

**Kentucky
4H
Wood
Science
Plans Notebook**



Plans – Level 4



Ky 4-H Wood Science Plans - Level 4

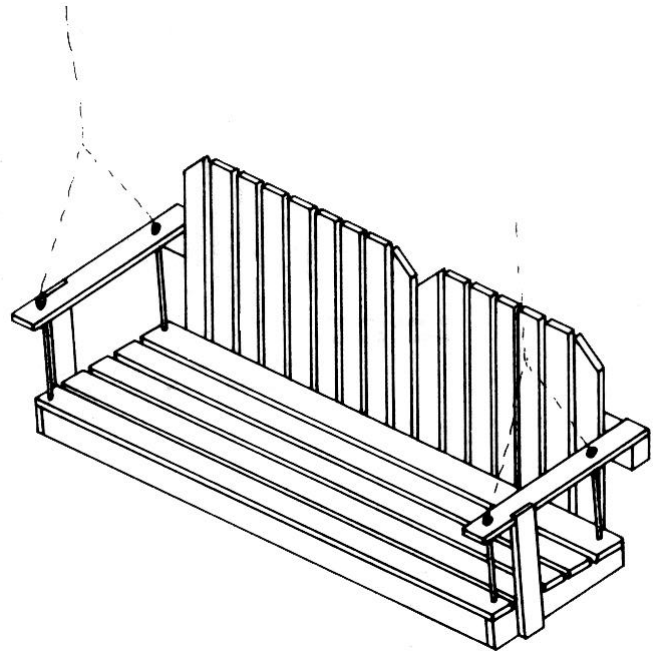


PORCH SWING WS401

MATERIALS NEEDED:

Note: 1" wood may be 3/4" thick
and 2" x 2" may be 1 1/2" x 1 1/2"

- 2 pieces wood 1" x 3" x 17"
- 1 piece wood 1" x 3" x 14 3/4"
- 2 pieces wood 1" x 3" x 13"
- 2 pieces wood 1" x 3" x 21"
- 6 pieces wood 1" x 3" x 21"
- 1 piece wood 1" x 3" x 52 1/2"
- 16 pieces wood 1" x 3" x 22"
- 1 piece wood 2" x 2" x 55 1/2"
- 1 piece wood 2" x 2" x 52 1/2"
- At least 100 #10 x 2" flathead wood screws
- 4 carriage bolts, 1/4" x 1 3/4" with washers and nuts
- 4 eye bolts, 1/4" x 13 1/2" with washers and nuts
- Waterproof glue



TOOLS NEEDED:

- Table saw
- Drill with 1/4" bit, 1/8" bit, countersink bit
- Screwdriver
- Wrenches to fit nuts of carriage bolts and eye bolts
- Sandpaper
- Exterior paint or varnish

INSTRUCTIONS:

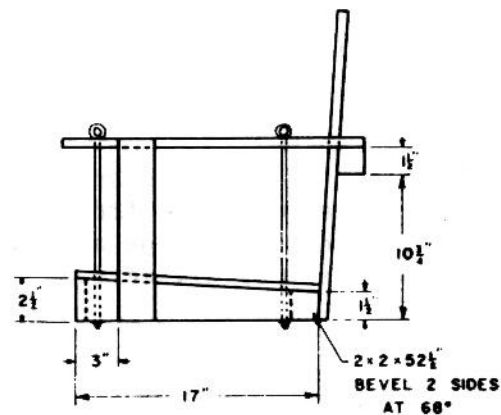
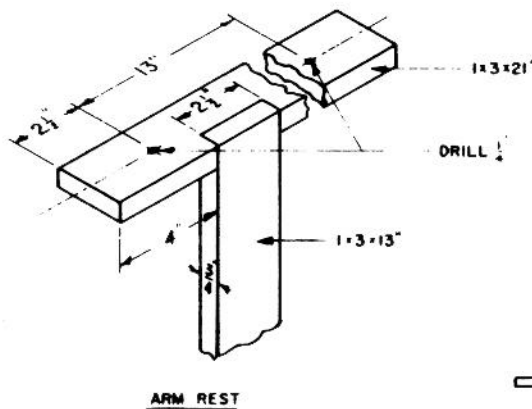
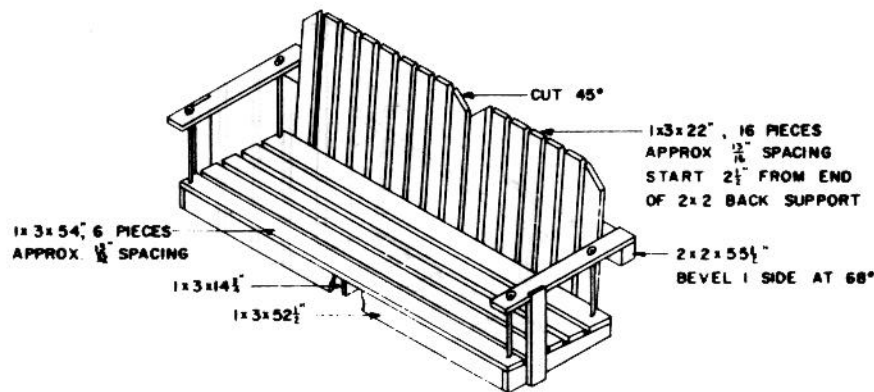
1. Cut pieces to size. Cut bevels and tapers where needed.
2. Make the seat by fastening the front piece, 1 x 3 x 52 1/2", between the two tapered end pieces with glue and #10 screws. Drill 1/8" pilot holes and countersink for all screws. Add center brace to front rail.
3. Lay seat pieces across frame with approximately 13/32" spacing. Fasten with glue and screws.
4. Lay back rest pieces across back support on beveled edge starting 2 1/2" from the end and with approximately 13/16" spacing. Fasten with glue and screws.



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5. Turn back rest over and lay it on the bottom support with an equal amount of the support on each end. Fasten with glue and screws.
6. Make the arm rests. Drill 1/4" holes as shown.
7. Fasten the back rest to the seat by fastening the bottom support between the ends of the seat frame with glue and screws. Fasten with bottom support to center seat brace also.
8. Fasten arm rests to back support and to ends of seat frame. No. 10 screws are used to fasten arm rests to back support and carriage bolts through predrilled 1/4" holes, fasten the arm rest to ends of seat frame.
9. Drop the eye bolts through hole in arm rests and mark where they will go through ends of seat. Drill 1/4" holes through seat board and ends of seat frame. Put eye bolts back through with a washer between eye and arm rest and a washer and nut under seat frame.
10. Sand and finish.



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PICNIC TABLE WITH BENCH WS402

MATERIALS NEEDED:

Note: 1" wood may be 3/4" thick and 2" x 4" may be 1 1/2" x 3 1/2"

3 pieces wood 2" x 4" x 3' 6"

4 pieces wood 2" x 4" x 2' 6"

2 pieces wood 2" x 4" x 4'

11 pieces wood 2" x 4" x 7'

2 pieces wood 2" x 4" x 6' 4"

3 pieces wood 2" x 4" x 3'

4 pieces wood 2" x 4" x 1' 5"

2 pieces wood 2" x 4" x 1'

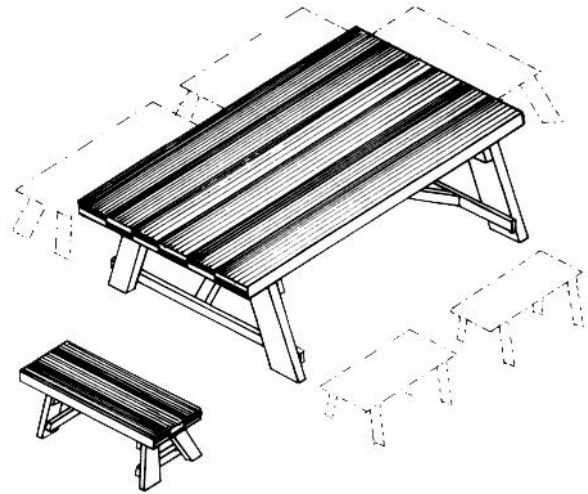
2 pieces wood 2" x 4" x 1' 3"

2 pieces wood 2" x 4" x 1' 4"

12d galvanized box nails for frame
or 3/8" x 4 1/2" carriage bolts

16d galvanized box nails for top boards

Note: "Deformed shank" nails are
recommended for better joint strength.



TOOLS NEEDED:

Saw

Wood file

Hammer

Sandpaper

Exterior paint or stain and varnish

INSTRUCTIONS:

1. Cut pieces to size.
2. Make 2 table leg frames as shown in drawing. Fasten together using 12d nails.
3. Lay the eleven top pieces flat on the floor with about 1/4" spacing between them. Nail a piece of scrap across them at each end to hold them temporarily; this is removed after table is assembled.
4. Set the leg frames upside down on the top, 10" from either end and toe nail cross-members of frames to each top board using 12d nails.
5. Toe-nail center cross-member in place. Mark off diagonal braces and nail them in place with 12d nails.
6. Set table right side up and nail each top board to the cross members of the leg frames using 16d nails.
7. Use wood file to round rough edges and corners.

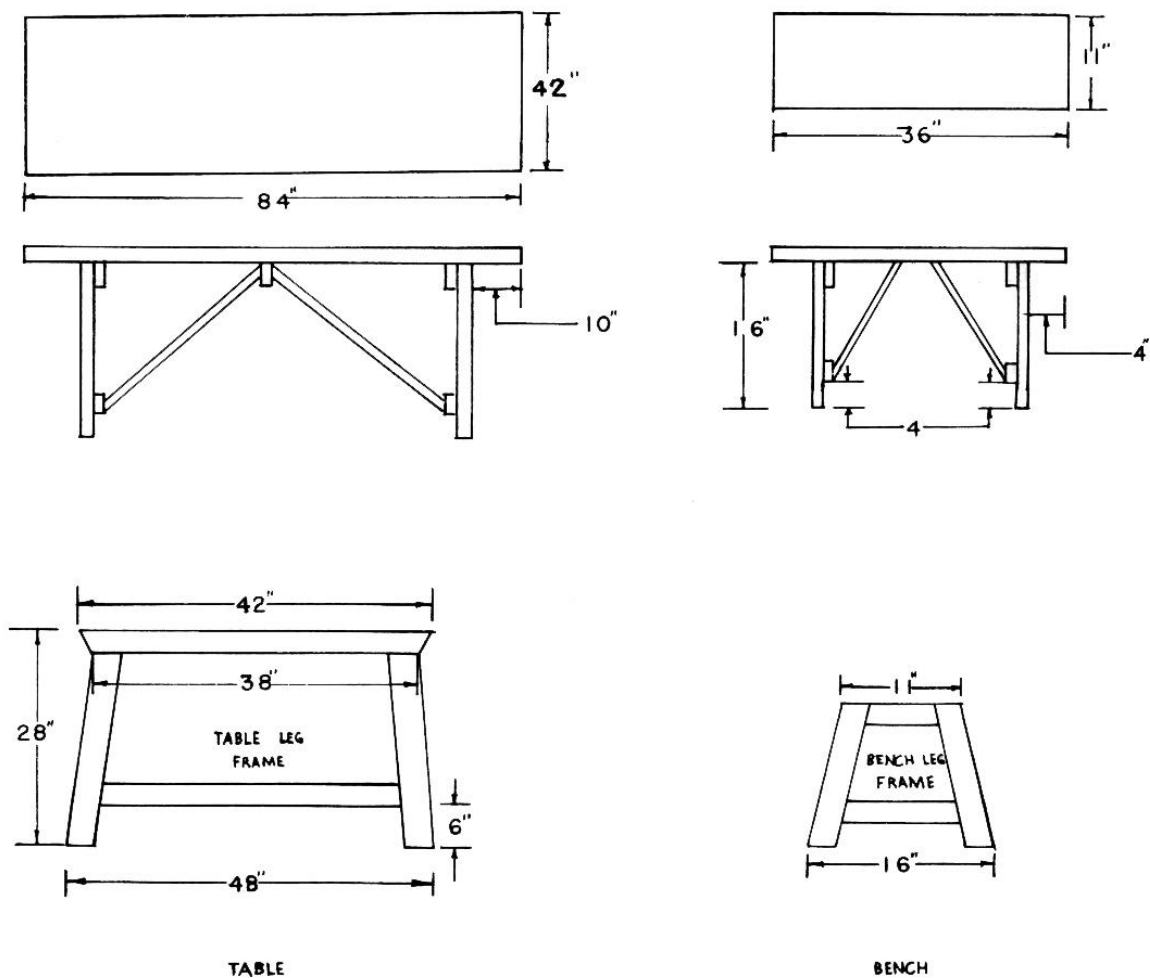


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8. Bench is made in same fashion as the table except that the top cross member of each leg frame doesn't extend past legs (i.e. it isn't tapered out).
9. Sand and finish bench and table.

NOTE: For maximum durability, especially if the table and bench are to remain outdoors, decay-resistant (redwood, cedar, etc.) or an approved preservative-treated lumber should be used.



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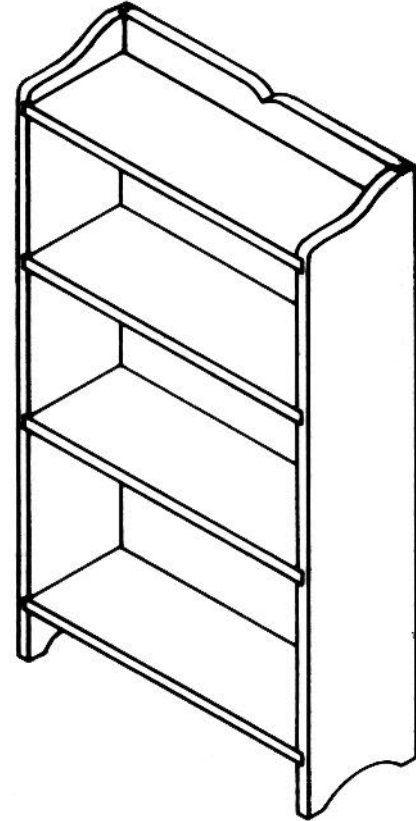
NARROW BOOKCASE WS403

MATERIALS NEEDED:

Note: 1" wood may be 3/4" thick and
other boards may be 1/2" less in width
2 pieces wood 1" x 8" x 36" – sides
2 pieces wood 1" x 11" x 36" – back
4 pieces wood 1" x 7" x 19 1/4" – shelves
Glue
4d nails
Wood filler

TOOLS NEEDED:

Band saw
Hammer
Nail set
Table saw with 3/4" dado blade
Bar clamps
Sandpaper
Stain and varnish

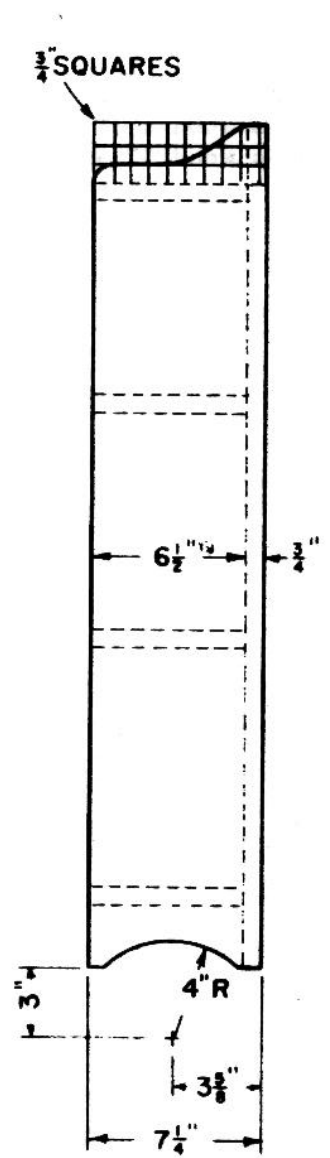
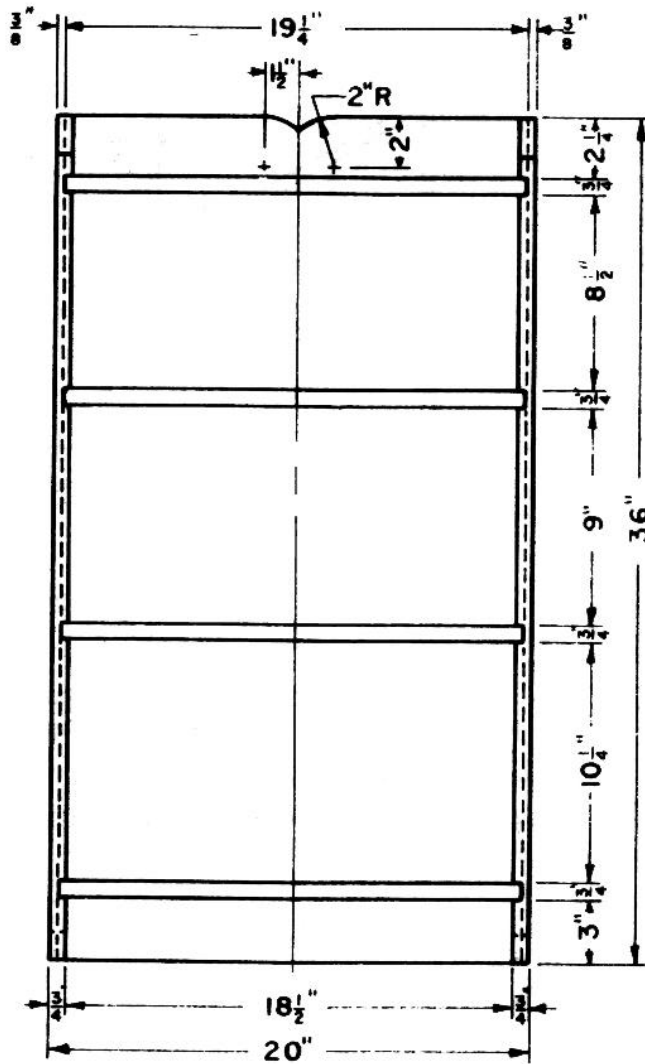
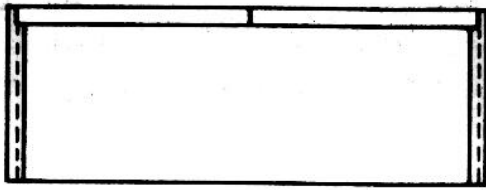


INSTRUCTIONS:

1. Edge-glue the back pieces together, clamp and be sure the boards are straight across (not cupped). When dry, trim off equal amounts on either side to make a piece 19 1/4" wide by 36" long.
2. Cut the other wood pieces to size, cut curves on sides and back.
3. Cut dado grooves on side pieces. There are four grooves front to back and one all along the back inside edge.
4. Glue and nail shelves between sides.
5. Glue and nail back piece in place.
6. Set all nails and fill depressions with wood filler.
7. Sand and finish.



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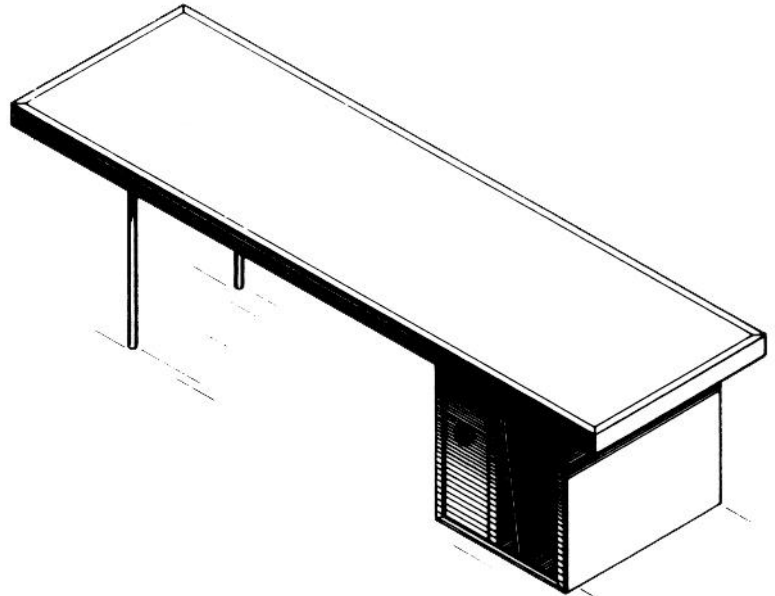
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MUSIC BENCH WS404

MATERIALS NEEDED:

- 2 pieces 1" aluminum rod
15 1/2" long – legs
- 1 piece wood 3/4" x 16" x 58"
– bench top
- 2 pieces wood 3/4" x 1 1/2" x
17 1/2" – edge strips
- 2 pieces wood 3/4" x 1 1/2"
x 59 1/2" – edge strips
- 2 pieces wood 3/4" x 14 3/4" x
16" – cabinet sides
- 1 piece wood 3/4" x 13" x 16"
– cabinet top
- 1 piece wood 3/4" x 11 1/2" x
16" – cabinet bottom
- 1 piece wood 1/2" x 11 1/2" x
14" – cabinet back
- 1 piece wood 3/4" x 15 1/2" x
14" – cabinet partition
- 1 piece wood 3/4" x 4 3/8" x 13 15/16" – drawer front
- 1 piece wood 1/2" x 3 7/8" x 14 1/2" – drawer bottom
- 1 piece wood 1/2" x 13 15/16" x 14 1/2" – drawer side
- 1 hardwood pull
- 2 pieces wood 1/4" x 3/4" x 14 3/4" – molding
- 1 piece wood 1/4" x 3/4" x 13" – molding
- 1 box 1" finishing nails,
5 – #8 x 1 1/4" wood screws,
2 – 1" flanges for ends of Al. rods,
- 1/2 lb. 6d finishing nails
8- #8 x 1/2" flathead screws
Glue Plastic wood Paint or varnish



TOOLS NEEDED:

Hammer, Table saw, Drill, Screwdriver, Paint brush, Nail set

INSTRUCTIONS:

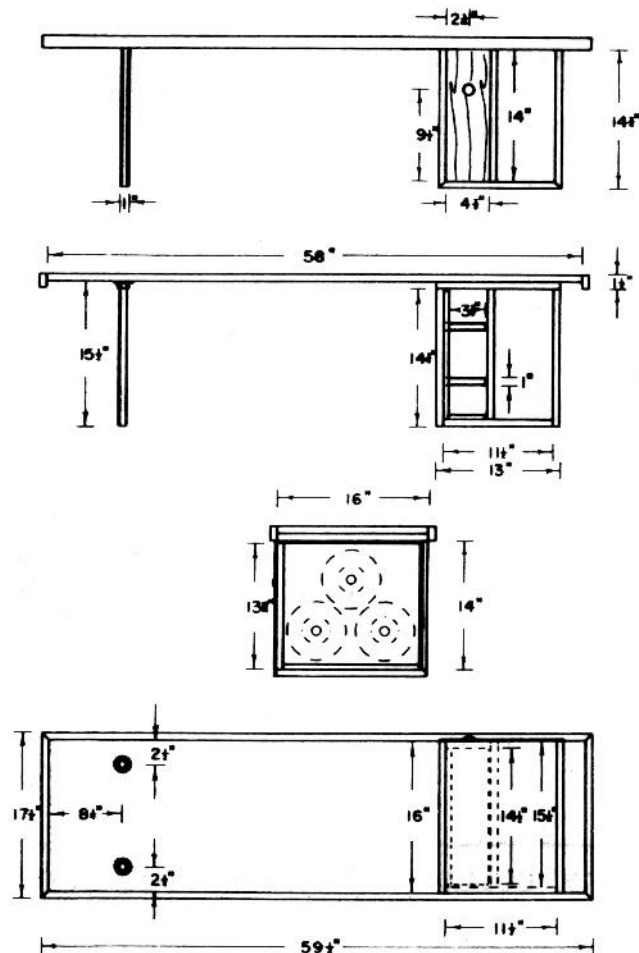
1. Cut pieces to size. Miter the ends of the edge strips. Miter the ends of the molding.
2. Glue and nail the cabinet sides to the 16" edges of the cabinet bottom.
3. Glue and nail the cabinet back between the two sides. Glue and nail the partition in place 4 1/2" from the left side.
4. Glue and nail the cabinet top to the assembly.
5. Hammer the two flanges onto the aluminum legs. Screw the flanges tight against the bottom of the top bench. (See drawing for spacing).



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6. Glue and screw the top bench to the top of the cabinet. Screw from under the cabinet top up into the top bench. Use four – #8 x 1 1/4" wood screws, one per corner, leave a 2 1/4" overhang on the cabinet side.
7. Glue and nail the edge strips to the edges of the top bench. (See drawing).
8. Glue and nail the two pieces of long molding to the front edges of the cabinet sides. Glue and nail the short piece of molding to the front edge of cabinet bottom.
9. Glue and nail the drawer side to the drawer bottom as shown. Glue and nail the drawer front to the front edges of the drawer side and bottom.
10. Mount the hardwood pull on the drawer front spaced as shown.
11. Sand cabinet and bench smooth. Set all nails and fill with wood filler. Finish with varnish or paint.



