DISCLAIMER:

READ BEFORE YOU BEGIN! THESE PLANS ARE INTENDED AS A GUIDE ONLY! READ THESE INSTRUCTIONS COMPLETELY THROUGH ONCE AND UNDERSTAND WHAT IS REQUIRED.

We will not be held responsible for any accidents or injuries anyone may sustain. Builder assumes all risks associated with construction work!

We assume some builder competency in the use of tools, safety and equipment.

If you are unsure of any procedures, please contact a professional. The methods in this plan assume a minimum amount of power tools. Also, if you know of alternate methods of construction, feel free to use them!

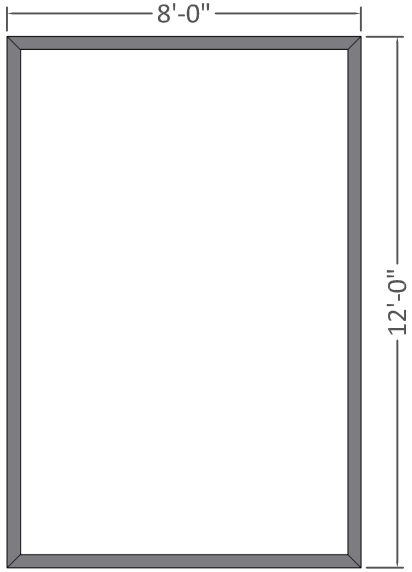
Using other tools to speed the work process is just fine.

Work safely and wear proper safety equipement such as gloves, ear protection and eye protection.

MATERIALS

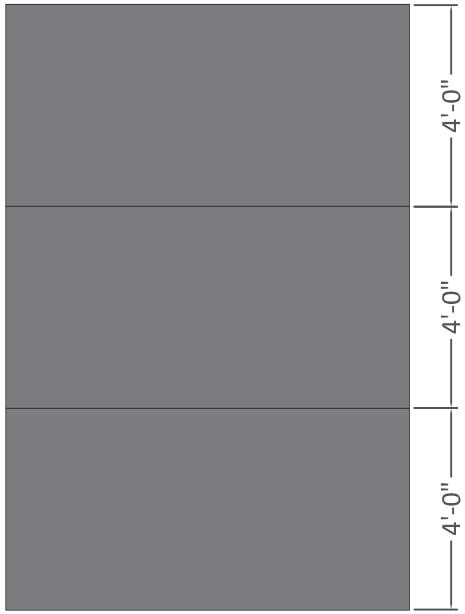
Description	Dimensions	Quantity
2x4 plank	2x4x8'	35
2x4 plank	2x4x6'	16
2x6 plank	2x4x12'	11
2x6 plank	2x4x8'	11
4x4 post	4x4x8'	3
4x4 post	4x4x12'	4
Plywood sheet	4x8x$\frac{3}{4}$"	18
Miscellaneous:		
Roofing		
Truss Plates		50
Veneer, Paint, Siding		
Fence Materials		
Weatherproof Sealant		

To begin, cut 4x4 pressure treated post as dimensioned below. Mitering the ends is NOT required, but we recommend it for a professional-looking finish!



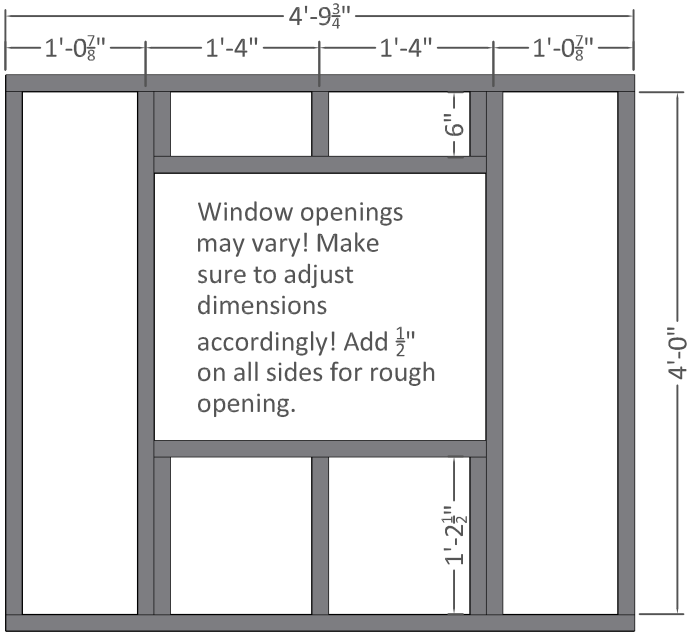
Use 2x4 planks for the floor joists. Just make sure the planks are flush with the top edge for flooring.

For the flooring, lay 3 plywood sheets across the top and attach to the joists with screws. Make sure the joists split the seam of the sheeting.

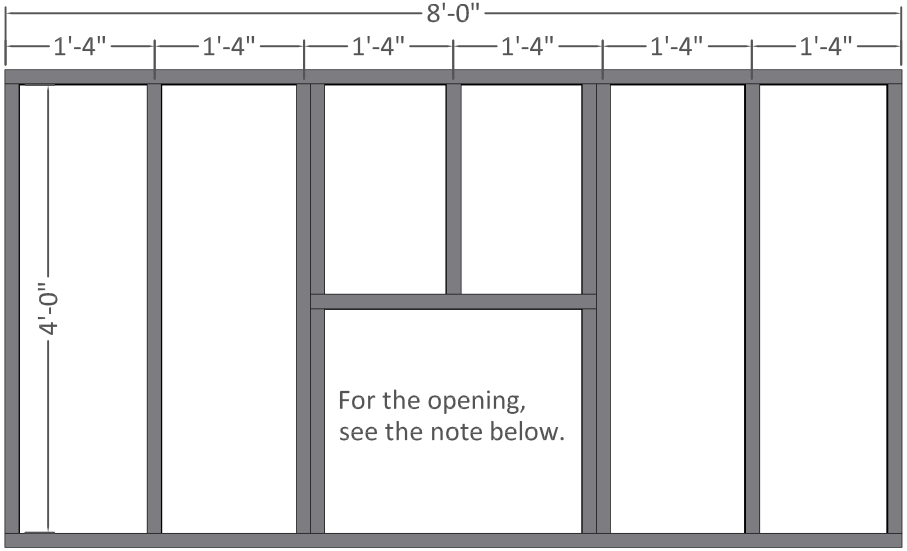


To this point, the floor should look like the diagram below.

