



Bristlebot

by [JoshuaZimmerman](#) on June 9, 2014



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I used to teach middle school science, but now I run my own online educational science website. I spend my days designing new projects for students and Makers to put together.

Intro: Bristlebot

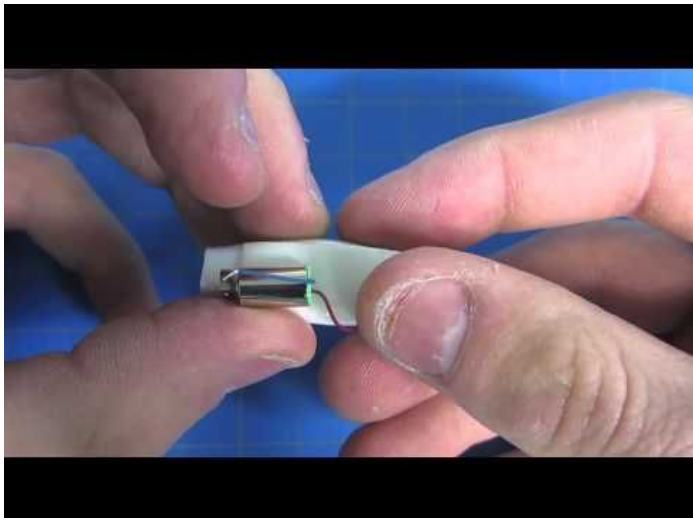
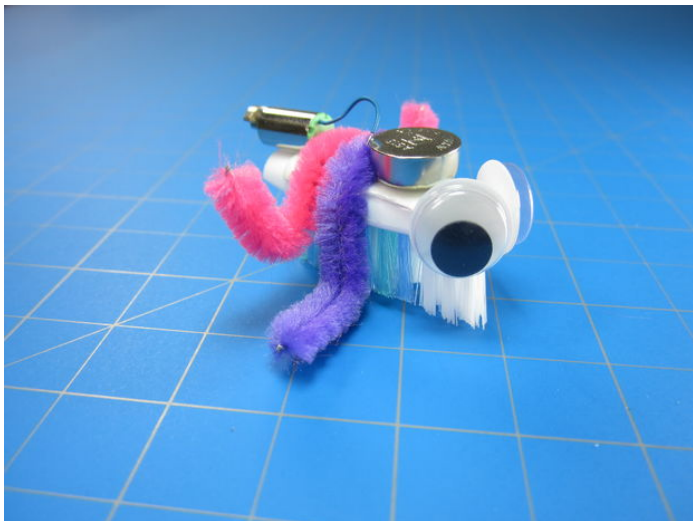
A Bristlebot is a small robot made by combining a toothbrush head and a vibrating pager motor. The vibrations from the pager motor travel down the bristles and cause the brush to scoot and spin on flat surfaces. This activity is great for kids as young as 10 years old.

This guide provides step-by-step instructions with pictures and video on how to make your own Bristlebot.

Difficulty: Easy

Cost: Low

Time: 5-15 minutes



Step 1: Gather Materials

You can easily make your own Bristlebot from parts you find in a junk drawer, or for a few dollars worth of parts. One easy source of vibrating motors are old cell phones or pagers, though they may require small amounts of soldering in order to get wires on them. Try experimenting with different motors for different effects.

The same goes for toothbrushes. Your local \$1 Store had a wide variety of brushes. The key to making a bot is to get a tooth brush with angled bristles. If they're just straight up and down the bot won't move (much). If you're a teacher, try asking local dentists for tooth brushes. Just maybe don't tell them what you're up to.