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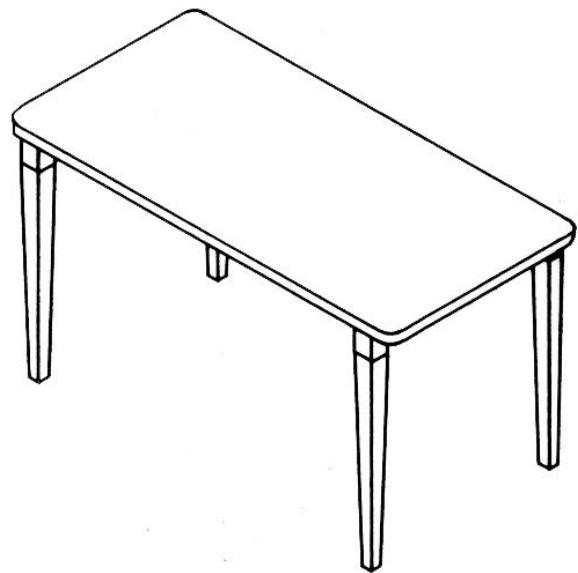
END TABLE WS405

MATERIALS NEEDED:

- 1 piece wood 1" x 5" x 30" – Top (A)
- 2 pieces wood 1" x 6" x 30" – Top (A)
- 2 pieces wood 1" x 2" x 12 1/2" – end rails (B)
- 4 pieces wood 2" x 2" x 16 1/4" – legs (C)
- 1 piece wood 1" x 2" x 24 3/4" – cross rail (D)
- 1/4" dowel x 18" long
- 5- #8 x 1 1/2" flathead wood screws
- Glue

TOOLS NEEDED:

- Band saw
- Drill with 1/4", 3/32", 3/16" bits and 1/2" counter sink bit
- Screwdriver
- Bar clamps
- Sandpaper
- Stain and varnish

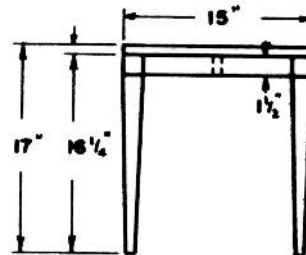
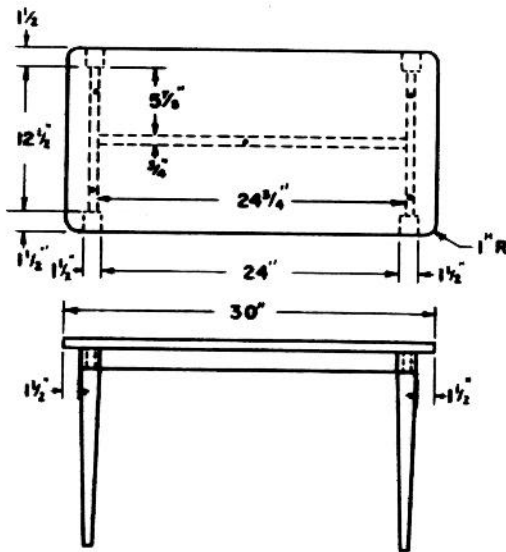
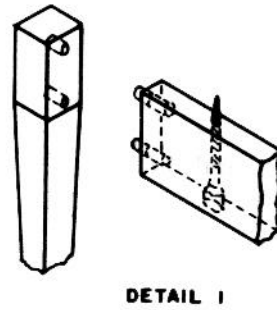
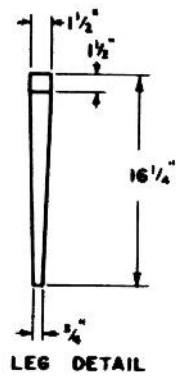
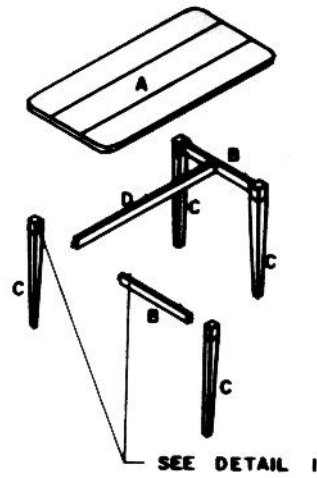


INSTRUCTIONS:

1. Glue pieces of wood for top and clamp.
2. When dry, cut top and other pieces to size.
3. Taper legs as shown in details.
4. Drill 1/4" holes for dowels in ends of rails (end and cross), at top of legs and in center of end rails. These should be 3/4" deep. Cut dowel to 1 1/2" pieces. Glue dowels in ends of end and cross rails.
5. On end and cross rails, mark holes for screws. Drill 3/16" all the way through, then 1/2" countersink about 1/2" deep.
6. Glue legs to end rails and clamp. Let dry.
7. Glue cross rail between end rails.
8. Set top in place. Drill 3/32" pilot holes into top (about 1/2" deep) by running bit up through 3/16" hole already drilled. Glue top on and fasten securely with screws.
9. Sand and finish.



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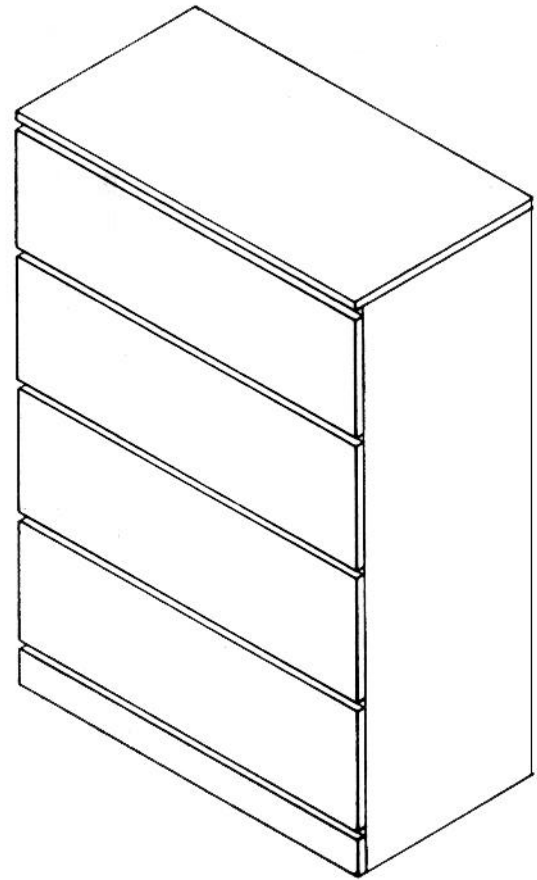
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CHEST OF DRAWERS WS406

MATERIALS NEEDED:

- 7 pieces wood 3/4" x 1 1/2" x 28 1/2" – rails
- 2 pieces wood 3/4" x 18" x 48 1/4" – sides
- 1 piece wood 3/4" x 18 3/4" x 30" – top
(May have to glue two 9" pieces together)
- 1 piece wood 3/4" x 2 1/2" x 30"
– front bottom face
- 1 piece wood 1/8" x 29 1/4" x 48 1/4"
– masonite back
- 8 pieces wood 3/4" x 1 1/2" x 16 3/8"
– side rails
- 1 piece wood 3/4" x 3 5/8" x 16 1/2"
– bottom back rail
- 1 piece wood 3/4" x 13/16" x 28 1/2"
– top rail
- 4 pieces wood 3/4" x 10 1/2" x 30"
– drawer fronts
- 4 pieces wood 1/4" x 18" x 27 7/8"
– drawer bottom
- 8 pieces wood 1/2" x 9 1/2" x 17 3/4"
– drawer sides
- 4 pieces wood 1/2" x 8 1/4" x 27 3/8" –
drawer backs
- 1 1/4" finishing nails
- 3/4" nails (brads) – back
- 1" nails (brads) - drawer assembly
- Glue Varnish or paint Plastic wood
- Hardware or hardwood pulls if desired



TOOLS NEEDED:

Table saw, Hammer, Sandpaper, Brush, Nail set

INSTRUCTIONS:

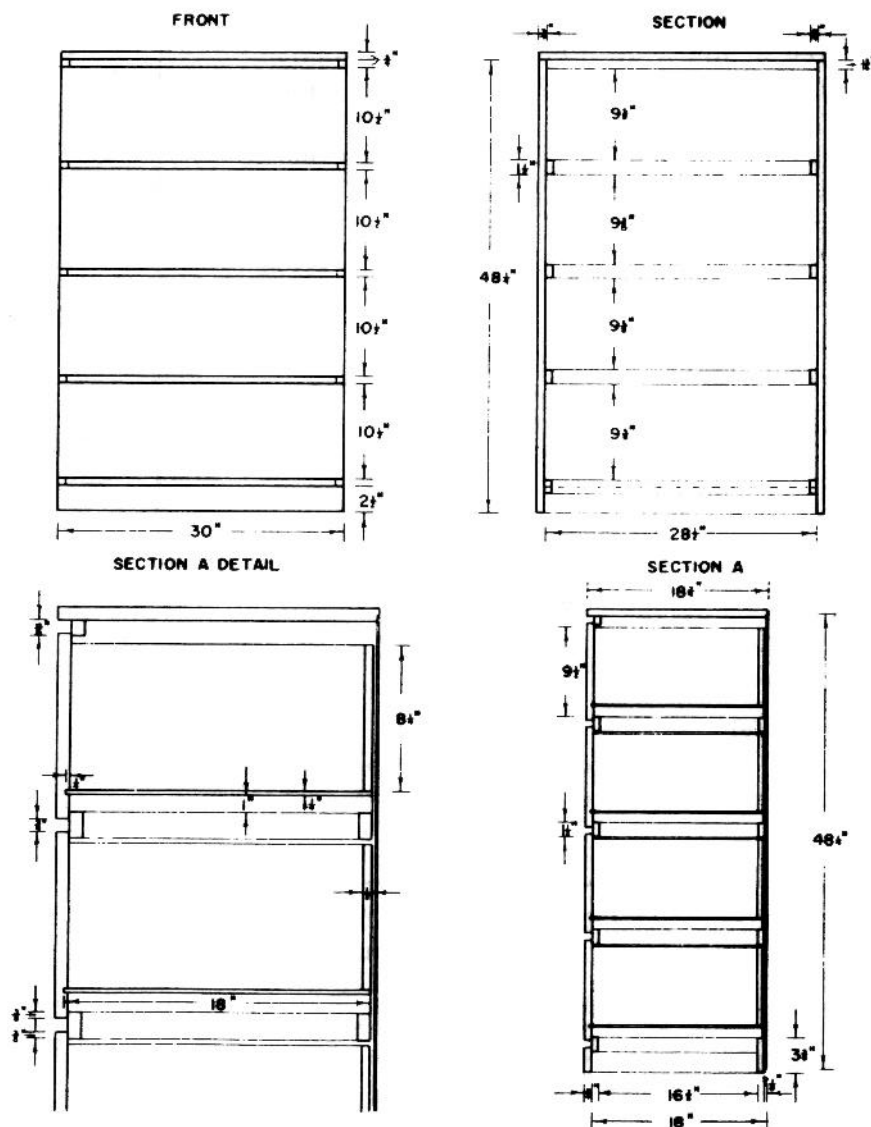
1. Cut pieces to size.
2. Cut a groove in the long edges 1/8" deep into the edge and 3/8" wide. Cut a similar groove along edge of the top.
3. Glue and nail the sides to the ends of the front top rail and front and rear bottom rails. Use 1 1/2" nails. (See drawing for spacing).
4. Glue and nail the three back rails as shown leaving 1/8" for the back.
5. Glue and nail the top to the top edges of the sides and top rail. Leave the 3/4" overhang in the front of the cabinet.
6. Glue and nail the eight side rails in place. Nail from inside the cabinet. Use 1 1/4" nails.
7. Glue and nail the four front rails in place.
8. Glue and nail the front bottom face to the assembly.



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9. Nail the 1/8" masonite back in the grooves in the top and sides. Nail the back to the four back rails using 3/4" brads.
10. Assemble the four drawers. Each drawer is made as follows: Cut a 1/4" dado parallel to the long side of the drawer front, 1/4" deep, 1" from and parallel to the long edge of the two drawer sides, glue and nail the drawer bottoms into the dado cuts in the sides. Leave the 1/4" to the front. Glue and nail the drawer back in place. Glue and nail the drawer front to the front edges of the sides and bottom. (The drawer bottom will fit into the groove in the drawer front.) Make sure the drawer front is centered, leave about 13/16" on either side.
11. Set all nails and fill all holes. Sand cabinet and drawers smooth.
12. Finish with paint or varnish.
13. If desired, mount hardwood or hardware pulls on the drawer front



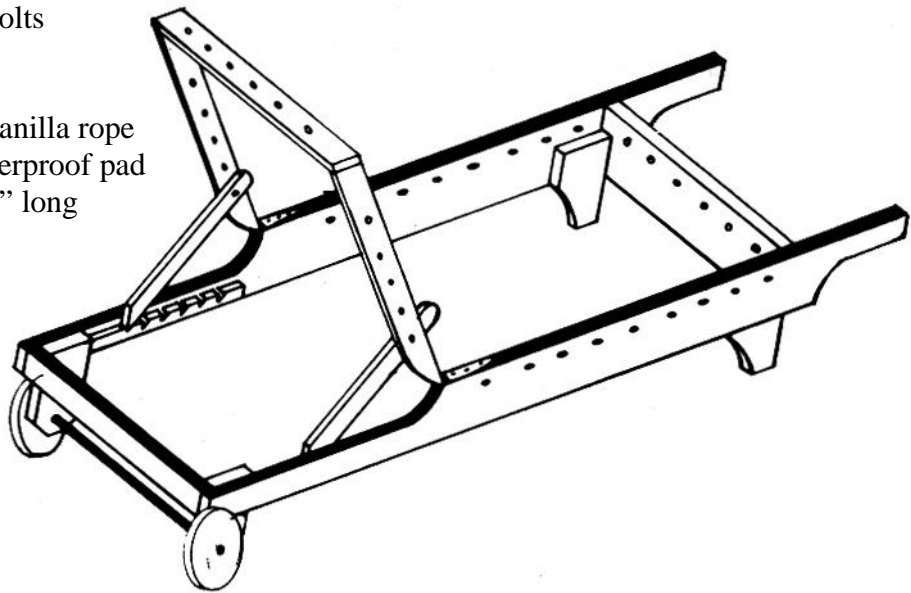
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CHAISE LOUNGE WS407

MATERIALS NEEDED:

- Note: 1" wood may be 3/4" thick and
2" wood may be 1 1/2" in width
- 2 pieces wood 2" x 5 1/2" x 5 1/2" – wheels
 - 2 pieces wood 1" x 5 1/2" x 80" – sides
 - 2 pieces wood 1" x 5 1/2" x 14" – legs
 - 2 pieces wood 1" x 1 1/2" x 14" – back support
 - 1 piece wood 1" x 5 1/2" x 30" – front rail
 - 1 piece wood 1" x 2 3/4" x 30" - back rail
 - 2 pieces wood 1" x 1" x 20" – notched supports
 - 2 pieces wood 1" x 5 1/2" x 11 3/4" – axle supports
 - 1 piece wood 1" x 2 3/4" x 30" – back top
 - 12 – #10 x 1 3/4" round head wood screws
 - 2- 1" butt hinges
 - 2 – 3/16" x 2 1/2" bolts
 - 4 washers
 - 2 – cotter pins
 - 100 foot of 5/16" manilla rope
 - Foam rubber or waterproof pad
 - 1 piece 1" dowel 36" long
 - Glue



TOOLS NEEDED:

- Band saw
- File
- Drill
- Chisel
- Screwdriver
- Sandpaper

INSTRUCTIONS:

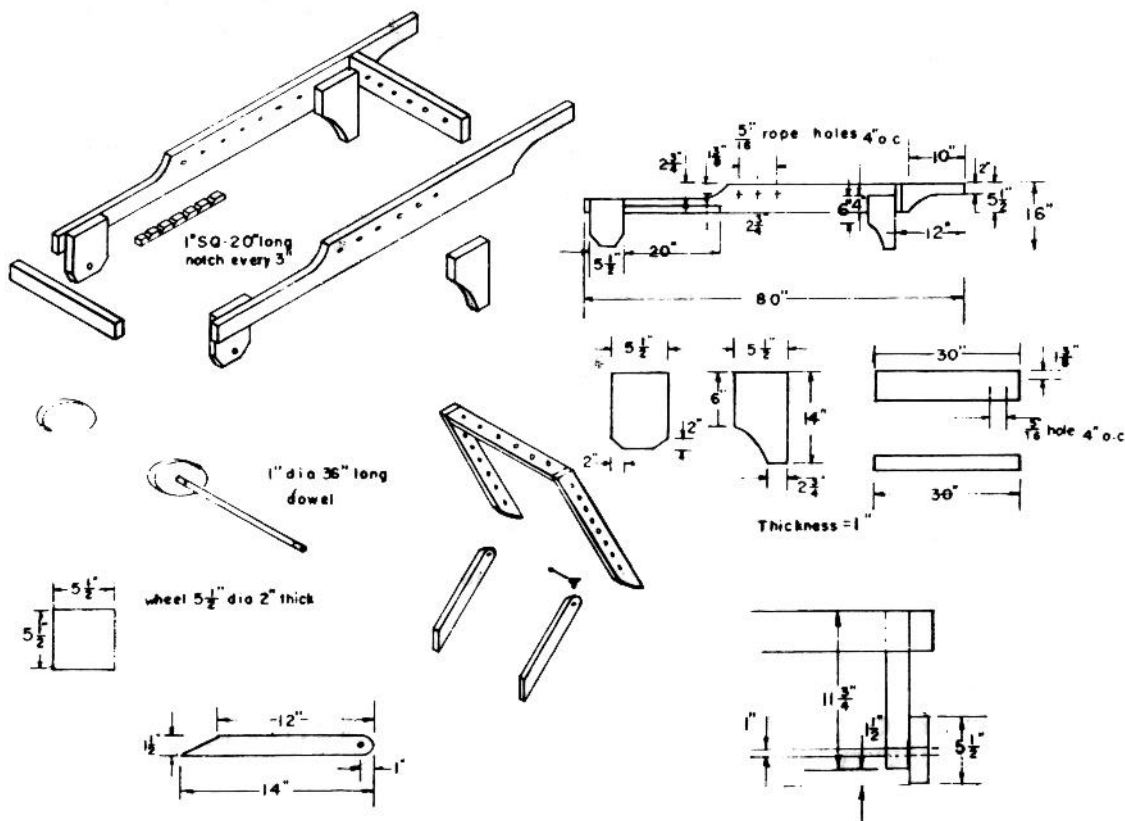
1. Cut pieces to size.
2. Draw the pattern for the sides on the 1" x 5 1/2" x 80" pieces. Cut these out and save the two long pieces to be used for the back sides.
3. Drill 5/16" holes along the sides and back sides. Space them 4" apart and 1 3/8" from the top edge. (See drawing). Make similar holes in the 1" x 5 1/2" x 30" rail and top of the back.
4. Glue and screw the two sides to the ends of the two rails using 1 3/4" screws.
5. Mark the pattern on the front legs and cut them out. Glue and screw these to the front of the frame.
6. Make the angled cuts on the axle supports. Drill a 1" hole in each, with center 1 1/4" from the bottom and 2 3/4" from a side. Glue and screw these to the frame, as shown.



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7. Slip the 1" dowel in the axle supports. Put a washer on either side. Cut out the 5 1/2" diameter wheels and drill a 1" hole in the center of each. Slip the wheels on the axle and add another washer on the outside. Drill a small hole in each end of the dowel and place the cotter pins.
8. Make the angled cuts on the back sides. Glue and screw the back sides to the top of the back. Hinge the ends of the back sides and mount the back in place. Fold it to the front.
9. Make the angled cuts on the back supports as shown and round the opposite ends. Drill a 3/16" hole 1" from the round edge (see drawing).
10. Make the two notched bars. Fasten them in place with 1 3/4" screws.
11. Drill a 3/16" hole 10" from the bottom of the back sides. Fasten the back supports with 3/16" bolts here and set the points of the supports into a notch.
12. Sand the lounge smooth, breaking all sharp edges.
13. Place the back rest horizontal. Knot one end of the 100 foot rope and starting at the wheel end of the frame, thread the rope back and forth through the holes, parallel to the long axis. Then thrash the rope parallel to the short axis, weaving it through the long rope to form a mesh. Draw the rope tight and tie to the frame.
14. A foam rubber or waterproof pad completes the lounge.



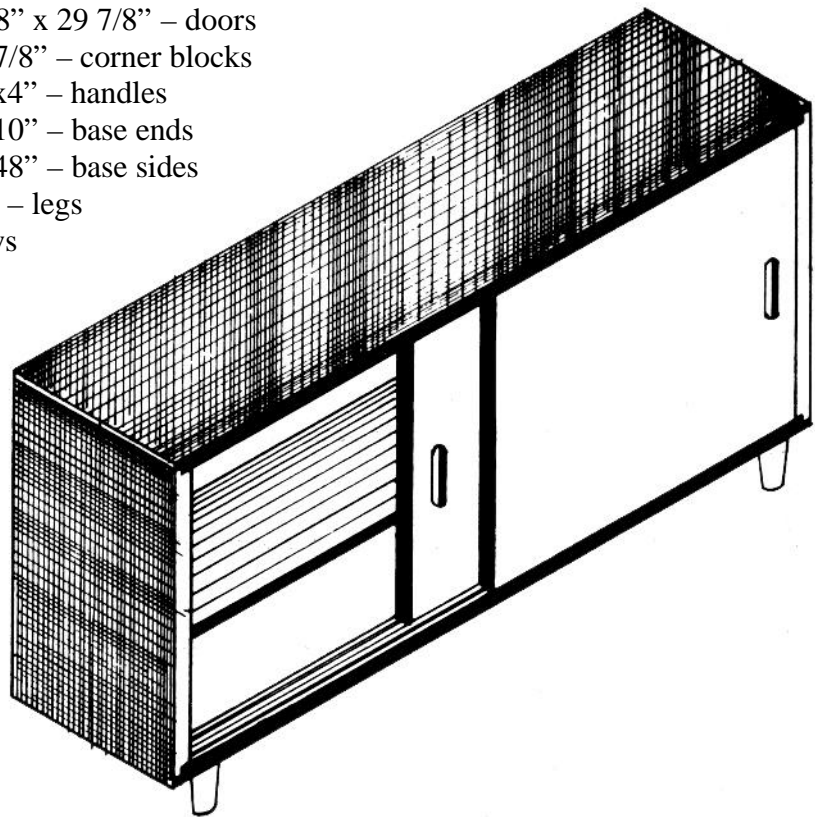
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ROOM DIVIDER WS408

MATERIALS NEEDED:

- Note: 1" wood may be 3/4" thick and
2" materials may be 1/2" less in width
- 2 pieces wood – 3/4" x 11 1/2" x 60" – top and bottom
 - 2 pieces wood 3/4" x 11 1/2" x 28" – sides
 - 2 pieces wood 3/4" x 2" x 26 1/2" – vertical supports
 - 1 piece wood 3/4" x 8 7/8" x 58 1/2" – shelf
 - 2 pieces wood 3/4" x 1 5/16" x 58 1/2" – top door runners
 - 4 pieces wood 1/4" x 26 1/8" x 29 7/8" – doors
 - 2 pieces wood 1" x 1" x 8 7/8" – corner blocks
 - 4 pieces wood 3/4" x 3/4" x 4" – handles
 - 2 pieces wood 3/4" x 2" x 10" – base ends
 - 2 pieces wood 3/4" x 2" x 48" – base sides
 - 4 pieces wood 2" x 2" x 5" – legs
 - 8 – #8 x 1 1/4" wood screws
 - 7/8" brads
 - 1 1/4" brads
 - Glue
 - Paint or varnish



TOOLS NEEDED:

- Wood clamps
- Table saw
- Band saw
- Chisel
- Hammer
- Lathe
- Drill
- Sandpaper
- Paint brush

INSTRUCTIONS:

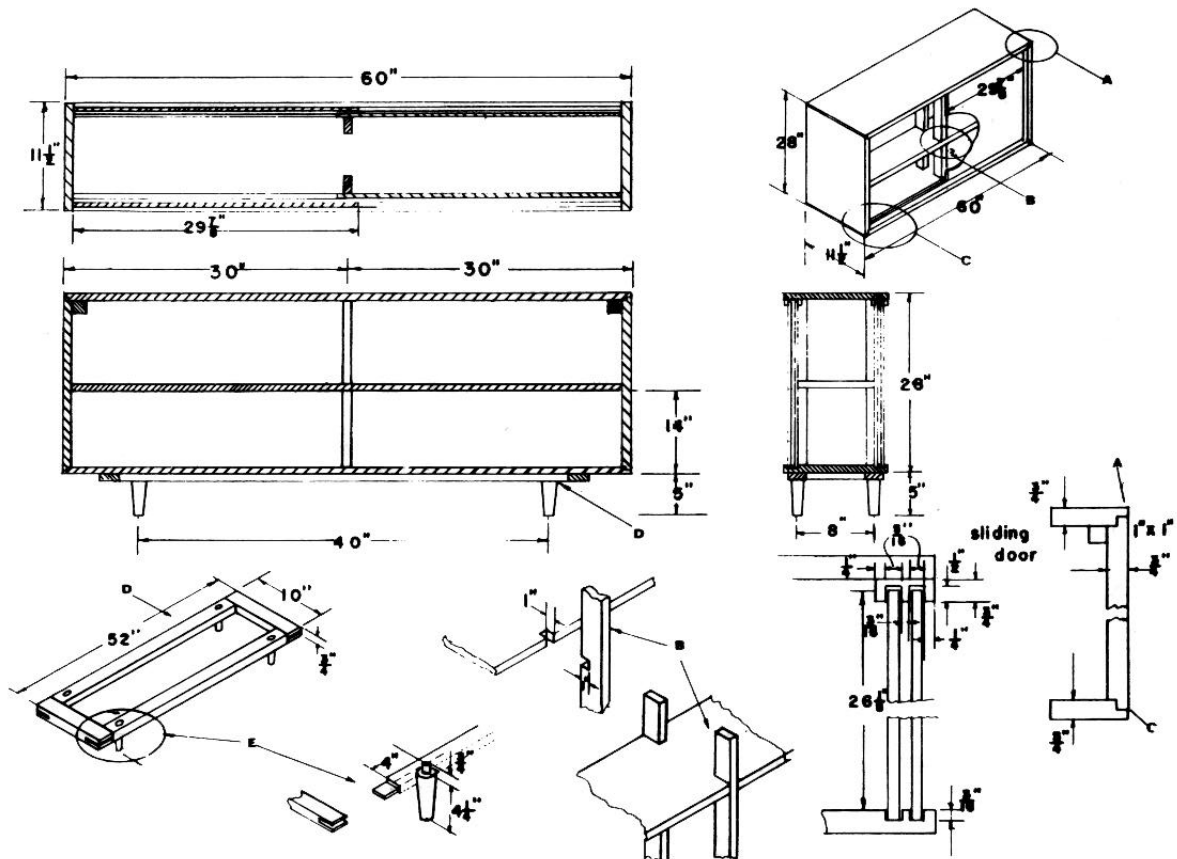
1. Cut pieces to size.
2. Turn down the legs as shown. (Top dowel 3/4" diameter, top 2" diameter, bottom 3/4" diameter). (See drawing E).
3. Cut the shiplap mortice and tenons for the four corners of the base. Make the tenons 1/4" thick. Glue the base ends to the base sides.
4. Drill 3/4" holes on the sides of the frame centered 4" from the ends. (See drawing E).
5. Glue the legs in place.



