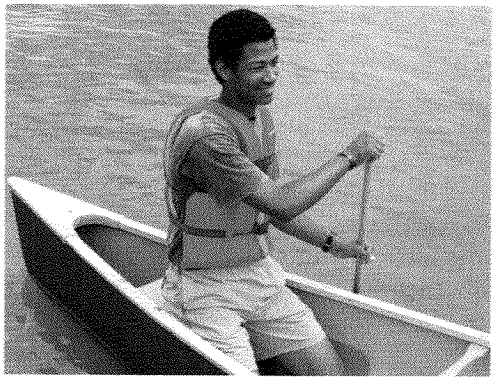
Paddling Positions

Most canoes have bow and stern seats. Whether paddling tandem or solo, sitting is comfortable for long cruises on open water. However, sitting also raises the joint center of gravity of the canoe and paddler, making the combination less stable. Paddling from the seat is acceptable on quiet waters, but on windy or rough water it is best to kneel. Kneeling lowers your center of gravity and makes the canoe more stable, especially in windy conditions.

It is important to learn a few kneeling positions so that you can change positions and give your muscles and joints some rest. You can use them whether paddling solo or in tandem. Always use a kneeling pad to protect your knees while kneeling.

The most common kneeling position is the **cruising position.** Kneel with your knees apart and with your weight against a thwart or the edge of a seat. To improve stability and control, wedge the knee that is on the paddling side against the bilge.

Whether you canoe with a partner or alone, either kneel in the canoe or sit solidly on a seat for stability and more efficient paddling. Think of yourself as part of the canoe, locked in place.



The cruising position is the most stable kneeling position and it lends the most power to a variety of strokes.

A variation of the cruising position is kneeling on one knee, called the **relief position.** Often alternated with the cruising position, the relief position provides some relief from the strain of kneeling during a long trip.

In the relief position, kneel on the knee closest to the paddling side and wedge it into the bilge. Extend the other leg in front of you, keeping the knee slightly bent.

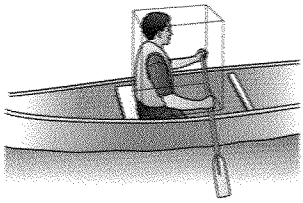
Strokes

When paddling, maintain a smooth rhythm with your paddle, keeping your strokes steady and crisp and in sync with your paddling partner. Use your arms to guide your paddle, but power the strokes with the larger muscle groups of your abdomen, shoulders, and back.

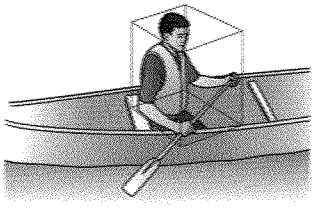
Practice the forward stroke, backstroke, draw stroke, pushaway, forward sweep, reverse sweep, J-stroke, stern pry, and rudder stroke using the following key principles.

Maintain good posture. Sitting straight will allow you to balance the boat more easily and to use your muscles more efficiently. Try not to hunch forward or overreach with your arms.

Center your body over the boat. Keeping your head over your abdomen, your center of gravity, will help keep the boat balanced. Even when sitting or kneeling close to the side of the boat, you can still maintain good balance by following this principle.



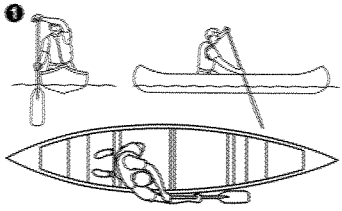
Paddle in the box. Imagine a box about as wide as your shoulders, as high as the top of your head, and as low as the top of the gunwales. It extends forward from your back to as far as your arms will reach while keeping good posture. Keeping your hands and arms in this box while you paddle will help prevent muscle strain and help you use the larger muscle groups of your abdomen, shoulders, and back to power your strokes.



Rotate from the waist. If you rotate your upper body to perform each stroke, the large, strong muscles of the torso will power the stroke and prevent fatigue. As you paddle, imagine your torso twisting around your backbone. Following the paddle blade with your eyes will help you learn to rotate your torso through each stroke.

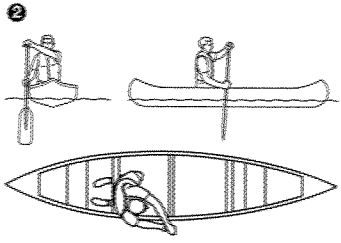
Forward Stroke and Backstroke

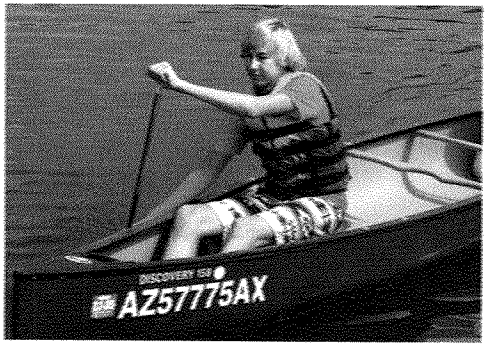
Bow paddlers, stern paddlers, and solo canoeists all can use the **forward stroke**.

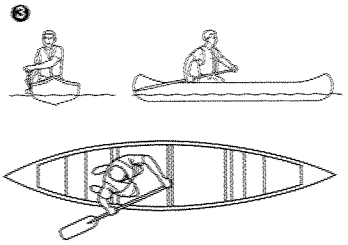


Step 1—Hold the paddle by the grip and shaft, your hands about shoulder-width apart, and twist your torso to move the paddle forward. The catch should be well forward, but within your paddling box.

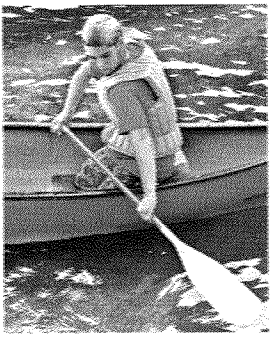
Step 2—Keeping your grip hand over the gunwale and lower than the top of your head, submerge the paddle blade, then use the muscles of your abdomen and back to pull the canoe ahead of the paddle. The sensation should be that the paddle remains stationary in the water while the canoe moves to it and then beyond. Keep the paddle vertical and close to the boat through the power phase.



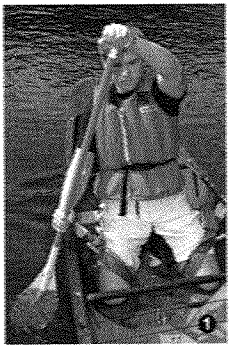


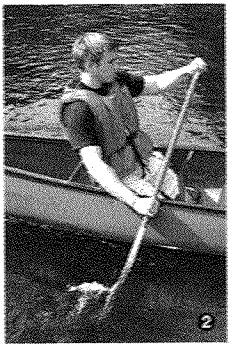


Step 3—Bring the blade out of the water near your hip and flip it sideways, or *feather* it, so that it will cut through the wind as you swing the paddle ahead to begin the next stroke. Tandem paddlers can synchronize their strokes to keep a canoe running true.



Each stroke is divided into catch, power, and recovery. During the *catch* phase, the paddler submerges the paddle blade. During the **power** phase, the paddler pulls or pushes depending on the stroke. The *recovery* phase occurs when the paddle blade exits the water and moves toward the catch position. These three phases of the stroke can be remembered with the abbreviation *CPR.*





Stop a canoe's forward progress and move it backward using the **backstroke.**

Step 1—Place the paddle blade in the water near your hip; keep the paddle vertical and close to the boat as it enters the water and through the power phase.

Step 2—Push the blade forward until you can no longer keep it vertical. The paddle can be returned to the starting position with an in-water or out-of water recovery. An in-water recovery takes less energy because the paddle stays in the water. At the end of the stroke, turn your grip hand so your thumb is pointed at the stern. The paddle blade should be parallel and next to the side of the canoe. At the end of the recovery, turn your grip thumb so it is pointing away from the canoe. For an out-of-water recovery, drop your grip hand down until the paddle blade is just out of the water. Feather it back to the starting point and repeat the stroke.

If you are on a long trip, a slower recovery allows more time for your arms and torso muscles to rest between strokes.

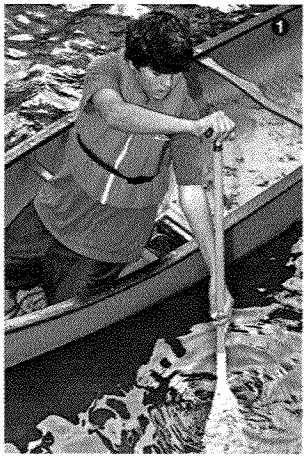
Draw Stroke and Pushaway Stroke

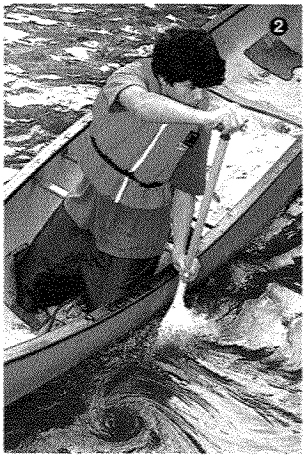
The **draw stroke** moves your canoe toward the paddling side.

Step 1—Begin the stroke by rotating your torso until your shoulders are parallel to the center line. Reach out with both arms, keeping the paddle shaft vertical and the blade facing the canoe, and place the blade into the water up to the throat. (Keep your center of balance over the center line of the boat; leaning out can capsize the canoe.)

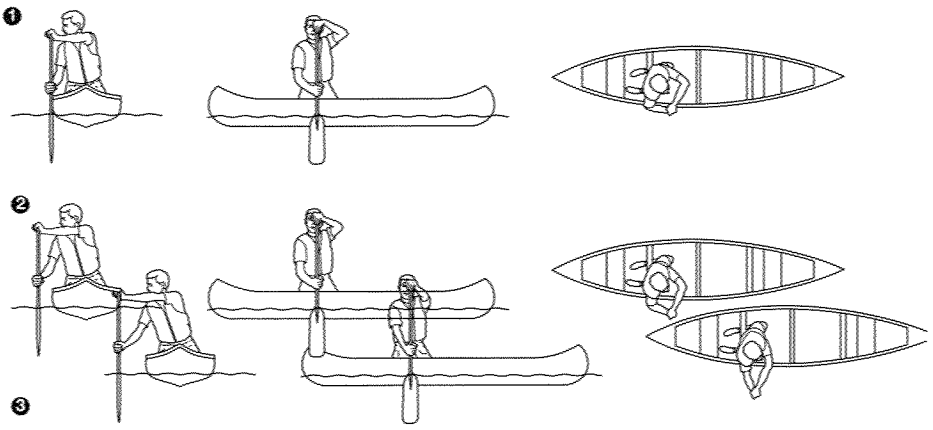
Step 2—Keeping the blade vertical and submerged to its throat, feel the blade catch in the water. Draw the canoe straight toward the paddle using the muscles of your torso.

Step 3—Slip the blade out of the water sideways just before it touches the canoe.





If you must paddle into the wind, try to keep the canoe pointed into the waves at a 30- to 45-degree angle to avoid being turned sideways or broadsided by the wind. Take short, choppy strokes. Alternate strokes to stabilize the canoe and to hold it on a steady course. When paddling through big waves, wait until your stern drops into the trough between waves and paddle hard until you are over the top of the next wave. If you are paddling with the wind at your back, let it carry you forward while you stay alert for sudden shifts in wind direction.



A **pushaway stroke** moves the canoe away from the paddling side.

