

MAKE IT YOURSELF
HOOK AND RING GAME



*Skill Development:
Sharpening and Joinery*



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#LVMadeByMe #LVLetsDoSomething

Skill Development: Sharpening and Joinery

This hook and ring game may look simple enough, but this project provides you with the opportunity to learn two key woodworking skills: sharpening and joinery, both of which involve a certain level of patience. You will begin by learning how to sharpen a chisel to a utility edge. Afterwards, you will learn how to mark and cut half-lap joints for the base and arms, as well as make dowel joints to connect the base and arms to the post. You can then use the milk paint as you wish before assembling the hardware components. Before you know it, you will be playing this fun and addictively competitive game that requires no electricity or batteries.

Skill Level: For adults, beginner to intermediate. Also appropriate for children 14 years and older when supervised by an adult.

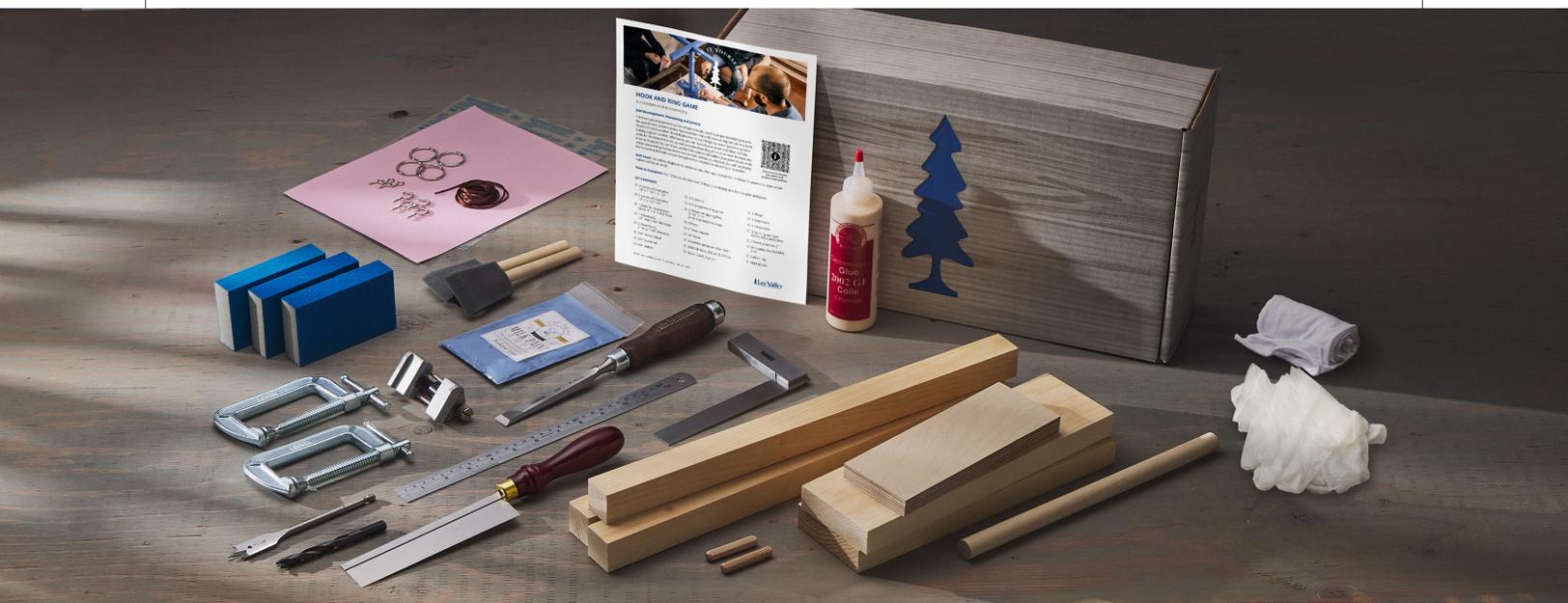
***Tip:** The video and written instructions go hand in hand to both tutor and guide you through the steps. We suggest you watch the video first, especially if you are a visual person, and then read through the instructions before you start. At the very least, be sure to read all the product instructions to familiarize yourself with how to use each product. For best results, always follow the product directions and safety notifications.*

Time to Complete: 6 to 11 hours divided over 3 days, plus drying time for the glue and paint.

***Tip:** While the estimated time to complete this project is based on our tests, we encourage you to take your time. The number of steps in these instructions may appear overwhelming at first, but once you have completed one joint, the others will be less daunting. Don't feel obligated to complete this project in one day. By all means, you can stretch this project over as many days as you would like. Savor the experience. Let the maker in you out to play. We want you to have as much fun making this game as you will playing it.*

KIT CONTENTS

- 3 pieces of clear pine, 18" × 1 1/4" × 1 1/4"
- 2 pieces of clear pine, 12" × 3 1/2" × 1"
- 1 Baltic birch plywood block, 8" × 3" × 3/4" thick
- 1 Dowel rod, 12" long × 3/4" diameter
- 2 Dowel pins, 2" long × 3/8" diameter
- 3/4" Narex chisel
- 3/4" Spade bit
- 3/8" Drill bit
- 2 C-clamps
- 1 Vise-type honing guide
- 2 Sheets of lapping film, 8 1/2" × 11" (9 micron and 3 micron)
- 1 Pencil
- 6" Steel square
- 12" Ruler
- 1 General-purpose razor saw
- 2002 GF Glue, 250 ml (8.5 fl oz)
- Rattail cord, 2 yards
- 4 Rings
- 4 Cup hooks
- 4 Screw eyes
- 3 Sanding sponges (120x, 180x and 220x)
- 2 Foam brushes, 2"
- Milk paint, Federal blue, 2 oz
- Cotton rag
- Vinyl gloves





