

Modeling a Lowell Grand Banks dory

An authentic scale model of a real boat

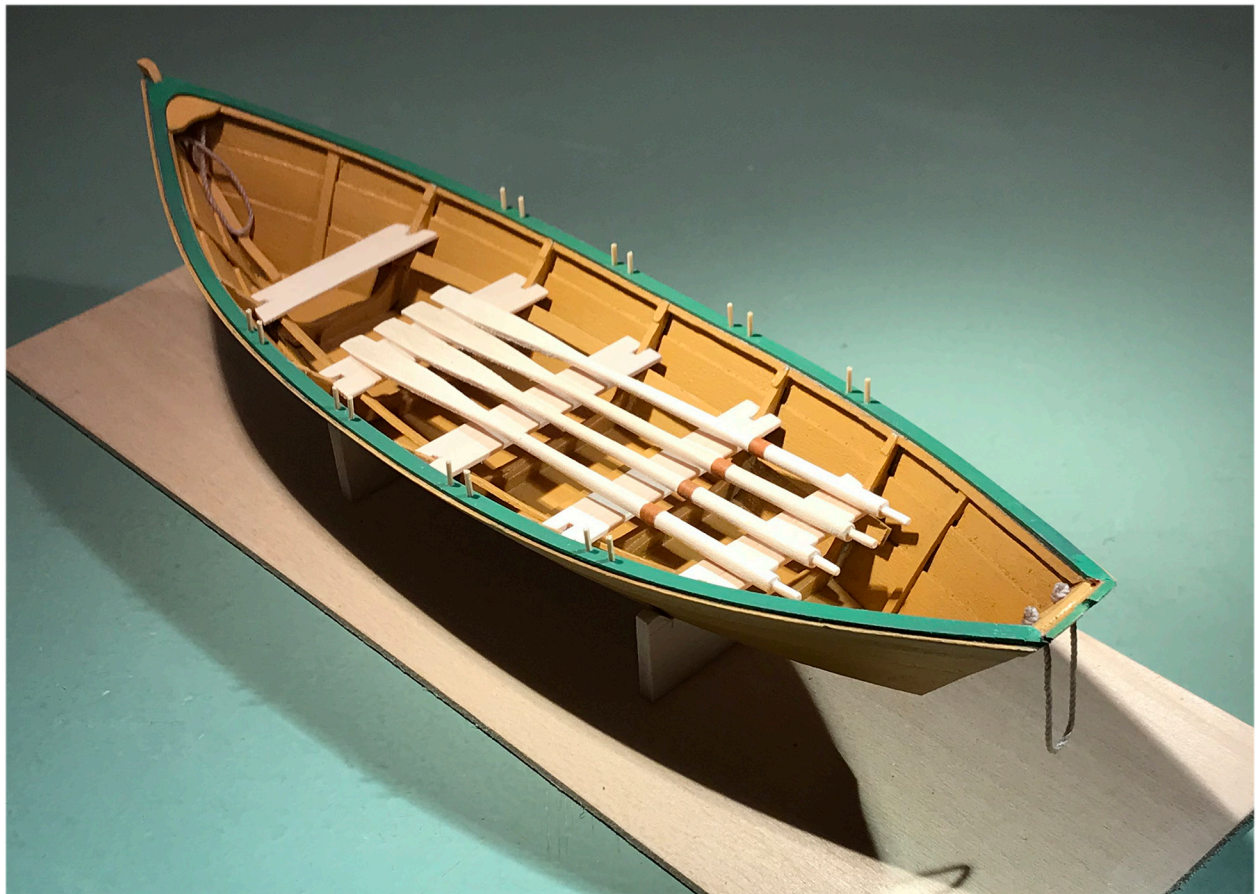
The first in a series of progressive model tutorials

Kit number MS1470

Scale 1:24 (1/2" = 1' 0")

Model overall length 10", width 3", height 1 1/2"

Baseboard: 3 1/2" by 11"



Model design and instruction book by David Antscherl

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Dory model parts list:

Your kit should contain the following:

3 sheets 1/8" basswood 4" x 12"
1 sheet 3/32" basswood 3" x 6"
1 sheet 1/16" basswood 4" x 12"
1 sheet 3/64" basswood 4" x 12"
2 sheets 1/32" basswood 4" x 12"
2 12" lengths of 1/16" square basswood
1 12" length of 3/64" x 1/8" strip basswood

12" of 0.08" beige line

The enhanced kit with tools and paint also contains:

Paint:

Hull yellow ochre MS4829

Bulwark dark green MS4801

Tools and materials:

Please read pages 26-28 for a description of all the tools and materials that you will need to build the model successfully. If you have the enhanced kit, then most of these items are included.

Please read this first!

Plans:

Plans included are for reference and may not be exactly to size. Review and study both drawings, photographs and assembly instructions before starting so that you understand how the parts come together. Please follow the recommended building sequence!

Make allowances:

You may need to adjust and compensate for small differences as your model shapes up and how the parts relate to each other. As long as it looks right, it is right. Again, study the photographs.

Kit lumber:

This kit contains laser cut basswood parts. A word about laser cutting: a common misconception is that the parts should simply be punched out of the carrier sheet. Not so! Laser cut parts are held in the carrier sheet by small bridges of uncut wood called *tabs*. These may be oriented at any direction to the grain.

It is always better to *cut* through all tabs rather than try to push out parts and risk breakage. You may need to cut through not only the tabs but any part of the outline not cut completely through the sheet. Turn the carrier sheet over and cut from the back to release parts without damaging them.

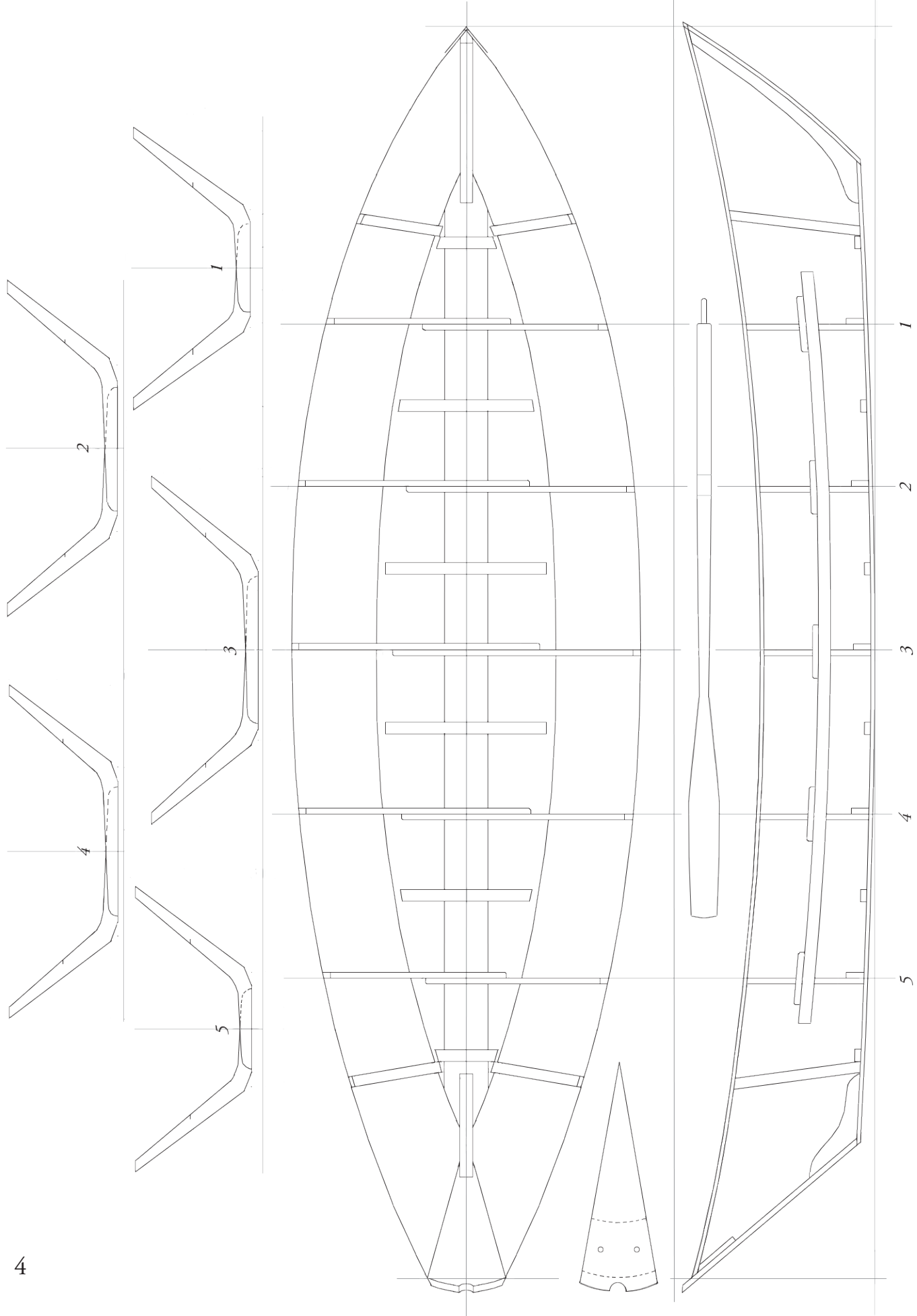
Preparation is needed before gluing laser cut parts. The laser cutter burns through the wood leaving a brown, shiny surface. This does not allow a good surface for glue adhesion. I recommend lightly sanding or scraping away the char before gluing. It is not necessary to remove all the char unless a finished wood surface is to show. Sometimes simply scraping using the back edge of a #11 blade (see the **tools and materials** sheet) is sufficient.

Take your time:

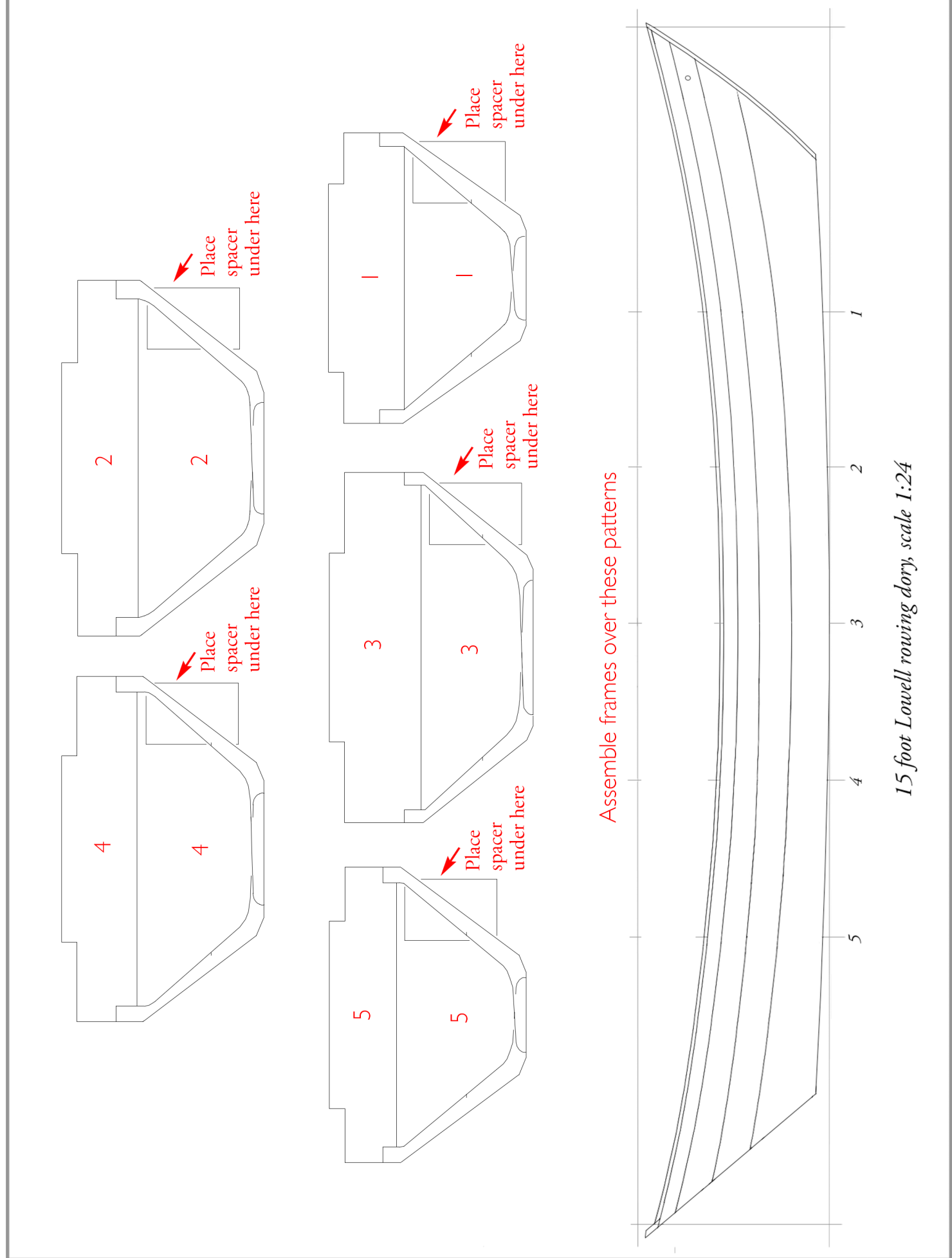
Building a model is not a race! Take the time to read the instructions over first to give yourself an overall view of the process and to familiarize yourself with the parts' names.

