Canoe Form and Function

Canoes are designed for a wide variety of uses from the recreational paddler to the racing enthusiast. The lines or shape of the craft, construction material, length and weight are all-important in choosing the canoe that's best for you.

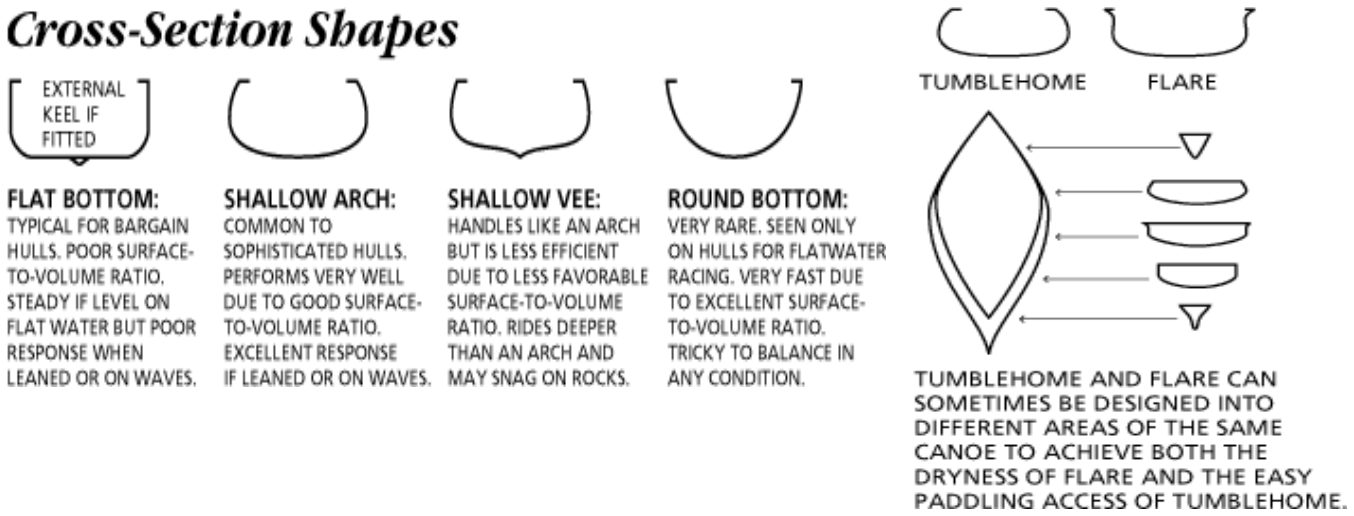
The kind of canoe you choose really depends on the philosophy you have toward canoeing in general. The main concern of most paddlers today is cost and durability of the canoe. Performance and aesthetics can be very important as well.

Lines of the Canoe

The lines of the craft really mean the overall shape of the canoe. A narrow canoe will cut through the water faster than a wide beam canoe, while a canoe with a straight flat bottom will add speed to your paddling.

The ability to turn depends on the amount of rocker exhibited by the canoe. Rocker is the amount of curvature along the keel line of the canoe from one end to the other. Canoes with a lot of rocker are very maneuverable in fast water however they track poorly on flat water.

The bottom shape of the canoe determines both stability and speed of the craft. A canoe with a flat bottom while being the most stable on flatwater will be somewhat sluggish to paddle.



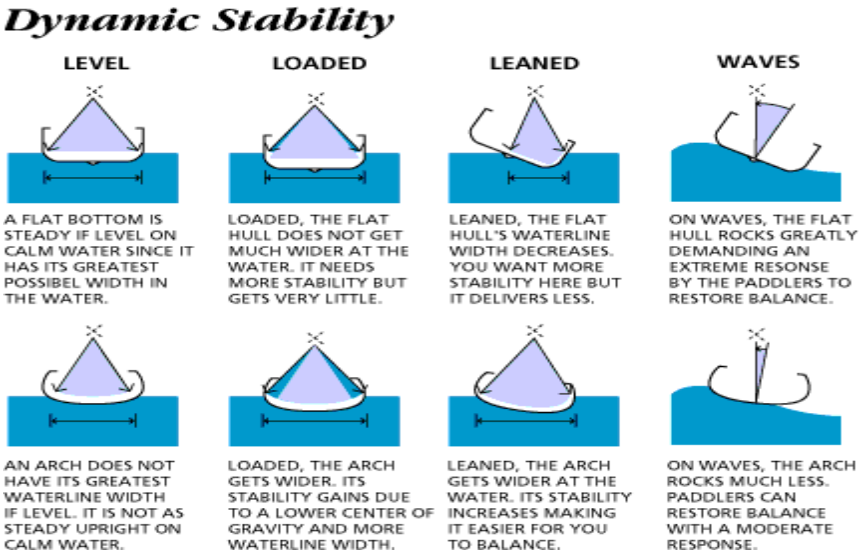
Faster canoes are rounded on the bottom but are quite tippy.