Other items you should have on hand (not included):

- Pencil sharpener
- Mallet (preferred; but a hammer will also do)
- Safety goggles
- Hand drill
- A small bowl of water
- Painter's tape
- Scissors
- Utility knife
- Toothpicks or other small stick to serve as a glue applicator

Tip: Feel free to use any other tools you have on hand that you think might be useful.

DAY 1: COVERS STEPS 1 TO 7 AND SHOULD TAKE APPROXIMATELY 2 TO 5 HOURS TO COMPLETE.

1 SETTING UP YOUR WORKSPACE

- a. Select a clean, open work area.
- b. Remove the contents of the kit from the box and set them aside, but close at hand. Unfold the empty box (or any old box you have around the house) and place it on top of your worksurface to protect it.
- c. If you haven't done so already, read all the product instructions to familiarize yourself with how each product is to be used.

***Tip:** As you unpack the contents, take a moment to mark the grit of each sanding sponge on the side so that you can easily tell them apart when you reach **step 6, Preparing the Surfaces**. If the grit is not labelled on the sanding sponge, the best way to identify the grits is to do a test sand to get a feel for the grit. You will see and feel the difference between the grits. The 120x feels the roughest of the three sponges, while the 220x feels the finest.*

2 SHARPENING THE CHISEL

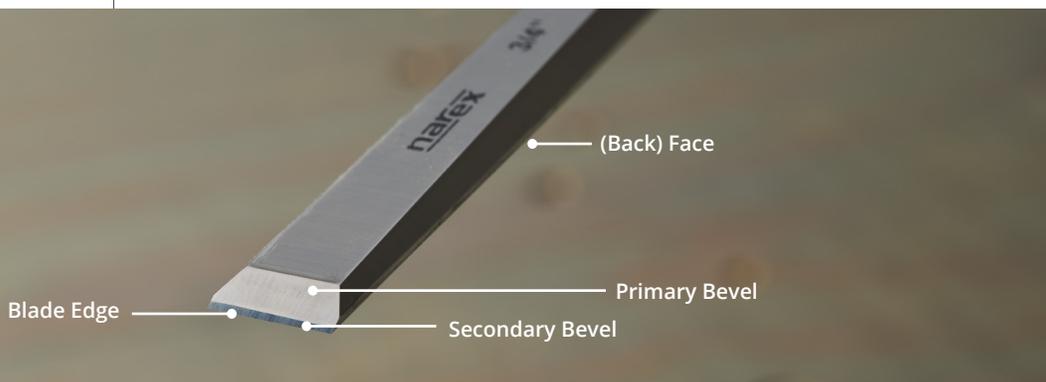


Caution: Careless handling of the chisel can result in injury. Always wear proper eye protection. Always work with the chisel blade pointing away from your body, and keep your hands behind the cutting edge.

Note: A new chisel does not come sharp, ready for use from the manufacturer. It will need to be sharpened in order to be used safely and effectively. A utility edge that has been lapped, honed and polished will be adequately sharp for the purposes of this project. However, keep in mind that sharpening is not one and done. Since re-sharpening will be necessary, it is important for every woodworker to establish a good sharpening routine to ensure edge tools are always performing at their best.

The sharpening method presented here uses a minimum of tools and is just one way to achieve a sharp edge.

The micro-abrasive lapping film used here is just one of many sharpening media available. Lapping film applied onto a substrate offers an inexpensive yet efficient sharpening set-up that produces excellent results on blade edges.



- a. To prepare the sharpening block, cut the adhesive-backed lapping film into three pieces. You can place the sheet on a flat surface, place the plywood block on top as a guide and cut to the required width.

Tip: To avoid getting a paper cut while handling the film-coated plywood block, be sure to trim off the sharp overhanging edges of the lapping film.



- b. Ensure the plywood block is clean and free of debris. Peel the backing off the lapping film. Apply one piece of the 9 micron lapping film on one side of the block, and a piece of the 3 micron film on the other side.
- c. The first step in sharpening a chisel blade is to ensure the back face is properly prepared. This lapping step provides the reference surface for the bevel. Apply a few drops of water onto the 9 micron side. Place the back of the chisel flat on the film and take several back and forth strokes. This process flattens the back face and removes any coarse grinding marks. It isn't necessary to lap the entire face of the chisel; however, you do want to completely remove the grinding marks across the face of the chisel right to the edge. Continue lapping until you reach this result.



Tip: The simple but effective honing guide included in your kit clamps and guides the chisel at the desired angle while you hone the cutting edge. It relies on the projection of the blade to set the bevel angle. The chisel comes ground to a 25° angle, and this angle is known as the primary bevel. Since it's a lot of effort to abrade the whole surface of the bevel, honing a secondary bevel (or micro-bevel) of a couple of degrees will speed up the sharpening process and get you working wood as quickly as possible.