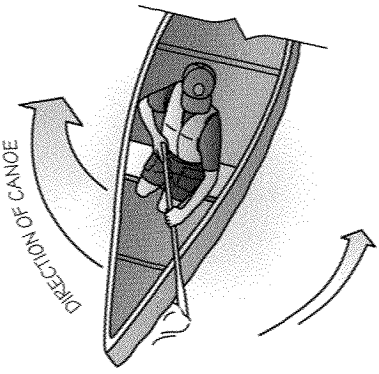
Step 1—Start with your shoulders parallel to the canoe's center line. With the paddle shaft vertical, place the paddle blade into the water, even with your hip and close against the side of the canoe (without touching it). Twist from the torso and perform the catch next to the canoe, even with your hip.

Step 2—Using the muscles of your torso, push the canoe away from the paddle as far as you can while still keeping the paddle vertical and the blade submerged to the throat. Do not lean your body over the canoe.

Step 3—Recover by turning the thumb of the control hand toward you and feathering the blade back to the boat next to your hip.

Paddling solo is essentially the same as paddling tandem. The main difference is that strokes are performed from amidships. The boat should be trim, with the bow and stern even in the water. You can take your time and enjoy your paddling experience at your own pace. But solo paddling does not mean boating alone. **Never paddle by yourself**—always have at least one buddy boat and two other paddlers with you.

Sweeps



In all the sweeps, the paddle moves in an arc, or a part of a circle. The **forward sweep** turns the canoe away from the paddle and the **reverse sweep** turns the canoe toward the paddle. Bow paddlers, stern paddlers, and solo canoeists all can do forward and reverse sweeps. However, to turn the boat when paddling tandem, one paddler performs a forward sweep while the other performs a reverse sweep. Also, the forward and reverse sweeps are performed differently from the bow than from the stern, and solo sweeps are slightly different from tandem sweeps because the paddling position is located in the middle of the boat.

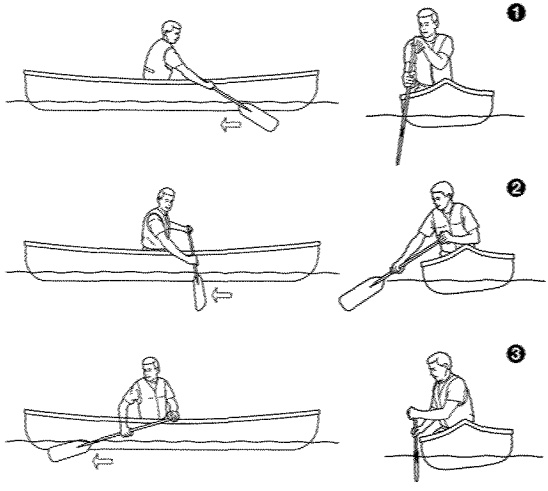
FORWARD SWEEP

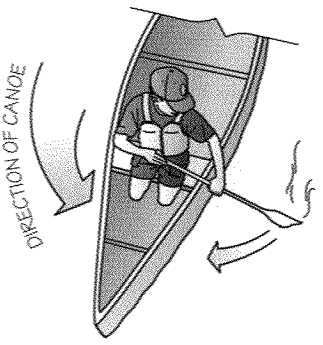
Step 1 (bow)—Begin with your grip hand lowered to your stomach and your shaft hand well forward so that the paddle shaft is extended over the water, parallel to the canoe's center line. The paddle blade should be perpendicular to the water. Bend forward slightly at the waist to place the tip of the paddle blade into the water as close as you can to the side of the boat's bow. For best efficiency, keep the blade fully in the water up to the throat of the paddle.

Step 1 (stern)—Begin with your grip hand at your side near the gunwale and your shaft hand extended out from the side of the canoe. The paddle blade should be perpendicular to the water. Be sure to keep the blade completely in the water throughout the stroke.

Step 2—Twist your torso as you pull the blade in an arc. Sweep from the bow to your hip when in the bow seat and from your hip to the stern when in the stern seat, making the widest arc possible without leaning.

Step 3—Lift the paddle out of the water and feather it just above the water's surface. Repeat the stroke as needed to turn the bow to the *offside*.





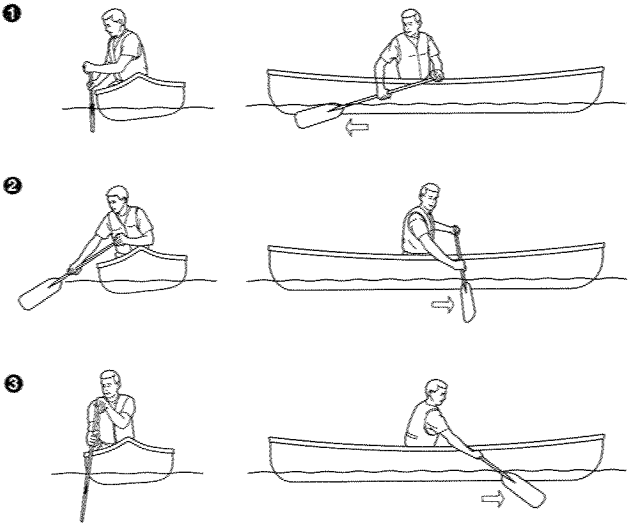
When paddling solo, begin the forward sweep as a bow paddler would and end as a stern paddler would. That is, extend the range of the sweep through an entire half-circle from bow to stern.

REVERSE SWEEP

Step 1—From the bow, begin with the paddle horizontal to the water and perpendicular to the center line, about even with your hip. From the stern, begin with the paddle extended behind you and parallel to the side of the canoe. Twist your torso and reach without leaning to submerge the paddle blade.

Step 2—Reaching the paddle out as far to the side as you can without leaning your body or the canoe, sweep hip to bow when in the bow seat and stern to hip when in the stern seat, making the widest arc possible.

Step 3—Lift the paddle blade out of the water just before it touches the side of the canoe, feather it, and swing it back into position to begin another stroke.



J-Stroke

The forward strokes of a paddler in the stern of a canoe will have more effect on the direction a canoe travels than will those of a paddler in the bow, causing the boat to turn away from the strokes of the stern paddler. The same is true when paddling solo: the forward stroke commonly turns the canoe to the paddler's offside. One way to counteract this effect is for stern paddlers and solo paddlers to use a **J-stroke.** When done correctly, the J-stroke allows for a smooth, continuous stroke that keeps the canoe on course with minimum effort.

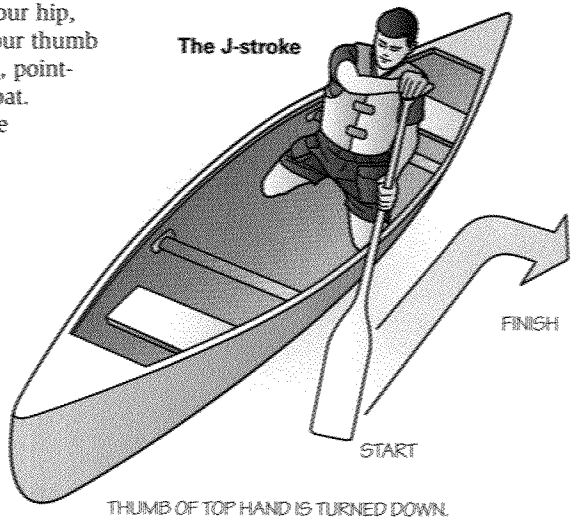
Only stern paddlers and solo paddlers perform the J-stroke.

Begin this stroke as you would a forward stroke. As the paddle reaches your hip, rotate your grip hand so that your thumb turns down and away from you, pointing toward the bottom of the boat. The paddle blade remains in the water but comes parallel to the side of the canoe. If you push the paddle blade out against the water with the shaft hand while pulling in slightly with the grip hand, the canoe will move back toward center.

Seen from above, the stroke forms the shape of the letter J, the hook in the J forming as you push the paddle away from the canoe to correct its course.

Avoid adding a backward hook, which slows the canoe. Apply only as much power to the stroke as is needed to keep the canoe going straight; too much power in the forward stroke phase will turn the canoe offside.

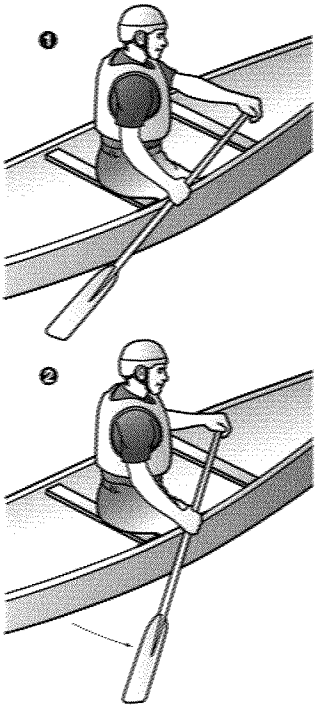
The J-stroke



It probably will take a bit of practice to master the J-stroke because the amount of correction needed changes often, and too much correction is as bad as not enough. Take it slowly. The first few times, you might want to stop just before the recovery to make sure your thumb is pointed down and the blade is properly angled.

Stern Pry

From the stern of a solo or tandem canoe, the **stern pry** is a powerful turning or correction stroke. Keep the pry stroke short and fast. Repeat the stroke if necessary. The stern pry is a powerful stroke for moving a canoe toward the paddler's offside.

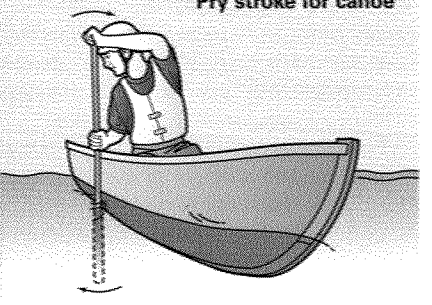


Step 1—Hold the paddle shaft parallel to the side of the boat and place the grip end of your paddle out over the water. Put the blade in the water to the throat so that the blade is slightly underneath the stern. The shaft hand should hold the shaft against the gunwales.

Step 2—Use the gunwales as a fulcrum and pull your grip hand into the boat. The power of the stroke increases with the speed you move your grip hand. Keep the stroke short—about a foot or so—since the blade quickly begins pulling your gunwales down, rather than pushing them away.

Step 3—An out-of-water recovery is most efficient for the stern pry and requires that you drop your grip hand down toward your lap, slicing the blade out of the water. Return to the starting point of the stroke by moving the grip hand out over the water and the blade underneath the stern.

The pry stroke will move your canoe away from the paddling side. Holding the paddle as you would for a draw stroke, slip the blade back into the water next to the canoe and pry it away. Though it can be hard on the paddle loom, you can brace the loom against the canoe, using the gunwale as a fulcrum or pivot for leveraging the stern away from the blade of the paddle.



Pry stroke for canoe

Rudder Stroke

Once the canoe is moving in a forward direction and has some momentum, an easy way to keep the canoe on course is to use the **rudder stroke.** This stroke uses the paddle blade as a rudder to make small corrections in direction. The faster the canoe is moving forward, the easier and better the rudder stroke works.

After taking a forward stroke, the stern paddler keeps the paddle blade in the water but turns it vertical, next to the hull of the canoe. This is done by holding the thumb of the top hand in either a thumb's-up position or a thumb's-up down position as in the J-stroke. The positioning of the blade in the rudder stroke is just behind the stern paddler, with the lower hand at the paddler's hip. The stern paddler must have the paddle blade fully submerged in the water and parallel to the centerline of the canoe, next to the stern.

The top hand should be outside the canoe, over the water and not in the boat. By moving the top hand inward or outward by an inch or two, the paddle acts as a rudder, and the direction of the canoe can easily be changed.

