

Floor Buffer for my home!



Robot Time!

Doesn't the thing on top look just so exciting! Wondering what it is? Let's find out in this very fun activity. You will be building a robot! We will also be exploring a method of generating motion in a robot.



WARNING: CHOKING HAZARD -

Pack may contain small items. Not for children under 4 years of age. Parents supervision is highly recommended



WARNING: Battery Usage -

Pack contains Batteries. Ensure not to short circuit them. (DO NOT connect) positive wire with negative wire directly

Let's see the Problem?

This is **Tim**. He is 12 years old.

He lives in Washington DC with his mother, father & little sister.



His little sister always spills food on the floor when she is being fed.

Tim's mother asks him to clean the floor each time.

Tim finds this task very very tiring :(Cleaning and mopping the floor is very troublesome and time consuming as you have to bend down and do it.



"I need to build Tim a Robot that can go around and brush the floor automatically for him!!"

Have a look at what you will be creating!

Open the IgniterBee app on your smartphone or tablet device and scan the image shown below using it!



Let's solve it!

In the box below, design your creation to solve the above problem. Ensure to clearly label the components that make up your creation! Good luck! :D

Design Goals:

- Should go around the floor automatically.
- Should be able to brush the floor when it moves.

Draw Your Design Here...

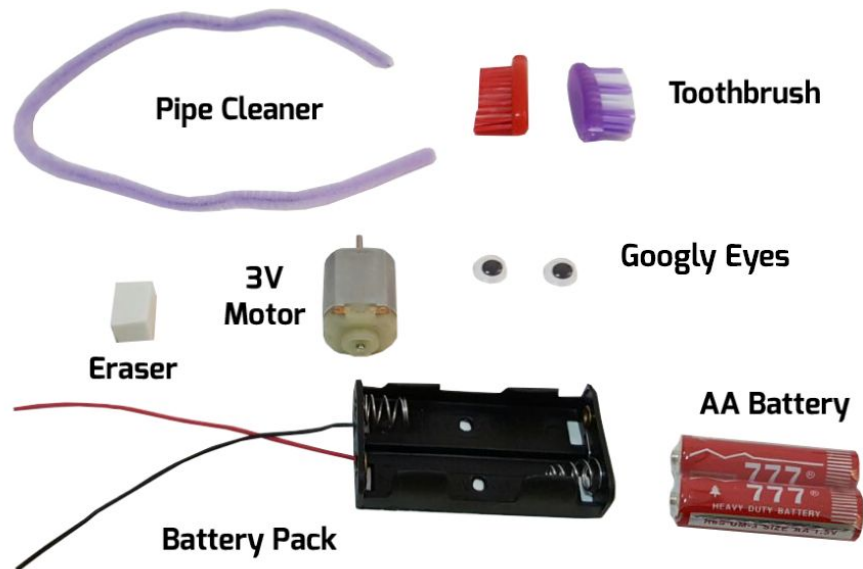
How does the above design solve the problem?

Explain how your creation solves the above problem :

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What Items are available?



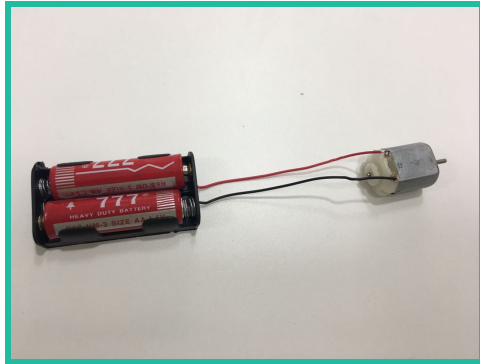
Qty.	Item	Alternative Material
2	AA Battery	You can use a 9V battery but it is too much of power.
1	Battery Pack	You can tape the two batteries together. Make your own battery pack -> https://goo.gl/MEBgL2
1	3V Motor	You can easily get one from a broken toy.
2	Toothbrush	Go searching for old used toothbrushes or try using a shoe brush.
2	Eraser	Dig into your pencil case and find some old eraser pieces.
1	Pipe Cleaner	Any other decorating materials you can find.
4	Googly Eyes	Make your own googly eyes -> https://goo.gl/ZwabKe

