littleBits™
SNAP THE GAP STEM KIT BIT™ INDEX

★ Occasionally Bits™ get updated, so the features or appearance of your Bits may differ from those used in this guide.

p4 **POWER**

The p4 power Bit converts the 9 volts of electricity in the battery to the 5 volts that littleBits circuits run on.

The power Bit also sends a signal through your circuit. Controlling this signal with inputs is how you control your circuit.
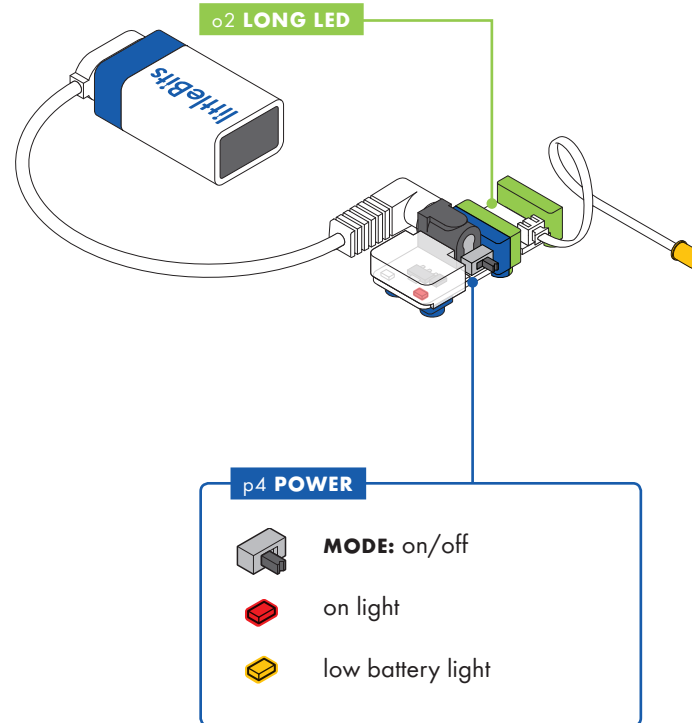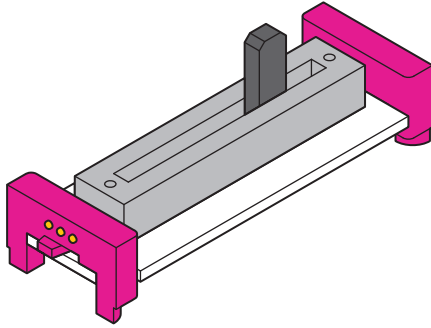
o2 **LONG LED**

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MEET THE BIT

Every circuit starts with power. It provides the electricity that makes your Bits spin, buzz, blink, and shine.

p4 **POWER**

MODE: on/off

on light

low battery light

REAL WORLD ANALOGIES

PHONE CHARGER

2

i5 **SLIDE DIMMER**

When the slider is all the way to the left, it's sending an off or 0 volt signal. When the slider is all the way to the right, it's sending an on or 5 volt signal. The slider can be positioned to send any signal between 0 and 5 volts.

o2 **LONG LED**

i5 **SLIDE DIMMER**
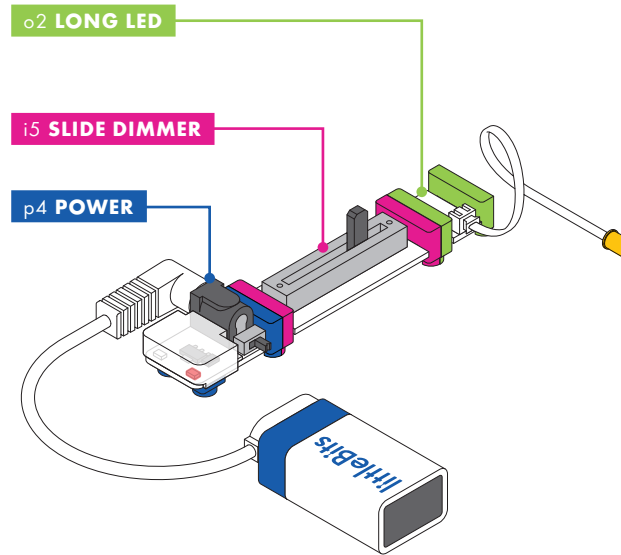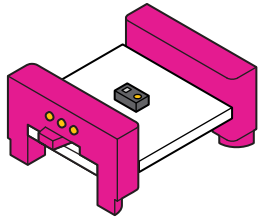
p4 **POWER**

