Sphero Driver's License Class A

Use the Sphero app to drive Sphero around the track while staying inside of the lines.

Sphero Driver's License Class B

Use the Tickle app to code Sphero to drive from one point (mark) on the track to the next.

Sphero Driver's License Class C

Use the Tickle app to code Sphero to drive from one point (mark) on the track to the next including a ramp in your course.

Sphero Angle Coding Challenge

On a large piece of paper, whiteboard or using blue tape draw out three angles (one acute, one right, and one obtuse) and code sphero to drive on them using the tickle app. Be sure to record your angles and the code you wrote!

Makey Makey Circuit Challenge 1

Draft

Simple Circuit: Figure out where to plug in the LED on the Makey Makey and complete a circuit by touching playdoh. (Remember that LEDs have a short leg to indicate the negative side. You need to create a loop for the current to flow!)

See MaKey Makey Simple Circuits Challenges   *Note: You will need LED lights for this challenge.

Makey Makey Circuit Challenge 2

Draft

Ask some friends to help you and use people to complete the circuit. Add people and see if the LED still will light up. How many people can be in your chain and still complete the circuit?

See MaKey Makey Simple Circuits Challenges   *Note: You will need LED lights for this challenge.

Makey Makey Circuit Challenge 3

Draft

Create a Makey Makey keyboard with tin foil and popsicle sticks. Use the scratch piano at

scratch.mit.edu/projects/2543877

See MaKey Makey Simple Circuits Challenges *Note: You will need tin foil and popsicle sticks for this challenge.

Makey Makey Circuit Challenge 4

Draft

Ask some friends to help you create human piano keys. Play the piano by playing your friends! Use the scratch piano at

scratch.mit.edu/projects/2543877

See MaKey Makey Simple Circuits Challenges

Makey Makey Circuit Challenge 5

Draft

Make a switch with Playdoh that will still light up your LED on the MaKey MaKey without using yourself or another person as a ground. (Hint: You will need two alligator clips to Earth.)

*Note: You will need LED lights & PlayDoh for this challenge.

Makey Makey Circuit Challenge 6

Draft

Create a parallel circuit that will successfully light up a second LED. (Hint: Where is your LED getting output from?) Forgot what a parallel circuit is? Google it! =)

*Note: You will need LED lights for this challenge.

Makey Makey Circuit Challenge 7

Draft

Power multiple LEDs at the same time. How many can you power? What ports on MaKey MaKey will allow you to power LEDs? (Hint: Earth is your ground. Attach your LED negative led to earth!)

See MaKey Makey Simple Circuits Challenges   *Note: You will need LED lights for this challenge.

Makey Makey Circuit Challenge 8

Draft

Use at least 3 different materials from around the lab to build your own switch? What materials work? What won't work? Why?

See MaKey Makey Simple Circuits Challenges   *Note: You will need LED lights for this challenge.
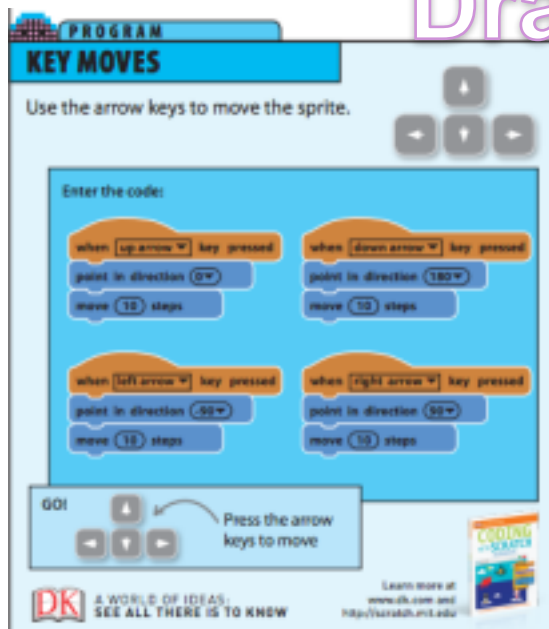
Scratch Coding Color Change Challenge

See DK Coding Kit
http://www.dk.com/us/explore/education/celebrate-global-scratch-day-with-this-downloadable-computer-coding-kit/