The *sequence* of building a model is important. You don't want to paint yourself into a corner and find out that you should have fitted something first that is now difficult or impossible to add. I've worked out the best order of things for you to make it easy. That said, some steps are not without challenge.

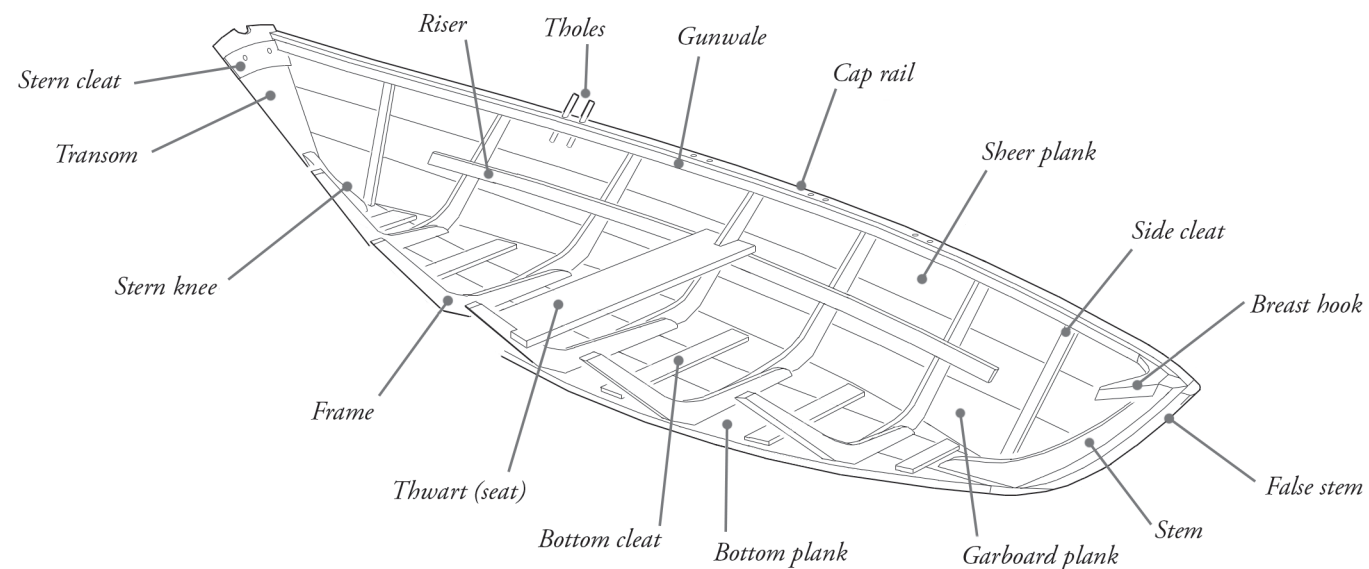
In summary, enjoy the process of building your first 'real' boat model. The skills you will develop while you construct your dory will help in future, more complex models.



15 foot Lowell rowing dory, scale 1:24



15 foot Lowell rowing dory, scale 1:24

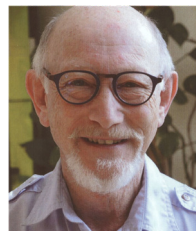


Typical Banks dory construction cutaway

Adapted from *The Dory Book* by John Gardner

So, you'd like to build a ship model? Well, you've come to the right place! So many would-be modelers want to begin by building a huge 100-gun ship of the line. Most of those very expensive kits get started but never finished. The job is much too complex and the poor builder hasn't acquired the skills needed. For this introductory kit, no previous knowledge is assumed or necessary.

Let me introduce myself first. My name – Antscherl, also spelled Ančerl – was originally Bohemian-Moravian. However, I was born and brought up in England close to the National Maritime Museum at Greenwich.



I've been building model ships since I was about six years old, which is a long time now. I became a professional model-maker in 2000 and have been happily sharing what I've learned over many years by way of articles and books, as well as giving workshops in both the U.S. and Canada. This progressive series of models is yet another way of helping folk like you either become model makers or better model makers. I'm glad you've decided to join me. So, let's get to it!

This kit is the first in a series designed to develop your skills and confidence, step by step, to more complex ship models. This series of kits are not toys but faithful miniature versions of real boats. I look forward to accompanying you in discovering the pleasure and satisfaction of building a scale model.

Each model will teach you new ideas, skills and tricks that prepare you for the next in the series. We will start with just a few simple tools, so there is minimal investment. This avoids buying tools that are unnecessary or will seldom if ever be used. Believe me, there are a lot of gimmicky tools out there! Please take a few moments to read about **tools and materials**, pages 26-28. You can add to these basics gradually as needed, as you progress to building more complex models.

First, a little background on the dory. These were developed on the East Coast in the 1800's and were descendants of the French settlers' *bateaux* of the 17th and 18th centuries. They were used extensively for fishing and lobstering. They were easy and inexpensive to both build and maintain. Despite their unusual shape, dories were very seaworthy and literally many thou-

sands were built. One feature of these boats was that they could be nested one inside the other like stacking chairs. Their seats, called *thwarts*, were removable so that boats would fit inside each other. Fishing schooners carried many dories on board. They were often stacked as many as eight high on deck, both to port and starboard, when sailing out to the fishing grounds of the Grand Banks and East Coast.

A word about scale. Our model is at a scale of 1:24. This means that one half an inch on the scale represents one foot in real life, or is 24 times smaller than the real boat. Below is a scale ruler that you can copy and paste onto a piece of card if you wish to measure anything on your model. Read off complete feet from the beginning of the arrow to its right, and then the number of additional inches to the left of the arrow.



Dories were painted in many different color schemes, but one frequently seen was yellow ochre. This gave high visibility at sea. Our dory will be painted traditionally in yellow ochre with a green *gunwale*; the horizontal plank that runs along the top of the boat's sides. Gunwale is pronounced "gunnel". *Each time a new term or word is introduced it is set in italics and its meaning or way the word is said follows.*

There were many kinds of dory. Ours is a typical fisherman's rowing dory as built by Hiram Lowell of Amesbury, Massachusetts. Above left is a cut-away view of a typical dory showing all its parts. One historian wrote; "A Lowell's dory to a fisherman is like a hammer to a carpenter". Hiram, grandson of the founder of this shipyard, Simeon Lowell, pioneered a process of mass production; over 2,000 boats were built in 1911 alone! Lowell influenced car manufacturer Henry Ford. Lowell's Boat Shop is still active today.

Our model is a 15' 0" Lowell design. Her described length is that of her almost flat bottom, while her overall length is almost 20' 0".

Ready to begin? I will take you step by step through the process of building your boat just like the real thing but in miniature. A dory looks deceptively simple to build, but you will find some interesting challenges to do it well. Don't rush; remember it's the journey, not the destination, that's important.

1. The bottom of the boat

This is the first step. The bottom consists of three planks held together by cross-battens called *bottom cleats*. Sand the long edges using a 150 grit sanding stick (read about sanding sticks in **tools and materials**, pages 26-28). You will find more control by placing the sanding stick flat on your work surface and rubbing the plank along it rather than the other way around. White glue the plank edges and align the planks with the cross-marks, photograph on the next page. **Note the dots indicating the bow end!** Your cutting mat or glass underneath will prevent planks from sticking down. There will be some glue squeeze-out, which is normal. Remove any excess with the damp brush before the glue sets. Getting a little water on the wood it not a problem; it will dry out.



Gluing method:

I like to squeeze a small blob of glue onto a piece of scrap plastic. Pick up some glue on an artists' round watercolor brush (a number 1 or 2 size is good for this) and transfer a generous amount of glue to one of the surfaces to be joined. Press the pieces together. Some glue will squeeze out. This indicates that the joint is not glue-starved. Adjust the pieces before the glue 'grabs'. Wash the brush in water and then mop up any excess glue using the same brush. You may need to wash glue off the brush and around the joint several times to clean things up properly.

Help! I glued it wrong.

Don't panic – you can rescue a mistake; we all make them. Isopropanol (rubbing alcohol) will dissolve white glue. Either 95% or 99%, available from your drug store, is best. Use this away from any source of ignition, please. Either immerse the parts to be separated in a closed container for an hour or more, or flood the joint repeatedly with isopropanol using your brush. Be patient, don't force it, and the joint will eventually separate. Scrape off the rubbery glue remnants, wait a few moments for the solvent to completely evaporate, then carry on as if nothing had happened.

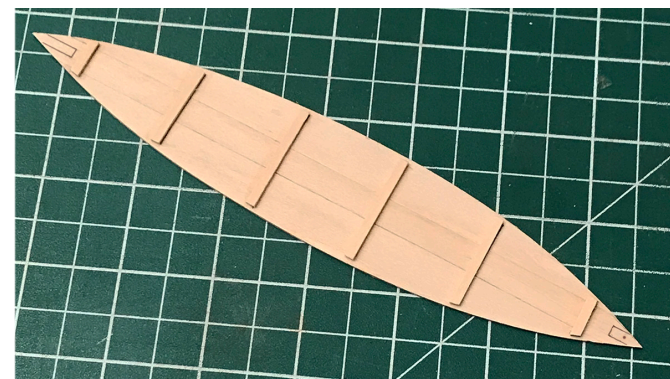
If you have trouble assembling the planks, don't worry; we have included a back-up one-piece bottom that you can use instead!

There are six *bottom cleats* whose positions are marked across the planks. These marks should line up. Take the $\frac{3}{64}$ " by $\frac{1}{8}$ " strip of basswood and cut pieces to length using a sharp #17 chisel blade (see tools).

A note about edges and corners:

In boats and ships, all sharp edges and corners need to be softened. A fisherman could be badly hurt if thrown against an edge in a lively seaway. Also, this reduces the possibility of splinters. All exposed edges are sanded off slightly in either a chamfer (a 45° angle) or are radiused. The upper edges of the cleats are treated this way. Don't overdo it, though!

Once cleaned up, the cleats can be glued to the bottom planks using white glue. Have your paintbrush and water handy. Run a small bead of glue on the underside of one of the middle cleats and press it carefully into place. Repeat for the other cleats (see below).

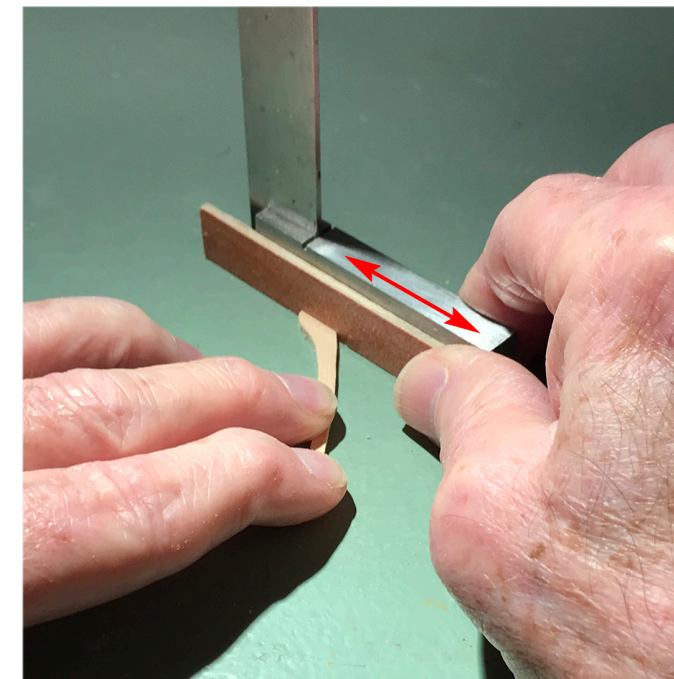


In the real dory, parts are not glued together; galvanized steel nails are used instead; either brad or chisel pointed, they vary from $1\frac{1}{2}$ " to 3" long. These are placed fairly closely together, between $1\frac{1}{2}$ " and 3" apart. Holes are first drilled through the planks. The nails holding them are driven through and then turned back by holding a large flat-headed hammer, called a *dopping iron*, against the point. The iron acts

as a kind of anvil while the nail is driven home. This bends the nail over in a 'J' so that it cannot back out. Some builders use copper rivets instead.