For the walls, we recommend you construct the side walls first as they are identical. DO NOT put the walls in place until you have all of the walls constructed and laid in place so you can ensure the walls will come together correctly.

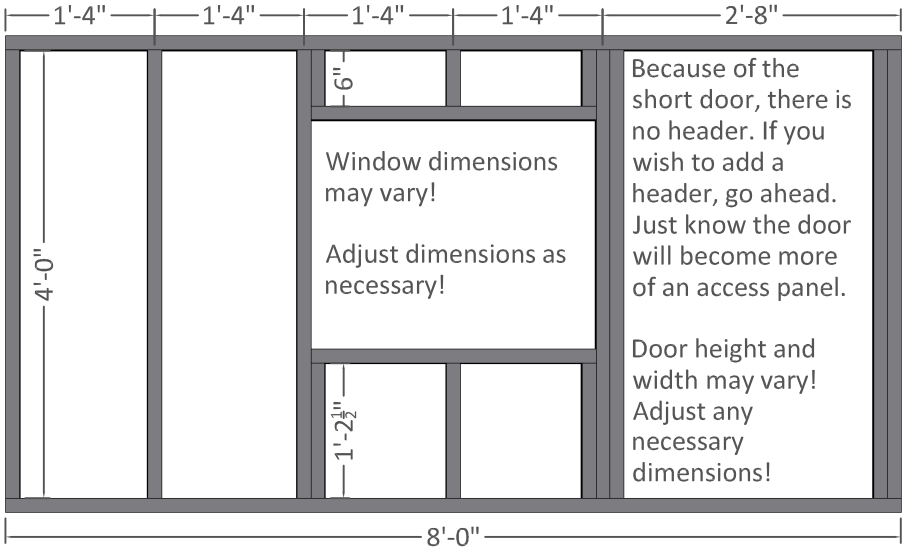


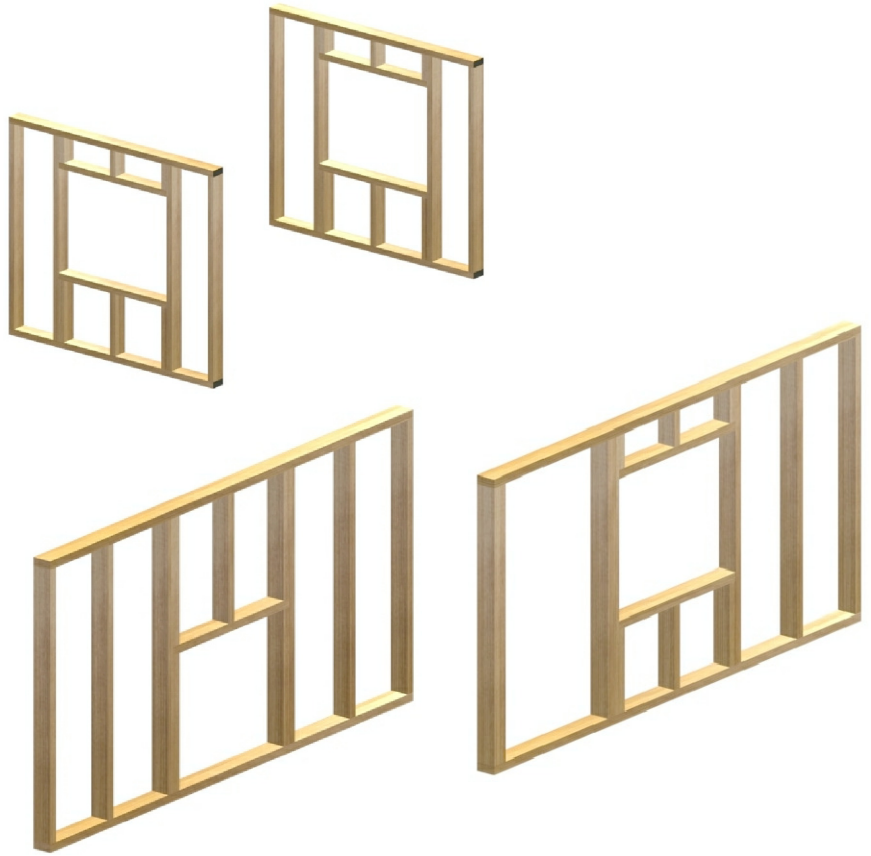
The front wall is constructed as shown below.



Note: We did NOT dimension the door opening or the header plank lengths. You MUST first purchase a pet door that will allow your pet to easily enter and exit. Measure the frame of the pet door and add ½" to all sides for rough opening.

For the rear wall, follow the diagram below and you should not have any problems at all.

