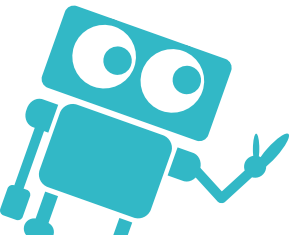
T
Tinker

4
Points

littleBits
Input/Output

Create a device that uses 2 inputs (buttons, light sensors, etc.) to make two different things happen (LED light up, servo move, etc.).



MackinMaker

T
Tinker

4
Points

Materials:

- littleBits STEAM+ Student Set)

Quick Start:

1. Gather the supplies.
2. Learn about the littleBits color-coding system (Blue = power, Pink = input, Green = output, Orange = branch).
3. Create a simple power, input, output circuit with a button and LED.
4. Once the simple circuit works, see how complex you can make your circuit.
5. Tinker with inputs and outputs as time allows.

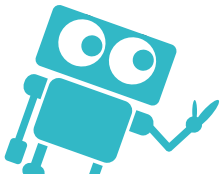
Hints and Tips:

- Look carefully at the littleBits to see what adjustments they have. If it has a toggle switch, test that out to see what it does.
- If you need more guidance, check out littleBits STEAM+ invention guide booklet. There is some great information about each of the Bits and even ideas of additional challenges!

Extended Challenges

Computer Science: Input/outputs are everywhere and are the basis of computing. Take a look around and see where other, "if this, then that" (input/output) statements can be found. List them and discuss them as a class.

Computer Science: Use the codeBit and littleBits Fuse app to code your inputs/outputs in a new way. Can you use a loop or logic to code a light to turn on and off depending on what information your inputs receive?



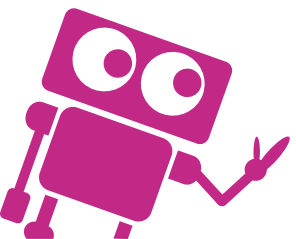
S
Skill-Up

8
Points

littleBits

Savings Alarm

Build a safe way to store your money that will blink or buzz when money is added to it or taken from your savings bank.



MackinMaker

S
Skill-Up

8
Points

Materials:

- littleBits STEAM+ Set
- Paper
- Tape
- Scissors
- Other miscellaneous craft supplies

Quick Start:

1. Gather the necessary supplies.
2. Design a littleBits circuit that will allow you to trigger sound when a coin (or other money) is added to your bank.
3. Sketch out your functional idea as well as how it will look.
4. Build it, test it, iterate, and share it with your peers.

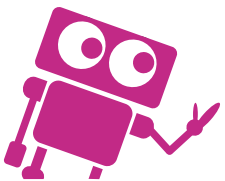
Hints and Tips:

- There are many ways to make the buzzer trigger mechanically, but you can also try to use a light or pressure sensor as the input that "sees" or "feels" a coin pass by and thus triggers a buzzer.
- Recycled materials such as 2-liter pop bottles, cardboard tubes, or even paper machete balloons are fun to use for the reservoir portion of your bank.
- littleBits are fun but also fragile. Be gentle with wire connections to make your littleBits last a long time.

Extended Challenges

English/Language Arts: Brainstorm a list of things you might save your money for.

Computer Science: Can you use the littleBits Fuse app and the codeBit to program your device to display how much money is in the bank? What would that program look like? What variable would you need to know? How would you sort each coin and assign a value? Discuss as a group what the programs would need to have in them.

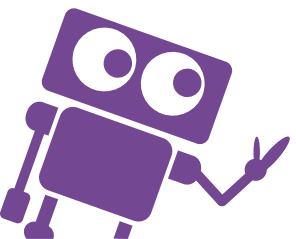


D
Design

13
Points

LittleBits
Out of This World Design

Design and create a device that astronauts could use on the Space Station, Moon, or Mars.



MackinMaker

D
Skill-Up

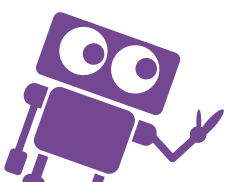
13
Points

Materials:

- littleBits STEAM+ Set
- Paper
- Tape
- Scissors
- Other miscellaneous craft supplies

Quick Start:

1. Brainstorm and sketch out three ideas that would help people in space.
2. Collect needed materials and littleBits blocks that you'll need.
3. Build your device making sure it is functional and looks good too.
4. Test, iterate, and show off your project to your friends.