Scratch Coding Challenge Move to a Beat

See DK Coding Kit
http://www.dk.com/us/explore/education/celebrate-global-scratch-day-with-this-downloadable-computer-coding-kit/

Scratch Coding Challenge Say Something

See DK Coding Kit
http://www.dk.com/us/explore/education/celebrate-global-scratch-day-with-this-downloadable-computer-coding-kit/

Scratch Coding Challenge Key Moves

See DK Coding Kit
http://www.dk.com/us/explore/education/celebrate-global-scratch-day-with-this-downloadable-computer-coding-kit/

Scratch Challenge: Coding & Drawing 2D Shapes

Draft

Using this tutorial **bit.ly/2d_shapes_with_scratch** code your Scratch sprite to draw 2D shapes! *Hint: you may want to work with a partner and have two computers open, one coding on scratch and the other viewing the tutorial.* To get to Scratch go to **scratch.mit.edu** & click on
Try It Out!

littlebits Challenge 1: Flashlight

Draft

See Basic Kit Booklet for complete directions
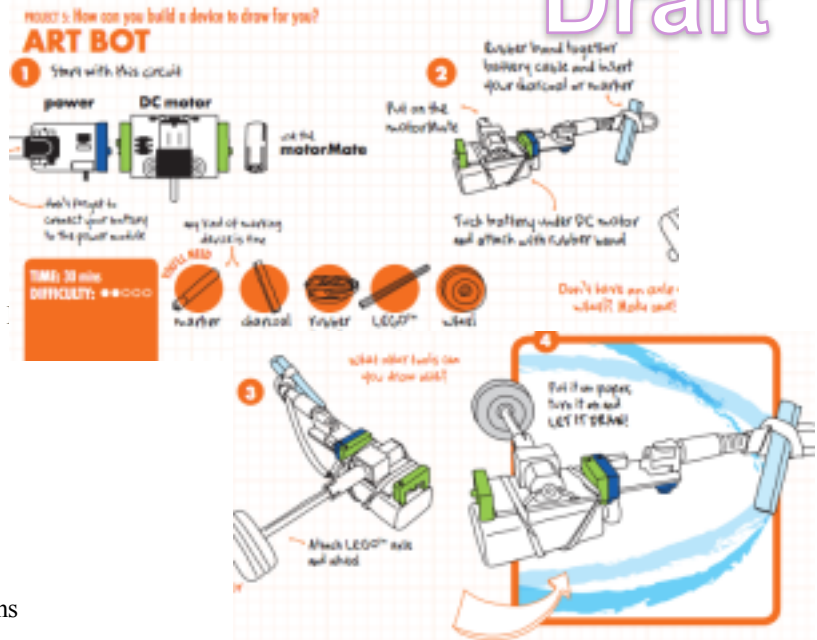
littleBits Challenge 2: Tickle Machine

Draft
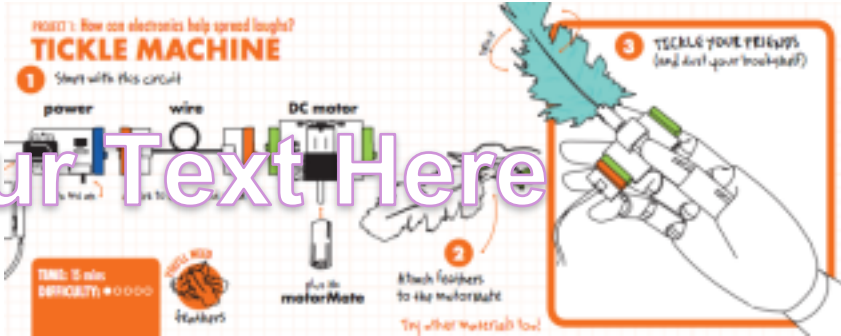
See Basic Kit Booklet for complete directions

littleBits Challenge 3: Art Bot

Draft

See Basic Kit Booklet for complete directions

littleBits Challenge 4: Breezy Buddy

See the Gadgets and Gizmos Activity Guide for full directions.

