THE BICYCLE BLENDER

Field To Table Schools
STEP BY STEP BUILDING GUIDE

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FoodShare Toronto

FoodShare Toronto is a non-profit community organization whose vision is Good Healthy Food for All. Founded in 1985 to address hunger in Toronto communities, FoodShare takes a unique multifaceted and long-term approach to hunger and food issues.

We work to empower individuals, families and communities through food-based initiatives, while advocating for the broader public policies needed to ensure that everyone has adequate access to sustainably produced, good healthy food.

Working "from field to table," we focus on the entire system that puts food on our tables: from the growing, processing and distribution of food to its purchasing, cooking and consumption.

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Welcome to the wonderful world of bike-powered blending! This guide will help you convert an old blender (even one that no longer works) into a pedal-powered smoothie machine.

Here at FoodShare we use our bike blenders to get students of all ages excited about healthy eating. Even the most unadventurous students will usually at least try a smoothie if they’ve been involved in the process by taking a turn pedaling.

Although we have tried to make the steps for building a bike blender as straight-forward as possible, it’s definitely not a project for everyone. If you’re never picked up a power tool before, you’ll probably want to get some help from a handy friend.

Good luck and happy pedaling!
THE BICYCLE BLENDER

MATERIALS

- Oster brand blender (old style with a detachable plastic ring that holds the jug)
- rear bike rack (MEC product number 1805-092†)
- 3/8” drill chuck and chuck key
- 5/8” plywood, about 12” x 16”
- Weldbond glue
- twelve 1 ½” wood screws (#8)
- six ½” pan head screws (#8)
- four 2” x ¼” bolts
- eight ¼” washers
- four ¼” nuts
- road bike (a step-through frame is nice)
- stationary trainer stand

TOOLS

- table saw and jig saw
- drill with #2 Robertson bit; #8 countersink bit; and 5/32”, 1/4” and 3/8” drill bits
- pliers
- adjustable wrench
- ratchet set
- pencil and pen/marker
- tape measure

OPTIONAL

- clear polycarbonate sheet, 6” x 12” (full sheets of this are quick expensive, so look for offcuts)
- ¾” webbing, approximately 3 ½’ (MEC product number 0407-056†)
- plastic buckle (MEC product number 5000-701†)

ATTENTION: Power tools can be very dangerous! If you’re not familiar with using them, make sure you get help from someone who is.

† Visit www.mec.ca for more details about these products

BLENDER

BIKE RACK

TIPS: Garage sales and second-hand stores are a good place to find an older model of blender like this. Check out Craigslist and Kijiji as well! Make sure that the bike rack is similar to the one shown here, with lots of open space between the horizontal bars.

BUCKLE AND WEBBING

TRAINER STAND

TIPS: Trainer stands come in a variety of models and usually include a resistance mechanism, which you can remove before using.

DRILL CHUCK AND KEY

BOLTS, NUTS, WASHERS

TIPS: You can try removing the chuck from a broken drill or just buy a replacement chuck from your local hardware store.
DISASSEMBLING THE BLENDER

Disassemble the blender base by undoing the three screws that attach the bottom cover and removing it. Disconnect the power cord, unscrew the top of the metal drive shaft (the part that interfaces with the blender jug) and remove the fan from the bottom of the drive shaft. Disconnect the coloured wires, undo the screws that hold the chassis in place and remove it. Remove the two screws that attach the plastic rim to the top of the blender base and set it aside.

Undo the two screws that hold the chassis together and take it apart. Cut the wires and remove the copper windings from the middle section of the chassis. Set aside the three parts of the chassis, the two screws that held it together, the drive shaft and the top interface.

PARTS TO SAVE

- **a** DRIVE SHAFT
- **b** PLASTIC RING
- **c** TOP INTERFACE
- **d** SCREWS
- **e** CHASSIS
BUILDING A NEW BASE

- Cut pieces for new base from 5/8” plywood:
  - Top - 1 piece at 6” x 6”
  - Sides - 2 pieces at 2 3/4” x 6”
  - Bottom - 1 piece at 8” x 6”
  - Middle - 1 piece at 4 3/4” x 6”
  - Braces - 2 pieces at 1” x 8”

**OPTIONAL**
- Cut the polycarbonate to the following sizes:
  - Top - 6” x 6”
  - Guard - 4 1/2” x 4 1/2”

**TIPS:** These components are optional but useful additions. The polycarbonate top makes it much easier to wipe the base clean after use and the guard prevents smoothie from dripping inside the blender box.

DIMENSIONS & ARRANGEMENT

STEP 1
In the centre of the top piece, trace a circle the size of the inside of the ring that holds the base of the blender jug. Cut this hole out by drilling a hole with a large drill bit and then using a jigsaw.

TRACE CIRCLE  CUT OUT CIRCLE
STEP 2
OPTIONAL: Take the top piece of polycarbonate (6” x 6”), trace a hole the same size as the one you just cut in the plywood, and cut it out using the same method you used to cut the hole in the plywood.

STEP 3
Take the bottom piece and cut out a 1-5/16” x 2-3/8” rectangle, centred on a 6” x 6” section of the plywood. Insert the bottom piece of the chassis in this hole to make sure that it fits.