Avoid taking too long to steer the canoe with the rudder stroke, or it will lose its effectiveness, since it works only if the canoe is moving. Also keep the blade close to the side of the canoe, since the farther it moves away from the hull, the more it causes the canoe to slow down or stop.

Correct vertical placement ensures a powerful stroke.

Changing Places in an Unloaded Canoe

For various reasons, you and your paddling partner might decide to change positions while in the canoe. It is always safer to paddle ashore than to change places on open water. Also, equipment and gear should be stored. Changing places in a loaded canoe is dangerous and should not be attempted. Instead, paddle to shore and change places there.

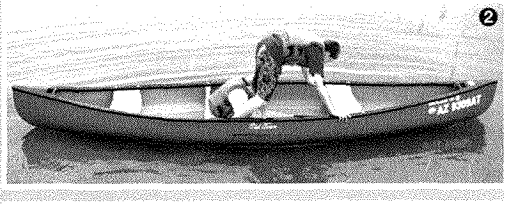
To change places in the canoe:

Step 1—The bow paddler backs up to amidships and either kneels or sits with legs extended in front. Be careful not to put your legs under a thwart. This could be dangerous if the canoe were to capsize.

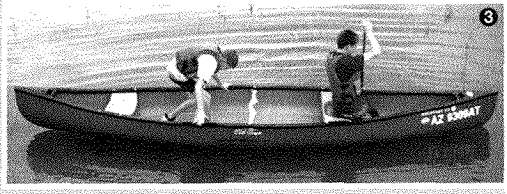
Step 2—The bow paddler leans to one side and the stern paddler passes on the opposite side, keeping three points of contact along the way.

OR

The bow paddler crouches and the stern paddler carefully steps over while maintaining three-point contact.



Step 3—Once past the bow paddler, the stern paddler settles into position at the bow and steadies the boat using a paddle. The bow paddler rises and moves to the stern position, keeping three points of contact.



When paddling, it is important to direct the force of the stroke in the proper direction by keeping the paddle blade at a 90-degree angle to the direction you are trying to move the boat. If the angle differs from that by more than 10 degrees, some of your energy will be wasted. For example, a stroke completed with the paddle at a 45-degree angle has half the power of the same stroke completed with the paddle at a 90-degree angle. To keep the paddle vertical, make sure that the hand on the grip is always directly above the hand on the shaft.

Maneuvers

Once you have mastered the strokes, you are ready to practice maneuvering the canoe. Having control of the canoe will make canoeing a more rewarding and enjoyable experience. You will be able to arrive at your destination quickly and efficiently, stop the canoe and avoid obstacles, easily change your direction, and move the canoe sideways to reach another canoe or to land.

Tandem Maneuvers

Communicating well is the key to successful tandem maneuvers, and tandem canoeing is the most fun and effective when you and your partner work as a team. Verbal commands, such as "Turn left," "Turn right," "Ready?" "Paddle ahead," and "Paddle back," are helpful. Here are some key points to help you paddle tandem.

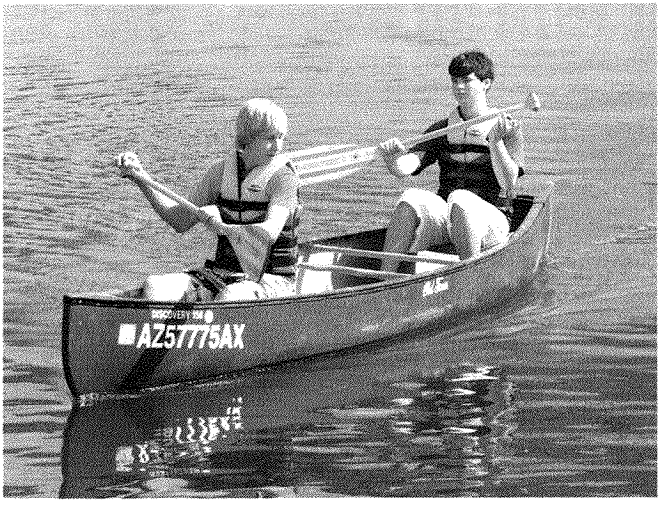
Paddling positions. Always paddle on opposite sides of the boat to keep the strokes balanced and efficient. Never switch sides without telling your partner first.

Paddle pace. The bow paddler sets the pace. If the pace is too fast or too slow, the stern paddler must let the bow paddler know. After paddling together for a while, the bow paddler can feel the stern paddler's strokes and can keep in time.

When canoeing tandem, *onside* is the side on which the bow paddler is paddling. When the bow paddler is tired of paddling on one side and switches to the other, the new paddling side becomes onside. In solo paddling, onside is the side on which the paddler is paddling; *offside* is the opposite side.

Paddle in unison. When you and your partner's paddling is synchronized, you combine the power of your strokes and the canoe moves much faster. Because the stern paddler can easily watch the bow paddler's movements, the stern paddler is responsible for synchronizing the strokes.

Communicate. Discuss your signals and commands ahead of time. Know where you are going and what you want the canoe to do. It is easier for the bow paddler to hear the stern paddler's commands. The bow paddler might have to turn slightly when calling commands to make sure the stern paddler hears them. Don't hesitate—communicate!



Complementary strokes. You are responsible for your end of the boat. You must know which strokes can be used together to maneuver the canoe in the direction you and your partner want to go.

Paddling Commands

Ready?—Asks if the other paddler is ready to start
Paddle ahead—Move the canoe forward
Paddle back—Move the canoe backward
Hold water—Brake the canoe, stop it from moving
Let it run—Stop paddling and let the boat coast

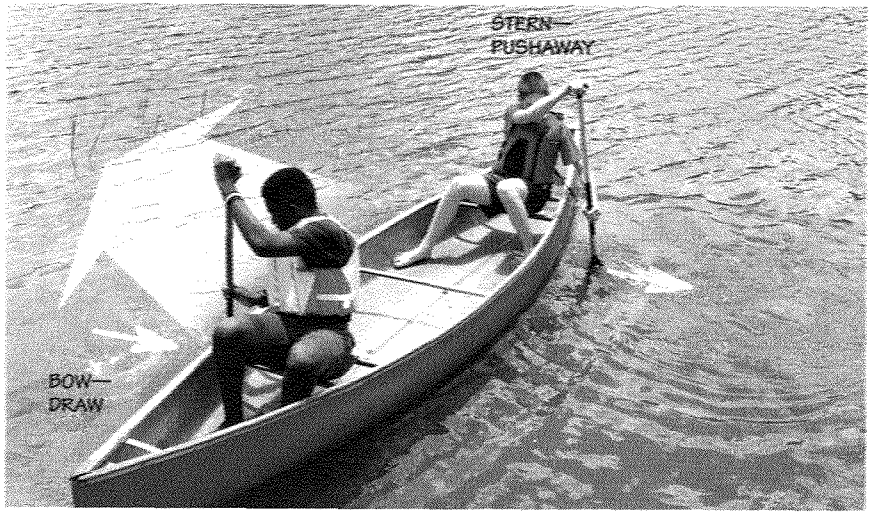
Onside pivot—draws. Turns the boat toward the bow paddler's paddling side.

Pivots or Spins

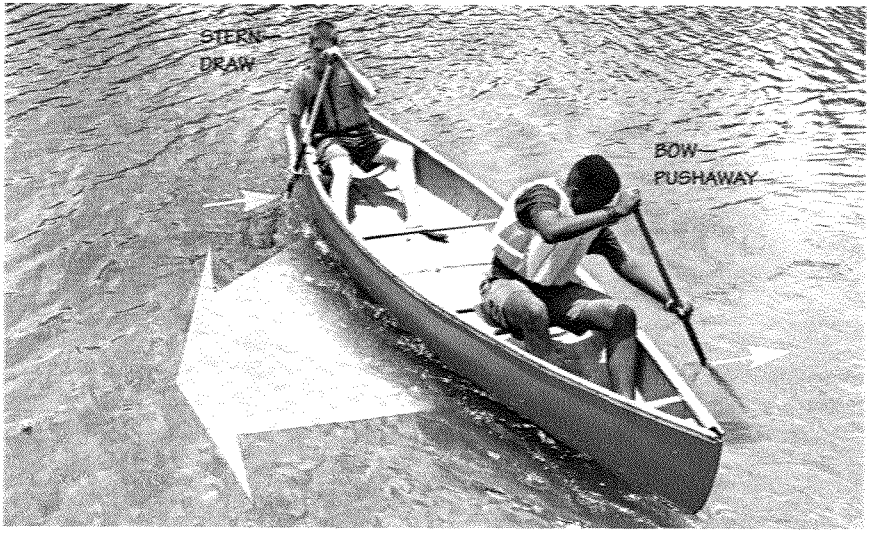
The **pivot point** is the balance point of the canoe and is found near the center of the canoe on the center line. It is the point around which the canoe spins. When canoeing tandem, perform turning strokes as close to the ends of the canoe as possible and sweep from tip to hip or hip to tip to make turns easier.

You and your partner can pivot the canoe to the onside or offside direction using sweeps, draws, and pushaways.

Offside pivot—pushaways. Turns boat away from the bow paddler's paddling side.



Moving abeam—onside. Moves the boat sideways toward the bow paddler's paddling side.



Moving abeam—offside. Moves the boat sideways away from the bow paddler's paddling side.

Anchor your paddle and make it "stick" in the water. Move your body into position before the paddle blade enters the water. Make a clean catch, and try not to splash. Leaning slightly toward the direction of travel will make this maneuver easier.

Abeams

You and your partner can move your canoe sideways, or *abeam* to the onside or offside direction using draws and pushaways. Moving the canoe abeam occurs at a right angle to the center line.

Maintaining the hold-water position while the canoe is stationary will reduce the drift and shift of the canoe.

Stopping the Canoe

To stop the canoe in the water, the stern paddler gives the command "Hold water" and both paddlers perform strong backstrokes in unison. Focus on a clean, deep catch, and at the end of the power phase, lock your arms with the paddle shaft in a vertical position. Don't recover until the canoe has stopped. You might find it helpful to lock the thumb of the lower hand over the gunwale.

Big corrections usually will slow your progress, so keep your eye on your target and make small corrections as you go.

Paddling in a Straight Line

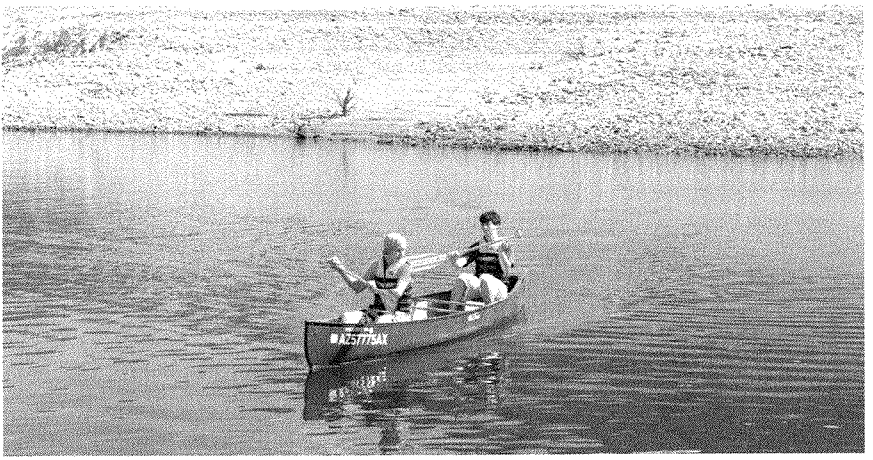
Paddling in a straight line is a great opportunity to experience teamwork and to exercise communication skills. It also is a good way to master tandem strokes and paddling in unison. Unless it is a rare, windless day, wind and waves can push you off course. Generally, it is best for the stern paddler to be on the opposite side of a wind or current.

