Week 5: Circuits

We are going to build a circuit today!

Go to URL microbit.org/join

Classroom name Red  Hamster  Car  Basketball

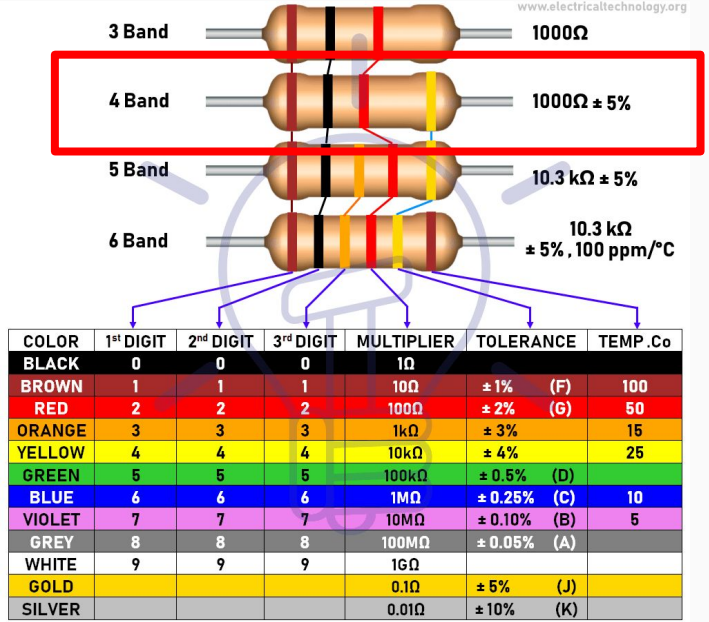
PIN 866150

Things we need

- Breadboard
- Two wires, preferably choose a red wire and a black wire
- An LED! Any!
- Microbit
- Alligator clips (two, red and black if possible)
- **And finally….**

A resistor!

Specifically, one of these

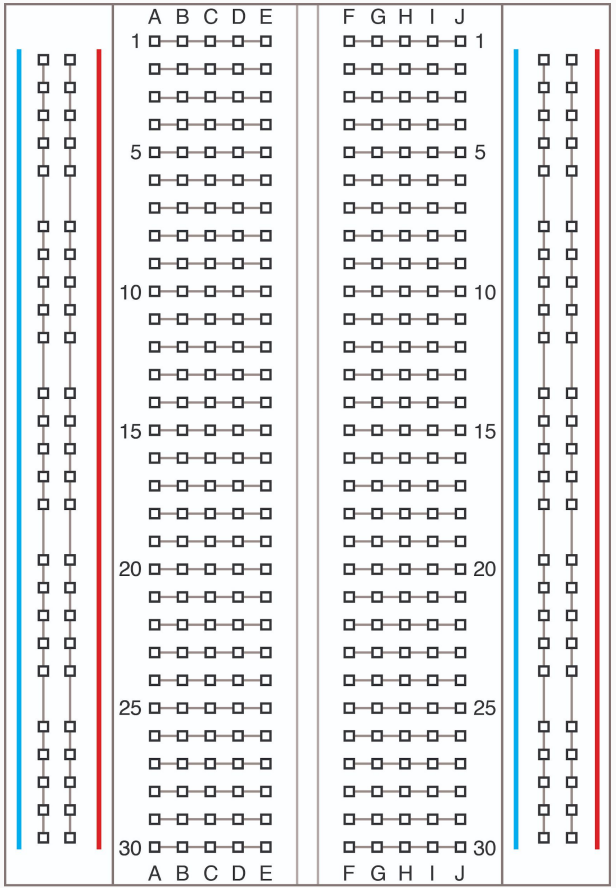


COLOR	1st DIGIT	2nd DIGIT	3rd DIGIT	MULTIPLIER	TOLERANCE	TEMP.Co
BLACK	0	0	0	1Ω		
BROWN	1	1	1	10Ω	± 1% (F)	100
RED	2	2	2	100Ω	± 2% (G)	50
ORANGE	3	3	3	1kΩ	± 3%	15
YELLOW	4	4	4	10kΩ	± 4%	25
GREEN	5	5	5	100kΩ	± 0.5% (D)	
BLUE	6	6	6	1MΩ	± 0.25% (C)	10
VIOLET	7	7	7	10MΩ	± 0.10% (B)	5
GREY	8	8	8	100MΩ	± 0.05% (A)	
WHITE	9	9	9	1GΩ		
GOLD				0.1Ω	± 5% (J)	
SILVER				0.01Ω	± 10% (K)	