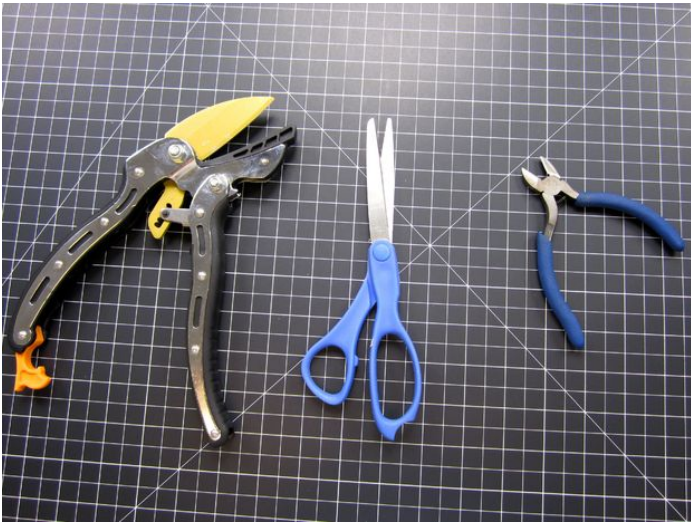
This Bristlebot Kit is available for purchase on browndoggadgets.com in single packs, 4 packs, and 25 packs.

Tools

Titanium Garden Shears
Scissors
Wire Cutter (if using wire)

Parts

Oral B Toothbrush
Double-sided tape
Vibrating Motor
Battery
Googly eyes
Pipe Cleaners

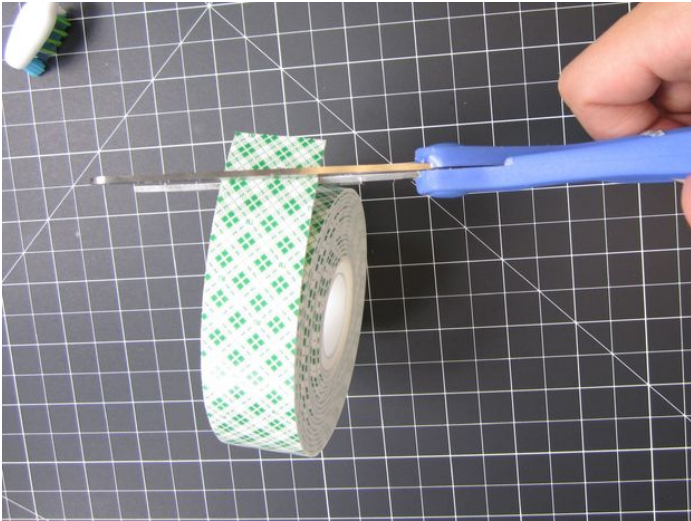
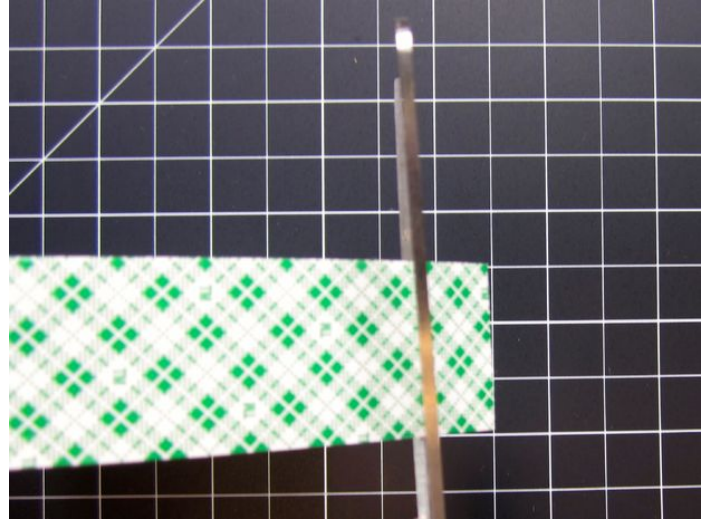


Step 2: Cutting

To get started, cut the top of the toothbrush off using titanium garden shears.

Then, cut a piece of the double-sided tape off the roll to fit the width of the toothbrush head.

