

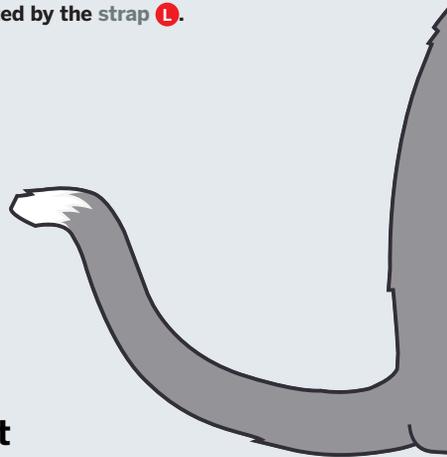
Has your cat left scratch marks on everything from grandmother's kneecaps to your grandfather clock? It's time to train Kitty to use this scratching post instead of everything else in your home.

A catnip cup in the top will attract your cat and place her in natural scratching position. Each time the cat claws downward on the spring-loaded carpeted cylinder, this device will deliver up to 4 special treats. Because you control the number of treats, you can keep your cat lean and gradually wean her off the treats altogether as she becomes accustomed to using the post, if you wish.

A catnip cup **A** attracts the cat to pull down on a carpeted scratch cylinder **B** causing the inner tube **C** to press down on a plunger **D** and also causing the wedges **E** to engage rotation pegs.

Pegs rotate a treat turntable **F** which releases treats through a hole in the treat disk **G** whence they fall onto a base tray **H** to reward the cat.

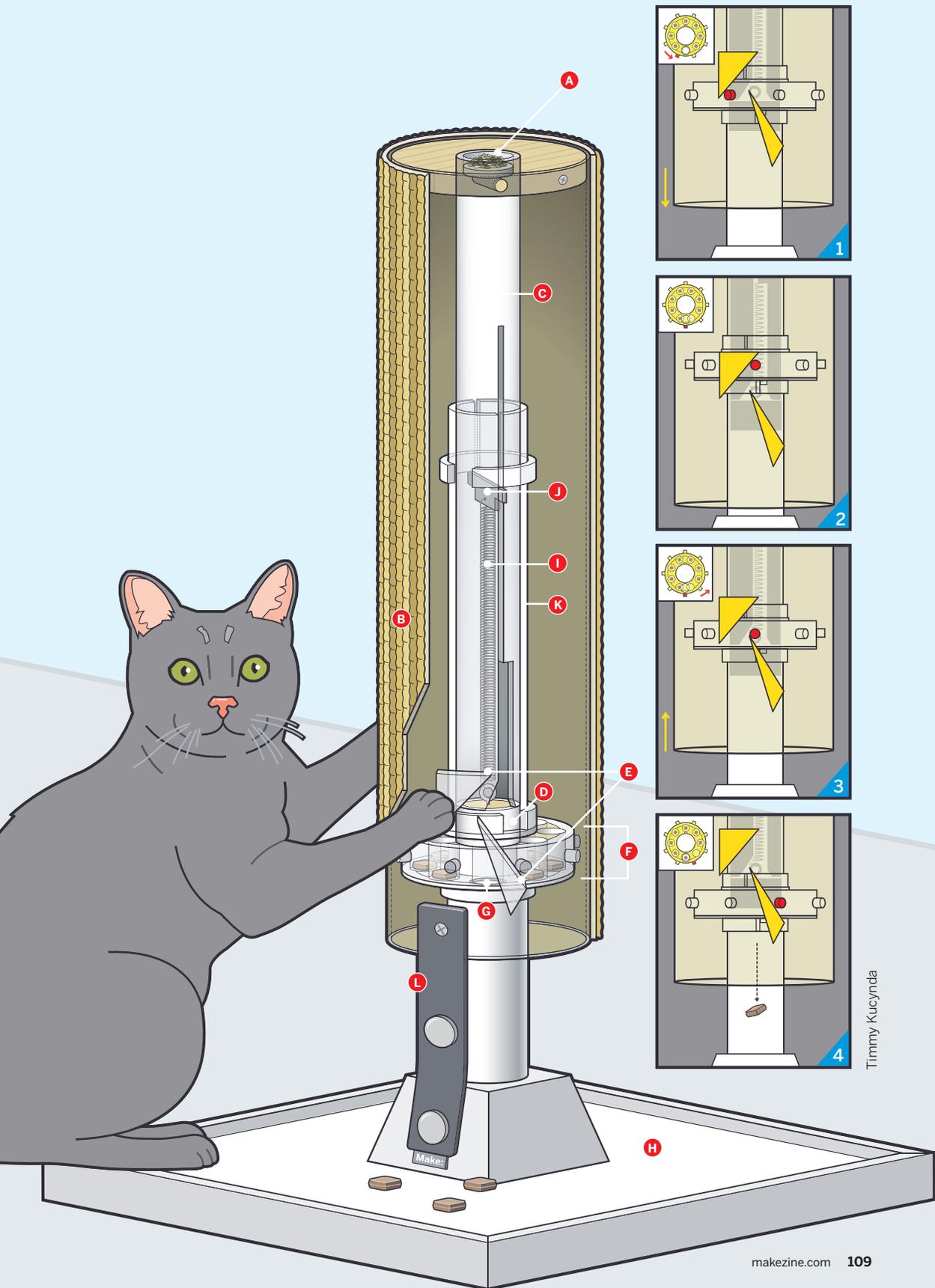
A spring **I** attached to a retainer **J** in the support tube **K** pulls the plunger back up, raising the scratch cylinder to the starting position. The spring rebound is limited by the strap **L**.