Paddling a straight line starts with picking a fixed object on land or in the water for which to aim. Use a combination of strokes to navigate the canoe straight to your destination.

- Bow paddler—forward stroke, draw
- Stern paddler—forward stroke, J-stroke, draw

Generally, to travel a straight course forward, the bow paddler performs a forward stroke and the stern paddler performs a J-stroke, focusing on the right amount of correction to maintain a straight course.

If wind, current, or uneven paddling causes the canoe to turn to one side, paddlers can apply corrective strokes to keep the canoe on a straight course. If the canoe turns to the offside, the bow paddler can perform a draw or paddle less strongly. The stern paddler can perform a forward stroke instead of a J-stroke, or a draw stroke if a strong correction is needed. If the canoe turns to the onside, the bow paddler can paddle harder to counter the force or perform a forward sweep to turn the boat straight. The stern paddler can make adjustments to the force of the J-stroke to counter the turn.



Solo Maneuvers

Performing solo maneuvers comes naturally if you are an experienced stern paddler. The strokes used to turn, move abeam, stop the canoe, and paddle straight are the same as those used when paddling tandem from the stern.

Turns and Abeams

When paddling solo, you can turn the boat to the offside with a forward sweep or to the onside with a reverse sweep. By repeating these strokes, you can turn the boat toward the opposite direction. Use the draw and pushaway strokes to move abeam, or sideways.

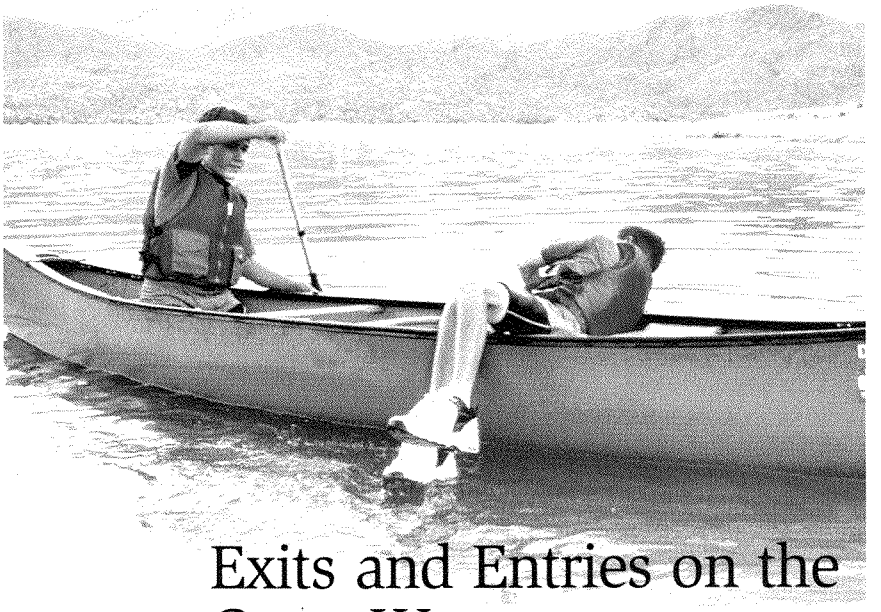
Stopping the Canoe

Stopping the canoe while paddling solo is similar to stopping the boat when paddling tandem. Perform a strong backstroke, focusing on a deep, clean catch. At the end of the power phase, lock your arms with the paddle shaft in a vertical position. Don't recover until the canoe has stopped. You might find it helpful to lock the thumb of the lower hand over the gunwale.

Paddling in a Straight Line

When paddling by yourself, your ability to paddle in a straight line depends on your mastery of the J-stroke. If you paddled using only a forward stroke, your canoe would turn to the offside. The J-stroke applies a small correction at each stroke to keep the canoe on course. However, you might not need to use the J-stroke for every stroke. If a headwind is coming from your offside, a forceful forward stroke might be enough to keep the canoe on course. If a headwind is coming from your onside, it might be better to switch to the other side and paddle there to keep the canoe going straight. But avoid switching sides every few strokes. It is better to pick a side and stay with it.

Remember that when you are canoeing solo, there should be at least one other boat on the water and two other canoeists with you.



Exits and Entries on the Open Water

Sometimes, on a hot day, you might hop overboard to cool off. Other times, you might find yourself overboard by accident. In either case it is important to learn how to safely exit the boat and reenter it.

Under supervision, practice in open water close to shore in an area that has been checked for and determined free of underwater hazards. Dress appropriately for the weather and water temperature. Dress may range from a T-shirt and bathing suit to a wet suit. A properly fitted life jacket is required for each participant.

Going Overboard—Exiting the Canoe

Tandem paddlers can use the following technique. Although tandem paddlers can time their exits so they land in the water at the same time, it is safer to exit the canoe one person at a time. In this way, one person always has control of the boat.

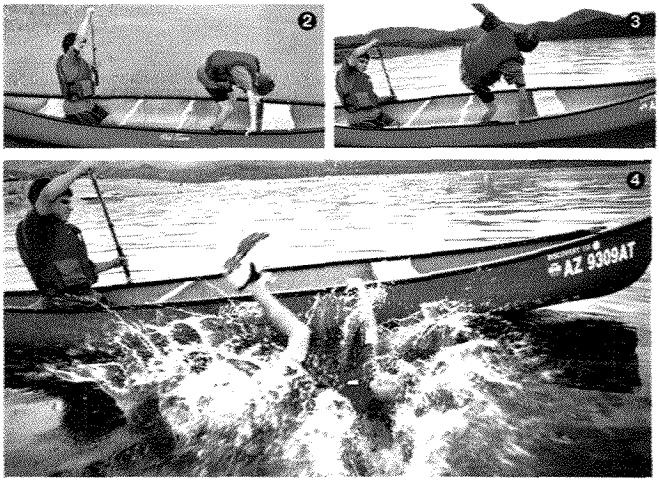
Step 1—If possible, move amidships, where there is more room to exit. However, you can exit safely from the bow and stern as well. Stay as close as you can to the seat or thwart in front of you to maximize the amount of free space behind you. Lean over with a hand on each gunwale and balance on your toes.

Step 2—Place your hand on the gunwale on the side of the canoe from which you will exit. Turn the hand that is on the side of the boat from which you will exit so that your thumb points toward the stern and your elbow points away from you. The other fingers of that hand should be inside the boat and wrapped over the inside part of the gunwale.

Step 3—Holding on to the gunwale with the hand that is turned inward, let go of the other gunwale. Without losing your grip on the canoe, swing your free arm around toward your back as you turn your body and fall out of the canoe backside first.

Step 4—You should land facing the opposite direction from where you started.

Never lose contact with the boat when going overboard. If you fail to hold on to the canoe as you go overboard, you might go under the water and the canoe might drift away from you.



Exiting the canoe—going overboard

Reentering the Canoe

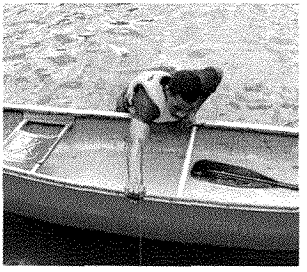
You can reenter a canoe in open water at either end of the canoe where there is enough open space, but amidships usually provides the most room for maneuvering. Amidships also has the smallest freeboard, so there is less height to overcome when pulling yourself up and over the gunwale.

Here are a few simple techniques for reentering a canoe in open water that you can use with a partner. Practice these techniques under supervision so you can learn how to do them correctly.

Do not push down on the gunwale at the point where you are entering—you could swamp the boat.

When the canoe has a section free of thwarts or a portage yoke, the **duck-and-roll reentry** works best. At the most open section of the canoe, place your hands inside the canoe, resting in the bilge. Straighten your arms so that the weight of your upper body rests on your hands and your waist is even with gunwale. Keep your head as low as possible and lean into the canoe. Push, kick, and lean forward until your hips are over the gunwale. Bend one arm and drop your shoulder toward the bottom of the boat. Then roll onto your back and swing your legs into the canoe.

Use the **arms-across reentry** when space is limited and the canoe has several thwarts or a portage yoke across the middle of the boat. First, grab the gunwale amidships and bring your body up to the surface of the water. It is much easier to enter the canoe from this position rather than trying to pull up your body from below the water's surface.



Arms-across reentry

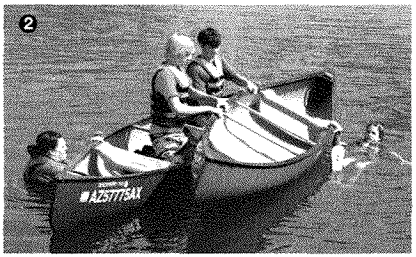
With one hand on the gunwale, rapidly reach across the canoe with your other hand as far as you can to the opposite side. Grab the opposite gunwale or a nearby thwart. Then do the same with your other hand so that both hands are in front of you. Kick and pull your body forward until your hips rest on the gunwale. Roll over and sit down in the canoe with your legs and feet hanging outside the canoe. Now bring in your feet and return to paddling position.

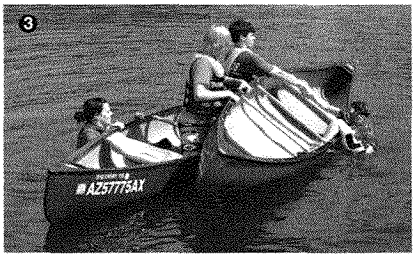
A paddling partner in the water on the opposite side can help by leaning the canoe toward you as you begin and then pulling down on the gunwale to counterbalance your weight as you pull yourself into the boat. A partner in the boat can do the same by leaning first toward you and then away from you while either kneeling or sitting on the bottom. Your partner can use a paddle as a brace on the side opposite you.

If both you and your paddling partner are in the water and are about equal in weight and size, you can work together to enter the canoe at the same time. With both hands on the gunwale, position yourselves on opposite sides of the canoe, one slightly forward and one slightly back of amidships. On signal, both of you scissor kick and push down on the gunwale to raise yourselves up to the point where your arms are straight and your waist is even with the gunwale. If one of you slips off, falls backward, or is unable to pull up, the other should immediately drop back into the water to prevent the canoe from capsizing. If you both have done this successfully, simply lean into the canoe and roll over so that you fall into the canoe, landing on the bottom of the canoe. Your knees should be bent over the gunwale and your feet hanging outside the canoe over the water.

The **heel-hook assisted reentry** requires less upper-body strength and flexibility of a tired paddler who is overboard.

Step 1—Bring the empty canoe next to the side of the buddy boat.





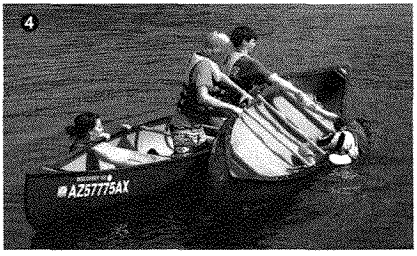
Step 2—Have the paddler in the water float on his or her back and hold on to the gunwale. The buddy boat paddlers raise the nearest gunwale of the empty canoe so the gunwale closest to the paddler is just above the water.

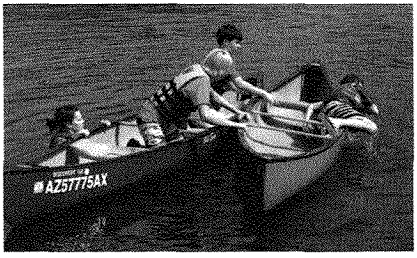
Step 3—The paddler in the water places his or her outside leg inside the canoe, under a thwart, rolls onto the gunwale, and extends the outside arm, reaching for the buddy boat paddler. That paddler reaches across to the paddler in the water, ensuring a strong and protected shoulder position. If the buddy boat paddler cannot reach the paddler in the water, he or she should tell the paddler in the water to grab the seat or thwart as far across the canoe as possible.