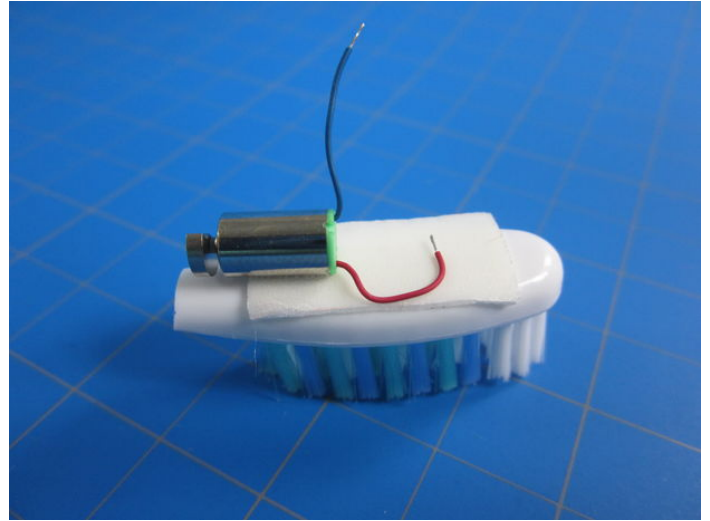
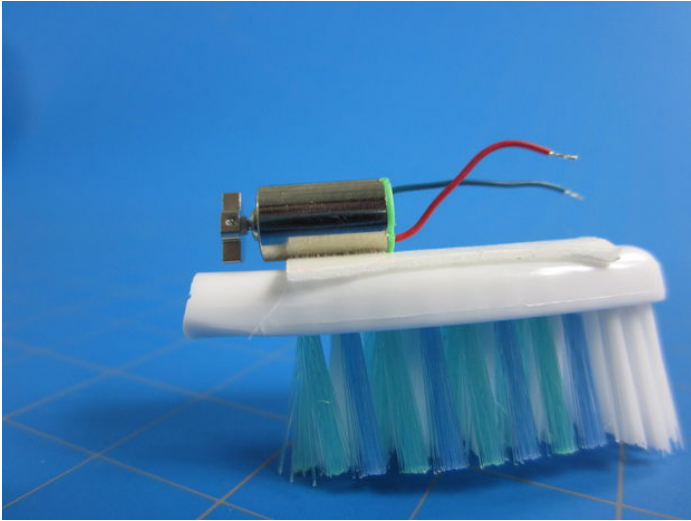
Stick it on top of the toothbrush head and peel off the top sticker.



Step 3: Attach the Motor

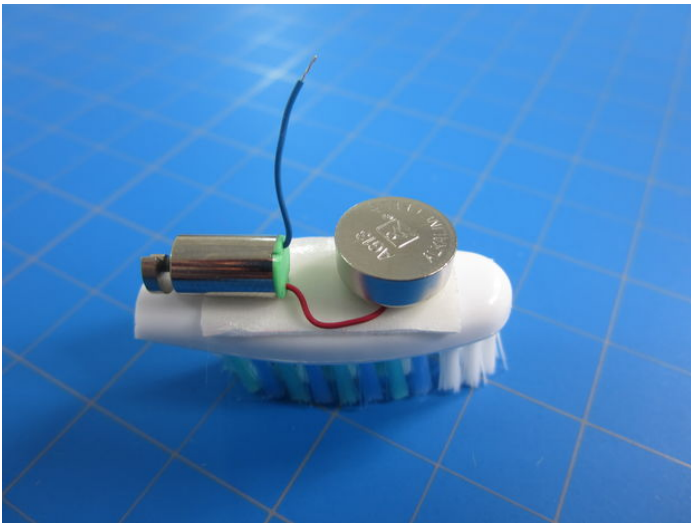
Stick the motor onto the tape with the motor near the cut end of the toothbrush. Make sure the offset weight of the motor (skinny end) is hanging off the tape so it can spin freely.

Stick one of the leads (red or blue wire) on the tape with the end of it closest to the head of the toothbrush.



