

A decorative graphic on the left side of the page, consisting of white lines and circles on a blue background, resembling a circuit board or a tree structure.

TINKERCAD TUTORIAL

A SCHOOL 3.0

ADDING COMPONENTS

The screenshot displays the Tinkercad web application interface. At the top, the browser address bar shows the URL: `tinkercad.com/things/kEcukVkh6KG-adding-components/editel?lessonid=EM7T14PIXKPYN1R&projectid=OIJ88OJ3OPN3EA#/lesson-viewer`. The page title is "Adding Components".

On the left side, there is a sidebar with a tutorial titled "Adding Components". The text reads: "In this tutorial, you'll learn how to add components to make an interactive motor controller. Let's get started!". Below the text is a small thumbnail image of the circuit being built. At the bottom of the sidebar is a "Next" button.

The main workspace shows a circuit diagram. It consists of four AA 1.5V batteries connected in series. A red wire connects the positive terminal of the battery stack to the positive terminal of a light bulb. A black wire connects the negative terminal of the battery stack to the positive terminal of a DC motor. Another red wire connects the negative terminal of the motor to the negative terminal of the light bulb, completing the circuit.

On the right side, there is a "Components Basic" panel with a search bar and a grid of component icons. The visible components include: Resistor, LED, Pushbutton, Potentiometer, Capacitor, Slideswitch, 9V Battery, Coin Cell 3V Battery, 1.5V Battery, Breadboard Small, micro:bit, Arduino Uno R3, Vibration Motor, DC Motor, and Micro Servo.

At the bottom of the screen, the Windows taskbar is visible, showing the search bar, taskbar icons for various applications, and system tray information including the temperature (29°C).

ADDING COMPONENTS

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Test the Circuit
In the workplane, you'll find a motor connected directly to a battery pack. When we start the simulator, the motor will begin to rotate!

Instructions

1. Click **Start Simulation** to start the motor. How fast is it spinning? Notice the text that displays the rotations per minute (rpm).
2. Continue to the next step.

The circuit diagram shows a battery pack of four AA 1.5V cells connected to a DC motor and a light bulb. A green callout bubble with the text "Click Start Simulation" points to the "Start Simulation" button in the top right corner of the interface.

The component palette on the right includes: Resistor, LED, Pushbutton, Potentiometer, Capacitor, Slideswitch, 9V Battery, Coin Cell 3V Battery, 1.5V Battery, Breadboard Small, micro:bit, Arduino Uno R3, Vibration Motor, DC Motor, and Micro Servo.

ADDING COMPONENTS

Inbox (528) - carla.bodea@civga x Circuit design Adding Componer x +

tinkercad.com/things/kEcukVkh6KG-adding-components/editel?lessonid=EM7TI4PIXKPYN1R&projectid=OIYJ88OJ3OPN3EA#/lesson-viewer

Getting Started Adding Components

Adding Components

Code Start Simulation Send To

Add a Photoresistor

Now, let's make our circuit interactive by adding a sensor.

Instructions

1. Click **+** **Components** and search for a **photoresistor**.
2. Click on the photoresistor and add it to your circuit below the red wire. Rotate the photoresistor by clicking the **rotate** icon (or pressing **R** on your keyboard) so that the pins are facing up.
3. Delete the existing red wire by clicking on it and then clicking the **trash** icon (you can also press **delete** on your keyboard).
4. Wire the photoresistor so that one end is connected to the Positive end of the battery and the other is connected to Terminal 2 of the motor.
5. Continue to the next step.

Next

Components Basic

Search

- Resistor
- LED
- Pushbutton
- Potentiometer
- Capacitor
- Slideswitch
- 9V Battery
- Coin Cell 3V Battery
- 1.5V Battery
- Breadboard Small
- micro:bit
- Arduino Uno R3
- Vibration Motor
- DC Motor
- Micro Servo

Type here to search

29°C

ADDING COMPONENTS

The screenshot displays the Tinkercad web application interface. At the top, the browser address bar shows the URL: tinkercad.com/things/kEcukVkh6KG-adding-components/editel?lessonid=EM7TI4PIXKPYN1R&projectid=OIYJ80J3OPN3EA#/lesson-viewer. The page title is "Adding Components".

