

One piece folding Bench and Picnic Table



Les Kenny

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The author

Les Kenny is a retired building contractor.

Two "DIY for Kids" books (co-authored with his daughter Roseanne) published in 2004 and 2005 respectively got him started on a writing career publishing numerous online woodworking projects, primarily for his website www.buildeazy.com.

The BuildEazy website is populated with his do-it-yourself woodworking and building projects.

Help resources:

Please note that Buildeazy does not offer or give any DIY advice or help directly.

Any help regarding this project is limited to user input.

Constructive user input is encouraged and can be of immense help to other DIYers contemplating a project.

User comments, and/or photos of their handiwork regarding this project, can be seen at <http://www.buildeazy.com/1pce-comments.php> when populated.

Another source is the blog helpfiles <http://www.buildeazy.com/blog/archive.php?cat=plan-help>

We would greatly appreciate any photos and maybe a note or two showing and/or explaining your handiwork re this project.

Any such feedback helpful to other users may be posted on the Buildeazy website and/or its social pages.

You can submit your photos / notes from the Buildeazy Contact page at http://www.buildeazy.com/contact_us.html

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Folding picnic table in both bench-seat and picnic table mode

Introduction

Description

A single bench seat that can be changed into a picnic table with ease.

This 'Bench come Picnic Table' is ideal for those smaller areas where you don't want a picnic table taking up all the space, all the time.

When the eating is over and the table is no longer needed, it can be folded back into a comfortable single bench seat and put to one side, still very much usable but taking up minimum room.

It can be either a 2½ seater bench seat (2 adult and a kid), or a 5 seater picnic table.

The front seat spans 1373 mm (54"), the rear seat spans 1245 mm (49"), and the tabletop spans 1487 mm (58½")

Changing stock size and table length: This folding picnic table is constructed out of two different stock sizes.

To use a different stock size or change the length of the table go to **page 11** for details.

The measurements: The measurements throughout this documentation are given in both metric (mm) and imperial (inches).

The metric measurements are given first followed by the standard measurements in brackets ().

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Materials List

The measurements given are the actual sizes.

Enquire at your local building supplies store regarding the availability of the stock sizes given in the table below. If different sizes are used, then slight adjustments will need to be made to the length of the bolts (4 only) and also the length of the rear seat boards and tabletop boards. Go to page 11 for details.

Sourcing the stock sizes

This project calls for two stock sizes - 90 mm x 45 mm (1½" x 3½"), and 90 mm x 32 mm (1¼" x 3½").

Both stock sizes are available in Australasia. In North America 90 mm x 45 mm (1½" x 3½") stock is widely available and 90 mm x 32 mm (1¼" x 3½") stock can be ripped out of 5/4 in. x 6 in. deck boards found at both Lowes and the Home Depot.

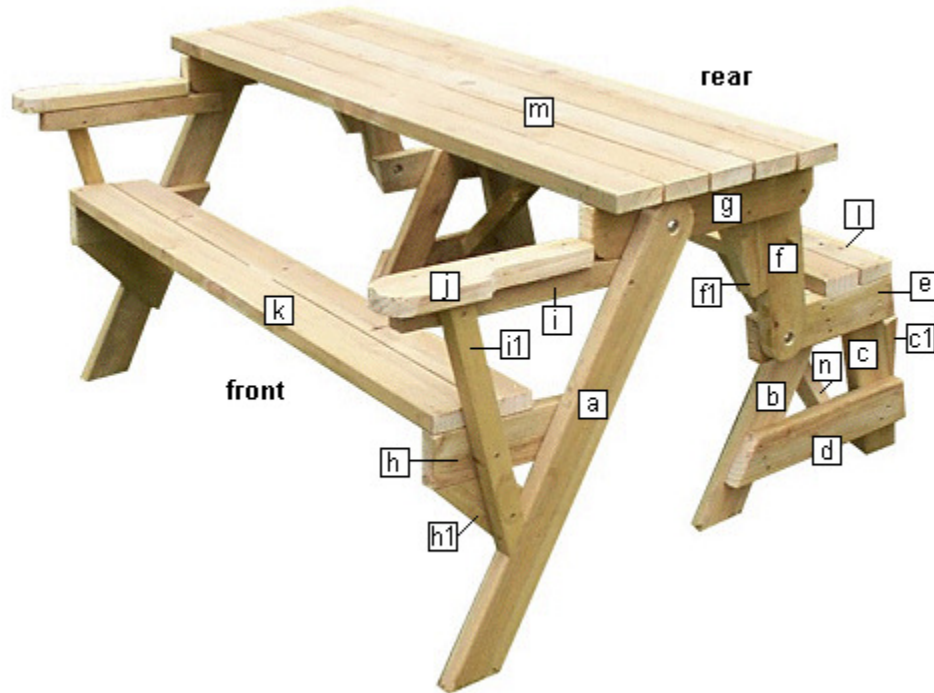
Ideally, if you can source or obtain both stock sizes all the better, but if you can only source the 90 mm x 45 mm (1½" x 3½") stock which is more widely available, then some changes to the plans would need to be made. Go to page 11 for details.

