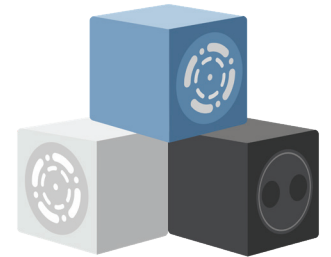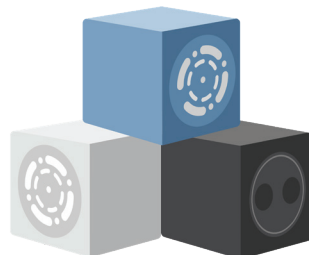**MackinMaker**

cubelets

1

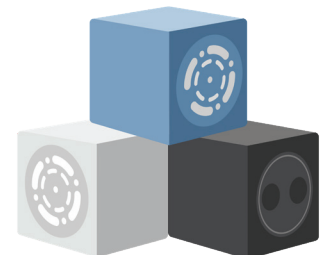**Build a robot you can steer by hovering your hands.**

2

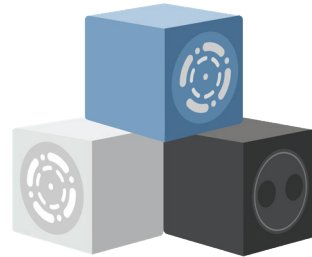**Build a robot that stops at the edge of a table.**

3

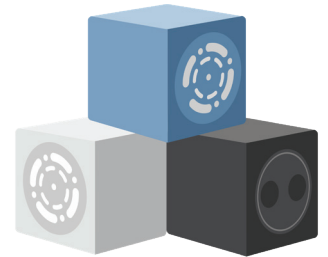**Build something that uses ALL of the Cubelets.**

4

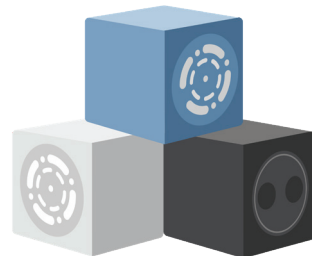**Using the LEGO® adapters and some LEGO® bricks, design a car.**
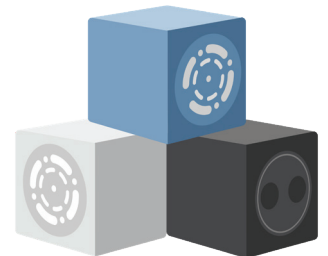
5

Add a headlight and a horn to your car.

6

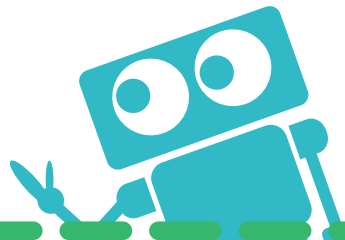**Add the Bluetooth block and open the Cubelets app. Try driving your car.**

7

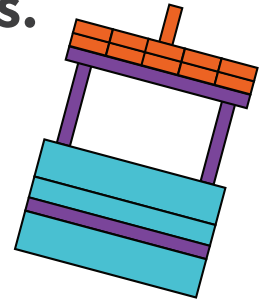**Build an art bot! Attach some LEGO® bricks and a marker(s) to your robot, and program it to draw a design.**

8

MackinMaker
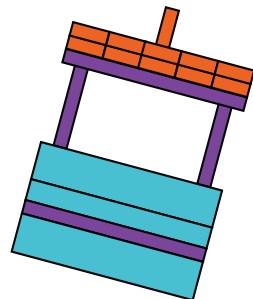
KĒVA®
planks

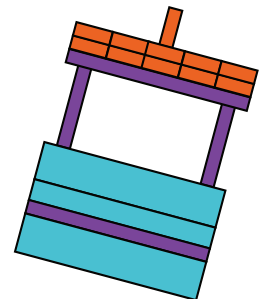**Create the tallest structure you can using only 10 planks.**

2

Using only planks (no fasteners, tape, glue, books, etc), bridge a span of 10 inches.
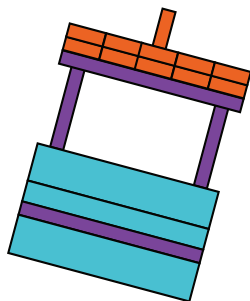
3

Create a wooden plank track that turns around 180 degrees and returns the ball back to you.
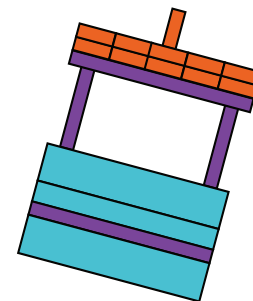
4

1

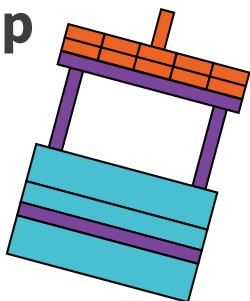**Create a staircase with at least 12 stairs.**

5

Design a beach house using at least 50 planks.

6

Using no more than 50 planks, create something that is bigger on the top than the bottom.
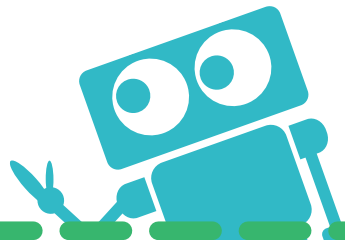
7

Using 20 planks exactly, create a ramp to roll the KEVA ball. Try different arrangements to see how far you can make your ball travel.
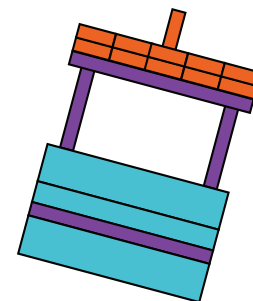
8

MackinMaker

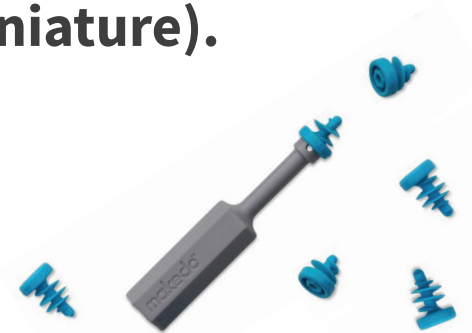**makedo**™

1

Design a piece of furniture (life size or miniature).