littleBits Challenge 5: Spinmate

See the Gadgets and Gizmos Activity Guide for full directions.

littleBits Challenge 6: Mega Blaster

See the Gadgets and Gizmos Activity Guide for complete directions.

littleBits Challenge 7: Wireless Doorbell

See the Gadgets and Gizmos Activity Guide for full directions.

littleBits Challenge 8: Mischief Machine

See the Gadgets and Gizmos Activity Guide for complete directions.

littleBits Challenge 9: Bubblebot

See the Gadgets and Gizmos Activity Guide for Complete directions.

littleBits Challenge 10: Bumperball
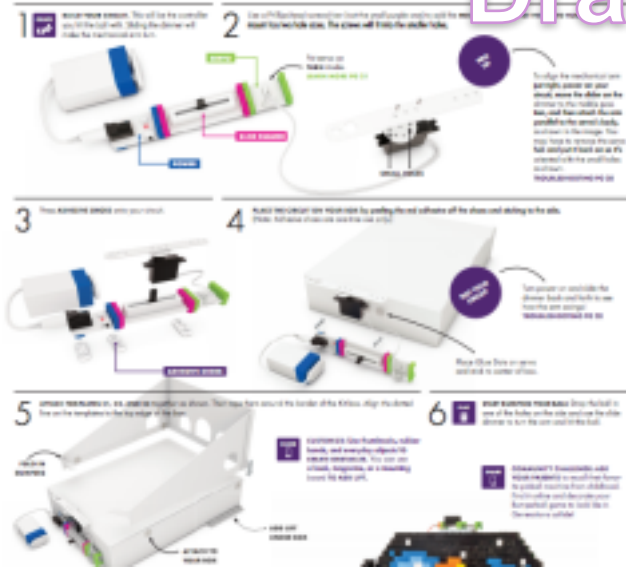
See the Gadgets and Gizmos Activity Guide for complete directions.

littleBits Challenge 11: Bitbot
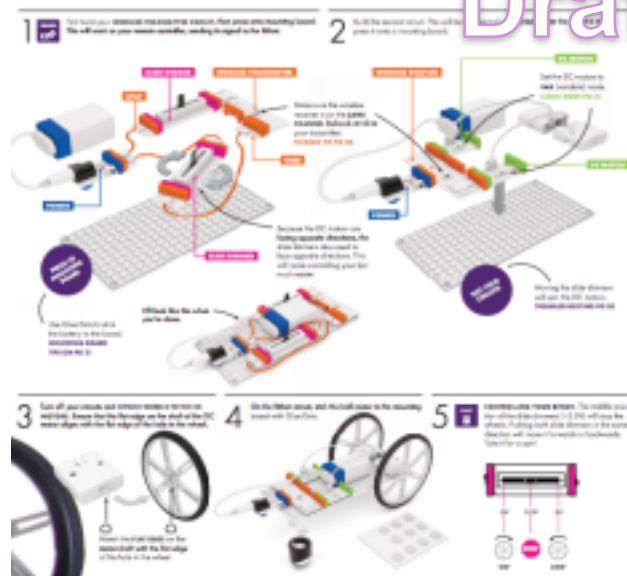
See the Gadgets and Gizmos Activity Guide for full directions.

littleBits Challenge 12: Rotolamp

Rotolamp
littleBits
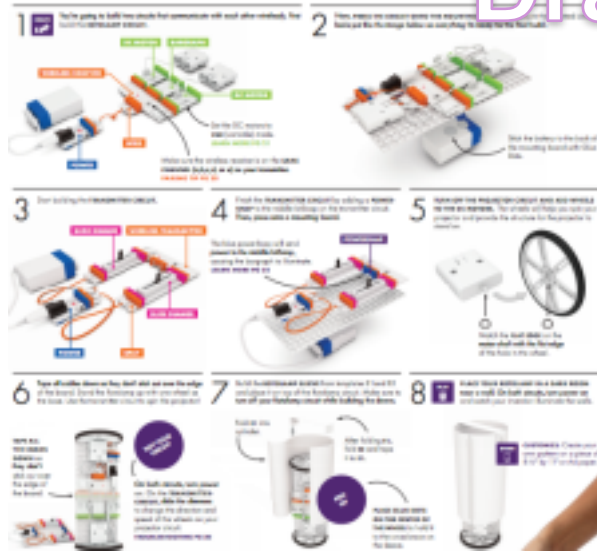
See the Gadgets and Gizmos Activity Guide for full directions.