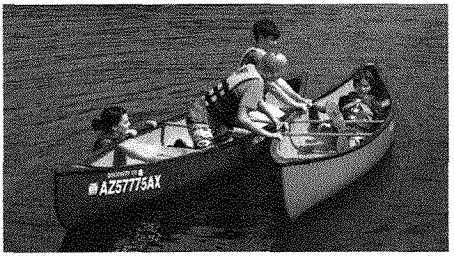
Step 4—Once the paddler in the water has completed steps 2 and 3, the buddy boat paddlers say,"Roll into the canoe on the count of three." On "three," the paddler straightens his or her leg, lets go of the rescuer, and rolls into the canoe while at the same time the buddy boat paddlers push down on the boat's gunwales.

This will help lever the paddler into the boat. The paddler should continue to roll into the canoe until he or she is sitting on the bottom of the canoe.

If a second paddler needs to reenter the craft, the process is repeated, with the first paddler kneeling in the canoe and assisting in the boat's stability.

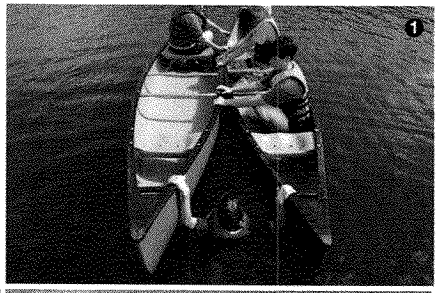




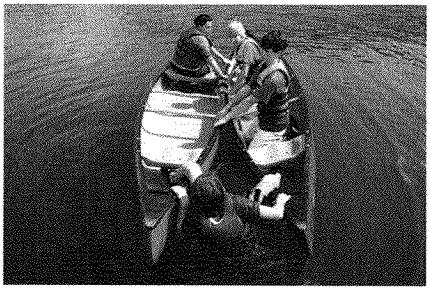


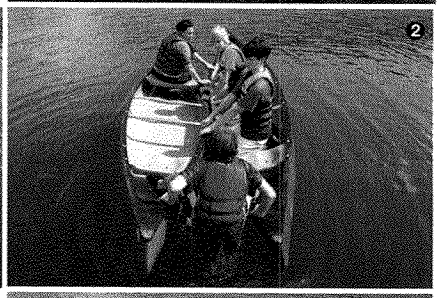
Between-the-Boat Entry

Another method to reenter a canoe from the water makes use of the buddy boat.

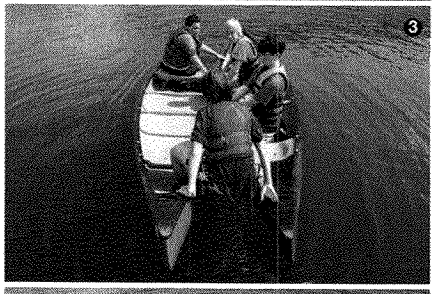


Step 1—The paddlers in the buddy boat bring the two canoes together while the paddler in the water lies on his or her back between the two canoes. The paddler in the water then grabs the gunwale on the right with the right hand and the gunwale on the left with the left hand.

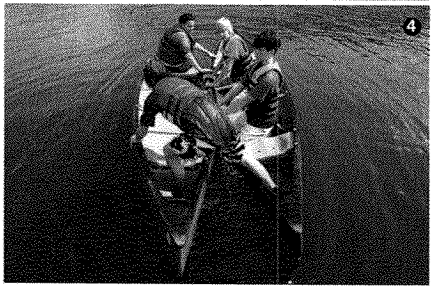




Step 2—The paddler in the water then places the right foot and right lower leg in the canoe on the right, and the left foot and left lower leg in the canoe on the left. Pulling up between the canoes, the paddler uses his or her arms and legs to lift out of the water.



Step 3—After the paddler has raised himself or herself to the level of the gunwales, he or she shifts weight to the legs and feet and begins to stand with a foot in each canoe.



Step 4—Once the paddler has risen to a low standing position, he or she steps into his or her own canoe and assumes a paddling position.

To tow a canoe to shore, two paddlers can hold on to the same painter, either the bow or stern, and together pull the canoe using a one-armed sidestroke.

Swamping and Rescues

Every canoeist manages to swamp a boat now and then. Intentionally capsize your craft in calm water and practice rescues and recoveries until they become automatic.

You are much more likely to be seen if you stay with a swamped canoe than if you swim away alone. If the shore is not too far away, try to move the boat to shallow water where you can empty it out. Otherwise, stay with the boat until help arrives. A canoe can stay afloat even if it is full of water. You can rest inside a swamped canoe, sitting on the bottom and facing the same direction as your partner. Or, you can crawl on top of an overturned canoe to avoid sitting in the water.

One important boating safety rule is "Stay with the boat."

Swamped Canoes

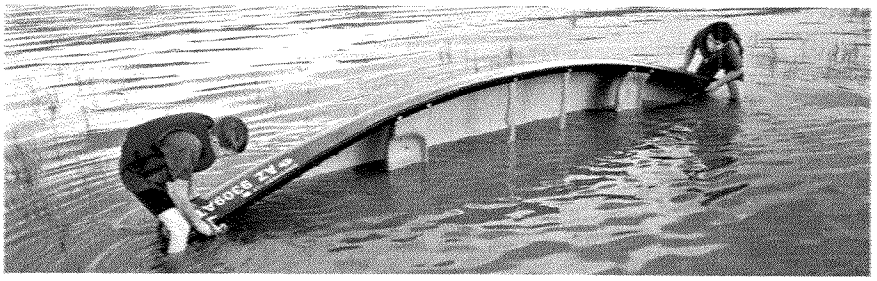
To safely capsize a canoe, sit next to your paddling partner in the bottom of the canoe facing the same side and with your legs hanging over the gunwale. Put the arm that is closest to your partner on the gunwale behind you. Put the other hand on the gunwale in front of you. Rock forward and backward until the gunwale in front of you goes below the water level and the canoe begins to fill with water.

If the canoe is full of gear, one paddler can push it from the stern using the breaststroke kick. The other paddler can pull it from the bow using a one-arm sidestroke.

Moving a Swamped Canoe

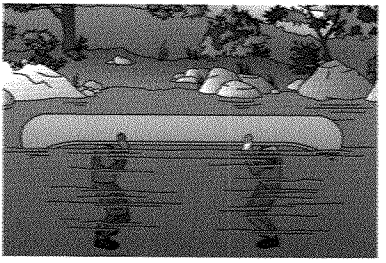
You can swim, tow, or paddle a swamped canoe.

An empty canoe can be paddled to shore. Sit in the bottom and use the paddles or your arms to paddle the boat forward. Use different combinations of forward strokes and backstrokes to turn the boat if necessary. Back paddle well short of landing to slow the canoe and avoid colliding with a dock or the shore.

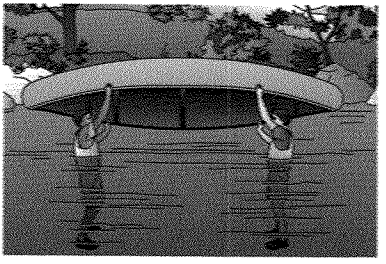


Shallow Water Emptying

The easiest way to empty a swamped canoe is to pull the canoe to shallow water and remove any gear that might be in the way. Roll the canoe on its side to empty out half the water and then turn it upside down, without lifting the canoe out of the water, to empty out the remaining water. Once the water is out, turn the canoe right side up.

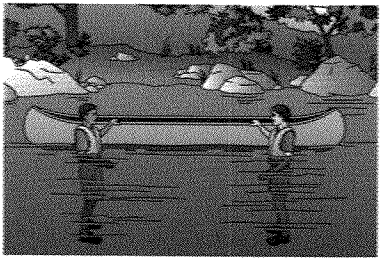


If you and your partner cannot lift the canoe completely clear of the water, you can move the canoe to shallower water where one end of the canoe can be rested on the shore. Stand at the other end of the canoe, where the water is deeper. Together, turn the canoe on its side and then completely over, with the other end of the canoe supported by the ground. Once emptied, turn the canoe upright and stow the gear.



Shallow Water Capistrano Flip

The Capistrano flip usually is performed in deep water, but it also can be done in shallow water. With your paddling partner, stand in waist-deep water and turn the canoe upside down. Squat under the gunwale and come up into the air pocket underneath the canoe. Facing each other and with one hand on each gunwale, tip the canoe slightly to one side until one gunwale is raised above the water line and the air seal is broken. Then stand up quickly, lifting the canoe up and over to the side. Make sure to tip the canoe toward the shoreline and to hold on to it so that it does not float away.



When using your canoe for a rescue, remember three important points:

- The welfare of the people—not their canoe and equipment—is your first concern.
- Approach the people cautiously, keeping their canoe between you and them, and make sure they are not panicking.
- Call out to the paddlers and give them instructions to hold on to their canoe.

Canoe-Over-Canoe Rescue

If paddlers capsize far from shore, a canoe-over-canoe rescue can be used to empty a swamped canoe.

Perform the rescue quickly, especially if the water is frigid and the paddlers are at risk for the rapid onset of hypothermia. Ignore the free-floating gear until the paddlers are safely back in their boat. You can retrieve the gear then and return it to them. Before approaching the capsized canoe, instruct the paddlers in the water to move to the side of the canoe opposite the side you are going to approach.

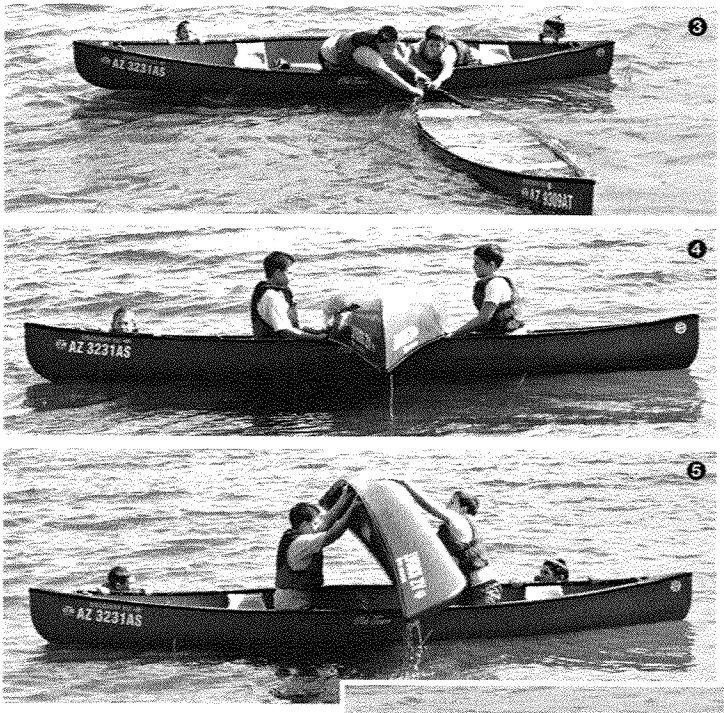
Step 1—Come alongside the capsized canoe on the side away from people in the water.

Step 2—Hold the capsized canoe and direct canoeists in the water to move hand over hand to the far side of your canoe near each end and to hold on.

