INSTRUCTIONS

Rev. 1

for Building

A Child's Stool

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A Few Remarks About Making the Child's Stool

Robert Penoyer

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A WARNING – PLEASE READ

Woodworking can be dangerous! It's up to you to determine if you can safely use the tools and perform the tasks needed to complete this and any other woodworking project. If you are unsure, STOP! Get advice from someone knowledgeable or do some careful studying on your own. Be safe!

Always wear at least an appropriate N95 dust mask or respirator when sanding or spraying paint. For advice about dust masks and respirators, visit this link:
https://woodworkingtoolkit.com/best-dust-masks-respirators/

READ, UNDERSTAND, AND FOLLOW ALL OF THE INSTRUCTIONS AND WARNINGS THAT CAME WITH YOUR TOOLS. BE CAREFUL!

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Why Build This Project?

This Child's Stool makes a great gift for any child in your life. Give him or her something of his very own. You might personalize it with a name or image like the Stool in the cover picture.

Your child, grandchild, niece or nephew can be proud that he or she can reach things that he couldn't reach before. Make it easier for the youngster to wash his hands or put things away on shelves or countertops.

The project is simple. It comprises only 4 pieces. Two of them (the Legs) are identical. You can build the Stool in a day and you might be able to complete it, including a finish, in a weekend.

Figure 1. Two Little Ones on Their Stools

Figure 2. Showing the Construction Underneath (Pocket Holes are Filled)

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Important Design Features of the Child's Stool

- Sturdy and simple to build
- Only 4 parts—2 of the parts (the Legs) are identical
- Made from readily available 3/4" plywood
- Simple pocket screw joinery
- Rounded-over edges and rounded corners help to make it safer
- Height: 10 1/8"
- Top: 14" x 10"
- Footprint: 14 1/4" x 12" — Bigger than the Top to reduce the chance of tipping

Figure 3 uses vertical lines in two views to show how the footprint is bigger than the Top. This feature enhances the safety of the Stool by resisting tipping.

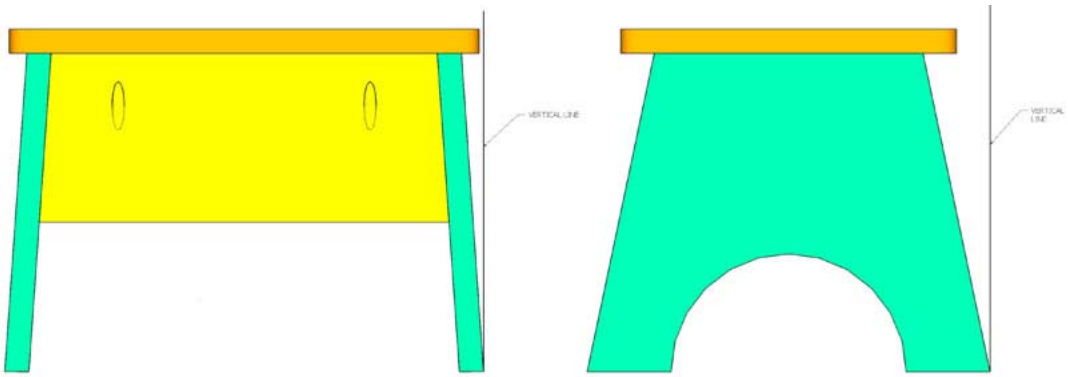

Figure 3. The Footprint is Bigger Than the Top to Resist Tipping

You'll need a Kreg Pocket Hole Jig or another manufacturer's pocket hole jig to complete this project:

https://www.kregtool.com/store/c13/kreg-jigsreg/p34/kreg-jigreg-k4/

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Details of the SketchUp File and Equivalent PDF File

File *Child's Stool 05.skp* is the SketchUp design for the Child's Stool. All of the dimensions and other necessary details are incorporated here. If you should find a dimension or other detail missing, it can be determined by examining this file. And, you can orbit and move the model around for a better look at everything.

File *Child's Stool 05.pdf* contains all of the images and dimensions from the SketchUp file. Use this if you're not familiar with, or don't use, SketchUp.

The descriptions that follow will help to make clear the details of some of the components and construction so that possible misunderstandings might be avoided.