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MEET THE BIT

Slide this dimmer back and forth to control your circuit. As you slide it up, more signal goes to the Bits that follow, brightening lights, speeding up motors, and raising the volume on buzzers.

MINI-CHALLENGE

Can you invent something with the slide dimmer that waves a flag back and forth? How could you change the speed it waves?

REAL WORLD ANALOGIES

HOUSEHOLD DIMMER SWITCH

CAR PEDAL

i8 PROXIMITY SENSOR

o9 BARGRAPH

i8 PROXIMITY SENSOR

p1 POWER

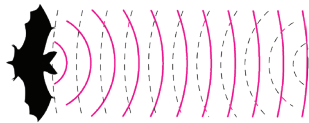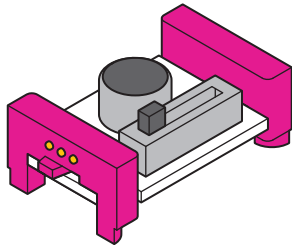## HOW IT WORKS

The proximity sensor is like a pair of eyes for your circuit. It detects objects by using an infrared beam to sense what's in front of it. As the object gets closer to the proximity sensor, more signal will pass to the following Bits in the circuit.

MEET THE BIT

This Bit beams an infrared light that allows it to sense objects in front of it.

REAL WORLD ANALOGIES

BAT VISION

i20 **SOUND TRIGGER**

o9 **BARGRAPH**

p1 **POWER**

i20 **SOUND TRIGGER**

sensitivity slider

HOW IT WORKS

The sound trigger has a microphone that measures how much noise is around it. When the noise goes above a certain level, the sound trigger will send out an on or 5 volt signal to the following Bits in the circuit. Use the adjustment slider to set the sensitivity (how much noise is needed to trigger your Bit).
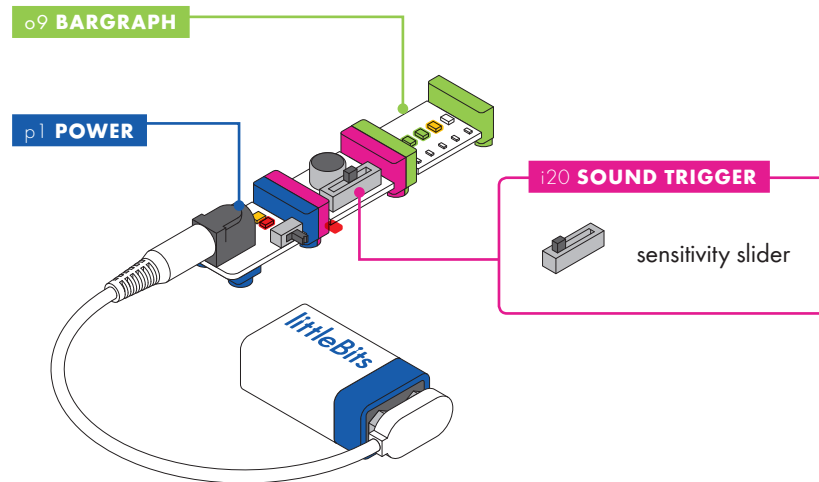
MEET THE BIT

Use this Bit to control your circuits with sound. It's a great way to make your inventions hands-free!

MINI-CHALLENGE

Can you invent something that moves at the snap of your fingers?