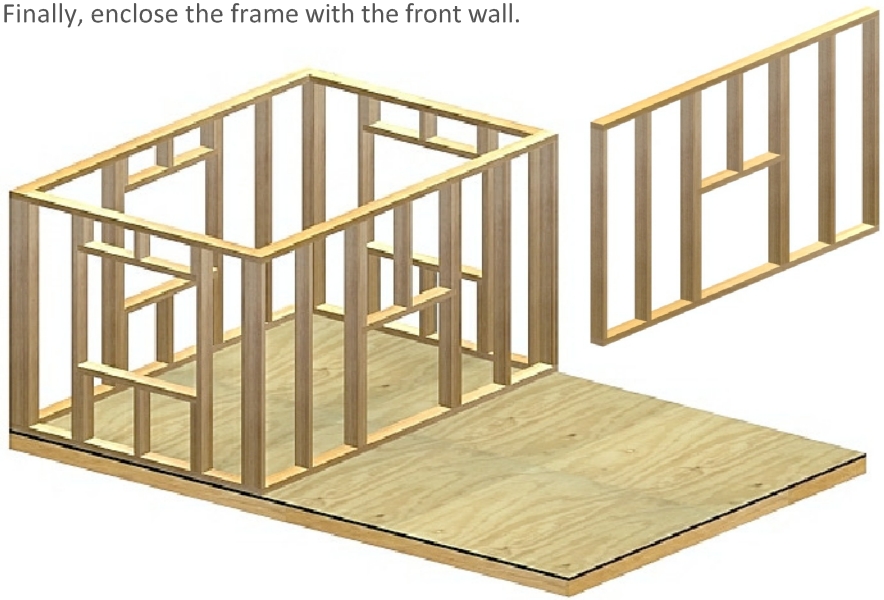




Construct the walls as shown in the diagrams below. Make sure outside edges are flush and the walls are level and square. Start with the rear wall. Attach the rear wall to the base frame. Make sure you screw the base board into the joists below!

Next, attach the side walls in place on both the base floor and attach to the side walls. Make sure your corners are flush!

Finally, enclose the frame with the front wall.

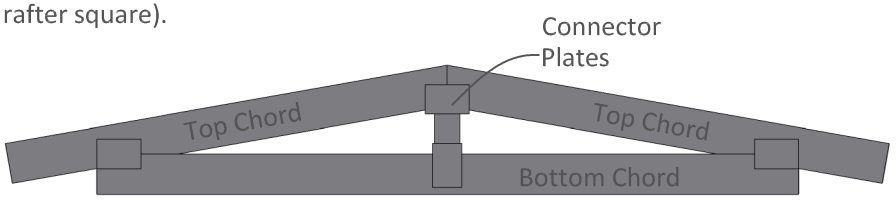


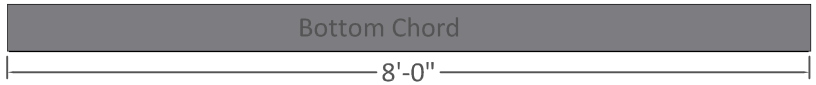
Notes:

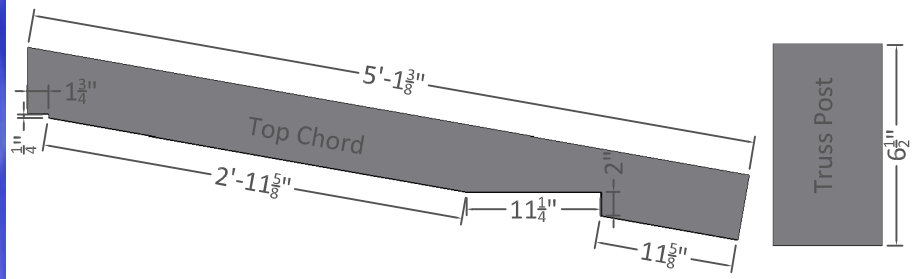
For the roof, you are going to construct some basic rafters. Don't let this scare you, but if you are uncomfortable constructing your own rafters, please consult a professional!

For the rafters, you MUST use at least 2x6 for the bottom chord. We recommend 2x6 for the top chord, but if you live in a warm climate with low snow loads, you MAY opt to use 2x4 for the top chord.

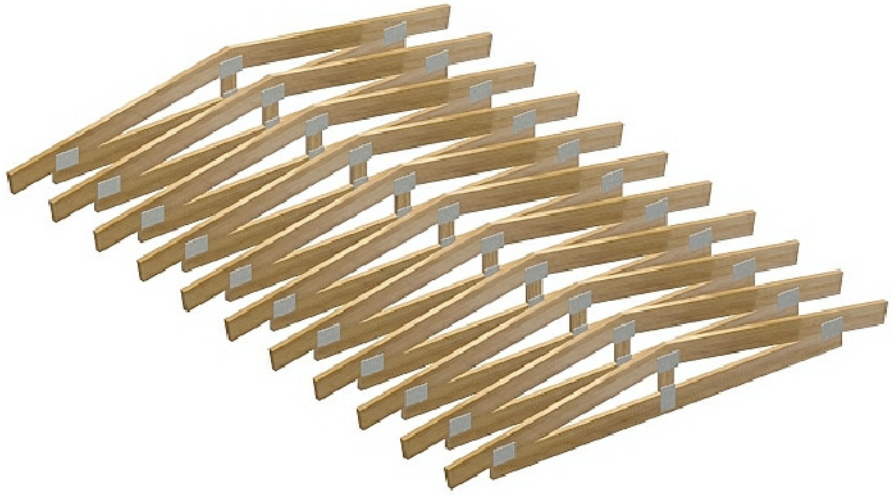
We have also included some basic instructions on constructing and cutting "birds mouths" or "seats" with a speed square or carpenter square (a.k.a rafter square).







You will need to construct 11 of these as shown below.

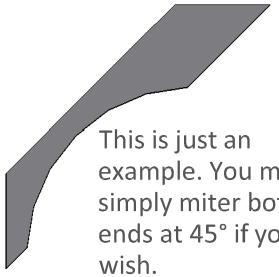


Once you have the rafters constructed, set them aside for a minute and work on the supports for the roof. You will want to either use angle brackets or a post seat to support the posts at the front of the the structure.

Notes:

Now just add the girders on each side to support the open span of the rafters. The girders are 4x4x12' pressure treated post. Make sure the girder runs flush along the top of the side walls and sits squarely on the support posts in the front. Attach the girders to the supports with angle brackets.

If you feel fancy, cut some knee braces and attach them to the outside of the cantilever. The cantilever is the part of the girder that reaches out into open space. Wether or not you choose to use a knee brace, it is a good idea to at least anchor both sides of the girder to the supports with an angle bracket!