Stock Size/ Material	Amount
90 mm x 32 mm (1¼" x 3½") natural decay-resistant or treated wood	16 m (53 ft)
90 mm x 45 mm (1½" x 3½") natural decay-resistant or treated wood	7 m (23 ft)
10 mm (⅜") carriage bolts 70 mm (2¾") long and self locking nuts	4 of
exterior type wood screws 50 mm (2") long	100 of
exterior type wood screws 75 mm (3") long	16 of
exterior wood glue	

Note: In some cases the metric stock sizes are not an exact match to the equivalent imperial sizes. The metric measurements are more suited to Australasian standards. The imperial measurements are more suited to North American standards.

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Identifying the pieces



- | | |
|---|-------------------------------------|
| [a] front leg | [h] seat rail (front) |
| [b] rear leg (inner) | [h1] seat rail brace (front) |
| [c] rear leg (outer) | [i] arm rail |
| [c1] back stop | [i1] arm rail brace |
| [d] lower seat rail (rear) | [j] arm pad |
| [e] seat rail (rear) | [k] seat board (front) |
| [f] leg extension part 1 (rear) | [l] seat board (rear) |
| [f1] leg extension part 2 (rear) | [m] tabletop board |
| [g] table rail | [n] seat brace (rear) |

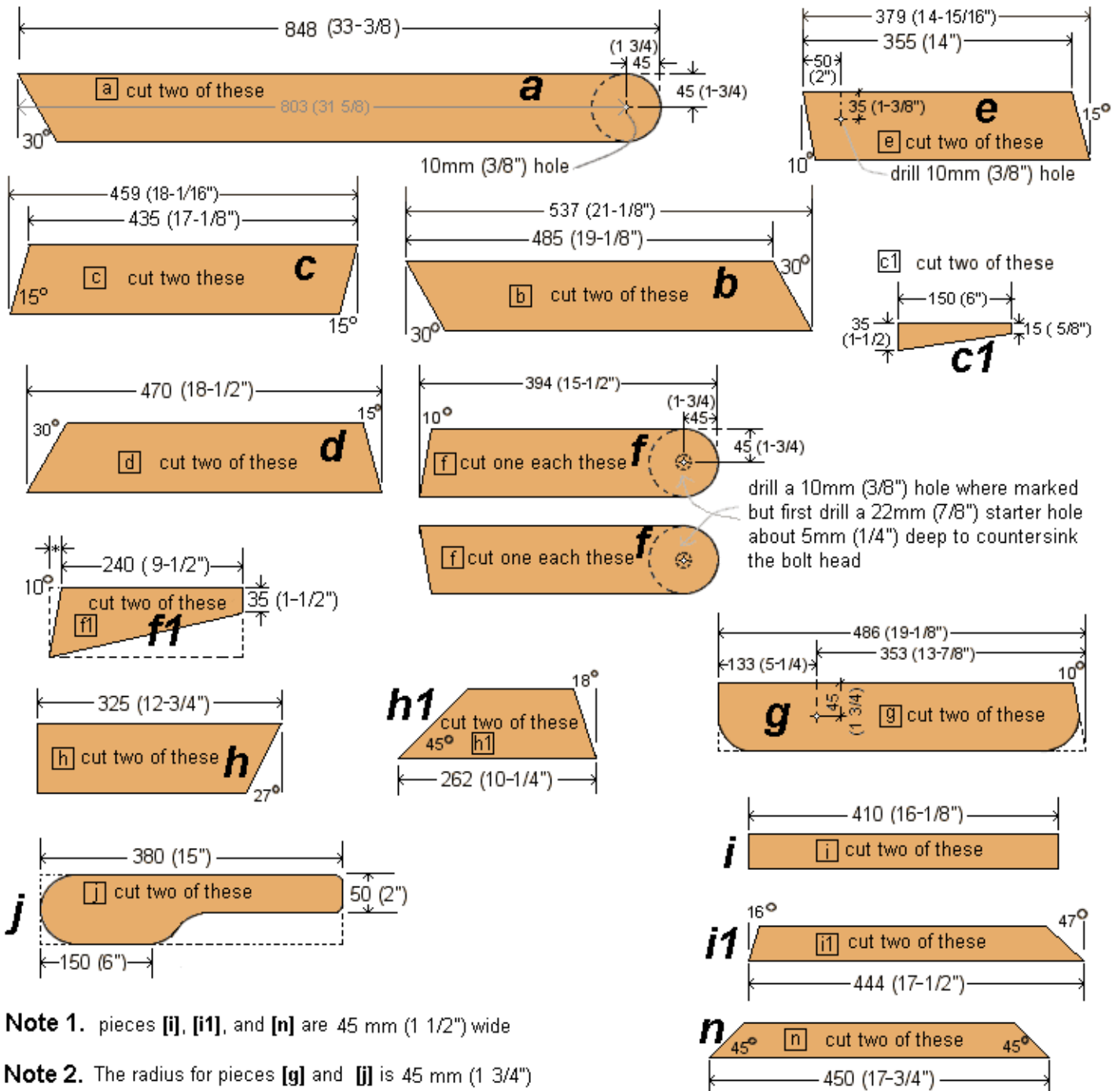
Tools you will need

• Circular power saw, • Drop saw (chop saw) - able to cut accurate angles, • Jigsaw, • hacksaw, • Electric drill, • Hammer, Hand saw, Measuring tape, pencil, square, screw driver, level, • 10 mm ($\frac{3}{8}$ ") drill bit for the bolt holes, • 3 mm ($\frac{1}{8}$ ") drill bit for the screw holes, • 22 mm ($\frac{7}{8}$ ") drill bit to countersink (embed) the bolt head. The bit must be a larger diameter than the bolt head.