Use the Included SketchUp or PDF File to Follow Along with These Descriptions

The heading of each section below corresponds to the name of a particular SketchUp/PDF page. Each unique part is given a unique color for easy identification.

<u>Perspective</u>

Look at the Perspective page to see a general view of the Stool. As declared in the image, all of the material used to build the Stool is 3/4" plywood.

It's not particularly clear in the image, but the Legs are flared out from vertical. This is more clear in Figure 1, Figure 2, and Figure 3, above. The sloping Legs help to prevent the Stool from tipping.

Some of the pocket screw holes are visible in this drawing.

<u>Top</u>

This drawing shows only the profile of the Top. Notice the two notes. One explains that you should apply a 3/16" round-over to all of the edges, including both the edges in this view and the edges on the opposite side.

The other note indicates that the corners have a 1/2" radius.

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The combination of rounded-over edges and rounded corners combine for both a nice appearance and enhanced safety. *If a child should fall against the Stool, he or she is less likely to be injured by softened edges and corners than if they remained sharp.*

<u>Leg</u>

Two views of one Leg are shown. The Stool uses two identical Legs.

The "Leg Outside" view shows details of the Leg when the Stool is viewed from the outside. No fasteners or joinery are visible in this view.

The "Leg Inside" view shows details of the Leg when the Stool is viewed from underneath. This view shows 4 pocket holes where screws are used to attach each Leg to the Top.

Look carefully at the side view of the Leg located between the "Leg Outside" and "Leg Inside" views. You can see that each end is cut with the saw's blade set to 86°, or 4° from vertical.

Because the top of each Leg is cut at an angle, each Leg is secured to the Top at an angle of 4° off vertical so that each Leg is angled outward from the Top.

The bottom of each Leg is angled the same way so that the bottom surface rests flat on the floor.

The dimensioning in the image provides you with two methods for cutting the angled sides of the Legs. One method is to mark two points on the top 2" in from each outside edge. Draw a line from each bottom corner to the respective mark. Then just cut along each of the lines.

The second method is to use the miter gauge on a table saw. Set the gauge for an angle of 78° (or 12°, depending on your miter gauge.) Cut from each bottom corner of the Leg toward the top.

Be careful to drill the pocket holes on the correct side of each Leg. The pocket holes should be facing inward toward the bottom of the Stool.

Notes in the image indicate that all edges except the top and bottom edges have a 3/16" round-over.

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Brace

There is only one Brace but two views are shown here so you can see how the pocket holes are arranged on each side. It should be clear that 4 pocket screws secure the Brace to the Top, and 2 pocket screws secure the Brace to *each* Leg.

The dimensioning in the image provides you with two methods for cutting the angled ends of the Brace. One method is to mark two points on the top 11/32" in from each end. Draw a line from each bottom corner to the respective mark. Then just cut along each of the lines.

The second method is to use the miter gauge on a table saw. Set the gauge for an angle of 86° (or 4°, depending on your miter gauge.) Cut from each bottom corner toward the top.

Notice the 1" and 2 1/2" dimensions shown at the end of the Brace. When the end of the Brace is set flush against the bottom of the pocket hole jig, these dimensions indicate the distance from the corner at the bottom to the centerline of each hole.

The strength of the joinery with each Leg is maximized because the two pocket holes at each end are set low on the Brace.

Notes in the image show that each of the bottom edges has a 3/16" round-over.

Prevent Movement

This is not a design drawing. Instead, this drawing illustrates how to prevent movement between two parts when driving in the pocket screws. Details of this procedure are described below.

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Assembling the Child's Stool

Sanding

Sand all surfaces of the components with at least 120-grit paper before assembly. You might want to go as high as 220-grit.

Glue and Screw

Strength is important. There are outward stresses on the angled Legs whenever someone stands on the Stool. That is, because the Legs are angled outward, a downward force on the Top tends to push the bottom of each Leg outward.

This force is overcome by the screws and by using glue. *It's important that each joint is glued as well as screwed together.*

If the Stool is to be used in a wet area such as a kitchen or bathroom, use a waterproof glue such as Titebond III.

Attach the Brace to One Leg

Mark a Leg on its inside surface (where the pocket holes are located) to indicate the exact location where the Brace should be attached.