2

Design a piece of playground equipment.

3

Build something to store your school supplies.

4

Design an animal than can move its arms and legs.

5

Design a ride you would find at an amusement park.

6

Build a musical instrument.

7

Design a car to use for a "Drive-In" movie.

8

MackinMaker
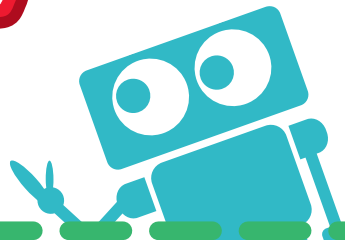
Makey Makey®

1

Design a musical instrument.

2

Create a game controller to play an existing game online.

Go to makeymakey.com/apps for some suggestions.

3

Design a circuit with Makey Makey, using people to complete the circuit.

4

Design a doorbell.

5

Did you know that your pencil lead is conductive?

Go to MakeyMakey.com/apps and try to control one of the programs using the drawing you've created.
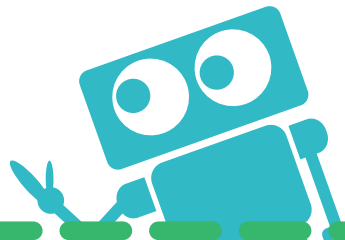
6

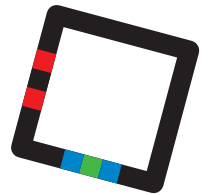**Using Scratch, design a single-player game to play with a controller you've designed.**

7

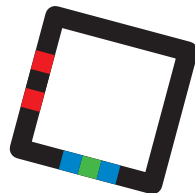**Using Scratch, design a two-player game that can keep score.**

8

1

MackinMaker

ozobot

2

Create a "light show" by writing a line of code that uses each of the colors.

3

Using a blank piece of paper, write a program that makes Ozobot go FAST on the long sides of the paper, but SLOW on the short sides of the paper.
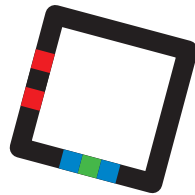

4

Go to Ozoblockly on your tablet or compute, or access the Ozobot Evo app. Be sure "Evo" is selected in the upper-left corner.

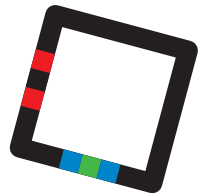Follow the tutorial to learn how to program Evo using block-based code.
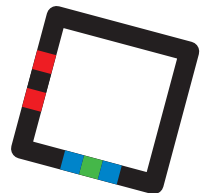
Try writing your own program in Ozoblockly or using the Ozobot Evo app with at least 3 different actions or commands.

5

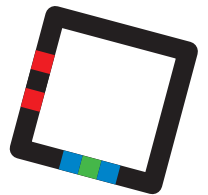**Using Ozoblockly or the Ozobot Evo app, write a program that uses the "REPEAT" or "LOOP" function.**

6

Head to Ozoblockly.com and try the Shape Tracer Challenge.

7

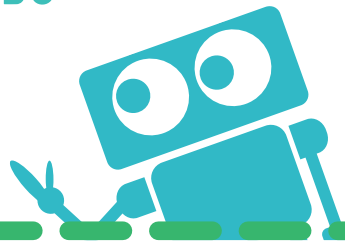**Open the Ozobot Evo app and head to the Play section. Challenge yourself or some friends to the Launch game.**

8

MackinMaker

SAM LABS

1

Design a nightlight.

2

Design a car that will only drive if something is behind it.

3

Using SAM Blockly, write a program that makes the SAM car drive in a square around an object.

4

Using your SAM Blocks, LEGO®
bricks, and a pen or pencil,
build a car that can
draw a picture.

5

Using SAM Blockly, program
your drawing car to write
your name.

6

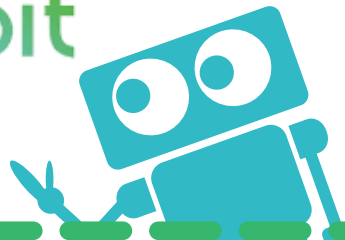Design and build a spin-art
machine.

7

Download the SAM Labs Curious
Car app. Challenge your friends
to a race through an obstacle
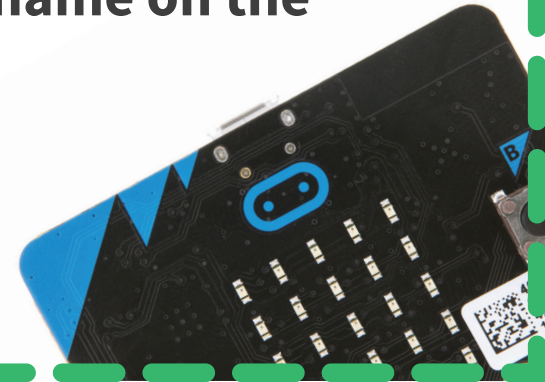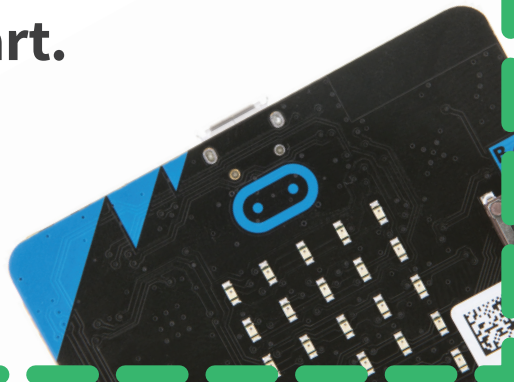course or to a game
of soccer.