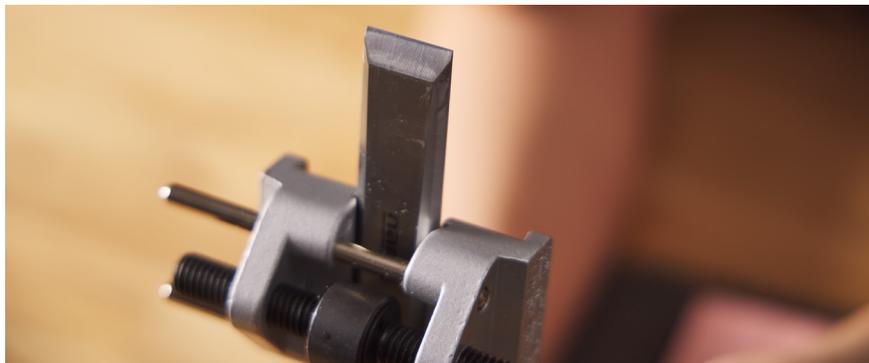
- d. Install the chisel face up (bevel down) in the honing guide and use the ruler to set the blade edge projection to 1 5/8" (40 mm). Measure off the leading edge of the guide to the tip of the chisel's cutting edge.



- e. If the 9 micron film is worn from lapping, replace it with a fresh piece.

Note: When replacing the lapping film, try to remove as much of the residual adhesive as you can. Every time you apply a new piece of lapping film onto the sharpening block, always make sure the surface is clean and free of debris.

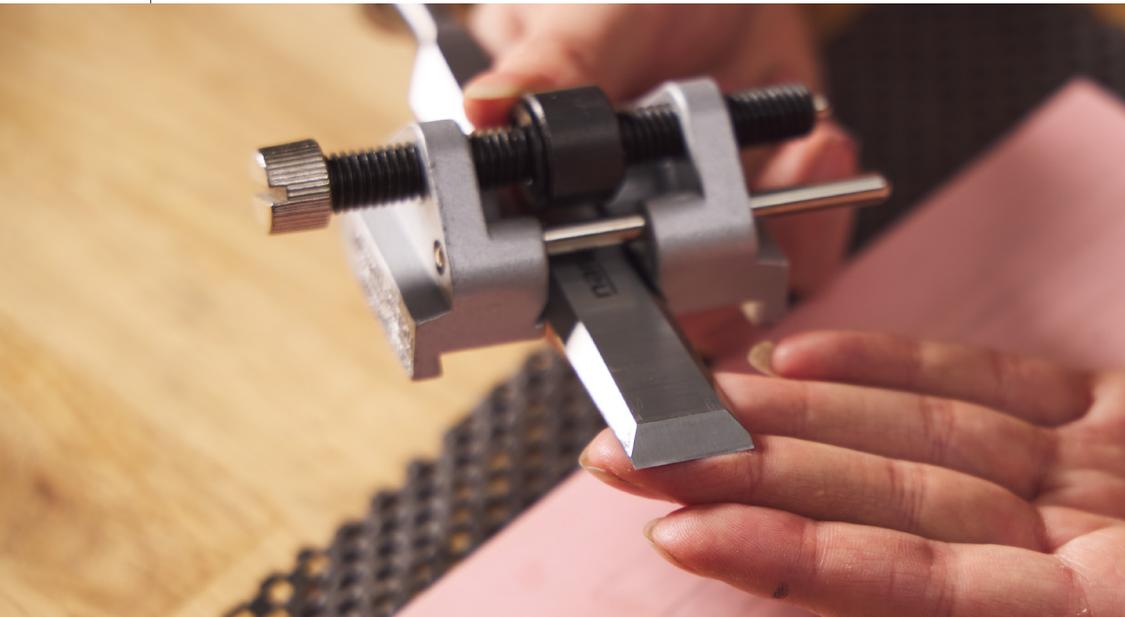
- f. The second step in sharpening a chisel blade is to hone a secondary bevel. Reduce the projection of the blade by a small amount – about 1/16" (1.5 mm). Apply some water to the film's surface and place the guide on the film. Draw the guide and chisel towards you a few times. This is important, as taking a forward stroke is likely to cut the film. Keep the pressure well forward on the blade so the guide rolls smoothly and easily. Stop honing when there is a narrow secondary bevel right at the tip of the chisel's edge.



- g. The third step in sharpening a chisel blade is to polish the secondary bevel. Switch to the 3 micron side of the sharpening block. Draw the guide and chisel toward you a few times. Once you're satisfied there is an even polish across the blade's edge, remove the chisel from the guide.