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6. Cut $5/16$ " dados $1/4$ " from both 60" sides of the bottom. Make similar cuts $1/4$ " from the $58\ 1/2$ " sides of both top runners, cut $5/16$ " dados $3/4$ " from the 60" edges of the bottom. Also cut $5/16$ " dados $1/4$ " from the other $58\ 1/2$ " sides. (See drawing).
7. Cut a $3/8$ " rabbet on both ends of both sides. Cut a $3/8$ " rabbet on both ends of top and bottom.
8. Glue the sides to the top and bottom with wood clamps. Glue and nail the 1" x 1" in the top corners for support.
9. Cut a notch in the middle of the shelf on both $58\ 1/2$ " edges, 1" deep and $3/4$ " wide, cut a notch in the middle of both vertical supports the same size. Glue the shelf to the supports. (See drawing B.) Glue and nail (with $1\ 1/4$ " brads) the shelf in place. Nail up through the bottom and through the sides. Do not nail form the top.
10. Glue the top runners in place. (Use clamps).
11. Set a door in the back bottom groove of one side. Push down and bow the door until it slips in the top groove. Do the same on the other side. Then mount the front doors.
12. Glue and nail the handles in place, use $7/8$ " brads.
13. Sand cabinet smooth and finish.





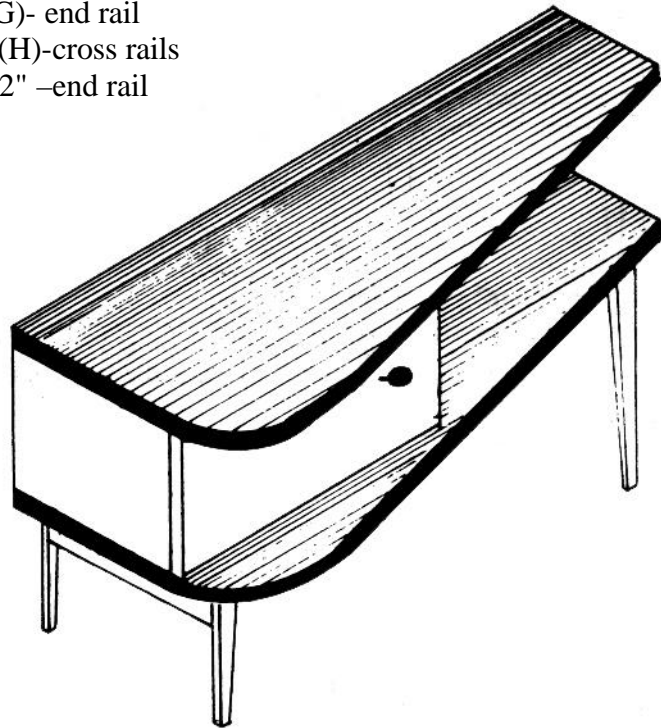
NIGHT TABLE WS409

MATERIALS NEEDED:

Note: 7/8" wood may be 3/4" thick and
2" materials may be 1/2" less in width
2 pieces wood 3/4" x 14" x 24"; (A) – top, bottom
1 piece wood 3/4" x 10 1/2" x 23 1/4"; (B)-Back
1 piece wood 3/4" x 10 1/4" x 10 1/2"; (C)- side
1 piece wood 3/4" x 9 1/2" x 10 1/2"; (D)-side
1 piece wood 3/4" x 10 1/2" x 11" ; (E)-door
4 pieces wood 7/8" x 2" x 14"; (F)-legs
1 piece wood 7/8" x 2 1/2" x 7"; (G)- end rail
1 piece wood 7/8" x 2 1/2" x 17"; (H)-cross rails
1 piece wood 7/8" x 2 1/2" x 10 1/2" –end rail
2 -1 1/2" butt hinges
1 hardwood or hardware knob
5d finishing nails
Glue
Plastic wood
Varnish or paint

TOOLS NEEDED:

Hammer and nail set
Table saw
Band saw
Drill
Sandpaper
Orbital sander
Paint brush



INSTRUCTIONS:

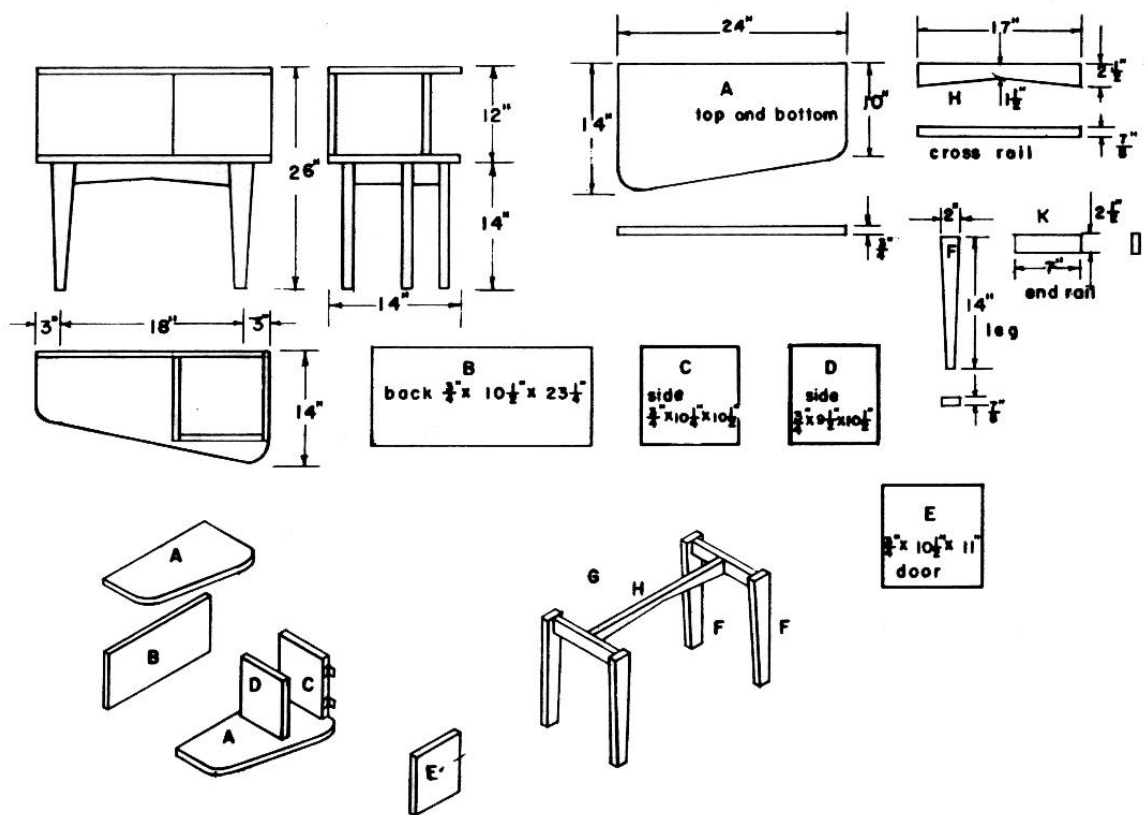
1. Cut pieces to size. Make the tapered cuts on the legs as shown. Make the tapered cuts on the top and bottom (A) as shown. Using an orbital sander round the front corners of the top and bottom. (See drawing.)
2. Glue and nail the top and bottom (A) to sides (C) and (D) and back (B).
3. Mount the hinges on the door E, about one hinge length from either 11" side, along the back face.
4. Mount the door on the cabinet, screw the hinges to the front edges of sides (C) and (D).



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5. Glue and nail the two end rails to the cross rail (H). Glue and nail the legs to the ends of the end rail.
6. Glue and nail the leg assembly to the underside of the bottom. The 14" side of (A) should match up with the long end rail.
7. Set and fill all nail holes.
8. Sand cabinet smooth and apply finish.



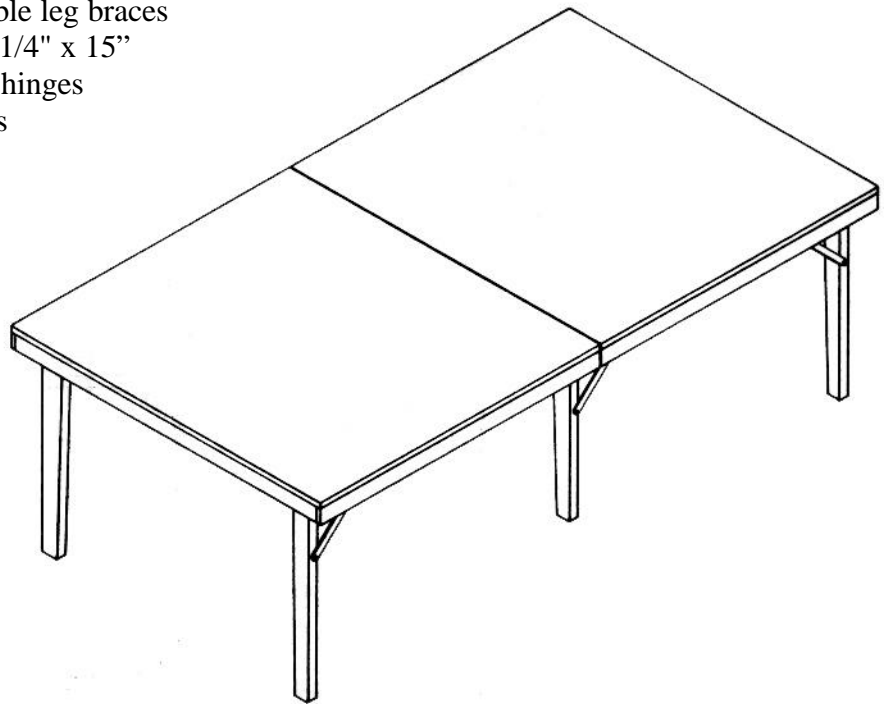
Ky 4-H Wood Science Plans - Level 4



FOLDING TABLE TENNIS WS410

MATERIALS NEEDED:

- 2 pieces wood 3/4" x 54" x 60" – top
- 6 pieces wood 1 5/8" x 3 5/8" x 31 1/4" –legs
- 7 pieces wood 3/4" x 2 1/4" x 58 1/2" – end trim and leg braces
- 4 pieces wood 3/4" x 2 1/4" x 54"- side trim
- 2 pieces wood 1 1/2" x 1 1/2" x 2 feet long – trim braces
- 6 – 2-inch butt hinges
- 6 – Stanley #466 1/2 table leg braces
- 2 pieces wood 3/4" x 2 1/4" x 15"
- 3 – 1 3/8" x 1 1/2" butt hinges
- 5 #8 x 5/8" long screws
- Green enamel paint
- 1/2" wide masking tape
- Table tennis net
- 5d box nails
- Glue
- 8 – 8d box nails



TOOLS NEEDED:

- Hammer
- Table or skill saw
- Screwdriver
- Paint brush
- Drill

INSTRUCTIONS:

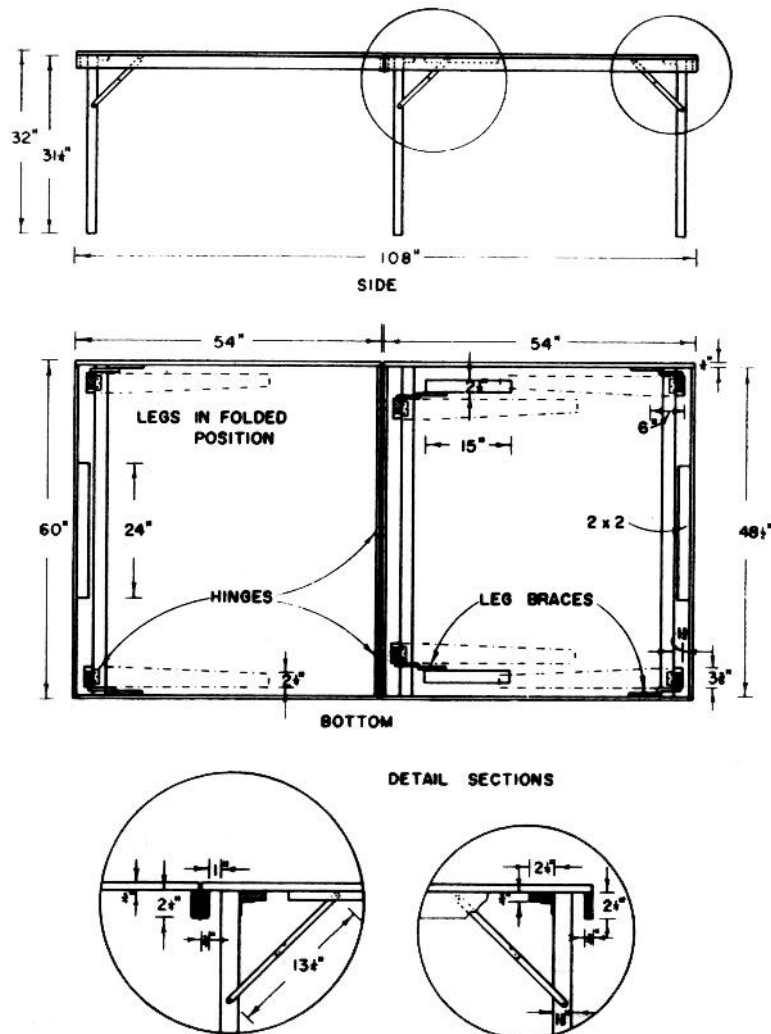
1. Cut pieces to size.
2. Glue and nail the side end trip to the bottom face of the two 3/4" x 54" x 60" pieces.
3. Glue and nail two 3/4" x 2 1/4" x 58 1/2" pieces, 2 1/2" from either end, also on the bottom face of a top piece.
4. Glue and nail the other 3/4" x 2 1/4" x 58 1/2" piece 2 1/2" from an end on the other top piece.
5. Glue and nail the two 1 1/2 x 1 1/2's in place, to the tops (using 8d box nails) and to the trim (using 5d box nails from the outside). This will support the trim and table top.



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6. Drill holes for leg braces $3\frac{1}{2}$ " from an ends of the $\frac{3}{4}$ " x $2\frac{1}{4}$ " x 15" pieces, and centered into a 15" edge. Screw one end of a brace to each.
7. Taper cut the 6 legs, as shown. Screw two legs, (straight edge out) to the braces on the $\frac{3}{4}$ " x $2\frac{1}{4}$ " x 15" pieces. Mount a 2" hinge on the top of these two legs. Mount this assembly on one of the $\frac{3}{4}$ " x $2\frac{1}{4}$ " x $58\frac{1}{2}$ " pieces of a top assembly, 6" over from the side trim. Do the same with the other leg.
8. Mount the two end legs on the hinges. Hinge the legs to the other $\frac{3}{4}$ " x $2\frac{1}{4}$ " x $58\frac{1}{2}$ " piece, such that the braces (to the outside) just slip against the outside trim. Screw the braces to the side trim. Mount the two legs on the other top piece in a similar fashion.
9. Place the two assemblies top down with 60" edges opposing and legs braced to trim to either end. Mount three $1\frac{3}{8}$ " x $1\frac{1}{2}$ " hinges as shown. Set the table upright with legs folded out.
10. Sand and paint. When dry, mark with white paint or masking tape and add the net.





ROOM DIVIDER WS411

MATERIALS NEEDED:

1 x 12, 1 x 9 and 1 x 4 lumber (Dimensions will vary with the room to be divided.)

Note: 1" wood may be 3/4" thick and 2" materials may be 1/2" less in width

1 piece 1/8" wood paneling, 40" x length of divider

2 pieces 1/4" hardboard, 39 3/4" x half length of divider +1"

2 knobs

Wood filler

Glue

6d and 8d finishing nails

3/4" brads

TOOLS NEEDED:

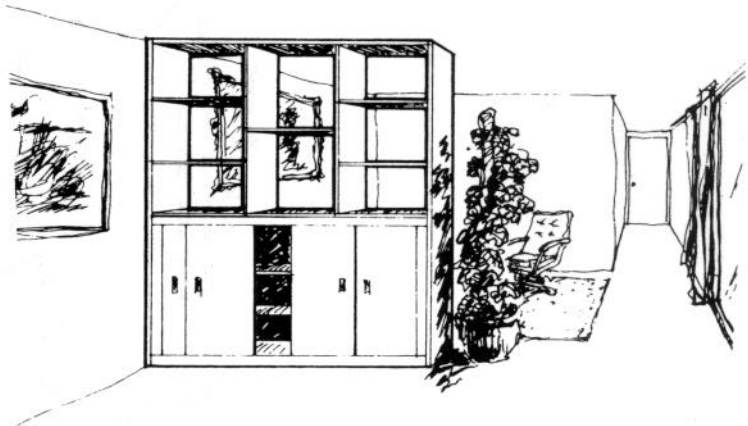
Table saw

Hammer

Nail set

Sandpaper

Stain and varnish (stain should match paneling)



INSTRUCTIONS:

1. Determine size divider needed and cut pieces.
2. Cut 3/16" deep dados on lower divider and 3/16" deep x 5/16" wide grooves for sliding doors in center full-length divider and bottom.
3. Glue and nail outside frame together with 8d nails. Glue and nail center full-length divider in place with 8d nails.
4. Glue and nail bottom center divider in place. Glue shelves into position and nail ends to sides.
5. Set sliding doors in place. Glue and nail 1" x 4" framing together and to front of shelves, on the back side, glue and nail 1" x 4" frame together and nail paneling to frame with 3/4" brads. Nail to back side.
6. Glue and nail upper dividers and shelving in place. Use 6d nails.
7. Sand and finish. Add knobs to doors.



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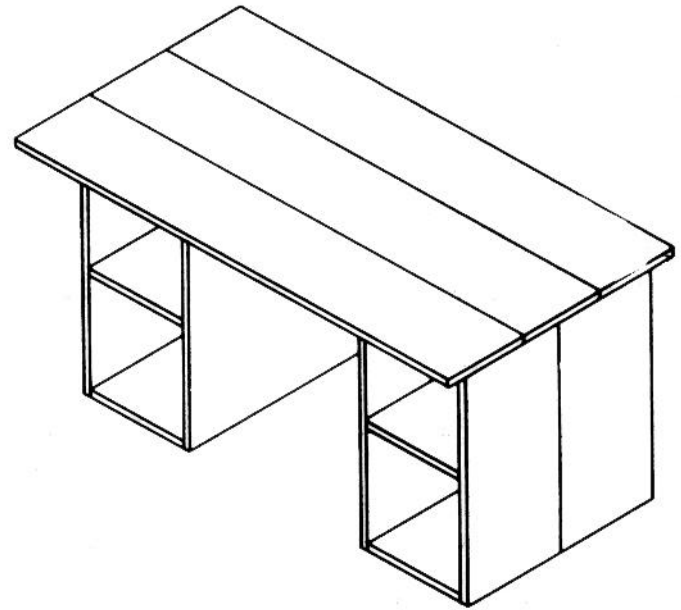


DESK THAT GROWS WS412

MATERIALS NEEDED:

Note: 1" wood may be 3/4" thick and other materials may be 1/2" less in width

- 3 pieces wood 1" x 10" x 52" – top
- 2 pieces wood 1" x 3" x 22 1/2" – top cleats
- 8 pieces wood 1" x 12" x 27 1/4"
– sides of boxes (2 per side, 4 per box)
- 2 pieces wood 1" x 12" x 21 3/4"
– shelves, tops and bottoms of boxes
(1 of each per box)
- 6 pieces wood 1" x 12" x 21 3/4" - shelves,
tops and bottoms of boxes (1 of each
per box)
- 12 #8 x 1 1/4" flat head wood screws
- 4d finishing nails
- 4 angle brackets with screws
- Glue



TOOLS NEEDED:

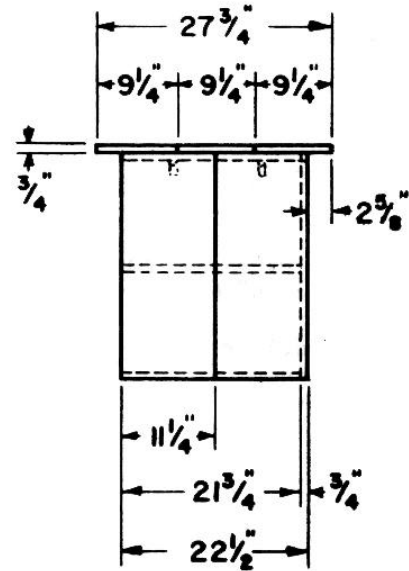
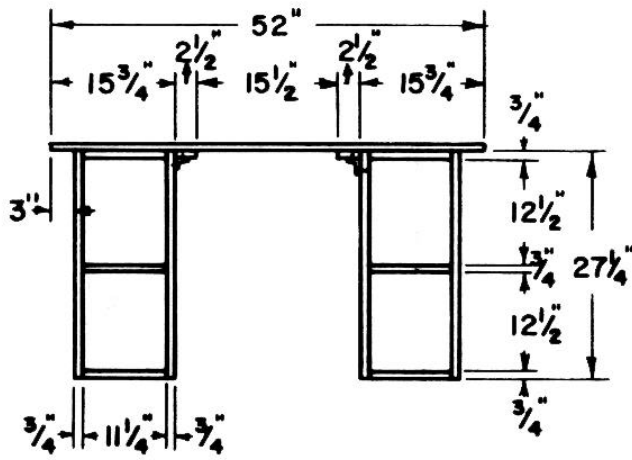
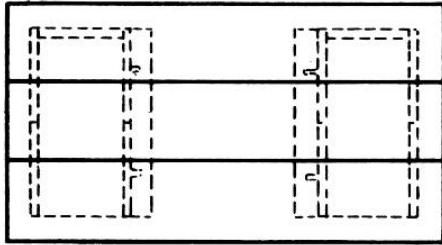
- Saw
- Drill with 1/8" bit, countersink bit, 1/16" bit
- Hammer
- Screwdriver
- Bar clamps
- Sandpaper
- Paint or stain and varnish

INSTRUCTIONS:

1. Cut pieces to size.
2. Edge-glide top pieces together and clamp. Do the same with sides of boxes, gluing in groups of two. Be sure boards are flat (not cupped) when gluing
3. When dry, fasten cleats to top by setting in place, drilling 1/8" pilot holes, countersink and insert #8 screws, (6 per cleat).
4. Glue and nail shelves, tops and bottoms between sides of boxes.
5. Glue and nail backs in place.
6. Sand and finish both boxes and top.
7. Depending on size of child, either set boxes up as shown in drawing or turn over with open sides of boxes to the floor. Set top in place and fasten to boxes with angle brackets and screws.