REAL WORLD ANALOGIES
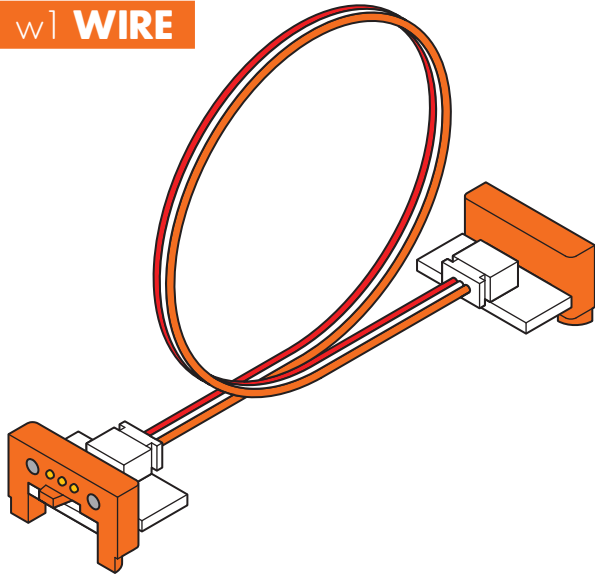

CLAP ON LIGHT

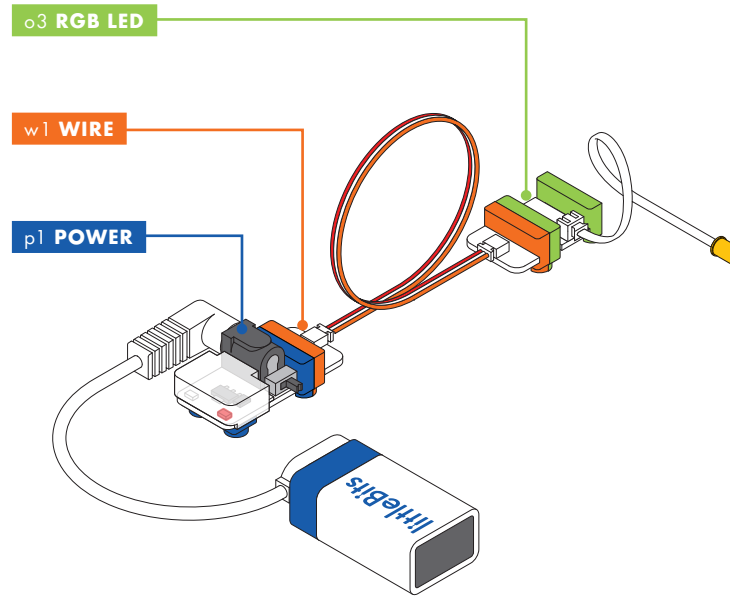**HUMAN EAR**

BEAR IN HIBERNATION

w1 **WIRE**

MEET THE BIT

The wire Bit has a flexible wire running between its two bitSnaps. This allows you to place your Bits farther apart, turn corners, and make connections that can twist, turn, and spin.

SAMPLE CIRCUIT
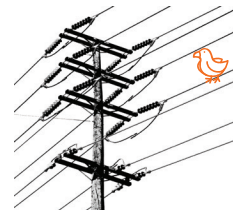
o3 **RGB LED**

w1 **WIRE**

p1 **POWER**

HOW IT WORKS

The wire doesn't change the signal in any way – it just carries the signal over from one Bit to another. Each wire Bit is 6 inches (15 cm) long.
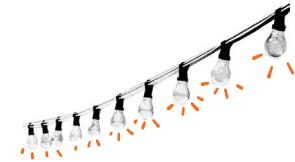
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MINI-CHALLENGE

Can you invent a circuit that you wrap around your arm?