***Tip:** If you run your finger underneath the blade, the edge will feel a little rough from the steel that has folded over. This is called a burr and needs to be removed after the secondary bevel has been polished. However, don't worry if you can't feel this burr.*

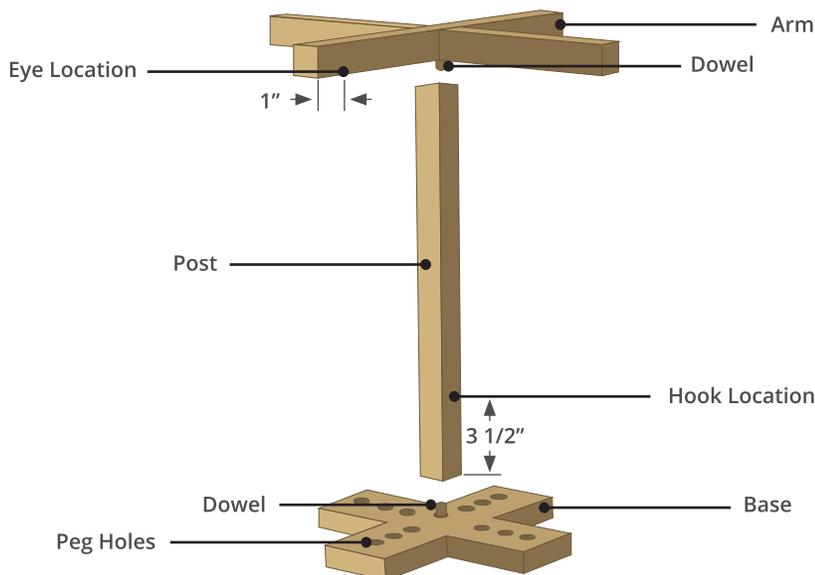
If you have followed the steps, you can test the edge by taking a shaving off the end grain of one of the pieces of pine.



- h. The final step is to remove the burr on the face of the chisel blade. Apply a bit of water onto the 3 micron film, place the face of the chisel flat on the film and take a couple of lapping strokes to remove the burr.

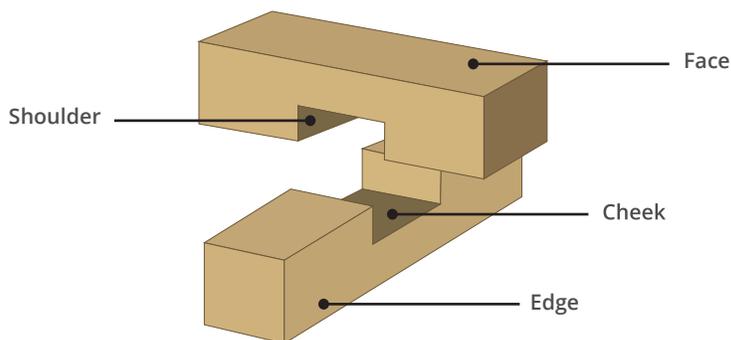
[Learn more about sharpening](#)

3 MARKING THE LOCATION OF THE HALF-LAP JOINT



Note: The base is made with the two 12" long pieces of pine and the arms are made with two of the 18" long pieces of pine.

The base and the arms are joined with half-lap joints. On a half-lap joint, half of the material thickness is removed from each piece of wood so that when the two of them overlap each other, they sit flush with each other. The resultant recess has two shoulders and one cheek. It is important that you mark and chisel one recess at a time. It may take you a bit of time to get through the first part of the joint, but once you complete one, the others will be much easier. You will need to follow steps 3 to 4 to complete the first recess for the 12" long base. For the mating recess, start with step 5, then follow step 3, f to step 4, i. You will then repeat steps 3 to 5 to complete the recesses for the 18" arms.



Tip: It is widely accepted that the accuracy of the layout will directly affect the outcome of the overall project. It is important to take your time during the layout phase to obtain fitting results. Having said that, for many aspects of woodworking, it is easier to simply fit parts to each other rather than carefully measure each part and presume they'll fit together. By transferring dimensions of one part directly onto another, without converting it into numbers, you avoid a primary.

- a. Start with a freshly sharpened pencil; a fine pencil line will go a long way towards laying the joint out accurately. Re-sharpen the pencil as necessary throughout.
- b. To lay out the face of the 12" long piece for the base, measure and make a slight pencil mark 4 1/4" from the right end of the piece. Place the square's blade on the mark, such that the square's body is flush with the long edge of the workpiece. Draw a line across the width of the face.



Note: For the 18" long arm pieces, measure and make a slight pencil mark 8 3/8" from the right end of the piece.

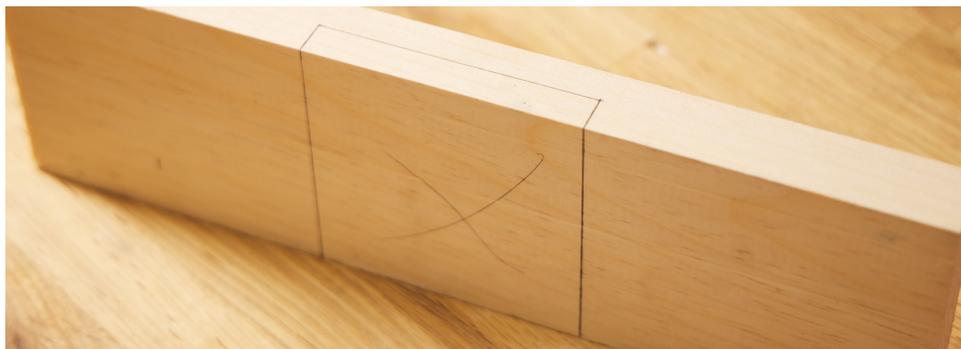
- c. Overlay the second 12" piece of pine such that its right edge aligns with the line you marked on the face of the first piece.