2. Adding the stem

Remove the stem from its sheet and clean up the bottom and inside edges as before. Leave the front edge char for now. This is the piece that forms the bow or front end of the boat. Take especial care to keep the bottom surface at right angles. The photograph below shows how to do this using a *set square* (see tools) or right angled block of wood. Fix the stem carefully to the bottom over the marked area using white glue.



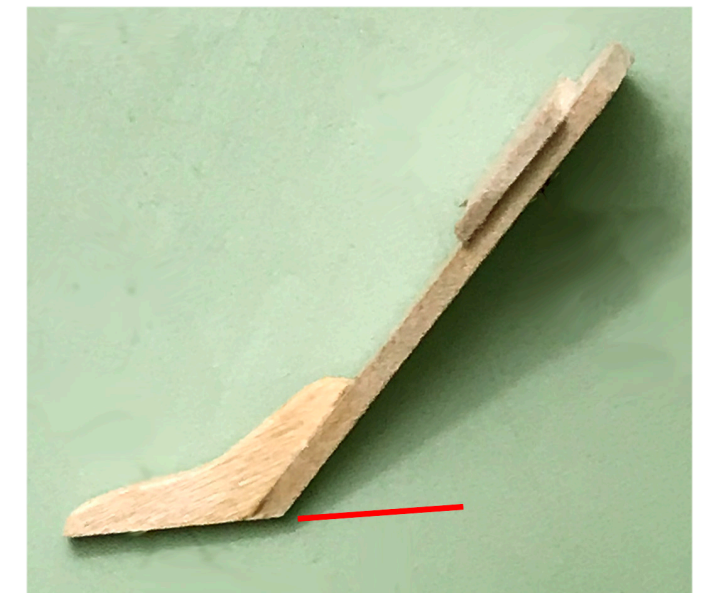
3. Adding the transom and stern knee

Press out the *stern knee* and *transom* pieces. These define the shape of the stern or back end of the boat. Sometimes the transom was called the *tombstone*. The semicircular notch is used for a steering oar when needed.

The stern knee was cut from wood whose natural grain ran along the two arms of the knee, giving it maximum strength. Clean this part up, keeping the two straight edges at right angles as you did the stem piece.

Glue it in place on its marks, making sure that the aft (back) end sits on the line on the transom.

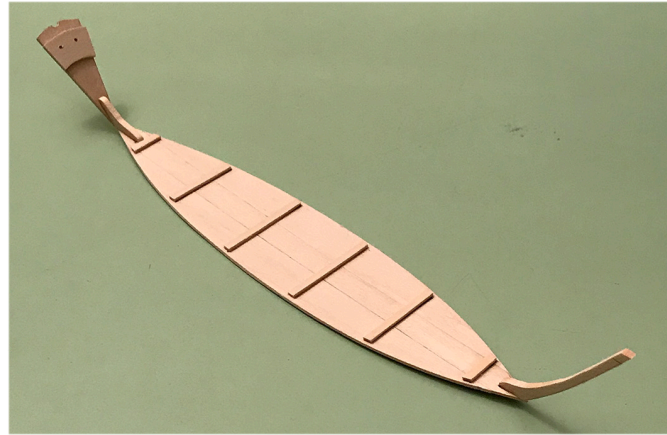
Next, remove the *stern cleat*. This is a reinforcing piece that sits across the inside of the transom. Glue it to its marks, making sure that the two sets of holes line up. These will be for a *becket*. This is a short loop of rope used as a handle and to haul the boat up by. There was a similar becket at the bow – more about these later. The ends of the cleat will protrude a little on either side at this stage.



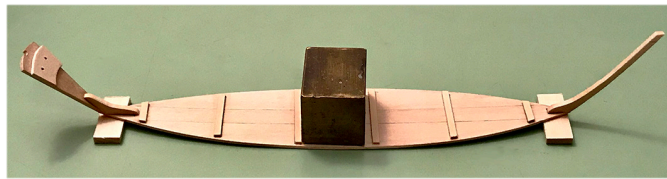
The lower end or point of the transom needs to be beveled, that is to say, cut at an angle. If you look at the plan section, you will see why. The angle is the same as that of the transom knee. This bevel is most easily sanded as shown above.

Now glue the combined transom and its cleat to the transom knee. Again, line up the knee with the marks on the transom. This will ensure that the transom is vertical and the boat symmetrical, photo next page.

The bottom of the boat is not completely flat, but curves up slightly both fore and aft. This slight curvature is called the *rocker*. In the case of the Lowell dory the amount of rocker measures 2", fore and aft.



To curve the bottom, wet its under surface using a brush and set the model on two scraps of 1/8" wood, placing a small weight on the middle; photograph below. Wood will swell on the side that is damp, bending it in a convex curve. Let everything dry thoroughly.

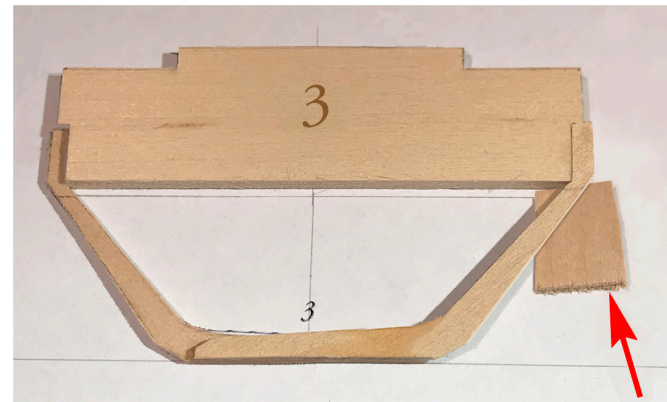
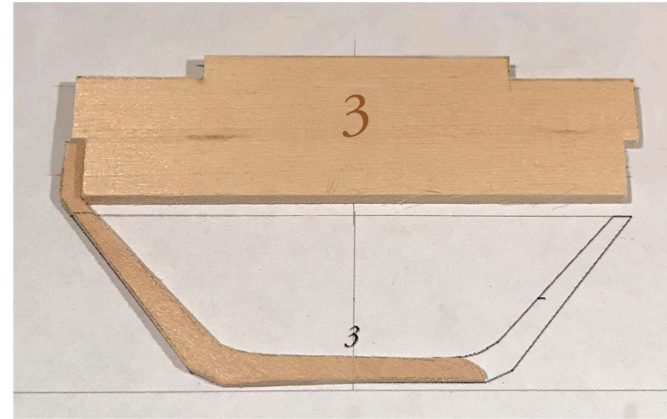


4. The boat's frames

All the frames look very similar. Don't mix them up! I suggest, to avoid any confusion, free only one pair at a time from the sheet to assemble.

Start with frame 3, the *midship frame* or *dead flat*. This has no bevel on its sides for the planks. Dory frames are in two pieces, each cut from a natural crook of wood. The model parts are arranged along the grain of the wood. Clean off char from the *inside* edges only. Remove cross-piece #3 from the sheet and glue the tab of the first half frame to it on a flat surface over its pattern on page 5 (photograph, top of next column).

Place a 1/16" spacer, supplied, as shown (see arrow in the second photograph, next column). Glue the second half frame along the overlap and tab. Allow the glue to dry completely. Repeat this process for frames 1, 2, 4 and 5.



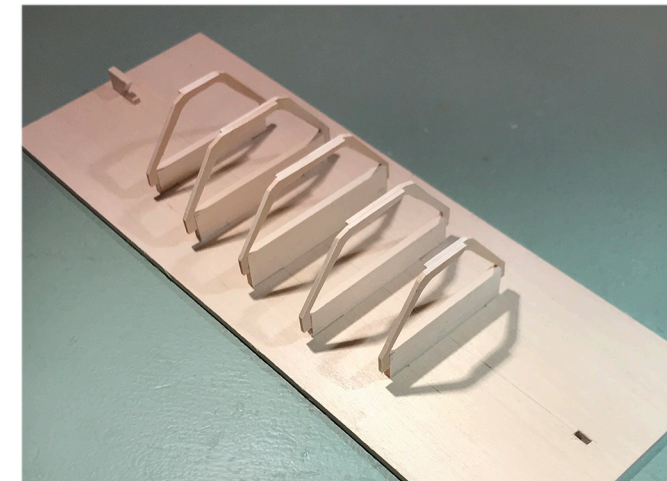
As naturally crooked wood is hard to find now, modern dories use three straight pieces for each frame instead. These are joined at the angles by galvanized steel plates or clips on each side of the joint, riveted through. Alternatively, plywood gussets, glued then nailed or riveted, are used instead.

5. Setting up the frames

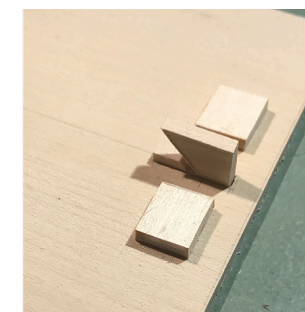
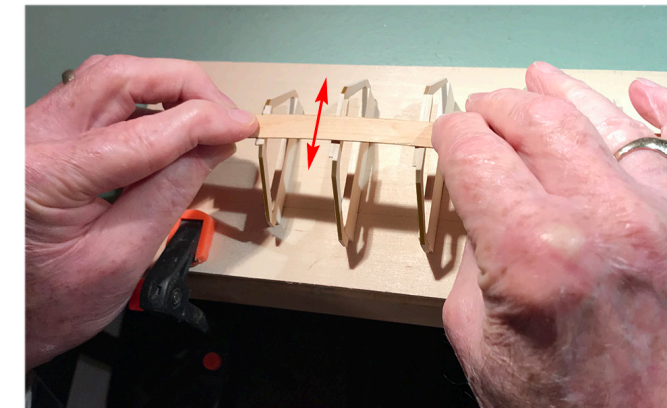
From this point on the boat will be built upside-down. Free the building board and clear the slots. Push the cross-pieces tabs with their frames into the slots making sure that they are pressed fully home; top photograph in next column. This is important. If the fit is too tight, gently sand one side of the slot. If a little loose, run a wet brush along both sides of the slot to swell the wood. **Press fit only; do not glue these in!**

6. Setting up the bottom/stem/transom assembly

To accommodate the bottom curvature, a slight bevel is needed on the bottom of the frames. Cut a long flex-



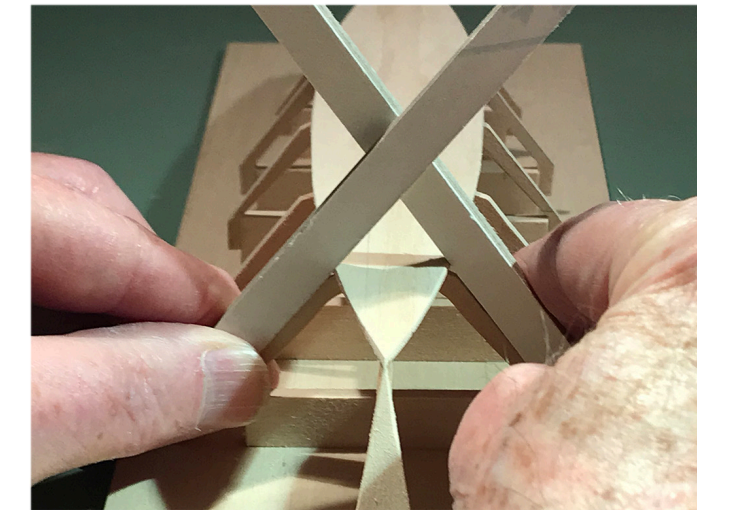
ible strip from one of the thin basswood sheets in the kit to use as a 150 grit sanding stick. Clamp the building board to the edge of your table, then *lightly* sand *parallel* to the upside-down frames, three at a time, as shown. If you sand in the other direction, there is a high risk of breaking a frame. Check your progress until the char marks just disappear, photograph below.



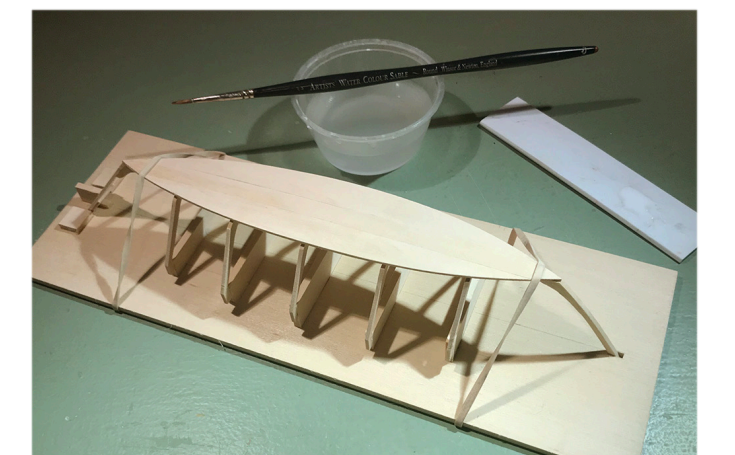
Once the bevels are complete, the bottom can be attached. Note the slots in the board for the stem and transom holder. Press out and clean up the transom holder and push it into its slot but **do not glue it.**

There are two small blocks on either side needed to prevent the transom from moving sideways. Do glue these in place.

