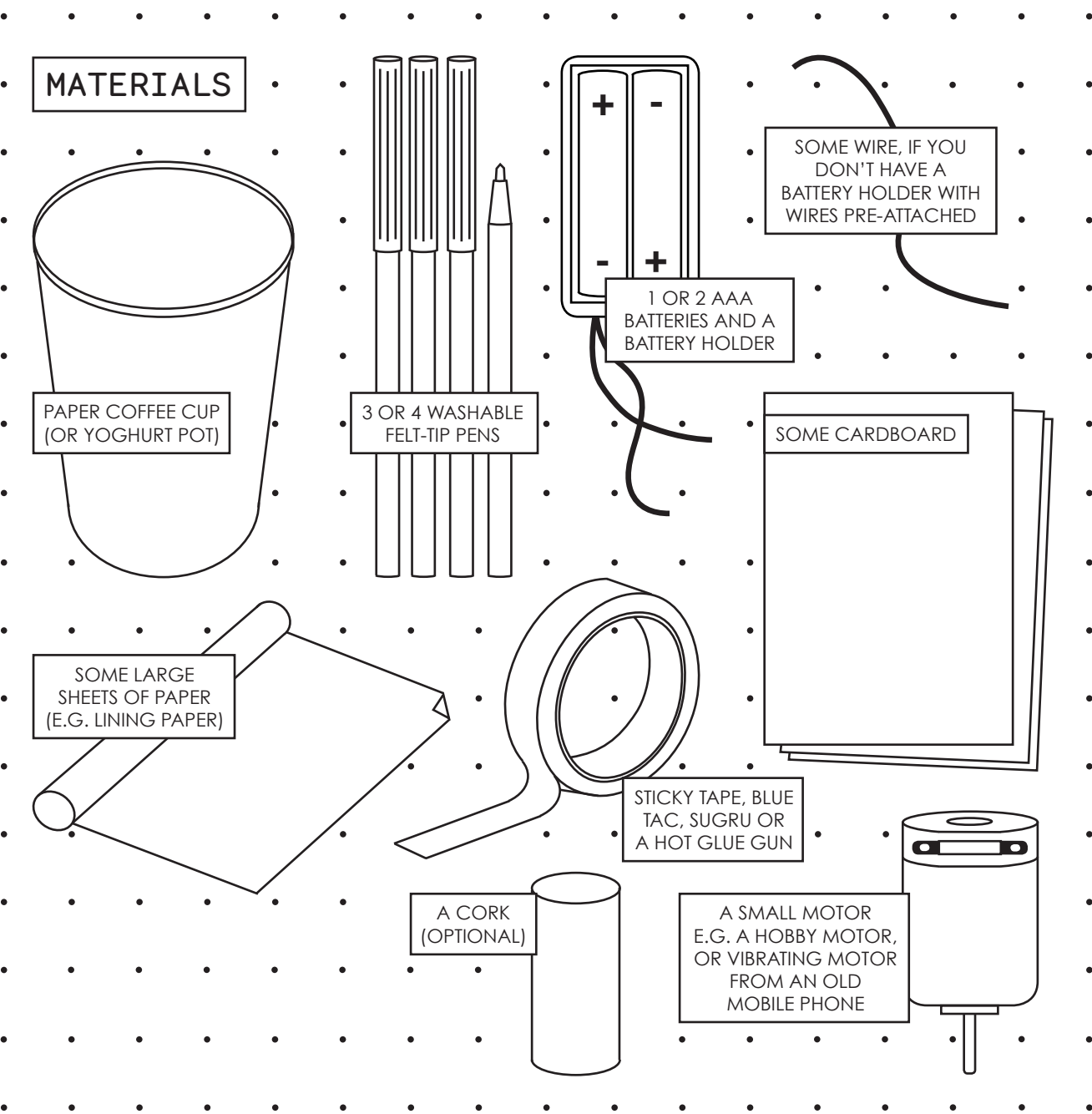


# DRAWBOT

ANDREW SLEIGH & BUILD BRIGHTON

Drawbot is a crazy little drawing robot who's got a mind of his own. You can make him easily with a paper cup, a few pens, a vibrating motor and a battery.