Cat Scratch Feeder

Build a snack-dispensing scratching post that will make Kitty forget the couch and curtains.

Written and photographed by *Phil Bowie and Larry Cotton*



Timmy Kucynda



Materials & Tools

Berber carpet scrap
15"×16"

Dowel, wood
¼" diameter,
2" length

Aluminum flat bar
⅛"×½"×2" long

Dowel, acrylic
¼" diameter,
6" length

Softwood lumber 2×4 nominal, 12" length actually measures 1½"×3½"

Extension spring
0.44"×10.25"×0.040", working load 1.4lb such as Hillman #222, from Lowe's. You'll cut it to 5¼", so shorter versions will work if you can find them.

Materials & Tools

PVC pipe Schedule 40, 1" nominal, 1.315" OD, 0.133" wall thickness, 15" length The outer diameter is almost exactly 1⅝", the wall thickness between ⅛" and ⅙". For a table of typical PVC dimensions see makezine.com/go/pvcdims.

PVC pipe Schedule 40, 3" nominal, 3½" OD, 0.216" wall thickness, 12" length

PVC pipe Schedule 40, 1¼" nominal, 1.660" OD, 0.140" wall thickness, 18" length This is approximately 1⅝" OD, 1⅜" ID, ⅙" wall thickness.

PVC pipe sewer & drain type, 4" nominal, 0.08" wall thickness, 18" length

Fabric strap non-stretching, ¾" or 1" wide, 5¼" length

- » **Softwood shelving board**, ¾"×11½"×18"
- » **Softwood strip**, ¼"×1"×50"
- » **Softwood or plywood**, ½"×4"×6" for top disk
- » **Screw eye, small**
- » **HDPE (high-density polyethylene) sheet, 2mm** We found 90mm disks on eBay that were perfect. You could also use furniture sliders or similar plastic material.
- » **Fabric snaps**, ⅝" OD (2) such

- as Dritz, available as a kit
- » **Various screws and brads**
- » **Table saw** You can do this project with hand tools, but power tools will be more accurate and save time.
- » **Band saw**
- » **Center punch**
- » **Drill press**
- » **Handheld drill**
- » **Drill bits** including spade bits and an adjustable (fly cutter) bit
- » **Power sander and sandpaper**

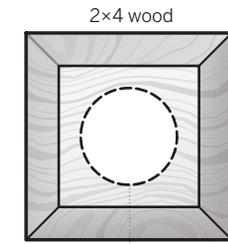
- » **Hammer, small**
- » **Pliers: needlenose and side cutting**
- » **Metal-cutting shears**
- » **Screwdrivers**
- » **Files**
- » **Square, small**
- » **Hot glue gun**
- » **Glues: wood glue, hot glue, cyanoacrylate glue (aka super glue), and spray adhesive**
- » **Scrap wood** for V-block and other drilling/sawing jigs

1a Base & edging

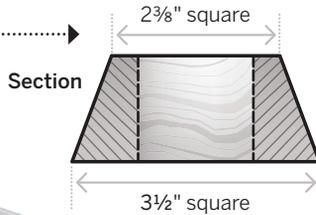


NOTE Keep your adjustable bit set at 1 1/8" diameter for drilling other parts later.