On the left side, there is a sidebar with the following content:

- Getting Started**
Adding Components
- Navigation: 4 / 5
- Start the Simulation**
A photoresistor works by sensing light. Let's test how it works.
- Instructions**
 1. Click **Start Simulation**.
 2. Click on the photoresistor. You should now see a slider appear below your photoresistor.
 3. Drag the slider from one side to another. Notice how the speed of the motor changes with more light!
 4. Continue to the next step.
- Next** button

The main workspace shows a circuit diagram with the following components and connections:

- A battery pack consisting of four AA 1.5V cells.
- A photoresistor connected to the positive terminal of the battery.
- A resistor connected in series with the photoresistor.
- A DC motor connected to the other end of the resistor and the negative terminal of the battery.

On the right side, there is a **Components Basic** panel with a search bar and a grid of component icons:

- Resistor
- LED
- Pushbutton
- Potentiometer
- Capacitor
- Slideswitch
- 9V Battery
- Coin Cell 3V Battery
- 1.5V Battery
- Breadboard Small
- micro:bit
- Arduino Uno R3
- Vibration Motor
- DC Motor
- Micro Servo

The Windows taskbar at the bottom shows the system tray with a temperature of 29°C and various application icons.

ADDING COMPONENTS

The screenshot displays the Tinkercad web application interface. At the top, the browser address bar shows the URL: `tinkercad.com/things/kEcukVkh6KG-adding-components/editel?lessonid=EM7TI4PIXKPYN1R&projectid=OIJ88OJ3OPN3EA#/lesson-viewer`. The main workspace shows a circuit with four AA 1.5V batteries connected in series to a motor and a light bulb. The left sidebar contains a congratulatory message and a list of tasks for continuing tinkering. The right sidebar shows a component palette with various electronic components like Resistor, LED, Pushbutton, Potentiometer, Capacitor, Slideswitch, 9V Battery, Coin Cell 3V Battery, 1.5V Battery, Breadboard Small, micro:bit, Arduino Uno R3, Vibration Motor, DC Motor, and Micro Servo.

Getting Started
Adding Components

Congratulations!
You've now learned how to add components and integrate a sensor into your circuits. Great job!

Continue Tinkering

- What happens to the speed of the motor when you adjust the number of AA batteries? Click on the AA battery to change the number of batteries in the inspector.
- Does the speed of the motor change when you change the battery type altogether? Try experimenting by replacing the AA battery with a Coin Cell Battery or the 9V battery and seeing how the rotations per minute (RPM) changes.

Reset Done

Components Basic

Search

Resistor LED Pushbutton

Potentiometer Capacitor Slideswitch

9V Battery Coin Cell 3V Battery 1.5V Battery

Breadboard Small micro:bit Arduino Uno R3

Vibration Motor DC Motor Micro Servo

29°C 4:33 PM 6/16/2022

WIRING COMPONENTS

The screenshot displays the Tinkercad web application interface. At the top, the browser address bar shows the URL: tinkercad.com/things/9K77fnf0ZpR-wiring-components/edit?lessonid=EB4XNWQJ1WEOONK&projectid=OIYJ88OJ3OPN3EA&collectionid=undefined&tenant=circuits#/lesson-vi.... The page title is "Wiring Components".

On the left side, there is a sidebar with the heading "Wiring Components" and the text "Let's learn how to wire components together to create electrical connections!". Below this text is a small thumbnail image of a breadboard circuit. At the bottom of the sidebar is a "Next" button.

The main workspace shows a breadboard circuit. A 9V battery is connected to a series of resistors. A 555 timer IC is connected to the circuit, and an LED is connected to its output. The breadboard is labeled with rows A through J and columns 1 through 30.

On the right side, there is a "Components Basic" panel with a search bar and a grid of component icons. The components listed include: Resistor, LED, Pushbutton, Potentiometer, Capacitor, Slideswitch, 9V Battery, Coin Cell 3V Battery, 1.5V Battery, Breadboard Small, micro:bit, Arduino Uno R1, Vibration Motor, DC Motor, and Micro Servo.

At the bottom of the screen, the Windows taskbar is visible, showing the search bar with the text "Type here to search", several application icons, and the system tray with the temperature "28°C" and "OneDrive - Personal Up to date".