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BENCH AND PICNIC TABLE WS413

MATERIALS NEEDED:

Note: 1" wood may be 3/4" thick and other materials may be 1/2" less in width

2 pieces wood 2" x 10", 10 feet long – top and top supports

1 piece wood 2" x 12", 8 feet long – seat

2 pieces wood 2" x 6", 8 feet long – legs and cross pieces

1 piece wood 2" x 4", 5 feet long – back rail

1 piece wood 1" x 4", 12 feet long – braces

2- 1/8" x 1 1/2" x 1 1/2" angle irons, 4" long

2 – 1/2" x 4" pins with chain

1 pound 16d galvanized box nails ("deformed shank" preferred for more joint strength)

4- 3/8" x 2" carriage bolts

8 – 1/2" x 4 1/2" machine bolts

20 – 1/2" washers

1/4 pound of 6d nails

1/2 gallon outside paint

TOOLS NEEDED:

Hammer

Wrench

Band saw

Radial arm saw

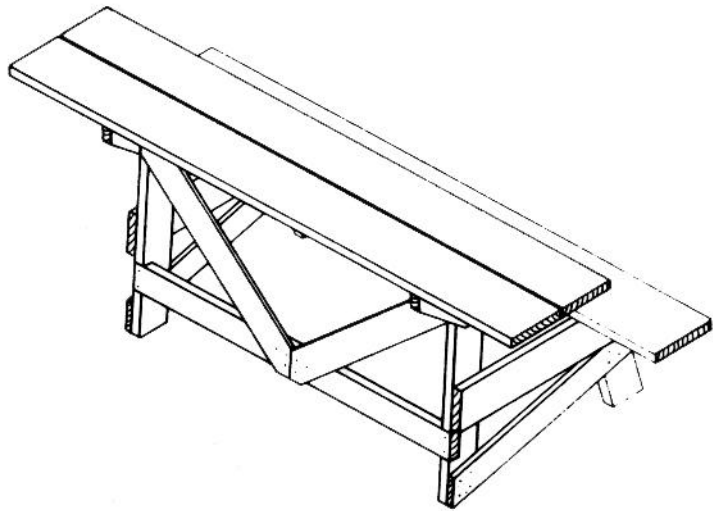
Chisel

Carpenters square

Sandpaper

Paint brush

Drill



INSTRUCTIONS:

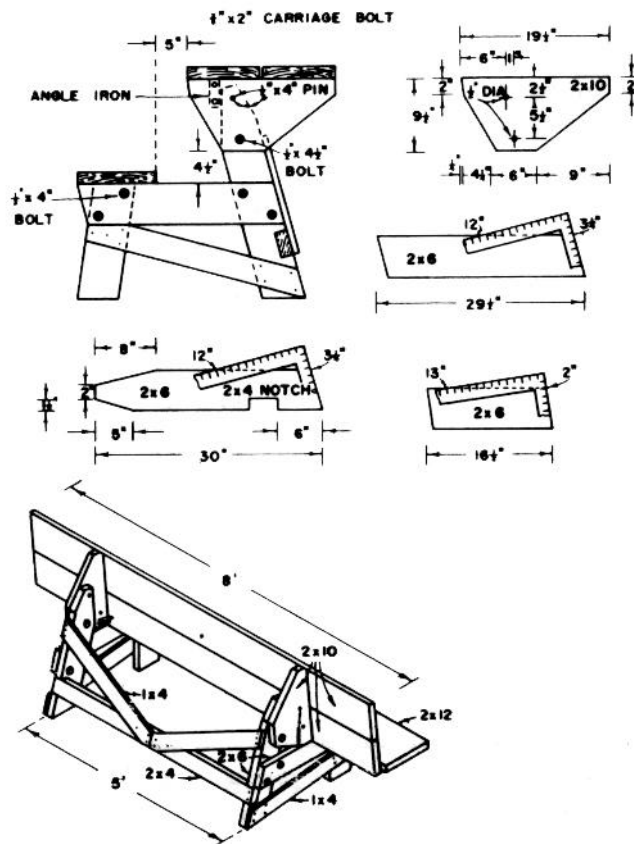
1. From the 2" x 6" lumber cut:
 - a. 2 – 29 1/2" cross pieces, angle the ends as shown,
 - b. 2- 16 1/2" front legs, angle the ends as shown,
 - c. 2 – 30" back legs, angle the end as shown and make the tapered cuts as shown. Cut and chisel out a notch for the 2" x 4" (1 5/8" x 3 5/8") 6" from the angled end.
2. From the 2" x 10" lumber cut:
 - a. 2- 8 foot lengths for the top
 - b. 2 – 19 1/2" top supports. Cut the top supports as shown in the drawing.



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3. Drill the appropriate holes for the 1/2" machine bolts and the 3/8" carriage bolts in all pieces.
4. Nail the 2" x 4" back rail to the notch in the back legs.
5. Bolt the 2" x 6" cross pieces to the front legs and back legs using 1/2" x 4" machine bolts.
6. Nail the 2" x 12" seat to the tops of the cross pieces and top edges of the front legs.
7. Mark the four 1" x 4" braces and cut them to size. Nail them in place.
8. Bolt the top supports to the assembly using 1/2" x 4 1/2" machine bolts.
9. Drill a 1/2" hole in the top supports and tops of the back legs to accommodate the pins.
10. Mount the angle irons in place as shown.
11. Nail the two pieces of 2" x 10" to the long edge of the top supports. Leave an equal overhang on either side.
12. Screw the pin chains in place.
13. Sand smooth and finish with two or three coats of exterior enamel.



Ky 4-H Wood Science Plans - Level 4



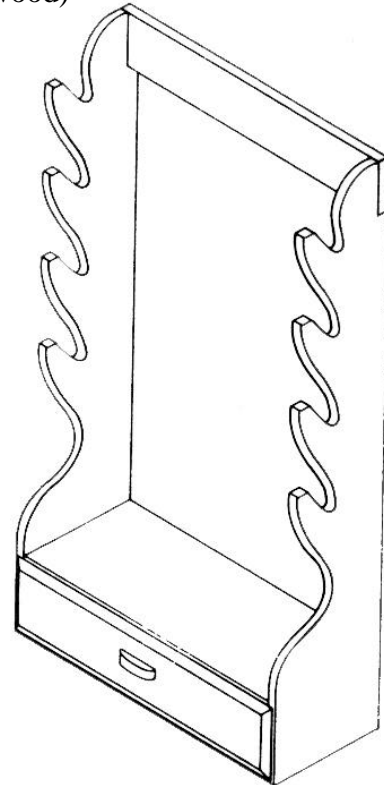
GUN RACK # 1 WS414

MATERIALS NEEDED:

- 1 piece wood 3/4" x 3 1/2" x 19" – top (hardwood)
- 2 pieces wood 3/4" x 7 1/2" x 36 3/4" – sides (hardwood)
- 2 pieces wood 3/4" x 7 1/2" x 17 1/2" – shelf and bottom (hardwood)
- 1 piece wood 3/4" x 4 5/8" x 18 1/2" – drawer front (hardwood)
- 1 piece wood 3/4" x 3 1/2" x 17 3/8" – drawer back
- 2 pieces wood 3/4" x 3 1/2" x 6 1/4" – drawer sides
- 1 piece 1/8" masonite – 6 1/2" x 16 1/8"
- 2 pieces wood 3/4" x 1 1/2" x 7 1/2" – drawer guides
- 1 hardwood or wooden pull as desired
- 1 1/4" finishing nails
- Glue
- Varnish

TOOLS NEEDED:

- Band or jig saw
- Wood clamps
- File
- Hammer
- Table saw
- Sandpaper, Paint brush

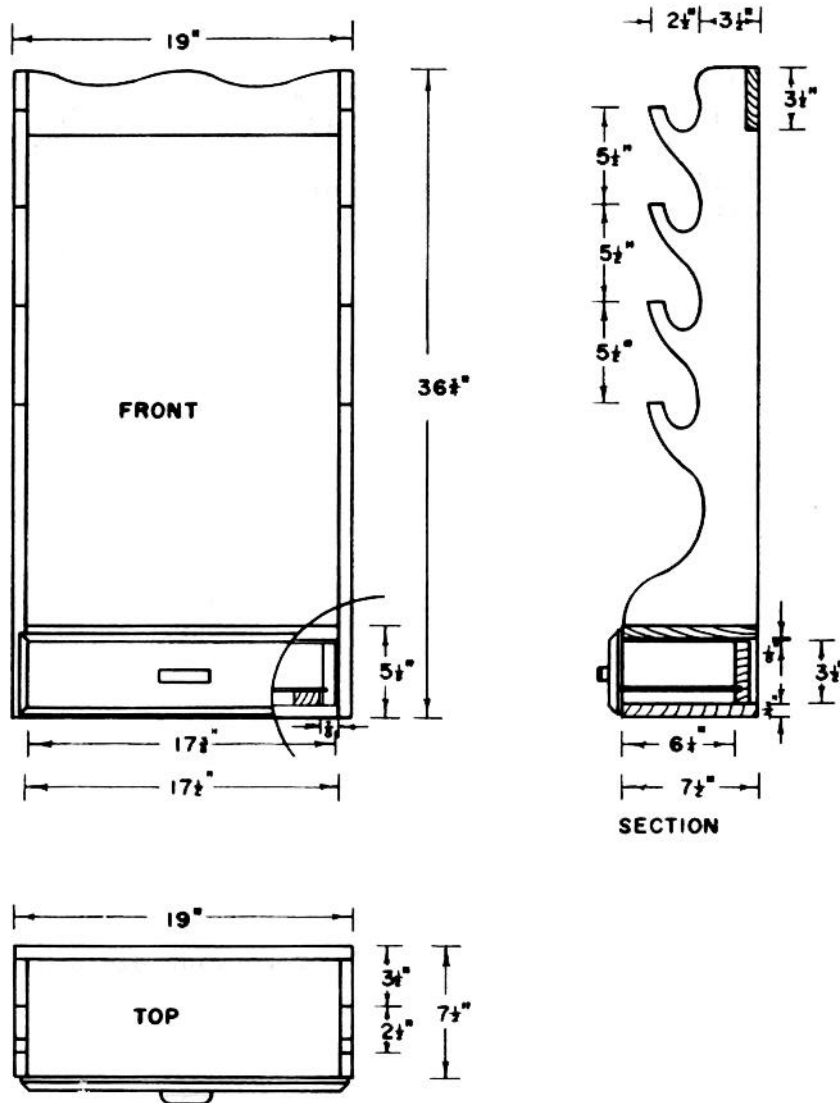


INSTRUCTIONS:

1. Cut pieces to size.
2. Draw the pattern on the top sides and cut them out. Be sure to cut out the 3/4" x 3 1/2" notch at the tops to accommodate the top bar. File the cuts smooth.
3. If desired cut a pattern on the top as shown or to your own design.
4. Glue the top bar, the shelf and the bottom to the two sides. Space them as shown and use a bar clamp at the bottom, and two clamps or parallel clamps at the top, wipe off excess glue.
5. Make the bevel cuts on the drawer front, use a table saw with a blade angle of 45°.
6. Cut a 1/8" groove 1/4" deep, 3/4" from a long side on the draw sides and back. Cut a 1/8" groove 1/4" deep on the back of the drawer front 1 1/4" from the bottom edge. Glue and nail the drawer bottom to the edges of the drawer bottom and sides, glue using clamps the drawer front to the front edges of the drawer bottom and sides, glue and nail the two drawer guides in place 7/8" from the side.
7. Sand gun rack smooth and varnish.
8. Mount a hardware or wood pull on the drawer front as desired.
9. Also if desired, to protect gun stocks, felt may be placed in the gun slots.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



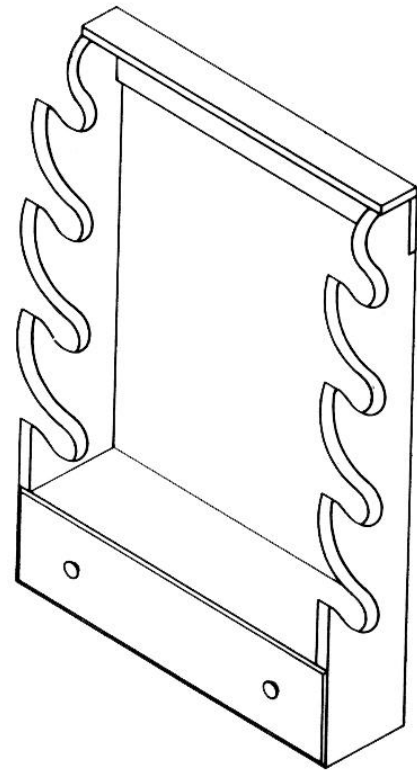
GUN RACK #2 WS415

MATERIALS NEEDED:

2 pieces wood 3/4" x 5 1/2" x 33" – sides
1 piece wood 1/2" x 2 5/8" x 21" – top
1 piece wood 1/2" x 3 1/2" x 22 1/2" – back
1 piece wood 1/2" x 5 1/2" x 21" – bottom
1 piece wood 1/2" x 5 1/2" x 21" – shelf
1 piece wood 3/8" x 5 3/4" x 21 1/2" – drawer front
2 pieces wood 3/8" x 4 7/8" x 5 1/4" – sides of drawer
1 piece wood 1/4" x 5 1/4" x 20 3/8" – bottom of drawer
1 piece wood 1 1/8" x 1 1/8" x 8" or 2 hardwood knobs
1 1/2" finishing nails
3/4" finishing nails (brads)
5/8" brads
2 – #8 x 1 1/4" flathead wood screws
Glue

TOOLS NEEDED:

Lathe or buy round knobs
Screwdriver
Hammer
Nail set
4 – small C clamps
Table saw
Jig or band saw
Drill with 2" drum sander attachment
Sandpaper
Paint brush



INSTRUCTIONS:

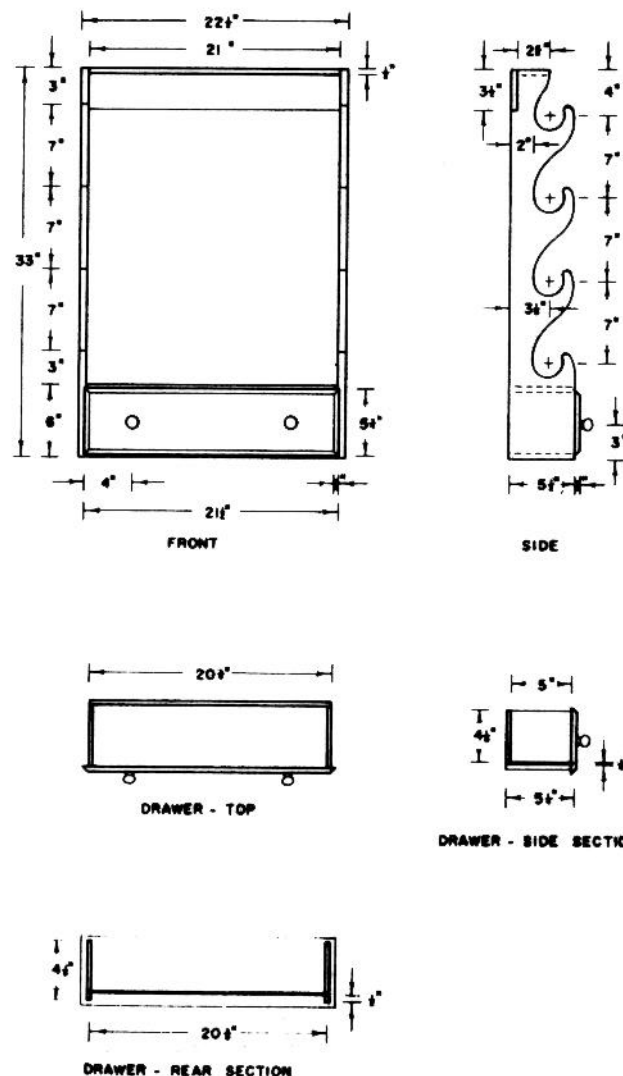
1. Cut pieces to size.
2. Draw the pattern on the sides including the notch for the 1/2" x 3 1/2" x 22 1/2" back. (The circles have a diameter of 2 1/2".) Cut out the sides and sand the edges smooth with a 2" drum sanding attachment.
3. Glue and nail the sides to the ends of the bottom, top and middle shelf. Glue and nail the top in place.
4. Run a 45° bevel on the edges of the drawer front.



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5. Cut a 1/4" wide dado, 3/16" deep parallel to and 1/2" from the 5" edge on the drawer sides. Cut a 1/4" wide dado 1/4" deep parallel to and 3/4" from the 21 1/2" edge of the drawer front.
6. Glue and nail the drawer bottom to the drawer sides. Use 5/8" brads and leave a 1/4" overhang in the front. Glue and nail the back in place. Use 3/4" brads. Center the drawer front and glue and nail the back in place. Use 3/4" brads. Center the drawer front and glue and nail it to the drawer assembly.
7. Acquire or turn down two 1 1/4" knobs. Mount them on the drawer front about 4" from either side as shown.
8. Sand the cabinet smooth and varnish.
9. If desired, 3/4" wide strips of felt can be used in gun slots to protect both cabinet and gun stocks.



Ky 4-H Wood Science Plans - Level 4



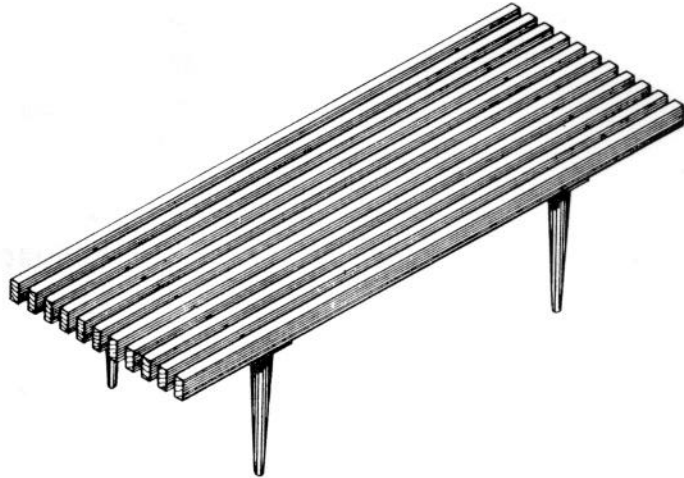
COFFEE TABLE #1 WS416

MATERIALS NEEDED:

11 pieces wood 1" x 2" (actual size) x 60"
2 pieces wood 3/4" x 3" x 20"
2 pieces wood 1/2" dowel 20" long
4 pieces wood 3" x 3" x 13 1/4"
4 – 3 1/2" hanger bolts
18 – 1 3/4" wood screws
1" finishing nails
1 piece 5/8" brass tubing 5" long
Glue
Varnish or linseed oil

TOOLS NEEDED:

Lathe, or buy tapered legs
Radial arm saw
Drill press
Hack saw
Screwdriver
Hammer
File
Sandpaper
Paint brush or cheese cloth



INSTRUCTIONS:

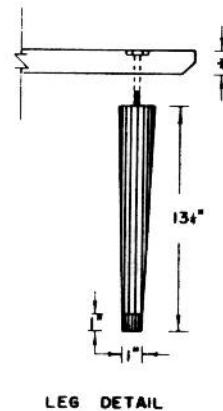
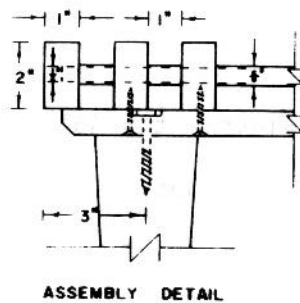
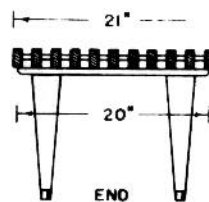
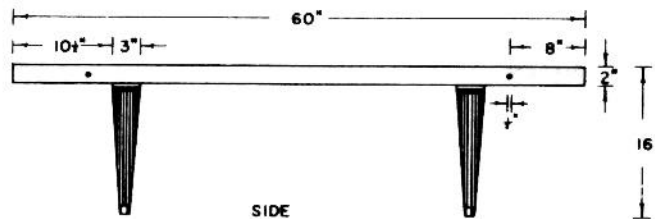
1. Cut pieces to size.
2. On the ends of the 3/4" x 3" x 20" slats cut a 45° bevel 3/8" from the bottom face.
3. Turn the four legs down on the lathe so that 3" diameter is on the top and a 1" diameter is on the bottom.
4. Drill 1/2" holes 8" from either end in nine of the 1" x 2" x 60" pieces. In the other two, drill 1/2" holes in the same position but only to a depth of 1/2". These will be the outside pieces.
5. Cut the 5/8" brass tubing into 1" lengths, glue and nail the two pieces of 1/2" dowel into one 1" x 2" x 60" outside pieces. Slip a piece of brass tubing on each of the dowels and add a 1" x 2" x 60" piece. Proceed adding brass spacers and 1" x 2" x 60" pieces until the dowel is full. Then glue and nail on the other outside 1" x 2" x 60" piece.
6. Mount the nuts of the hanger bolts in the top of the 3/4" x 3" x 20" pieces as shown. Be sure to drill holes to accommodate the bolts.



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7. Screw the 3/4" x 3" x 20" pieces to each of the 1" x 2" x 60" pieces. The slats should be 10 1/2" from either end. (see drawing).
8. Mount the bolts in the tops of the legs. Cut the 1" brass tubing to 1" lengths. File off the bottoms of the legs and slip on the 1" brass caps.
9. Screw the legs to the slats via the bolts.
10. Sand table smooth and finish with varnish or oil.