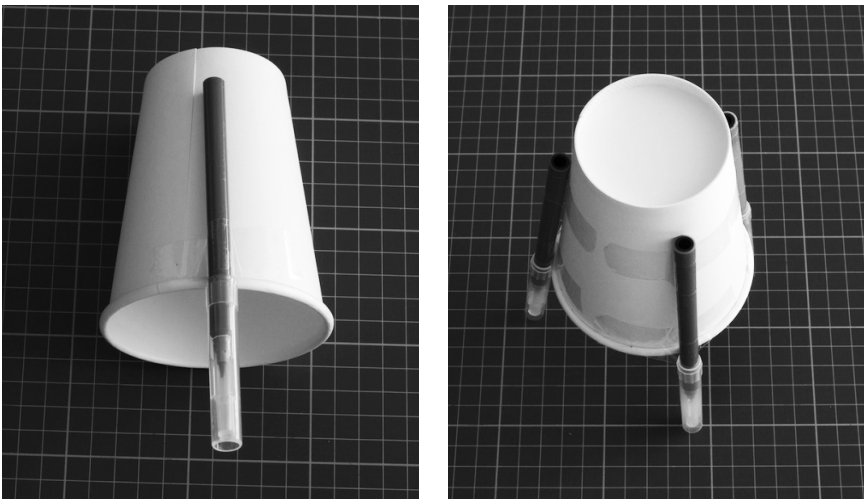


# INSTRUCTIONS

## STEP 1

Attach 3 pens to your paper cup with tape or glue. Space them equally around the cup, with the tips all at the same height, and facing out above the top.

Turn the cup over and check it's roughly balanced. The base of the cup is now the 'top'



## STEP 2

Put some batteries in your battery holder.

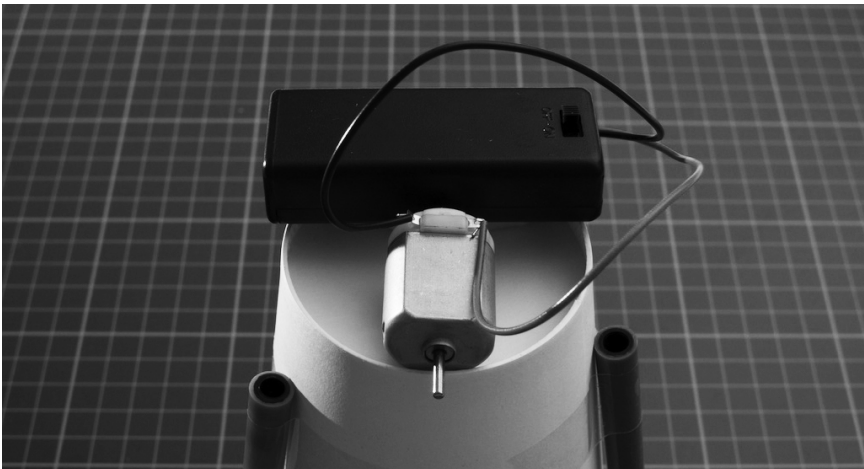
Attach your motor on top of your battery pack. Make sure the end of your motor sits proud of the battery pack, you want plenty of free space for your propeller. If you have a battery holder with a switch, you can go ahead and wire up the red and black wires to the terminals of your motor. It doesn't matter which way you wire it up.

If you don't have a battery pack, or it doesn't have a switch, wait until you have Drawbot fully assembled and ready to go before you attach the last wire.



## STEP 3

Attach the motor and battery on top of the cup. If you're just using a single battery without a holder, use Blue Tac or tape to attach it. You can secure some wires to the battery with sticky tape too.