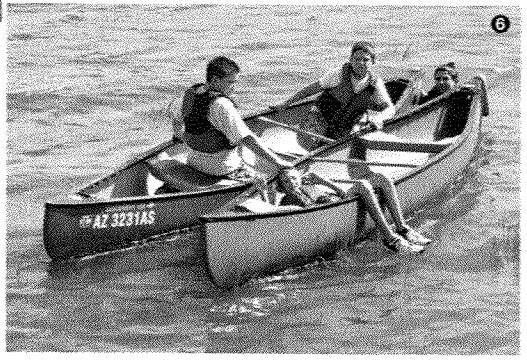
Step 3—Swing the capsized canoe at a right angle to yours. As you raise the end, turn the canoe bottom up.

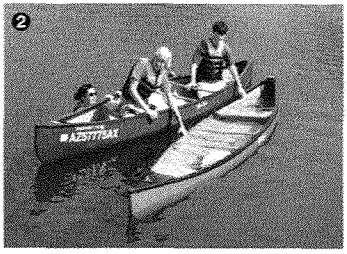
Step 4—Ease the canoe across the gunwales of your canoe, scooting it along until it is balanced.

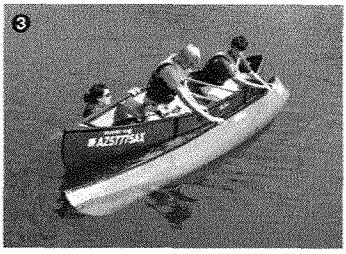
Step 5—Roll the capsized canoe upright on your canoe's gunwales, then slide it back onto the water.



Step 6—Hold the emptied canoe alongside yours and stabilize it as its crew climbs back aboard.







Parallel Canoe Rescue

Step 1—Bring the swamped canoe alongside the rescue boat. Make sure the paddlers in the water are on the opposite side and ends of the rescue boat.

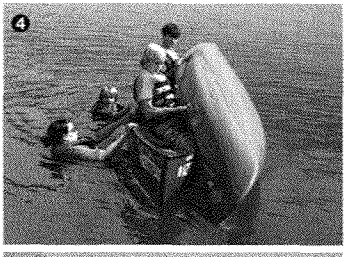
Step 2—Both rescuers turn and kneel in their boat, facing the swamped canoe.

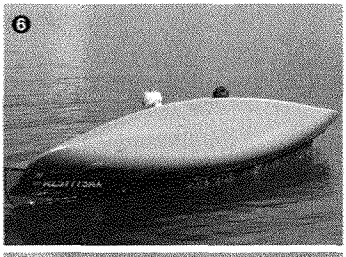
Step 3—Both rescuers reach across the swamped canoe and take hold of the gunwales on the opposite side.

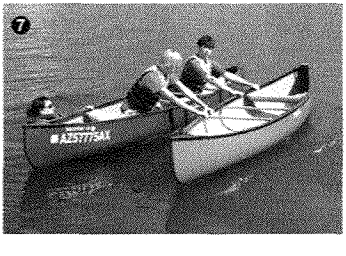
Step 4—The swamped canoe is then pulled all the way over until its gunwales are resting on the gunwales of the rescue boat.

Step 5—The rescuers then pull the swamped canoe up on the gunwales of the rescue boat until the gunwales on the opposite side are completely out of the water. The canoe is held in this position until all the water has drained from it.

Step 6—Together at the same time, the rescuers flip the canoe away from the rescue boat while holding on to a thwart or to the gunwale of the previously swamped canoe.







Step 7—The canoe is now empty and upright, next to the rescue boat and ready for the paddlers in the water to reenter their canoe.

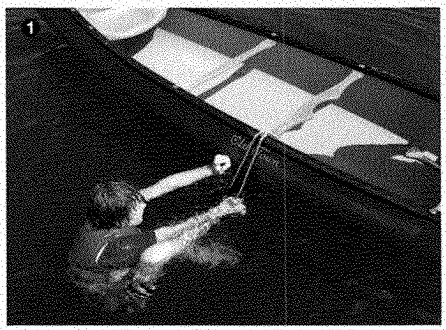
Reentry Using a Rescue Sling

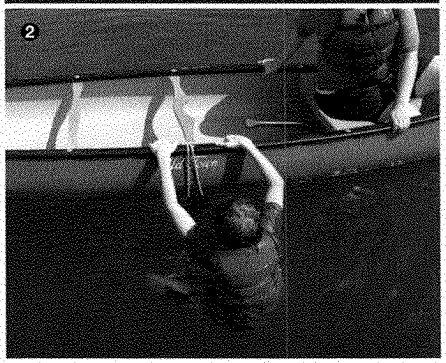
A simple device to assist a paddler in reentering his or her canoe is a rescue sling. The sling can be made from a loop of rope or webbing. The loop should be long enough so that the end in the water is just below the bottom of the canoe. In this position, the rescue sling is like a stirrup on a saddle.

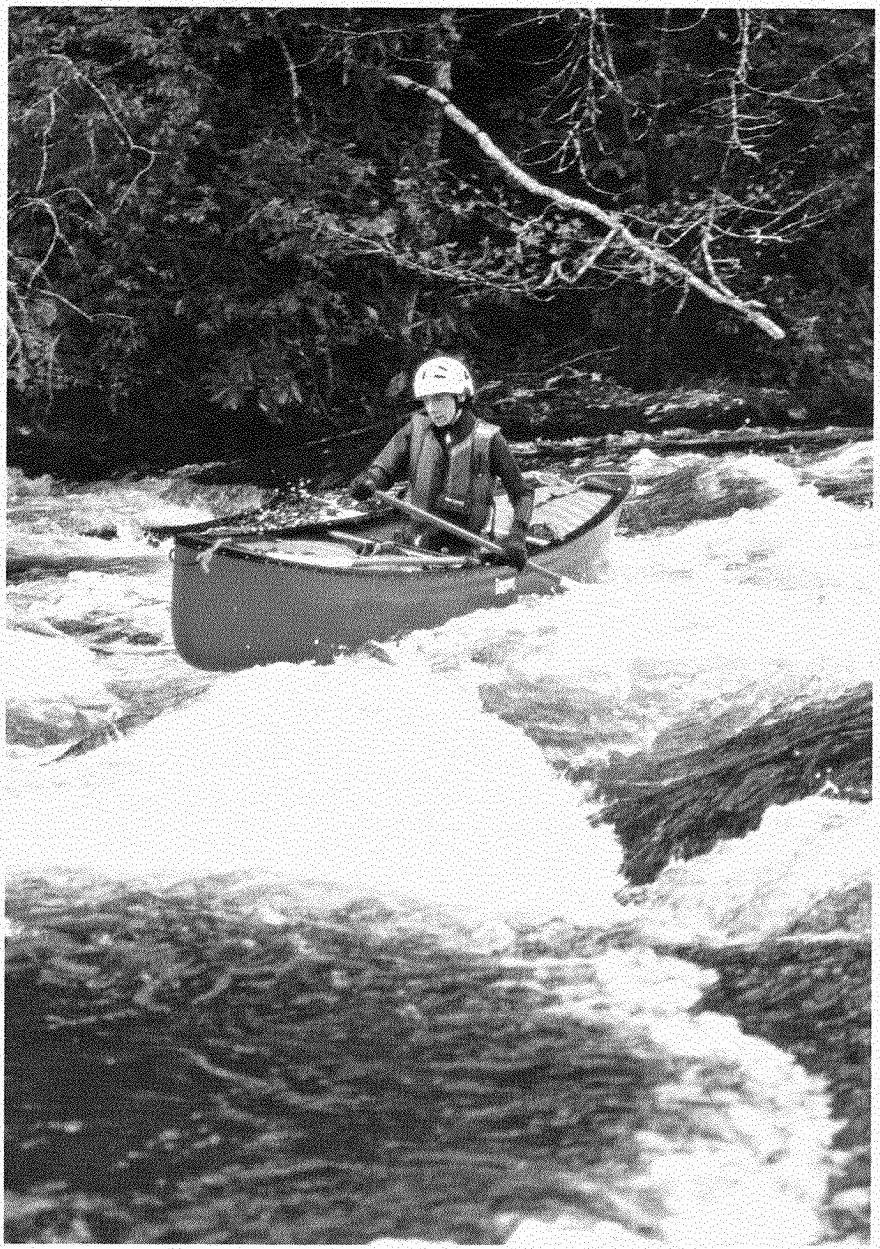
Step 1—Attach the rescue sling to a thwart or the end of a paddle in the middle of the canoe. The opposite side of the canoe is balanced by the paddlers in the buddy boat, a paddler in the water on the opposite side, or the paddler in the boat leaning the other way.

Step 2—The paddler places a foot in the loop and puts both hands on the gunwales.

Step 3—The paddler steps down on the rescue sling and pulls himself or herself up. He or she may then reach across the boat and use the arms-across reentry or enter the canoe using the duck-and-roll reentry technique.







Canoe Sport

Canoeing is an activity that can be enjoyed for a lifetime. The United States offers many diverse opportunities for canoeists. Whether whitewater canoeing on the fast flowing rivers of the mountains, river touring on the slow, meandering streams of the plains, or recreational canoeing on the lakes and ponds of flatlands, canoe sport is recreation available to the entire nation.

As your interest and skills in canoeing develop, you might decide to participate in one of the many canoe sports, such as Olympic flatwater, outrigger, marathon, freestyle, and whitewater canoeing and canoe poling.

Olympic Canoe Sprint

Olympic canoeing began as an exhibition sport in Paris in the 1924 Olympic Games. The International Olympic Committee approved canoeing as a medal sport in the 1936 Olympic Games in Berlin. Today, Olympic sprint canoe races are held on straight courses of 500 and 1,000 meters on calm water. Annual events include the U.S. National Team Trials and U.S. National Championships. Youth ages 15 to 18 can compete in the Junior National Championships and World National Championships.

Olympic canoe sprint paddlers kneel on one knee on a platform in the boat and extend the other leg in front of them. This is known as a high-kneeling stance. Olympic sprint canoes are long, narrow, and diamond-shaped. The solo canoe, the C-1, is about 17 feet long and only 30 inches wide at its widest, and it weighs only 35 pounds. The tandem canoe, the C-2, is 21 feet long and weighs just 44 pounds. These boats are sleek, light, and very tippy because of their high center of gravity and narrow beam.

Flatwater and River Touring

A recent survey found that about 3.5 million youth in the United States went canoeing at least once during the past year. They most likely went canoeing on lakes or ponds. This is called flatwater canoeing because there is no current as on a river or the ocean. Flatwater paddling could be a short relaxing paddle at a nearby lake or a weeklong canoe trip at the BSA's Northern Tier National High Adventure Program.

River touring involves canoeing on moving water with a slow to moderate current, usually on dammed rivers where there is no whitewater. Canoes for this type of paddling are designed to be steady, easy to control and turn, and yet track (go straight) well. These canoes are typically 8–14 feet for solo boats and 15–18 feet for tandem. They usually have a width of 30–36 inches for stability. The longer the boat, the more capacity it has for equipment and passengers. These canoes are popular for fishing, day trips on local lakes and rivers, and overnight trips. Most recreational canoeing would be considered flatwater paddling or river touring.

Outrigger Canoeing

Part of the culture of the Pacific Islands for thousands of years, the original outrigger canoes were carved from koa wood, a beautiful and durable native wood of the Hawaiian Islands. A typical outrigger canoe is 45 feet long and 18 inches wide, and can carry six people. It has a rounded hull and an outrigger that extends 6 feet from the left side of the boat to steady the craft. Today's fiberglass competition boats weigh a standard 400 pounds.