Canoes with a lot of recurve to the sides are most efficient as the paddle can be brought closer to the keel line but the recurved sides, or 'tumblehome' can be a disadvantage in rough water as water can be deflected into the canoe.

Flared sides on a canoe act to deflect water from craft. However, paddling with flared sides is not as efficient and a canoe flared through the center section can be difficult to paddle solo.

Straight-sided canoes offer more secondary stability, (the stability of the boat as it leaves a level position), than a craft with tumblehome.

A canoe with flared sides has the best secondary stability. A combination of these qualities along the canoe's length can be used for different reasons.



Length and width

The length of the canoe in general will determine the speed of the craft. Generally, the longer the canoe, the faster it will go. However, the speed of the canoe will also depend on the weight and the lines of the canoe. Canoe length will also determine the carrying capacity and handling of the canoe. In general, shorter canoes will turn more easily than longer canoes.

Wider canoes are more stable than a narrow one however, again speed is sacrificed for stability and turning ease. A wider canoe will have more carrying capacity, which is a feature that must be considered if the canoe is intended for tripping.

Construction material

Construction material of the canoe will determine weight, durability, speed, aesthetics and cost. Every material has both advantages and disadvantages.

Birch bark

Although extremely aesthetic, they are expensive and not nearly as durable as the canoes constructed of more modern materials. Although very beautiful, not the most practical.

Cedar strip

These craft are beautiful yet expensive. Made entirely of wood, the cedar-strip canoe is constructed of a rib frame covered with thin strips of cedar. An outer coat of varnish or polyurethane provides a sealant and protectant.

Wood-strip epoxy
Similar to a cedar-strip without the ribs. Made over a form, the strips of cedar are nailed and glued into place. The nails are removed, and the entire canoe is covered with fiberglass cloth and polyester or epoxy resin. The result is a light, beautiful craft, and much stronger than most people think. These canoes are moderately expensive but not as costly as the cedar-strip. These canoes are lightweight and moderately durable, but very rigid.

Aluminum
Aluminum canoes are easy to manufacture and so relatively low cost. The half shells of the canoe are heated before being riveted together making the aluminum about 35% stronger than the original sheets. They are very durable but extremely heavy and loud to paddle.

Fiberglass
Fiberglass cloth is laid into a meld by hand and saturated with resin and then squeezed dry. The cloth gridwork can be seen on the inside walls of the boat. Many good fiberglass and Kevlar canoes are built this way.

What fiberglass canoes lose in aesthetics and strength, they make up for in their low cost.

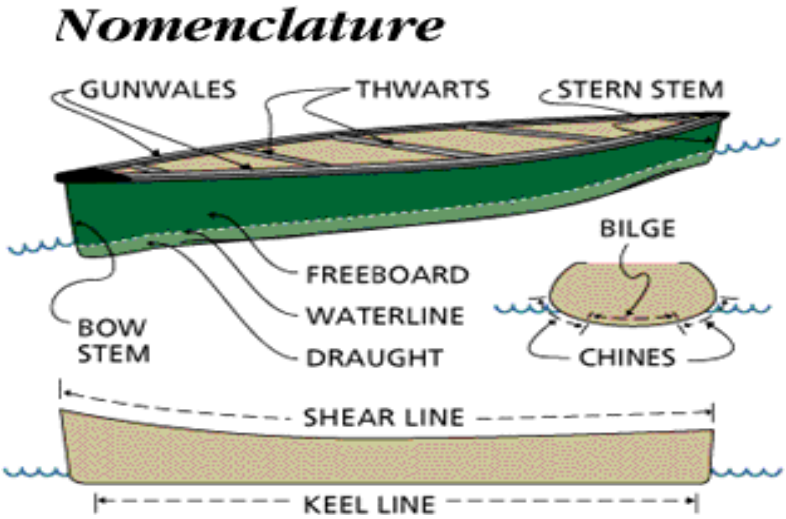
Kevlar
Pound for pound, Kevlar is five times as strong as steel. The Kevlar canoe is lighter and stronger than a canoe made from any other widely used material. A quality 16x2-foot Kevlar weighs about 45 pounds, as opposed to about 72 pounds for one made of ABS or aluminum.

Kevlar is a golden-yellow fiber. A similar technique is used to make Kevlar canoes as fiberglass. However, Kevlar is much more difficult to work with and more expensive than fiberglass. The result is a canoe that is two to three times more expensive than fiberglass. The great advantage of a Kevlar canoe is that it is lightweight and durable.

ABS
ABS is a modern plastic used in a sandwich method of construction to make canoes.
A half-inch thickness plastic foam core is sandwiched between two to three layers of ABS plastic and covered with a final layer of vinyl. The ABS canoe is unusually durable, rigid and reasonably light. These slippery canoes slide over rocks that would stop Aluminum in its tracks. An ABS canoe wrapped around a rock will bounce back to its original shape with merely a few wrinkles. Although extremely impact resistant, ABS can only withstand limited abrasion. Continual dragging over sharp rocks will reduce the outer vinyl skin to a series of deep cuts. The ABS canoe is the favorite of whitewater daredevils.