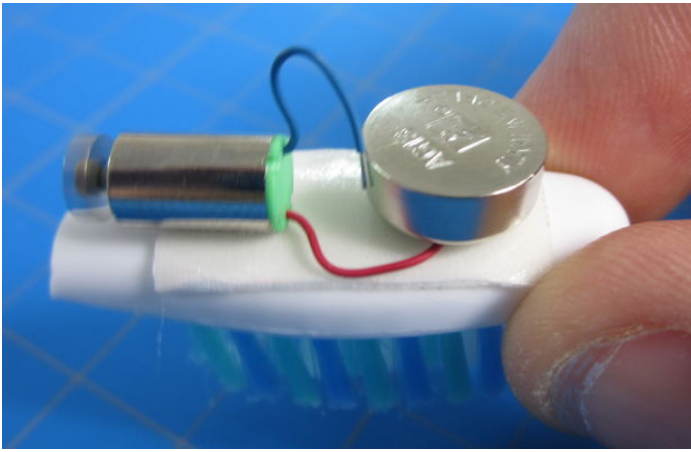
Step 4: Attach the Battery

Stick the battery on top of the lead (the one stuck in the tape) with the words facing up.



Step 5: Test the Connection

Next, take the free wire (the one not under the battery) and tap it to the battery to make sure the motor works. If it doesn't, check that the wire is being touched by the battery and that the motor can spin freely.



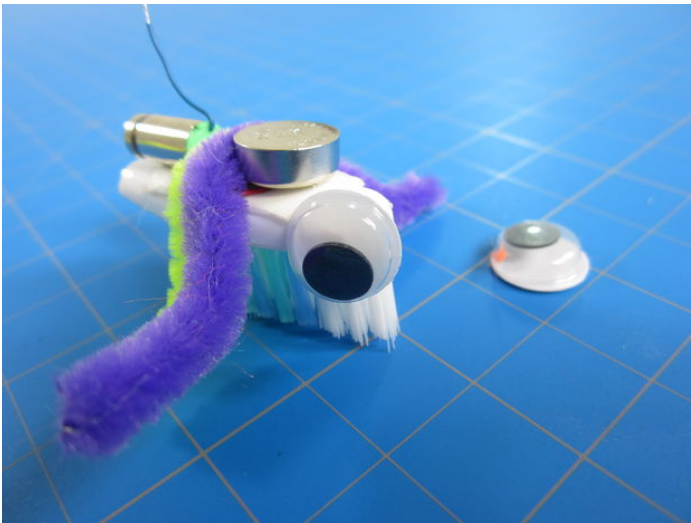
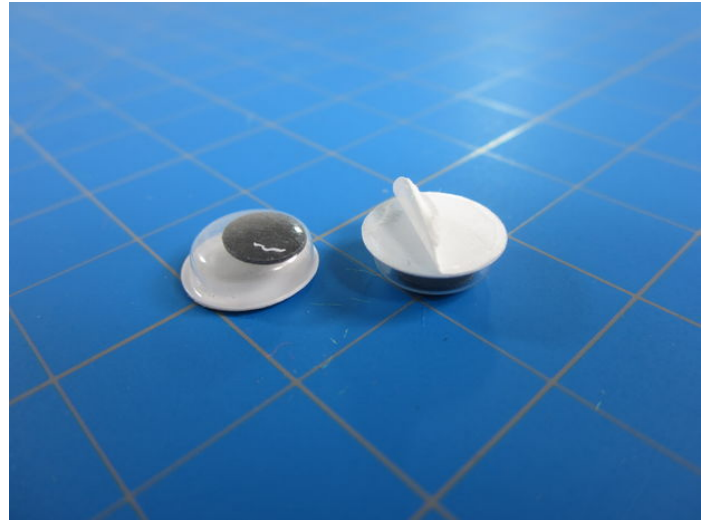
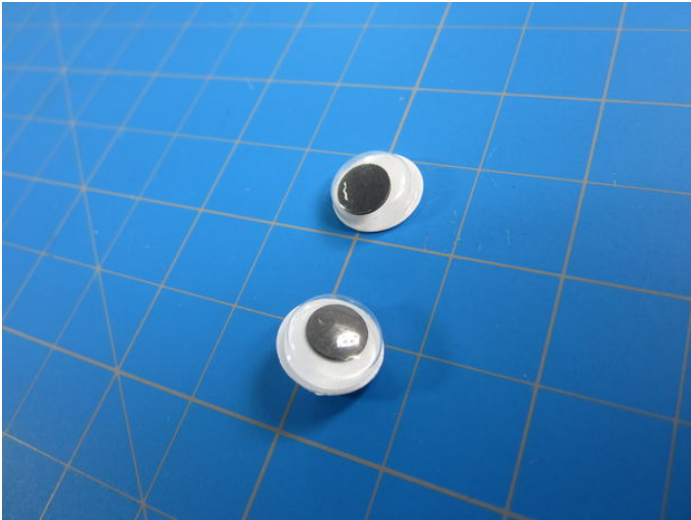
Step 6: Add Feet onto Your Bot