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COFFEE TABLE #2 WS417

MATERIALS NEEDED:

Note: 7/8" wood may be 3/4" thick

2 pieces wood 7/8" x 8" x 14 1/2" – swivel supports and support guides

1 piece wood 7/8" x 18" x 48" – top

2 pieces wood 7/8" x 11 1/2" x 18" – leaves

4 pieces wood 7/8" x 1 3/4" x 15 1/8" – legs

4 pieces wood 7/8" x 1 3/4" x 18" – end rails

2 pieces wood 7/8" x 1 3/4" x 8" – vertical supports

2 pieces wood 7/8" x 1 3/4" x 50" – rails

2- piano hinges and screws, 1/2" wide, 18" long

8 – #8 x 1 3/4" wood screws

4 – 2" metal plates with 3/4" screws

12 - #6 x 2 1/4" wood screws

5d finishing nails

Glue, Varnish, Plastic wood

TOOLS NEEDED:

Table saw

Band saw

Coping saw

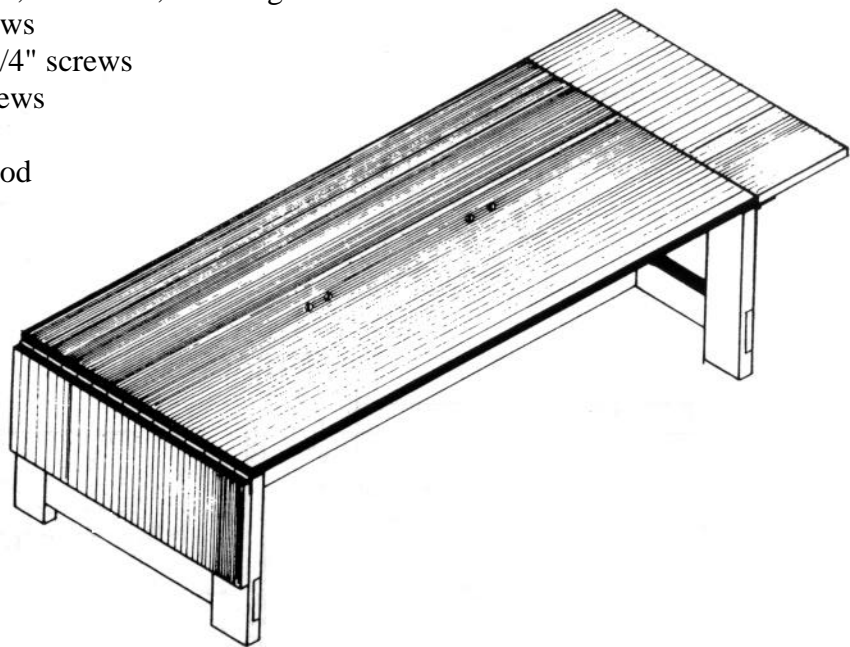
Drill, Hammer

Sandpaper

Paint brush

Screwdriver

Wood clamps, Nail set

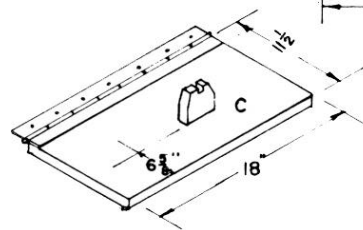
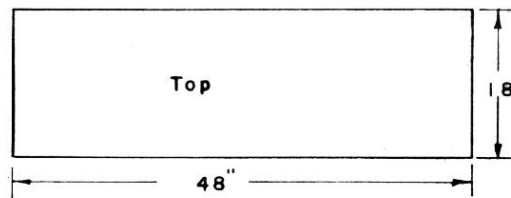
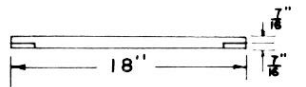
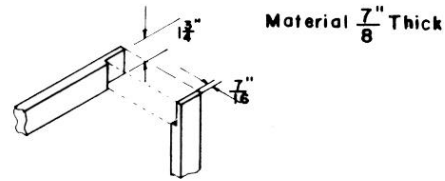
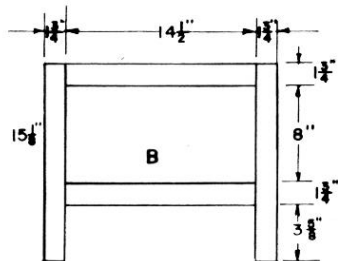
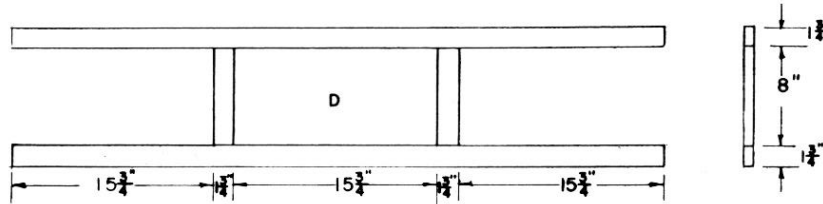
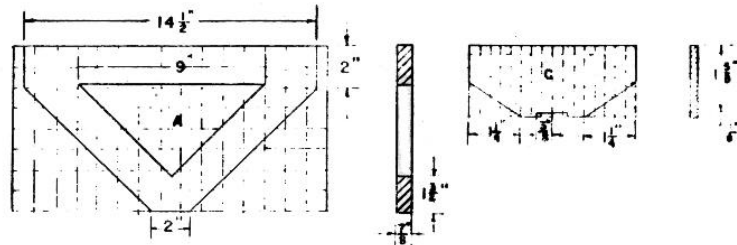
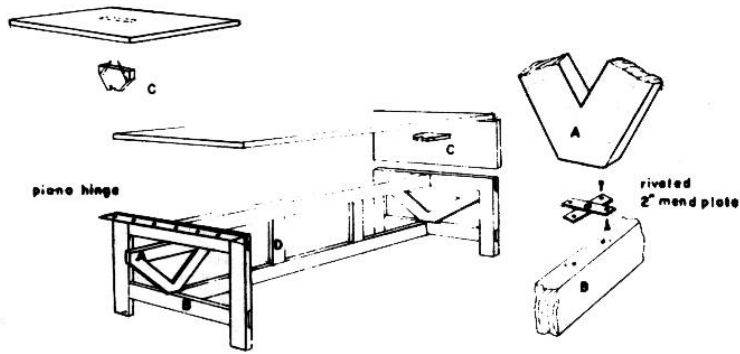


INSTRUCTIONS:

1. Cut pieces to size.
2. Cut a 7/16" deep rabbet 1 3/4" wide on the tops of the four legs and on the ends of the four rails. Cut a 7/16" deep dado 1 3/4" wide 3 5/8" from the bottom of each leg. Glue the two rails to the two legs for each side.
3. Glue and screw the two vertical braces to the two long rails. Space them 15 3/4" apart as shown. Use 2 1/4" screws.
4. Glue and screw the ends of the two long rails to the end frames. Be sure to center the long rails, use 1 3/4" screws.
5. Cut out the triangular swivel support, mount a mending plate centered on the top edge., and one on the bottom of the vee. Repeat for the other support, mount the swivel supports on the frame, screwing the mending plates down at the intersections of long and short rails.
6. Cut out the support guides, as shown in drawing C, mount these on the undersides of the leaves 6 5/8" from the 18" side and centered on the long axis, use 2 1/4" screws.
7. Mount the top to the frame, mount the leaves via the piano hinges to the end frames.
8. Sand smooth and varnish.



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SECTIONAL PATIO TABLES WS418

MATERIALS NEEDED:

All pieces are from 3/4" exterior A-C plywood.

1 piece plywood 43" x 43" –Triangle Top – A

3 pieces plywood per table 7" x 7" – leg pads – B

3 – 3/8" wrought iron hairpin type legs with screws approximately 1 1/4" long

Waterproof glue

TOOLS NEEDED:

Saw

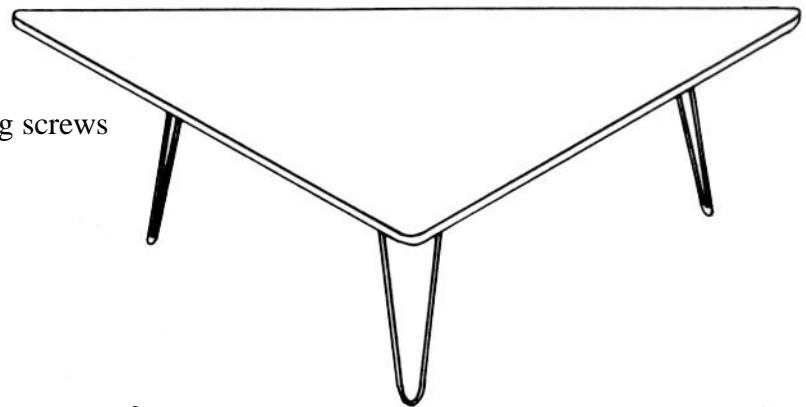
Drill with bit for pilot holes of leg screws

Parallel jaw clamps

Screwdriver

Sandpaper

Exterior paint or varnish

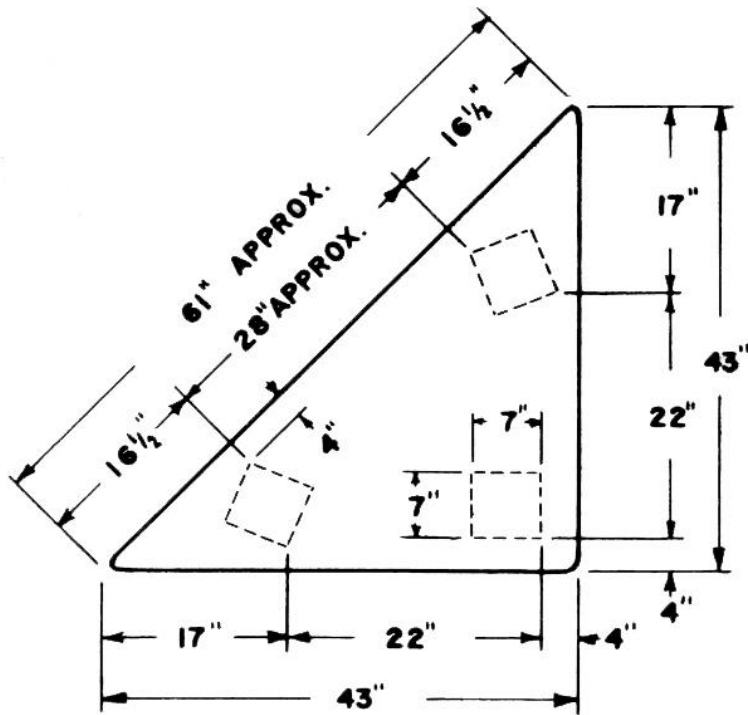


INSTRUCTIONS:

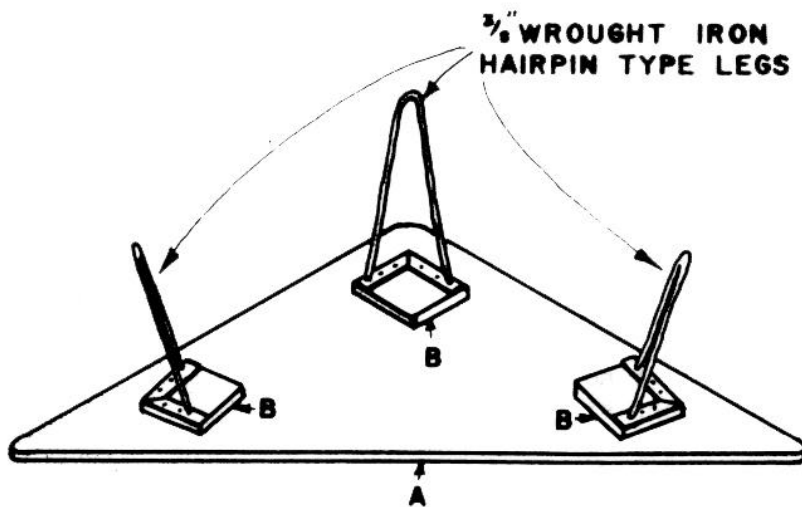
1. Cut pieces to size. Round corners of top.
2. Glue and clamp pads to underside of top.
3. Set legs on pads to underside of top.
4. Set legs on pads, drill pilot holes (make sure they don't come out the other side of the top), and fasten legs with screws.
5. Sand and finish.



Ky 4-H Wood Science Plans - Level 4



LOCATION OF LEG PADS



DETAIL SHOWING HOW LEGS ARE ATTACHED TO TABLE



Ky 4-H Wood Science Plans - Level 4



BENCH WS419

MATERIALS NEEDED:

Note: 1" wood may be 3/4" thick.

2 pieces wood 1" x 8" x 48" – Top – A

2 pieces wood 1" x 3" x 34" – Rail – B

4 pieces wood 1" x 3" x 15 1/4" – Legs – C

2 pieces wood 1" x 3" x 9" – Brace – D

1 piece foam rubber cushion 14 1/2" x 48" about 2" thick

8 pieces 1/4" dowel, 1 1/2" long

6d finishing nails

4 – #8 x 2 1/2" flathead wood screws

Glue

TOOLS NEEDED:

Saw

Hammer

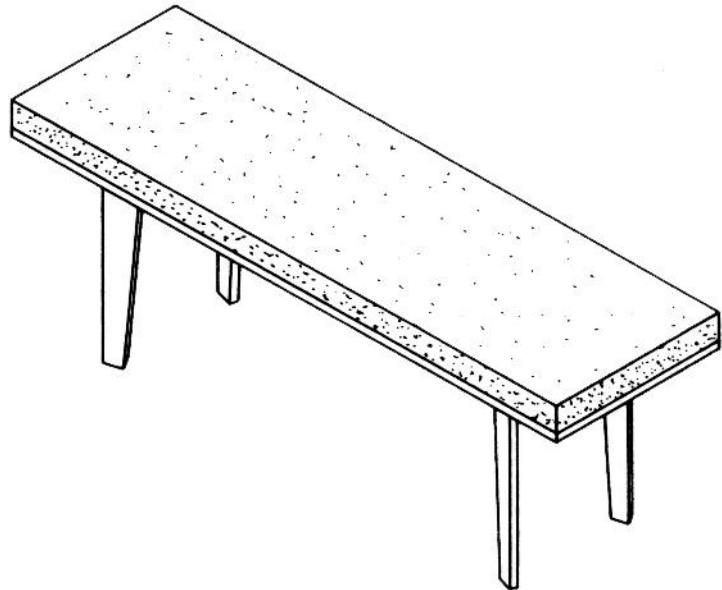
Drill with 1/4", 3/16", 3/32", 1/2"
countersink bit

Screwdriver

Bar clamps (at least 42" wide open)

Sandpaper

Stain and varnish

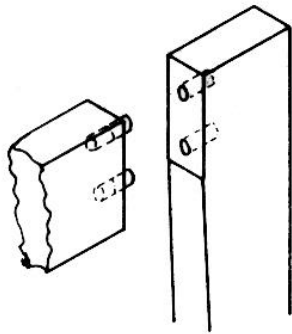


INSTRUCTIONS:

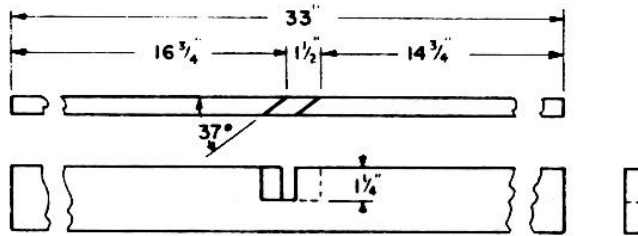
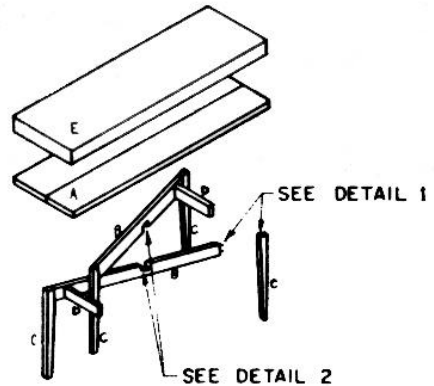
1. Glue up pieces to make top.
2. Cut all pieces to size. Cut notches in rails.
3. Drill dowel holes and glue dowels in place. Glue legs to rails.
4. Glue rails together. Glue and nail braces in place.
5. Set top in place and drill 3/32" holes through rails and into top about 1/2". Take top off, turn leg assembly upside down and drill 3/16" holes where 3/32" holes are. Then drill 1/2" countersink, 1/2" deep. Set top back in place and fasten with screws.
6. Sand and finish.
7. When dry, add cushion.



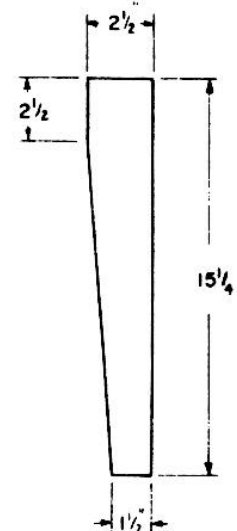
Ky 4-H Wood Science Plans - Level 4



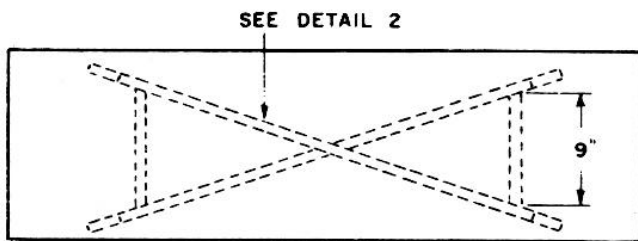
DETAIL 1



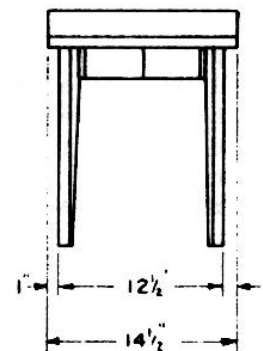
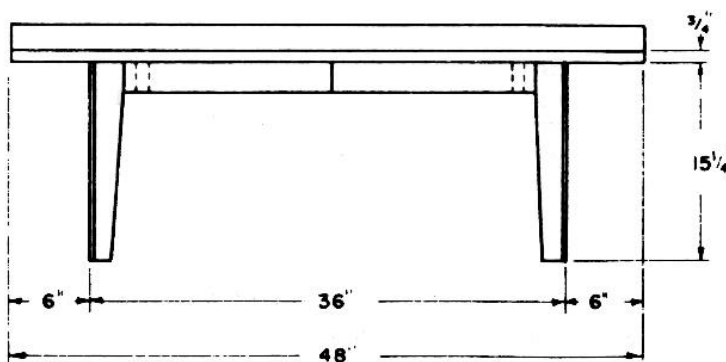
DETAIL 2



LEG DETAIL



SEE DETAIL 2



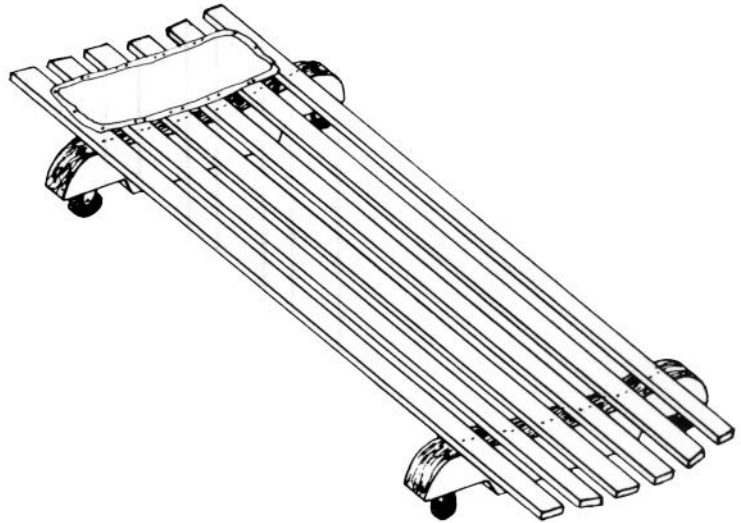
Ky 4-H Wood Science Plans - Level 4



SHOP CREEPER WS420

MATERIALS NEEDED:

6 pieces wood 3/4" x 2" x 42"
2 pieces wood 1 1/2" x 3 1/2" x 18"
4 casters
Materials for headrest
16 – #8 x 1" flathead wood screws
Upholsterer's tacks



TOOLS NEEDED:

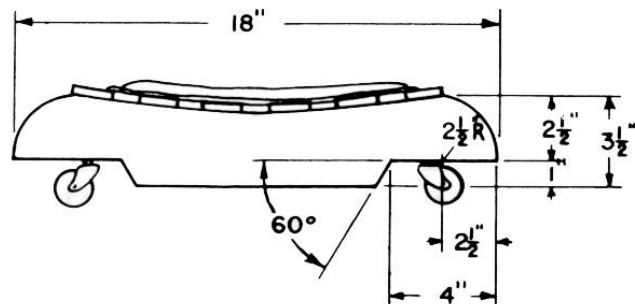
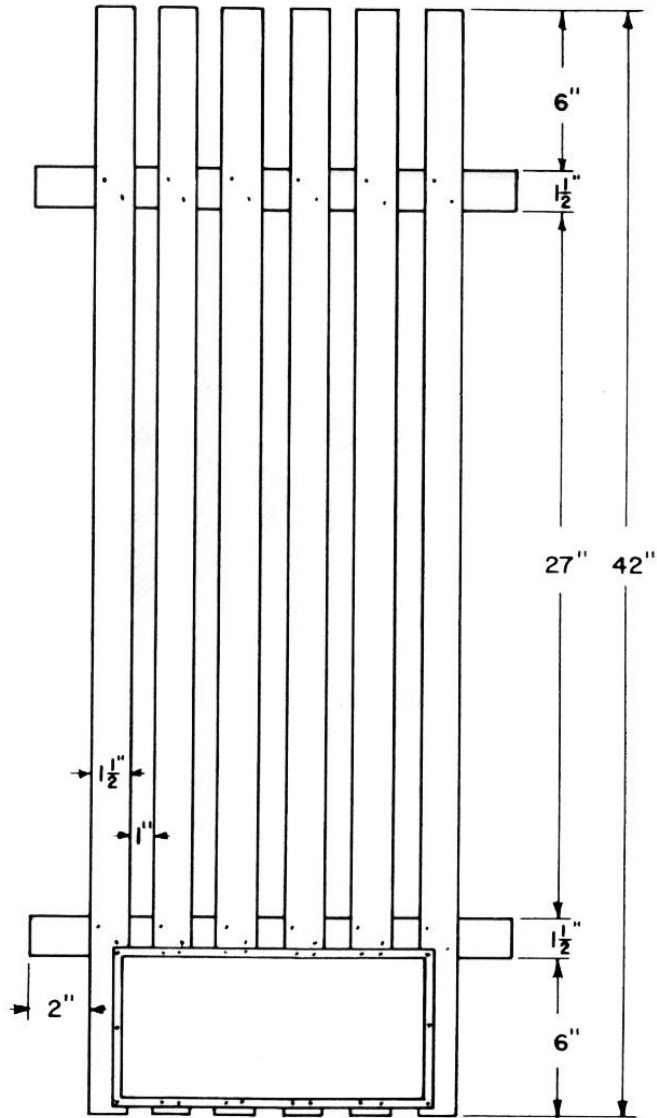
Band saw
Drill with 3/32" bit and countersink bit
Screwdriver
Hammer
Sandpaper
Varnish

INSTRUCTIONS:

1. Cut pieces to size. Cut curves on 1 1/2 x 3 1/2" pieces.
2. Set 1 1/2" x 3 1/2" braces on ground 27" apart and lay strips on these.
3. Drill pilot holes and fasten strips to the supports with No. 8 screws.
4. Fasten headrest to strips with upholsterer's tacks.
5. Add casters to bottom.
6. Sand and finish.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



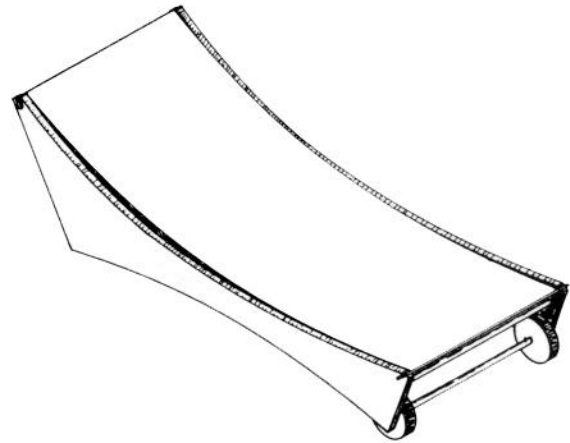
SUN SLED WS421

MATERIALS NEEDED:

2 pieces 3/4" exterior plywood, 21" x 77"
4 pieces 3/4" exterior plywood, 7" diameter wheel
4 pieces 1 3/8" hardwood dowel, 31" long
2 pieces 3/8" dowel, 3" long
2 pieces 3/4" x 2 1/4" hardwood, 32" long
1 piece canvas 30" wide x 7 feet long
Waterproof glue
6d galvanized finishing nails
Upholsterer's tacks

TOOLS NEEDED:

Band saw
Drill with 1 3/8", 1 7/16" and 3/8" bits
Hammer
Sandpaper
Exterior paint

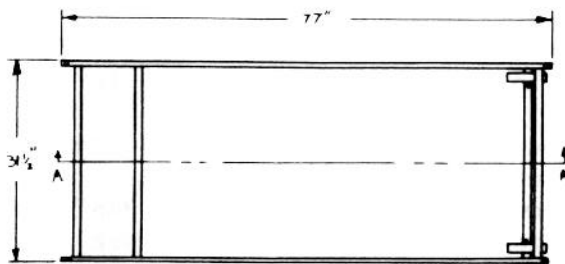
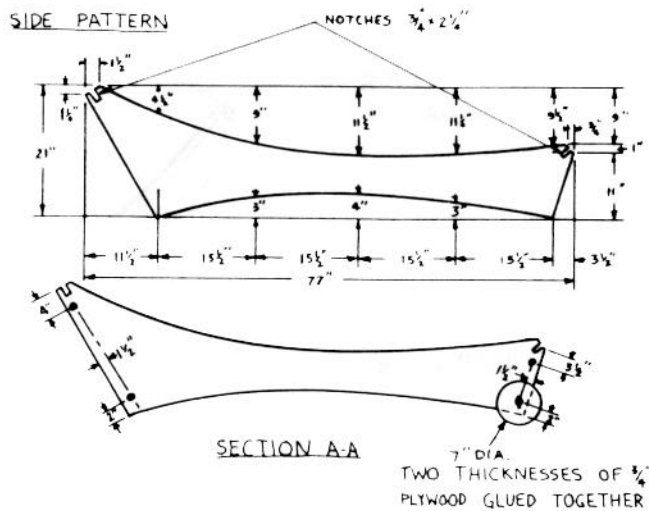
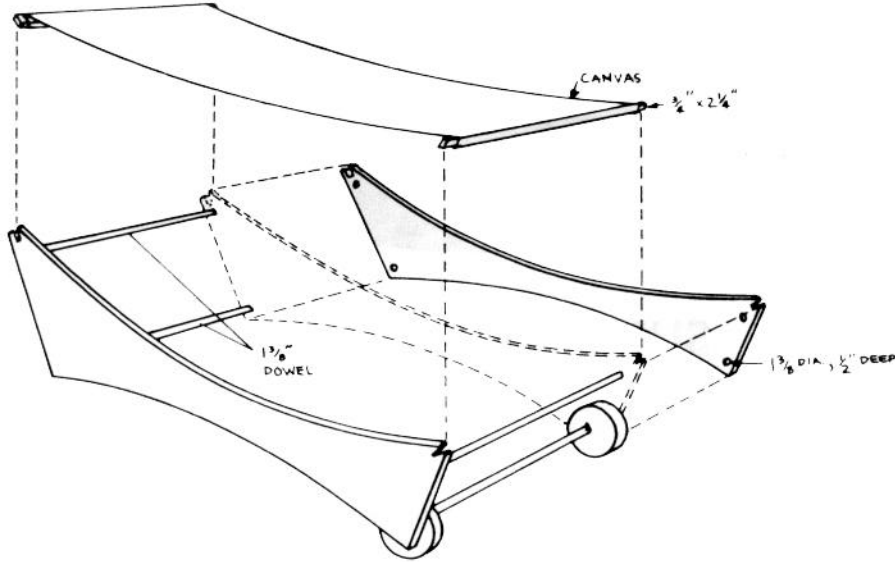


INSTRUCTIONS:

1. Cut pieces to size and shape. Cut notches in ends of side pieces.
2. Drill 1 3/8", 1/2" deep in side piece where shown in section A-A drawing.
3. Drill 1 7/16" holes through the centers of the wheels, which are glued up from two thicknesses of 3/4" plywood.
4. Place wheels over axle dowel and glue and nail 1 3/8" dowels between sides to make frame. Slide wheels to frame and mark about 1/2" to the inside of each wheel.
5. Drill 3/8" holes and glue 3/8" dowel lock pins in place. This keeps the wheels toward the outside of the frame.
6. Tack canvas to one piece of 3/4" x 2 1/4" and set in notches at one end. Place the other 3/4" x 2 1/4" piece in the notches at the other end. Stretch canvas tight as desired and tack in place.
7. Sand and paint entire sled.



