

Making a Canoe Paddle

Ron Liskey

October, 2012 (v 1.0)



Figure 0.1: Pear-grip canoe paddle.



Figure 0.2: T-grip canoe paddle.

Note to teachers

This is an early draft with directions for building a high quality, customized canoe paddle. I will soon add detailed photos and expand the directions as needed. If you see mistakes or would like more explanation in some parts, feel free to contact me at, <http://www.ronliskey.com/contact>. I'm happy to answer questions via email.

Parts of a canoe paddle

Blade

Blades vary in width and length. A large, wide blade will power you through the water quickly, but each stroke requires more energy. A small, narrow blade is easy to paddle and more efficient over a period of time, but your stroke will not be as powerful. Some specialized paddles designed for flatwater cruising have long, narrow blades, which offer a fairly good balance of power and efficiency. Typical paddle blades measure about 8 x 20 inches. Square-tipped blades can catch in the water and throw a paddler off balance. Beginners may want to consider rounded blades, which are more forgiving.

Grip

The two most common shapes for grips on canoe paddles are the pear grip and the T-grip. Many flatwater paddlers will choose a pear grip for comfort and control. The shape fits naturally into the palm of your hand and is comfortable for long hours on the water. The T-grip is the preferred shape for whitewater paddlers and some flatwater paddlers. It allows for more control over the angle of the paddle blade and it's easy to hang onto in rough water. Children's paddles usually feature a T-grip because it's easier for small hands to hold.

Shaft

The shaft length can be bent for ease of use on multi-day journeys, or straight for maximum speed and maneuverability. The shaft shape can be either round, oval, or a combination of both.

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

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

Shaft profile Shaft profiles can be round or oval in shape. Oval shafts are stronger and offer a more comfortable grip than round shafts. Some round shafts have an oval section for better grip. This is called oval indexing.

Example Paddles

The following paddles are from Great Canadian. Lengths: 48", 54", 57", 60", 63"



Figure 0.3: Example paddles from Great Canadian Company.

- a) Spruce Goose lightweight, round shaft. Blade: 18" x 6"
- b) Spruce & Cherry. Blade: 20"x 6.5"
- c) Maine Guide Beavertail rugged maple, round tip, smooth performance. Blade: 19"x 6.5"
- d) Maine Guide rugged maple, square tip, extra blade area. Blade: 19" x 6.5"
- e) Ottertail one-piece cherry, light, durable, ideal for lakes. Blade: 22" x 6.5"
- f) Ash Beavertail traditional one-piece ash, Blade: 20" x 7"
- g) Class III laminated spruce and cherry, broad blade, resin tip, for whitewater. Blade: 17" X 8"
- h) Paddle sport Canoe T-grip, aluminum shaft, rugged plastic blade. Blade: 15" x 7.5"

Source: Great Canadian Canoe & Kayak Co.,
http://www.greatcanadian.com/accessories_canoepad.html

Designing your paddle

Dreaming of exploring a series of wilderness lakes, or a fast-moving, heart-racing run down class four whitewater rapids? Either way, if you want the perfect adventure, you'll need the right paddle. With the proper paddle, you'll canoe more efficiently and become less tired, making your time on the water safer and more enjoyable. One of advantage of making your own paddle is that you can optimize it for your exact size and skill level.

Determining the paddle length

Standing height is not an accurate way to size a canoe paddle. Because you sit while boating, the best way to choose a paddle length is to sit — either in a canoe or on the floor. Most adult flatwater and whitewater canoeists will require a paddle in the range of 52" to 60", but lengths vary to fit paddlers of all sizes. Bent-shaft paddles are shorter overall, with common lengths of 48" to 54".

There are several ways to determine which length is right for you. Kneel down with your rear about 6" off the floor, as if sitting in a canoe. Measure from the floor to your nose. Add this measurement to the blade length (about 20"). This total length is the correct overall length for your paddle.

If you have access to a canoe, sit in the canoe and measure the vertical distance from your nose to the water. Add the blade length (about 20") to get the correct overall paddle length.

Fine-tuning the fit

If using a bent-shaft paddle, follow the above instructions, but deduct 2" to 4" from the length. The width of the canoe affects the length. In a wide canoe, a longer paddle allows you to reach the water with less stretching or straining. A paddle that's too short requires extra effort to bring the blade down to the water.