- d. Referencing the left edge of the second piece, make a slight pencil mark, and then set that second piece of wood aside. Place the square's blade on the mark, such that the square's body is flush with the long edge of the workpiece. Draw a line across the width of the face.
- e. Mark an X between the two pencil lines to denote the waste area where you will remove material to form the recess.
- f. To lay out the shoulder lines of the joint, use the square to transfer the two reference lines from the face onto the side edges of the piece, carrying each line about halfway down. Do this on both edges.



- g. To lay out the depth of the joint, measure and mark $1/2''$ down from the face along each shoulder line. Draw a line to connect these two points. Do this on both edges.



Note: For the arm pieces, measure and mark $5/8''$ down from the face along each shoulder line.

4 CHISELLING OUT THE WASTE

- a. Clamp the workpiece face up so you can see the X mark indicating the waste area.

Tip: Place a cardboard shim between the wood and the clamp to prevent bruising the wood. Should the wood show compressed marks after clamping, you can use a damp cloth and a hot iron to raise the fibers.

- b. Set the cutting edge of the chisel over the pencil line, such that the bevel points toward the waste area. Tap on the chisel handle with a mallet to get a nice, evenly incised shoulder line across the piece of wood.

Tip: A mallet is preferred for tapping on the chisel handle, as it won't mushroom the end of the handle in long-term use. For a single project with only two joints, if a mallet isn't available, a hammer will be fine, but tap gently.



- c. Set the cutting edge of the chisel bevel up against the incised line. Pare across the grain to make a V-shaped stop cut.
- d. Place the saw along the incised shoulder line and saw down across the width to make an accurate cut to the depth marked on the side edges, being careful not to overcut them.

Note: The general-purpose razor saw is useful for any detailed work. It cuts a variety of materials, including wood, plastic and brass. The quick-cutting, 24 teeth per inch blade has minimal set and leaves a satin-smooth finish regardless of grain direction. The alloy-steel blade does not bind because it cuts on the pull stroke.

- e. Unclamp the piece of wood and turn it end for end. Repeat steps a to d to incise and cut the shoulder line on the other side of the waste area.
- f. Once the shoulder lines are cut, you can remove the waste with the chisel (bevel up). Begin to pare down adjacent to each shoulder cut and partway across the width, leaving a high spot in the middle. Continue to pare down to the baseline that you've laid out.



Tip: Cut down to the baseline by paring across the grain, cutting about halfway across the width of the piece. If you cut all the way across the workpiece, there is a chance that you will experience tear-out. That is, the wood will tear ahead of the chisel's cutting edge. Pay attention to the direction of the grain; you may need to take slightly angled cuts in the direction of the grain if it runs out.

- g. Turn the piece of wood end for end, and pare the other side of the recess.

- h. Turn the piece of wood end for end again, and even out the cheek.

Tip: To check for high spots, place the edge of the square in the cheek. If the square rocks a bit, this indicates that there are some high spots. Continue to pare out the cheek until there are no high spots.

- i. Test the fit of the recess by pressing it onto the other piece of wood (of the same size). Don't worry if it's a bit loose at this point. If the crosspiece is too tight, remove a slight amount of material from one of the shoulders by paring vertically against the shoulder. Test the fit again. If more paring is needed, work on the other shoulder; removing equal amounts will help keep the joint centered, though that isn't critical. If all is well, proceed to the next step.



- j. Once you are satisfied with the fit, proceed to mark and chisel the mating piece.

Tip: Re-sharpen the chisel as necessary throughout, especially when you notice a change in performance.

5 MARKING AND CHISELLING THE MATING PIECE

- a. To lay out the mating 12" long piece for the base, measure and make a slight pencil mark 4 1/4" from the right end. Place the square's blade on the mark, such that the square's body is flush with the long edge of the workpiece. Draw a line across the width of the face.

Note: For the arm pieces, measure and make a slight pencil mark 8 3/8" from the right end.

- b. This time, overlay the piece with the recess (facing down) such that its right edge aligns with the line you marked on the face of the mating piece.
- c. Referencing the left edge of that piece, make a slight pencil mark, then set it aside. Place the square's blade on the mark, such that the square's body is flush with the long edge of the workpiece. Draw a line across the width of the face.
- d. Mark an X between the pencil lines, and repeat steps 3, f to 4, i.



Note: To layout the 18" long piece for the arms, repeat steps 3 to 5, making adjustments as noted.

6 PREPARING THE SURFACES

Tip: Each of the three sanding sponges included in the kit have different grits, or surface roughness, labelled as 120x, 180x or 220x. The 120x sanding sponge is the coarsest of the three. The first grit – 120x – is for rough sanding. Use it to flatten the surface. After sanding with the 120x sponge, use the 180x and repeat the sanding step. Before sanding with the final grit (220x), it's a good idea to raise the grain. This step is particularly beneficial when using water-based finishes, but is a good practice generally. The sanding steps tear the wood fibers at a minute level, and raising the grain makes them stand up so you can cut them back to the surface with a fine grit. For the purposes of this project, there is no need to use a grit any finer than 220x. The idea is to sand the surface smooth enough for the milk paint to penetrate the wood.