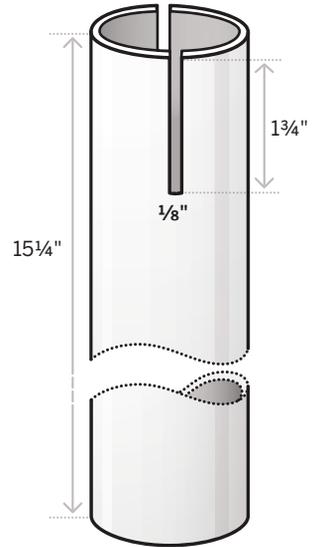
1b Support tube holder



Hole: Drill using 1 1/8" fly cutter bit



2a Support tube



PVC tubing 1 5/8" OD, 3/64" wall



1d

1. MAKE THE BASE

1a. Cut the base square, mitering 1/4" wood strips so they form a lip all around to help retain the dispensed treats. Fasten with brads and a bit of wood glue.

1b. Follow the support tube holder diagram to build the holder. For safety, drill the hole with a fly cutter before cutting the wood to size. The hole is nominally 1 5/8", but drill it slightly undersize to ensure

a press fit between the holder and the support tube.

Chamfer the holder's edges on a table saw or band saw.

1c. Fasten the support tube holder to the center of the base with wood screws.

1d. Insert a stub of 1 1/4" PVC pipe (1 5/8"-OD) into the hole as a mask, then sand, prime, and paint the base a light color so the cat treats will show up on it.

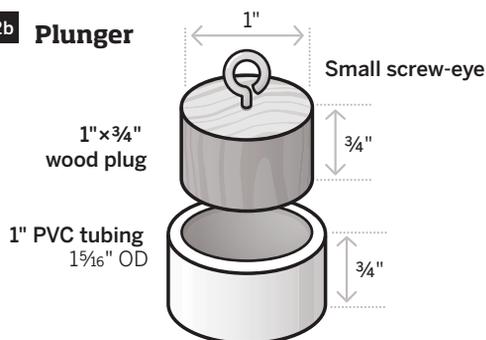
Attach a male fabric snap

to the center of any face of the holder with a wood screw.

2. MAKE THE SUPPORT TUBE COMPONENTS

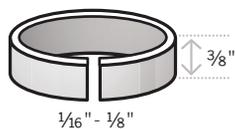
2a. Cut the support tube from 1 1/4" PVC pipe, using a table saw, following the diagram. To cut the slot in the center of one end, hold the pipe vertically and use wooden pushers at the bottom and side as shown (ask a friend to help).

2b Plunger



2e Split ring

Make 3 from 1 1/4" PVC.



Notch one ring near split, approx. half material thickness deep.



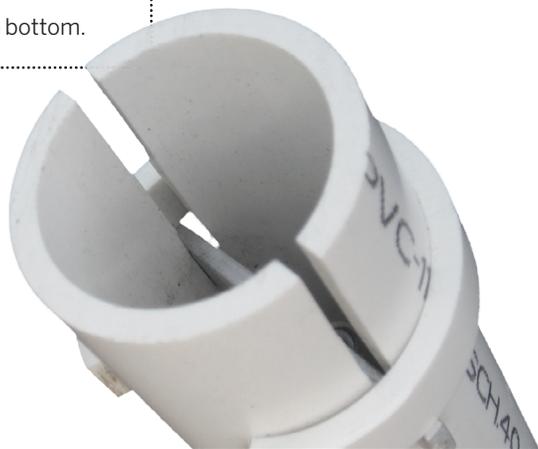
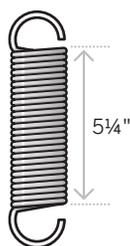
2c Top spring retainer

Make from 1/2"-wide aluminum.



Drill 1/16" hole on centerline, 1/8" from bottom.

2d Spring



2b. Make the plunger from 1" PVC pipe, following the plunger diagram. Cut the 1"-diameter wood disk on a band saw, sand it to fit tightly in the ring, and glue it in place. Sand the top and bottom of the plunger flat and square, then insert a small screw eye in the center of one face.

2c. Make the top spring retainer from the aluminum bar, following the diagram, using a band saw. For safety, drill the hole and notch the

corners before cutting the part to final size.

2d. Cut the extension spring down to 5 1/4" over the closed coils, per the spring diagram. Use needle-nose pliers to bend out new hook coils on the ends, then cut them with side-cutting pliers. Insert the hook coils into the top spring retainer and the plunger screw eye. Then insert that assembly into the support tube per the assembly diagram in step 4 on page 114.