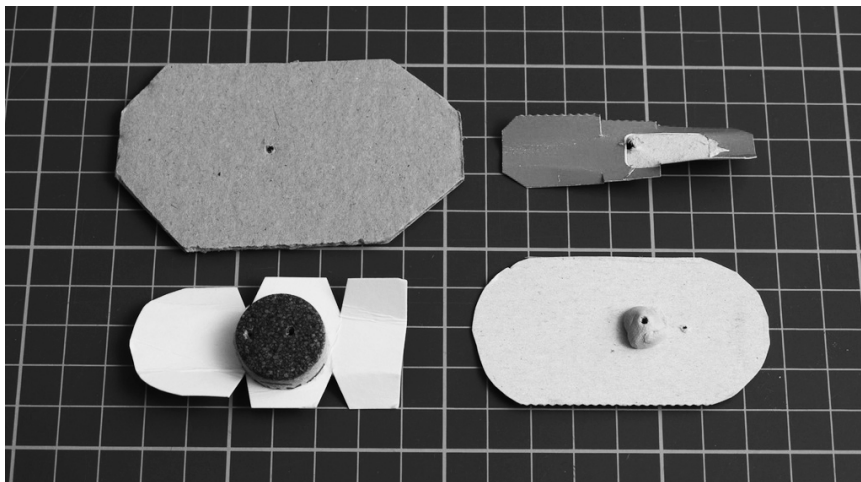
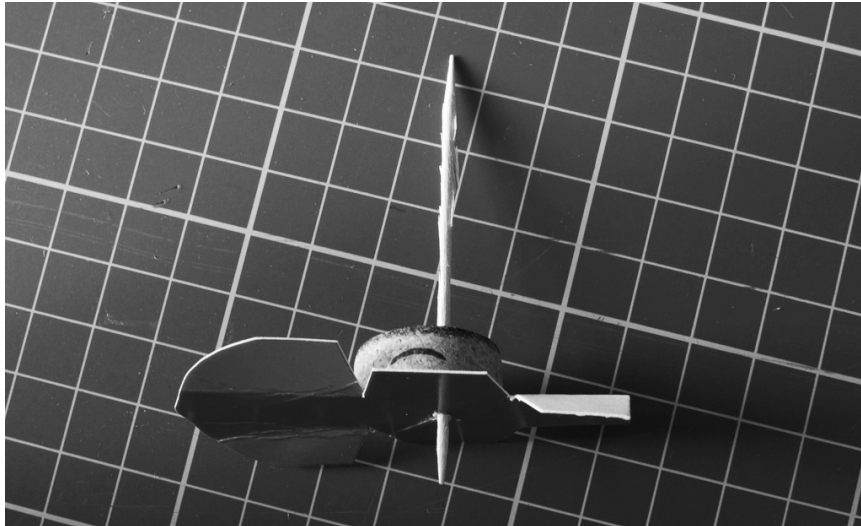


## STEP 4

Make a vibrating propeller. This is where it gets noisy! Drawbot moves by shaking around. You can make him shake by attaching an uneven weight onto the spindle of the motor. You can use a lump of Blue Tac, or make an off-center hole in a piece of cork or corrugated cardboard.

If you want Drawbot to move a little faster, make a propeller out of a piece of card; just cut and twist it so it has a propeller shape. But he'll still need to shake, so add some extra weight to one half of the propeller.

Here are a few propellers and weights I tried.