WIRING COMPONENTS

tinkercad.com/things/9K77fnf0ZpR-wiring-components/editel?lessonid=EB4XNWQJ1WEOONK&projectid=OIYJ88OJ3OPN3EA&collectionid=undefined&tenant=circuits#/lesson-vi...

Getting Started
Wiring Components

TINKERCAD Wiring Components

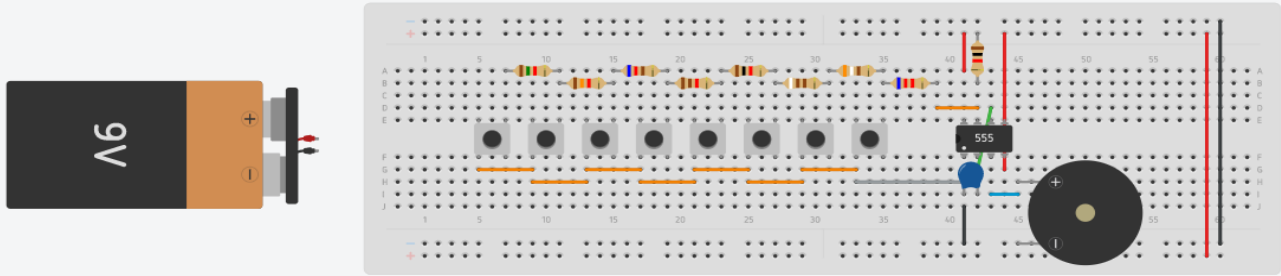
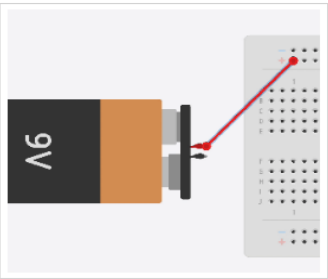
All changes saved

Code Start Simulation Send To

Wire the Positive Side of the Battery

In the editor, you'll see a 9V battery on the left. We need to add wires to connect the battery to our circuit.

1. Hover over the red terminal of the 9V battery until you see the Positive label. Click to begin adding the wire.
2. Hover over the breadboard (the white component that all the other electronics are connected to) and click on the hole next to the "+" symbol to complete the wire.
3. Click on the wire and change the color to red in the inspector.
4. Continue to the next step.



Components Basic

Search

- Resistor
- LED
- Pushbutton
- Potentiometer
- Capacitor
- Slideswitch
- 9V Battery
- Coin Cell 3V Battery
- 1.5V Battery
- Breadboard Small
- micro:bit
- Arduino Uno R3
- Vibration Motor
- DC Motor
- Micro Servo

Next

WIRING COMPONENTS

Getting Started
Wiring Components

TINKERCAD
Wiring Components

All changes saved

Code Start Simulation Send To

Wire the Negative Side of the Battery

Now we'll connect the negative side of the battery.

Instructions:

1. Hover over the black terminal of the 9V battery until you see the Negative label. Click to begin adding the wire.
2. Hover over the breadboard (the white component that all the other electronics are connected to) and click on the hole next to the "-" symbol to complete the wire.
3. Click on the wire and change the color to black in the inspector.
4. Continue to the next step.

WIRE COLOR

- Black
- Red
- Orange
- Yellow
- Green
- Turquoise
- Blue
- Purple
- Pink
- Brown
- Grey
- White

Change the color of the wire

Resistor LED Pushbutton

Potentiometer Capacitor Slidswitch

9V Battery Coin Cell 3V Battery 1.5V Battery

Breadboard Small micro:bit Arduino Uno R3

Vibration Motor DC Motor Micro Servo

Next

EDITING COMPONENTS

tinkercad.com/things/kWQ46aaEcu-z-editing-components/editel?lessonid=EFU6PEHIXGFUR1J&projectid=OIJ88OJ3OPN3EA&collectionid=undefined&tenant=circuits#/lesson-vie...