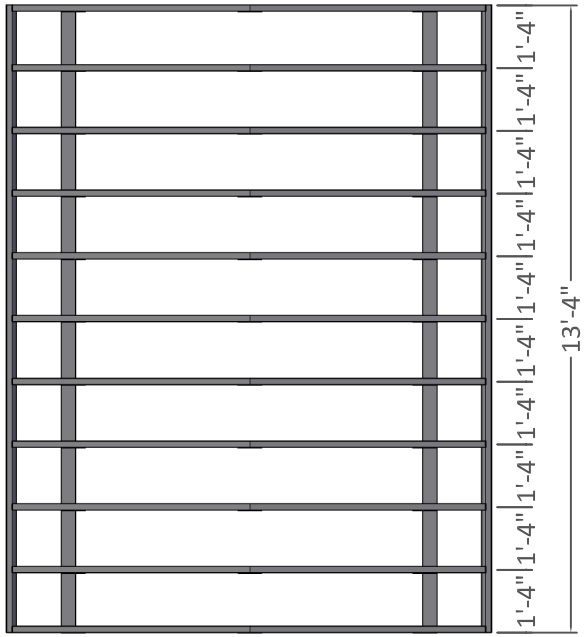


This is just an example. You may simply miter both ends at 45° if you wish.

Notes:

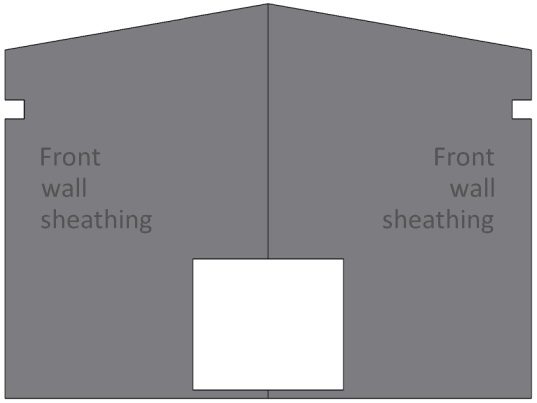
Before you begin setting the trusses in place, we want to take a moment and remind you to be CAREFUL! Falls from even a short height can result in serious injury! Make sure you work with assistance. Do NOT attempt to put the trusses up by yourself. Always work carefully and use any safety equipment necessary such as gloves and eye protection!

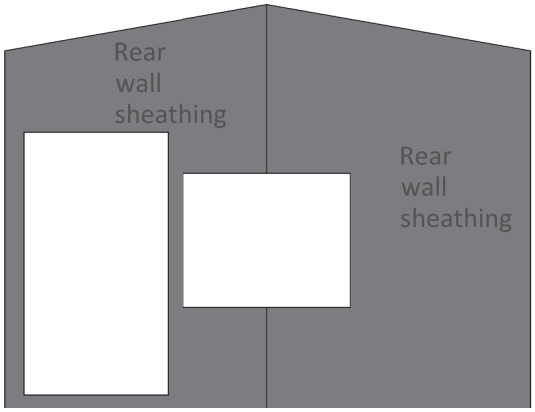
Align the rafters as shown below. We recommend at LEAST a 16" center. Once you have the rafters in place, attach a fascia board to the rafter ends.



For the sheathing and trim, we do not dimension either directly. For the walls, your sheathing will look something like the diagram below, but the openings may be different depending upon door, window, and and pet door openings. You will need to cut a seat out of the front wall sheathing to wrap around the girders.

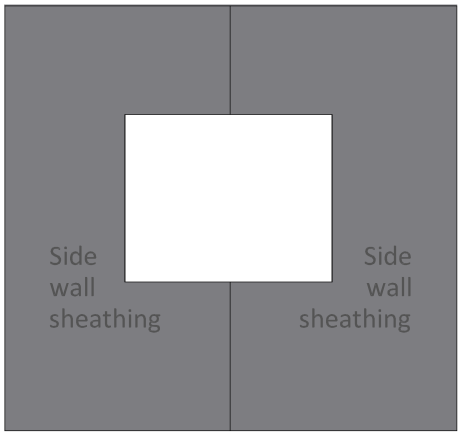
For the front wall sheathing, the only tricky part will be the cut-out that encompasses the girders. Measure carefully and you should not have any problems.



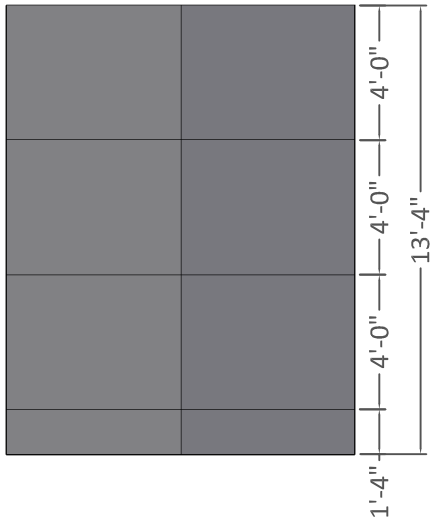


For the rear wall, go ahead and measure the dimensions. You will want assistance so you can mark the location of the door and window and cut them out BEFORE you attach the sheathing to the wall frame.

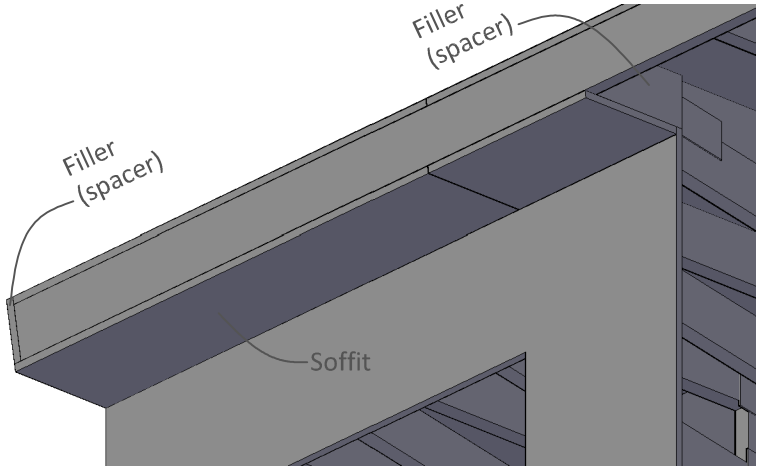
For the side wall sheathing, you should be able to access the inside. If you are good with a circular saw, miter the top of the side wall sheathing to match the pitch of the rafters above.