Have a flat assembly surface available. Apply glue to the Leg and Brace where they will be joined. Place the Leg and Brace upside down on the flat surface so that the tops of the Brace and Leg (now on the flat surface) are flush with one another. Use pocket screws to secure them together.

NOTE: The wet glue will act like thick grease so that the pieces will easily slide out of position. A pocket screw enters at an angle and causes the piece that the screw passes through to be pulled in the direction of the driven screw. Wet glue tends to make that movement more likely. *The following procedure prevents any movement.*

Place a temporary wood block against the back of the Brace and clamp the block to the Leg as shown in Figure 4. This will prevent the Brace from moving as the screws are driven into the Leg. Use other clamps as needed to hold the pieces in their correct orientation while driving the screws.

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Remove the block immediately after driving the screws to prevent it from being glued into place.

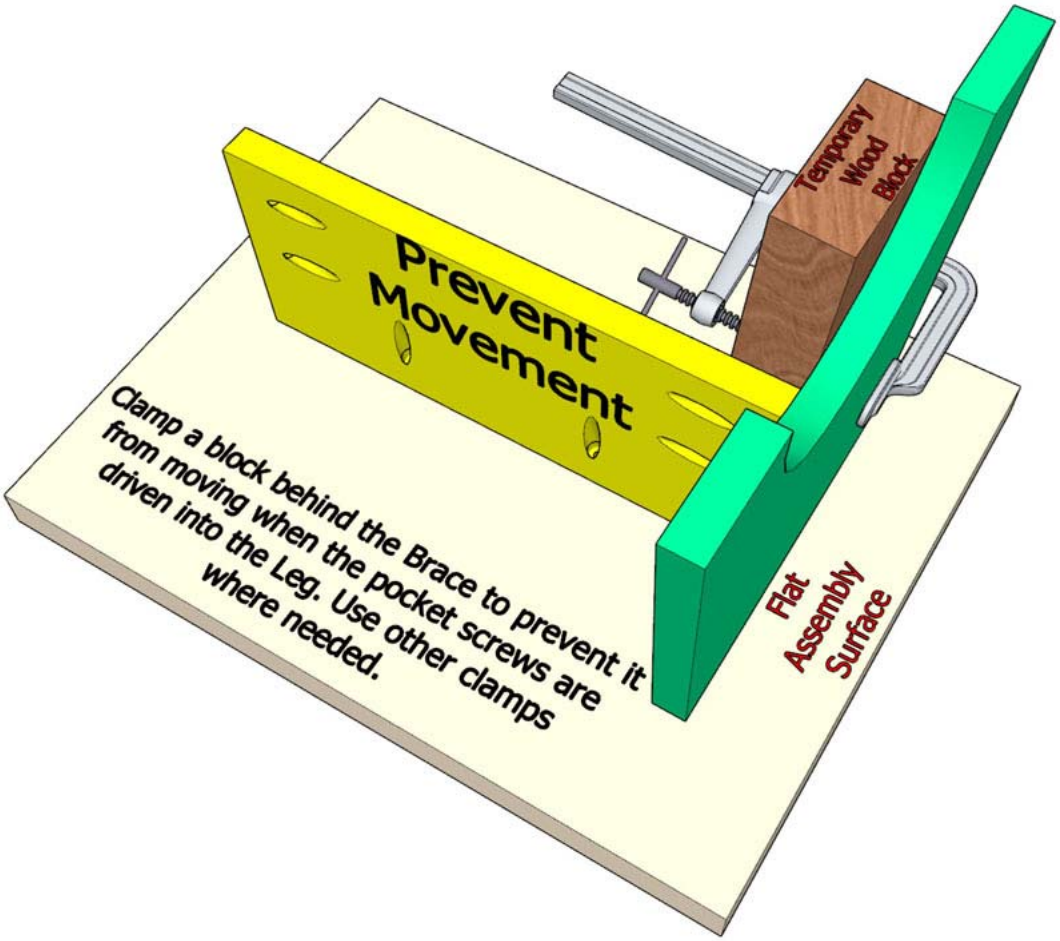

Figure 4. Clamp a Block Behind the Brace to Prevent Any Movement

Attach the Brace to the Other Leg

You're ready to attach the other Leg once the first Leg has been secured to the Brace.

As before, make sure the Leg is marked to indicate the exact location where the Brace should be attached. Apply glue to the Brace and the Leg.

