

# Ames Public Library @HOME Activities

## Robots!

Robots are machines that can be programmed to do different tasks. Building a robot includes principles of science, engineering, and technology. The ScooterBots are little robots that can be colorfully decorated and personalized. See a related video on the Library's YouTube Channel at <http://bit.ly/APLvideos>.

### Books and Media:

Title	Author / Performer	Call Number
<i>Robots: From Everyday to Out of This World</i>	Editors of Yes Mag	J 621.3 FEL
<i>My First Guide to Robots</i>	Clay, Kathryn	J 629.8 CLA
<i>Robots</i>	Crane, Cody	J 629.8 CRA
<i>Robots</i>	Lepora, Nathan	J 629.8 LEP
<i>Fighting Robots</i>	Nagelhout, Ryan	J 629.8 NAG
<i>Robotify It! Robots You Can Make Yourself</i>	Olson, Elsie	J 629.8 OLS
<i>Robots</i>	Oxlade, Chris	J 629.8 OXL
<i>Robots</i>	Shulman, Mark	J 629.8 SHU
<i>Bots! Robotic Engineering with Hand-on Makerspace Activities</i>	Ceceri, Kathy	J 629.892 CEC
<i>Robots</i>	Fretland VanVoorst, Jenny	J 629.892 FRE
<i>Robots</i>	Gifford, Clive	J 629.892 GIF
<i>Cool Robots</i>	Kenney, Sean	J 629.892 KEN
<i>Robots</i>	Leider, Rick Allen	J 629.892 LEI
<i>Build It! Robots: Make Supercool Models with Your Favorite LEGO Parts</i>	Kemmeter, Jennifer	J 688.725 KEM
<i>Robots</i>	Rosier, Maggie	J 743 ROS
<i>Robots &amp; Robotics: An Introduction to Robotic Technology</i>		J 629.892 (DVD) ROB

### Websites:

URL	Notes
<a href="https://iowa.pbslearningmedia.org/resource/eng06.sci.engin.design.lp_robot/what-is-a-robot/">https://iowa.pbslearningmedia.org/resource/eng06.sci.engin.design.lp_robot/what-is-a-robot/</a>	This site has a variety of lesson plans for different grades.
<a href="https://www.media.mit.edu/posts/measuring-kids-relationships-with-robots/">https://www.media.mit.edu/posts/measuring-kids-relationships-with-robots/</a>	This article talks about how to approach robotics with children.

## Vocabulary

Android – A robot which looks (to an extent) like a human.

Artificial Intelligence – Intelligence associated with a machine.

Automation – The use of technology to ease human labor, or to extend the mental and physical capabilities.

Autonomous – Device that works on its own without human help.

Battery – A cell or a group of cells that can create an electric current.

Circuit – A path that an electric current follows in order to reach its final destination. For example when electricity goes from the meter in your home to the computer it is following a circuit. Circuits need to be complete or closed for it to work.

Code – Written commands used in a computer program.

Computers – Machines that can perform different tasks by following programs.

Electricity – The flow of electrons is called electricity. Electricity helps power our world, and can be seen in nature in a bolt of lightning.

Machine – Something that is powered by energy and is used to carry out a task.

Motor – Device that changes electricity into movement. Motors make robots move.

Vibrate – Move back and forth, shake.

Program – A series of instructions that a computer or a robot follows to complete a task.

Robot - A machine that performs complicated tasks and is guided by automatic control.

Rotary – Object moving in a circle.

Sensor – Part of an animal or machine that picks up information from its surroundings, such as eyes or a camera.

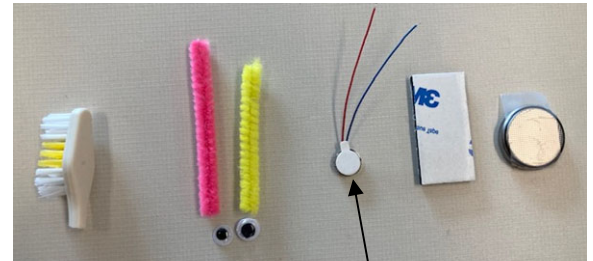
*(Vocabulary source: DK Findout! Robots by Nathan Lepora, J 629.8 LEP)*