For the roof sheathing, again please be very careful and work carefully; Especially when working at heights!



Don't forget the soffit (under the overhang) or the filler pieces off the front and rear sheathing.



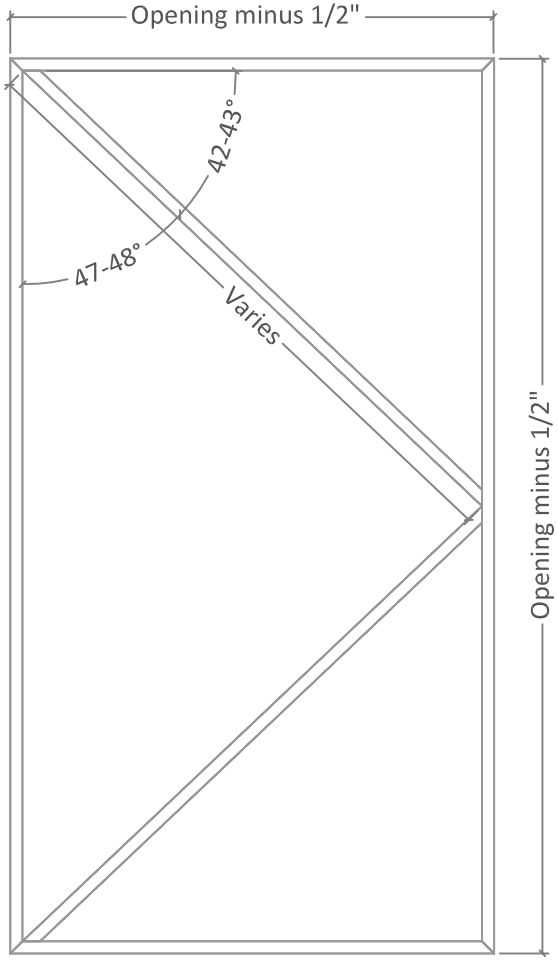
For the door and windows, we recommend you purchase your door and windows BEFORE you begin construction. That way you can measure the rough opening to match the frames. We have included some BASIC instructions on constructing a door and a simple sliding window, but the materials are NOT part of the material list!

Esthetics such as roofing trim, paint or veneers are up to the builder!

The fence for the kennel area is up to the builder!

For the door, construction is relatively simple. If you want to install a latch, that is up to you. We do not show the details because there are special tools involved, most of which the normal person does not have. However, if you DO happen to come across such tools, you will be able to add a doorknob and catch should you desire.

As with the window, this is a very simple door and you do NOT have to construct the door in this way.
If you prefer to purchase a door, make sure the rough opening size is adequate. The frame rough opening in this instance can be anything. Just tweak the dimensions to match your rough opening. **Be sure you subtract $\frac{1}{2}$" from the rough opening to allow for swing!**
1) To begin, we are using 1'4 planks and $\frac{1}{2}$" plywood sheeting. Cut the frame pieces as shown below. You DO NOT have to miter the corners, we just recommend it for aesthetic purposes.



We will show the door in this example with a pattern cut out of the front and back sheeting, but this is not required. It is purely for looks and does not affect the integrity of the door at all.

Before you attach the panel to the door frame, you will want to check the swing in the doorway. We have allowed for $\frac{1}{2}$" swing, but depending on construction methods and accuracy, swing may be affected by as much as 1".

Please ensure the frame will swing in the opening without getting stuck or caught. You should allow more swing once you add the door panels so check after each step to ensure swing is not impeded.

Materials

Description:	Qty:
1x4x6' Planks	5
4x8'x$\frac{1}{2}$" Plywood Sheet	2
Hinges	3

2 Attach the front panel to the door frame, and MAKE SURE THE CORNERS ARE SQUARE and edges are flush. You may even want to sand the corners of the inside swing so they are rounded a little bit.

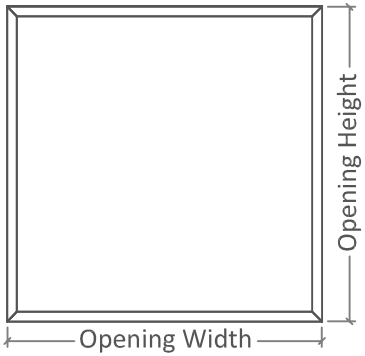
3) Insulate the door with either blow foam or regular R-13 roll insulation will work.

4) Enclose the door with the second panel. You may want to round the edges on this side also.

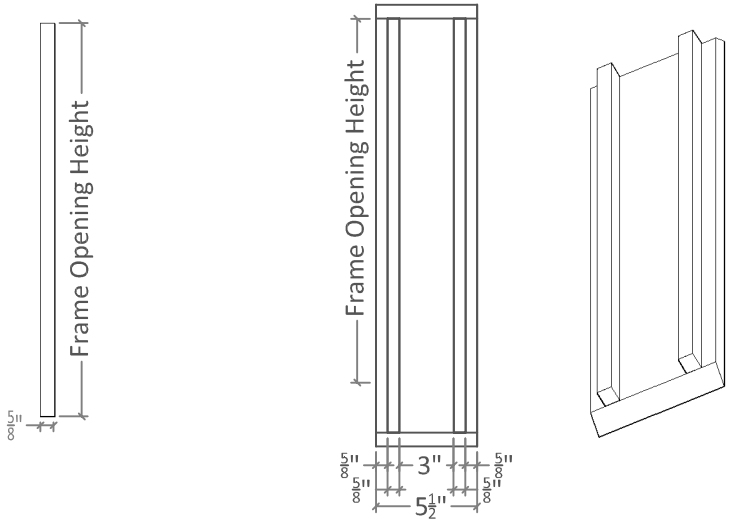
5) A single slide bolt works wonders on the outside and inside to lock the door shut. If you don't want your kids to be able to lock the door, only install the slide bolt on the outside! The slide bolt also offers a grip to pull the door open.

