

## Equipment List/Costs/Suppliers

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Toothbrush (angled)	1		Supermarket
single vibrating (eccentric) motor	1	\$5.00	Hobbies Mackay Ph: (07) 4942 8711 <a href="http://www.browndoggadgets.com/products/3mm-vibrating-pager-motor">http://www.browndoggadgets.com/products/3mm-vibrating-pager-motor</a>
small battery (CR1216)	1	\$5.00	Battery world
Double sided tape		\$1.00	Office works
Copper wire (20mm)	2	\$0.50	Jay car

# Activity

## Bristlebot: A tiny directional vibrobot

The Bristlebot is a simple and tiny robot with an agenda. The ingredients? One toothbrush, a battery, and a pager motor. The result? Serious fun.

(YouTube video [here](#).)



The BristleBot is our take on the popular [vibrobot](#), a simple category of robot that is controlled by a single vibrating (eccentric) motor. Some neat varieties include the [mint-tin version](#) as seen in Make Magazine (check the video), and the kid's [art bot](#): a vibrobot with pens for feet. The starting point is of course the toothbrush. We need one that has more-or-less uniformly angled bristles. (While it may be possible to take one with straight bristles and bend them to suit.



If the bristle length is nonuniform (as it is here), it may take scissors to make the bristles all the same.

MakerSpaces Mackay [www.makerspacesmackay.com](http://www.makerspacesmackay.com)

Cut off the handle of the toothbrush, leaving only a neat little robotics platform.

Next, we need a vibrating pager motor or other tiny motor with an unbalanced output shaft. If you should happen to find a small enough motor you can always add the weight yourself, but usually motors this size are made for pagers anyway.



As a power source, you can use an alkaline or lithium coin cell or watch battery, either 1.5 V or 3 V. To hook the motor to the battery I soldered short copper wire leads to the motor terminals.



The last substantial ingredient is some foam tape. Apply a small piece to the top of the toothbrush robotic platform, which will be used to hold the motor in place.



Attach the motor to the foam tape. The tape provides a spacer so that the rotating weight does not hit the toothbrush head. It also provides a strong, flexible connection to the base that is able to handle the severe

vibration that this robot experiences. A first approach to hooking up the battery might be to stand it on end. However, the battery itself is not held in place very well this way and will fall out shortly.



A better method is to bend one of the leads down flush with the foam tape, so that you can \*stick\* the battery to the foam tape as well and still make an electrical connection. The other lead contacts the other side of the battery, and the motor can run.