Paddles for younger folk often have shorter lengths, and are often built with narrower shafts and T-grips to match smaller hands.

Choosing materials

The less a paddle weighs, the less fatigue you'll feel during a long day of canoeing. But don't design a paddle based on weight alone — the best paddles offer a good balance of light weight, strength and flexibility. For whitewater canoeing, a strong, stiff paddle will hold up to the rigors of the river and provide a quick response in rapids. For flatwater canoeing, a flexible paddle helps absorb shock with every stroke.

Wood

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

Finish

Boiled linseed oil, tung oil or a mixture of both is recommended for finishing and sealing paddles. Oil gives the wood a soft touch for your hands. Linseed oil can be mixed with crushed charcoal for added weather protection. Multiple coats are recommended. Do not let the oil application dry between coats, as this will seal the wood and prevent it from absorbing any more. A marine grade varnish works well if natural products are not available.

Construction

1. Establish paddle length

1. If you are on land, kneel down with your rear about 6” off the floor as if sitting in a canoe. Measure horizontally from the floor to the tip of your nose. This is the correct shaft length, typically about 37 inches for adults.
2. If you have access to a canoe on the water, sit in the canoe and measure the vertical distance from the water to the tip of your nose. This is the correct shaft length, typically about 37 inches for adults.
3. Add your preferred blade length—typically about 20 inches—to the above shaft measurement. This is the total length of your paddle. Adult paddles are usually about 57” long.

2. Select wood

1. The idea wood is strong and lightweight. Excellent woods include spruce, ash, poplar and maple. In a pinch, inexpensive woods, such as fir and pine, can also work.
2. If making a laminated paddle, consider choosing a combination of light and dark colored woods, such as ash or poplar with walnut.
3. Select clean, straight grained, knot-free boards that are longer than the full length of the paddle. Overall dimensions should be 6 feet x 1 inch x 8 inches.
4. Trim the board ends to eliminate any splits from end grain drying.

3. Laminate blade and handle

Note If you are making a paddle out of a single piece of wood, you can skip this section.

1. Rip board stock into a prime number of strips (5, 7 or 9) about 1” thick.
2. Choose one clean and strong strip for the center line. This will become the shaft, as well as the center of the grip and blade.
3. Rip two strips about 1” x 1” x 3” for the grip. Remember to alternate wood types.
4. Cut an even number (2, 4, 6, 8) of additional strips that are about 20” in length for the blade.
5. Arrange the strips as you would like them to appear in the finished paddle. Observe the grain and other natural wood artifacts to create the most aesthetically pleasing pattern. A natural herringbone pattern sometimes be created by alternating grain directions.
6. Take the time to ensure that everything looks perfect on all sides of the paddle. (Note that once glue is applied it’s too late to decide how to arrange the wood pieces.)
7. Using a pencil, draw a few light lines across the face of all the strips. These lines are used to ensure the correct alignment of the strips during final clamping and gluing.

8. Using a roller or brush, apply a thin layer of waterproof glue to the sides of each strip. Completely cover the surfaces, but don't overdo it. Your goal is to end up with a very small amount of "squeeze out" when the wood is clamped.
9. Carefully align the penciled guidelines and clamp the strips together. (Note that it may be possible to glue up more than one paddle in each set of clamps.)
10. Set aside to dry. Warning: Do not wipe away fresh glue squeeze out! Once the glue is fairly tacky (about 30 minutes for yellow wood glue), use a scraper to peel the glue away. This method eliminates the mess of smearing glue over the face of your paddle.
11. Set aside for the glue to dry completely.

4. Transfer design

1. Using a pencil and straightedge, carefully mark the centerline. Accuracy is critical!
2. If you have not already done so, create grip and blade templates. There are two methods.
 - a) Half Template: The preferred method is to create a half template and transfer this absolutely identical design to each side of the paddle, being careful to align the template to the center line each time.
 - b) Full Template: The other method is to create a full template. For custom work this is considered a less accurate method. Full templates are usually copied from half templates. The final design is thus one generation away from the original template and may include small errors from the copying process.
3. Align the templates along the center line.
4. Using a pencil trace around the template edges.

