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How to be a maker 2 Week 9 Sparrows in, squirrels out

If squirrels are stealing the bird food, **Hannah Joshua**'s discerning feeder will stop them in their tracks

Hannah Joshua is a science writer and maker based in London. You can follow her on Twitter @hannahmakes

New stuff you need

Empty large plastic drinks bottle Cardboard Zip ties Servo motor Zip Glue Nuts (the edible kind)

For next week

You've got it all already

Next in the series

- 1 Moisture-sensing plant
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- **5** Pest scarer
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- 8 Mini weather station
- **9** Remote controlled pest-proof bird feeder part 1

10 Remote controlled pest-proof bird feeder part **2** IT'S called a bird feeder – but that doesn't stop other garden guests trying their luck. So how can you select what wildlife it serves? Over the next two weeks, we will build a remote-controlled device that will let you shut up shop when greedy squirrels come calling.

First, we will assemble the feeder itself. Take a 2-litre plastic drinks bottle and cut it in two about a third of the way down from the neck. Next, cut out a circle lower down the size of a bottle top. This is big enough to give birds access, but small enough to keep peanuts from tumbling out. Also, it means we can use a cap from another bottle as the door to our feeder.

Now to fit the servo motor that will open and close the door on command. Mounting it inside the bottle keeps it away from the elements. We will need to make a hole for the servo's shaft, and two other pairs of holes for some zip ties to secure the device.

Hold the servo inside the bottle, putting its shaft as close as you can to the door hole without any part of the servo blocking it. Mark the shaft's position on the bottle, as well as either side of the lower and upper halves of the servo.

Put the servo aside and use a sharp implement to poke holes through the five marks. Widen the central hole just enough so the servo shaft can poke through. It should be snug, but still able to turn unhindered. Thread zip ties through the top and bottom pair of holes, making sure both ties loop around the servo, then



SERVO MOTOR

Make online

Projects so far and a full list of kit required are at newscientist.com/maker Email: maker@newscientist.com

tighten them to hold it in place.

For the door, take a bottle cap, make a slit in the side and poke it onto one of the small plastic arms that came with your servo. It should now look like a lollipop. Glue the two together.

Your feeder can stand alone or can hang, in which case the birds might need a perch too. If you make a small hole below the door, you can insert a skewer for avian guests to use while they dine.

Next, we are going to make a divider to keep the electronics and peanuts apart. Cut out a circle of cardboard to match the cross section of your bottle (you can do this by drawing round one of the cut edges), then chop it in half. In addition, create a rectangle of card that is about 10 centimetres long and the width of the diameter of the semicircle. With the semicircle lying flat and the rectangle upright at 90 degrees, glue the flat edge of the semicircle to a matching side of the rectangle, creating an L-shaped piece. This will slip inside the bottle as a platform for your BBC micro:bit. We will need this to make the brain of the bird feeder.

BOTTLE CAP

Lastly, glue your zip around the cut edges of the bottle so you can open and close the feeder and keep the rain off the electronics. It might not look like much now, but we will add the magic next week.