Ky 4-H Wood Science Plans - Level 4



FRAME PLAN



Ky 4-H Wood Science Plans - Level 4



BUNK BED WS422

MATERIALS NEEDED:

4 pieces wood 3 x 3 x 74"
4 pieces wood 1 x 8 x 80"
4 pieces wood 1 x 8 x 38"
4 pieces wood 1 x 10 x 38"
4 pieces wood 1 x 2 x 75"
8 pieces wood 1 x 3 x 38"
16 pieces wood glue blocks 1" x 1" x 1"
32 #6 x 1 1/2" flathead wood screws
60 #8 x 2" flathead wood screws
16 – 1/4" x 4" carriage bolts with nuts and washers
4d finishing nails
Wood glue



TOOLS NEEDED:

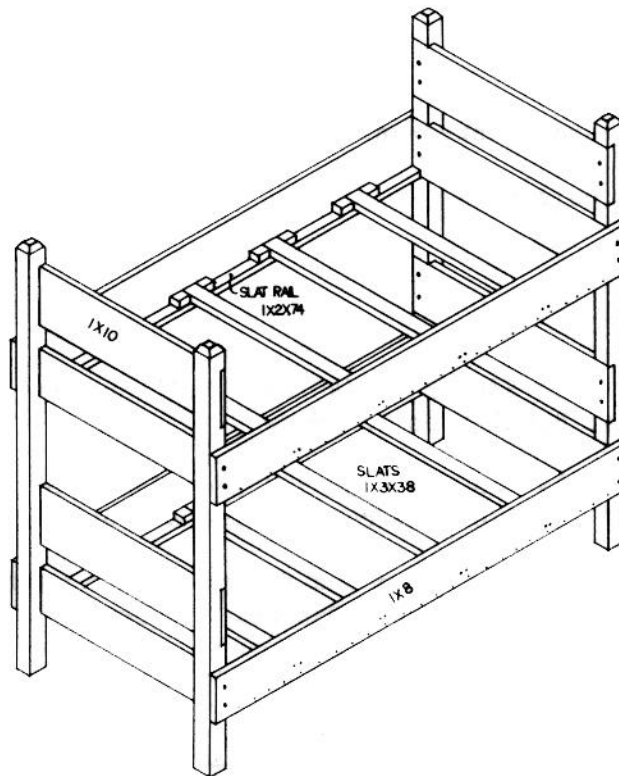
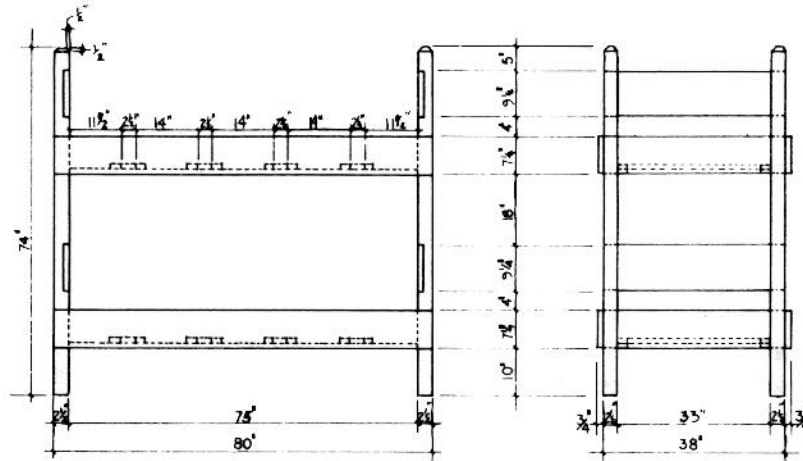
Table saw
Drill with 1/16", 1/4" and countersink bit
Screwdriver
Wrench to fit carriage bolt nuts
Sandpaper
Stain and varnish

INSTRUCTIONS:

1. Cut pieces to size. Cut 3/4" x 7 1/4" or 9 1/4" notches in 3 x 3 posts for 1 x 8's and 1 x 10's, bevel tops of posts.
2. Glue and fasten 1 x 10's and 1 x 8's, 38" long to posts to make head and foot boards. Drill 1/16" pilot holes, countersink and use No. 6 screws.
3. Glue and fasten 1 x 2 rails to 1 x 8 x 80" pieces to make bed rails. Drill 1/16" pilot holes and countersink. Use No. 8 screws.
4. Set rails against head and foot boards and drill 1/4" holes for carriage bolts. Fasten rails to head and foot boards with carriage bolts.
5. Lay slats in place. Place blue blocks beside slats. Glue the blocks down slightly outside of slat. Let dry. Secure better with 4d nails, 1 per block.
6. Sand and finish entire bed.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



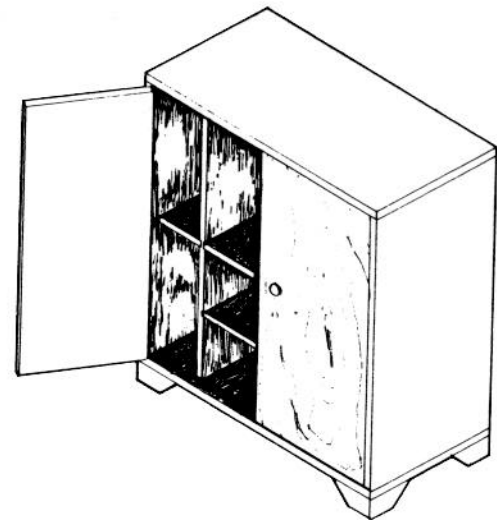
STEREO PLAYER CABINET WS423

MATERIALS NEEDED:

8 pieces wood 1 x 5 x 33" – top and bottom (4 per top, 4 per bottom)
8 pieces wood 1 x 5 x 34 1/4" – sides (4 per side)
6 pieces wood 1 x 6 x 34 3/16" – doors (3 per door)
4 pieces wood 1 x 9 x 6 3/16" – shelves (2 per shelf)
4 pieces wood 1 x 9 x 18 3/8" – middle shelves (2 per shelf)
4 pieces wood 1 x 9 x 34 1/4" – dividers (2 per divider)
8 pieces wood 1 x 3 x 5" – legs (2 per leg)
2 pieces wood 1 x 3 x 2 1/4" – leg braces
1 piece wood 1/4" hardwood plywood, 32" x 34 3/4" – back
1 piece wood 1 x 1 x 32"
3 – 1 1/2" x 1 1/2" butt hinges
No. 4, 1 1/2" flathead wood screws
No. 4, 1 1/4" flathead wood screws
No. 3, 3/4" flathead wood screws
Glue, Door knobs

TOOLS NEEDED:

Drill with 1/16, 3/64, and 1/4" bits, countersink bit
Table saw, Bar clamps
Screwdriver, Chisel
Hammer, Sandpaper
Stain and/or varnish



INSTRUCTIONS:

1. Edge glue pieces to make top, sides, doors, bottom, dividers and shelves, clamp.
2. When dry, cut pieces to size and shape as in drawing. Be sure that allowance is made for mortises.
3. Cut 3/16" dados (mortises) in dividers where shown, these are cut 3/4" wide. Cut 1/4" rabbets along back edge of sides, bottom and top.
4. Glue shelves between dividers and clamp. Glue side shelves to dividers and clamp.
5. Fasten bottom to sides with glue and No. 4, 1 1/2" screws. Drill 1/16" pilot holes and countersink first. This is done for all screws.
6. Set the shelf assembly into cabinet temporarily and mark on the sides along lower edge of side shelves. Remove shelf assembly.
7. Cut the 1 x 1 into 4" lengths. Fasten two to each side just under the shelf line with glue and No. 4, 1 1/4" screws. The forward block should be 3" from front edge. Do the same along the top edge.
8. Slide shelf assembly back in place and fasten to block with No. 4, 1 1/4" screws. Fasten dividers to bottom with No. 4, 1 1/2" screws.
9. Fasten top to blocks with glue and No. 4 1 1/4" screws through blocks into top.
10. Mark grid on back and drill as explained on drawing, fasten back to cabinet with No. 3 screws, about 6" apart.





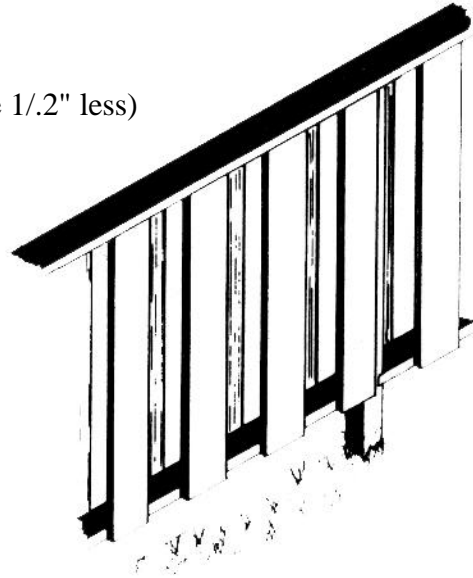
ALTERNATE BOARD FENCE WS424

MATERIALS NEEDED:

4 x 4, 2 x 4, and 1x6 lumber (actual sizes may be 1/2" less)
6d and 8d galvanized box nails

TOOLS NEEDED:

Saw
Hammer
Chisel
Post hole digger or shovel
Tamping rod
Sandpaper
Exterior paint

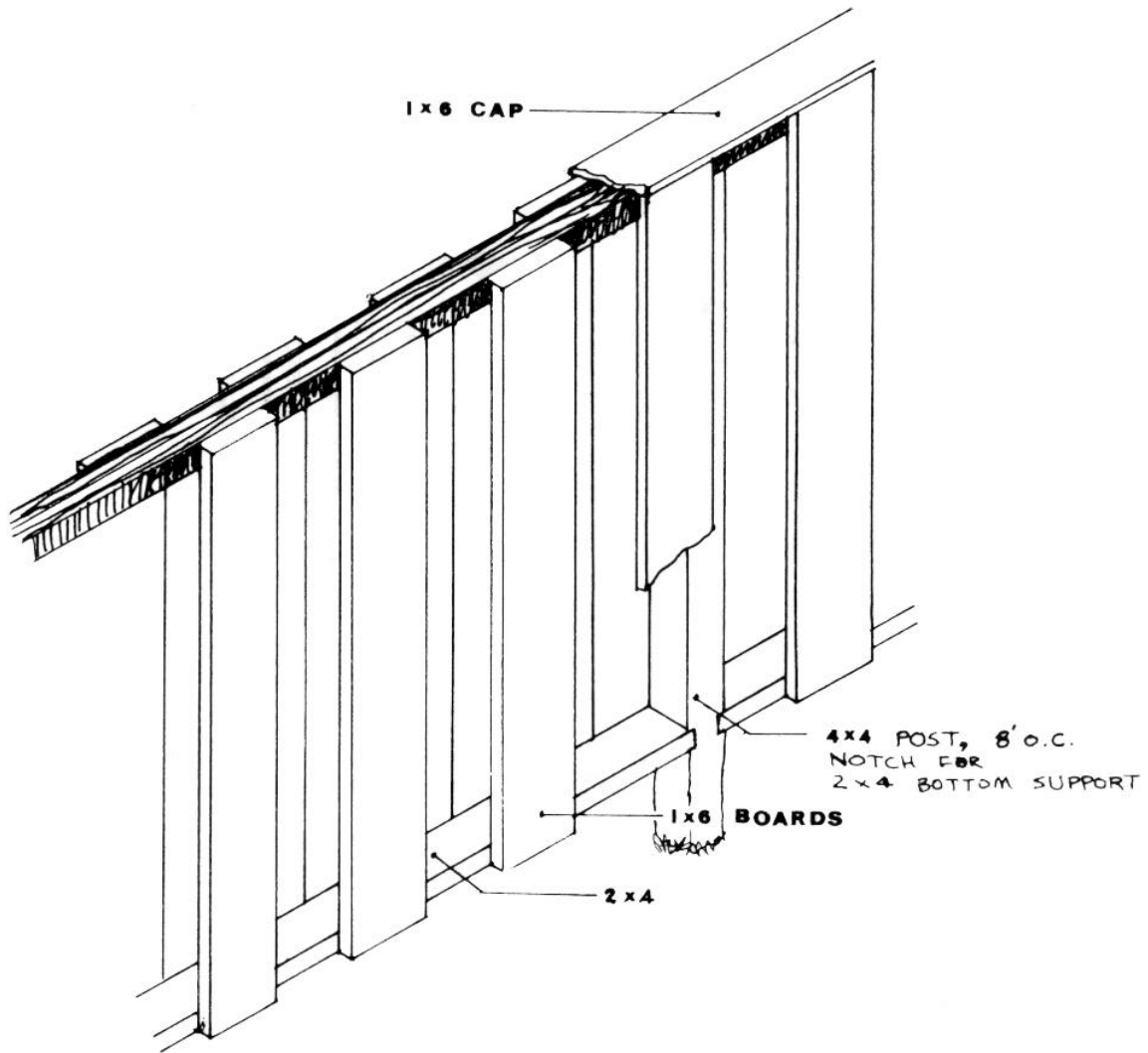


INSTRUCTIONS:

1. Determine height of fence desired. If 5 feet high, set posts in ground 2 feet, if 6 feet, set poles 2 1/2 feet, and if 8 feet, set poles 3 feet. Cut posts to length needed.
2. Dig holes to correct depth. Set posts in place and fill and tamp or set posts in concrete.
3. Cut notches for bottom 2 x 4 supports.
4. Nail 2 x 4 supports to posts. Upper supports are spliced on top of posts.
5. Nail 1 x 6 boards to 2 x 4 supports, alternating sides.
6. Nail 1 x 6 cap to 2 x 4 support.
7. Sand and paint.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



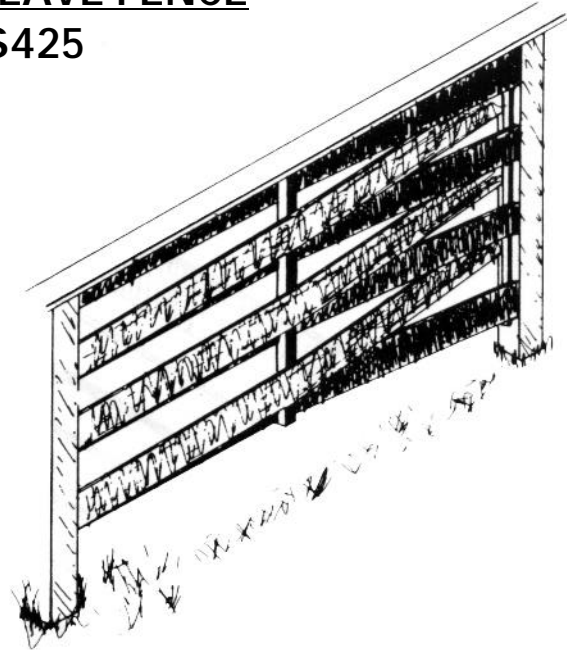
BASKET WEAVE FENCE WS425

MATERIALS NEEDED:

4 x 4, 1 x 2, 1 x 4, and 1/2 x 6 lumber (actual sizes may be 1/2" less)
6d and 8d galvanized box nails

TOOLS NEEDED:

Saw
Hammer
Shovel or post hole digger
Tramping rod
Sandpaper
Exterior paint

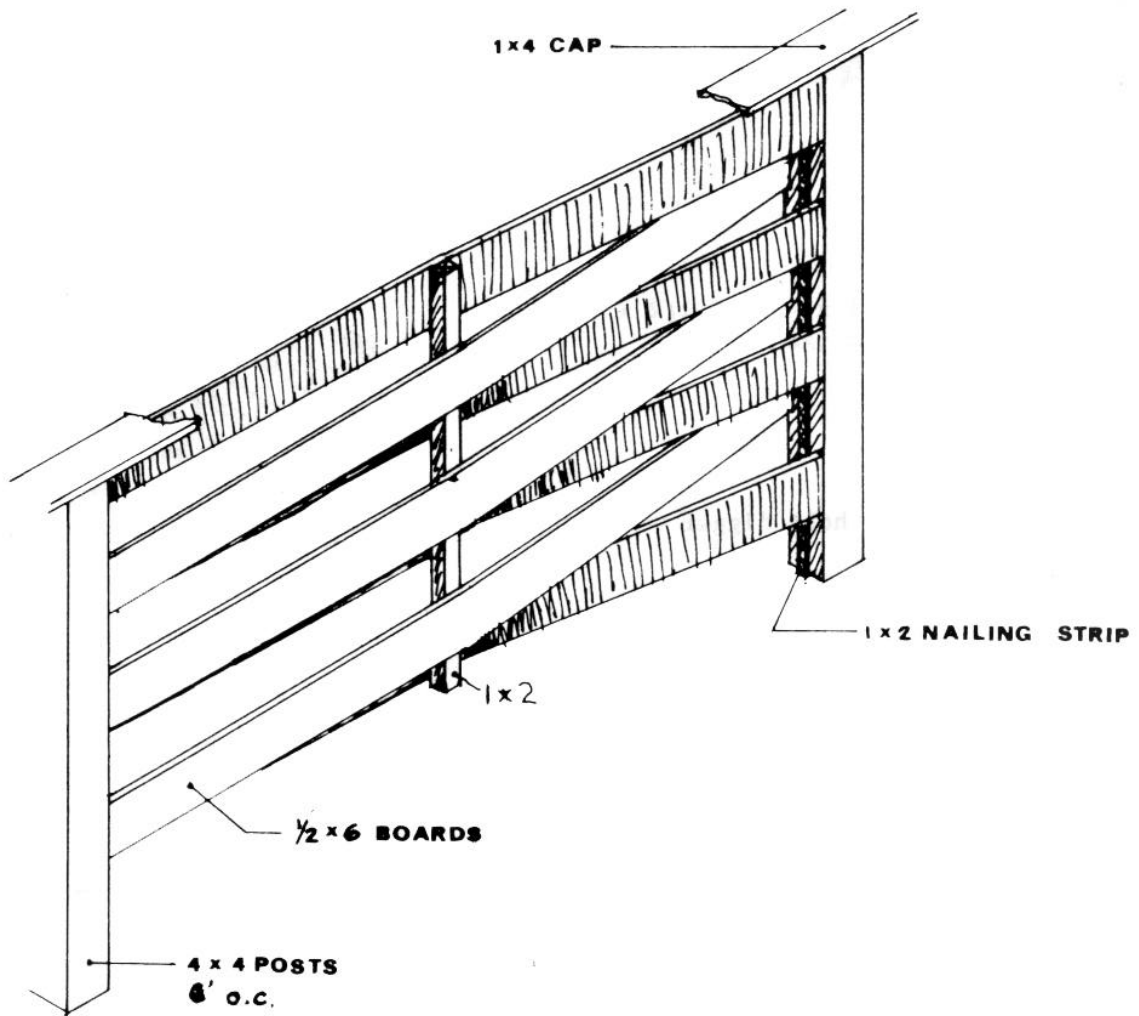


INSTRUCTIONS:

1. Determine height of fence desired. If 5 feet high, set poles 2 feet in ground, if 6 feet high set poles 2 1/2 feet, and if 8 feet or over set poles 3 feet. Cut poles to length.
2. Dig holes to correct depth, 6 feet on center and set poles in ground. Fill with dirt and tramp or set in concrete, be sure poles are set straight.
3. Nail 1 x 2 nailing strips to posts.
4. Start with top board and nail 1 1/2 x 6 boards to strips and into posts. Nail to one side at one end and on the opposite side at the other end. Reverse sides on the next board.
5. Wedge 1 x 2 strip between boards about midway between posts as shown. Nail in one or two boards.
6. Nail 1 x 4 cap to posts.
7. Sand and paint.



