

VENTURING MAGAZINE

Building Folding Kayaks for a Trip Down the Colorado River

by Troop 128 Ventura County Council, California

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Crews are often thinking of fun, challenging, creative and team-building activities, and I believe that this troop's project/trip is a great example.

Woodcraft. It is the sort of thing that men start to think about when their sons are born. Looking forward to the time when their sons are old enough to absorb and appreciate the delicacy and beauty of literally putting their blood, sweat and tears into a woodworking project. Ok, so that may be a little melodramatic, yet few things in life have the ability of drawing a boy and father closer together than putting sharp power tools to big chunks of wood.



Troop 128 in Ventura California believe they have one of the best bonding projects ever ... Building folding kayaks.

The plans for these boats were originally published in Popular Mechanics in June of 1963. The writer of the original wrote "It's not fast, it's not roomy and you won't find many practical uses for such an outlandish craft. In fact, this center-folding kayak has only one feature to recommend it. It's fun!" It is indeed fun; fun to build and fun to ride. There are much nicer, and more comfortable kayaks to build, but it is doubtful that anyone will find one easier to build and any better suited for boy scout, water borne adventures than the one designed by Jess E Rathbun in 1963.

This article will not take you through the steps of how to build them, nor will it have the dimensions and plans you need since the plans are still easily found with a simple Google search for Boy Scouts of America, Folding Kayak.

The boys in Troop 128 have a 35 year long tradition of building these kayaks. Every other year beginning in January, the boys, their parents, and the adult leadership of the Troop begin the process of building dozens of kayaks for their trip down the Colorado River. The build process is actually pretty easy and a complete kayak could be built and finished in three days. The kayaks are built out of plywood, glue and canvas.

These kayaks are indeed easy to build, I may have mentioned that before, but don't get the idea they are simple. There are indeed some challenges around building these boats. The biggest challenge we face today is finding the materials.

The plans call for ¼ inch thick by 10 foot long, exterior grade plywood which is increasingly hard to get. Most lumber yards that cater to contractors should be able to special order it for you if they do not have it in stock, though be prepared, it could take months to receive it. Larger chain stores like Home Depot and Lowe's have proven less than reliable in getting that size material shipped to all locations.

Another item that is increasingly hard to get, at least here in Southern California is the contact cement needed to glue the boats together. Volatile Organic Compounds (VOCs) are strictly controlled in some states. There are lower VOC, water-based contact cements available, but those particular cements will not produce satisfactory results. Fortunately, auto body shops and upholstery shops are still good sources for quantities of quality contact cement.



When I talk about quality contact cement, understand that I am talking about glue that once two glued sections come into contact it is nearly impossible to get them apart again, more on that later. The kind of glue that we use is pictured to the right.

Troop 128 usually makes it a point to start ordering the materials, plywood, canvas and glue, at least two months before the first build day to ensure the materials are on hand. Another wise tip is to order more than you think you need, there are always one or more stragglers that come in late to the party and want to build boats once they see all the fun that everyone else is having.

This goes especially for the contact cement. Not only do you need to plan for stragglers, but it always seems to take more glue than you think to build the boats. Typically we see about a gallon of glue per kayak. Every item that gets glued on the kayaks needs to be painted with three coats of glue, on both surfaces.

Don't forget your incidentals. You will need brushes, gloves, and containers for the glue. A ready supply of rubber gloves is important to keep hands clean. For brushes, do not spend a lot of money on them, buy the cheapest you can find. We buy them by the box at Harbor Freight. Brushes are one time use, but remind the boys that scouts are thrifty and they can and should share the brushes. When you consider containers for the glue, it is important to know that the glue will melt plastics and Styrofoam, so you will want something better than that. We found aluminum bread pans (3 for \$1) at the dollar store and they worked outstanding.

Again, whatever you use, it is pretty much one time use and throw it away, so do not spend a lot of money.

As mentioned above, these kayaks can be built in three days, so I will now go through each day's work.

Day 1

The boys will cut out all the plywood, and canvas material and they will glue stiffening strips into the bottom of their kayak. Once complete, they will take them home to primer and paint the inside of their boat.