STEP 4
Trace the middle section of the chassis centred on the middle plywood piece and cut it out. Insert the middle section of the chassis into the hole you just cut and then reassemble the chassis around the plywood.

STEP 5
Attach the plywood sides to the plywood top with 1 ½” screws. Place the middle plywood with the chassis in position and then attach the plywood bottom to the sides with 1 ½” screws.
STEP 6
Fasten the drill chuck to the bottom of the drive shaft and tighten it with the chuck key. Reattach the top interface to the top of the drive shaft by screwing it back on.

STEP 7
Using two short pieces of 2”x4” or other scrap wood as a stand to accommodate the drill chuck, place the plywood base you have just assembled upright. Place the plastic ring and blender jug on top of the base, with the drive shaft inserted into the notch on the bottom of the blade assembly of the blender jug. Shift the jug and chassis until the blade assembly rotates easily when you turn the drill chuck. Trace the outside of the ring on the plywood top.

STEP 8
Use a pencil to make two marks on the outside of the plastic ring in line with where the screw hole are on the bottom. Transfer these marks to the plywood and then make marks the same distance in from edge as the screw holes. Unscrew the plywood top and drill two 5/32” holes in the plywood for the screws that will attach the ring. Place the polycarbonate on top of the plywood and drill holes in the polycarbonate where the six screw holes are.
STEP 9
Remove the protective film from the polycarbonate and then, with it in place, screw in the ring from below. Attach this whole top assembly to the rest of the plywood blender base.

STEP 10
Put the blender jug in place and lift the chassis up until the top interface fits into the slot in the blade assembly. Adjust the position of the chassis until you find a spot where the blade assembly spins freely when you turn the chuck and mark the position of the centre piece of plywood. Attach this piece to the sides with 1 ½” screws.

STEP 11
Put the new base back on the stand, replace the jug and test to make sure that the blades still turn smoothly. You may need to adjust the positioning slightly by undoing one or more of the screws, moving the chassis, and then sinking the screws back in.

STEP 12
OPTIONAL: Take the 4 ½” x 4 ½” polycarbonate guard and drill a ¾” hole in the centre. Remove the top assembly, unscrew and remove the top of the drive shaft and attach the polycarbonate in position on the underside of the top assembly with ½” screws. Reattach the top assembly.

STEP 13
Turn the box upside down and place the two 1” x 8” braces 5/8” in from each side. Drill a 1/4” hole through the end of each brace and the bottom of the blender base (making sure not so drill too deeply and accidentally drilling through the centre piece of plywood. Attach the braces temporarily using the bolts and nuts.
STEP 14
Loosen the drill chuck and remove it. Apply glue to each of the three “teeth” inside the chuck and then carefully mount it back onto the bottom of the drive shaft. Tighten it with the chuck key and spin it with your fingers to make sure it is centred properly, adjust as needed so that it spins without wobbling. When you find the sweet spot, fasten it as tightly as possible.

STEP 15
Place the box on its side and apply glue to the small gap beside the jagged teeth on the outside. Smooth this glue out with a small piece of scrap cardboard and let it dry for at least 24 hours.

MOUNTING THE BLENDER ON THE BIKE
Mount the bicycle in the training stand and attach the rack to the rear of the bicycle, using the provided instructions. When the glue has cured, mount the blender base on the rack with the drill chuck pressed up against the left sidewall of the tire. Attach the box to the rack by fastening the braces with the bolts and nuts, clamping the bike rack between the box and the braces. Test the blender by cranking a pedal slowly and watching to make sure that the chuck is spinning. If it comes out of contact with the tire at any point in the rotation, loosen the nuts, push the box so that the chuck presses up against the tire more snugly, and tighten the nuts again.

OPTIONAL: Thread the webbing through the catch side of the buckle, run it from the underside of the top piece of the box to the top of the blender jug, and then cut it double that length. Fasten both ends of to the top piece of the box with a small screw. Thread the leftover webbing through the hook side of the buckle. Fasten one end to the top piece of the box, clip the buckle together at the top of the blender jug and tighten it snugly.

TIPS: The safety strap is a great added feature for making sure that the blender jug doesn’t accidentally get knocked of the bike and smashed when people are getting on and off of the bike. It also allows the blender to be used by just one person if there isn’t an extra pair of hands to hold the jug in place while the bike is being pedaled.
GREEN SMOOTHIE RECIPE

INGREDIENTS
1 pear, cored and quartered
1 very ripe banana
1 cup water
1 cup of torn or ripped spinach leaves or other leafy vegetable
1 or 2 pitted dates (optional)
1 cup crushed ice (optional)

DIRECTIONS
Place all of the ingredients in the blender and peddle until smooth.

TIPS: Dark green, leafy vegetables will add more fibre, chlorophyll, vitamins and minerals to your smoothie. Choose from a variety of greens: spinach, kale, collards, chard, dandelion greens, parsley or even romaine lettuce.

Remember to remove and compost the thick, hard stems from your leafy, green vegetables before adding leaves to the blender.

Find more great recipes like this one in our cookbook:

share: Delicious Dishes from FoodShare and Friends