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Plans - The individual pieces (frame)

Cut all the pieces below from 90 mm x 32 mm (1 1/4" x 3 1/2") stock. Pieces **i**, **i1**, and **n** are from the same stock ripped in half. If you use a slightly different stock size, refer to '**Changing stock size and/or table length**' on page 11.



Note 1. pieces **[i]**, **[i1]**, and **[n]** are 45 mm (1 1/2") wide

Note 2. The radius for pieces **[g]** and **[j]** is 45 mm (1 3/4")

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Plans - The individual pieces (tabletop and seat boards)

In the drawings below, the seat boards are from 90 mm x 45 mm (1½" x 3½") stock, and the tabletop boards are from 90 mm x 32 mm (1¼" x 3½") stock.

If you use a slightly different stock size, refer to '**Changing stock size and/or table length**' on page 11.

tabletop boards and seat boards

← 1487 (58-1/2") →

m tabletop board - cut five of these out of 90x32 (1-1/4 x 3-1/2) stock m

← 1373 (54") →

k seat board - cut two of these out of 90x45 (1-1/2 x 3-1/2) stock k

← 1245 (49") →

l seat board - cut two of these out of 90x45 (1-1/2 x 3-1/2) stock l

m 90x32 (1-1/4 x 3-1/2") stock 5 lengths at 1487 (58-1/2") long for tabletop m

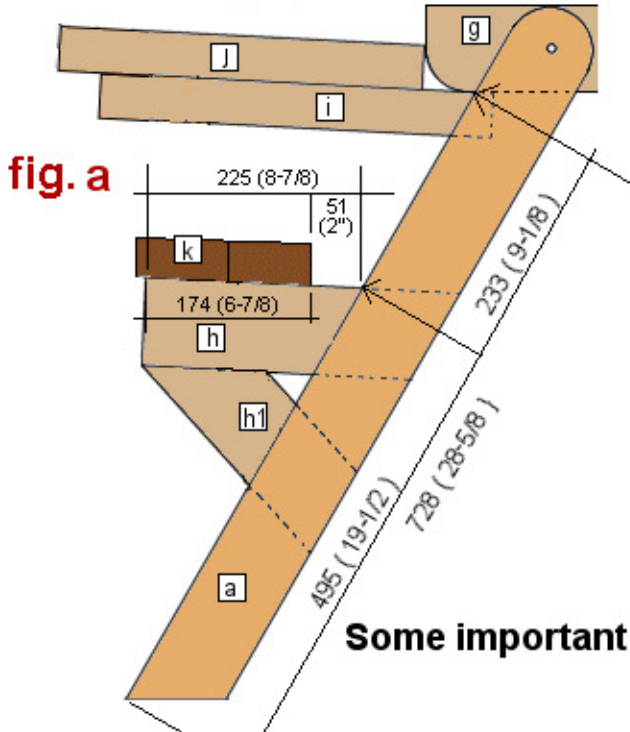
k 90x45 (1-1/2 x 3-1/2") stock 2 lengths at 1373 (54") long for seat k

l 90x45 (1-1/2 x 3-1/2") stock 2 lengths at 1245 (49") long for seat l

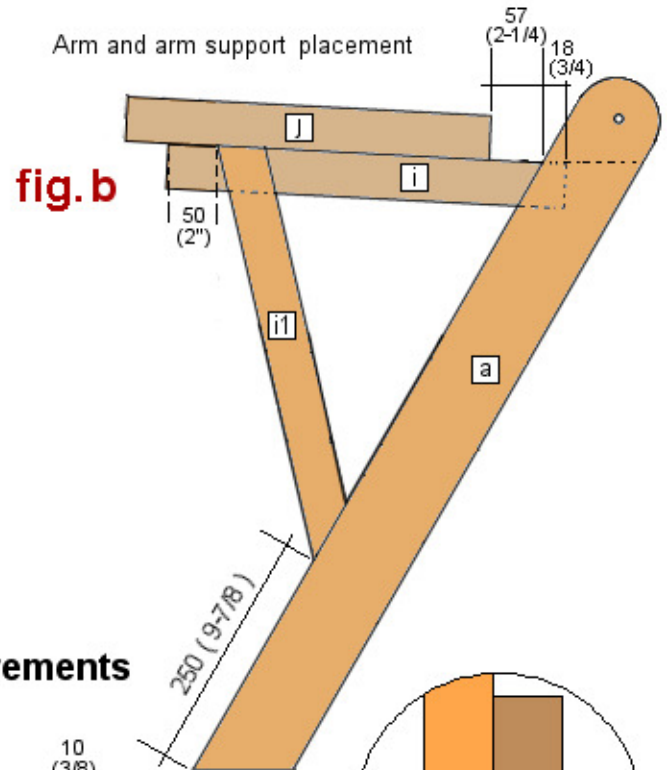
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Plans - Sectional details