Ky 4-H Wood Science Plans - Level 4





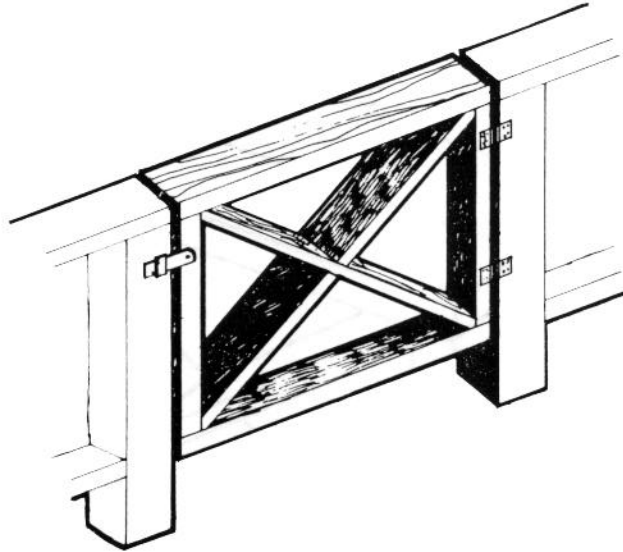
X-SUPPORT YARD GATE WS426

MATERIALS NEEDED:

2 x 4 lumber (actual
sizes may be 1/2" less)
8d common nails (galvanized)
2 heavy duty hinges (rust proof
with screws)

TOOLS NEEDED:

Saw
Hammer
Chisel
Screwdriver
Sandpaper
Exterior paint

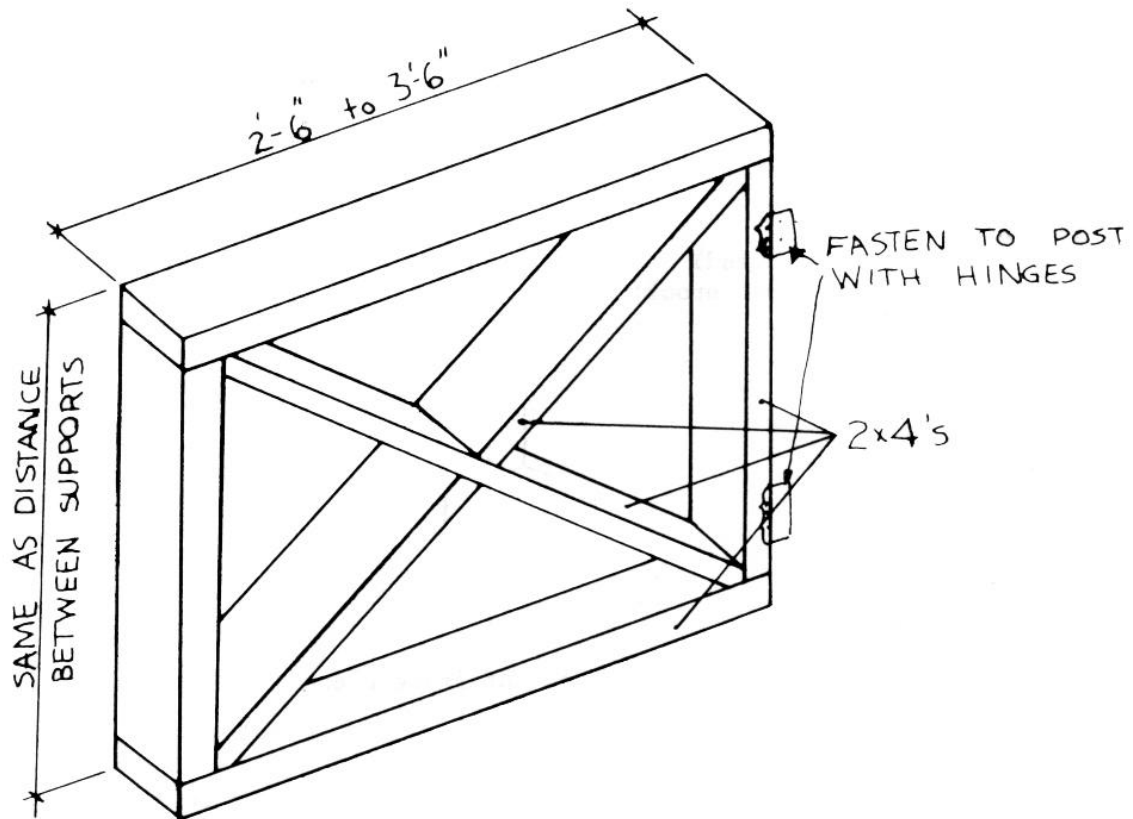


INSTRUCTIONS:

1. Determine size of gate desired and cut frame pieces to size.
2. Nail frame together.
3. Lay a piece of 2 x 4 on edge on the ground and set gate on it so that 2 x 4 piece goes from corner to corner. Mark for angles and cut. Cut another piece the same size using the first one as a pattern.
4. Set both pieces into frame and mark where they cross on each other. Notch out at the angle marked halfway into each piece so that they fit together to make "X". Nail together at the point where they cross.
5. Nail cross into frame.
6. Sand and paint.
7. Fasten gate to post with hinges.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



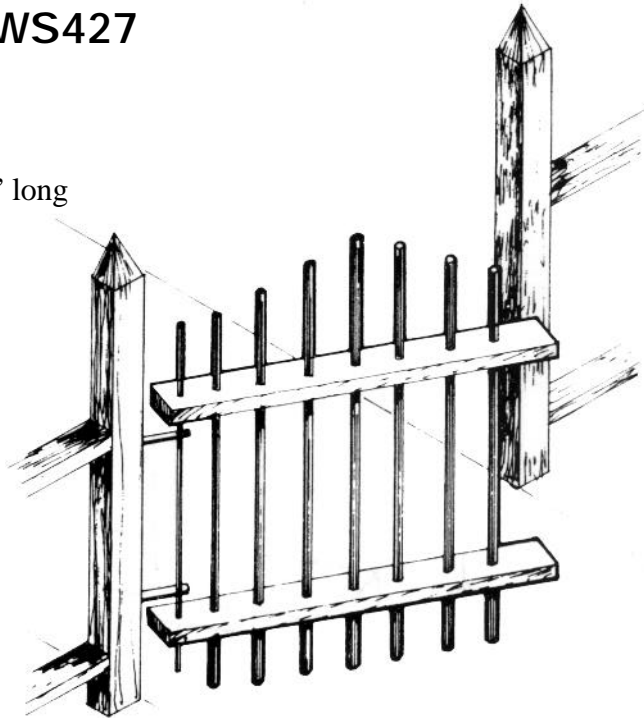
DOWEL YARDGATE WS427

MATERIALS NEEDED

2 pieces wood 2 x 4 , 2 feet 6" to 3 feet 6" long
(actual sizes may be 1/2" less)
7 pieces 1" dowel, about 4 feet long
Waterproof glue
8d galvanized finishing nails

TOOLS NEEDED:

Saw
Hammer
Drill with 1" bit
Sandpaper
Exterior paint

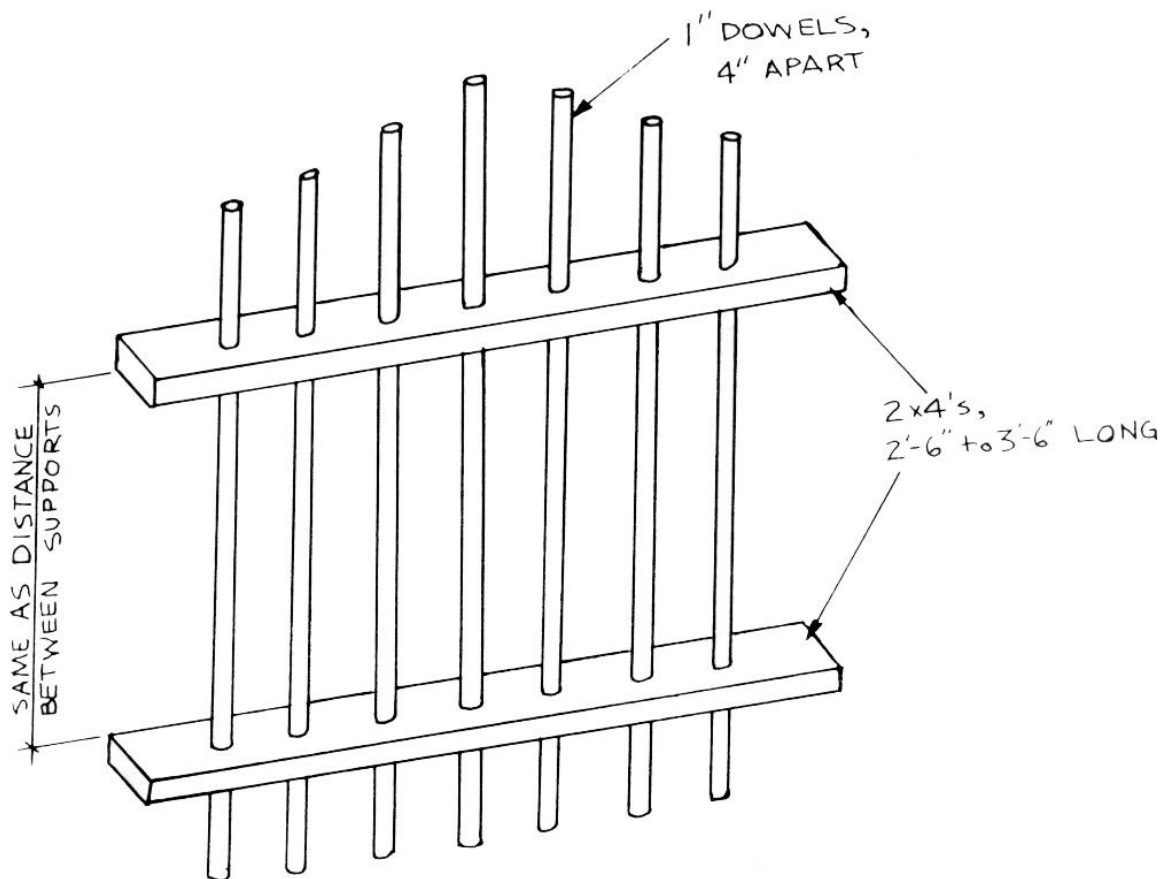


INSTRUCTIONS:

1. Cut 2 x 4's to length desired. Cut dowels to lengths desired.
2. Drill 1" holes in 2 x 4's.
3. Glue dowels into 2 x 4's and put one nail through edge into each dowel.
4. Sand and paint.
5. Hang by any method desired.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



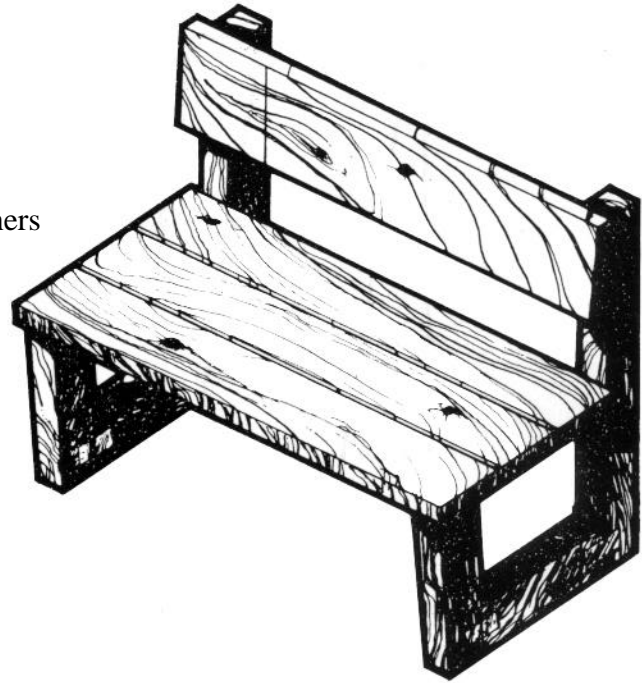
PATIO BENCH WS428

MATERIALS NEEDED:

2 x 4 stock lumber
3 pieces wood 2 x 6 x 48" to 60" long
1 piece wood 2 x 10 x 48" to 60" long
16 pieces 1/8" x 1 1/2" x 3" steel plates
16 – 1/4" x 4" hex bolts with nuts and washers
16d galvanized common nails

TOOLS NEEDED:

Table saw
Drill with 1/4" bit
Wrench to fit bolts
Hammer
Sandpaper
Exterior paint or varnish

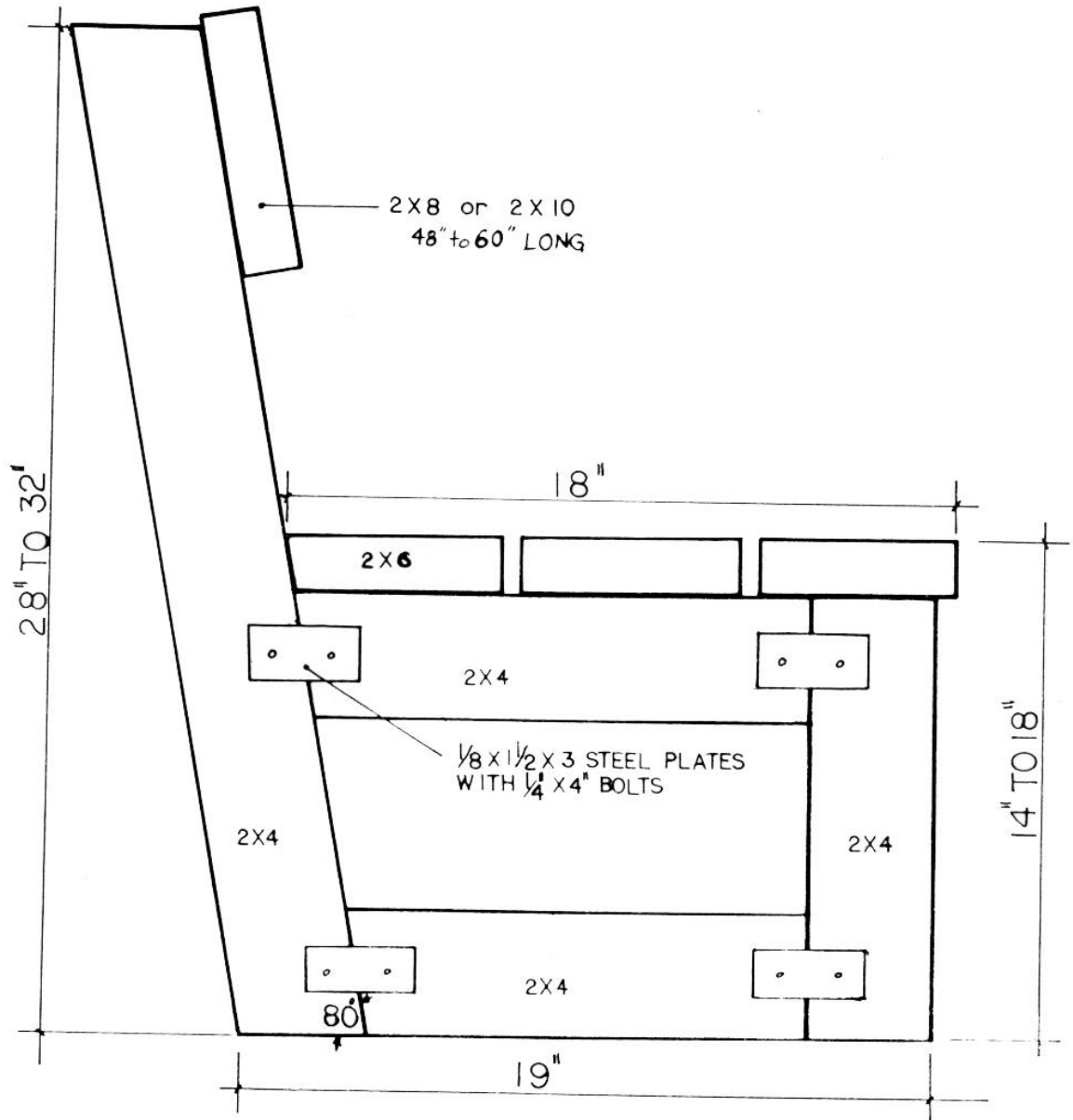


INSTRUCTIONS:

1. Determine height of bench desired and cut two pieces for front and two pieces for back supports. On the back supports, cut off at 80° angle. The front pieces are square on both ends.
2. Lay one of each on the ground 19" apart at the bottom (outside to outside). Lay 2 x 4 stock across at bottom and mark off at 80° angle. Do the same for top piece. After these are cut, use them as pattern for the two remaining pieces.
3. Drill 1/4" holes in metal plates.
4. Lay out and frame pieces on ground in position and lay metal plates in place. Drill 1/4" holes through 2 x 4 frame members. Do the same for the other set of frame pieces. Fasten frame together with 1/4" bolts through plates and frame members. There should be a plate on both inside and outside at each joint.
5. Set ends up and lay 2 x 6's across, overlapping about 4" at each end. Nail in place with 16d nails.
6. Lay seat backwards and lay 2 x 10 across, overlapping about 4" at each end. Nail in place with 16d nails.
7. Sand and finish.



Ky 4-H Wood Science Plans - Level 4



Ky 4-H Wood Science Plans - Level 4



TABLE-DESK WS429

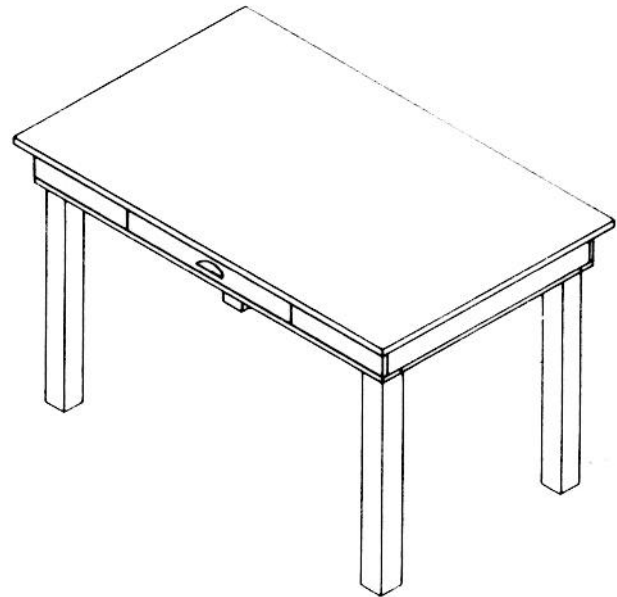
MATERIALS NEEDED:

Note: actual wood dimensions may be 1/2" less)

- 4 pieces wood 1" x 8" x 48"
- 1 piece wood 1" x 4" x 45"
- 2 pieces wood 1" x 4" x 12"
- 4 pieces wood 1" x 4" x 24 1/2"
- 2 pieces wood 1" x 2" x 45"
- 4 pieces wood 3" x 3" x 29"
- 4 pieces wood 1" x 2" x 24 1/2"
- 1 piece wood 1" x 4" x 20 7/8" – rip to 3 7/16" wide
- 2 pieces wood 1/2" x 4" x 22 1/4" – rip to 3 3/16" wide
- 1 piece wood 1/2" x 4" x 20" – rip to 3 3/16" wide
- 1 piece 1/4" plywood, 20 7/8" x 22 1/4"
- Knob or handle
- Glue
- 6d finishing nails
- Wood filler

TOOLS NEEDED:

- Table saw
- Band saw
- Hammer
- Nail set
- Bar clamps
- Sandpaper
- Stain and varnish



INSTRUCTIONS:

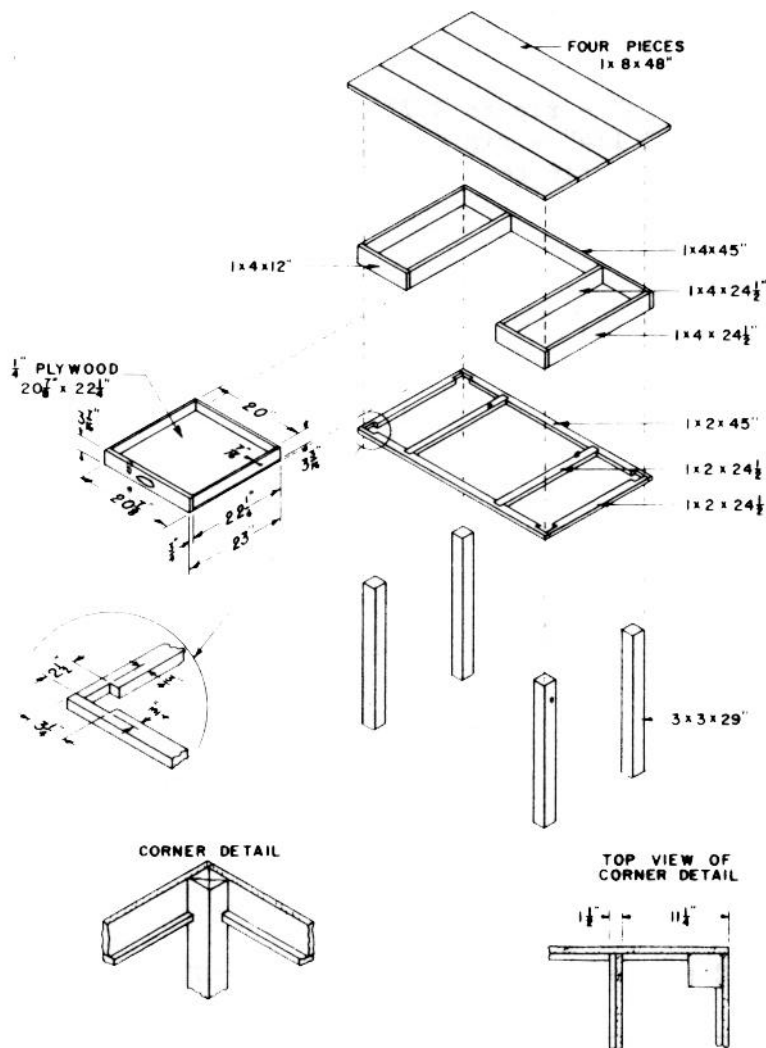
1. Cut pieces to size.
2. Glue top pieces together and clamp.
3. Glue and nail 1 x 4 frame together as shown.
4. Cut notches in 1 x 2 pieces or frame where shown. Glue and nail 1 x 2 frame together.
5. Glue and nail sides of drawer to back of drawer. Glue and nail to bottom of drawer. Glue and nail front of drawer in place. Add knob or handle of some type.
6. Glue and nail 1 x 4 frame to 1 x 2 frame as shown.
7. Glue and nail legs to frame.
8. From 1/2" scrap, cut two pieces about 3/4" x 3/4" and glue and nail to frame for drawer stops about 3" from back edge of frame.



Ky 4-H Wood Science Plans - Level 4



9. Glue and nail top to frame.
10. Set all nails and fill with wood filler.
11. Sand and finish desk and drawer.



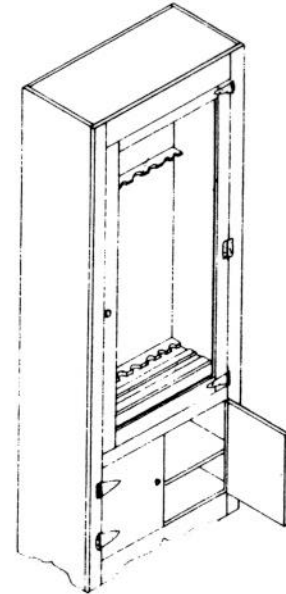
Ky 4-H Wood Science Plans - Level 4



GUN CABINET WS430

MATERIALS NEEDED:

- 1 piece wood 3/4" x width desired x 72" – back
- 2 pieces wood 3/4" x 11 3/4" x 72" – sides
- 4 pieces wood 3/4" x 11" x length needed – top, shelves and bottom
- 1 piece wood 3/4" x 3 3/4" x length needed – butt spacer
- 1 piece wood 3/4" x 3" x length needed – barrel spacer
- 2 pieces wood 1/2" x 2" x length needed – butt rests
- 2 pieces wood 3/4" x 3" x 72" – front side pieces
- 3 pieces wood 3/4" x 4" x length needed – front cross pieces (top, middle and bottom)
- 2 pieces wood 3/4" x 2 1/8" x 44" – glass frame sides
- 1 piece wood 3/4" x 3 3/4" x length needed – glass frame top
- 1 piece wood 3/4" x 4" x length needed – glass frame bottom
- 2 pieces wood 3/4" x width needed x 16" – bottom doors
- 1 piece glass 1/8" thick, 37 1/4" x width between inside edges of glass frame +1"
- 4d and 6d finishing nails
- 3/4" brads
- Hinges and door locks, with screws
- Rubber matting
- Wood filler



TOOLS NEEDED:

- Table saw
- Band saw
- Hammer
- Nail set
- Screwdriver
- Assorted clamps (bar, "C", hand-screw)
- Sandpaper
- Stain and/or varnish

INSTRUCTIONS:

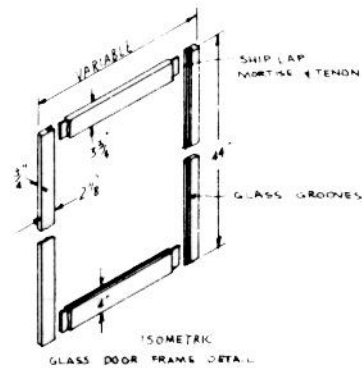
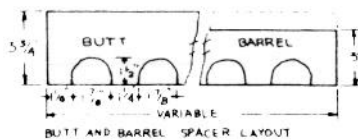
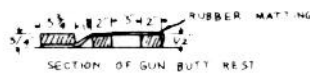
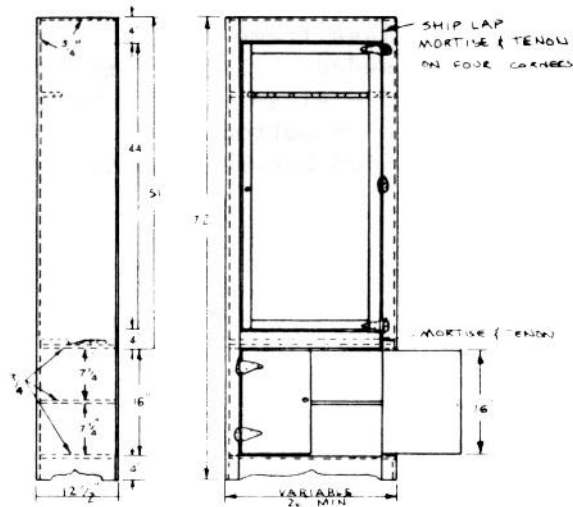
1. Cut pieces to sizes on material list. Cut curves on sides and front bottom cross piece. Cut notches in butt and barrel spacers.
2. Glue and nail sides to back with 6d nails.
3. Glue and nail top, shelves and bottom in place with 6d nails.
4. Glue and nail barrel and butt spacers and butt rests in place with 4d nails.
5. Cut mortises in side pieces and tenons on cross pieces (top, middle and bottom) of front frame. Glue frame together and clamp. Let dry.



Ky 4-H Wood Science Plans - Level 4



6. Glue and nail front frame in place with 6d nails.
7. Cut mortises and tenons on glass frame pieces. Cut glass grooves, 1/8" wide x 1/2" deep, in frame pieces. Glue and nail bottom piece to sides with 3/4" brads. Slide glass in place. Glue and nail top piece to frame with 3/4" brads.
8. Fasten doors (at bottom) and glass door to front with hinges. Add door locks.
9. Set all nails and fill with wood filler.
10. Sand and finish.