Windows are complicated to design and when at all possible, should be purchased. These details are for a very simple sliding window. You will need, and know how to use, a miter saw, a router (preferably with a guide) or table saw with an adjustable gouging blade (or blade kit, and a square (speed square, carpenter square, either works).

1) Cut and miter 1x6 planks as shown below. DO NOT ASSEMBLE YET!

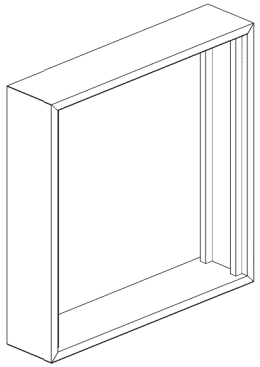


2) Rip a 1x4x8' into strips $\frac{5}{8}$" thick. These will serve many purposes in the future but for now, we just want four of them to match the opening, so either rip and cut one piece or rip an entire board into $\frac{5}{8}$" strips and place the pieces to the side for late.



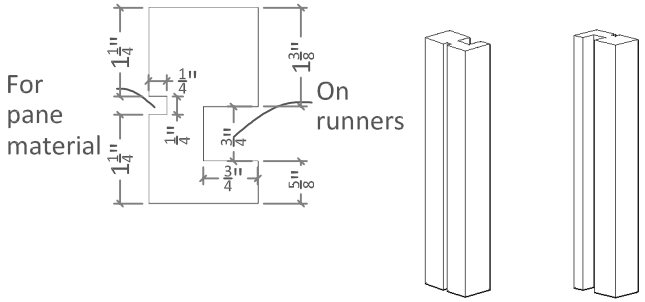
3) Using 1" screws and a level, screw two runners onto one of the exterior frame pieces. Repeat for the second side (see above).

4) Check to make sure the runners will fit inside the frame when assembled. Make any adjustments if necessary. DO NOT ASSEMBLE!

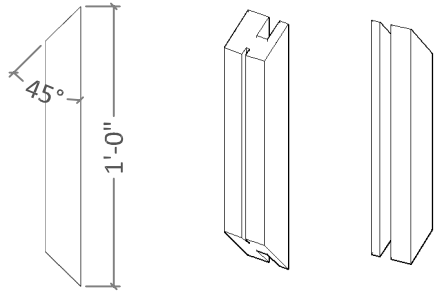


5) Rip a 8'-2x6 down the center lengthwise.

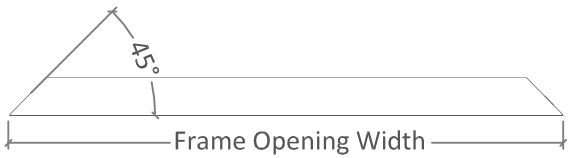
6) Use a router to gouge a $\frac{3}{4}$"x$\frac{3}{4}$" groove down the center of one side. Flip the board over and gouge a $\frac{1}{4}$x$\frac{1}{4}$" groove down the center of the other side (see detail)

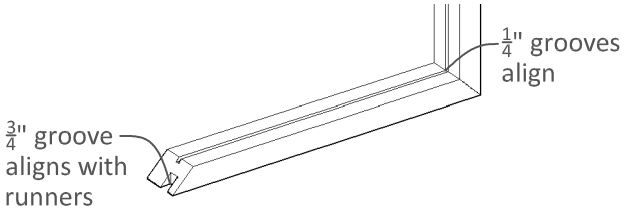


7) Miter the ends. Make sure the narrow ($\frac{1}{4}$x$\frac{1}{4}$") groove is facing inwards! The wide ($\frac{3}{4}$x$\frac{3}{4}$") grooves go out toward the runners, the inside grooves will hold a pane of window material.



8) Rip a 2x6 lengthwise down the middle and miter ends as shown below. Run a $\frac{1}{4}$"x$\frac{1}{4}$" groove down the middle, just as with the 2x6 above. Hold them together and MAKE SURE THE GROOVES ALIGN PROPERLY! You will need to gouge a $\frac{3}{4}$x$\frac{3}{4}$" groove out of the ends.





Materials

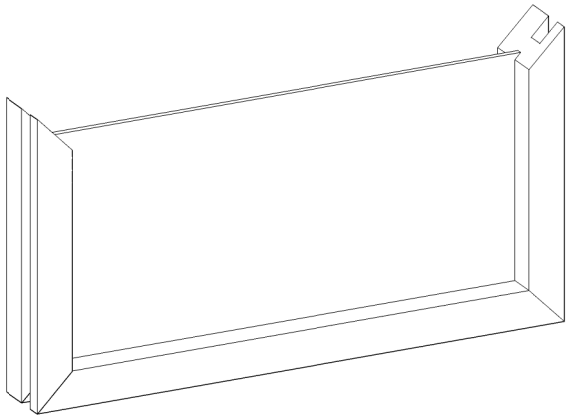
Description:	Qty:
2x6x6' Planks	24
1x6x8' Planks	6
1x4x8' Planks	6

9) Lastly, before construction, you will need to determine what type of pane material you want to use. For a playhouse, we would recommend against using glass and go with clear acrylic or polyvinyl pane.

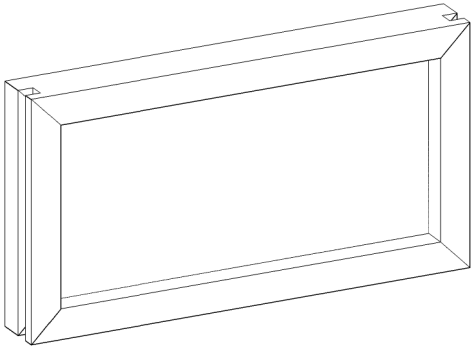
IF YOU DECIDE TO USE GLASS, WE HIGHLY RECOMMEND PURCHASING $\frac{1}{4}$" THICK PROFESSIONALLY CUT PANES. YOU WILL NEED 2 PER WINDOW. ON THIS SET THAT EQUALS 12 PANES OF GLASS TOTAL.