Now make a trial assembly without using glue. Fit the transom into its slot first, then push the stem into its slot. Be sure that everything fits as it ought. Make any small adjustments if needed. Once you are confident, remove the bottom, glue along the frame edges and set the bottom in place with the stem and transom back in their slots. Check that the bottom is sitting centrally on frame 5 as shown below.



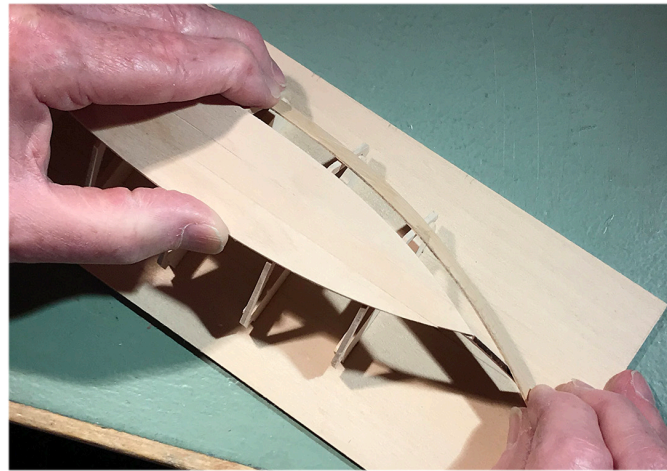
A couple of elastic bands as hold-downs are helpful here. Before the glue sets, look at the model from the side to make sure that all the frames are still vertical. Clean up any squeeze-out with brush and water. Let the glue dry thoroughly before proceeding.



7. Preparing for planking

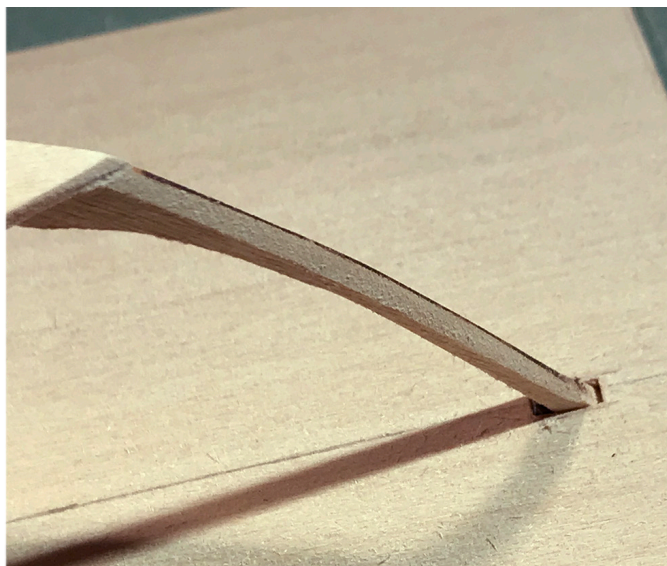
Before planking the boat, more sanding is required. The sides of the frames (except the center frame 3), the

edges of the bottom, the stem and transom all need beveling. Once again, use your flexible sanding stick.



Do not overdo nor skimp this process. You want the planks to attach properly all surfaces. Be careful and watch the char marks disappear as before. Use a light touch and be patient! Clamping the board to your work surface will also help.

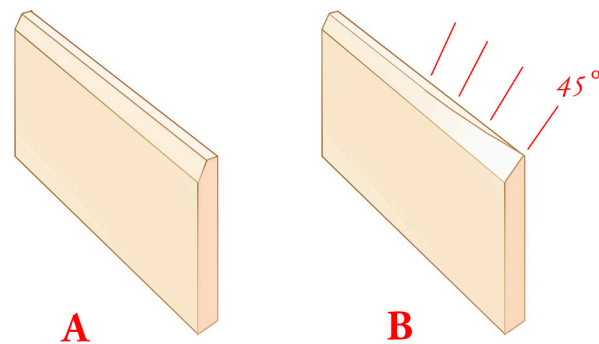
You will notice that the stern knee becomes beveled at its aft corners. This is correct! The stem should bevel to almost a point all the way up and down. The char line here should slowly vanish along a straight line down the center, photograph below. First work one side then the other alternately to gradually and equally achieve this result (below).



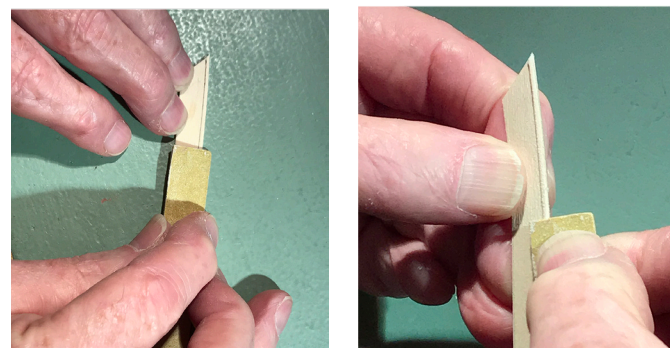
8. The garboard plank

The lowest plank on each side is called the *garboard*. Remove the garboards from the sheets. You will see that they are a curious shape. In later kits you will learn how to develop the shape of planks for yourself, but here it has been done for you. You can only use straight planks on a flat surface like the side of a house. Even a simple boat like a dory isn't shaped like that!

Before you can add the garboards, they require some preparation. Their upper edges (when the right way up!) are beveled to accept the next plank above. Using a small sanding stick, bevel along the edge until you reach the marked line on the outside of the plank and the top edge is half the thickness of the plank, as illustrated in A, below.



To create the bevel, use a small sanding stick resting on your work surface below left, or held pinched between your fingers as shown below right. Lightly sand down just to the line. First practice this technique on scrap.

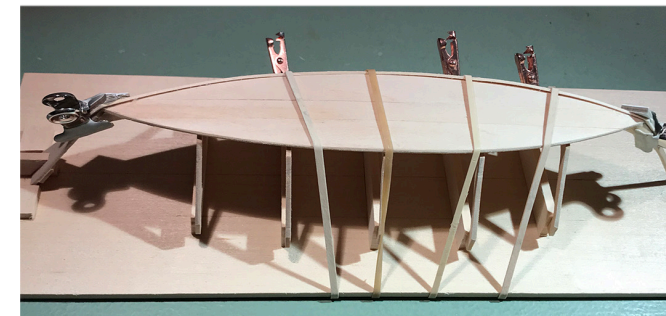


Some additional beveling is needed at both ends of the plank. The reason for this extra *rolling bevel* is so that, at each end of the boat, you don't end up with a saw-

tooth effect of overlapping planks. The plank overlaps gradually disappear and adjacent planks should end flush with each other.

Starting about 1' 6" (that is to say, about three quarters of an inch or a little more at model size), the bevel increases in angle progressively until the edge comes to a point at the end at 45°, illustration B, opposite. Make sure that you don't bevel beyond the line along the flat side of the garboard. When you are happy that the bevels at both ends look like those in the illustration, it is time to fit the garboards.

Test-bend and fit each so that the edge against the bottom slightly overlaps the bottom of the boat, photograph below. The plank ends are slightly long and will be trimmed back later.



Have a good supply of clips and elastic bands on hand for this. I put a pad of thick card under the clips at each end to prevent denting the wood.

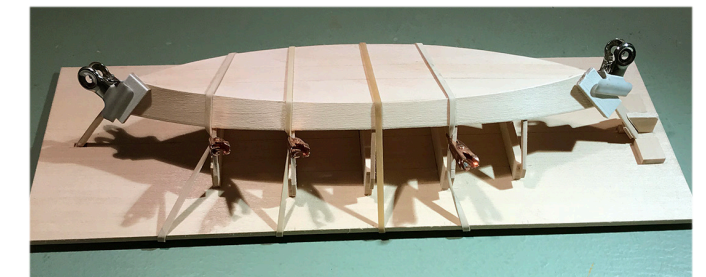
Bending wood

There are several methods of bending wood. For this model we will use the simplest one; hot water. Soak the garboard for about five minutes, then remove and pat off any surface moisture. Using clips and elastic bands, temporarily attach the plank to the model as shown above and opposite. Do not try to glue it on yet! The plank must dry out thoroughly first, so let it dry in place at least a few hours. In the meantime do something else; like preparing the oars, section 22.

There are two reasons for letting the plank dry. One is that wet wood swells and shrinks again as it dries. This will create stress on the frames or, in the case of a boat with flush planking, will gap along the seams as the wood contracts again. The other reason is that it will not glue properly when damp. So, please be patient!

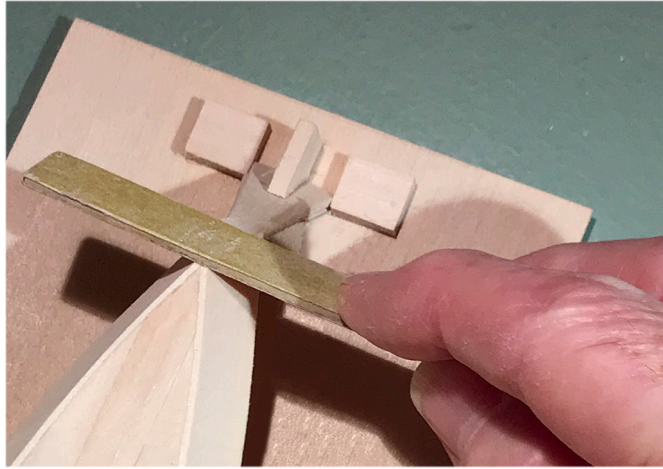
Once dry, you will notice that the surface of the plank is no longer smooth, as the grain has been raised. Lightly sand it smooth again on the inner side using a 220 grit sanding stick. The outer surface will be sanded later. If there is a spot where an elastic band dented the edge of the plank, it can be restored by a little water applied with your brush. Basswood responds well to this treatment. Ignore any spring-back.

Glue the surfaces of the frames, the edge of the bottom planks, stem and transom. Place the first garboard in place, making any small adjustments before the glue sets. Set its forward end flush to the front edge of the stem and let any overlap happen at the transom. Again, make sure that the garboard is level with or protrudes very slightly above the bottom planks. Hold the plank down as before while the glue 'grabs'. Creative clamping is need here!



Run a mix of glue and water into any open spots along the bottom joint and close it using elastic bands. Remove any excess glue before it hardens.

Sand off plank overhang along the lower corners. Sand the bow and stern at right angles to the keel, photograph next page. Sand up and down the transom, not across, to keep its surface flat.



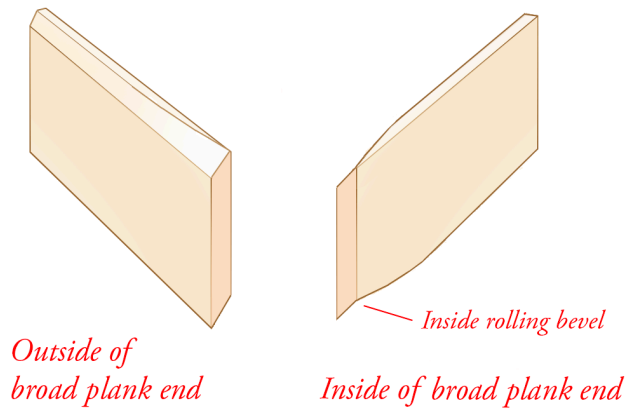
Repeat this process to attach the other garboard. In addition to clips and elastic bands, you will need finger pressure at each end of the plank, as one cannot use clips here. Holding it for a minute or two is all it needs, as the warmth of your fingertips will speed setting of the glue. Sometimes fingers work better than clamps!

To complete work on the garboards, sand the edges flush with the bottom planks. Sand down the overlap at the bow and transom. Also lightly sand the outer surfaces of the garboards to remove raised grain from the bending process.

9. Broad plank

The middle or *broad plank* requires some preparation. The upper edge is beveled the same way as the garboards. Both ends are also given a rolling bevel. There is one additional step here; the *inner* sides of both ends on their lower edges also require a rolling bevel. This is so that, at bow and stern, the planks become flush to each other. This additional bevel is shown above in the next column. Soak and apply the wet plank as you did the garboard. Let the plank dry in place completely.