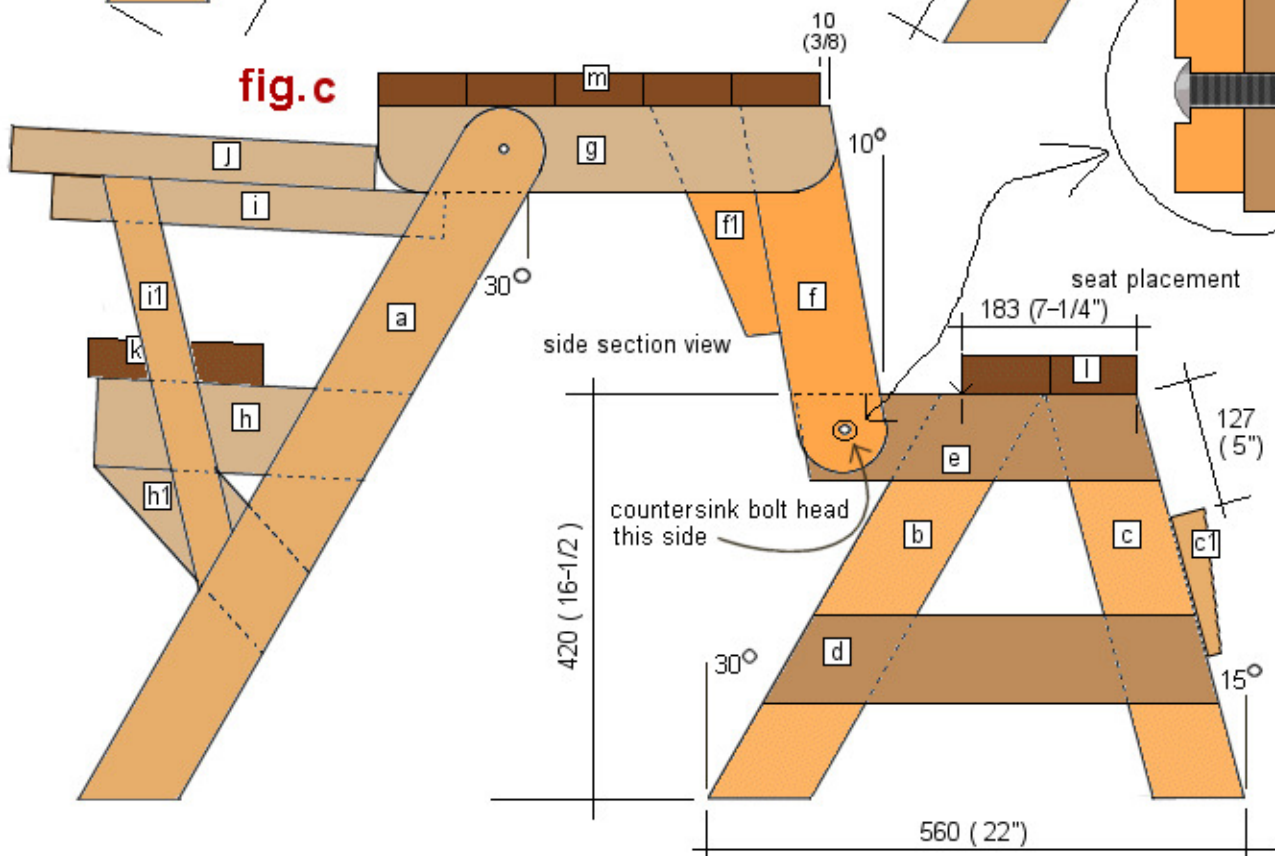
Seat and seat support placement



Arm and arm support placement



Some important measurements



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Important points

Some fairly accurate measuring, drilling, and cutting is required for this folding table to work in the manner that it is meant to, however, due to Murphy's law, wood sizes being different, and dare we say it, a slight error in measurements, the table might not work as smooth as it should so some precautions can be taken.

Point 1. Pay special attention to the paragraph in **step 3** that says "Special care should be taken for the following....."

Point 2. piece **[c1]** is a back stop. It stops the tabletop going down too far when the table is folded into bench seat mode. Because the placement of this piece is important, it is advisable to temporary place it, i.e., hold it in place with only one screw until the folding motion has been tried. A slight adjustment may then be required.

Point 3. The placement of seat **[k]** along seat rail **[h]** is also crucial. Study the dimensions shown in **fig.a** in the plans on page 9. Because the placement of this seat is important, it is advisable to temporary place it, i.e., hold it in place with only one screw each end of each piece, until the folding motion has been tried. A slight adjustment may be required.

A bit about the wood size

All the wood used is 90 mm x 32 mm (1¼" x 3½") stock except the seat boards **[k]** and **[l]** which are 90 mm x 45 mm (1½" x 3½") stock.

If 90 mm x 32 mm (1¼" x 3½") stock is unavailable in your area, and you choose to use 90 mm x 45 mm (1½" x 3½") stock instead, then adjustments will need to be made to the length of the bolts (4 only), the rear seat boards **[l]**, and the tabletop boards **[m]**.

Sourcing the stock sizes

This project calls for two stock sizes - 90 mm x 45 mm (1½" x 3½"), and 90 mm x 32 mm (1¼" x 3½").

Both stock sizes are available in Australasia. In North America 90 mm x 45 mm (1½" x 3½") stock is widely available and 90 mm x 32 mm (1¼" x 3½") stock can be ripped out of 5/4 in. x 6 in. deck boards found at both Lowes and the Home Depot.

Ideally, if you can source or obtain both stock sizes all the better, but if you can only source the 90 mm x 45 mm (1½" x 3½") stock which is more widely available, then some changes to the plans would need to be made. Go to page 11 for details.

