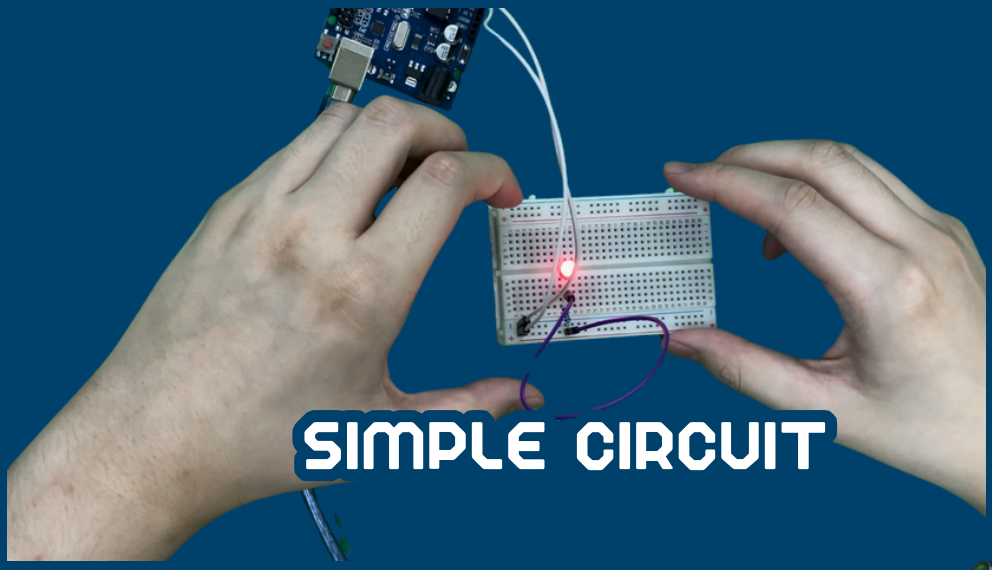
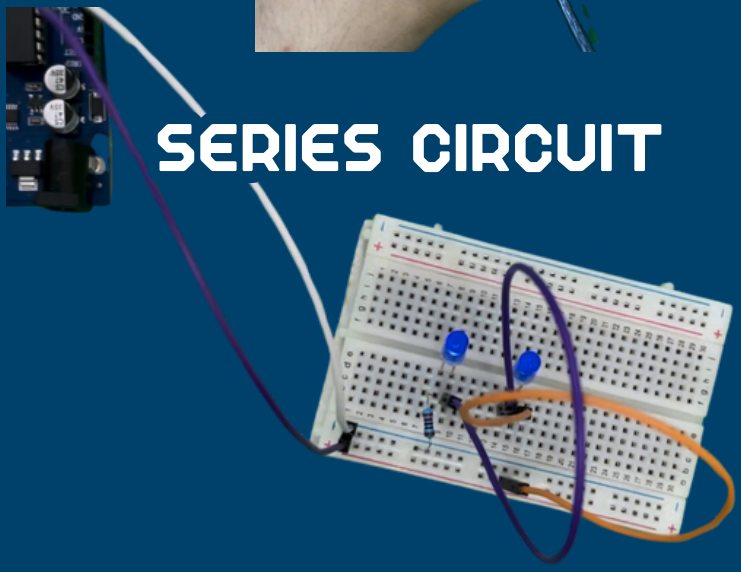
SPARK MANUALS