- a. Once you're happy with the fit of the joint, sand the faces of all the pieces of pine, including the remaining 18" long piece for the post. Begin by using the 120x sponge to sand the front surface of the board in the direction of the grain. Sand the back and sides the same way as the front. (Do not sand the shoulders or the cheek that make the recess.)
- b. Use a dry piece of the cotton rag to remove the sanding dust. Repeat the sanding step using the 180x sanding sponge.
- c. After sanding with the 180x sponge, wipe all the pieces, including the front and back, sides and ends, with a lightly dampened cotton rag. This will expand the fibers and raise the grain slightly. Let the water evaporate for approximately 10 to 15 minutes.
- d. When the board is dry to the touch, proceed with sanding the board with the 220x sanding sponge, as per the previous two sanding steps. Use a dry piece of the cotton rag to remove the sanding dust.

7 GLUING THE HALF-LAP JOINTS

- a. Apply a thin even coat of glue onto the contact surfaces of the shoulders and cheek of each recess.
- b. Press fit the base pieces together, and press fit the arm pieces together.
- c. Clamp and let the glue dry overnight.

END OF DAY 1

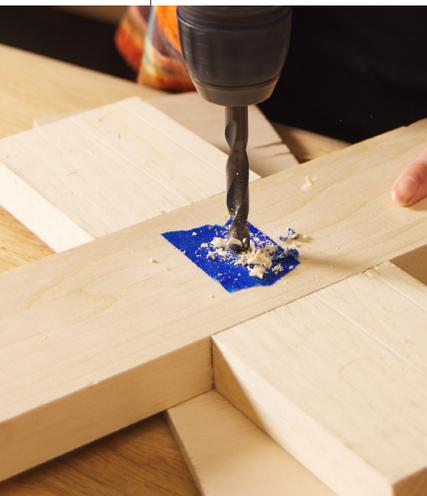


DAY 2: COVERS STEP 8 TO 13 AND SHOULD TAKE APPROXIMATELY 2 TO 4 HOURS TO COMPLETE.

8 DRILLING THE THROUGH HOLES IN THE BASE AND ARMS



Caution: Always wear proper eye protection when drilling.



Tip: To ensure you drill a clean hole (with no tear-out), apply a piece of painter's or masking tape on the face where the hole will be drilled. Mark the center of the hole directly on the tape. Since you will be drilling all the way through the base and arms, position it such that the section to be drilled overhangs your worksurface. This will ensure that you do not inadvertently drill into your worksurface. Also, to prevent breakout on the exit side of the hole, apply another piece of tape on the back of the wood. The tape will stabilize the wood grain beneath it. Pull the tape off once the hole has been drilled. Alternatively, use a piece of scrap wood under the wood to provide support as the drill bit is pushing through.

- a. To mark the center of the hole on the base where the crosspieces overlap, place the ruler corner to corner and draw line. Rotate the ruler so it crosses the other corners and draw a line. The intersection of the lines marks the center of the hole.
- b. Clamp the base.
- c. Install the 3/8" bit in your drill and bore a hole all the way through the joint, and set the base aside.
- d. Mark the center of the arms, clamp and drill all the way through.



9 DRILLING THE HOLES IN THE POST

- a. On each end of the post, mark the center of the hole to be drilled.
- b. Clamp the post horizontally.
- c. Wrap a piece of masking or painter's tape 1 1/16" above the tip of the bit and around the shaft. This will serve as a depth stop so that the holes will be drilled to the same depth.
- d. Install the bit and bore a hole approximately 1 1/16" deep on each end.
- e. Set aside.



Tip: To ensure proper alignment of the parts, be sure to drill the holes into the post as straight as possible. Adjust the drill by eye so that it is in line with the post. Maintaining up and down alignment is harder, unless your drill has an integral level.

10 MARKING THE LOCATION OF THE HOOKS AND EYES

- a. On the underside of each arm, measure and mark the location of the eye, approximately 1" from the end. Use the 3/8" drill bit as a makeshift awl. Place the point of the drill bit on that mark and press down just enough to dimple the wood.

Tip: Use the tip of the 3/8" drill bit to dimple the wood. This will make it easier to start driving the cup hooks and eyes by hand.

- b. On each face of the post, measure and mark the location of the cup hook, approximately 3 1/2" from the bottom. Place the point of the 3/8" drill bit on that mark and press down just enough to dimple the wood.
- c. Set aside.



11 DRILLING THE PARKING SPOTS ON THE BASE



- a. Mark the lengthwise center of each crosspiece on the base. Make three marks at 1 1/4" intervals, starting at the free end of each crosspiece.
- b. Clamp the base.
- c. Wrap a piece of masking or painter's tape approximately 3/8" above the cutting lip of the 3/4" drill bit. This will serve as a depth stop so that the holes will be drilled to the same depth.
- d. Install the bit and bore the holes approximately 3/8" deep where marked.
- e. Set aside.