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Changing stock size and/or table length

Changing a stock size

This project calls for two stock sizes - 90 mm x 45 mm (1½" x 3½"), and 90 mm x 32 mm (1¼" x 3½"). The latter is readily available in some places, but not so in others.

Ideally, if you can source or obtain both stock sizes all the better, but if you can only source the 90 mm x 45 mm (1½" x 3½") stock which is more widely available, then the following changes to the plans would need to be made:

The bolts would need to be ½" inch longer (there are only four),

Pieces (**l** - rear seat boards) would need to be ½" inch longer, and pieces (**m** - tabletop boards) would need to be ¾" longer.

Pieces (**k** - front seat boards) would remain the same.

To use a different stock size apply The '**The formula**' below.

Changing the table length

You can change the overall length of the unit simply by changing the length of the tabletop boards, the seat boards, and the bolts. But there is a formula...

The formula is worth considering if you want to make the table and seats longer (or shorter), or use a different stock size for the side frames.

The formula -

The difference in length between the shorter and longer seat boards is the sum of the thickness of four side framing members.

For example, if the side framing members are 45 mm (1½") thick, four times that is 180 mm (6").

Therefore 180 mm (6") will be the difference between the length of the front and rear seats boards.

The difference in length between the tabletop boards and the longer seat boards is the sum of the thickness of two side framing members plus 50 mm (2") for the end overhangs.

For example, if the side framing members are 45 mm (1½") thick. Two times that is 90 mm (3"), and plus the 50 mm (2") overhang = 140 mm (5").

Therefore, In that case the table boards will be 140 mm (5") longer than the longer seat boards.

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Instructions

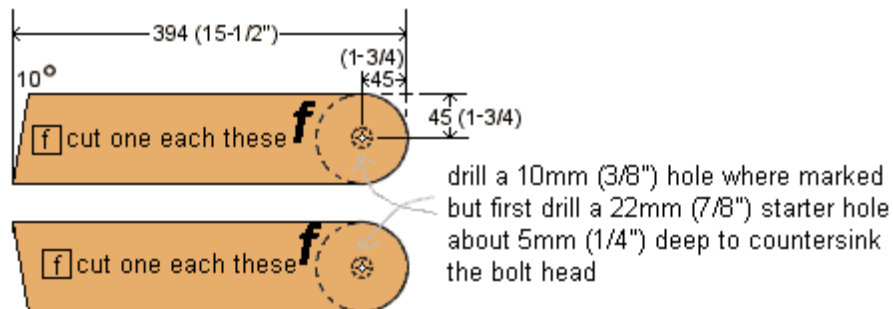
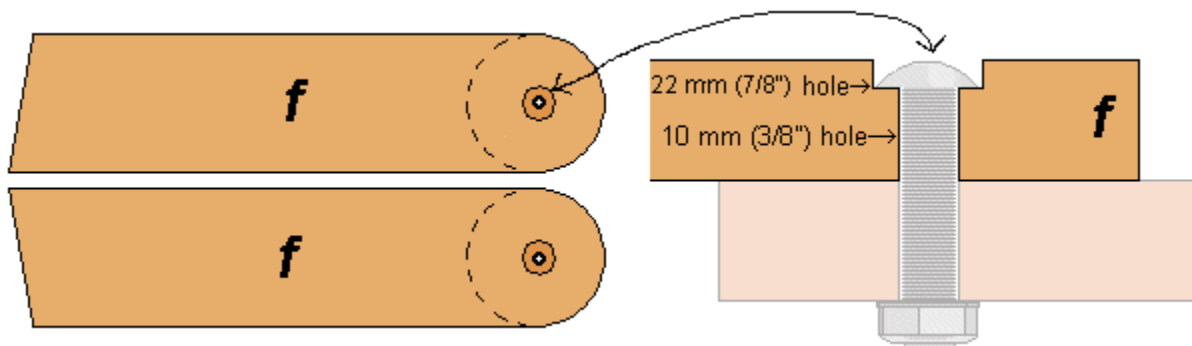
Step 1. Cut and drill all the pieces



Cut all the pieces to the length as shown in 'Plans - The individual pieces (frame)' on page 7. Mark the holes and curves. Pay particular attention as to the marking of the holes.

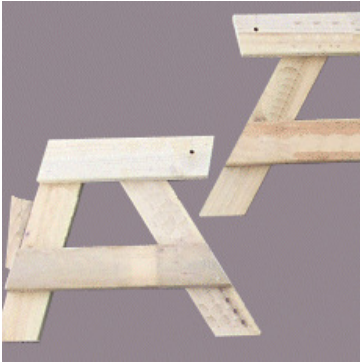
Cut the curves and drill 10 mm ($\frac{3}{8}$ ") holes where marked.

In pieces [f] only, first drill a 22 mm ($\frac{7}{8}$ ") starter hole about 5 mm ($\frac{1}{4}$ ") deep to countersink the bolt head. Refer to the picture below or piece [f] on page 7.



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Step 2. Make the rear seat side-frames



Assemble both rear seat side-frames. Make one to the dimensions shown in the drawing below.