The process of attaching the broad plank is as follows: Sand the inner side smooth. Glue the stem end making sure the diagonal bevels match and allow it to dry. Then, one frame at a time, run dilute glue along the



joint and to the edges of the frames. Hold in place by finger pressure until dry. As you proceed along the plank, make sure that its edge aligns with the edge of the bevel on the garboard plank. You may need to make slight adjustments as you go. If necessary, wet the plank a little to help it adapt to the frames.



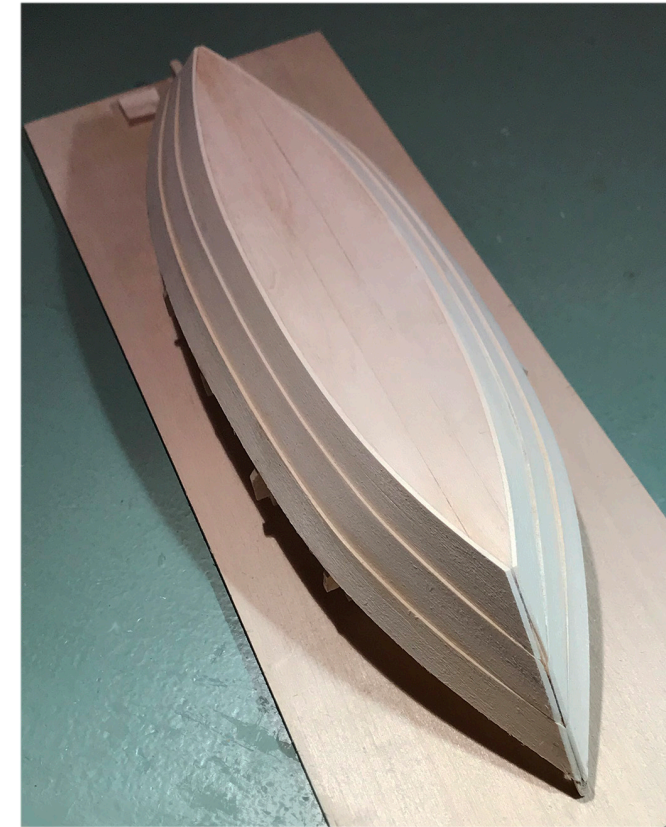
The completed plank is trimmed at both ends and the outer surface sanded lightly. It should now look like the photograph above. Note the disappearing overlap at each end. Repeat the process on the second side.

10. Upper or sheer plank

The last or uppermost plank is called the *sheer plank* or *sheer strake*. A strake of planking usually consists of more than one plank, but in smaller boats such as this dory it is a single, continuous plank. The *sheer* describes the curve along the upper edge of a boat or ship.

The sheer plank only requires a rolling bevel on the *inner* side of its lower edge both fore and aft. Once this is done, the plank may be soaked, then dried in place as you did the other planks. Once dry, sand the

inner surface, then glue it in, bow to stern, as you did the broad planks. Trim the plank ends when the glue has dried. Repeat the process on the opposite side. You have now successfully planked your first model!

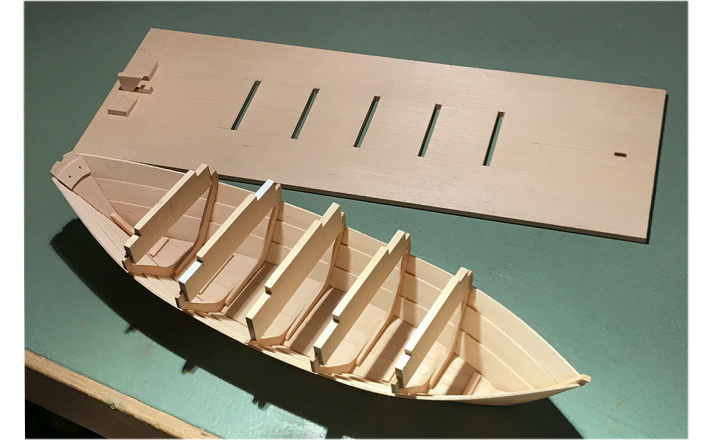


11. Tidying up the planks

The wood grain may have been raised in places by moisture during assembly. If so, lightly sand smooth again using a 220 grit sanding stick. Try to avoid rounding the plank edges and corners for now.

12. Freeing and cleaning up the hull

Now is the moment to separate the hull from the building board. From below the board, push the tabs out, starting at the bow end. There may be an alarming crack or two, but this should free the hull. Lift off the stem first and then slide the transom out from its slot. You may find that the sheer plank has separated from a frame or two along its upper edge. Re-glue and use a clip to close the joint.

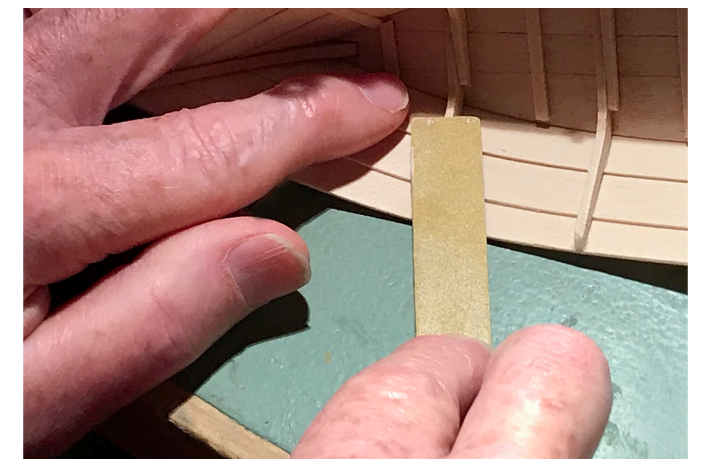


Next, use a razor saw to cut off the frame tops and cross-pieces just above the sheer. Go carefully so as not to cut into the plank. Gently sand down the protruding tops so that you do not catch on them. They will be cut down further later on.

Any glue remnants on the inside of the hull should be dealt with now. Soften any dried blobs with brush and water. Repeated applications may be needed. You could use rubbing alcohol, which is quicker. However, don't overdo the application of this, or the planks may come unglued! When soft, scrape the excess away using a small blade screwdriver. Be careful, as basswood is easily marred.

12a (optional detail)

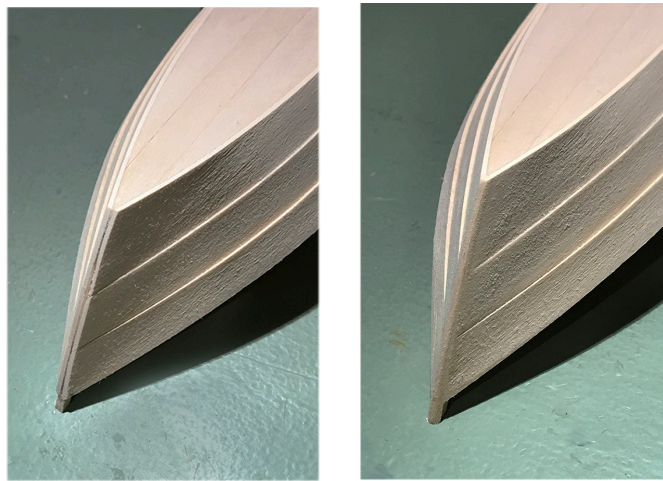
The inner sides of the frames may be sanded down parallel to the side planking. Doing so will simplify fitting the risers (section 15).



The greatest bevel is needed on frames 1, 4 and 5. Some bevel is required on frame 2, but none on 3. The easiest technique is to hold the model on the work-bench as shown, bottom of previous page. The tops should be a little more than $\frac{1}{16}$ " across when sanded.

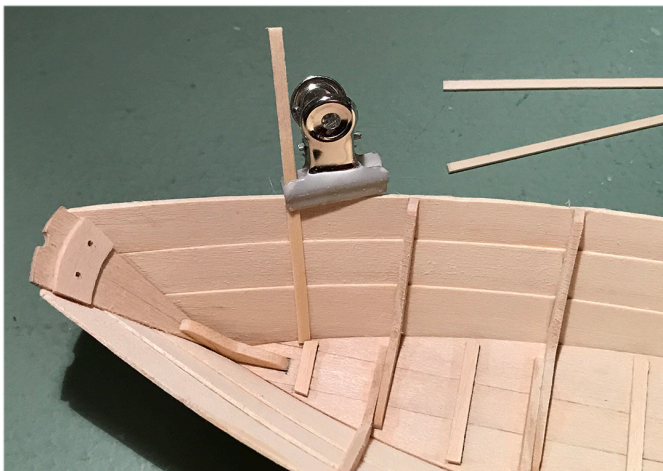
13. The false stem

This is an extra piece added to the bow as a sort of nose. Then false stem covers the plank ends to protect them and gives the bow a finished look. Wet the outer surface and glue this extra piece on. Finger pressure may be needed. When the glue has set, sand the lower end and sides down at the same angle as the planks, then gently round off the front edge as shown.



14. Side cleats

There are additional supports for the planks fore and aft called *side cleats*. These are fitted as shown on the



plan (page 4) at an angle just forward of the foremost floor cleat and just aft of the aftermost floor cleat.

These pieces are over-length for ease of handling. Wet the inner face and glue the outer face. Secure the lower end between the corner of the bottom cleat and side, then clamp it at the sheer as shown. Cut off the excess length when dry and sand flush to the sheer.

15. Seat risers

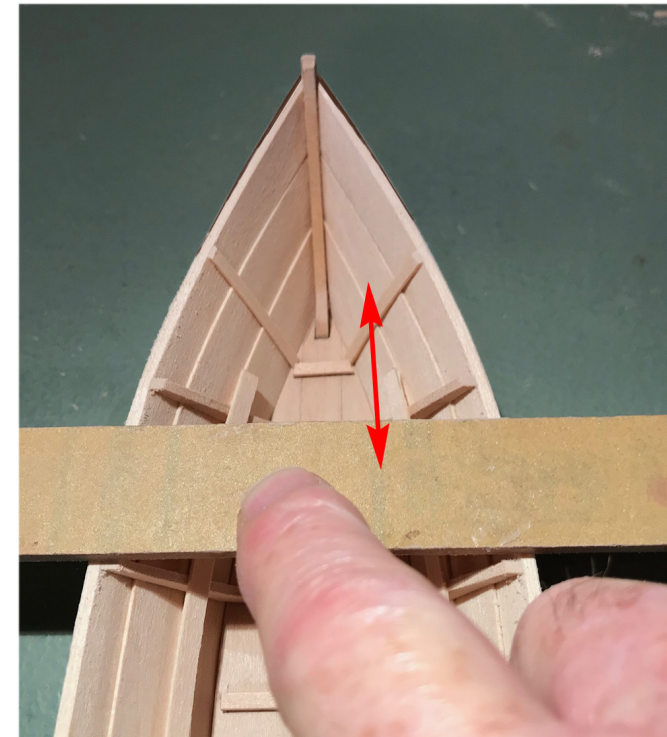
Risers are the longitudinal boards inside the boat that support the ends of the thwarts. Soften the pieces with water to pre-bend them. Glue these in, convex side up, with their upper edges along the marks provided on frames 1, 3 and 5 as shown below. This completes fitting out the fixed features inside the boat.



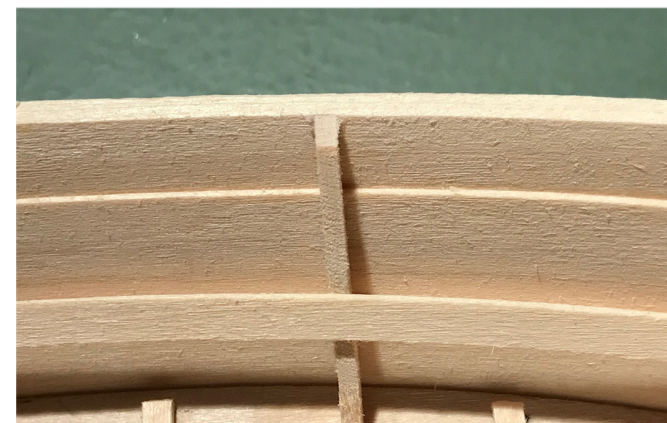
16. Bands

Extra planks, called *bands*, reinforce the top edges along the hull. Their upper edges are flush with the upper edges of the sheer planks. I suggest leaving the char along the top edges for the moment. Dampen the bands before gluing them on. Use clips to help here. Make sure that they are well glued to the sheer strake and that they are at the same level at bow and stern.

Prepare a wide, rigid sanding stick. When the bands have dried, sand the tops of the combined sheer strakes and bands horizontally. Keep the sanding stick across the boat and apply *gentle* pressure in the middle of the stick (photo below). If you press down too hard there is a risk of separating the planks from bow or stern.

