Stevens Creek Elementary
Makerspace

BRISTLEBOTS

| SUGGESTED MONTH / EVENT	SUGGESTED GRADE
1st week of November, International STEM Day	Grades 4-5

WHAT ARE BRISTLE BOTS?
Bristlebots are simple, tiny robots that buzz around like bugs. It is a fun robotics activity that is powered by vibration.
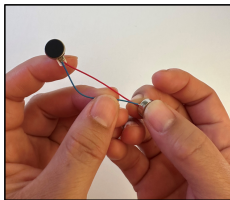
OBJECTIVE
To connect a simple battery and motor circuit to create a bristlebot.

MATERIALS (per student)
- 1 toothbrush head
- 1 vibrating pager motor
- 1 LR44 battery
- foam tape, 2" long
- 2-3 pipe cleaners, 3" long (for legs)
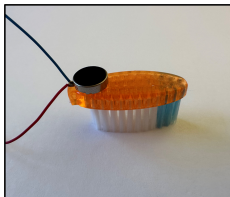- 2 googly eyes
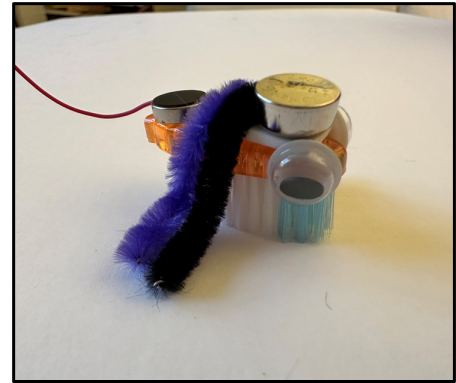
INSTRUCTIONS

STEP 1 – Test the battery
Touch one wire from the motor to the top of the battery and then touch the other wire to the bottom of the battery. If the battery has enough power, the motor should vibrate. If it doesn't, get another battery.
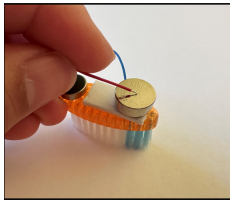

STEP 2 – Attach the vibrating pager motor
Remove the paper backing on the motor and stick on the tail end of the toothbrush head.
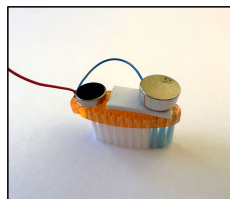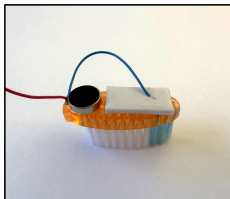
STEP 3 – Attach the wire to the battery
Stick the foam tape on the toothbrush head and stick one of the motor wires on it. Then, stick the battery on top of the wire with the words facing up.

STEP 4 – Test the connection
Take the other wire from the motor (<u>not</u> the one under the battery) and tap it to the battery. If the connections are working, the motor should vibrate. If it's not vibrating, check the following: (1) make sure that the wire under the battery is touching it and (2) the motor is not obstructed by anything.

STEP 5 – Add legs for stability
Place the pipe cleaners between the motor and the battery and press down. Then bend the end to mimic legs to help stabilize the bot.
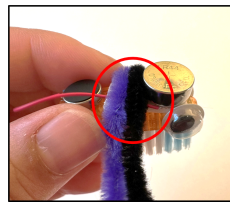
STEP 6 – Add googly eyes
Remove the backing from the googly eyes and place on the <u>head end</u> of the bot.

STEP 7 – Turn it on!
Take the free wire from the motor and wedge it between the pipe cleaners and the battery (use the pipe cleaners to hold down the wire). When the wire touches the battery, it will turn 'on'.

REFLECTION
1. What makes bristlebots move?
2. During build time, were there any challenges that you encountered?
3. At what point did you utilize the engineering process to create, test, and modify your bristlebots?
4. Some of the issues reported in previous activities were:
    a. "Bristlebot wasn't moving/vibrating"
    b. "Bristlebots wouldn't stay up straight – it's always tilting to one side"
    c. "Bristlebots just go in circles"
    If you experienced any of these, what did you do?