littleBits Challenge 13: Spy Box

Spy Box
littleBits
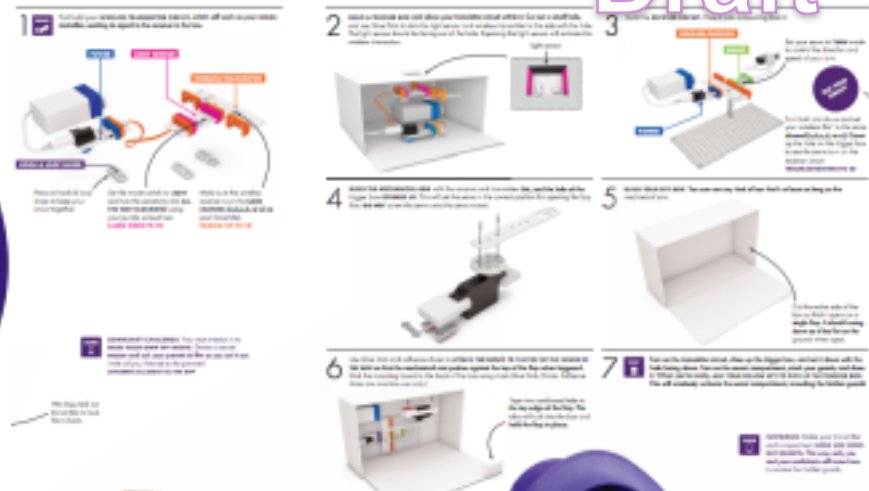
See the Gadgets and Gizmos Activity Guide for full directions.

Dash Challenge 1: Turn Dash into a Car

TURN DASH INTO... A CAR!

Help Dash get ready to hit the open road! Add **sounds**, **lights**, and **movement** to make your car a reality.

Backward

Tail

Transport

©The Digital Scoop

Dash Challenge Cards created by The Digital Scoop

Dash Challenge 2: Turn Dash into a Fire Engine
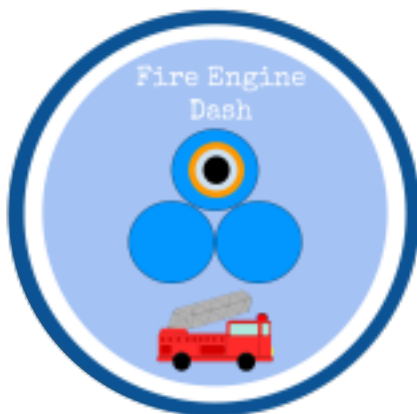
TURN DASH INTO... A FIRE ENGINE!

Help Dash get ready to put out fires and rescue people! Add **sounds**, **lights**, and **movement** to make your fire engine come to life.

All Colors

Transport

Forward

©The Digital Scoop

Dash Challenge Cards created by The Digital Scoop

Dash Challenge 3: Turn Dash into a Train

TURN DASH INTO... A TRAIN!

Toot! Toot! All aboard the Dash express! Add **sounds**, **lights**, and **movement** to turn Dash into a train. Bonus: Can you have Dash the train pull Dot or a LEGO creation?

Transport

©The Digital Scoop

Dash Challenge Cards created by The Digital Scoop

Dash Challenge 4: Turn Dash into an Animal

TURN DASH INTO... AN ANIMAL!

Roar! Bark! Squeak! Add **sounds**, **lights**, and **movement** to turn Dash into an animal.

Forward

Animal

Mood

©The Digital Scoop

Dash Challenge Cards created by The Digital Scoop

Dash Challenge 5: Turn Dash into an Alien

**TURN DASH INTO...
AN ALIEN!**

Beep! Beep! Add **sounds**, **lights**, and **movement** to turn Dash into an alien from another planet.