8

MackinMaker

micro:bit

1

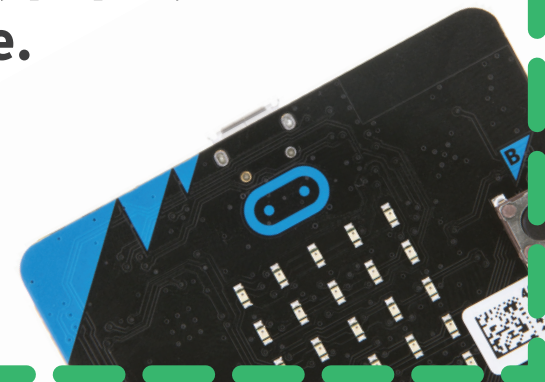Write a program that will display your name on the Micro:bit.
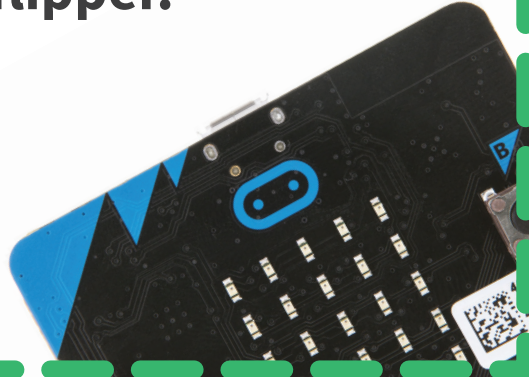
2

Write a program that will flash a heart.

3

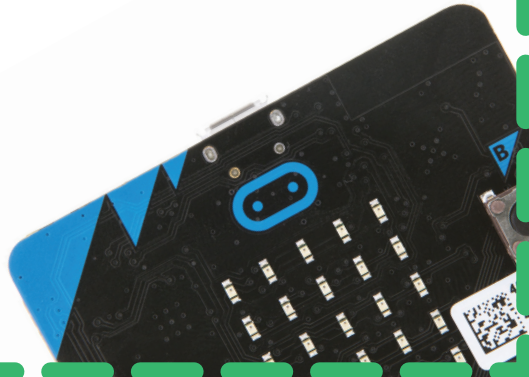Create a rock, paper, scissors game.

4

Create a coin flipper.

5

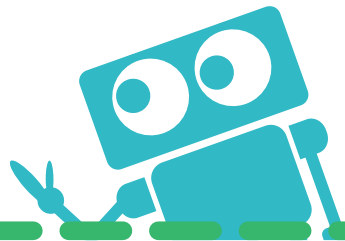**Write a program that will display different emojis.**

6

Create a stopwatch.

7

Create something that you could use while you play a sport.
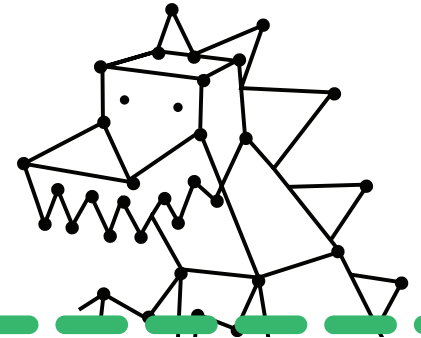
8

MackinMaker

Strawbees.

1
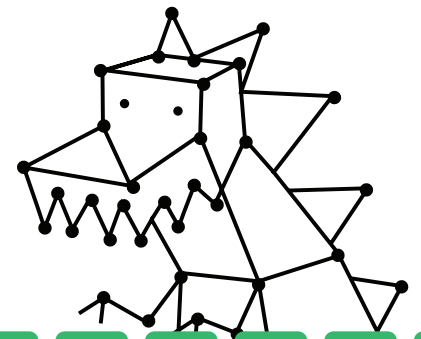
Build a stand for a cell phone.

2

Build a bridge that is at least 10 inches long and see how much it can hold.
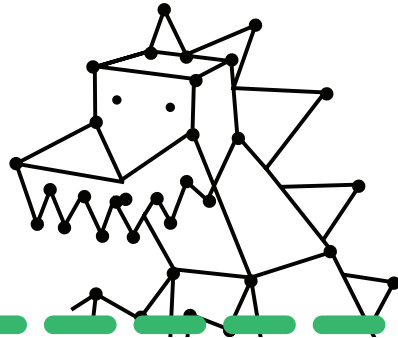
3

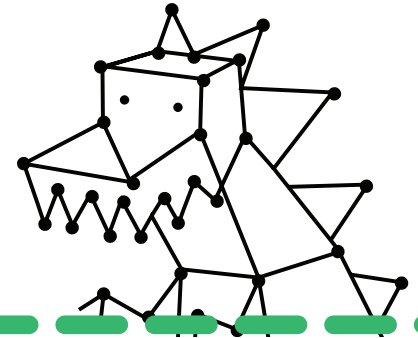**Design a throwing arm that can throw your trash away.**

4

Design a helmet for a football player.

5

Design a piece of playground equipment or an amusement park ride.

6

Build the tallest free-standing structure you can in 3 minutes.