Equipment

- Scissor
- Double Tape

Building Goals

Goal 1 - Getting the motor to run



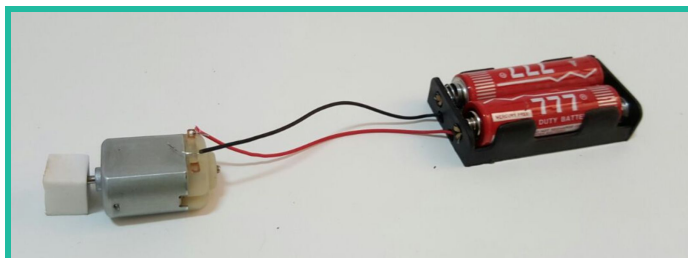
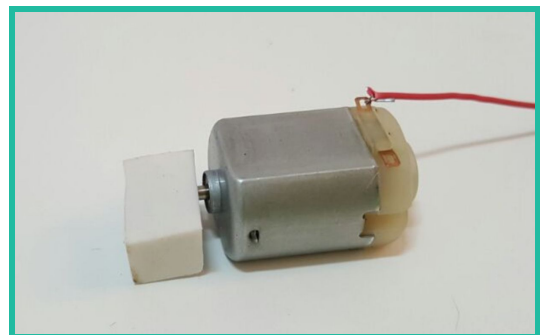
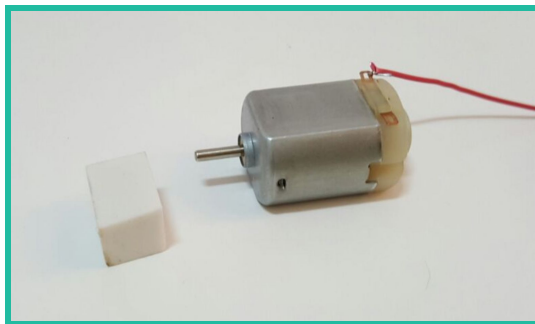
First Take the motor, battery pack and 2 batteries.
Put the batteries into the battery pack.

Then connect the motor to the battery pack using
the two wires.

Test : *If the motor works properly*

Goal 2 - Making the Vibration Motor

To convert the normal motor into a vibration motor, simple take the motor and the piece of eraser , then insert the eraser onto the axle of the motor. (Please note, when you fix the eraser onto the axle do not fix it on the center. Fix it to a side of the motor.)



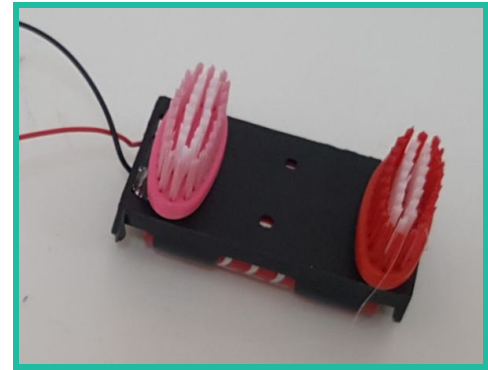
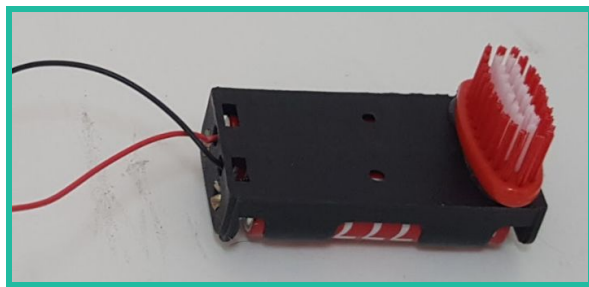
Test : *Connect the motor to the battery pack and test whether the motor successfully vibrates.*

Alternatively : You can attach another different object to the motors axle.