REAL WORLD ANALOGIES

EXTENSION CORD

POWER LINES

STRING OF LIGHTS

w8 **LATCH**

If you place a button in front of the latch, and a light after, pressing the button once will turn it on and keep it ON. Pressing it again will turn it off. Try placing a sound trigger in front of the latch and a light after it, then, just snap your fingers!
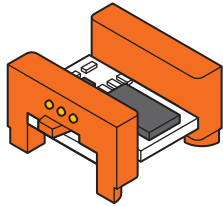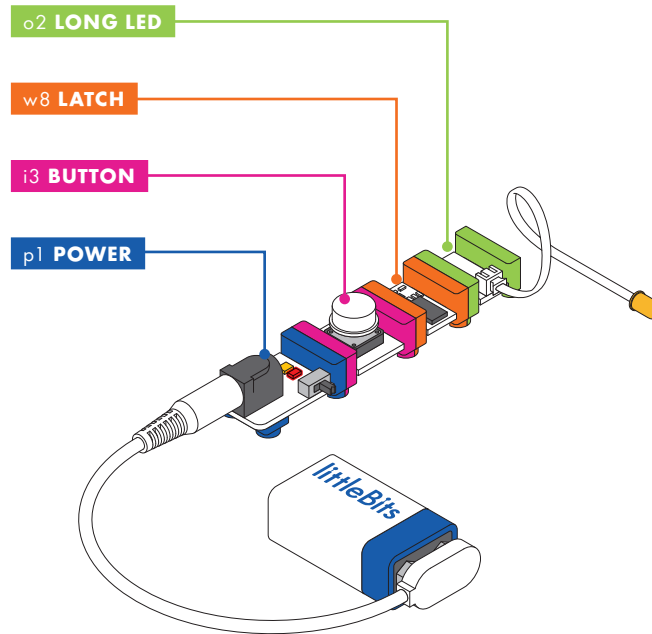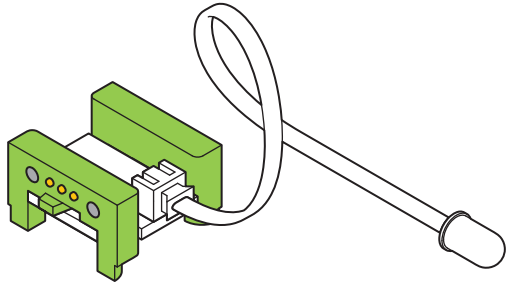
o2 **LONG LED**

w8 **LATCH**

i3 **BUTTON**

p1 **POWER**

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MEET THE BIT

Use the latch to turn any momentary input, like a button or a trigger Bit, into an on-off switch, like a toggle!

REAL WORLD ANALOGIES

DOORSTOP

CLICKING A PEN

o2 **LONG LED**

This Bit uses a light-emmiting diode (LED) to turn electricity into light. The more signal you send the Bit, the brighter the light shines.

i3 **BUTTON**
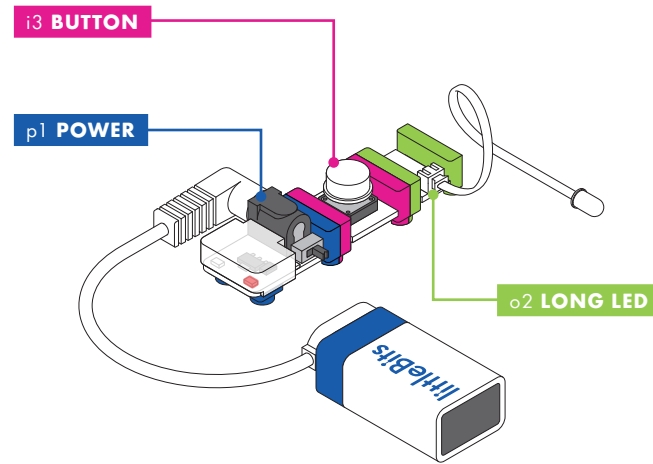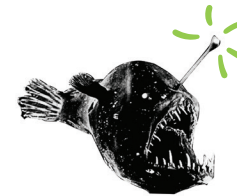
p1 **POWER**

o2 **LONG LED**

MEET THE BIT

The long LED is a flexible lighting option. We call it the "long" LED because the light is connected to the board by a cable, which lets you put the light in some interesting places.

MINI-CHALLENGE

Can you invent a new wearable accessory using the long LED?