Getting Started
Editing Components

Editing Components

All changes saved

Code Start Simulation Send To

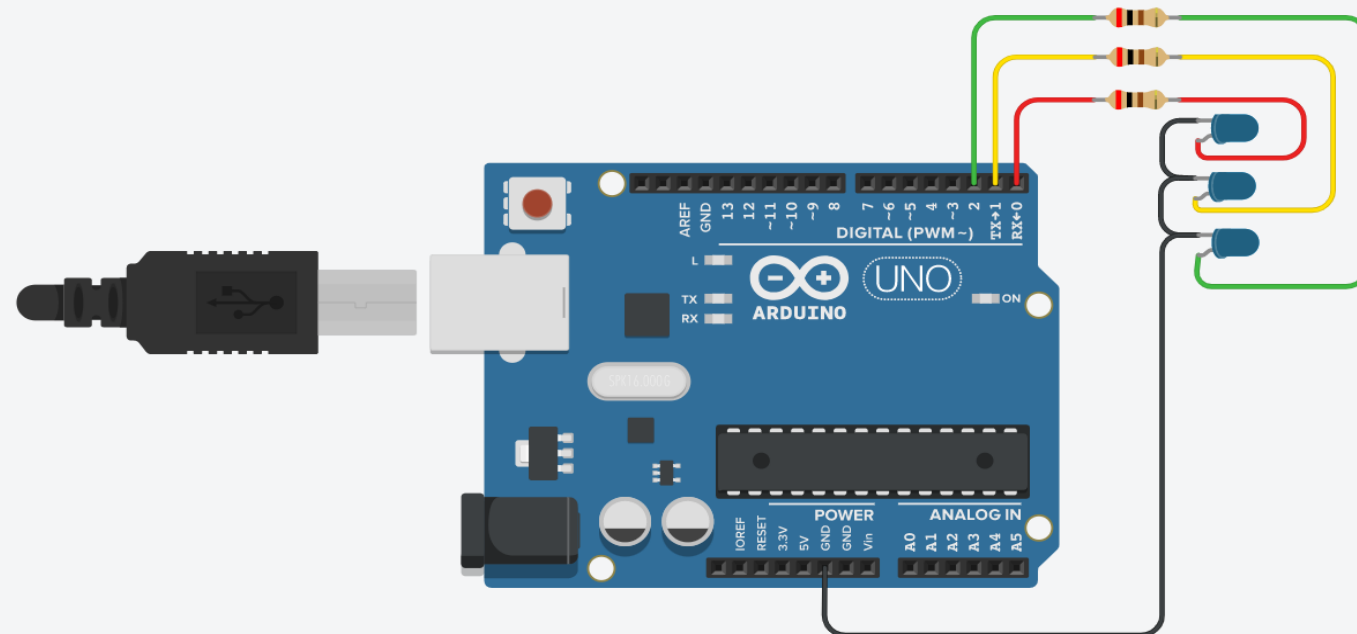
Click the Top LED

In the workplane, you'll find three blue LEDs, three resistors, and an Arduino. (Don't worry about the Arduino for now – we'll get to that soon!)

We're going to go ahead and edit the LEDs so that we have a traffic light.

Instructions

1. Click on the top-most LED. You'll see an **inspector** appear that lets you edit the properties of the component. Change the color of the LED to **red**.
2. Click and change the middle LED to **yellow**.
3. Click and change the bottom LED to **green**.
4. Continue to the next step.



LED

Name 1

Color Blue

Next

Components Basic

Search

Resistor LED Pushbutton

Potentiometer Capacitor Slideswitch

9V Battery Coin Cell 3V Battery 1.5V Battery

Breadboard Small micro:bit Arduino Uno R3

Vibration Motor DC Motor Micro Servo

EDITING COMPONENTS

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On the left side, there is a "Test Your Circuit" section with the text: "Let's check that our traffic light works as expected." Below this, under "Instructions", there are two steps: "1. Click on the **Start Simulation** button on the top right to test out your traffic light." and "2. Continue to the next step." A "Start simulation" button is located below the instructions.

The main workspace shows an Arduino Uno board connected to three LEDs and three resistors. The LEDs are connected to digital pins 2, 3, and 4. The resistors are connected to pins 2, 3, and 4 and ground. A USB cable is plugged into the board.

On the right side, there is a "Components Basic" panel with a search bar and a grid of components including Resistor, LED, Pushbutton, Potentiometer, Capacitor, Slideswitch, 9V Battery, Coin Cell 3V Battery, 1.5V Battery, Breadboard Small, micro:bit, Arduino Uno R3, Vibration Motor, DC Motor, and Micro Servo.