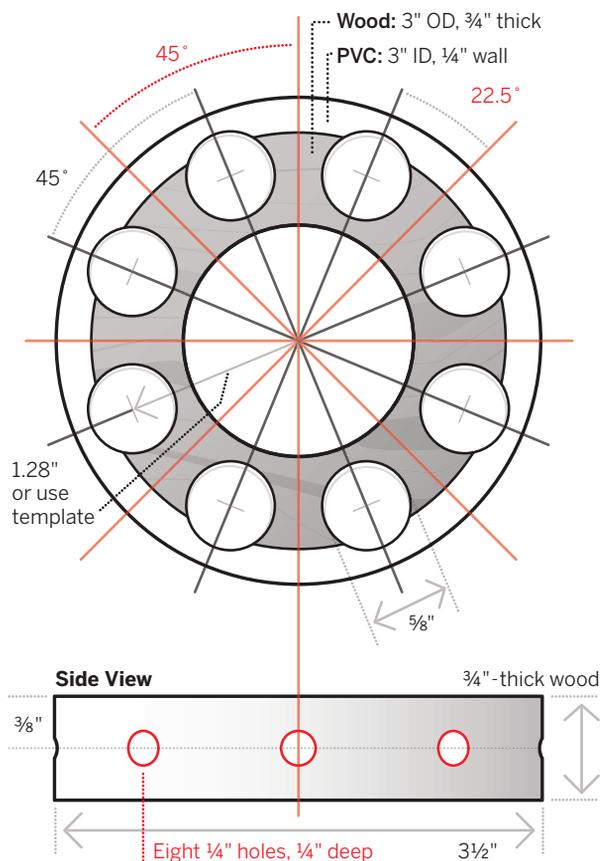
2e. Make 3 split rings from 1 1/4" PVC pipe per the split ring diagram.

Note that one has a notch in its outside surface near the split, which can be rough-cut with a band saw, and the inside corners filed square.

Put the top spring retainer in place. Then, expand one of the rings without the notch (it's not easy) and push it over the top end of the support tube to hold the top spring retainer in place.

Turntable & rotation pegs (shown at ¾ scale)

Use the full-sized turntable template provided at makeprojects.com/v/33. Peg specs are in red.



3a

The turntable is just ¾" deep, but start with at least a 12" length of pipe for safe cutting on a power saw.

3. MAKE THE TREAT TURNTABLE

3a. Follow the diagram to make the turntable and rotation pegs. When cutting the ¾" wood and 3" PVC pipe, ensure that the cuts are straight, parallel, and square to the sides. The wood disk should fit tightly into the PVC ring. Glue it in place and sand both faces smooth.

3b. The positioning of the rotation pegs and the locations of the treat holes are

critical. The red lines indicate peg locations; extend them onto the sides of the PVC pipe. Draw a line around the outside, centered between the 2 faces.

3c. Drill the center hole with a fly cutter bit. This hole should initially fit snugly over the support tube. Drill the 8 treat holes using a spade bit.

Make a drill press jig for the peg holes. Using a length of the 1¼" pipe (1½" OD) resting in a wood V-block, with the bit

IMPORTANT Center-punch all hole locations before drilling.

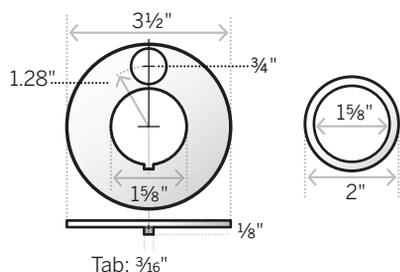


set to stop at a depth of ¼", drill the 8 peg holes.

3d. Cut eight ½" rotation pegs from ¼" acrylic dowel, ensuring the ends are square and smooth. Tap them lightly into the peg holes with a hammer and glue them in place. The ends of the pegs should just clear the ID of the 4" PVC drain pipe.

You can radius the ends slightly on a sander to help achieve a close fit.

