Veneered Checkerboard

This project is a perfect introduction to veneering. It calls for small pieces (which are easier to work with), demonstrates the veneering process, and includes a technique for concealing rookie mistakes. It also makes a great gift!

Choosing materials

1. **Substrate.** This is the surface on which the veneer squares will be glued, so you’ll need material that is stable and void-free, such as 3/4” Baltic or Finnish birch plywood, MDF, or particleboard.

2. **Veneers.** The choice of veneers for the checkerboard squares will determine the visual character of your board. Pick two species that will provide a fairly dramatic contrast (light and dark), and be sure that at least one of the species is available as 1” stock to make the molding that frames the board. Also, make sure both veneers are the same thickness (usually either 1/32” or 1/40”), and choose pieces that are at least 4 1/4” wide.

3. **Molding.** Choose 3/4” stock that’s the same species as one of the veneers and wide enough to yield the final 2 1/8” molding.

**Note:** On most veneer projects, a layer of veneer must be glued to both sides of the substrate to avoid distortion linked to seasonal wood movement. For this project, a backer veneer isn’t necessary; the V-grooves relieve the stress.

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**Materials list**

<table>
<thead>
<tr>
<th>Part</th>
<th>Qty.</th>
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<tbody>
<tr>
<td>1 Substrate</td>
<td>1</td>
<td>3/4” x 16” x 16”</td>
</tr>
<tr>
<td>2 Light Squares</td>
<td>32</td>
<td>1/40” x 2” x 2”</td>
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<tr>
<td>3 Dark Squares</td>
<td>32</td>
<td>1/40” x 2” x 2”</td>
</tr>
<tr>
<td>4 Molding</td>
<td>1</td>
<td>3/4” x 2 1/8” x 80”</td>
</tr>
<tr>
<td>5 #0 Biscuits</td>
<td>4</td>
<td>1 1/8” x 5/8”</td>
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Add wooden checkers (Rockler item #21758), and you’re ready to play.

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Cutting to size

1. Cut the substrate to 16" by 16" and rip the molding stock to 2\(\frac{1}{8}\)" wide.

2. Each checkerboard requires 64 veneer squares — 32 of each species — measuring 2" by 2". With the following method, you can cut enough squares for as many as three boards at once.

   a. Cut two pieces of 3/4" plywood as long as and a little narrower than your veneer sheets. (For three examples, see the illustration below right). Plywood scraps work well for this, but it is crucial that the edges of the plywood be straight.

   b. Sandwich alternating sheets of veneer between the pieces of plywood, making sure that the veneer edges extend past the plywood edges (Fig. 1). For more than eight pieces of veneer, make a second sandwich.

   c. Check that the plywood edges are precisely aligned, then drill the sandwich for three sets of screws, positioned as shown at right. Clearance holes should be the full diameter of the screws in the top layer of plywood and in the veneers (to prevent splitting); pilot holes should be only half the thickness of the screws in the lower plywood piece. Drive the screws to bring the sandwich tightly together.

   d. With a bearing-guided flush trim bit in a router, trim a straight edge along the sheets of veneer, using the plywood edges as a guide (Fig. 1).

Use a stop block clamped to the fence to make the repeated cuts accurately and safely. Never crosscut with the stock up against the fence.

Fig. 1. Sandwich layers of veneer between two pieces of scrap plywood, then use an edge-trimming bit to establish a straight edge.

Fig. 2. With the straight edge against the fence of your table saw, rip the plywood (and the veneers) into 2" strips.

Fig. 3. With a wide auxiliary fence attached to your table saw’s miter gauge and a stop block on the fence to register the cut length, crosscut the strips into 2" squares.

Three ways to make a sandwich

- **To make one checkerboard**
- **To make two checkerboards**
- **To make three checkerboards**

- e. At the table saw, rip the sandwiches into 2" strips, taking care to register the straight edge of the plywood sandwich against the fence. If your veneer was a little more than 4" wide, this process will yield two strips. The screws will hold the sandwich together (Fig. 2).