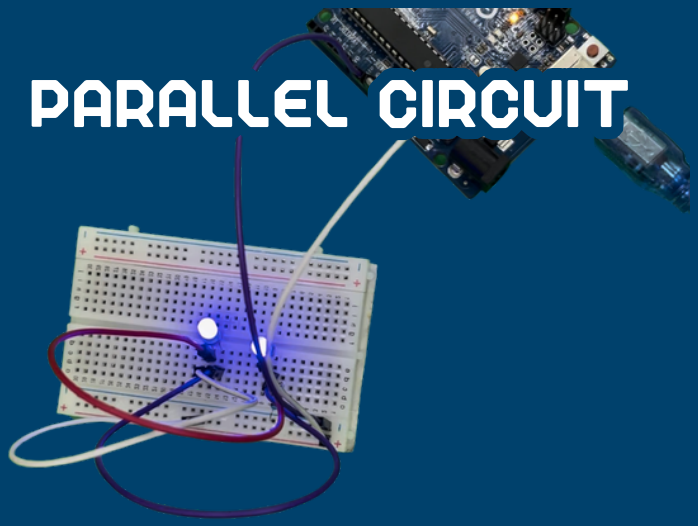
ARDUINO UNO



SIMPLE CIRCUIT



SERIES CIRCUIT



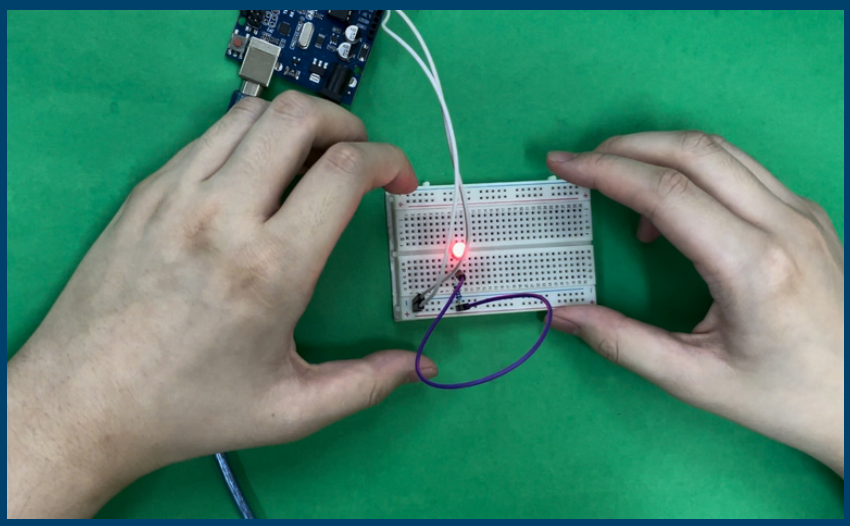
PARALLEL CIRCUIT

CIRCUITS

MADE BY PAUL LEE

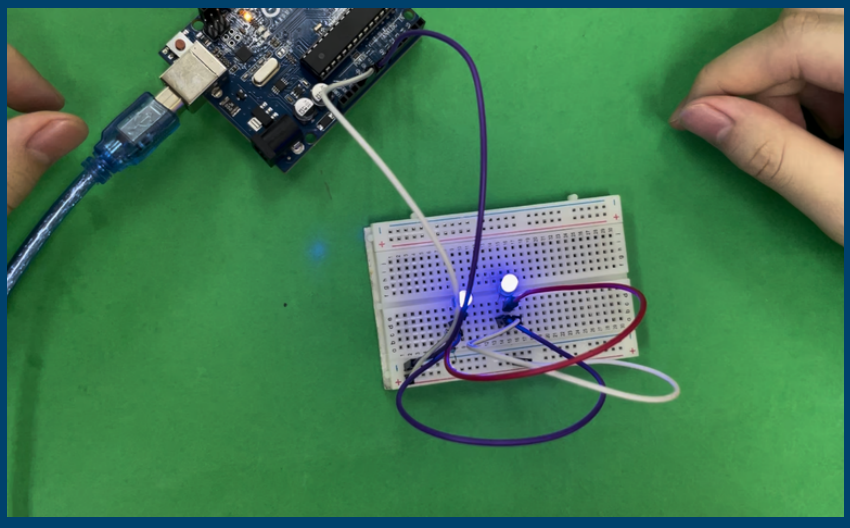
STEPS: CIRCUITS

FIRST, YOU GET ONE OF YOUR JUMPER WIRES AND PLUG ONE SIDE IN THE 5V AND THE OTHER SIDE ON THE POSITIVE OF THE BREADBOARD. THEN, YOU TAKE ANOTHER JUMPER WIRE AND PLUG IT IN GND, BESIDE THE 5V, THEN THE OTHER SIDE ON THE NEGATIVE SIDE OF THE BREADBOARD. AFTER THAT, TAKE ONE LED BULB AND PLACE IT ON THE BREADBOARD. THE LONGER LEG IS THE ANODE WHICH IS THE POSITIVE AND THE SHORTER LEG IS THE CATHODE WHICH IS THE NEGATIVE. THE DIRECTION OF WHETHER THE ANODE IS LEFT OR RIGHT DOESN'T MATTER. ONCE YOU'VE PLUGGED THE LED IN THE BREADBOARD, PLACE ONE SIDE OF THE RESISTOR IN THE NEGATIVE TERMINAL OF THE BREADBOARD AND THE OTHER SIDE ON THE BREADBOARD ITSELF, ALIGNED WITH THE CATHODE. THEN TAKE THE FINAL JUMPER WIRE AND PLUG IT ON THE POSITIVE TERMINAL OF THE BREADBOARD AND THE OTHER SIDE ON THE BREADBOARD ITSELF. THEN TAKE YOUR DOWNLOADER AND CONNECT IT TO THE ARDUINO UNO BOARD AND YOUR COMPUTER. AND DONE!



STEPS: CIRCUITS

FIRST, YOU GET ONE OF YOUR JUMPER WIRES AND PLUG ONE SIDE IN THE 5V AND THE OTHER SIDE ON THE POSITIVE OF THE BREADBOARD. THEN, YOU TAKE ANOTHER JUMPER WIRE AND PLUG IT IN GND, BESIDE THE 5V, THEN THE OTHER SIDE ON THE NEGATIVE SIDE OF THE BREADBOARD. AFTER THAT, PLACE TWO LED BULBS THAT'S SPACED APART ACCORDING TO YOUR LIKING. THEN, PLACE A RESISTOR, ALIGNED WITH THE CATHODE OF THE FIRST