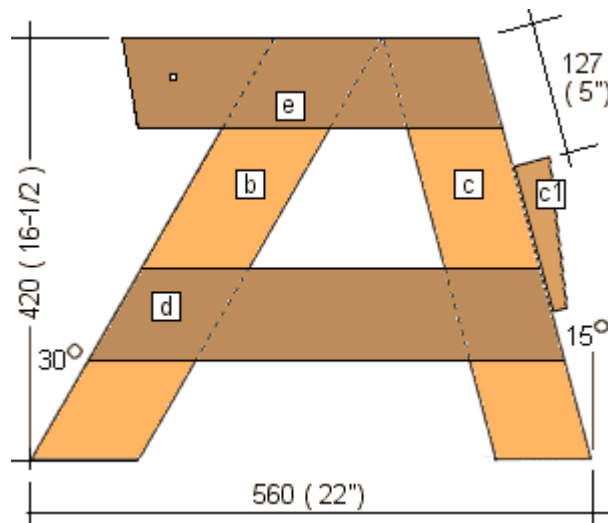
Fix horizontal pieces **[d]** and **[e]** to pieces **[b]** and **[c]** with screws and exterior wood glue. Use 3 screws per meeting. Pre-drill the screw holes through the horizontal pieces.

Make up the second in the same way but as a **mirror image** of the first.

Ensure that the bottoms of pieces **[b]** and **[c]** and the horizontal pieces

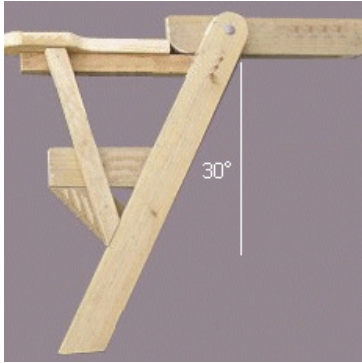
[d] and **[e]** are parallel.

Temporary fix [c1]. Piece **[c1]** is a back stop. It stops the tabletop going down too far when the table is folded into bench seat mode. Temporary place it for now. Hold it in place with only one screw until all the mechanism is working and the folding motion has been tried. A slight adjustment may then be required.



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Step 3. Make the front side-frames



Assemble the two front side frames. Make one to the dimensions shown in the drawing below.

Make up the second in the same way but as a **mirror image** of the first.

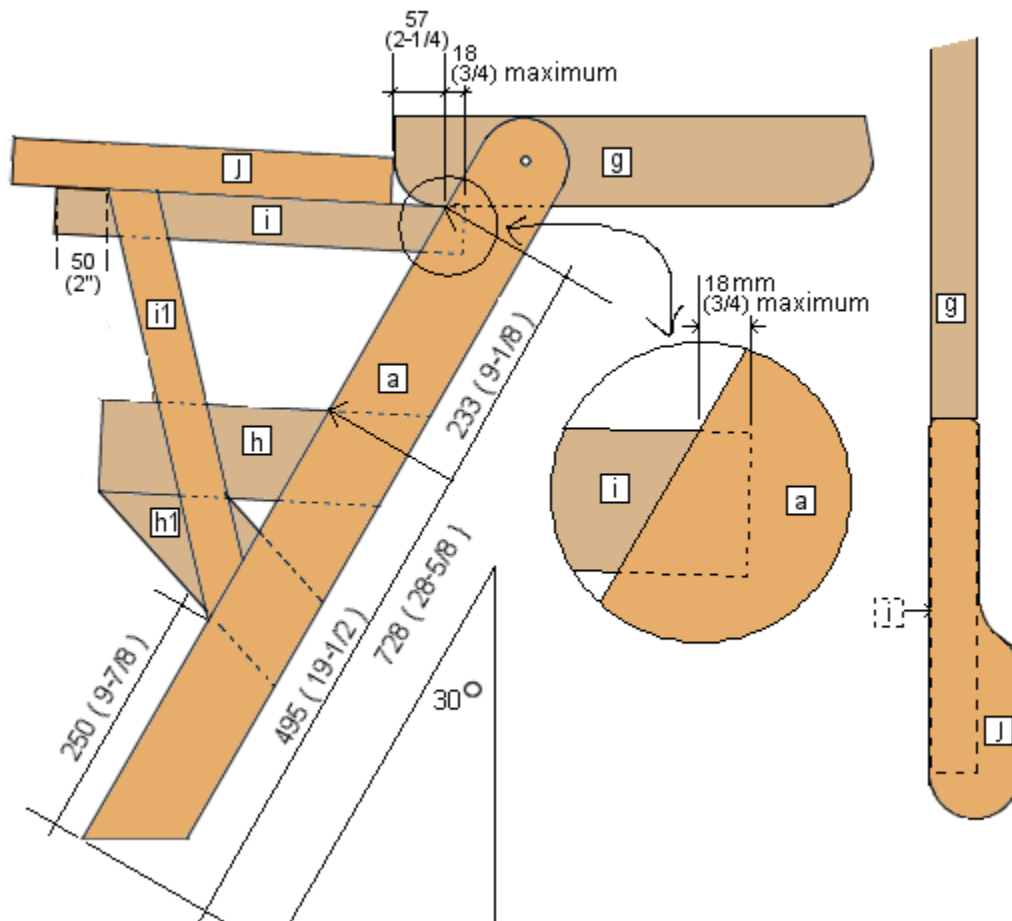
Special care should be taken for the following.....

When piece **[a]** is 30 degrees off right angles to piece **[g]** (as in the picture), ensure that the arm rail **[i]** is tucked up firmly under the table rail **[g]**, and also that the top of the arm rail **[i]** does not encroach into piece **[a]** by more than 18 mm ($\frac{3}{4}$ "). See the insert in the drawing below.