Polyethylene
The Coleman Company made the polyethylene canoe famous when they found that by adding ribs, struts, and an inner keel of aluminum this bleach-jug material could be strengthened enough to paddle. Polyethylene is tough, resists impact and has a memory so the canoe will bounce back to its original shape when distorted. Polyethylene is more flexible than ABA therefore easier to handle in shallow water but it is also very heavy.

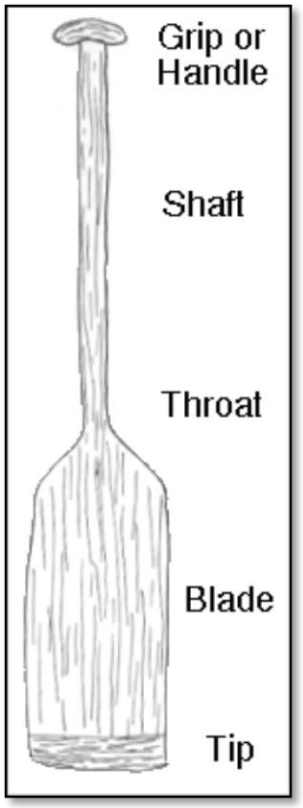
Canoe Nomenclature



Paddling Techniques

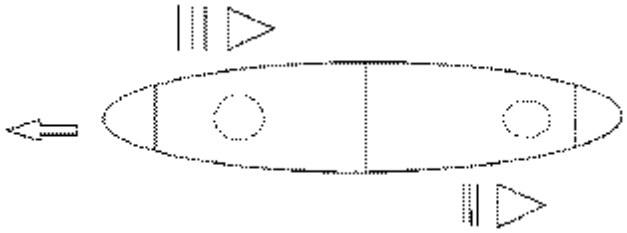
The basic theory of paddling a canoe is to place the paddle in the water and move the canoe toward it. Keep the paddle as near vertical as possible. Your upper hand should be at eye level. Reach out with your lower hand as far as possible, arm fully extended. Dip the blade in the water and push with your upper hand. Don't continue the stroke beyond your body, as you'll waste effort. Keep it in front of you. The idea is to create a fulcrum with your arms.

Parts of a Paddle

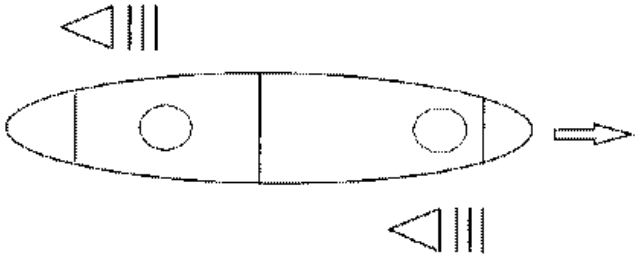


Some Strokes to Practice

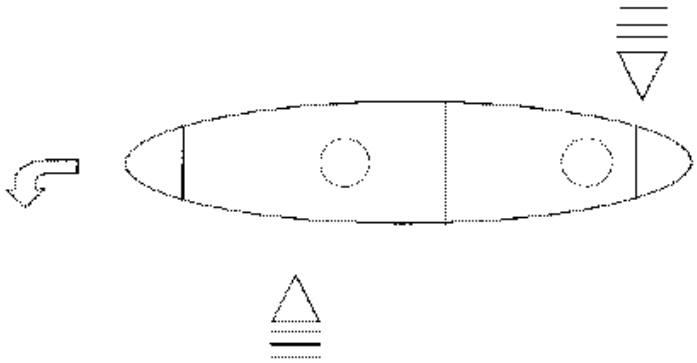
(1) Forward or Power Stroke: To paddle on the left side, place your right hand on the grip. It controls the blade angle. Your left hand holds the shaft several inches above the blade. Keep this hand out of the water. Wet hands only cause blisters. (To paddle on the right, just reverse hands).



(**2) Reverse or Back Stroke**: This important stroke gives you time to decide which way to go, slow your approach to a standing wave, or to stop. Opposite of the power stroke.



3) Draw stroke: The draw is used for quick change of direction. The mechanics of the stroke are basically the same as the forward stroke, except that the draw stroke is perpendicular to the centerline. Lean out over the water as you begin your stroke. The water from the blade pushes against the side of the canoe and tends to tilt the canoe away from the stroke. Don't let the paddle get swept under the canoe.



4)'J' Stroke: To keep a canoe on course, the stern paddler must make some adjustments to his stroke. The most common way is by using the traditional 'J' stroke. Flip the paddle out at the end of a forward stroke and either push out or rudder to maintain a straight course.