7

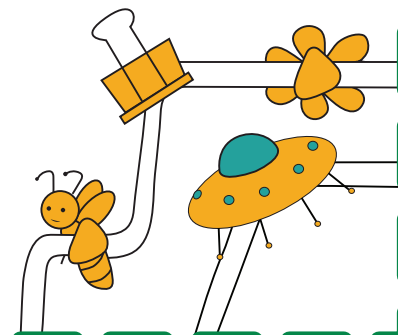**Design and build an animal and see if your friends can guess what it is.**

8

MackinMaker

chibi tronics®

1
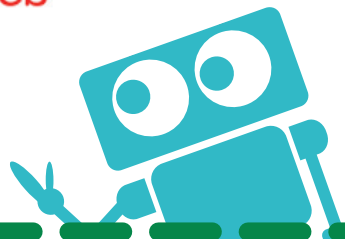
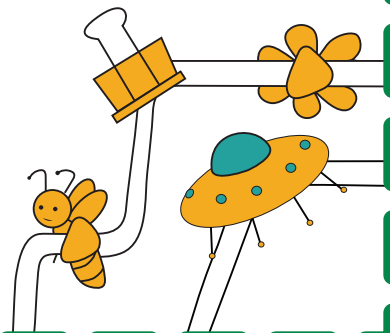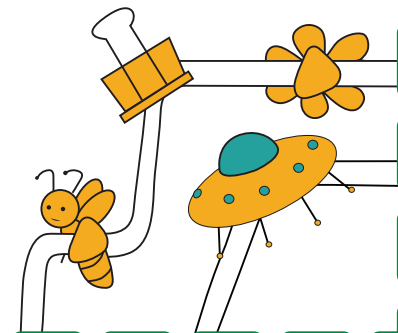**Design a light-up bookmark.**

2

Design a light-up card.

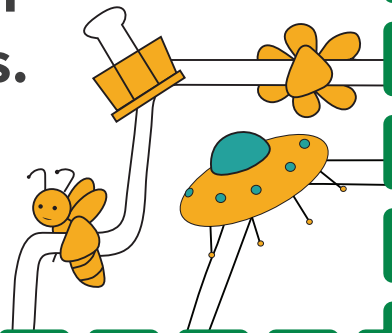Perhaps one for your teacher?

3

Build a house and light it up with Chibitronics.

4

Build something using a parallel circuit with at least three lights.

5

Build something runners could wear at night to keep them safe.

6
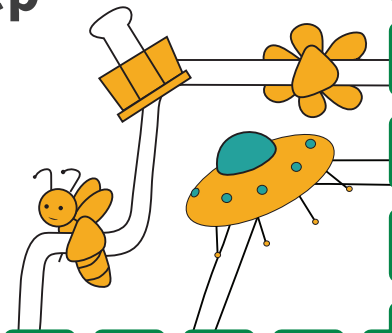
Design a piece of light-up jewelry.

7
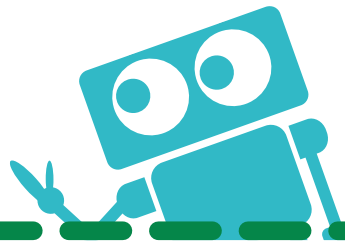
Design a popular constellation using a series circuit?
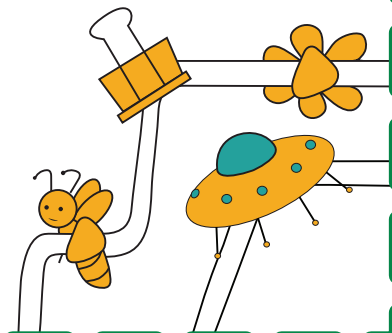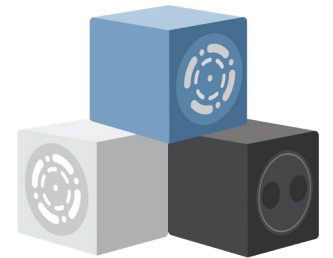
8

MackinMaker

cubelets

1

Build a robot you can steer by hovering your hands.

2

Build a robot that stops at the edge of a table.

3

Build something that uses ALL of the Cubelets.

4

Using the LEGO® adapters and some LEGO bricks, design a car.

5

Add a headlight and a horn to your car.
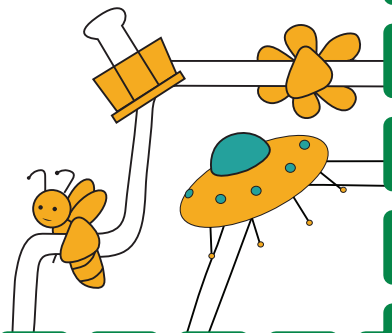
6

Add the Bluetooth block and open the Cubelets app. Try driving your car.

7
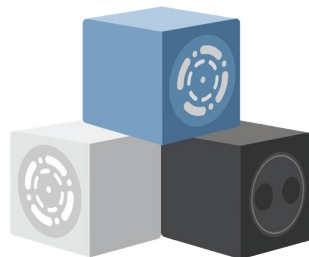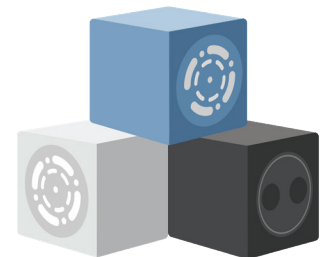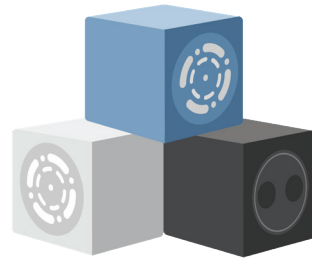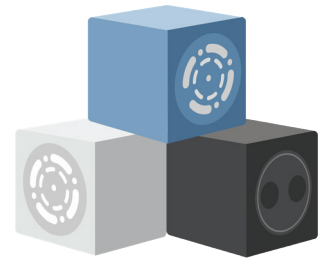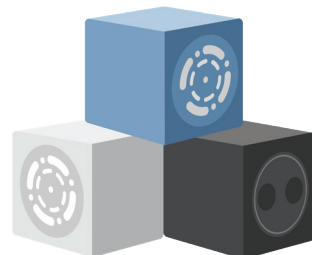
Build an art bot! Attach some LEGO®bricks and a marker(s) to your robot, and program it to draw a design.
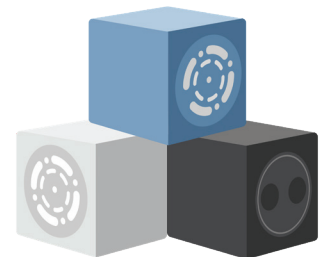
8

Design a nightlight.