REAL WORLD ANALOGIES

FLASHLIGHT

STREET LAMP

ANGLERFISH

8

o6 **BUZZER**

The buzzer converts the electrical signal it receives into a vibration, which creates a buzzing sound. The higher the signal it receives, the more intense the vibration, and the louder the sound is.
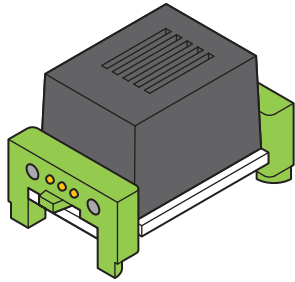
o6 **BUZZER**

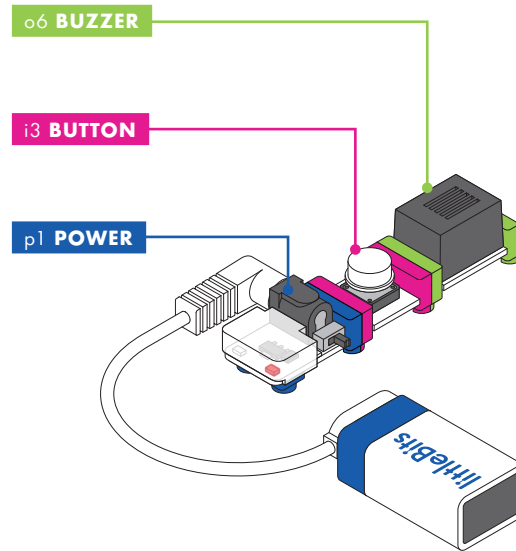i3 **BUTTON**

p1 **POWER**

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MEET THE BIT

The buzzer makes a sound no one can ignore. It's great at sounding the alarm or annoying those nearby.

MINI-CHALLENGE

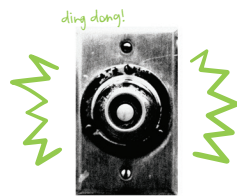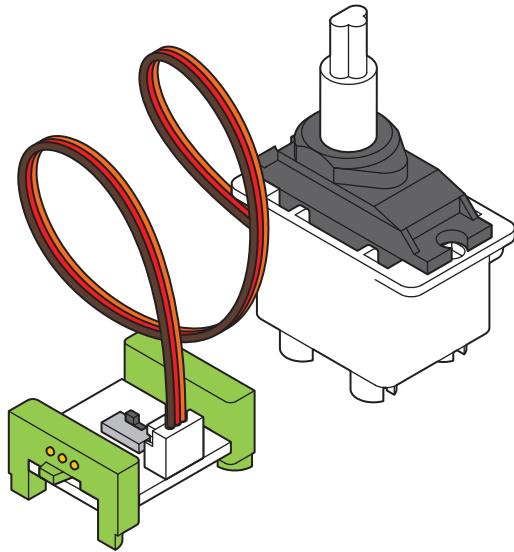Can you invent a way to communicate with your friends using the buzzer?

REAL WORLD ANALOGIES

ding dong!

DOORBELL

CAR ALARM

done!

WASHING MACHINE

o11 **SERVO**

The servo has two modes. In **TURN** mode, the input from other Bits determines the position of the hub – try using a dimmer to set the angle you want. In **SWING** mode, the servo will move back and forth on its own like a pair of windshield wipers – the input signal controls the speed of the swing.
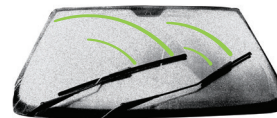
The servo's range of motion is about 180 degrees.

The servo motor is contained within a servo bucket. Simply press the plastic feet into a mounting board for extra stability.

MEET THE BIT

The servo is a motor that can swing back and forth or be turned to a specific position.

There are a few accessories you can use with the servo (like the mechanical arm). You can find out how to use those on page 26.

i5 **SLIDE DIMMER**

p4 **POWER**

littleBits

o11 **SERVO**

MODE: turn or swing

Feet for attaching to mounting boards or shoes

MINI-CHALLENGE

Can you invent something that uses the servo to clean up your desk?

