2. Cut the pieces to length.
Par-take your pieces of bamboo to the lines in the Bill of Materials. Make sure that the piece for the keel is nice and straight, and the top, middle- and bottom-stringers are matched to be about the same diameter and straightness. Begin cutting the pieces to length, starting with the stringer pairs, the bitt, and then the fore- and aft deck.

3. Cure the bamboo.
Use a preheated tool to heat the bamboo. This will prevent drying and cranking over time. We have found that this gear stack better if the bamboo is allowed to dry (for a couple of weeks before cutting). We have also found that if you let the bamboo dry for too long before cutting, it may become brittle. Be careful not to heat it too far or too much because the chambers between the rings may pop from the trapped steam pressure inside. It makes a loud noise and destroys your bamboo. You may even want to drill a small hole near the ring to let the steam out if this becomes an issue.

4. Cut Notches on the Fore and Aft deck, and both ends of the keel.
We recommend using a jigsaw to do this. First, trace out a rectangle that is the thickness of the plywood and 3" deep in the middle of the bamboo. Make two cuts in the bamboo along the 3" lines. You can clean up the other side of the cut later, so only worry about getting the tip side right first. Make sure that your bamboo is trimmed to the correct thickness before cutting through. As you cut through and clean out the cut side of the notch by gently grinding it away with the jigsaw blade. Repeat on the opposite side of the notch. It’s a little bit of a hack job, but it works. Make sure that when you are cutting the notches at both ends of the keel, they are aligned so that the stem and stern are parallel and that any natural curve in the bamboo is in the same plane. If you want the notches to be nice and straight, then the starboard and stern to be straight up and down. Notch one end 3". It’s apparent that the square end of the cable ties are pulled in against the plywood so that they will not slide out when the bamboo is stitched on there. You will see on what we mean later.

6. Cut the stem, stern and frames out of plywood.
Using the forstner bit, drill out semi-circles in the frames first. These will hold the cables in the inframes later. Then using the jigsaw, cut out the frames following the lines printed on the paper. Drilling the holes first makes the drilling less dangerous. Also, make sure you mark the bitt and stern when you have the 3 small circles done for the inframes.

7. Sand and polyurethane (or paint) all the plywood parts. Don’t forget to re-move the paper!

8. Attach the keel to the stem and stern.
Dowel small holes in the stem and stern to pass the cable ties through. Make sure that the distance between the holes and the edge of the plywood are matched to the diameter of the bamboo. We will make sure that the passer line is sticky. Apply some pressure to the contact surface between the bamboo and plywood and hold them in place with a cable tie (or two). NOT2: Make sure that the square end of the cable tie is pulled to the plywood or the stem will not slide out when the bamboo is stitched on there. You will see what we mean later.

Attach the frames to the stem and stern with wood glue and screws. You will have to drill small holes in those frames for the cable ties so that you did for the connections between the stem and stern and the keel. Please make sure that the frames are ori-ented correctly. The bottom of the boat is actually flatter than the deck at Frames 2 and 5. We have made this mistake before ourselves.

10. Attach fore- and aft deck to the keel using cable-ties.
Locate Frames 5 and 6 where Frame 5 is about 24" in from the center along the length of the keel. The cockpit sits between Frames 2 & 5, and it will be open. Leave 6" - 8" of fabric so that it can be pulled tight and grommeted later. Leave the same space along the fore- and aft deck.

11. Attach the remaining frames to the keel using cable-ties.
Locate Frames 4, 1 & 2 on the keel. You can attach them in the same manner as the other frames, or in any other manner as you see fit. The bottom of the boat is actually flatter than the deck at Frames 2 and 5. We have made this mistake before ourselves.

12. Taper the ends of the stringers.
By drilling the bamboo stringers in place, you should be able to approximate the super relaxed for a nice fit against the stem and stern. Make sure the bamboo terminates on the stern and stem at the small circles in the drawing mentioned earlier. There is also a notch in the stem to reduce the stringer, and cut using the jig saw.

13. Attach the stringers.
Pre-drill 1/4” holes just below the points of contact for cable ties to pass through. Using the cable ties, attach the stringers in pairs. Because the shape of the keel is curved by the bamboo in tension, it is important that you do this carefully—starting that the knot stays straight and the frames remain perpendicular to the keel and parallel to each other. You will probably want to have a few people on hand to help to pull tight and collar them. Keep the cable ties a little bit loose at first until all the parts are attached and then go around tightening everything up, keeping an eye on the first stringer and trim. You will notice that the stress in the bamboo may become quite high. It is helpful.

The fabric should be just a bit larger than the boat, but not much. Remember that the width of the fabric needs to go all the way around the hull. Be generous. It is easier to trim later and impossible to add more material. Using the forstner bit, drill out semi-circles in the frames first. These will hold the cables in the inframes later. Then using the jigsaw, cut out the frames following the lines printed on the paper. Drilling the holes first makes the drilling less dangerous. Also, make sure you mark the bitt and stern when you have the 3 small circles done for the inframes.

15. Loosely wrap and trim away spare fabric.
Without attaching it, you can start to cut away bits. Go slowly.

Nail a few times along the top, flat edge of the stem. Pull it fairly tight along the keel and right again at the stem.

17. Trim the fabric from the cockpit, and fore- and aft deck.
The cockpit sits between Frames 2 & 5, and it will be open. Leave 6” - 8” of fabric so that it can be pulled tight and grommeted later. Leave the same space along the fore- and aft deck.

18. Begin grommeting in the middle of the boat and work out to the decks.
Find the forward edge of the cockpit and start grommeting at the stem and aft deck. If you do not have a fancy grommet tool, you may have to remove the fabric now to make these modifications. You may need to finish where more trimming needs to happen and you think the grommets need to go. You will need grommets every 1” inside the cockpit and 6” along the stem.

19. Cut and tuck where the deck meets the cockpit.
Remove the fabric in the stems and stern if you had to remove it. Now you can start to tuck the edges by tying the rope through the grommets and around the middle stringers inside the cockpit and between the grommets over the push along the four and aft deck. Pull tight and off.

20. Clean up the fabric at the stem and stern.
Beginning at the bottom of the boat and working towards the top, pull the fabric tight, rock the extra material neatly against the plywood under the skin and attach lightly with staples. Make sure you are pulling out any gathering as best you can or you move towards the top by pulling pretty hard. This def-initely works best with two sets of hands. Once you are happy with the look of the fabric, you can start the stem and stern with upholstery tacks along the edge. This looks nice and protects the skin a bit when you bounce into things in the water and drag the boat around.

21. Wet the whole boat and let it dry.
Use a sprayer to get the whole boat a little wet. This will help it roll in all of the fiber tips you couldn’t get out during the trimming.

22. Seal the fabric.
If you used canvas, print and finish with an waterproof, base-coated boat paint. We have used a base of 50% linseed oil and beeswax. We have also used a mixture of 50% linseed oil and tung oil. A base coat of varnish can be sprayed on to the canvas, and once dry, a layer of wiping varnish can be applied. Sealing the canvas adds extra protection for the skin a bit when you bounce into things in the water and drag the boat around.

23. Put in the floor.
Using the frames, cut out the hull from oak wood or balsa. Make sure that the bamboo stringers cut lengths just a bit bigger than the cockpit and cable ties to the frames.

24. Escape the trappings of land!
The project draws from the proposals of others to make visible specula cuit as an alternative to life on land. The project derives from across as diverse as reconceiving bamboo as a viable resource, improvising refugee raft assemblages, and modern stitch-and-build construction methods that make complex, clean boat designs approachable by novice builders.