**This project has small parts, ask a grown-up for assistance.**

## Take Away Kit: ScooterBot

### Bag Contents:

- 1 – Mini vibration motor
- 1 – 3V Lithium Button Cell Battery with tape on it (don't take the tape off)
- 1 – Toothbrush head
- 1 – Square double sided foam pad (cut this in half or one-third)
- 2 – Self-adhesive wiggle eyes
- 2 – Pieces of chenille stems

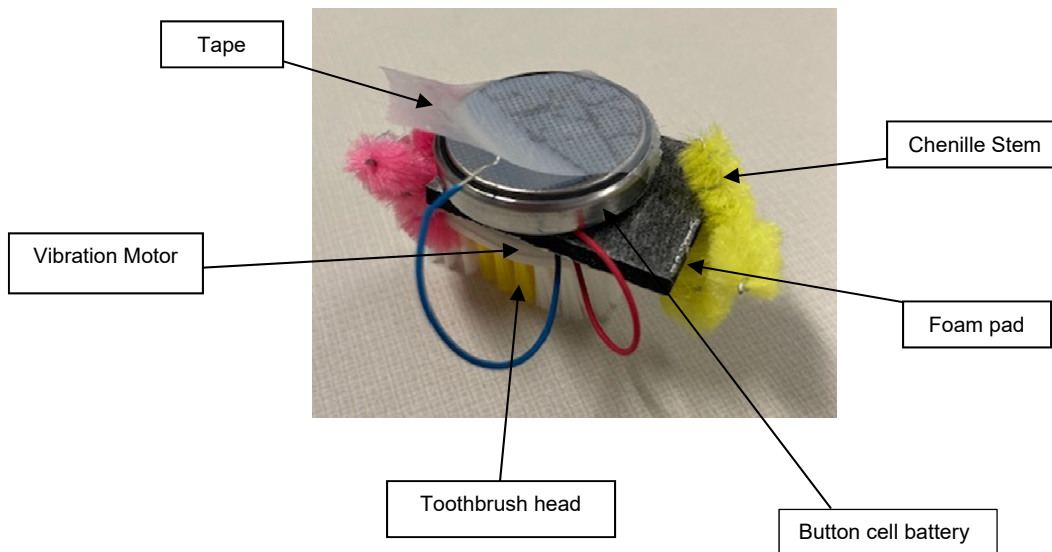


Mini Vibration Motor

A circuit is a path that an electric current follows. A circuit needs to be closed or complete for it to work properly. Here you are going to build a simple circuit to activate the vibration motor and make the bot move.

Take out all the items in your bag; you will need all of the items listed in the contents to make the bot.

Watch the video on Robots on APL's YouTube Channel at <http://bit.ly/APLvideos> to learn how to put your ScooterBot together.



**This project has small parts, ask a grown-up for assistance.**

**Steps to put together the ScooterBot:**

- Peel the adhesive off the back of the vibrating motor (this is the item that has two wires leading out of it), and attach it to the back of the toothbrush. Try to be as centered on the brush as possible.
- Next, decorate you brush head by wrapping and twisting the chenille stems around the toothbrush. Make sure the chenille stems don't touch the ground. The bristles on the brush head need to be flush and touch the ground, as it is the vibrations of the toothbrush bristles that make the Bot move. You can add the wiggle eyes also.
- Now cut the provided double sided foam pad into half or one-third and stick it on top of the vibrating motor.
- Strip both the wires on the vibrating motor a little by peeling back the red and blue plastic covering, to expose more of the metal wire. You can do this with your finger nail OR a butter knife. **Ask a grown-up for help.**
- Take one of the wires and place it on top of the foam pad. It does not matter which of the two wires you stick down.
- Take the cell battery with the tape and stick the side without the tape on top of the foam pad. This ensures that one of the wires is always connected to the battery.
- Next, peel back the tape on top of the cell battery and place the wire that is not connected yet on top of the battery. You should feel the vibrating motor start to vibrate. Stick the tape back on it to hold the wire in place.
- Set the ScooterBot down, and watch it "scoot" and move around.



ScooterBot

You may have to adjust the position of the cell battery to ensure that the ScooterBot is balanced, and does not tip over.

To stop your ScooterBot from moving simply disconnect the wire on top of the cell battery by peeling back the tape. Have fun with your ScooterBot!