REAL WORLD ANALOGIES

bleep blorp

TRUCK CRANE

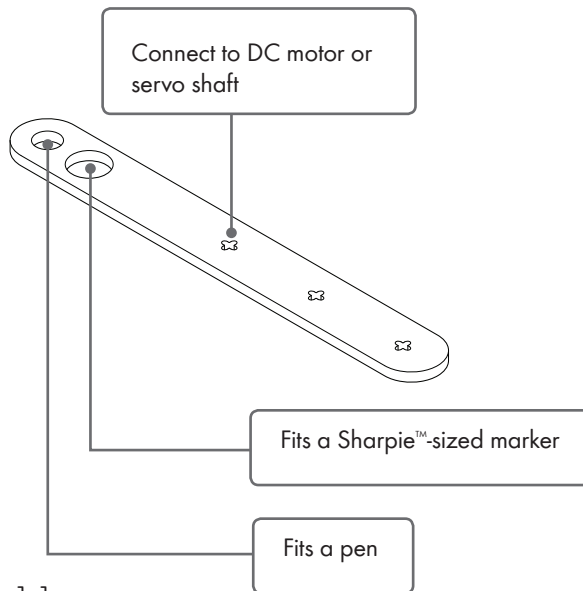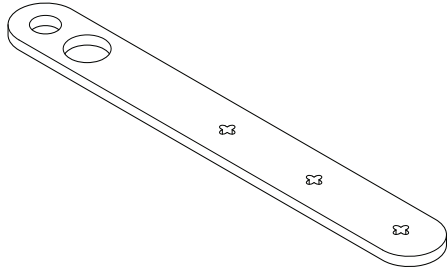**WINDSHIELD WIPERS**
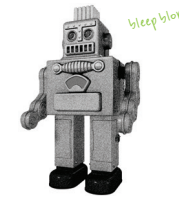
ROBOT

a23 MECHANICAL ARM

The mechanical arm attaches to both the servo and the DC motor shaft, and offers lots of leverage for pushing, pulling, and throwing.

Connect to DC motor or servo shaft

Fits a Sharpie™-sized marker

Fits a pen

HOW IT WORKS

To attach the mechanical arm to the DC motor, line up the DC motor cross shaft with one of the cross holes in the mechanical arm.

For the servo, line up the T shaft with one of the cross holes in the mechanical arm and press firmly.

The two large holes on the end are perfect for holding pens and markers in place.
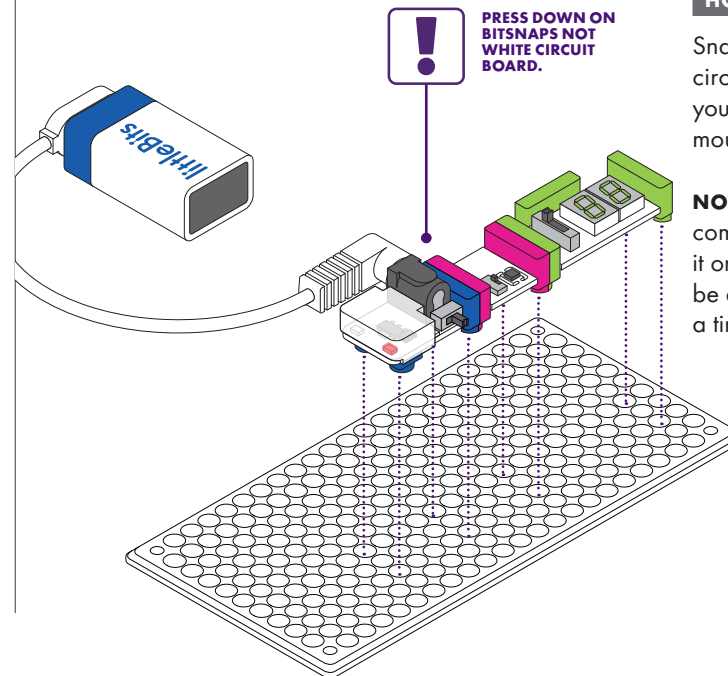
a30 MOUNTING BOARD
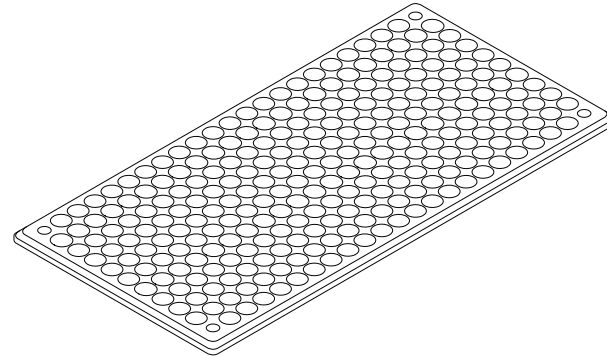
MEET THE ACCESSORY