Place the pipe cleaners (2-inches long) in-between the motor and the battery on the adhesive and press down. Then fold the pipe cleaners down to press onto the table surface to help stabilize the bot.



Step 7: Adding Googly Eyes

Remove the adhesive cover from the googly eyes and press them to the head of your bristlebot (tape/glue can also be used).



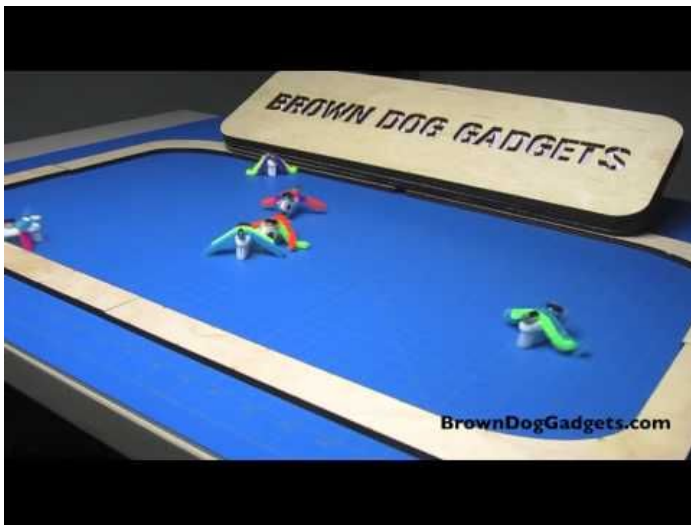
Step 8: Let it Run!

Finally, take the free wire and wedge it between the pipe cleaners and the battery to make a stable connection. This wire will act as your on/off switch.

You have now built a bristlebot! Enjoy!

If you want to go super crazy, grab a large hand scrub brush from your local \$1 Store and a \$1 Electronic Tooth Brush. Same idea, just far bigger. We like to use zip ties to get the Electronic Tooth Brush to stay in place.

[Purchase Bristlebot Kit Here](#)



Step 9: Large Group Activity/ Classroom Activity

Bristlebots are fun for the solitary child but even more fun in groups. Below is a sample activity which is easily expandable for kids in high school. Bristlebots make for a fun activity when talking about energy, motion, and animal movement.

Goal: Students will learn how to make a Bristlebot then create their own versions in order to meet engineering challenges.

Supplies Needed:

A large variety of tooth brushes, different sizes and shapes

A large variety of motors, different sizes and power

A large variety of coin cell batteries, different sizes and shapes

Foam tape

Wires, pip cleaners, and just general junk

Wooden block or other materials to make a "track". Taping up a floor also works.

Simple Worksheet or handout

Procedure:

1) First, students make their own standard Bristlebot.

2) Present your challenges. We enjoy the following.

A) Going over a small ramp.

B) Going around a corner. Use block to make this happen.

C) Going in a strait line. Tape up a floor to make this happen.

3) Students are given a handout. If a student makes a bot which can complete a challenge, they get a stamp/ sticker/ teacher signature.

4) Students draw and explain their bots. If a student is unable to complete a challenge they must explain why their bot didn't work and draw a design they think might work.

5) Once they complete all three challenges, or time runs out, give an additional handout with critical thinking questions.

It is unusual for students to create one single bot that can do all three challenges. Typically only 50% of students complete all three challenges in the time allotted.

Cleaning Up and Reusing:

After the activity you can have the students take their bots home or return the supplies. If you choose to have students return the supplies your only investment in future activities will be for more foam tape and batteries, both which are very inexpensive.