2
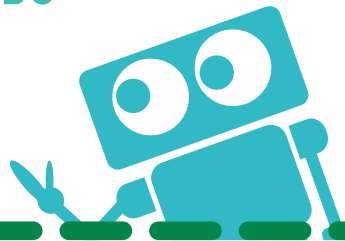
Design a car that will only drive if something is behind it.

Using SAM Blockly, write a program that makes the SAM car drive in a square around an object.

4

Using your SAM Blocks, LEGO® bricks, and a pen or pencil, build a car that can draw a picture.

5

Using SAM Blockly, program your drawing car to write your name.

6

Design and build a spin-art machine.

7

Download the SAM Labs Curious Car app. Challenge your friends to a race through an obstacle course or to a game of soccer.

8

MackinMaker

k'nex

1
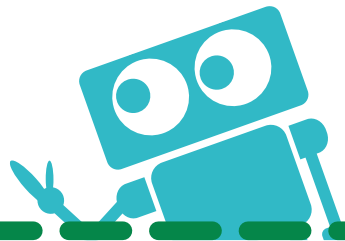
Design an amusement park ride that moves.
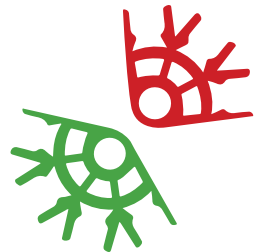
2

Build a drawing machine (you may want to use rubber bands to assist with this).

3

Design a scale and test its accuracy.

4

Design a bed using only 15 pieces.

5

Design a bridge that spans at least 5 inches without supports.

6

Design a musical instrument.

7

Design a prosthetic hand.

8

MackinMaker

littleBits™
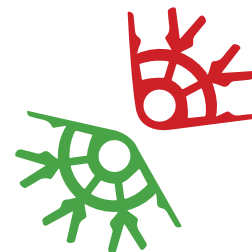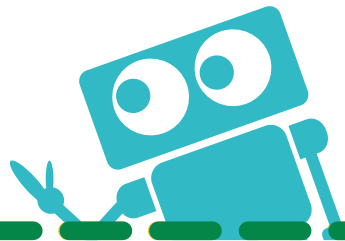
1

Construct a circuit using **Power** + **Pulse** + **Bar Graph**. Can you change the speed of the flashing to flash the lights every 1 second and flash the lights every 3 seconds? If you only want to light up 2 bars, what bits do you add?

2

Build an art machine.

3

Design an alarm with lights and sounds if someone opens your backpack.

4

Design something to help you in your morning routine.

5

Design something to keep you cool on a really hot day.

6

Invent a device to clean your room.

7

Design something to keep babies safe.

8

MackinMaker

makedo

1

Design a piece of furniture (life size or miniature).

2

Design a piece of playground equipment.

3
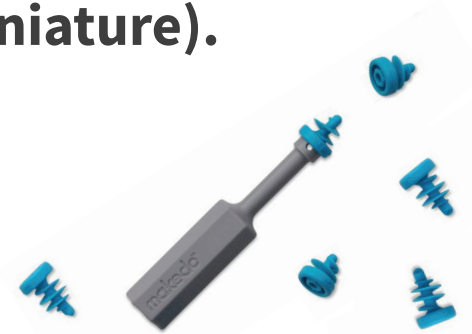

Build something to store your school supplies.

4

Design an animal that can move its arms and legs.

5

Design a ride you would find at an amusement park.

6

Build a musical instrument.

7

Design a car to use for a "Drive-In" movie.

8

MackinMaker

micro:bit
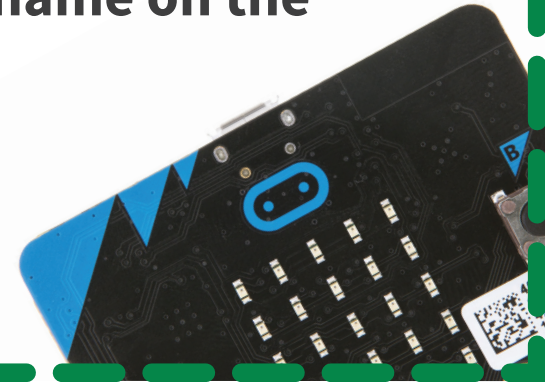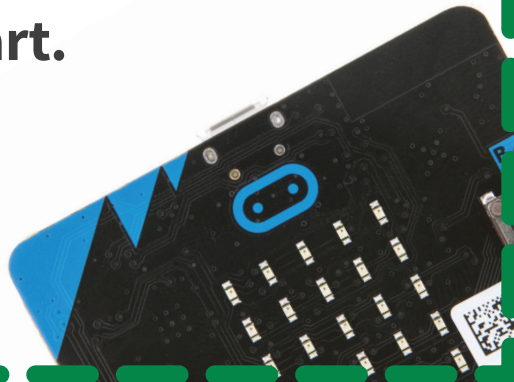
1

Write a program that will display your name on the Micro:bit.
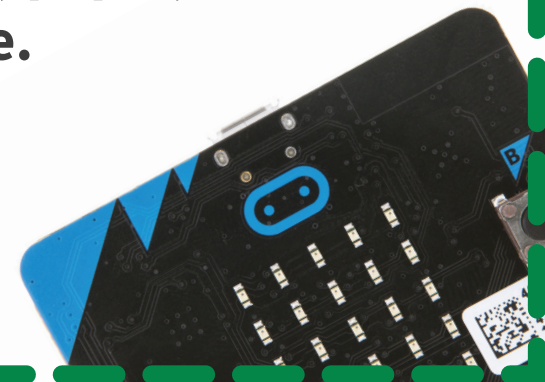
2