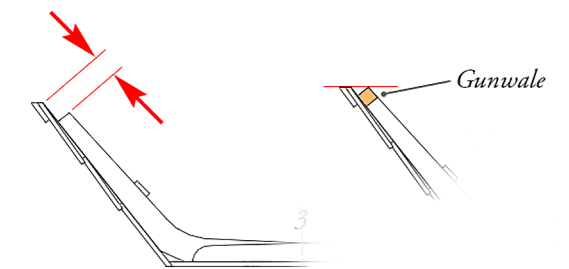


Extra care is needed at the stem and transom. When the char line has just disappeared, leveling is complete. The top of the sides should now look like the photograph below. If not leveled, when you come to add the cap rail (section 19) there will be a gap between it and the band outboard and it will not sit level.



17. Gunwale

The *gunwale*, pronounced "gunnel", sometimes called the *inwale*, reinforces the inner edge of the sheer. In order to fit these, first the tops of the frames need to be cut down about $\frac{1}{8}$ " below the top of the sheer plank. This is where a #17 chisel-shaped blade will come in useful. Be careful not to cut into the sheer plank! Study the illustration and photograph to see how the frame top is cut back for the gunwale. (In the photo below, a chisel is shown for clarity.) The model is held flat on the work surface and the cut is made vertically downward.



Cutting back the frame tops



The gunwale is made from $\frac{1}{16}$ " basswood strip, supplied with the kit. The gunwale will need to be carefully fitted at both ends. This step is a little tricky. Start at the forward end. First cut the angle at the bow as seen from above. To sit snugly against the stem, this end will now need to be undercut. Use the chisel blade for this. Repeated offering up and test fitting will result in success here.

Now bend in the gunwale. Obviously it will still be too long at the transom. Gradually trim the end back until it fits neatly into place. Again many trial fittings and patience are required to do this neatly. It's much easier to cut off too much than stick it back on again!

As you fit the gunwale you will notice that there will be a slight ledge between the top of the sheer plank and this piece. This difference in level will be covered by the cap rail. To ensure a level surface for the rail, lightly sand the tops using the same technique as in section 16, the bands.



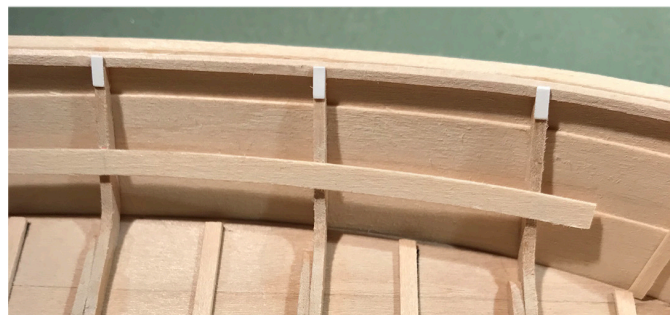
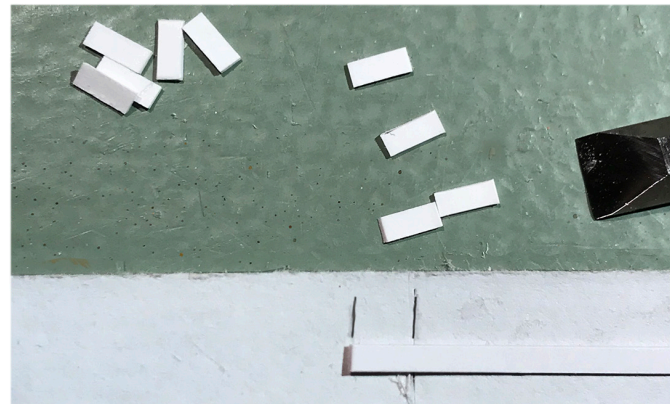
17a (optional detail) Frame head irons

These are straps of galvanized steel that hold the gunwales down on the frames. They are also helpful in hiding any small gap between the tops of the frames and the gunwale!

First pare down the frames flush to the gunwale using a sharp chisel blade, as shown below. Take very light cuts and finish the surface using a sanding stick. If you are not sure of your skill with a chisel, simply use the sanding stick.

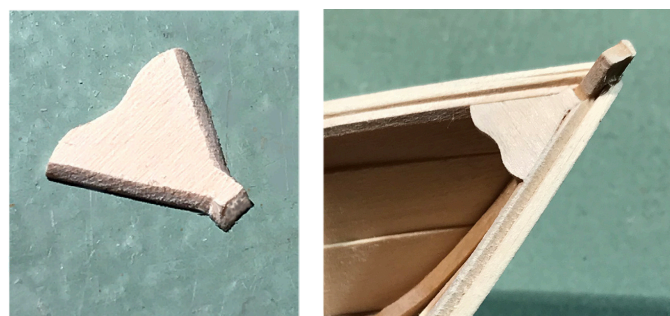


You can represent these straps down the inside of the frames by card strips cut a scale 3" wide and 4" long. They don't have to be made of metal! Use the scale rule to figure out the actual size of these pieces. Cut a thin card strip to width and chop off pieces as shown using two spaced marks on a cutting surface. This is the easiest way to cut pieces of consistent length. Glue them into place with a little glue. Use tweezers to place the card pieces. These will be painted.



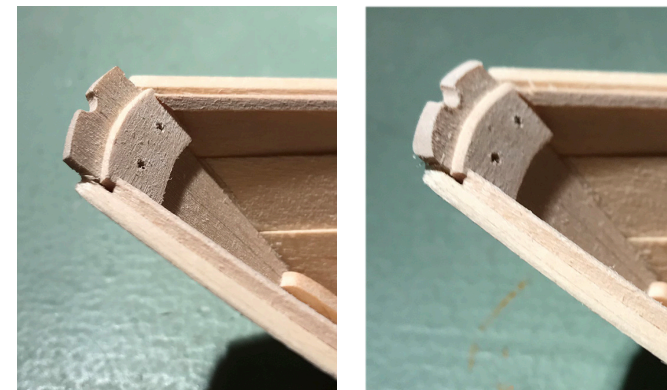
18. Breast hook

This triangular piece unites the gunwales inside the bow. Its edges will need a little shaping to fit neatly (underside, below left). When glued in, its top surface should be flush with the top of the gunwales (below).



19. Completing the stern

The upper edge of both transom and stern cleat may be beveled to match the sheer as seen from the side. If you are confident, the cleat can be pared using the chisel blade. Cut outwards from the centerline so that you are cutting with the grain of the wood, not against it. Otherwise, use a sanding stick to achieve the bevel. Sand the top of the transom to the same angle. If you have a round Swiss file, the recess for the steering oar can be filed to match. Before and after are seen below.



Painting your model

I like to paint parts before final assembly whenever possible. This saves tedious and awkward masking off. Our dory is painted yellow ochre inside and out. The one drawback to acrylic paint is that it is water based, which raises the grain of the wood. There are two solutions to this. One is to rub the model or parts down with fine sandpaper after the first coat of paint seals the wood. This is difficult when there are lots of crevices and hard-to-reach places on the model. The other and (to my thinking) better solution is to seal the wood by spraying it with gray universal primer from a rattle spray can, available from your local hardware store.

If you decide to spray, there are several precautions to take. One is a well-ventilated space. Second is adequate protection of everything else from over-spray. A spray booth is ideal, but most of us lay down a wide area of newspaper. And, of course, make sure that there is no source of ignition nearby!

Several light passes of spray paint are better than a single heavy, wet coat. Allow drying time between coats and turn the model so that all surfaces, inside and out, receive a light covering. You only need to lay down enough paint to seal the wood.

Painting tips:

We've all done bad painting jobs! The following tips will help you get better results:

First and importantly, several light coats are also better than one heavy one.

Make sure the paint is well stirred before you begin and have water and a rag handy in case of an accidental spill.

Don't dunk your brush deep in paint! It is wasteful and gets paint up inside the brush. This makes it harder to clean and will eventually ruin the brush. Only dip about 1/4" of the bristles into the paint.

If the paint seems too thick, a few drops of water mixed in will help. The first coat will probably be a little patchy and transparent. This is fine. Allow time for this to dry *completely*. A subsequent coat or two will build up an opaque, smooth layer of paint.

As you paint, try to avoid a build-up in any corner. Brushing lightly out away from the corner will disperse the paint layer evenly.

Wash your brush out right away in water, then use a little hand soap, massaging the bristles to get the last of the paint out, rinsing again until the water is clear. Shape the damp bristles and let the brush dry.

Painting the hull

I used Model Expo's Hull Yellow Ochre for the dory. Begin by painting the inside of the model using a flat 3/8" or 1/2" artists' brush for the job (see the tools sheet).

A flat brush will enable you to get paint under the risers along the inner sides.

After the second coat is dry, examine for any little 'blips' in the paint. Gently pick them out with a knife point. The third coat should be evenly opaque.

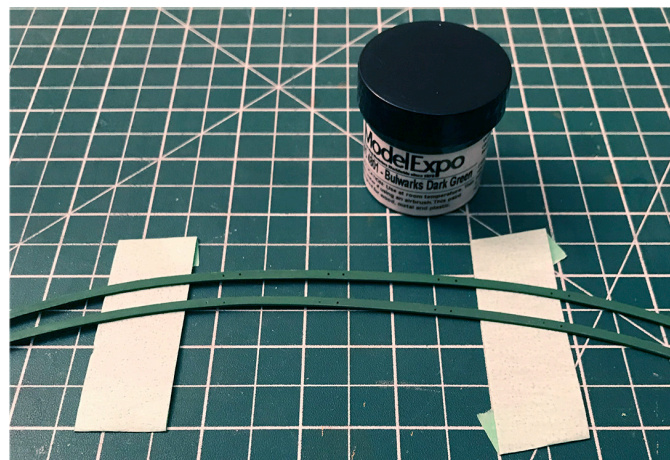


When you are happy with the inside of the model, turn it upside-down and paint the outside in the same way.

19. Cap rail

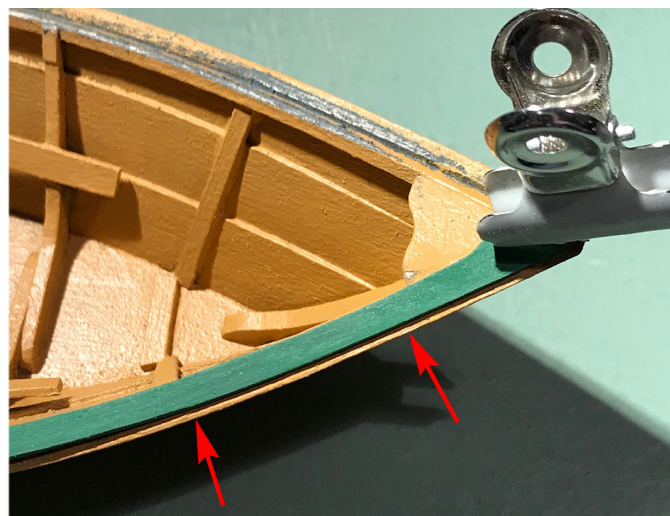
The *cap rail* covers the gunwale and sheer plank, as well as provides support for the *tholes* – the pins that the oars work in. As these parts are delicate, please handle them with particular care! Make sure all the holes are clear before installing them. Like the gunwales, the aft ends of the cap rail have to be fitted at the transom.

The cap rails are traditionally painted green. Paint the rails *before* attaching them to your model. This avoids having to mask the model. Prime the rails first, then apply several coats of paint as before. I used Model Expo's Bulwarks Dark Green. You will only need to paint the top and edges of the rails. To hold the rails while you paint them, take lengths of masking tape and, attaching the ends to your protected work surface, stick the parts to be painted to the upside-down sticky side of the tape. When the paint is dry, scrape any paint from where the rails attach to the model.



19a. Attaching the cap rail

You need to be patient and careful here. Take the first side and carefully fit the bow end at the breast hook so that the inner edge of the rail coincides with the inner edge of the gunwale. The edge of the band should extend beyond the outer edge of the rail (arrows, below). The notch at the stem may need some attention.



Make sure that the card frame head irons (17a) if fitted do not protrude above the gunwale, or the cap rail may not seat properly. Trim them using a sharp blade if necessary.

Now glue the bow end (only an inch or two) to the model and allow it to set completely. Then continue aft, a few inches at a time, aligning the rail with the gunwale as you proceed. Lift the aft loose end above the transom for convenience.