Racing occurs in marathons and sprints. You can paddle solo or as part of a six-member team. Sprint distances range from 500 to 3,000 meters. Marathon distances range from 5 to 30 kilometers (3 to 18.6 miles). World-class teams can paddle at a rate of one stroke per second and average 10 miles per hour.

Marathon canoes are long and narrow so that they slice through water with little resistance. Solo marathon canoes also have a lot of tumblehome to make paddling from a seat in the middle of the canoe easier.

Marathon Canoeing

Known for their long, smooth courses and exceptional speed, marathon races can cover distances of 5 miles to more than 100 miles over lakes, rivers, and the ocean. The average race distance is usually more than 10 miles, and often includes portages. These races are held in more than 50 countries, and recreational canoeists using recreational canoes form the largest class of participants. More serious racers use specialized canoes made from advanced materials such as graphite.

Paddling techniques for marathon racing differ significantly from recreational paddling methods. Using bent-shaft paddles, racers switch sides every eight to 12 strokes at the command "Hut!," usually given by the stern paddler. The paddling style, also known as sit-and-switch, rests alternate muscle groups in shoulders and arms and eliminates the need to use corrective J-strokes. The bow paddler sets the paddling pace at a relatively fast 55 to 75 strokes per minute.

Freestyle Canoeing

Freestyle combines paddling precision and boat control to create a graceful form akin to ballet or figure skating. Freestyle solo and tandem canoes are designed for performing freestyle maneuvers, which involve a lot of turning. Common canoe strokes are modified to fit freestyle moves, and paddlers kneel in the canoe to perform them.

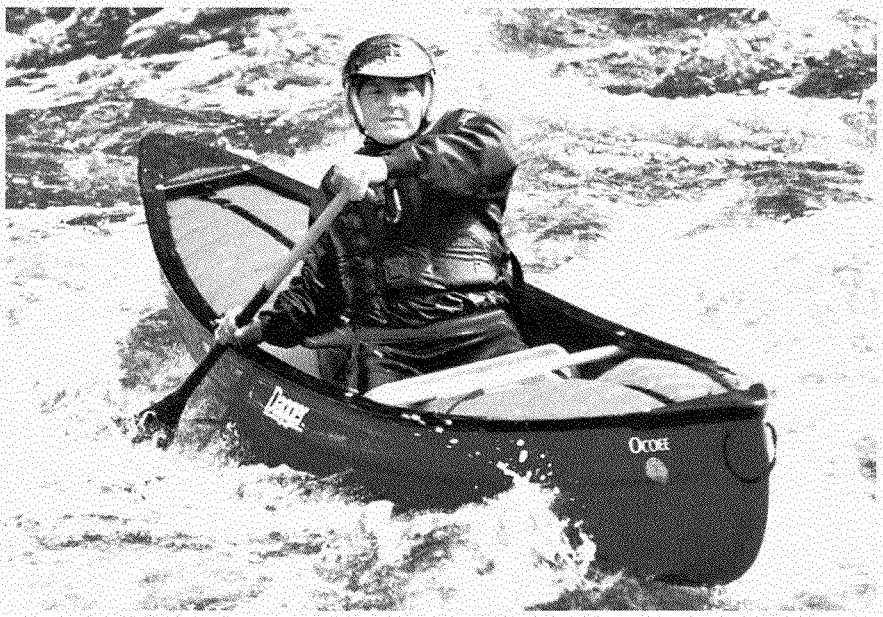
For competitive freestyle paddling, freestyle canoeists perform to music. Like figure skating, the program is short and choreographed to popular or classical music. Freestyle paddlers are judged on compulsory moves, execution, degree of difficulty, showmanship, and choreography. The National Freestyle Championships include solo competitions for men and women and a competition for couples.

Whitewater Canoeing

Whitewater canoeing can be done wherever there is adequate water flowing in a river, stream, or creek. The BSA offers a Whitewater merit badge to Scouts who want to learn this type of paddling. Whitewater canoeing is great fun, but it also has a higher level of risk that increases with the difficulty of the river being paddled. Using the International Scale of River Difficulty, a Class I or II river is adequate for most Scouting whitewater experiences. Only very experienced paddlers with proper rescue training, advanced technical skills, and adequate supervision should attempt Class III rivers.

Scouts should attempt whitewater paddling only under the direct supervision of a properly trained and council-approved whitewater specialist who is a qualified supervisor as outlined in the Safety Afloat guidelines.

Whitewater canoeing requires not only sound stroke technique but also a knowledge of how to use those strokes at the right place and time. A whitewater paddler must know how to read a river, such as what different kinds of waves mean and how they affect the canoe, and be able to recognize hazards such as undercut rocks, submerged trees, strainers, ledges, and waterfalls in order to deliberately choose the path that avoids danger.



Whitewater canoeing also requires special equipment. A whitewater solo boat can be as short as 10 feet, while tandem boats usually range from 15 to 17 feet. Whitewater canoes are highly maneuverable yet quite stable. Solo boats are fitted with saddles on which to sit and most boats have systems with which to attach flotation bags. These bags provide buoyancy and prevent water from filling up the boat. Whitewater paddlers kneel while they paddle and usually prefer a straight-shaft paddle.

Besides whitewater recreational canoeing, there are several types of whitewater canoeing competitions. Whitewater slalom racing occurs on rivers or constructed whitewater courses, and competitors maneuver through gates set up along the course. In slalom races, paddlers complete a 25-gate course suspended over stretches of whitewater rapids 300 to 600 meters long. They must successfully paddle through a series of upstream and downstream gates as quickly as possible without accruing time penalties for touching poles. There are two whitewater slalom medal events in the Olympics. In non-Olympic years, there are numerous national and international competitions, including the U.S. Team Trials and U.S. National Championships. There is a Slalom Junior National team for paddlers 15 to 18 years old.

Other types of whitewater canoeing include rodeo and wild-water events. In rodeo events, paddlers perform moves while surfing a wave or spinning in a hole. Wild-water racing combines great skill in river reading with the endurance of long-distance canoeing. Races usually occur on 3- to 5-mile stretches of class III to class IV whitewater. The goal is to find the fastest way through a series of rapids in the shortest time possible.

Canoe Poling

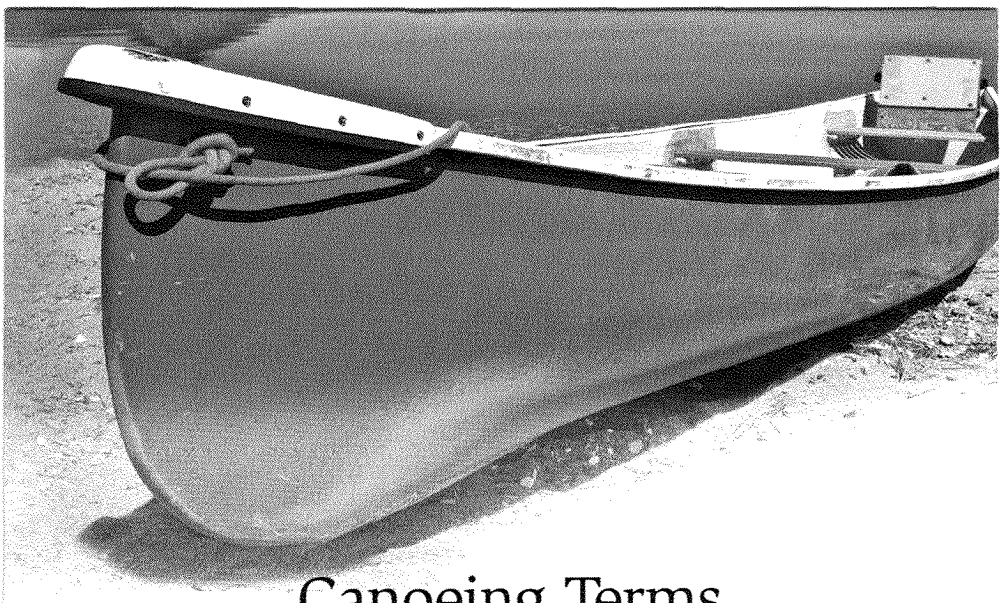
Canoe poling has a rich frontier tradition. Poling and snubbing allow for passage up and down shallow, swift currents and rapids. **Poling** propels the canoe upriver as the paddler stands in the canoe and pushes along the bottom of the river with a long pole. **Snubbing** is the technique used to control the speed and direction of the canoe when going down shallow rapids. The tip of the pole is positioned ahead and downstream of the canoeist where it is snubbed off the river bottom repeatedly, resulting in a braking effect.

Most recreational canoes 15 to 18 feet long will provide adequate stability for poling. A good pole is 11 or 12 feet long and about 1½ inches in diameter. It can be made of aluminum or any wood that is dense, straight, and knot-free and that has parallel grain, good strength, and flexibility. A metal sleeve and cap protect the end of the pole. A short spike of about 2 inches is needed to grab river bottoms with gravel beds.

Canoe Sailing

Canoe sailing has been an organized sport for over 100 years. Any canoe hull of the most common lengths, from 13 to 18½ feet, can be converted for canoe sailing. Commercial kits as well as several inexpensive designs available from the American Canoe Association and other canoe sailing organizations can be used. Once you have converted a canoe to a sailing craft, get some basic instruction in sailing.

Canoe poling allows canoeists to travel against the current on a river instead of traveling with it.



Canoeing Terms

abeam. The direction that is perpendicular, or at a right angle, to the center line.

ahead. The direction in front of the bow.

amidships. The middle section of a canoe.

astern. The direction aft, or behind, the canoe.

bailer. A scoop used to empty water from the canoe.

beam. The canoe's width at the widest point.

bilge. The part along the hull of a canoe where the bottom curves into the side. Sometimes confused with *chine,* which is a seam line between flat portions of a hull.

catch. The phase of a paddle stroke during which the paddle is placed into the water.

chine. The angle between the bottom and side of the canoe.

deck plate. A triangular reinforcement that overlays the gunwales at each end of the canoe.

feather. Turning the paddle sideways, so that its edge leads first, to reduce wind resistance during the recovery phase of a paddle stroke.

flare. The outwardly curved sides of a canoe. Flared sides more easily deflect waves.

freeboard. The distance between the surface of the water and the gunwales.

grip. The top of the paddle, where one hand is placed. A T-grip is shaped like a T and allows for precise control of the paddle. A pear grip is shaped to fit in the curve of the palm to improve comfort when paddling.

gunwales. The rails that run along the top edge of both sides of the canoe.

keel. A ridge that runs along the center line of the bottom of a canoe.

offside. For solo paddlers, the opposite side from the paddling side. Or, in tandem paddling, the side opposite from the bow paddler.

onside. The solo or bow paddler's paddling side.

painters. The lines attached to a canoe's bow and stern.

port. The left side of the boat.

portage yoke. A detachable or built-in shoulder frame for carrying a canoe.

primary stability. The ability of a canoe to stay steady and not tip. The flatter and wider the bottom of the canoe, the more primary stability the canoe has.

recovery. The phase of a paddle stroke when the paddle blade exits the water and moves toward the catch position.

rocker. The curve of the hull from the bow to the stern. The more curve in the rocker, the shorter the waterline length of the canoe.

secondary stability. The ability of a canoe to return upright when leaned to the side.

starboard. The right side of the boat.

stem. The vertical portion of the center line where the sides come together at the canoe's bow and stern. A *plumb* stem is straight, a *raked* stem is slanted, and a *recurved* stem curves inward.

tracking. The ability of a canoe to travel straight.

thwart. A brace that spans the gunwales and gives rigidity and support to the canoe.

trim. The horizontal position of a canoe in the water when it is balanced from end to end and side to side.

tumblehome. The inward curve of a boat's sides; narrows the distance between the gunwales without affecting the width of the canoe, making it easier to paddle.

waterline. The boundary along the hull between air and water.