Hints and Tips:

- Try to think like an astronaut. What are their problems and biggest needs? Put yourself into their mindset and let the ideas flow.
- Think about what sensors might be helpful in space. Could a light sensor count the orbits? Would the temperature sensor be helpful in some way? Then focus on the outputs, what you can make happen (turn on a servo, buzzer, LED), to help solve the problem at hand.

Extended Challenges

English/Language Arts: Write a story about a day in the life of an astronaut and then use your insights to build a better device to solve their needs.

Art: What does art look like in micro gravity, on the Moon, or on Mars? How would it differ or be the same? Think about how environment (and available materials) influence art and then add this artistic style to your new space device.

G
Global

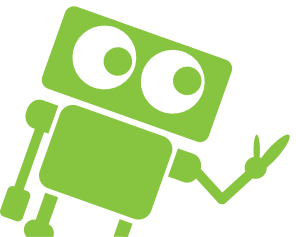
20
Points

LittleBits

Remote Medical Device

Design and build a prototype of a remote medical device. This could be a robotic surgery device or another futuristic medical device of your own design.

MackinMaker



G
Global

20
Points

Materials:

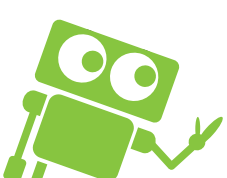
- littleBits STEAM+ Set
- Paper
- Tape
- Scissors
- Other miscellaneous craft supplies

Quick Start:

1. Brainstorm global medical problems that could be solved.
2. Sketch ideas on how you could solve them.
3. Gather the necessary supplies.
4. Build your prototype using littleBits and craft materials.
5. Test, iterate, redesign, and share it with your class or friends when you finish.

Hints and Tips:

- If you need more guidance, check out littleBits STEAM+ invention guide booklet. There is some great information about each of the Bits and even additional challenge ideas!
- Use the littleBits Fuse app and codeBit to program your device. Explore the littleBits website for more guidance on coding with these tools.
- For inspiration, have an educator help you look at the littleBits, "Change the World Arcade" lesson on the littleBits website. Use it as a starting point to get you thinking about the world and then focus in on your new medical device mockup.



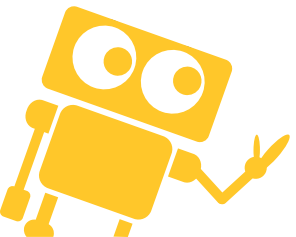
Extended Challenges

Geography: Map out places around the world that could benefit from your device. Do they need remote surgeries in Antarctica? What areas of the world have needs that could be solved by your device and why?

Social Studies: Explore the social studies of medicine. What innovations and discoveries have changed the world? Research Louis Pasteur, Alexander Fleming, or Marie Curie.

I
Innovator

23
Points



littleBits

Build a Better Dog Bowl

We challenge you to build a better dog bowl. Will it dispense food on a timer or a sensor? Will it require your dog to bump it with its nose? It is up to you. Make this the best dog bowl ever!

MackinMaker

I
Innovator

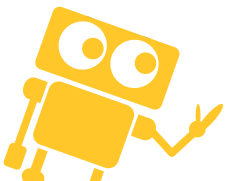
23
Points

Materials:

- littleBits STEAM+ Set
- Paper
- Tape
- Scissors
- Other miscellaneous craft supplies

Quick Start:

1. Brainstorm how you will make a better dog bowl using littleBits.
2. Sketch ideas on what this new bowl would look like and do.
3. Gather the necessary supplies.
4. Build your prototype using littleBits and additional craft materials of your choice.
5. Test, iterate, redesign, and share it with your class, friends, or dog when you are done.



Hints and Tips:

- Want to make your littleBits last even longer? Use Sugru (moldable silicon) to reinforce your bit connectors and wires.

Extended Challenges

Music: Can you add in a way to bring soothing music to your pet while you're away? Maybe a pressure or light activated song? Design and build a mockup of this and see how you can add it into the original project to make this the ultimate pet happiness device. Use the littleBits Fuse App and codeBit to program your device with logic blocks.

Science: Explore how each of the littleBits' sensors work. How do pressure sensors vs. Potentiometers (the dimmer) differ? Where are they found in our world and what are they used for? How do the light and temperature sensors work? Learn and then use this knowledge to make your next project even better.