LED. THEN TAKE A JUMPER WIRE AND CONNECT ONE SIDE OF THE WIRE ALIGNED WITH THE RESISTOR AND CATHODE OF THE FIRST LED, AND TAKE THE OTHER SIDE OF THE RESISTOR AND CONNECT IT TO THE SAME VERTICAL LINE OF THE OTHER LED'S CATHODE. THEN, DO THE SAME AND CONNECT THE ANODES OF THE TWO LED'S WITH A JUMPER WIRE AS WELL. ONCE THAT'S DONE, PLACE A JUMPER WIRE IN THE POSITIVE SIDE OF THE BREADBOARD AND CONNECT IT ON THE BREADBOARD ITSELF, ALIGNED WITH THE ANODE OF THE SECOND LED. THEN TAKE YOUR DOWNLOADER AND CONNECT IT TO THE ARDUINO UNO BOARD AND YOUR COMPUTER. AND DONE!



STEPS: CIRCUITS

FIRST, YOU GET ONE OF YOUR JUMPER WIRES AND PLUG ONE SIDE IN THE 5V AND THE OTHER SIDE ON THE POSITIVE OF THE BREADBOARD. THEN, YOU TAKE ANOTHER JUMPER WIRE AND PLUG IT IN GND, BESIDE THE 5V, THEN THE OTHER SIDE ON THE NEGATIVE SIDE OF THE BREADBOARD. AFTER THAT, PLACE TWO LED BULBS THAT'S SPACED APART ACCORDING TO YOUR LIKING. THEN, PLACE A RESISTOR, ALIGNED WITH THE CATHODE OF THE FIRST LED. THEN TAKE A JUMPER WIRE AND CONNECT ONE SIDE OF THE WIRE ALIGNED WITH THE RESISTOR AND CATHODE OF THE FIRST LED, AND TAKE THE OTHER SIDE OF THE RESISTOR AND CONNECT IT TO THE SAME VERTICAL LINE OF THE OTHER LED'S CATHODE. THEN GRAB A JUMPER WIRE AND CONNECT ONE SIDE TO THE SAME VERTICAL OF THE ANODE OF THE FIRST LED TO THE CATHODE OF THE SECOND LED. THEN GRAB ANOTHER JUMPER WIRE AND CONNECT IT TO THE ANODE OF THE SECOND LED AND THE OTHER SIDE ON THE POSITIVE SIDE OF THE BREADBOARD. THEN TAKE YOUR DOWNLOADER AND CONNECT IT TO THE ARDUINO UNO BOARD AND YOUR COMPUTER. AND DONE!