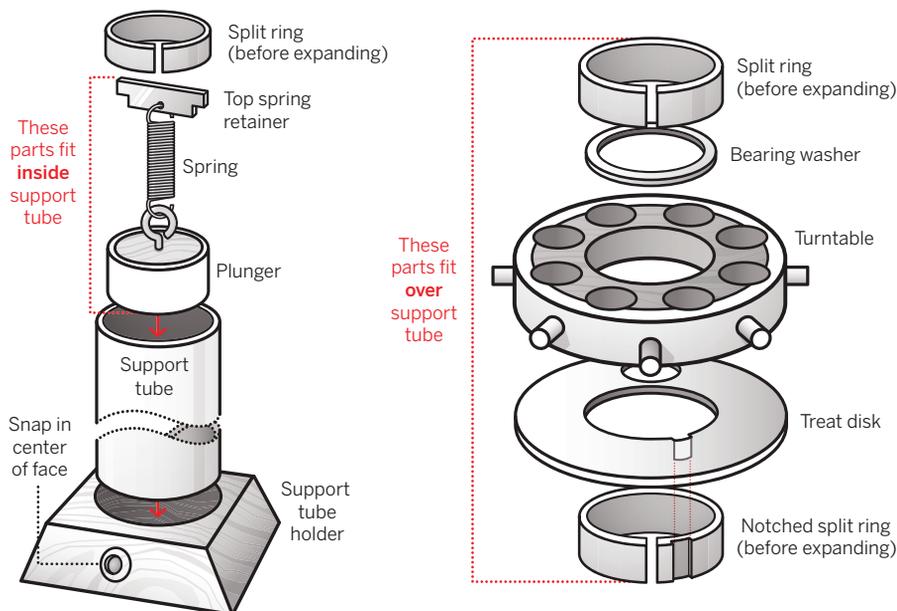
3f Treat disk & bearing washer



4a



4



3e. After the turntable is completed, sand the large center hole so it rotates freely on the support tube.

3f. Cut the treat disk and bearing washer from 2mm HPDE plastic, following the diagram. (If you bought 90mm disks, they're almost exactly the size of the treat disk.) Lay out the 2 parts on the plastic and drill both large holes with the fly cutter bit. Use a 3/4" spade bit for the smaller hole in the treat disk.

Then cut out all the parts with shears.

Use side-cutting pliers to snip the tab on the inside diameter of the treat disk, and carefully bend it down 90°.

4. ASSEMBLE THE SUPPORT TUBE.

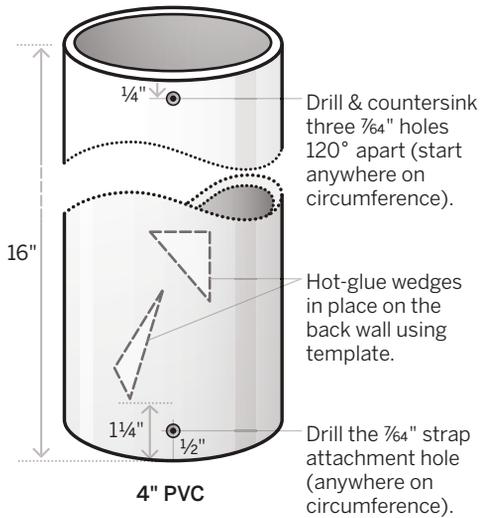
Following the assembly diagram, spread and slip the second notchless split ring onto the support tube from the bottom. Follow with the bearing washer, the turntable, and the treat disk.

4a. Press the notched split ring on last, so that the bent-down tab on the treat disk will be trapped by the notch to keep it from turning.

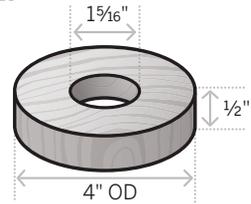
Position the bottom surface of the treat disk 5 1/2" from the bottom of the support tube.

4b. Press the support tube assembly into its holder on the base without fastening it. Don't fasten the split rings either, to allow for adjustment.