Weird

Turn Left

Eye Pattern   Start at

©The Digital Scoop

Dash Challenge Cards created by The Digital Scoop

Dash Challenge 6: Obstacle Course Level 1

Obstacle Course

L1
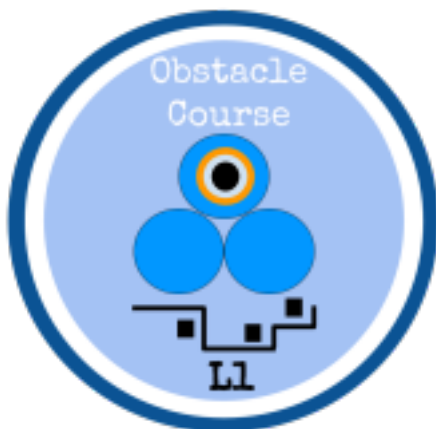
Program Dash to navigate around at least **three** obstacles on a track using the Path App.

Dash Challenge 7: Draw a Heart Level 1

Draft
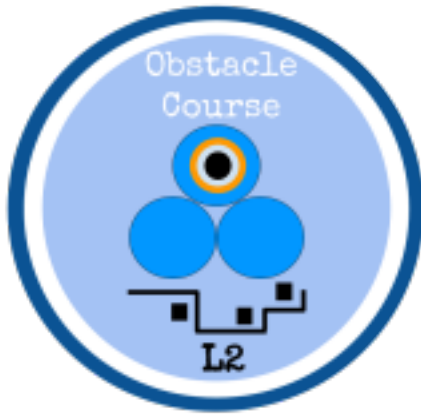
Make a Dash Robot that draws a heart using the Path App. *Hint, you may need the lego adapters, tape and a marker.*

Dash Challenge 8: Draw a Heart Level 2

Draft
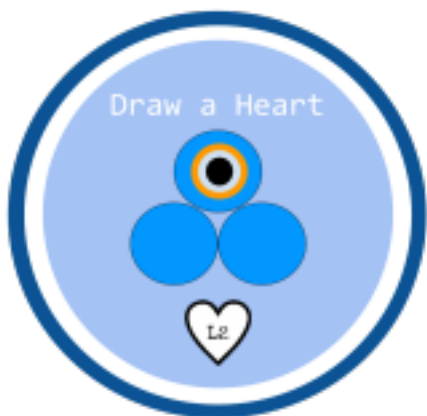
Make a Dash Robot that draws a heart using the Blockly App. *Hint, you may need the lego adapters, tape and a marker.*

Dash Challenge 9: Obstacle Course Level 2
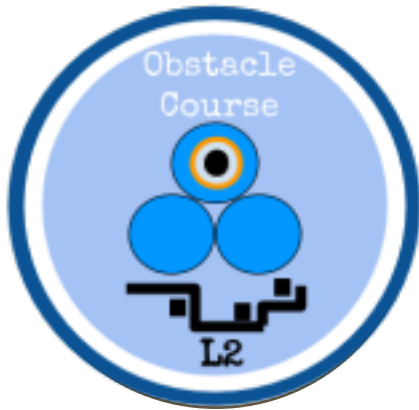
Program Dash to navigate around at least **three** obstacles on a track using the Blockly App.

Dash Challenge 10: Coding Challenge Square L1
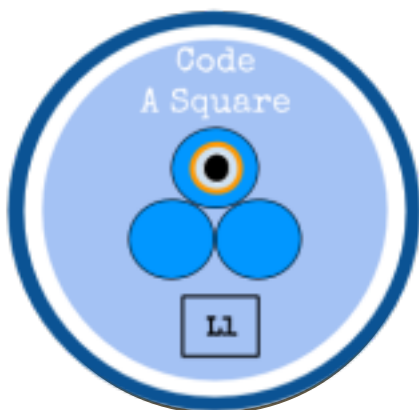
Program Dash to drive around a square (draw one or use blue tape) by coding with the Blockly App.