The end of the arm pad **[j]** should be touching the table rail **[g]**.

The arm pad also acts as a brake to contain the unit from spreading out too far.

Fix together with screws and glue.



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Step 4. Assemble the side-frames

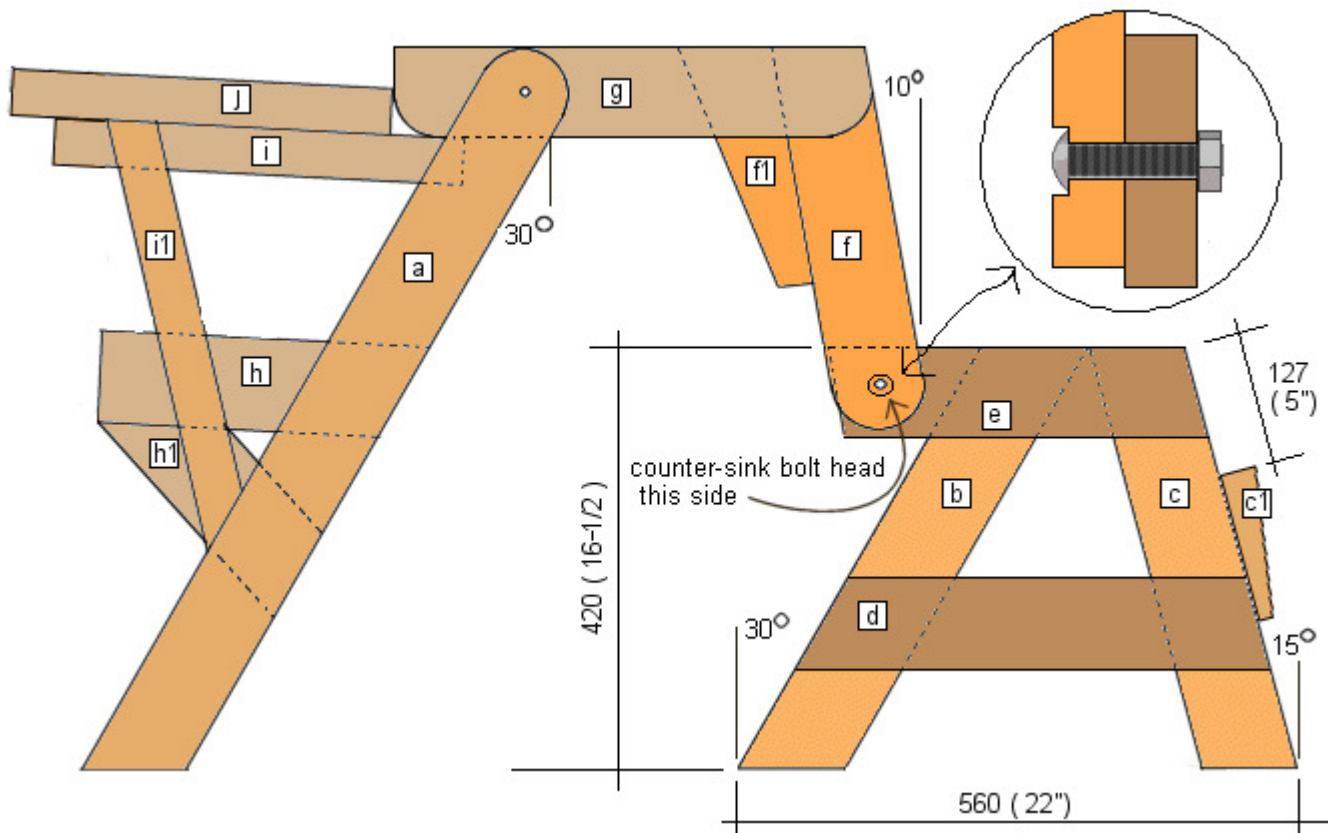


The two complete side-frames can now be assembled.

This is simply a matter of joining pieces **[f]** and **[f1]** together with screws and glue, then fixing them to the table rail **[g]** (with screws and glue), and also to piece **[e]** (with a bolt). Refer to the drawing below.

Make one complete side as shown in the drawing below, and then make up the second in the same way, but as a mirror image of the first.

Take note which side of piece **[f]** has the countersink hole.



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Step 5. Hold the table / seat boards together



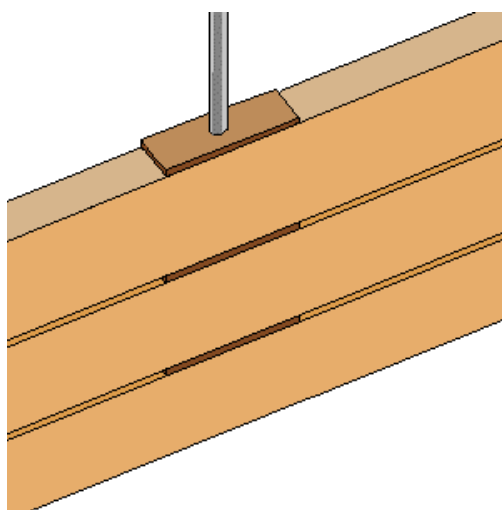
The tabletop boards and the seat boards need to be held together at the middle to stop warping and creating an uneven tabletop or seat.