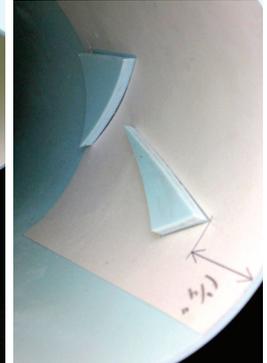
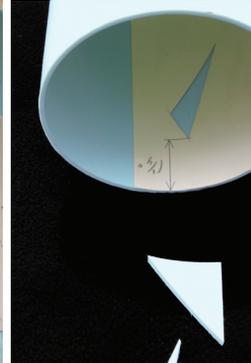
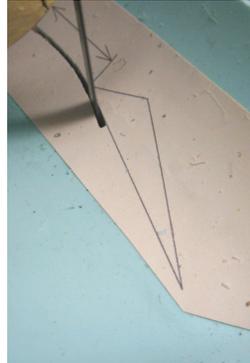
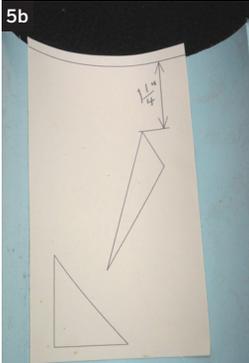
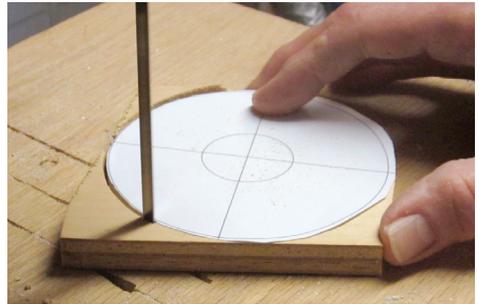
5a Scratch cylinder



5c Top disk



Make from 1/2"-thick wood.



5. MAKE THE SCRATCH CYLINDER PARTS

5a. Cut the scratch cylinder, following the diagram.

5b. Cut the 2 sets of wedges using the full-sized template at makeprojects.com/v/33. These will rotate the turntable one-half position on the downward stroke of the scratch cylinder, and then one-half position on the upstroke, releasing the treat.

Split lengthwise an 8" piece

of 4" PVC pipe. Temporarily spray-glue the template to the inside of one of the pieces, and cut 2 sets of wedges with a band saw. Super-glue the duplicate wedges together, doubling their thickness.

On another copy of the template, cut out the wedge holes. Temporarily spray-glue this template to the inside wall of the scratch cylinder 1 1/4" from the bottom end, anywhere on the circumference. Hot-glue the wedges in place, using the negative template to position

them accurately.

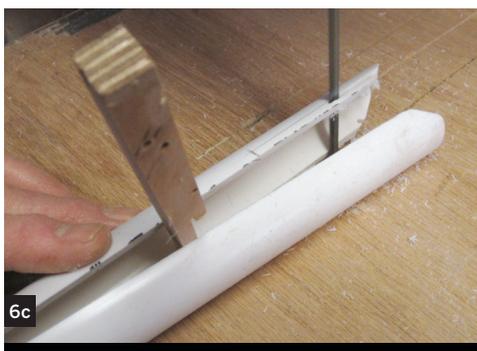
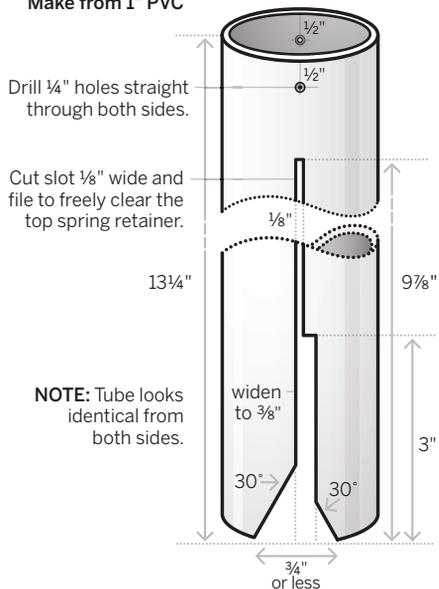
5c. Using a band saw, make the top disk and sand it to fit tightly into the top end of the scratch cylinder. Use the fly cutter bit (reset to just under 1 5/16") to drill its center hole.

Fasten the top disk to the cylinder using 3 small flat-head wood screws.

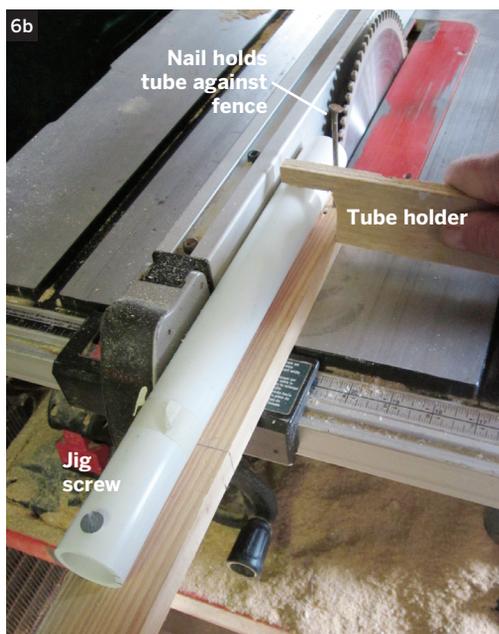
5d. Wrap the scratch cylinder with Berber carpet hot-glued in place.