Dash Challenge 11: Coding Challenge Square L1

Draft
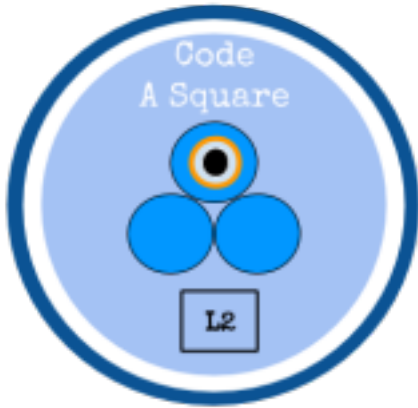
Program Dash to drive around a square (draw one or use blue tape) by coding with the Blockly App. Use the repeat block to program a loop.

Lego Wall Challenge 1: 5x Facts Array

Draft

Create a 5s multiplication facts array (must have all facts 5x1 through 5x9) on the lego wall.

Lego Wall Challenge 2: 6x Facts Array

Draft

Create a 6s multiplication facts array (must have all facts 6x1 through 6x9) on the lego wall.

Lego Wall Challenge 3: 7x Facts Array

Draft

Create a 7s multiplication facts array (must have all facts 7x1 through 7x9) on the lego wall.

Lego Wall Challenge 4: 8x Facts Array

Create a 8s multiplication facts array (must have all facts 8x1 through 8x9) on the lego wall.

Lego Wall Challenge 5: 9x Facts Array

Create a 9s multiplication facts array (must have all facts 9x1 through 9x9) on the lego wall.

Lego Wall Challenge 6: Marble Run Level 1

Draft

Create a marble run with at least one turn/drop.

Lego Wall Challenge 7: Marble Run Level 2

Draft

Create a marble run with at least three turns/drops.

Pegboard Wall Challenge Level 1
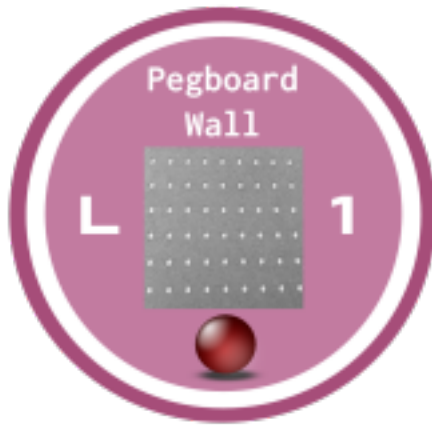
Create a marble run with at least one PVC pipe, two 90° elbows and two colorful pieces.

Pegboard Wall Challenge Level 2
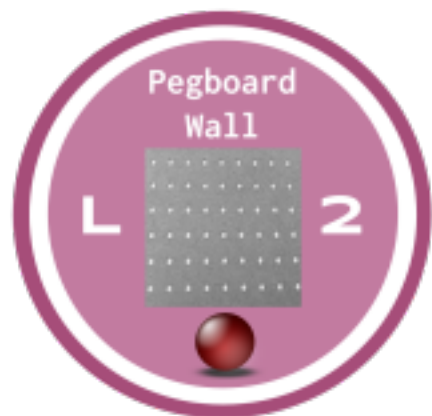
Create a marble run with at least two PVC pipes, three 90° elbows and three colorful pieces.

Pegboard Wall Challenge Level 3

Draft

Create a marble run with at least four PVC pipes, four 90° elbows and five colorful pieces.

Pegboard Wall Challenge Level 4

Draft

Create a marble run that goes from the top of the wall to the bottom. Must have at least three PVC pipes, three 90° elbows and four colorful pieces.

Pegboard Wall Challenge Level 5

Using littlebits (and other materials) create a sign that has at least one light and one moving part.

Cubelets Challenge 1: Creature Behaviors
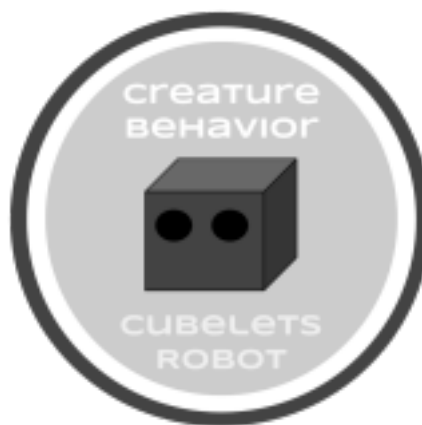
Make driving robots that represent different creature behaviors. Some of these might even make you think of different emotions.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 2: Motion Activated Alarm