Canoeing Resources

Scouting Literature

Basic Illustrated Canoe Paddling; Basic Illustrated Canoeing; Deck of First Aid; Emergency First Aid pocket guide; Scouts BSA handbooks and *Fieldbook; First Aid, Kayaking, Rowing, Small-Boat Sailing,* and *Whitewater* merit badge pamphlets

With your parent's permission, visit the Boy Scouts of America's official retail website, www.scoutshop.org, for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Books

American Canoe Association. *Introduction to Paddling.* Menasha Ridge Press, 1996.

Davidson, James West, and John Rugge. *The Complete Wilderness Paddler.* Vintage Books, 1983.

Gordon, I. Herbert. *The Complete Book of Canoeing,* 3rd ed. Globe Pequot Press, 2001.

Jacobson, Cliff. *Basic Essentials: Solo Canoeing,* 2nd ed. FalconGuides, 1999.

Jennings, John, ed. *The Canoe: A Living Tradition.* Firefly Books, 2002.

Poling Sr., Jim. *The Canoe: An Illustrated History.* Countryman Press, 2001.

Rock, Harry. *The Basic Essentials of Canoe Poling.* ICS Books, 1992.

Rounds, Jon, ed. *Basic Canoeing: All the Skills and Tools You Need to Get Started.* Stackpole Books, 2003.

Warren, Graham, and David Gidmark. *Canoe Paddles: A Complete Guide to Making Your Own.* Firefly Books, 2001.

Organizations and Websites

American Canoe Association

503 Sophia St., Suite 100
Fredericksburg, VA 22401
Telephone: 540-907-4460
Website: www.americancanoe.org

American Whitewater

P.O. Box 1540
Cullowhee, NC 28723
Telephone: 866-262-8429
Website:
www.americanwhitewater.org

United States Canoe Association
Website: www.uscanoe.com

Scouting Canoe Adventures

The Northern Tier National High Adventure Base offers wilderness treks through Minnesota and Canada. Information is available at www.ntier.org. Several BSA local councils offer high-adventure canoe treks and whitewater experiences.

Acknowledgments

This edition of the *Canoeing* merit badge pamphlet is the work of a team of experienced paddlers, instructors, and Scouters. The team was headed by Richard Thomas. Other team members included David Bell, John Brennard, Lynn Brennard, Scott Cameron, Jeff Cannon, Kevin Cordray, Michael Donigan, Douglas Kennedy, J. David McClary, Jeremy R. Oyen, Richard Shank, and Jim Virgin.

The Boy Scouts of America has a long and proud canoeing tradition. Many of the early pioneers in safety and canoeing instruction were BSA staff members and volunteer Scouters. The Boy Scouts of America gratefully acknowledges the contribution of these pioneers to canoeing and to this pamphlet: Fred C. Mills, W. Van B. Claussen, Dr. John B. May, and Ernest F. Schmidt. Recognition also is given to the previous author of this pamphlet, K. Gregory Tucker.

The Boy Scouts of America recognizes the significant contributions made to canoeing by the American Canoe Association in terms of safety, paddling technique, and teaching. The information contained in this pamphlet is consistent with American Canoe Association curriculum and safety training.

The Boy Scouts of America is grateful to the men and women serving on the National Merit Badge Subcommittee for the improvements made in updating this pamphlet.

Photo and Illustration Credits

Shutterstock.com—cover (*canoe on water's edge,* ©Wildnerdpix); pages 2 (©My Good Images), 21 (©Patryk Kosmider), 22 (CL-Medien), 42 (©David Gallaher), and 92 (©Mountainhardcore)

All other photos and illustrations not mentioned above are the property of or are protected by the Boy Scouts of America.

David Bell, courtesy—page 18 *(Type I; Type V)*

Dan Bryant—cover *(bags; Type III life jacket);* pages 18 *(Type III),* 30–31 *(paddles),* and 35 *(all bags and containers)*

John McDearmon—all illustrations on pages 14, 25–27, 36, 38, 55, 56, 58–62, and 81

Brian Payne—pages 18 *(Type II; Type IV),* 43–45 *(moving a canoe; perpendicular launch),* 46 *(two canoeists),* 49, 52, 63 *(two canoeists),* 64 *(both),* 69, 72–73 *(exiting; going overboard),* 79, 80, 81 *(emptying a canoe),* and 82–83 *(canoe-over-canoe rescue)*

Randy Piland—pages 6, 32, 56–57 *(backstroke; draw stroke and pushaway stroke),* 67 *(onside pivot),* 86, and 90

Steve Seeger—page 41

MERIT BADGE LIBRARY

Though intended as an aid to youth in Scouts BSA, and qualified Venturers and Sea Scouts in meeting merit badge requirements, these pamphlets are of general interest and are made available by many schools and public libraries. The latest revision date of each pamphlet might not correspond with the copyright date shown below, because this list is corrected only once a year, in January. Any number of merit badge pamphlets may be revised throughout the year; others are simply reprinted until a revision becomes necessary.

If a Scout has already started working on a merit badge when a new edition for that pamphlet is introduced, *they may continue to use the same merit badge pamphlet to earn the badge and fulfill the requirements therein.* In other words, the Scout need not start over again with the new pamphlet and possibly revised requirements.

Merit Badge Pamphlet	Year
American Business	2013
American Cultures	2013
American Heritage	2013
American Labor	2018
Animal Science	2014
Animation	2015
Archaeology	2017
Archery	2015
Architecture and Landscape Architecture	2014
Art	2013
Astronomy	2016
Athletics	2016
Automotive Maintenance	2017
Aviation	2014
Backpacking	2016
Basketry	2017
Bird Study	2017
Bugling (see Music)	
Camping	2018
Canoeing	2014
Chemistry	2018
Chess	2016
Citizenship in the Community	2015
Citizenship in the Nation	2014
Citizenship in the World	2015
Climbing	2011
Coin Collecting	2017
Collections	2013
Communication	2013
Composite Materials	2012
Cooking	2014
Crime Prevention	2012
Cycling	2017
Dentistry	2016
Digital Technology	2014
Disabilities Awareness	2016
Dog Care	2016
Drafting	2013
Electricity	2013
Electronics	2014
Emergency Preparedness	2015
Energy	2014
Engineering	2016
Entrepreneurship	2013
Environmental Science	2015
Exploration	2016
Family Life	2016
Farm Mechanics	2017
Fingerprinting	2014
Fire Safety	2016
First Aid	2015
Fish and Wildlife Management	2014
Fishing	2013
Fly-Fishing	2014
Forestry	2015
Game Design	2013
Gardening	2013
Genealogy	2013
Geocaching	2016
Geology	2016
Golf	2012
Graphic Arts	2013
Hiking	2016
Home Repairs	2012
Horsemanship	2013
Indian Lore	2008
Insect Study	2018
Inventing	2016
Journalism	2017
Kayaking	2016
Landscape Architecture (see Architecture)	
Law	2011
Leatherwork	2017
Lifesaving	2017
Mammal Study	2014
Medicine	2012
Metalwork	2012
Mining in Society	2014
Model Design and Building	2010
Motorboating	2015
Moviemaking	2013
Music and Bugling	2013
Nature	2014
Nuclear Science	2017
Oceanography	2012
Orienteering	2016
Painting	2016
Personal Fitness	2016
Personal Management	2015
Pets	2013
Photography	2016
Pioneering	2017
Plant Science	2018
Plumbing	2012
Pottery	2008
Programming	2013
Public Health	2017
Public Speaking	2013
Pulp and Paper	2013
Radio	2017
Railroading	2015
Reading	2013
Reptile and Amphibian Study	2018
Rifle Shooting	2012
Robotics	2016
Rowing	2014
Safety	2016
Salesmanship	2013
Scholarship	2014
Scouting Heritage	2017
Scuba Diving	2009
Sculpture	2014
Search and Rescue	2018
Shotgun Shooting	2013
Signs, Signals, and Codes	2015
Skating	2015
Small-Boat Sailing	2016
Snow Sports	2017
Soil and Water Conservation	2016
Space Exploration	2016
Sports	2012
Stamp Collecting	2013
Surveying	2004
Sustainability	2013
Swimming	2014
Textile	2014
Theater	2014
Traffic Safety	2016
Truck Transportation	2013
Veterinary Medicine	2015
Water Sports	2015
Weather	2013
Welding	2016
Whitewater	2005
Wilderness Survival	2012
Wood Carving	2016
Woodwork	2011

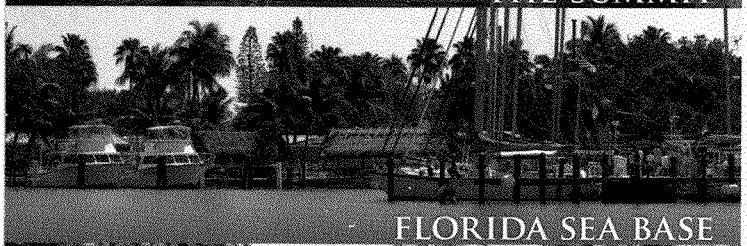
BOY SCOUTS OF AMERICA • SUPPLY GROUP

NATIONAL DISTRIBUTION CENTER
2109 Westinghouse Boulevard
P.O. Box 7143
Charlotte, NC 28241-7143

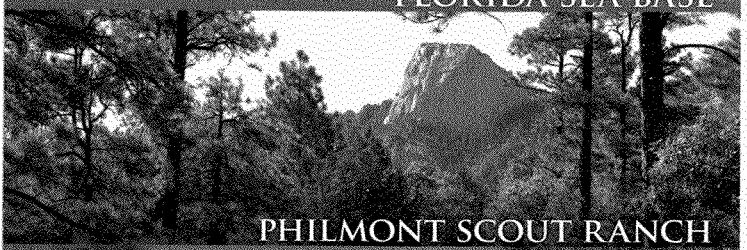
To place an order,
call customer service
toll-free 800-323-0736
or go to
www.scoutshop.org

EAGLE SCOUT

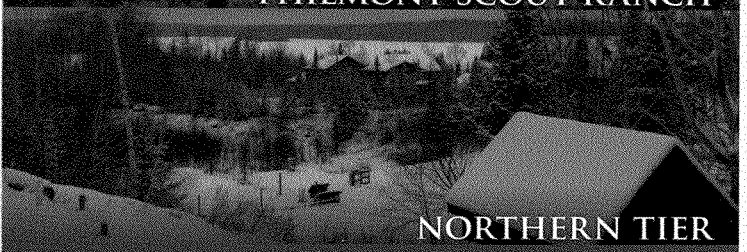
THE SUMMIT



FLORIDA SEA BASE



PHILMONT SCOUT RANCH



NORTHERN TIER

ON THE ROAD TO HIGH ADVENTURE

THE SUPPLY GROUP IS READY TO BE A PARTNE ON YOUR TRAIL TO EAGLE THROUGH HIGH ADVENTURE. THE ADVENTURE IS YOURS, AND WE ARE READY WITH THE GEAR YOU WILL NEED. YOU CAN DEPEND ON THE LATEST IN LIGHTWEIGHT, DURABLE, QUALITY GEAR THAT WILL MEET AND SURPASS YOUR TOUGHEST REQUIREMENTS.

SATISFACTION SUPPLY GROUP GUARANTEED

WWW.SCOUTSHOP.ORG

SKU 650866

7 30176 35083

35867 2019 Printir