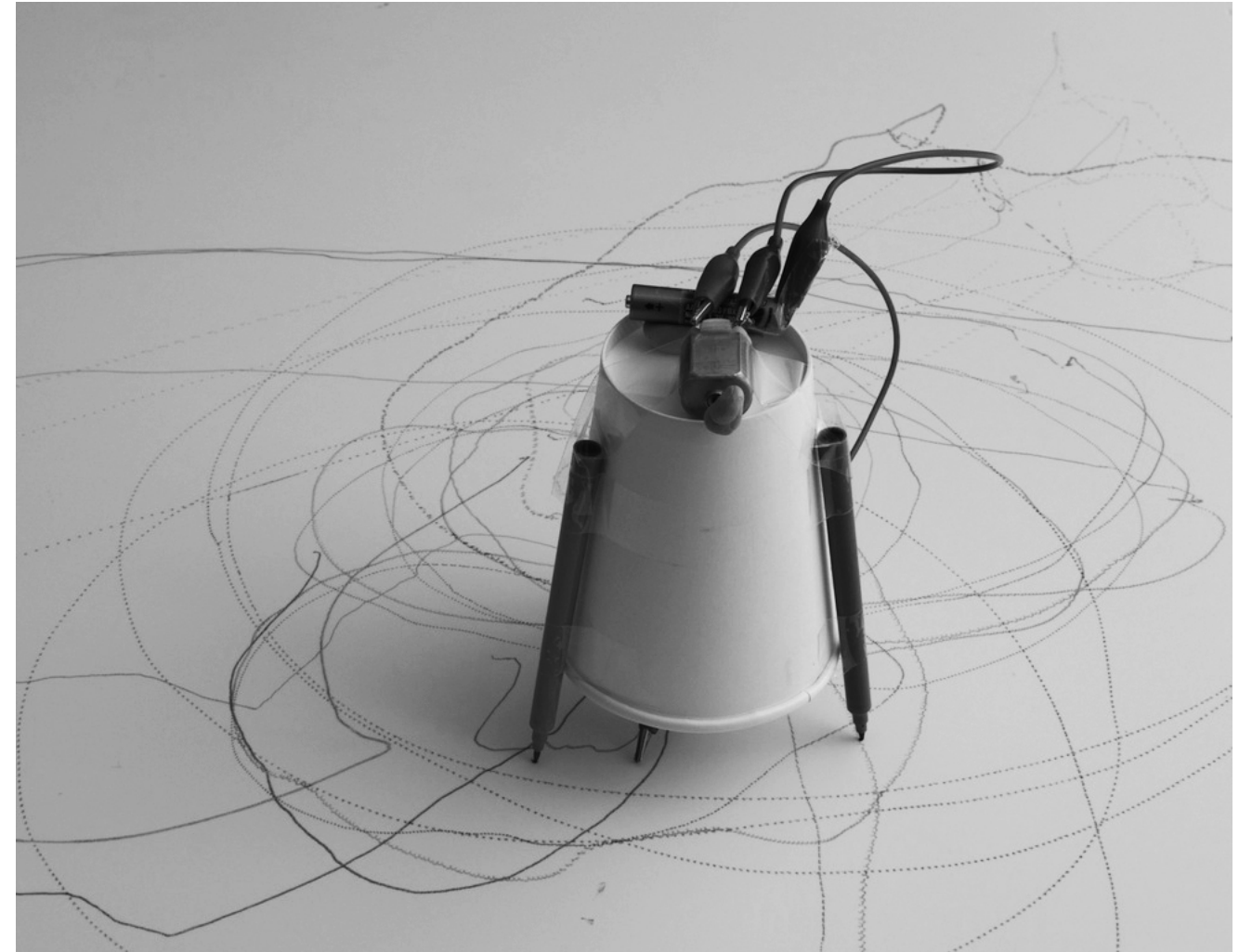


## STEP 5

Stick your propeller or off-center weight onto the motor, take the lids off your pens and put Drawbot down on a large piece of paper. Switch him on and watch him go!

## WARNING

Whatever you attach to the motor will almost certainly fly off at some point, unless you glue it on. So once he's going, stand back! Blue Tac tends to fly off quite easily, cork grips really well.



## WHAT NEXT?

Make several Drawbots and see how they get on with each other. How about a race?

Make him some wings, a moustache or a funny face.

Try adding other weights to Drawbot and see how wild you can make him.

Try a bigger propeller, or a more unbalanced weight. How does it affect the way he moves?

Try adding more pens, or changing the angle they're stuck on at.

Try using the vibrating motor to make other bots. What else can you make them do?

Andrew edited this zine, and also helped set up and run Brighton Mini Maker Faire. More about him at [andrewsleigh.com](http://andrewsleigh.com)

This Drawbot is based on a Build Brighton design by Steve Carpenter and Chris Holden. Build Brighton is Brighton's local hackerspace. More info at [buildbrighton.com](http://buildbrighton.com)

And that Drawbot is based on an original project by Jonah Brucker-Cohen ([coin-operated.com](http://coin-operated.com)). Phew!