While cutting the plywood is better suited for adults, or perhaps older scouts, once the plywood is cut, letting the boys use a jigsaw or saber saw is a great way to allow them to start learning about power tools. Jigsaws are relatively safe to use, just make sure you have eye and hearing protection when using power tools.

A note on templates

At this point I want to talk to you about using templates. If you are planning on building more than three of these boats, then taking the time to make templates is going to make life so much easier. Make templates for the radius cuts, the seats, paddle blades, and spreaders to help save time.



When you glue two pieces together it is a good idea to apply some pressure to break the tack surface of the glue, in this picture a scout is using a hammer to pound the stiffening strips onto the bottom of their boat.



Here you see a dad applying glue to both the bottom of the kayak and the stiffening strip to prepare to glue them on.



These kayakers are large and strong enough for grown men to ride in them, so do not be afraid to build one for your son and yourself. The boys find it very encouraging when they see their dad willing to ride in the same thing they are going to be riding in.



In this picture we see a dad laying out the glue marks for the stiffening members. This is another place where a template is useful.



Each kayak will need two spreaders. A template to help layout the dimensions of the spreader is helpful. Once cut, we like to route the inside and outside edges. As mentioned before, young scouts can use a jigsaw. Here two scouts are cutting out their cockpit on their boat. Here you see a father and son team working with a router with a round-over bit. A router is another generally safe power tool that even young scouts can learn to operate.



As mentioned before, young scouts can use a jigsaw. Here two scouts are cutting out their cockpit on their boat.



Another scout cutting out the cockpit of the boat.

A couple of other time saving tips we have found when building the boats. Whenever possible, we try to make multiple cuts with one cut. For instance, if I am cutting plywood, I usually cut two pieces at the same time. When cutting the outside rounded corners of the boat, you can stack all the pieces of the boat and cut them all at once. Just be careful to have them laid out correctly when making the cuts.

Once all the pieces are cut out, the boys will take them home and paint the inside of their boat. Stress they should only paint the inside at this time.

Day 2

On day two, the boys will glue together the two sides of their kayak with canvas around the perimeter of the boat. They will also cut a 1.25 closet rod to length and cut the blades for their paddles. Refer to the plans for the lengths of canvas you need.



In this picture we see a boy using a hammer and block of wood to seat the canvas onto the edge of their kayak.



When bending the canvas around the outer radii on the kayak, sometimes folds and bubbles will appear. Those can be worked out with a block of wood and some persistence.



This young man is applying the first of three coats of glue to the strips that will tape the outside of the kayak together. Teaming up on this operation can sometimes speed up the process.



Here this father and son team are applying the first of three coats to the wood portions of the boat. Again, both surfaces to be glued will require three coats of glue.

Day 3

The boys will come in and glue the center strip of the kayak together. They will also glue their paddle blades and handles together. Once complete, the boys can take the boat home and paint the outside of the boat with whatever decorations they would like and the boats are complete.

Putting on the center strip of the kayak is probably the most challenging. Some plans call for making the center strip into three pieces, but we have found that taking a little extra time and care and putting a single strip on the kayak produces better results.



Here a dad is applying the prerequisite three coats of glue to the wooden portion of the kayak. Notice the spreaders are in place for this operation.



This step really uses a lot of glue. Being liberal with the glue is a good thing as it makes the canvas more pliable and easier to conform to the radii of the boat.



In this picture one boat is behind schedule and is gluing the sides, the other one has had their center strip applied and the builder is making sure to break the tack layer on the glue to ensure good adhesion.

The boat to the right is all ready to be marked and have glue applied for the center strip.





This boat is complete and is ready for exterior paint.

One nice thing about this kayak plan is with a little more knowledge and work, you can modify the plan to meet your needs. Here we have a tandem kayak that allowed one of our scouts and his father to participate in the fun. This boat took a little more work as we had to join two pieces of plywood to extend the length. This can be done in a number of ways, but we used an old boat builder's technique of using a "scarf" joint and we epoxied the two pieces together. This kayak ended up being 12 feet 9 inches long and worked incredibly well.