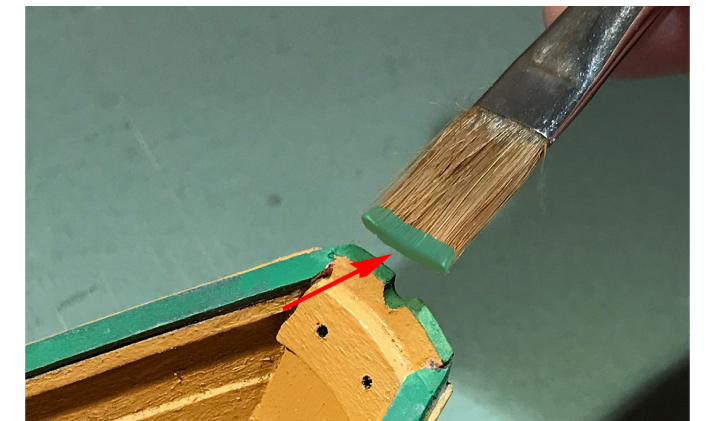
The cap rail is provided over-length. As you near the stern you can determine where it needs to be cut short.



A small pair of scissors will do the trick. If you cut the rail a little short it can easily be fixed. Use a little automotive body filler. Let this dry thoroughly, then sand and paint. Repeat the process on the second side, trying to match the joint at the bow (below). Again, any gap can be fixed with a little filler and paint.



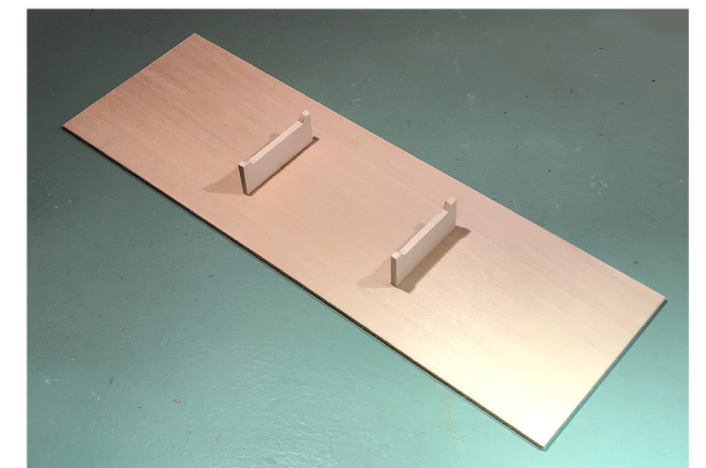
There will undoubtedly be paint touch-ups required! Carry out the green ones first. The top edge of the transom was sometimes painted green as well. This is an option. If you decide to do this, touch the flat brush lightly down (shown below) across the top edge. If the brush is not overloaded, you will get a clean edge to the paint.



20. The presentation baseboard

Next prepare the baseboard parts as usual by removing the char. Either sand the edges of the base with a bevel or round them off instead.

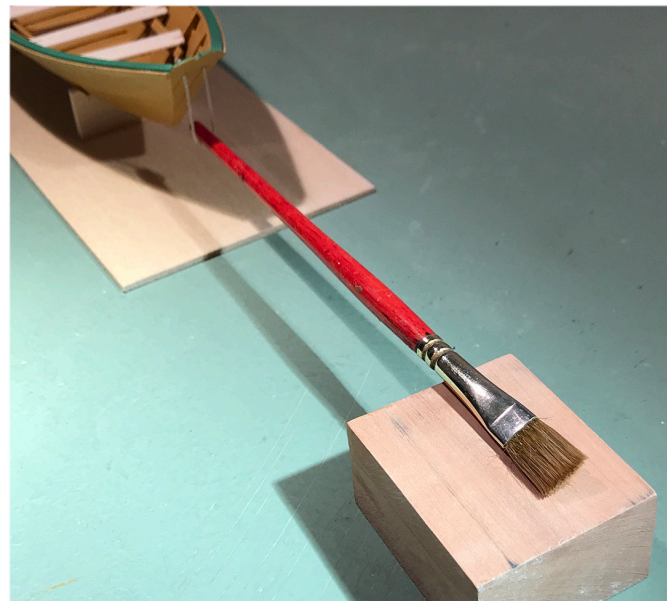
You may wish to leave the base in natural wood, varnish or paint it. Apply any finish before assembling the cradle pieces on it. The wider cradle is toward the bow of the model. A plaque is included that you can attach on one side or bow end of the board to complete the presentation. You could bevel the edges of the plaque. Carefully glue the model on its cradle.



21. Becketts

These are the rope loops at bow and stern for moving and hoisting the dory. These are *reeved* (passed) through the two holes at each end and are then knotted to form a loop. Start with a piece of line about 4" (actual length) long; it will be easier to handle and knot than a short piece. Rub a little white glue into the ends to stop them fraying and to stiffen them. (This also makes it easier to thread them through the holes.) Reeve the line through one hole in the transom from inside to out. (Some dories had the knots on the inner side of the transom – your choice.) Make a knot in this end of the line and draw the line through until the knot catches on the inside of the transom. Form a loop large enough so that its top is above the transom, then knot the other end of the line inside the transom. Apply dilute white glue to the knots and let it dry. When completely dry, cut the ends of the line off close to the knots with a sharp blade.

The line will stick out at an unnatural angle unless you soak it with dilute white glue and drape it as shown. Once dry, the line will keep its shape.



At the bow, form a similar becket; except that the knots are made outside the bow and the line draped inside the boat.



22. Thwarts

Thwarts are the seats in an open boat. Press these from the sheet and clean the edges as usual. Sand the long edges round, because you don't want splinters in your thighs when rowing! The thwarts simply slot into place, as they are removable for stacking these boats. Thwarts are left in natural wood or are painted to match the boat – your choice. I like the contrast between paint and wood. Glue them in, unless you want to demonstrate their portability.

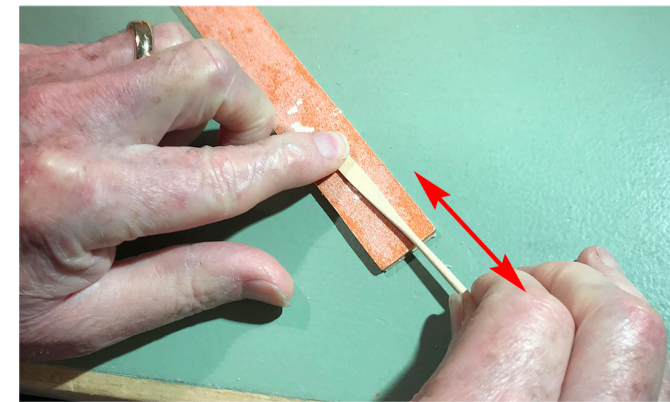


23. Oars

This dory is a two-man one so, although there are eight sets of tholes, there are only four oars. This gives

two rowers different possible seating positions. Oars are shaped as follows after freeing them from the sheet:

After removing char, thin the blade of the oar from the tapered portion of the body so it looks like the photograph. You can either whittle, then sand or simply sand the oar down as shown. Hold the oar at a slight angle, apply light pressure with your finger and sand as shown below, alternating sides.

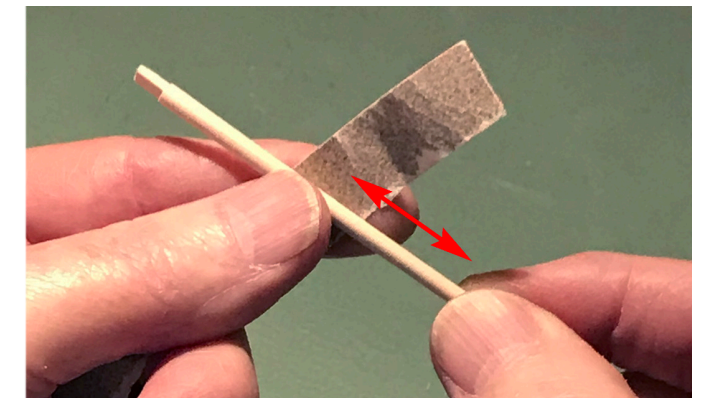
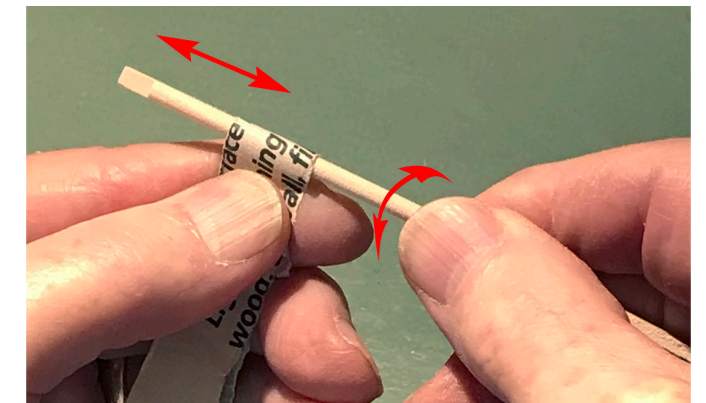
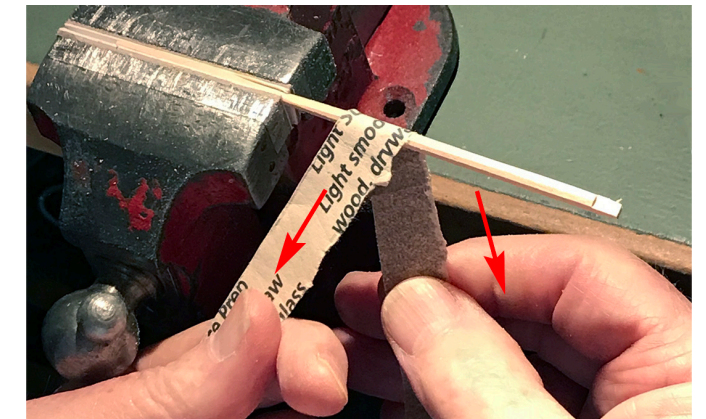


The handle, *loom* (inboard section) and *body* (outboard part down to the blade) are all round in cross section. Using a sharp blade, shave off each corner at about 45°, top example in the photograph below.

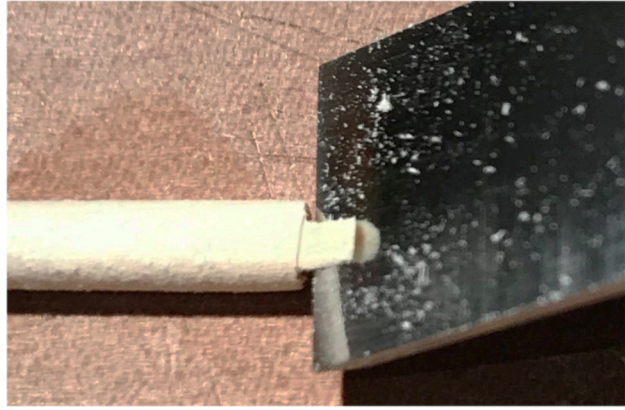


A small clamp-on vise (see the tools and materials sheet) will hold the oar while shaping it. Do this a section at a time so that there is not too great a length protruding from the vise. Turn it a quarter turn to keep the rounding off even on all sides. If the oar starts to bend, it will be in danger of snapping. Take a small

strip of 150 grit sandpaper and round off the body and loom by one of the methods shown. Be methodical and careful. The oar should now look like the middle example opposite.



Cut the two sides of the handle down to a square cross-section (shown on the following page), shave the corners off, then round the handle *very* gently and carefully using a sanding stick. You don't want to break it now! Round off the corners of the blade a little to complete the oar. Your oar should now look like the lowest example shown in the previous column.