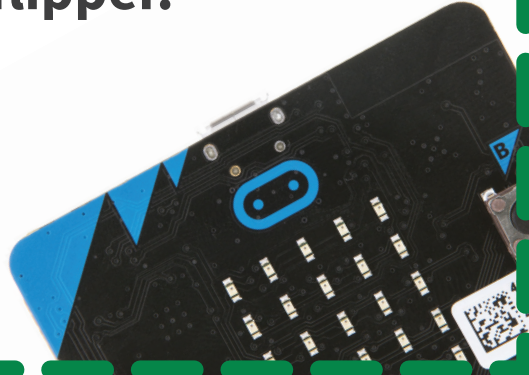**Write a program that will flash a heart.**

3

Create a rock, paper, scissors game.

4

Create a coin flipper.

5

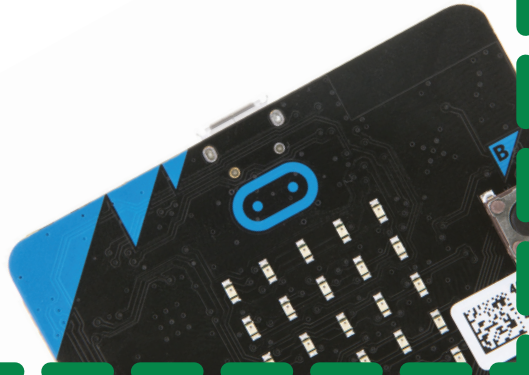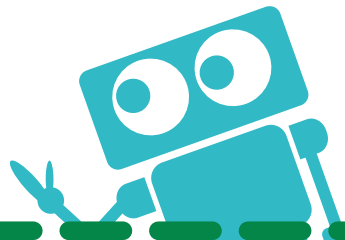**Write a program that will display different emojis.**

6

Create a stopwatch.

7

Create something that you could use while you play a sport.

8

MackinMaker

sphero SPRK+
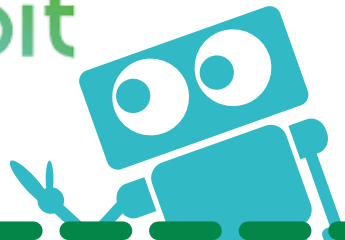
1

Open the Sphero Edu app on your device. Choose the "Drive" option.

Explore how Sphero moves. Test how fast it can go and how quickly it can stop. Try making a sharp turn. Does it make a difference if you drive on carpet or hard floors?

2

On the Sphero Edu app, choose the "Activities" tab and choose "Blocks 1: Intro & Loops" to complete this activity.

3

Open the Sphero Edu app and choose the "Programs" tab and hit the "+" choose. "Blocks" type and choose "Sphero".

Name the program "Block Maze". Using the same object as before, try writing a program to navigate Sphero around the object and back to its original location.

4

Learn about rotational velocity and absolute value by completing the "Blocks 3: Lights" activity in the Sphero Edu app.

5

On the Sphero Edu app, choose "Activities" and select "Fortune Teller - Middle School" to create a Magic 8 ball.

6

Design an obstacle course for Sphero.

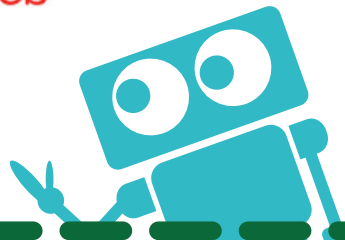Challenge your friends to see who can navigate through the course the fastest.

7

Using empty bottles, challenge your friends to a bowling match using Block-based coding.
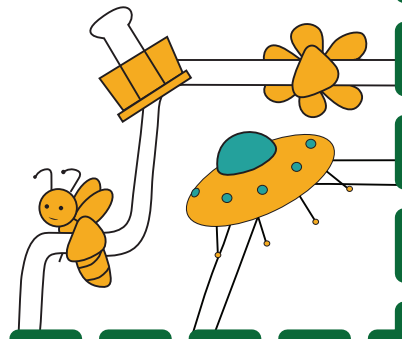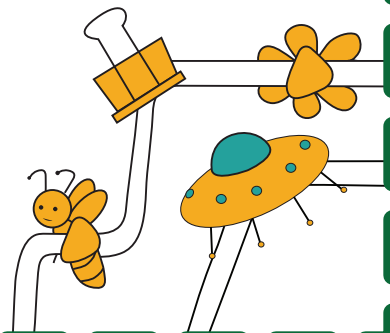
8

MackinMaker

chibitronics ®

1

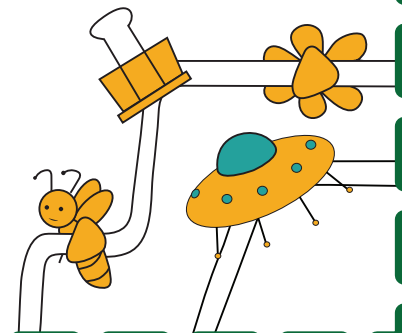**Design a light-up bookmark.**

2

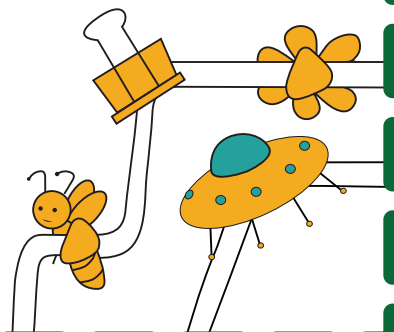**Design a light-up greeting card. (Perhaps one for your teacher?)**