LAWN CHAIR WS431

MATERIALS NEEDED:

Note: actual wood sizes may be 1/2" less

2 pieces wood 1" x 4" x 21 1/4" – legs

2 pieces wood 1" x 6" x 37" – legs

1 piece wood 1" x 6" x 23 1/2" – front apron

9 pieces wood 1" x 2" x 22" – seat slats

2 pieces wood 1" x 8" x 26" – arms

7 pieces wood 1" x 3" x 34" – back slats

1 piece wood 1" x 3" x 20 1/2" – lower back support

1 piece wood 2" x 2" x 26 1/2" – upper back supports

1 piece wood 1" x 6" x 6" – arms support

#10 x 1 1/2" flathead wood screws

Glue

TOOLS NEEDED:

Table saw

Drill with 1/8" bit and countersink bit

Screwdriver

Sandpaper

Exterior paint or varnish

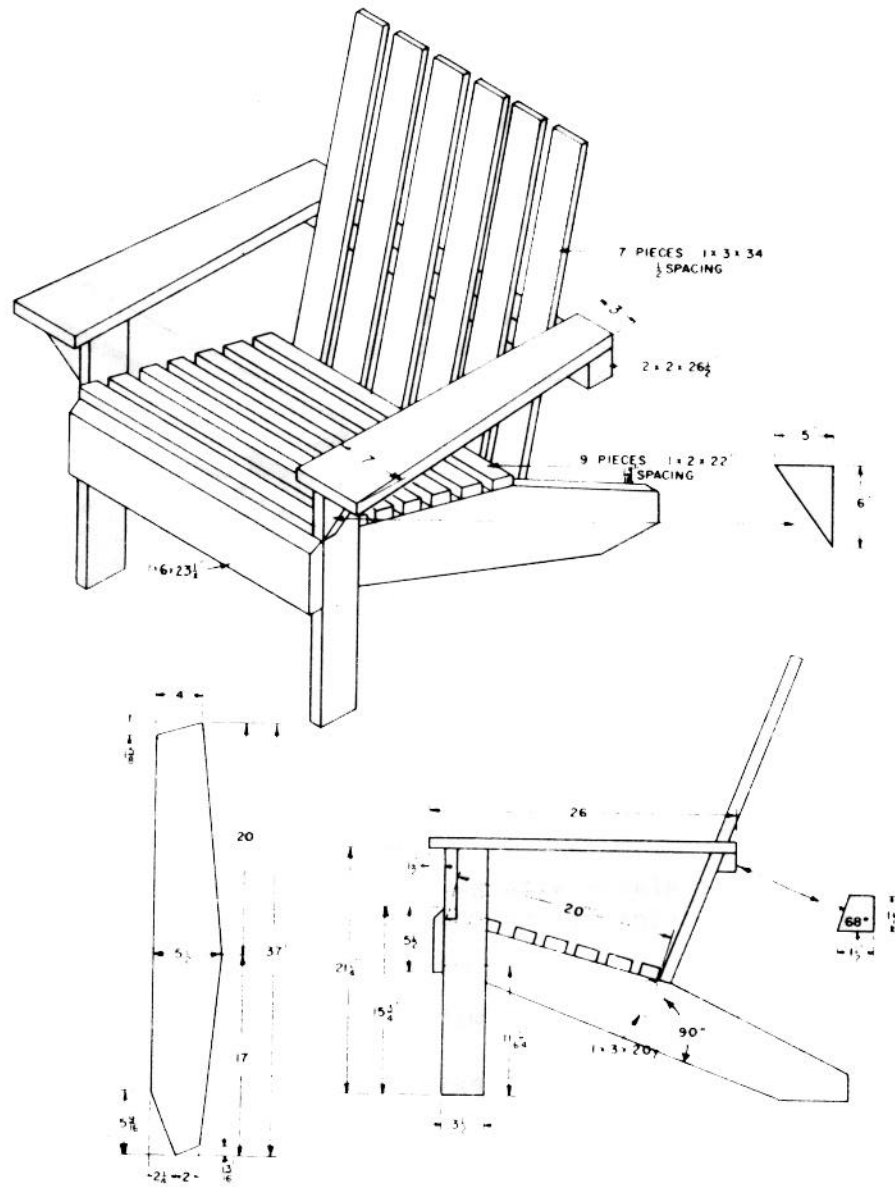


INSTRUCTIONS:

1. Cut pieces to size and shape.
2. Fasten leg uprights to slants with glue and No. 10 screws. Drill 1/8" pilot holes and countersink before inserting screws. This should be done for all screws.
3. Fasten the front apron to the legs with glue and No. 10 screws.
4. Fasten lower back support between legs as shown with glue and No. 10 screws.
5. Fasten arm supports to leg uprights with glue and No. 10 screws.
6. Fasten seat slats to leg assembly with glue and No. 10 screws.
7. Fasten arms to leg uprights and arm supports with glue and No. 10 screws.
8. Fasten upper back support to arms with glue and No. 10 screws.
9. Fasten back slats to back supports with glue and No. 10 screws.
10. Sand and finish.



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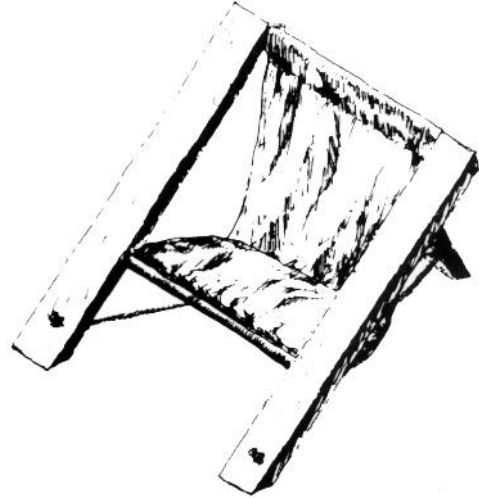


DECK CHAIR WS432

MATERIALS NEEDED:

Note: actual wood sizes may be 1/2" less

2 pieces wood 2 x 4 x 28 1/4"
1 piece wood 1 x 4 x 21"
1 piece 1 1/4" dowel, 17" long
2 pieces 3/4" dowel, 6 1/2" long
1 piece 3/4" dowel, 24" long
2 pieces 1/4" dowel, 1 1/4" long
6 feet nylon rope, 1/4" diameter
40" canvas, 24" wide
2 - #10 x 2" flathead wood screws
Glue



TOOLS NEEDED:

Table saw
Drill with 1/4", 3/8", and 13/16" bits
Sandpaper
Paint or stain and varnish (exterior)

INSTRUCTIONS:

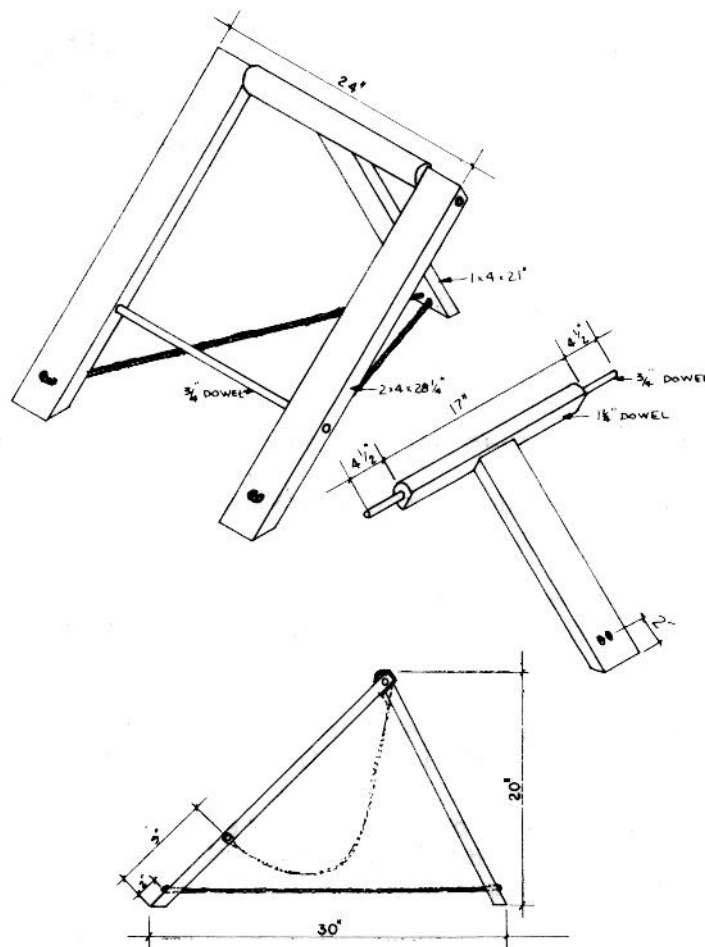
1. Cut pieces to size. Cut a flat surface on the 1 1/4" dowel.
2. Drill 3/4" holes into the ends of the 1 1/4" dowel, 2" deep. Glue the 3/4" dowels, 6 1/2" long into each end.
3. Drill 13/16" holes near one end of the 28 1/4" long 2 x 4's. They should be about 1" in from the end. Drill 3/4" holes up from the other ends about 9".
4. Glue and fasten the 1 x 4 x 21" piece to the flat side of the 1 1/4" dowel with No. 10 screws. Drill 1/8" pilot holes and countersink first.
5. Drill 3/8" holes about 2" up from the bottom ends of both 2 x 4's and 1 x 4, two holes per piece. The bottom ends of the 2 x 4's are those without the hole one inch from the end.
6. Set the frame together temporarily and drill 1/4" holes through the ends of the 3/4" dowels at the top just outside of the edge of the 2 x 4's, insert 1/4" dowel pins temporarily.
7. Fold rope in half to find center and mark. Stick the rope ends through the holes in the 1 x 4, making sure the mark stays centered between the two holes. Stick the ends of the rope through the other holes. Set ends of frame 30" apart (front of 2 x 4's to back of 1x4). Pull rope taut and tie knots just behind 2 x 4's. Trim off excess rope. Trim edges of 2 x 4's and 1 x 4's to set flat on ground.



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8. Hem canvas into 17" width and make loop at one end. Take 3/4" dowel from lower end of frame and stick through loop. Glue dowel back in place. Pull canvas up to top and cut a 3 3/4" wide x 3 1/2" deep strip out of the middle of the top edge of canvas. Wrap both sides around dowel and stick in place to make loops around dowel.
9. Glue 1/4" dowel pins in place.
10. Sand and finish.





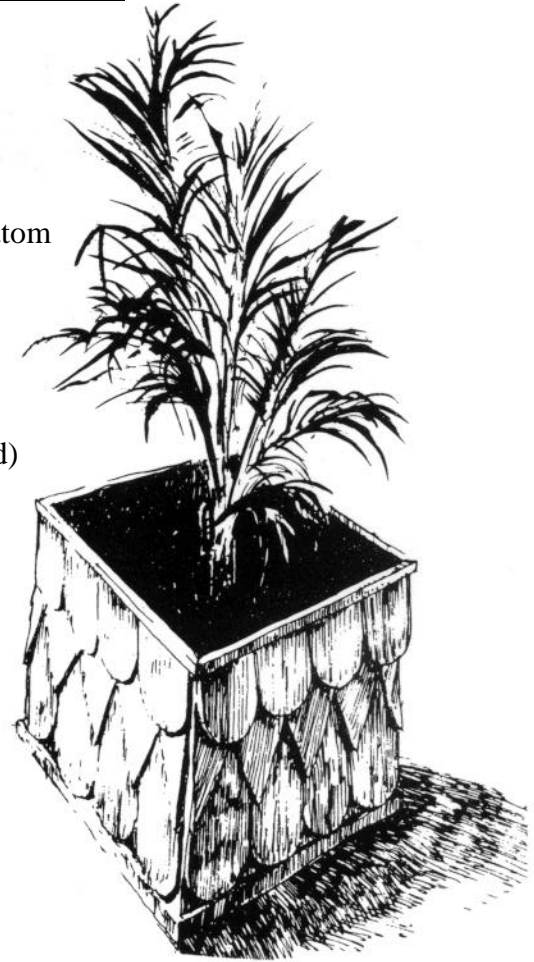
VICTORIAN PLANTER WS433

MATERIALS NEEDED:

4 pieces 5/8" exterior plywood, 23 3/8" x 24" – sides
1 piece 5/8" exterior plywood, 22 3/4" x 22 3/4" – bottom
Note: actual wood sizes may be 1/2" less
4 pieces wood 2" x 2" x 18" – base supports
4 pieces wood 2" x 2" x 20" – corners
4 pieces wood 1" x 2" x 25" – bottom trim strip
4 pieces wood cap string 26 1/4" long
48 – 6" wide cedar shingles (32 half round, 16 pointed)
Waterproof glue
4d and 6d galvanized finishing nails

TOOLS NEEDED:

Tab table saw
Drill with 1/2" bit
Staple gun with 3/4" staples
Hammer
Sandpaper
Waterproof paint
Exterior paint

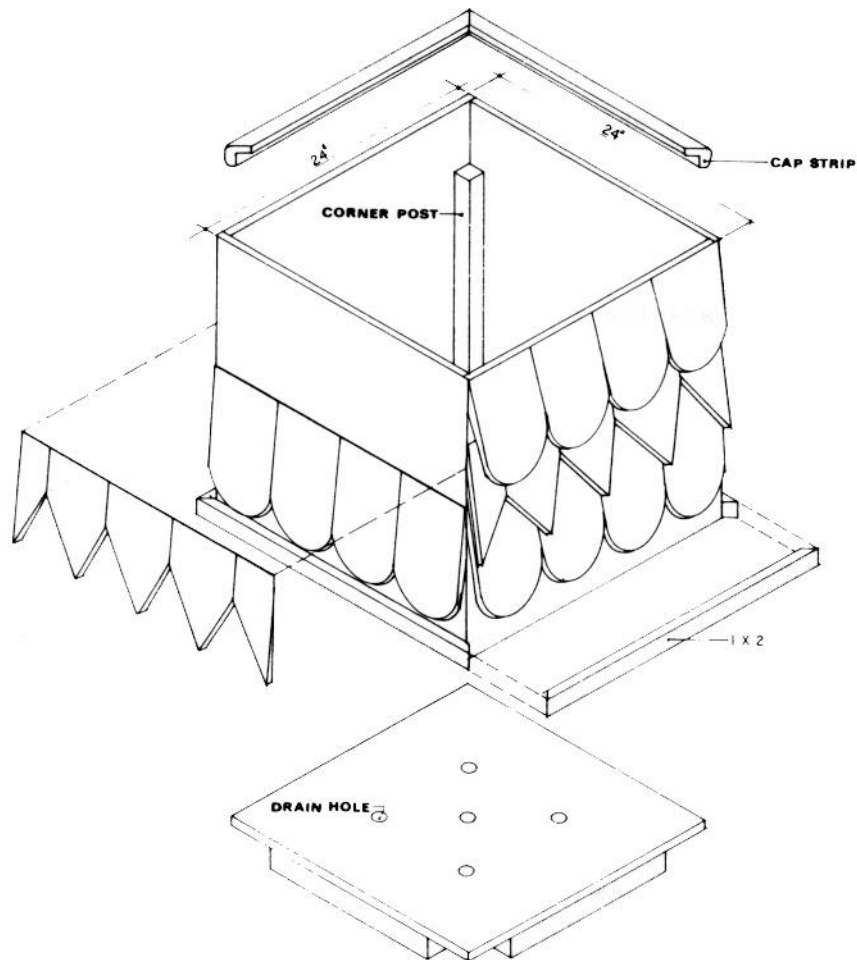
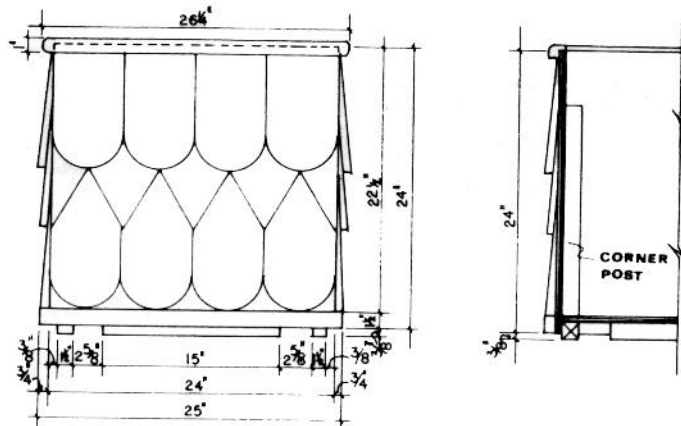


INSTRUCTIONS:

1. Cut pieces to size.
2. Glue and nail base supports to bottom with 6d nails, drill 1/2" drain holes.
3. Glue and nail corners to sides, one corner per side along one edge. Be sure you nail them all along same edge on each side piece. Glue and nail four sides together.
4. Glue and nail box to bottom.
5. Staple shingles to box as shown.
6. Glue and nail 1 x 2 bottom strip and cap strip to box.
7. Sand box, paint outside with exterior paint and inside with waterproof paint.



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TELEPHONE BENCH WS434

MATERIALS NEEDED:

Note: actual wood sizes may be 1/2" less

3 pieces wood 1" x 6" x 60" – bottom

3 pieces wood 1" x 6" x 16" – top

4 pieces wood 1" x 2" x 18" – trim

2 pieces wood 1" x 2" x 61 1/2" – trim

3 pieces 1" dowel, 9" long

4 – 14" legs with hardware (available at hardware, lumber or discount stores)

Glue

4d finishing nails

Wood filler

TOOLS NEEDED:

Table saw

Planer/jointer

Bar clamps

Hammer

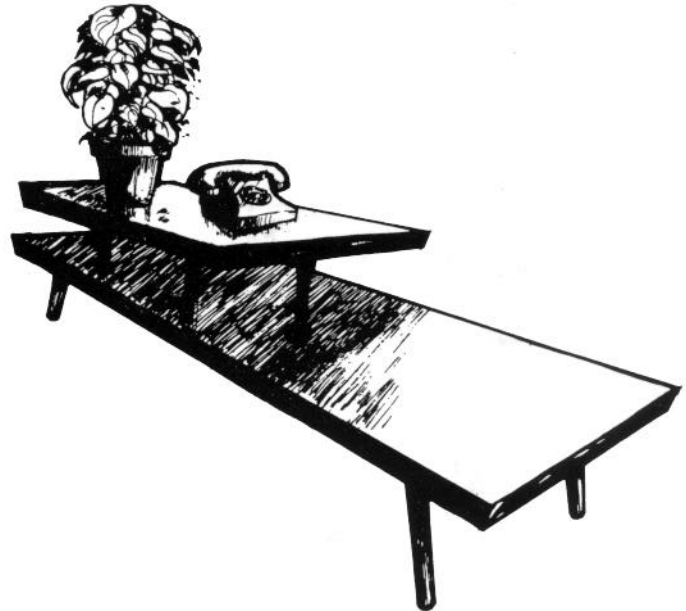
Nail set

Drill with 1" bit

Screwdriver

Sandpaper

Stain and varnish

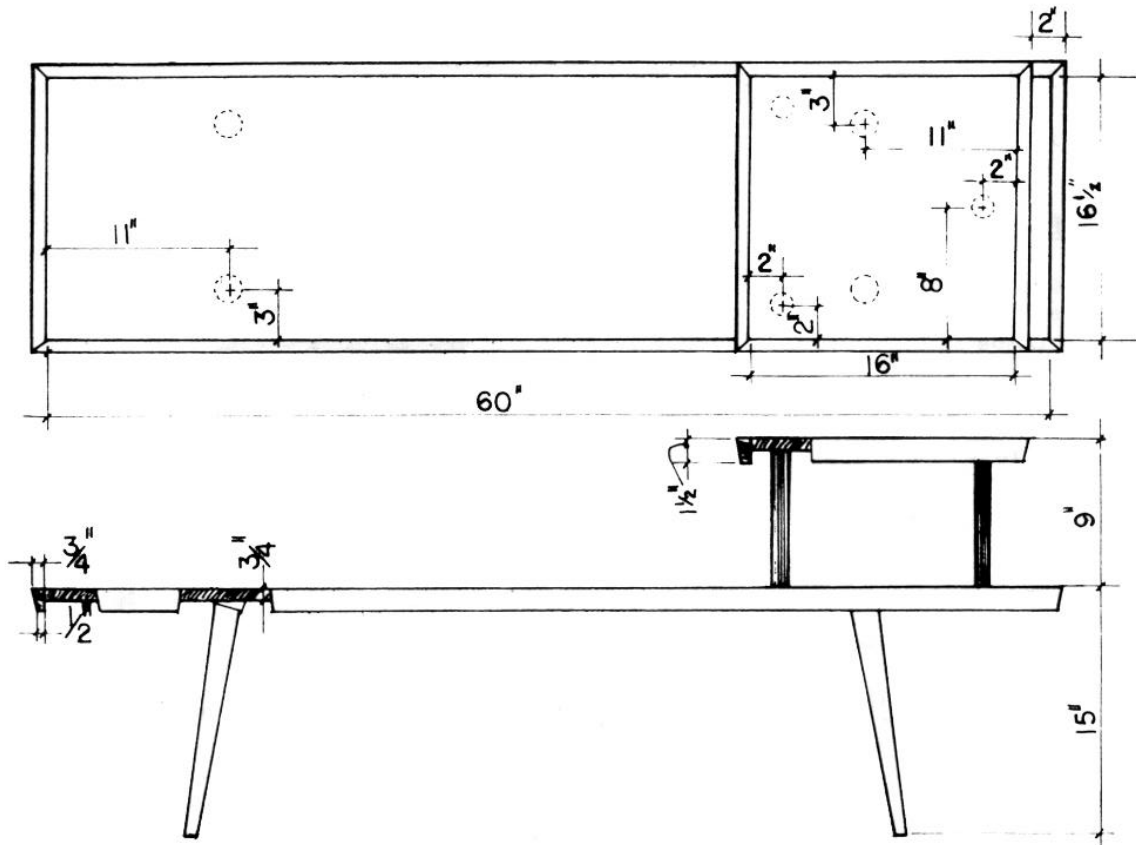


INSTRUCTIONS:

1. Edge glue pieces to make top and bottom. Clamp. Let dry.
2. Plane wide surface of 1 x 2 trim so that one edge is 3/4" and the other is 1/2" as shown on drawing.
3. Drill 1" holes for dowels to connect top and bottom. Glue dowels between top and bottom and put one 4d nail through top into each dowel and the same way up through bottom.
4. Mitre corners of trim. Glue and nail trim to edges of top and bottom.
5. Add legs to bottom.
6. Sand and finish.



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PLANTER WITH GRAVEL TRAY WS435

MATERIALS NEEDED:

PLANTER BOX

Note: actual wood sizes may be 1/2" less

- 2 pieces wood 2 x 4 x 22" – cleats
- 6 pieces wood 2 x 4 x 21 1/2"-bottom
- 4 pieces wood 2 x 4 x 18 1/2" – end braces
- 4 pieces wood 2 x 4 x 21" – side braces
- 4 pieces wood 2 x 4 x 12" – side braces
- 26 pieces wood 2 x 4 x 13 1/2" – sides
(6 per short side, 7 per long side)
- 2 pieces wood 2 x 6 x 27" – top rail
- 2 pieces wood 2 x 6 x 27 1/2" – top rail

GRAVEL TRAY

- 1 piece wood 2 x 4 x 33" – cleat
- 6 pieces wood 2 x 6 x 33" – bottom
- 2 pieces wood 2 x 6 x 33" – sides
- 2 pieces wood 2 x 6 x 36" – sides
- Waterproof glue
- 8d and 16d galvanized box nails



TOOLS NEEDED:

- Table saw
- Band saw
- Hammer
- Drill with 3/4" bit
- Sandpaper
- Waterproof paint
- Exterior paint or varnish

INSTRUCTIONS:

1. Cut pieces to size.
2. Glue and nail bottom pieces of gravel tray to cleat. Use 8d nails.
3. Cut long notches in gravel tray sides and ends. Glue and nail sides to bottom with 8d nails. Glue and nail ends to bottom and between sides with 8d and 16d nails.
4. Glue and nail planter bottom pieces to cleats with 16d nails.



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5. Mitre corners of side brace pieces and glue and nail together with 8d and 16d nails.
6. Glue and nail side braces to end braces with 16d nails.
7. Glue and nail frame to bottom with 16d nails.
8. Glue and nail side pieces to frame (6 on sides where mitered members are, 7 where the two pieces are across) with 8d nails.
9. Mitre corners and glue and nail top rails to box.
10. Drill 3/4" deep holes in both box and tray.
11. Sand and finish.