The mounting board is like the backbone of some of your inventions. It allows you to keep your circuit intact and move it around with ease! It also provides structure which is helpful for building out projects, like a vehicle.

PRESS DOWN ON BITSNAPS NOT WHITE CIRCUIT BOARD.

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HOW IT WORKS

Snap together your littleBits circuit and press the feet of your Bits into the holes of the mounting board.

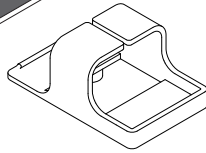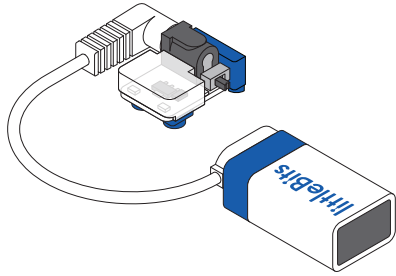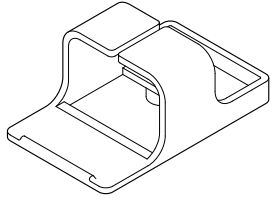**NOTE:** Your circuit must be complete before you press it onto the board. You won't be able to add Bits one at a time.
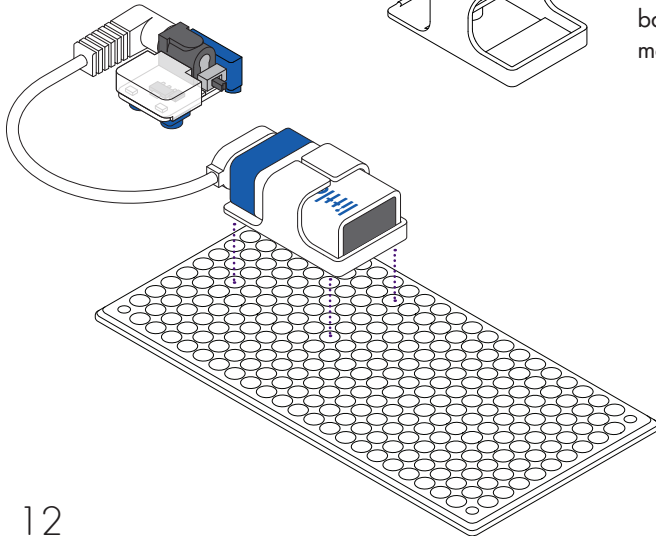
MEET THE ACCESSORY

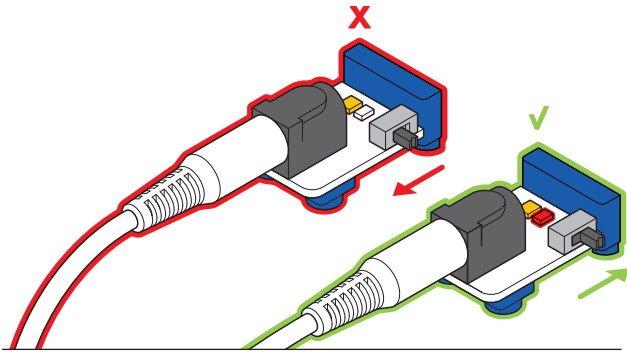The battery mount secures the 9-volt battery to the mounting board.