SHOULD YOU DECIDE TO CUT YOUR OWN GLASS, YOU DO SO AT YOUR RISK! USE ALL SAFETY PROCEDURES AND EQUIPMENT WHEN HANDLING GLASS!

10) Assemble the window frame around the pane. Run a bead of epoxy or polyethylene (or equivalent) seal down the frame pieces as you assemble the window to get a good, weather-tight, bond. You could increase rotting and mildew growth if you choose not to.

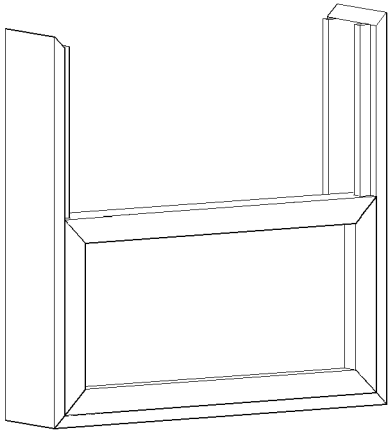


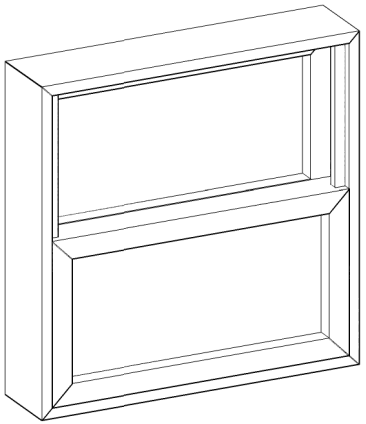
11) Cap off the window with the top piece and connect all pieces with 1" small radius ($\frac{1}{4}$" or smaller) screws. Be sure you don't screw down into the window pane!



12) Repeat for second window.

13) Once you have two window assemblies, two exterior frame pieces with runners on them, and two exterior frame pieces for the top and bottom, carefully assemble the exterior window frames AROUND the window assemblies.





14) Cap off the window assembly, Ensure the windows slide easily and there is about $\frac{1}{16}$-$\frac{1}{8}$" gap between the window assemblies so they will not impede each other's movement.

15) Place the window in the window frame. Screw the exterior frame to the opening provided. You may have to use a soft mallet or a dead-blow hammer to get the window centered in the opening.

16) How the windows stay up or down is up to the user. We recommend getting a slide bolt and installing at least one on the movable assembly. Which assembly moves or stays stationary is up to the builder.

17) Lastly, before construction, you will need to determine what type of pane material you want to use. For a playhouse, we would recommend against using glass and go with clear acrylic or polyvinyl pane.

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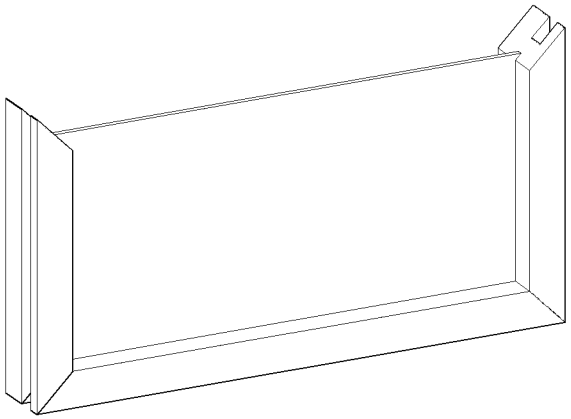
18) Assemble the window frame around the pane. Run a bead of epoxy or polyethylene (or equivalent) seal down the frame pieces as you assemble the window to get a good, weather-tight, bond. You could increase rotting and mildew growth if you choose not to.



Additional Stuff for the Window Assemblies:

1) Use weather striping along the seam between the window assemblies to keep wind, and weather out as much as possible.

2) We recommend having one stationary, and one movable window. Most often, anchor the exterior window to the top of the assembly and let the interior window slide up and down.

1) Drill a $\frac{1}{4}$" pin hole in the interior, left or right, side of the movable window assembly.

2) While the window is closed, drill into the runner about $\frac{1}{4}$".

3) Keeping the drill bit inside the pin hole, pull the drill bit back out a little, raise the window and drill back in about $\frac{1}{4}$" into the runner. We recommend about 3" increments.

4) Repeat as necessary for how much you wish the window to open. Cut a length of $\frac{1}{4}$" dowel (may need sanding to slide freely) to use as a pin.

5) Add a slide pin to both the top and bottom of the movable window so the windows can be "locked" shut if you wish.

To determine the rafter lengths,

1) Divide the entire span by two (example: If the roof span is 20 feet, divided by 2 = 10 feet, 0 inches.

2) Now add the overhang (example: 18-inch overhang makes the length 11 feet 6 inches).

3) Now, convert the 6 inches of the 11 feet 6 inches into a fraction. It happens to be 0.5 (6 divided by 12). Thus 11 feet 6 inches is now 11.5

4) Suppose you desire an 5/12 roof pitch, or for every 12 inches horizontally, you get 5 inches up and 12 inches vertically. Convert that number by using the rafter conversion chart below or can be found on any framing square.