Be sure the tops of the second Leg and the assembly are flush against the flat assembly surface.

Clamp a temporary block into place to prevent movement, similar to what was done before, and drive two pocket screws into the second Leg. Remove the temporary block immediately. Remove all of the clamps.

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Attach the Assembly to the Top

Place the Top upside down on a flat assembly surface. Carefully mark the Top to show exactly where the Leg-Brace-Leg assembly will be attached.

Do a dry fit of the assembly on the Top. Clamp temporary blocking into place (similar to Figure 4) to ensure that the assembly and Top won't move relative to one another while driving in the pocket screws.

Apply glue to the Top and the assembly and carefully locate the assembly on the Top where the two will be joined. Clamp as needed. Drive two pocket screws on one side of the Brace into the Top. Then apply two pocket screws on the other side of the Brace into the Top.

Now is the time to drive pocket screws through the Legs and into the Top.

Beware that the Legs might be forced to move against the Top as the screws are being driven into the Top. So, drive the screws carefully. *One approach is to drive all the screws in partially, then come back and tighten each completely.*

Clean up any glue squeeze-out.

Personalizing the Top

Using a Stencil

You might want to personalize your Stool for a special boy or girl in your life. Two personalized Stool Tops are shown in Figure 5. Just make a stencil.

Figure 5. Examples of Personalization

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You can find free clipart for your stencil online. For example, the Hello Kitty image is available from

http://clipart-library.com/hello-kitty-wall-stencils.html

Text items like names can be found online or you might create your own. The one in Figure 6 was customized by fixing the link between the o and the p and by appending a swoosh as in the Los Angeles Dodgers logo.

Figure 6. A Modified Text Stencil

Cutting the Stencil

Print out your image or text at the desired size onto a piece of paper. Secure the paper onto a flat surface that can withstand cutting with a knife. Use tape to hold it in place.

Transparent acetate or Mylar sheets are available from craft stores. Put an acetate or Mylar sheet over the image and secure it with tape.

Use a sharp X-Acto knife with a pointed blade to follow the pattern and cut out the stencil. Take your time. Be patient.

The use of the stencil is discussed below under *Applying the Finish*.

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Applying the Finish

Fill the Pocket Holes First

Your project will look much cleaner if you fill the pocket holes. One way to do this is by gluing in Kreg pocket hole plugs:

https://www.kregtool.com/store/c21/kregreg-plugs/

Trim and sand the plugs flush with the surface. Clean up the gaps between the plugs and the surface using wood filler.

You can simply use filler material if you choose not to use the plugs. Either way, your project will look better.

Painting

Since the Stool is fabricated using plywood, paint is the obvious choice for a finish.

You should apply at least 2 coats of gloss or semi-gloss paint.

Do not apply paint to the bottoms of the Legs. Paint on the bottoms can rub off onto the floor when the Stool is pushed or dragged across it.

Watch Out for a Wet Environment

The Stool might be used in a wet environment like a kitchen or bathroom. The plywood might delaminate if you leave the bottoms of the Legs unprotected and they get wet repeatedly.

One way to avoid damage to the Legs by water is to apply a hard finish such as two coats of clear polyurethane to the bottoms.

Using a Stencil

Allow the paint plenty of time to cure before adding any personalization to the Top.

Center your stencil on the Top and secure it place with tape. Cover all other areas around the stencil to prevent any spray from getting onto other parts of the Stool.

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Be sure the stencil lies flat. If any part of it is raised, the paint can get beneath it and cause an undesirable under spray.

One way to keep the stencil flat against the Top is to use spray adhesive. Spray some adhesive on the back of the stencil sparingly. Avoid using too much. You won't want it to affect the smoothness of the paint on the Top.

Once the stencil is secured to the Top and lying flat against it, use some spray paint of a contrasting color to spray the image or text. Spray several coats of paint over the stencil.

Remove the stencil before the spray paint is completely dry to avoid peeling or chipping the paint after it's cured.

Be sure to remove any adhesive that might remain on the paint.

Protecting the Stenciled Image

Whoever uses the Stool will be standing on it with shoes. Shoes can scrape and damage the image. To help reduce the threat of damage, apply 3 or 4 coats of clear polyurethane over the entire Top.

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