Draft

Make a robot that acts as a motion-activated alarm light.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 3: Refrigerator Alert System

Draft
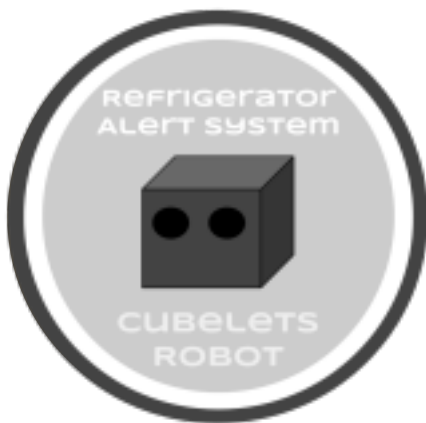
Imagine that your power has gone out, but your Cubelets have plenty of batteries. How could you build a robot that alerted you when the refrigerator was starting to get warm inside?

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 4: Conveyor Belt

Draft

Make a conveyor belt robot that can move something across it.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 5: Flashlight

Draft
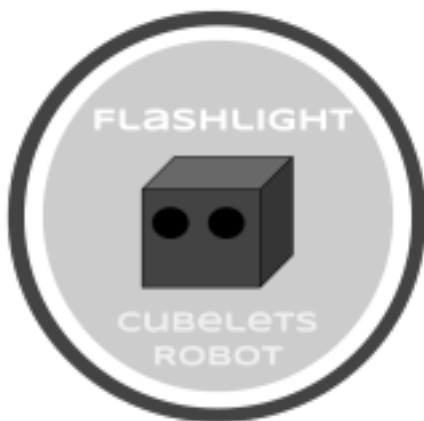
Make a flashlight that "knows" to come on in the dark.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 6: Forever Bot

Draft
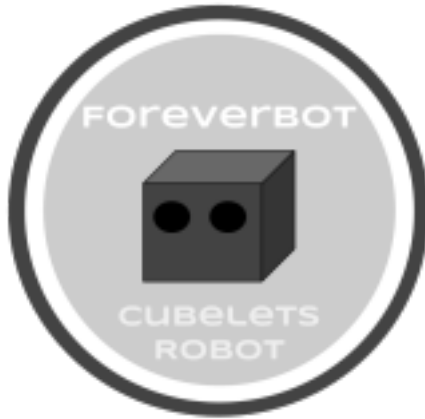
Make a robot that will "go forever" by using at least two senses and two actions.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 7: Environment Sensing Bot

Draft

Construct an "environment" or arrange other objects around a robot so that it will "go forever" or "never quit"

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 8: Lighthouse

Draft

Can you make a robot lighthouse that knows to come on in the dark?

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.
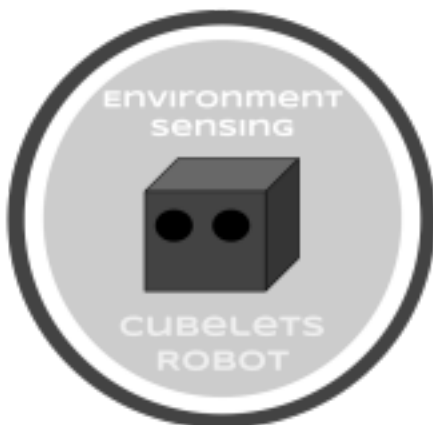
Cubelets Challenge 9: Sense and Drive Bot

Draft
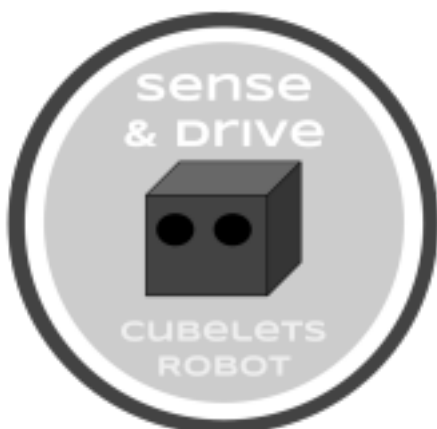
Using the Blocker Cubelet can you make a steering robot with sides that drive and sense independently?"