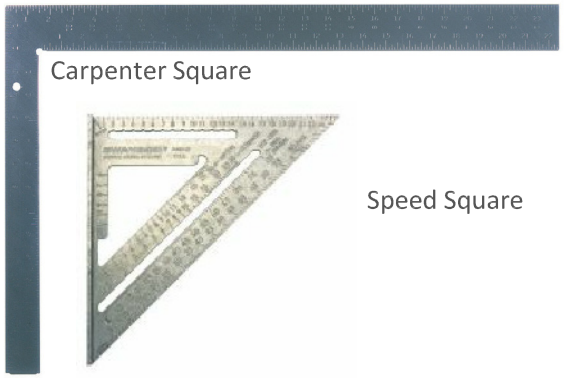
5) For the purpose of this article, the 5/12 roof pitch converts to 1.083 on the rafter conversion chart found on any framing square.Therefore, 11.5 x 1.083 = 12.4545 feet is what the rafter length will be.

6) Obviously, getting to the thousands of an inch is a feat in itself, so lets just round to the nearest $\frac{1}{8}$" which is 12.5 feet or 12'-6".

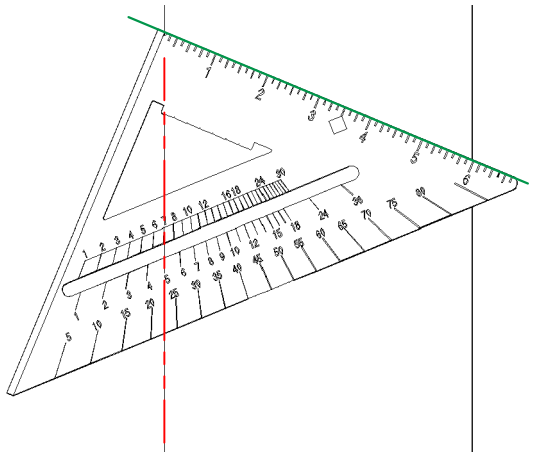
Roof Slope	Factor
Flat	1.0
1:12	1.003
2:12	1.014
3:12	1.031
4:12	1.054
5:12	1.083
6:12	1.118
7:12	1.158
8:12	1.202
9:12	1.250
10:12	1.302
11:12	1.357
12:12	1.414
13:12	1.474
14:12	1.537
15:12	1.601
16:12	1.667
17:12	1.734
18:12	1.803
19:12	1.873
20:12	1.943
21:12	2.015
22:12	2.088
23:12	2.162

If you feel at all uncomfortable constructing roof elements, consult a professional. Also, you will need to be comfortable with heights and please use all safety precautions when placing the rafters. Not every rafter will be directly above a solid surface and there will be open spans beneath them. We recommend use of a ladder and assistant(s) to help you get the rafters into position.

1) If you need to be introduced to the tools most professionals work with when cutting rafters. There are basically two tools used commonly, the speed-square and the carpenter square. Both are shown below.

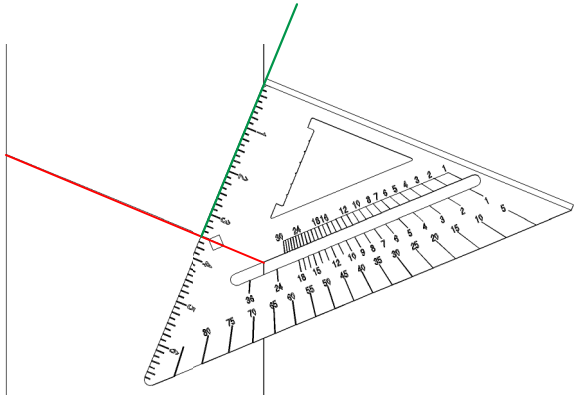


For the speed square, start by lining up your plumb cut by aligning the pivot point on the speed square with the desired pitch. This example is going to use a 5-12 slope but the principle is the same with any slope. See the diagram below.



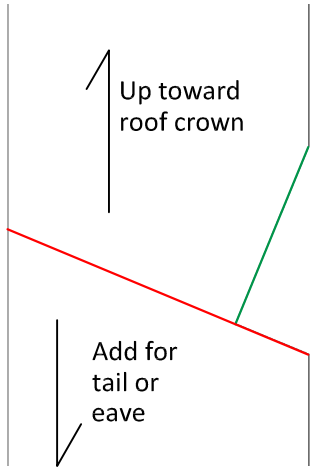
See how the red line lines up with the little notch in the back of the speed square and the number 5 in the "common". The common simply refers to a common rafter. Notice also, how the "HIP/VAL" lines up quite nicely with 7? For a $\frac{5}{12}$ slope, the corresponding hip/valley slope would be 7. Easy peasy.

2) Anyway, mark your line along the GREEN side with all the numbers.To make your seat cut, simply plumb the other side at the length you need and follow the diagram below for a nice $3\frac{1}{2}$" seat cut.



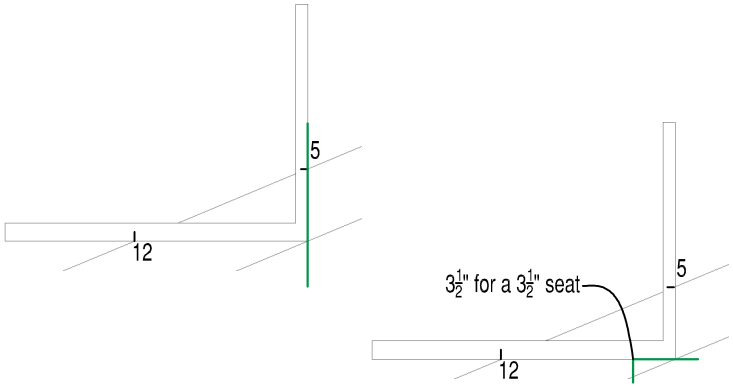
Align the diamond sight so the line cuts the sight down the center and your pivot point is flush against the outside edge of the rafter to be cut.

The RED line represents the mark you just made for plumb. Now again, mark along the green line for your seat cut. See the nice "L" shaped seat? Cut your seat out and it should look something like below.



The previous page contains instructions with a table which will help you measure the overall rafter length.

For a Framing (Rafter) Square it is basically the same principle. Align the 5 and the 12 as shown below. Mark the GREEN line shown in 1 for plumb.



To mark the seat measure the $3\frac{1}{2}$" on the square and mark the plumb at the end as shown above in 2.