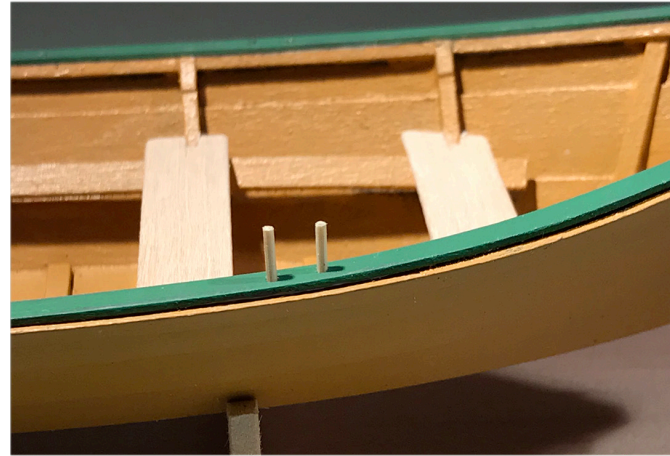
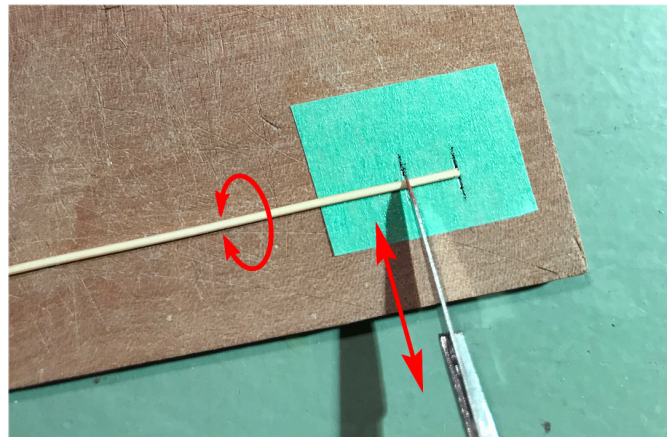


23a Leathering (optional)

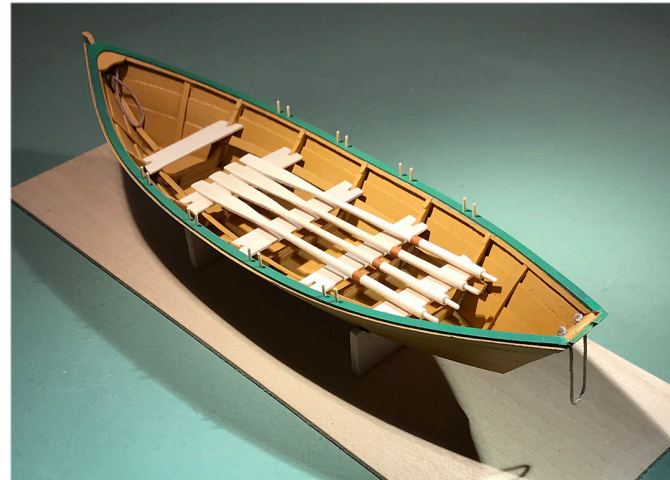
Some oars had wear strips of leather nailed around them where they worked against the tholes. You can imitate this using a 1/8" to 1/4" wide strip of brown wrapping paper wrapped around the oar and glued on as indicated on the plan, page 4.

24. Thole pins

Thole pins are made from the small 3/64" dowel included in the kit. You will need to cut 6" (1/4" full size) lengths for these. The easiest method for cutting thin dowel into consistent pieces is to mark a piece of masking tape with two parallel lines 1/4" apart and stick it to your cutting surface. Place one end of the dowel on the right hand mark (if you are right-handed) and place the knife at the other mark. Move the blade back and forth to score the dowel all the way around as it rolls. You can then break the piece off cleanly.



Insert the tholes into the cap rail holes with a small spot of glue. Make sure that the pins are vertical. Tweezers will make this work much easier to accomplish. It's the little details like this that bring a model to life.



The oars may now be glued across the thwarts, if you wish. And that's it!

Congratulations on completing your first model; you should be proud of your work. You are now an experienced apprentice boat-builder. To protect your work, I suggest you consider a protective case to keep dust, inquisitive fingers and house cats away.

The next model in this series will build on the skills you have now mastered as well as add new ones. See you again soon!

Your next model:

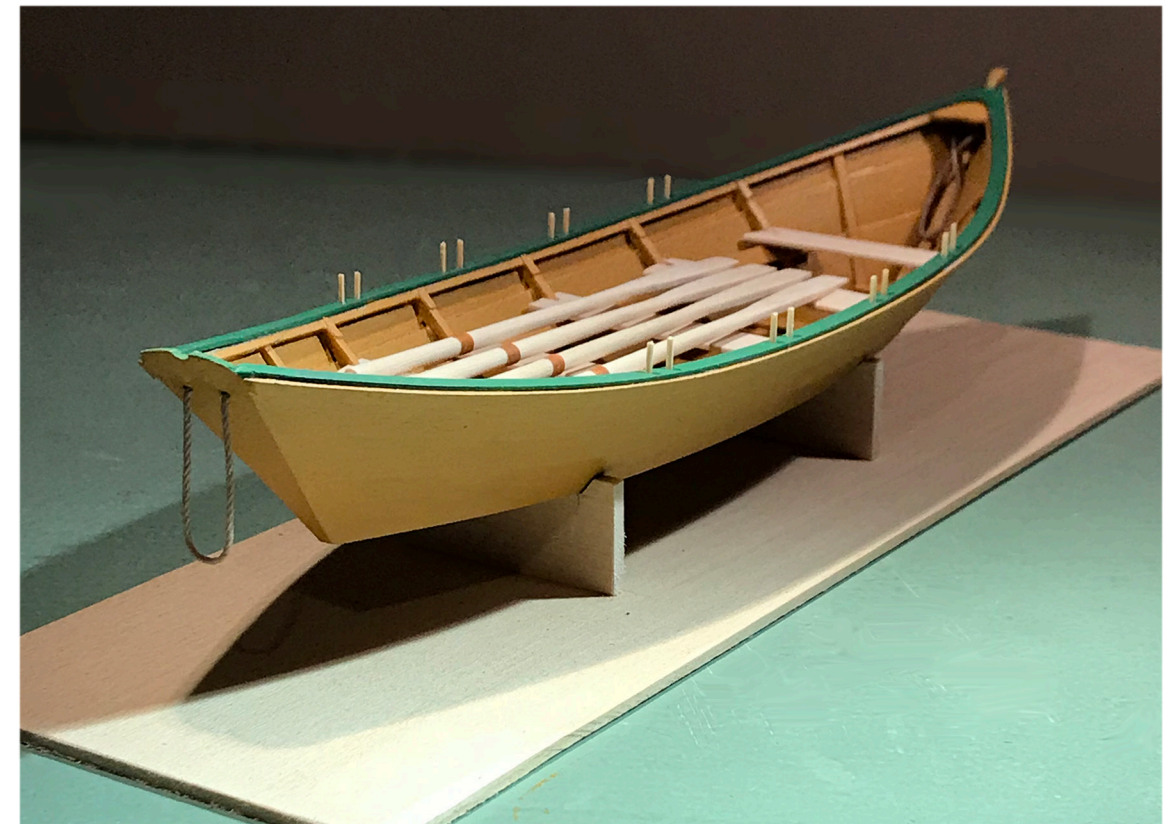
The second model in this series is more complex and will stretch your skills a little more. It is a very attractive [sailing Norwegian pram with a centerboard](#). You will be introduced to spars, rigging and sails. I hope you'll enjoy this new challenge.

Reference:

If you are interested in more information about the history of dories, the different varieties of these watercraft and how they are built, the following book is highly recommended:

The Dory Book written by John Gardner
International Marine Publishing Company,
Maine, 1978

Hard back edition: ISBN 0-87742-090-4
Soft cover: ISBN 0-91337-244-7



TOOLS AND MATERIALS

The following tools and materials are all you will need for your first model. Other items can be added as you progress. **Those marked with an asterisk are available from Model Expo.**

Glues*



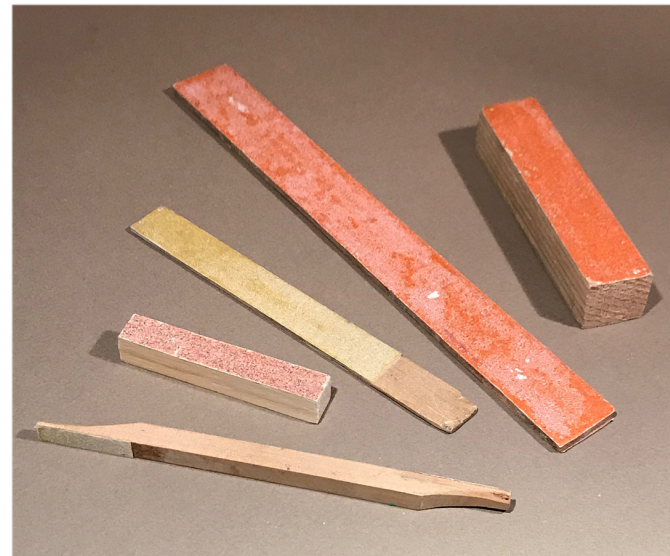
The most often used glues are polyvinyl alcohol (PVA) white glue and aliphatic yellow carpenters' glue. Both are easy to use and clean up with water before setting. Available from your local hardware store. These glues can be dissolved using rubbing alcohol (see below).

Another useful glue is rubber cement. This is used like contact cement. Coat both surfaces to be joined and allow the cement to dry. They will then stick to each other. Excess dry glue can be rubbed off with a piece

of crêpe rubber, or use a regular rubber band like an eraser. This is very useful for sanding sticks. Rubber cement is available at your local craft store.

Rubbing alcohol

You will need this to separate a glue joint if something goes wrong. Try to get 95% grade or higher, available from your local drug store. The 70% has higher water content and wood will need time to dry out before re-gluing. Do not use near a source of ignition!



Sandpaper and sanding sticks

Sandpaper comes in a wide variety of grades from coarse to very fine. Two useful grades for our purpose are 150 grit and 220 grit. Coarser grades cut too aggressively and finer ones produce very fine dust without finishing the surface appreciably better. Find these at your local hardware store.

Sanding sticks are very helpful. They can be easily made by sticking sandpaper to a piece of flat or curved scrap wood, or even heavy card, as needed (photo above). You can control the sanding process much better by moving the item to be sanded than holding a piece of sandpaper or the sanding stick in your hand. Move

the piece back and forth along the stick.

I use rubber cement (see *glues*) to stick sandpaper to the stick. When dulled, the paper can be peeled off and replaced with a new piece. You could use white or yellow glue instead, but then you can't peel off used sandpaper to replace it.

I coat the back of the sandpaper and the stick with rubber cement and let it dry. When both surfaces are ready, press the stick onto the sandpaper. Trim the paper using a disposable box-cutter style blade.

Cutting surface*

A plastic self-healing cutting mat is a must, particularly if building on the dining room or kitchen table! It will save a lot of grief or explaining. Get the largest size that will work best for your situation.



Knife and blades*

For these kits, a basic knife such as an X-Acto or Excel with #11 blades is a start. However, these blades get blunt and need to be replaced quite often, so the cost can add up. You might wish to consider a surgical scalpel handle, such as Swann Morton. A box of 100

#11 blades will last you a long time. These are available from medical supply houses or from Model Expo on-line. I recommend changing blades using small flat-nose pliers*; even dull blades can cause damage! Don't ask how I know this! Dispose of used blades in a sharps disposal container, please. A small supply of 3/8" wide chisel-end blades such as #17 size* will also be useful.



Set square*

A small steel or plastic engineer-style set square will be very useful.

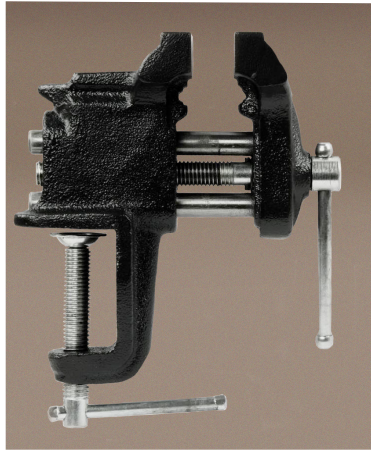
Saw*

A small razor saw with replaceable blades such as X-Acto or Excel (above) is a very helpful tool to have.

Clamp-on vise

I prefer the kind that clamp onto the table edge. There are suction-mount ones available, but I find that they always come loose when you don't want them to! A small vise is all that is needed, such as a 3" Irwin, DeWalt or Bessey. A more expensive option is a universal or rotating vise, but this is not really necessary. Find one at your local hardware store or on-line.

So that you do not mar the workpiece, line the jaws with a softer material. I custom cut pieces of cardboard to size and rubber cement them on. They are easily replaced when they get chewed up, as will happen.



Paint brushes*



For model work I find ‘flat’ brushes best. Please buy quality brushes and look after them – cheap brushes that you replace cost more in the long run and will probably shed hairs in your paint! I find $\frac{3}{8}$ " or $\frac{1}{2}$ " wide ones for acrylic paint the most useful. Also from your local art or craft store.

For glue, I use a number 1 or 2 size artists’ round brush. Wash it out well after every session. Should glue dry on it, rubbing alcohol will rescue the brush.

Care: wash your brush out well with soap and water after use. Should paint dry on the brush (please try not to let this happen!) you can dissolve acrylic paint in rubbing alcohol. When washed and clean, rub a little

soap into the hairs to re-shape them before storing. Never, *ever* leave your brushes bristles down in a water jar! They will splay out permanently. I have brushes over 20 years old that are still in good shape because of the care suggested here.

Paint*

Any good acrylic paint for models such as the Model Expo range will perform well.

Tweezers*



A good pair of fine pointed stainless steel tweezers are a useful item to have, but not essential for this first model.

Clips*

2" mini-spring clamps with rubber tips are very helpful. ‘Bulldog’ style binder clips are also occasionally useful. An assortment of smaller sizes can be found on-line or at your local stationery store. Buy more in the sizes you need, as you need them. One can never have enough clamping gizmos!

Elastic bands

These are handy and inexpensive items to have. Keep a number of different sizes on hand.