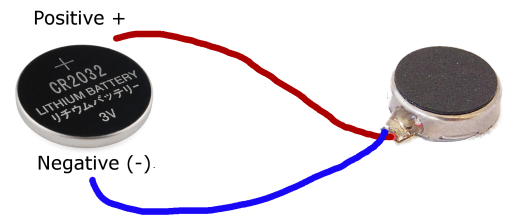


BristleBots!!

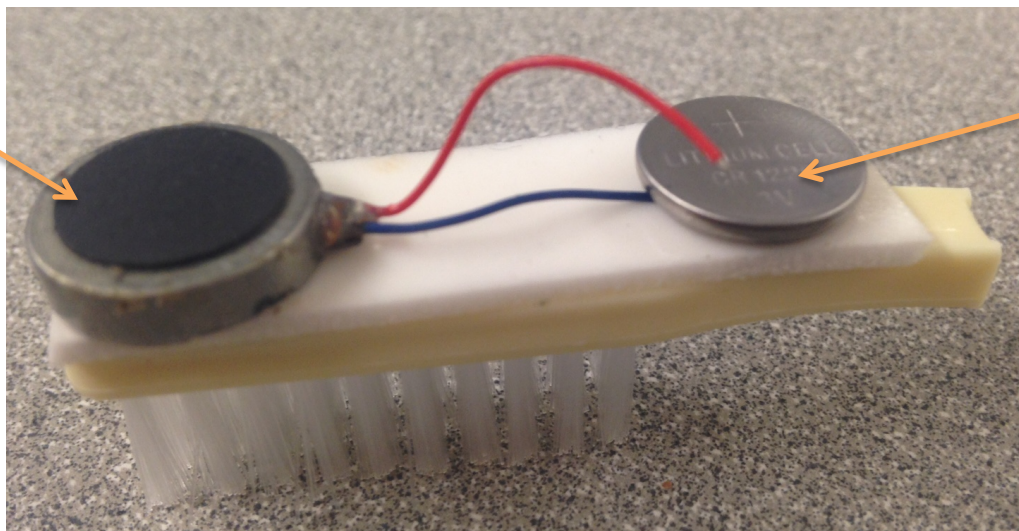


Bristlebots are robots made of a vibration motor, battery, toothbrush, and some sticky tape. The robot is brought to life by completing a simple circuit between the battery and the motor. The vibrations of the motor cause the bristlebot to move and shake in all sorts of directions.

Make your own Bristle Bot!

1. Stick double-sided foam tape to top of toothbrush.
2. Stick vibration motor to the tape on toothbrush.
3. Stick the battery onto same tape, with one of the wires pressed underneath the battery (it doesn't matter which wire)
4. Add pipe cleaner legs and decorate (eyes, etc!).
5. Tape the other wire so that it's touching the top of the battery, which will make the bot turn on.

vibration
motor



battery

Challenge: Try giving your bristlebot some legs with pipe cleaners and see if you can change the way it moves!

Computational Thinking Skills:

- Algorithms and procedures: series of ordered steps taken to solve a problem or achieve some end. Students must first design the robot by following instructions or creating their own unique model. They then have to program the robot's movements, refining and editing their scripts in order to achieve the desired outcome.
- Automation: having computers or machines do repetitive tasks.
- Open-ended project with opportunity to engage in the design process: identify a problem, brainstorm, design, build, test and evaluate, redesign, rebuild, share solution.

Real World Application:

Electrical engineering includes the study of electricity and the design of electrical systems like circuits and computer chips. Some of the areas electrical engineers might work in include telecommunications, electronics, signal processing and control systems.

Next Generation Science Standards

4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Engineering Design Standards

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.