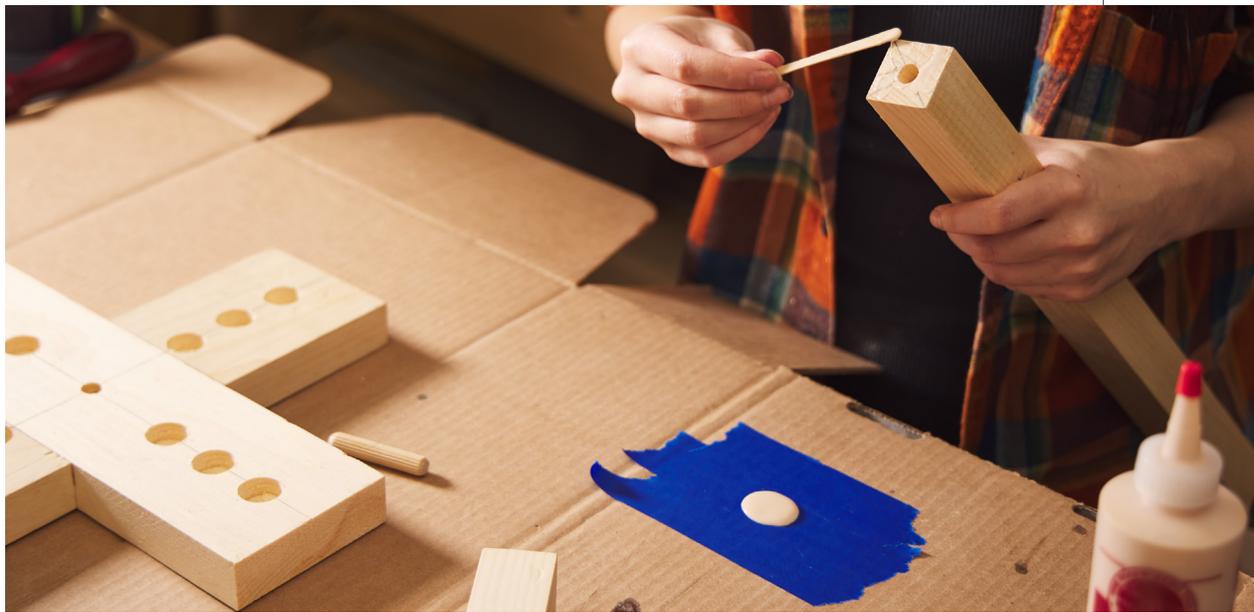
12 MAKING THE PLAYING PEGS

- a. Mark the 12" long dowel rod at 3" intervals.
- b. Clamp the dowel rod horizontally and use the saw to cut the rod into four pieces.
- c. Gently round the projecting ends of the pegs with the 120x sanding sponge.
- d. Set aside.



13 GLUING THE ARMS AND BASE TO THE POST

- a. Apply a thin, even coat of glue onto the 2" long × 3/8" dowels, as well as into the holes drilled in the base, arms and post.
- b. Press a dowel into the bottom end of the post (end where you have marked the location of the cup hooks).
- c. Insert that end of the post into the hole in the base, making sure to align the location of the cup hooks with the crosspieces.
- d. Press the second dowel into the top of the post.
- e. Position the hole in the arms into the dowel, making sure that the marks for the eye hook face down and are aligned with the base crosspieces. Press until there is no gap between the pieces.
- f. Let the glue dry overnight.



END OF DAY 2

DAY 3: COVERS STEPS 14 TO 15 AND SHOULD TAKE APPROXIMATELY 2 HOURS TO COMPLETE.

14 PAINTING THE PROJECT

Note: To personalize your game, you can paint only the crosspieces and leave the pegs natural, do the opposite, or paint the entire project. The decision is yours. If you are leaving some surfaces unpainted, be sure to mask these off with painter's tape first in order to achieve crisp transition lines.

Tip: The milk paint powder supplied in the kit is a traditional product. It is made with casein (a type of milk protein), clay, lime and natural pigments. The lime and casein react to make a tough, non-fading paint that penetrates and bonds to the wood fibers for a durable finish. It comes as a powder that you simply mix with water. Of course, historically, liquid milk would have been used as the base. The manufacturer's instructions state to use equal amounts of water and milk paint powder to obtain paint that is opaque after a couple of coats. If you wish to create more of a wash effect that is translucent and permits some of the wood grain to show through, then mixing two parts water to one part powder is a good place to start. If in doubt, test the mixture on a scrap of wood, which is always a good practice with any finish.



- a. Mix the paint according to the product's instructions.
- b. Apply the paint where desired with the foam brush supplied.
- c. Let the first coat dry.
- d. Lightly sand with the 220x sanding sponge, wipe the dust off and paint a second coat.
- e. Let the second coat dry.
- f. Lightly sand with the 220x sanding sponge and wipe the dust off.

Note: The first coat will dry to a slightly rough texture because the water in the paint has raised the grain. For a smooth finished surface, sand lightly with the 220x sanding sponge. If you want a more opaque appearance, just apply additional coats of paint. Two coats of a 1:1 mixture are usually sufficient to provide a surface with good color saturation. Be sure to sand between coats and after the final one.

15 ASSEMBLING THE GAME

- a. Flip the assembly upside down and install an eye hook into the underside of each arm.
- b. Flip the game right side up and install a cup hook into each face of the post. (Open end of the hook pointing up.)
- c. Cut the rattail into four equal pieces.
- d. Use a double knot to tie a piece of rattail to each ring.
- e. Place the ring on the cup hook, and thread the free end of the rattail into an eye hook.
- f. Determining the exact length of rattail needed is a trial and error process, based on the distance between the eye hooks and the cup hooks. Adjust the amount of slack on the string to the proper length. Use a double knot to tie the rattail onto the eye and trim off any excess.