HOW IT WORKS

Slide the 9-volt battery into the opening of the battery mount and press the feet of the battery mount into the mounting board.
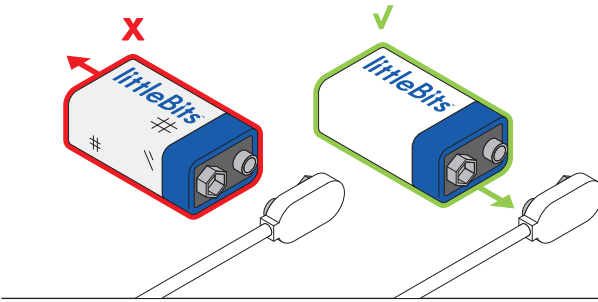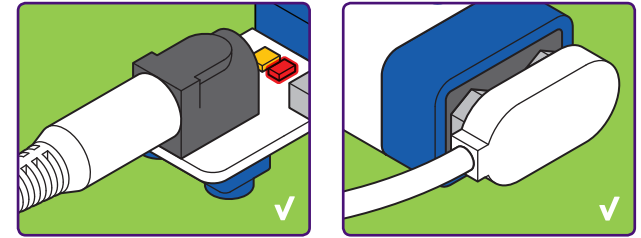
TROUBLESHOOTING

1 **MAKE SURE YOUR POWER BIT™ IS ON.** You should see a red LED illuminated on the board.

2 **TRY SWAPPING IN A NEW 9 VOLT BATTERY.** Low batteries can cause a circuit to act erratically. Bits™ have different power demands. For example: a DC motor may appear to not be working while a light still shines brightly.

3 **ENSURE THE POWER CABLE IS SECURELY FASTENED TO BOTH THE POWER BIT AND THE BATTERY.**
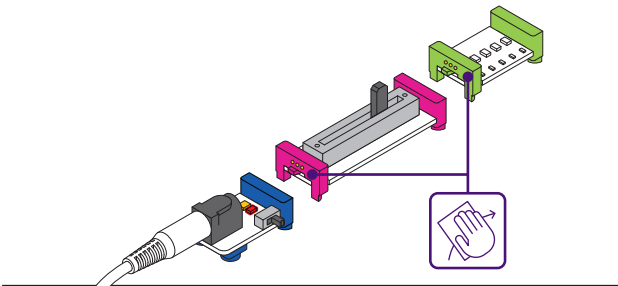
4 **CHECK YOUR CONNECTIONS**. Are all the Bits securely snapped to each other? You can also try gently wiping down the ends of the bitSnaps with a soft cloth (like your sleeve). Sometimes dust gets in the way of a strong connection. Try unsnapping, cleaning the bitSnaps, and snapping it all back together again.
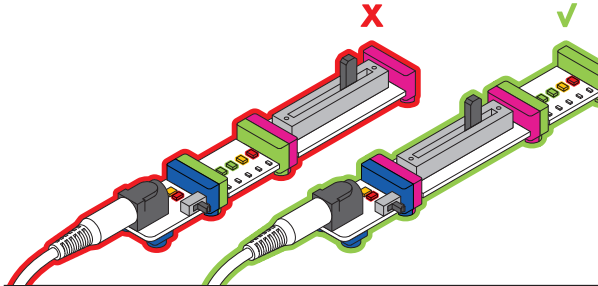
5 **MAKE SURE YOUR BITS ARE ARRANGED IN THE PROPER ORDER.** Remember that you always need a power Bit & power supply at the beginning of each circuit, and an output Bit at the end. If the last Bit in your chain is an input, then it won't do anything to affect your circuit.
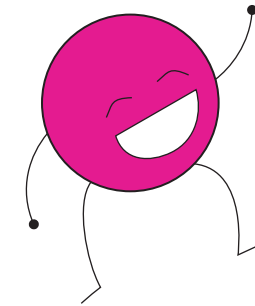
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