Mental Preparation

Not only do the boys work hard building their kayaks, but there is also some mental preparation to take place. For our trips, we like to have the boys also begin working on the kayaking merit badge. This merit badge will give the boys the skills and knowledge they need to be successful in the trip, but more importantly, safe on the water.



Additionally, everyone must take and pass the BSA swim test for all water borne activities. So we also test every individual, youth and adult alike to ensure they are BSA swimmers. Non-Swimmers, according to BSA rules, can ride in a tandem kayak if there are with a person that is a BSA swimmer.

Everyone also has to present their safety gear for inspection. Signaling devices like whistles, life jackets, first aid kits, and water bottles are all inspected before the trip.

Adult leaders all take the BSA trainings for Safety Afloat, Safe Swim Defense, and Weather Hazard trainings and other parents are encouraged to take those trainings as well.

What is all this hard work for?

We do all of this work in our troop to enjoy a 54 mile kayak trip down the Colorado River. We undertake this trip over father's day weekend. The trip takes three days to complete.

For our trip, we set out on a Friday and we travel to Needles California. Needles is out in the desert and sits right on the Colorado River which separates Arizona and California. To say that it is hot is an understatement as daytime temperatures at Needles average around 104 degrees in June.

Day 1



The trip starts on father's day. We put our boats in the water at a place called "Big Bend of the Colorado River State Park" This park is actually in Nevada when we start. The first leg of the trip takes us 24 miles back to Needles California. This is the hardest leg of the trip as it takes longer than the other days and the boys can start to feel discouraged as if the trip will never end.



On a trip like this it is imperative to keep the participants drinking water and to keep their spirits up. We find that having bilge pumps in the boats help the boys keep unwanted water out of their kayaks and tends to give them a distraction when trying to fill up their buddy boat's kayak with water. Additionally, on this part of the river, the winds start to pick up in the afternoon, so we work hard to keep the pack moving throughout the morning only taking breaks when absolutely necessary. Too many breaks in the morning can create a greater challenge when the winds pick up. This leg takes most of the day to complete, but usually around 4:30PM we arrive back at Needles Marina Park where we typically camp the first and second nights.

Day 2



On our trip, we typically change campsites on Day 2, so the day starts with the striking of camp and loading the gear in the vehicles. Once complete, the boys will then set out for their second, 12 mile leg. This day is the shorter day and usually the boys are starting to find their stride. It is also the easiest day so we typically take more breaks and allow the boys more free time for service projects and play. There is one spot on the river we always like to stop as there is a shell of a boat that sunk many years ago. The boys enjoy things like that.



At the end of day 2, the boys end up at Camp Moabi where they set up camp and prepare for the 3rd day.

Day 3

The final leg of our trip takes us very nearly to the mouth of Lake Havasu at a place called "Castle Rock". This leg is by far the most beautiful, but can also be the most treacherous.



This section of the river will take us through the Topock Gorge. It has beautiful rock outcroppings and we nearly always see mountain goats climbing on the rocks.



However, because of the nature of the gorge, wind can be a real problem. When the wind picks up through the gorge it can be nearly impossible to paddle through. With the current carrying you down the river, and the wind blowing you back up, getting stuck halfway through the gorge is a real possibility. Additionally, high winds will create very choppy waters in this section of the river and these kayaks really do not handle choppy water all that well.



To avoid the winds, we leave very early on the third day. Usually we get on the water as soon as it is light enough to see in order to get through the gorge before the wind picks up. For safety sake, we typically bring along a motorboat as well, just in case. Call it paranoia, but safety is most important.



The other challenge with this section of the river is there are very few places to stop along the river bank for rest, play, or lunch. There is one sandbar along this trip that most people stop at, but it is important to get there early in the day as other boaters will have occupied this spot as the day goes on.

In the end

There are few rewards in life better than seeing the face of a boy who has built his own kayak out of canvas and wood and watch them reflect on what they just did over the last three days when they pull their boats into shore on that last day. The realization that they have done something very few people have ever done comes across their face and shows as smiles.

It is a long trip, made all the more challenging with the heat of the trip. However, for most, it is the fun they have along the way, the beauty of the river around them, and the desire to press themselves to do something this challenging that brings them back to the river for this trip.