Goal 3 - Fixing the brushes

Next step is to fix the brushes onto the battery pack. Apply some double tape onto the base of the battery pack and paste the brushes as shown.

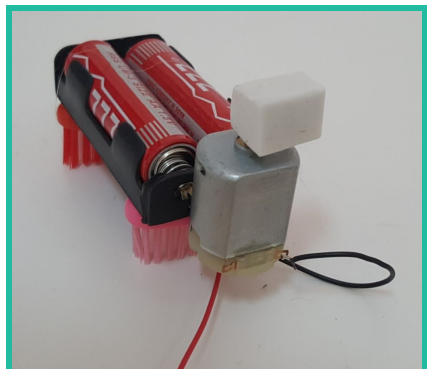
Refer to the images below when pasting the brushes.



Alternatively : You can paste one big show brush on this to make a bigger brush robot.

Goal 4 - Fixing the vibration motor onto the battery pack

To fix the vibration motor onto the body of the polishing bot, use some double tape to stick onto the motor and paste it onto the battery pack.



Make sure to paste the motor to the sides with the battery pack wires. And make sure the terminals of the motor are facing the front.

The polishing bot is now done. Fix the other wire to the motor and test it out.

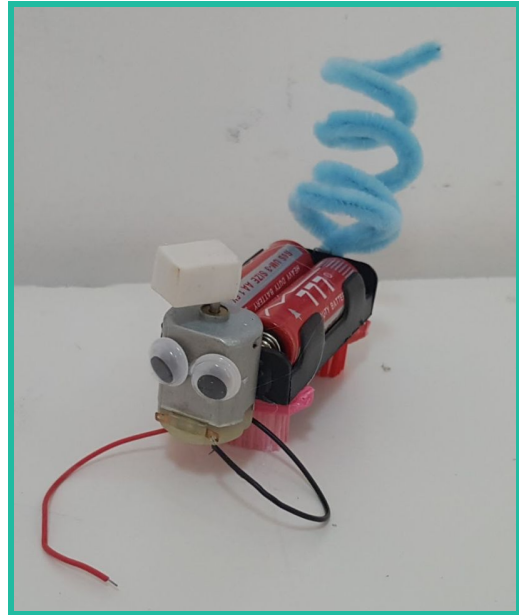
Goal 5 - Decoration time

Now it's time for decoration. Use the googly eyes first to add eyes to the polishing bot as shown below.



Finally use the pipe cleaner to add a further decoration to the brushbot as shown in the image below.

The polishing bot is now complete! Have fun!





CHALLENGE

This polishing bot can only clean a small area since the brushes are very small. Build a much larger brush bot that can clean a much larger area & can pick up the dirt as it moves around.

Observations:

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EXPERIMENT

1. Find out what happens if you change the positions of the brushes on the battery pack. Does this affect the movement direction of the robot?

Observations:

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2. Try to add a switch to the polishing bot if you do have any at home, so you can easily on & off it.

Observations:

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Doesn't work? Try the Troubleshooting Guide

Check if the batteries have been inserted correctly onto the battery pack.

You need to ensure that the flat side of the battery (negative) is connected onto the spring side of the battery pack and the pointy side of the battery (positive) is connected onto the other side of the battery pack.

Replace the motor with a new one

If the above steps do not work try to use another motor and try out.

Try replacing the battery pack

If the above two steps do not work, then it could be an issue with the battery pack. Swap it out for a new one and try out to see if the motor works.

If you are not getting enough movement from the Robot

If your polishing bot does not move significantly, you can try out the fixes below:

- See if you have fixed the eraser properly. It should be fixed from one of it's sides rather than from the middle. The more uneven it is, the higher the vibration produced. higher the vibration, more movement will be produced.
- Your batteries may have run out of power. Try replacing the two batteries.

About IgniterBee



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