3

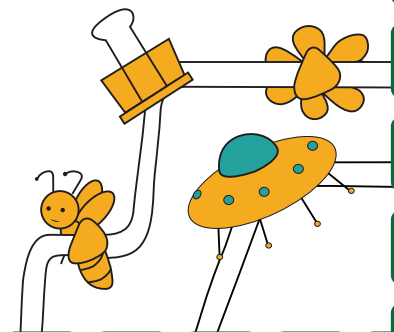**Build a house and light it up with Chibitronics.**

4

Build something using a parallel circuit with at least three lights.
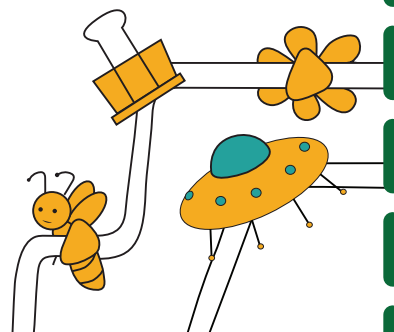
5

Build something runners could wear at night to keep them safe.

6

Design a piece of light-up jewelry.

7

Design the constellation for your zodiac sign using a series circuit.

8

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k'nex

1
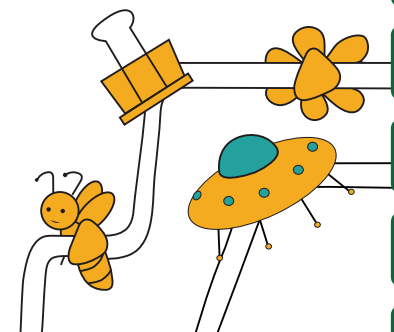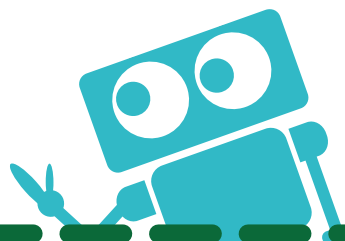
Design an amusement park ride.

2

Build a drawing machine (you may want to use rubber bands to assist with this).
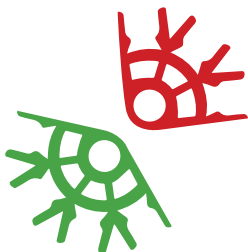
3

Design a scale and test its accuracy.

4

Design a bed using only 15 pieces.

5

Design a bridge that spans at least 5 inches without supports.

6
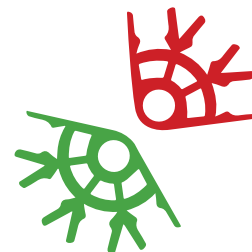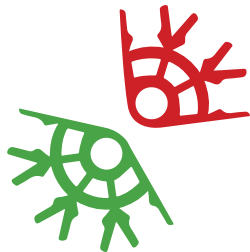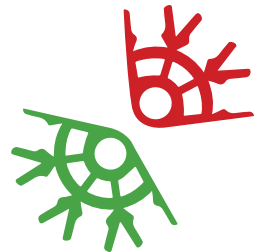
Design a musical instrument. Try playing a tune. Grab some friends and make a band.

7

Design a prosthetic hand. Can you use your hand to grab something?
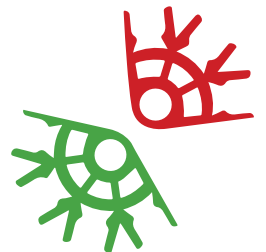
8

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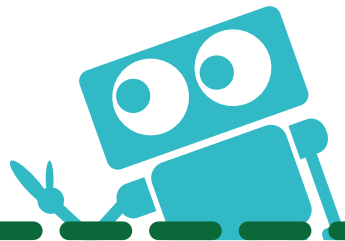
makedo

1

Design a piece of furniture (life-size or miniature).

2

Design a piece of playground equipment.

3

Build something to store your school supplies.

4

Design an animal that can move its arms and legs.

5

Design a ride you would find at an amusement park.

6

Build a musical instrument.

7

Design a car to use for a "drive-in" movie.

8

1

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MERGE ®
VIRTUAL REALITY

2

Become a galactic explorer! Use the Galactic Explorer app with your Merge Cube and hold the solar system in the palm of your hands!
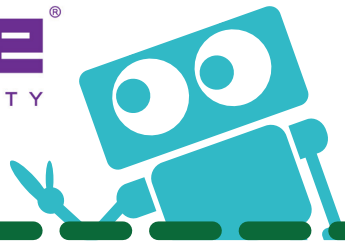
Share what you learn with the record feature and teach the rest of the class all about your explorations!

3

Hold NASA and NOAA visualizations of the Earth in the palm of your hand!

Download Hologlobe for Merge Cube to explore stunning views of Earth and its many systems.

4

Channel your inner artist with Cube Paint AR. Paint a 3D animal in any way you choose and view your creation from all sides.

Everyone loves the logic behind the Rubik's Cube. Download the Rubik's Cube app and twist and turn your virtual Rubik's Cube.

5

Do you love Minecraft? Then you will love Dig! It's like Minecraft in the palm of your hand! Get digging! Plan and build your own design.

6

Don't have an aquarium? No problem! The MyARquarium app allows you to select from more than 60 fish variations in your cube aquarium and feed them, too.
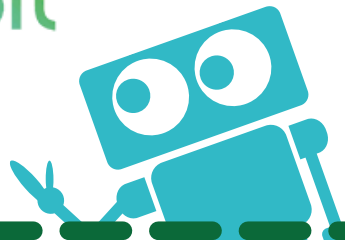
7

Shipwrecked! Use the Things! app to head to Pirate Island. Look through the telescope and what do you see?