One way of doing this:

Drill a 10 mm ($\frac{3}{8}$ ") hole widthways through the center of all the tabletop / seat boards and drill a countersink hole wherever there is a nut and washer to go.

Align the packers between the boards and run a 10 mm ($\frac{3}{8}$ ") threaded rod through all the holes. Add nuts and washers, tighten, and cut off any rod excess with a hacksaw.

The packers or spacers can be either washers, or thin strips of wood with holes drilled through them. (see picture).



How thick are the packers?

The overall tabletop width is 460 mm ($18\frac{1}{8}$ "), and the overall seat width is 183 mm ($7\frac{1}{4}$ ").

Evenly spread the tabletop boards and the seat boards over those widths respectively, and that will determine the gap between each board - hence the thickness of the required packers (spacers).

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Step 6. Add the table and seat boards



First fix the seat boards **[k]** and **[l]** to their respective seat rails **[h]** and **[e]** ensuring the frame is square, level and plumb.

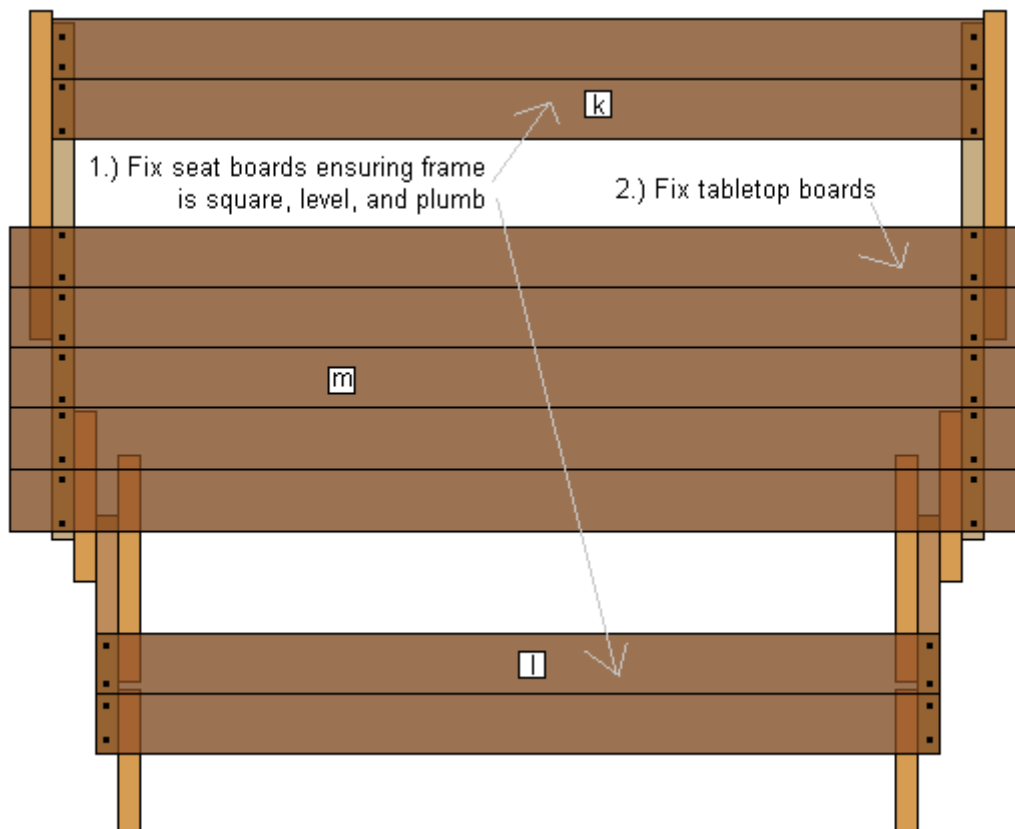
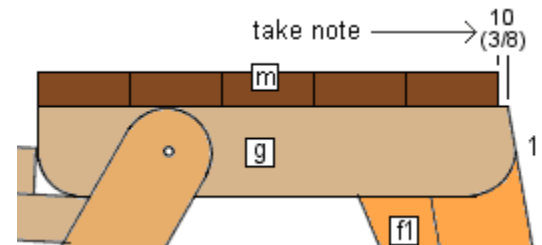
The placement of the seats along the seat rails is crucial. Refer to the dimensions shown in **fig.a** on page 9.

Because the placement of this seat is important, it is advisable to hold it in place with only one screw each end of each piece, until the folding motion has been tried as a slight adjustment may be required.

Next screw the tabletop in place. It starts 10 mm ($\frac{3}{8}$ ") in from the rear of the table rail **[g]**. See picture.

Ensure that the overhang at each end of the table side-frames are equal.

All seat and tabletop boards should be pre-drilled and screwed with two screws at each meeting.



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Step 7. Brace the rear seat



Turn the table upside down and prop or sit the rear seat on something solid. Ensure that the seat side-frame and the seat are at right angles to each other and fix the braces in place. Just like in the picture.

Flip the folding table up the right way and see how it works. Make any necessary adjustments as described in **point 3** on page 10.

All done!



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User contributed photos

From T. Mhlope

'To buildeazy, attached is my little project from a plan I purchase from you. Thanks'



We appreciate your photos and comments.

All submissions can be sent via the BuildEazy Contact page at http://www.buildeazy.com/contact_us.html