6a Inner tube

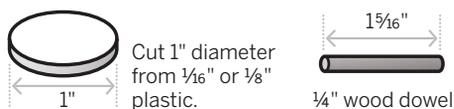
Make from 1" PVC



6b



7a Catnip disk, and disk pin



6. MAKE THE INNER TUBE

6a. Following the diagram, drill the 1/4" holes in the 1" PVC pipe (1 5/16" OD). Then make a wood jig and screw the pipe to it through the holes.

6b. On a table saw, cut the top slot 1/8" wide. Allow for the radius of the blade and the thickness of the jig itself to determine where to stop cutting. Finish extending the top slot on a band saw to its full 9 7/8" length.

6c. On both sides of the tube, widen 3" of the slot to 3/8" with a band saw as shown. Use a wood wedge to hold the slot apart for easier blade access. File the slot if necessary to make sure it clears the top spring retainer during the plunge stroke.

7b. Insert the catnip disk pin through the end of the inner tube, and glue the catnip disk into place using the pin as a stop and gluing surface.

7c. Press and glue the inner tube into the cylinder top disk. It must be centered within the scratch cylinder.

7. ASSEMBLE THE SCRATCH CYLINDER

7a. Follow the diagram above to make the catnip disk and disk pin.

8. TEST AND TROUBLESHOOT

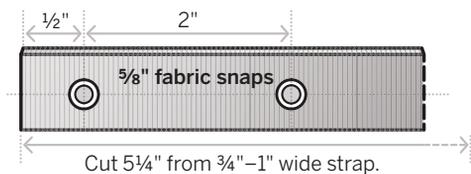
Load the turntable with treats, and drop the scratch cylinder assembly over the support tube assembly. The inner tube must slide easily into the support tube.

Pull down on the scratch cylinder to cycle your Scratch-a-Treat, testing for smooth operation and ensuring that treats are dispensed.

If you feel friction, there could be several sources:

- » Between the slot in the inner tube and the top spring retainer. Try removing the scratch cylinder, turning it 180°, and replacing it. Or widen the slot slightly, especially at the top.
- » Between the inner tube and support tube. Remember that the inner tube must be centered in the scratch cylinder.
- » Between the turntable and support tube. Sand the center turntable hole as necessary.
- » Between the rotation pegs and the wedges inside the scratch cylinder. Smooth these parts as necessary to reduce friction.

If treats aren't dispensed, adjust the height of the turntable on the support tube and/or turn the treat disk (and its split ring) so it releases all the treats reliably.



9 Strap

9. FINAL ASSEMBLY

Remove the scratch cylinder and fasten the 2 lower split rings to the support tube with short screws. These must not protrude inside the support tube.

Make the fabric strap per the strap diagram and screw it to the inside bottom wall of the scratch cylinder. Turn the support tube in its holder to align the snaps. ■

■ **TEST BUILDER: Isabella Ghirann, MAKE Labs**

Tame That Kitty



When you first set up your Scratch-a-Treat, use the strap's end snap to limit the spring's bounce when Kitty releases the scratch cylinder. Use the shorter snap position to disable the plunge action altogether when Kitty becomes accustomed to using Scratch-a-Treat as a proper scratching post.

You don't need to remove the scratch cylinder to load treats. Simply unsnap the strap, lift the scratch cylinder about 4", rotate it clockwise, and let go. Load the treats into the turntable, then reverse the process to drop the scratch cylinder back into scratching position.

A variety of treats can be used. We favor the crunchy, catnip-flavored Temptations brand.

Rubbing a bit of catnip onto the carpet will help attract your cat initially and encourage scratching.

As with all pet training, praise Kitty generously when she uses the Scratch-a-Treat, and administer a stern scolding when she does not.

Grandma's knees will be happy.

Larry Cotton is a semi-retired power-tool designer and part-time community college math instructor. He loves music and musical instruments, computers, birds, electronics, furniture design, and his wife – not necessarily in that order.

Phil Bowie is a lifelong freelance magazine writer with three suspense novels in print. He's on the web at philbowie.com.