What items would you need to survive on this island? Make a list of most important to least important. Why are those your items?
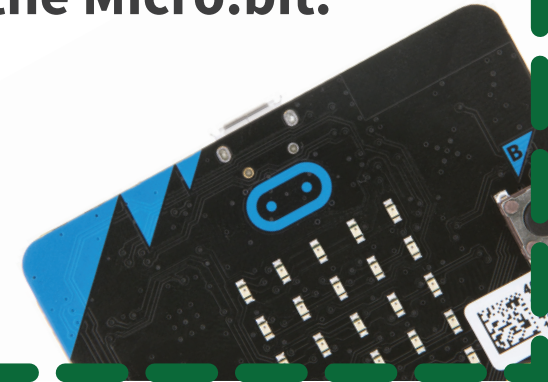
8

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micro:bit

1

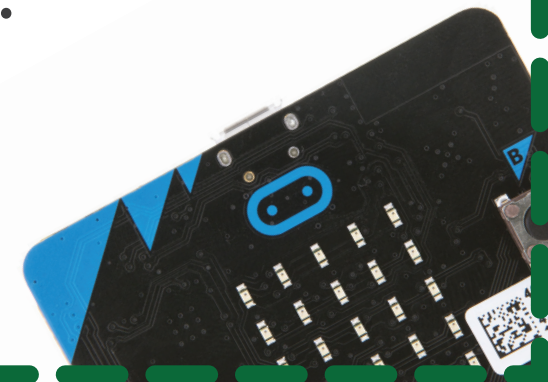Write a program that will display your name on the Micro:bit.

2

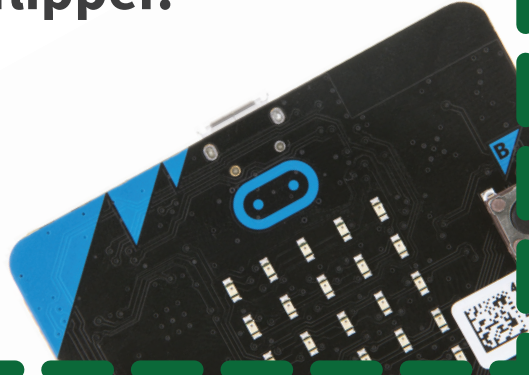Write a program that will flash a heart. Try making other shapes.

3

Create a rock, paper, scissors game.
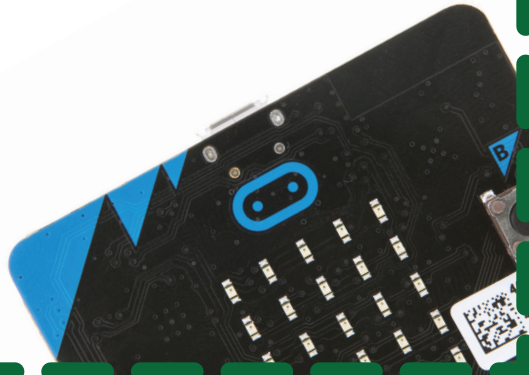
4

Create a coin flipper.

5

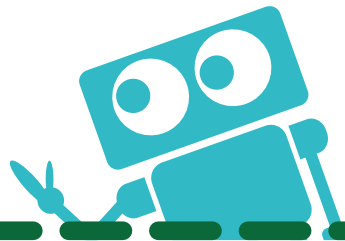**Write a program that will display different emojis.**

6

Create a stopwatch.

7

Create something that you could use while you play a sport.
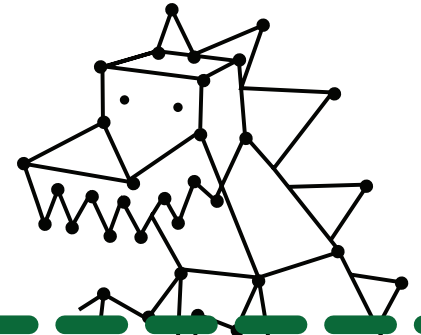
8

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Strawbees.®

Using Quirkbot Code, design something to wear that can light up.
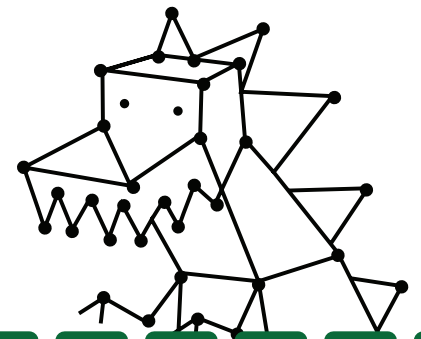

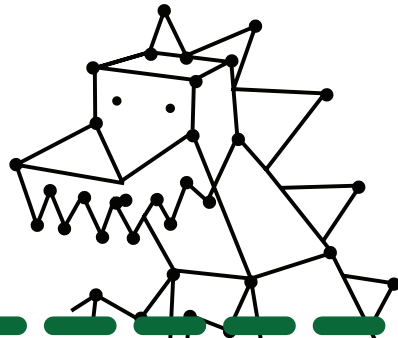**Design a crane and use Flow programming to operate it. How much can you lift?**

Are you a thrill seeker? Design an amusement park ride that rotates in circles.
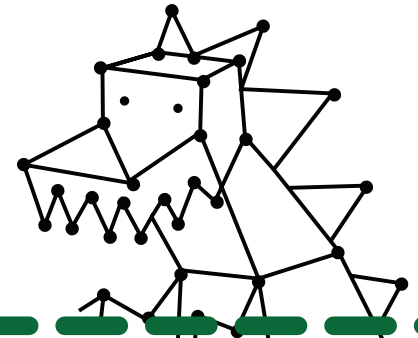
1

2

3

4

Perhaps you're more of a roller coaster fan? Design an amusement park ride that goes up and down.

5

Are you a trickster? Design a creepy crawly to scare your friends. Try writing a program to make it move.

6

Time to jam. Use Strawbees to design a musical instrument that can play various notes.

7

Help a new business get attention by designing a moving sign.

8