5. Final shaping

1. Shape the blade, with 45-degree beveled edges and about 3/8" thickness.
2. Carve the shaft into an octagonal shape then sand it into an oval cylinder. Note that for strength the wide dimension of the oval aligns with the direction of paddling (90° to the face of the blade).
3. For maximum comfort shape the grip to your hands. Be sure to check your work often by holding the paddle on either side and in both left-handed and right-handed positions

6. Apply finish

1. Sand all surfaces smooth working from 80 grit to 220 grit.
2. If you have created a brand, heat your branding iron, and briefly press it into one face of the paddle blade. You can also use a wood burner or soldering iron to create a custom brand. For best results, create a design on paper, and carefully transfer your brand to the paddle using a pin or other sharp object.

CONSTRUCTION

3. Applying a water repellent protective finish, sanding lightly with 220 grit between each applications
4. For maximum protection, apply at least three complete coats.

Example 15-session schedule

Session	Stage	Description
1	Planning	Review safety and tools guidelines. Determine paddle length, design and wood.
2	Laminating	Complete laminating all parts.
3		
4	Carving	Complete carving the paddle.
5		
6		Complete carving the shaft.
7		
8		Complete carving the grip.
9		
10		Complete final shaping.
11	Sanding	Begin sanding with 80 grit.
12		Continue sanding with 120 grit.
13		Complete sanding with 220 grit. Burn in the brand (optional).
14	Finishing	Apply the first protective coat. At least two more coats are applied during the week.
15		Finish applying at least three protective coats.

Table 0.1: Canoe paddle project schedule

Canoe Paddle Worksheet

Name _____ Class _____ Date _____

Dimensions

1. Paddle shaft length.
 - a) If on land, kneel down with your rear about 6" off the floor as if sitting in a canoe. Measure horizontally from the floor to the tip of your nose. _____ inches (*37" is typical*)
 - b) If in a canoe on the water, sit in paddling position and measure vertically from the water to the tip of your nose. _____ inches (*37" is typical*)
2. Paddle blade length: _____ inches (*20" is typical*)
3. Total paddle length (Add shaft and blade measurements): _____ inches
4. Shaft profile: ___ Round ___ Oval Design
5. Grip: ___ Pear-type ___ T-type

Design

1. Blade tip: ___ Squared ___ Rounded
2. Blade guard: _____
3. Construction type: ___ Laminated ___ Solid
4. Wood selections: _____
5. Finish type: _____

Resources

Web

1. Ron Liskey, ronliskey.com
2. How to Make Your Own Canoe Paddle, by Darren Bush, artofmanliness.com/2011/08/25/make-a-canoe-paddle
3. Great Canadian Canoe & Kayak Co. www.greatcanadian.com/accessories_canoepad.html
4. REI, www.rei.com/learn/expert-advice/canoe-paddle.html
5. www.mothering.com/interactive/webinars/dusicktutorial.htm
6. www.amberdusick.com/woodmouse_loves_crafts/woodworking

About the author

Ron Liskey is an experienced woodworker and teacher, with a California Teaching Credential and a Waldorf Teaching Credential. Ron began his teaching career as a Waldorf main class teacher, and graduated his first eighth grade class in 2003. Since then, Ron has focused on teaching various specialty classes, including traditional woodworking, bookbinding, boatbuilding, mathematics, computing, science and art. For more information, see Ron's website at, www.ronliskey.com.

Colophon

This document was produced using 100% GNU-GPL tools and techniques.

Typesetting: $\text{L}^{\text{E}}\text{T}_{\text{E}}\text{X}$, and $\text{T}_{\text{E}}\text{X}$

Editor: $\text{L}_{\text{Y}}\text{X}$

Template: book (KOMA-Script)

Fonts: Times Roman, Helvetica

Index

B

balance, 3
bent shaft, 3
Bent-shaft, 5
blade, 3
boiled linseed oil, 6

C

crushed charcoal, 6

E

efficiency, 3

F

flatwater, 3

G

Glue

 squeeze out, 8

M

marine grade varnish, 6
multi-day journeys, 3

O

oval indexing, 4

P

paddle length, 5
pear grip, 3
power, 3

R

round tip blades, 3

S

shaft length, 3

shaft profiles, 4

square-tipped blades, 3

straight shaft, 3

stroke, 3

T

T-grip, 3, 5

Tools

 straight edge, 8

tung oil, 6

W

weather protection, 6