PLAYING THE HOOK AND RING GAME

For up to four players of all ages.



There are many variations of this game. Here's one version.

The object of the game is to swing the ring so it catches on the hook.

Place the base on a flat surface. Each player gets one peg and plays on one of four sides.

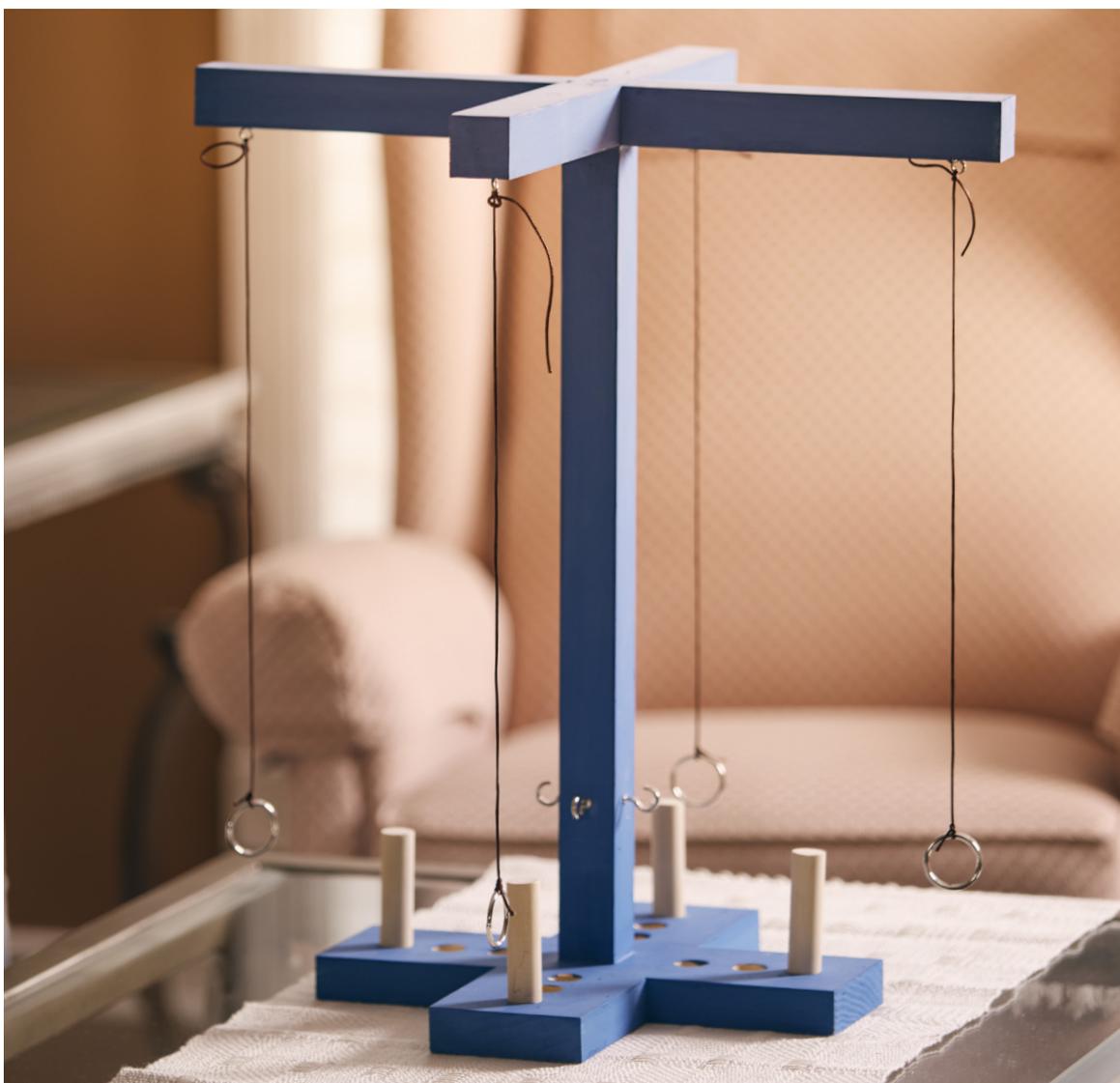
Each player gets three turns to swing the ring. One point is awarded each time the ring gets hooked.

The first player to reach the predetermined score, say 11 or 21, wins the round, and places their peg in the first hole on the base. The next player to win the next round places their peg in the first hole on the base. A player who already has their peg on the base, advances their peg one hole. The closer the peg gets to the central post, the harder it is to hook the ring. If a player's peg falls over, the player starts from the beginning and tries to win the round to get their peg back in the first hole on the base. Whoever reaches the hole nearest to the central post first wins the game.

NOW WHAT?

The tools and supplies in this kit are reusable. We hope that you will be inspired to make more projects where you can continue to hone your sharpening and joinery skills with the hand tools provided.

You can reassemble the box and store the tools and supplies in it so you know where to find them when the need for them arises. The more you make, the more the tools will be of continued service.





CREATED BY LEE VALLEY. MADE BY ME.

Now that you have completed your project, we would love to hear about your experience and see the finished project.

#LVMadeByMe #LVLetsDoSomething



MK104 Hook and Ring Game

Lee Valley Tools Ltd. Ottawa ON K2H 1C2 Canada leevalley.com

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