- f. Attach a wide auxiliary fence to your table saw’s miter gauge and use a stop block clamped to the rip fence to crosscut the strips into 2" squares, releasing the veneers (Fig. 3).
Layout and glue-up

1. Lay out the veneer squares in eight rows of eight squares, beginning with a light square at top left and alternating from there. Orient the grain of the squares in the same direction, and turn the best side up for each square. Use a framing square as a guide to help establish straight rows.

2. Apply veneer tape — a special paper tape with holes — to the best side of the veneers to join the squares (Fig. 4). Make sure the lines are straight; a small gap won’t hurt if it’s necessary to keep everything aligned (and the gap will be removed later during the V-groove operation).

3. To apply uniform pressure to the veneer as you glue it to the substrate, you’ll need to build a simple press (see illustration above). The press consists of two cauls made from scrap plywood, six battens, which are sticks that are thicker in the middle than at the ends, and six clamps. The battens, which can be made easily by gluing two strips of 7”-long veneer to the center of each piece, allow the press to distribute pressure to the entire surface.

4. Use a roller to apply an even, light coat of standard yellow glue to the substrate (Fig. 5). Lay the veneer (taped side up) in place on the substrate, carefully align the edges, and briefly allow the veneer to tack.

5. Place the substrate on the bottom plywood caul. Cover the veneer with a layer of waxed paper, then place the top caul on top of that. Arrange the battens as shown in the illustration above and apply and tighten the clamps.

6. Keep the press together for 24 hours so the glue can cure.

**Fig. 4.** Use special, quick-sanding veneer tape (Rockler item #49858) to assemble the squares into the checkerboard grid. Apply the tape to the best side of the veneer.

**Fig. 5.** Apply a light coat of standard yellow glue to the substrate with a roller to get even coverage. The veneer grid will be applied with the taped side up.

**Note:** The backer veneer typically isn’t necessary here; the V-grooves relieve the stress caused by seasonal wood movement.
Adding V-grooves and molding

1. After removing the board from the press, sand the surface lightly to remove the veneer tape and any residual glue — but be careful not to sand through the veneer.

2. Install a 45° V-groove bit in a table-mounted router and raise the bit to expose 1/16” of the tip. Make a test pass on scrap and adjust the height if necessary. This setup will be used to rout decorative grooves that will hide any gaps between veneer squares.

3. Set the router table’s fence so the tip of the bit is aligned with the center of the checkerboard. Plow a center groove in each direction, then move the fence in 2” to make the next series of grooves. (Use the board to check fence distance.) Rout four grooves this time, rotating the board 90° after each cut. Move the fence in another 2” to make the next series of grooves; repeat until all grooves have been routed (Fig. 6). Use the same bit to chamfer the outside top edges of the board.

4. After adjusting the router table’s fence, use the same bit to rout a groove in the face of the molding 1 1/8” from the outside edge (Fig. 7).

5. Switch to a straight bit or use a dado blade in a table saw to mill a rabbet 3/8” wide by 1/4” deep on the inside edge of the molding’s face and a 3/8”-by-3/8” rabbet along the bottom edges of the substrate (Figs. 8 and 9).

6. Complete the molding profile by setting a table saw blade to 30° and chamfering the top outside edge. Be sure to use a featherboard and push stick during this operation (Fig. 10). Sand the molding and miter it to length, dry-fitting it to the substrate as you go.

7. To increase the miter joints’ strength, reinforce them with #0 biscuits. Cut the slots, apply the glue and clamp the frame together. Make sure it’s both flat and square as you apply pressure with a band clamp. (You can insert the checkerboard to help with alignment, but remove it before the glue sets.)

8. After the joints have set up, apply glue to the rabbet of the molding frame and install the checkerboard, clamping it in place. Clean up any glue squeeze-out immediately with a damp rag.

Finishing touches

1. Sand the entire project with 220-grit paper. Remember to go easy on the veneer, especially if you’re using a power sander.

2. Apply a finish durable enough to stand up to heavy use — three coats of clear satin polyurethane, for example, with a light 320-grit sanding between coats. Add checkers and enjoy!