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 10: Wall Sensing Bot
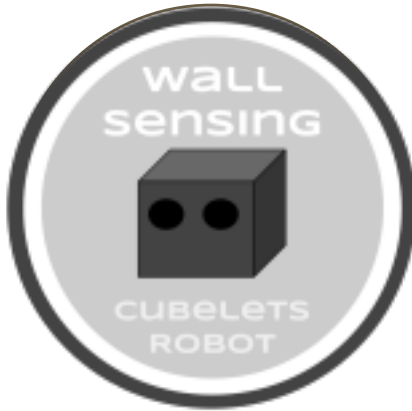
Make a robot that slows down and stops as it approaches objects or walls.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 11: Drawing Bot

Make a robot that can draw a line. Hint you will need legos, tape and a marker.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Cubelets Challenge 12: Remote Control Bot

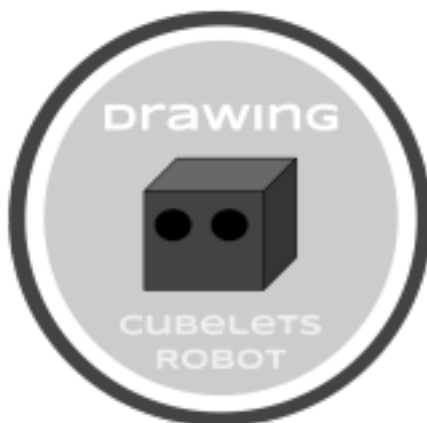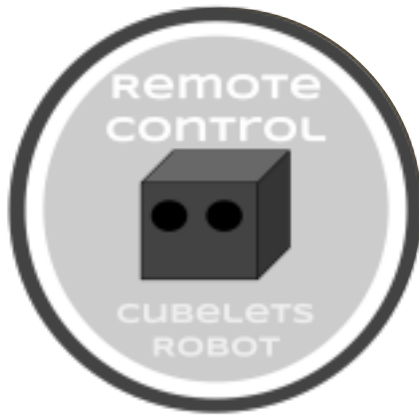# Use the BlueTooth Cubelet to control your robot to drive around a stool and back.

See 10 Cool Things You Can Do with Cubelets! for hints and detailed instructions.

Art Challenge 1: Binary Bracelet

Directions:
1. Find the first letter of your first name in the Binary Decoder Key.
2. Use two different colored beads and a pipe cleaner to make the code for your name.
3. Wrap the bracelet around your wrist to wear it!
4. Share your bracelet with your classmates to see if they can figure out your letter.

Letter	Code		Letter	Code	
A	■□■■	■■■□	N	■□■■	□□□■
B	■□■■	■■□■	O	■□■■	□□□□
C	■□■■	■■□□	P	■□■□	■■■■
D	■□■■	■□■■	Q	■□■□	■■■□
E	■□■■	■□■□	R	■□■□	■■□■
F	■□■■	■□□■	S	■□■□	■■□□
G	■□■■	■□□□	T	■□■□	■□■■
H	■□■■	□■■■	U	■□■□	■□■□
I	■□■■	□■■□	V	■□■□	■□□■
J	■□■■	□■□■	W	■□■□	■□□□
K	■□■■	□■□□	X	■□■□	□■■■
L	■□■■	□□■■	Y	■□■□	□■■□
M	■□■■	□□■□	Z	■□■□	□■□■

This activity is a Code.org Unplugged Activity

Magna-Tiles 3D Shape Designer

Using Magna-Tiles design three different 3 dimensional shapes (cube, rectangular prism, pyramid, triangular prism etc.)

Magna-Tiles Fraction Challenge Level 1

Using magna-tiles design three 2 dimensional shapes that represent different fractions (for example place a green and a purple square next to each other, the one color would represent ½).

Magna-Tiles Fraction Challenge Level 2

Draft

Using magna-tiles design three 2 dimensional shapes that represent equivalent fractions. For example create a shape that represents ⅓ then another that represents 2/6 and another that represents 3/9. *(You may not use this example!)*