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Occasionally Bits™ get updated, so the features or appearance of your Bits may differ from those used in this guide.
Every circuit starts with power. It provides the electricity that makes your Bits spin, buzz, blink, and shine.

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.

**REAL WORLD ANALOGIES**

**PHONE CHARGER**
**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.

**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
**MEET THE BIT**

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

**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.

**REAL WORLD ANALOGIES**

- **BAT VISION**
**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

**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**

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**

![Sample Circuit Diagram]

**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.

**MINI-CHALLENGE**

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

**REAL WORLD ANALOGIES**

- Extension Cord
- Power Lines
- String of Lights
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!

HOW IT WORKS
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!

REAL WORLD ANALOGIES

DOORSTOP
CLICKING A PEN
**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?

**SAMPLE CIRCUIT**

**HOW IT WORKS**

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

**REAL WORLD ANALOGIES**

- Flashlight
- Street Lamp
- Anglerfish
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
- DOORBELL
- CAR ALARM
- WASHING MACHINE

HOW IT WORKS
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.
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.

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

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

HOW IT WORKS
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.
**MECHANICAL ARM**

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

**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.

**Fits a Sharpie™-sized marker**

**Fits a pen**

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**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.

**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.

STILL HAVING TROUBLE? Visit littleBits.com/faq or contact our customer service team at support@littleBits.com.