Breadboards 101

Vertically, the minus and plus ‘columns’ are connected

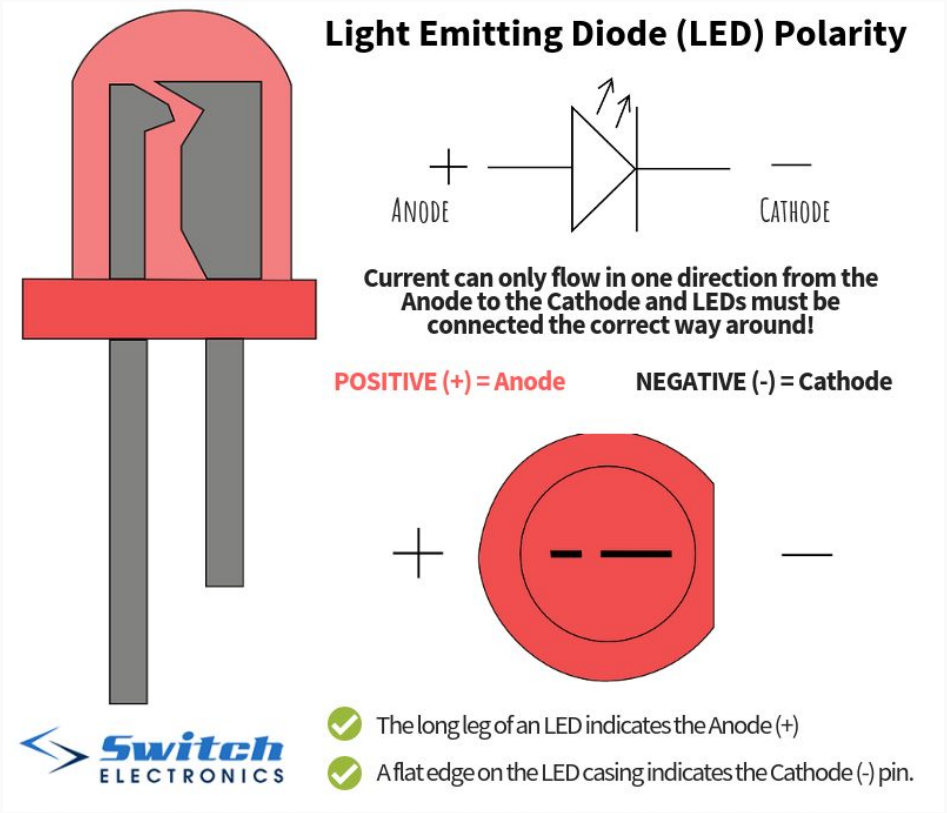
Horizontally, A-E are connected as illustrated here



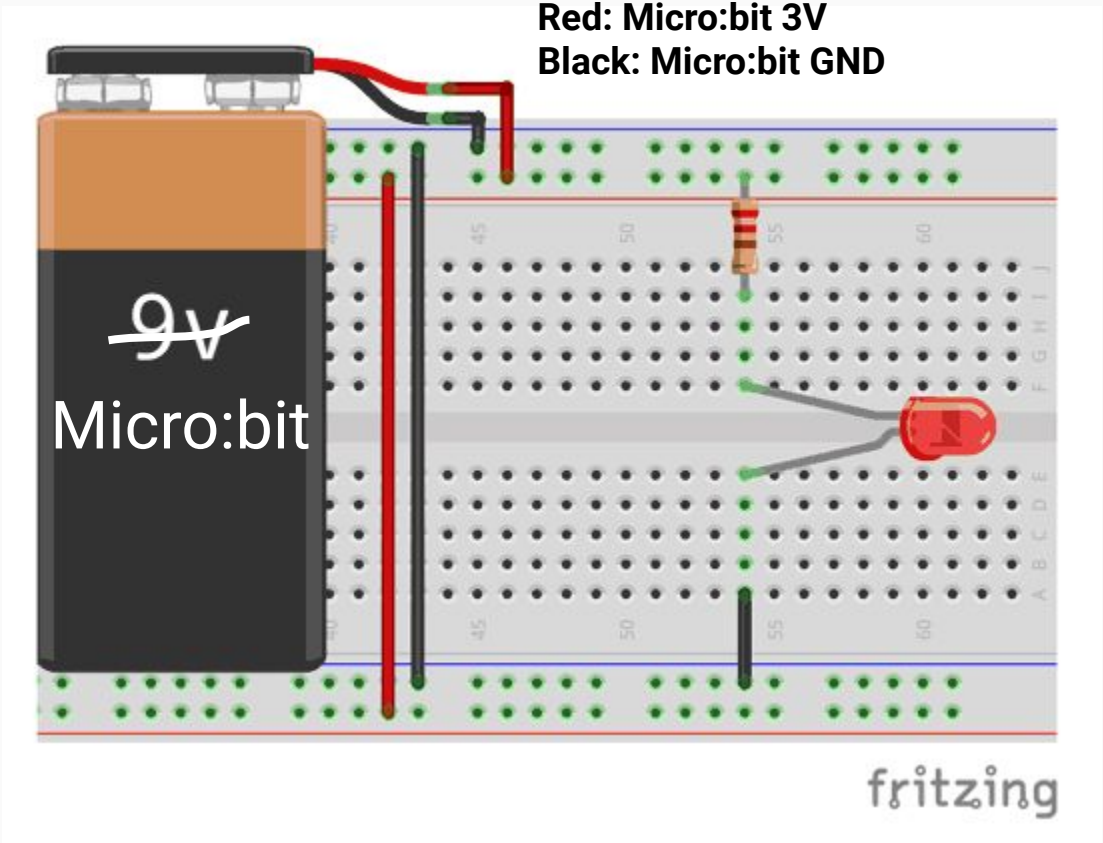
Connected meaning there is a strip of wire connecting these rows or columns, which will carry current/voltage across the whole circuit

LEDs 101

For LEDs, the direction they are oriented is *essential*. The longer end of the LED should be directed towards the positive end of the battery/power source. The shorter end should flow towards the other end of the battery.



Building a circuit



Final Project

Don’t Worry!

What is the final project?

- A small project (shouldn’t take more than 2-3 hours)
- Demonstrates your understanding of python and/or micro:bit
- The next slide is full of ideas!

Final Project Ideas

Python

- Password Generator (1-3 hours)
- Number Guessing (1-2 hours)
- Hangman (2-4 hours)
- Rock Paper Scissors (1-2 hours)
- Advanced Python projects
  - Twitter bot (2-4 hours)
  - Weather reporter (2-4 hours)

Micro:bit

- Reaction game (1-2 hours)
- Figure out the speaker (1 hour)
- Timer pt. 2 (Including the speaker) (1-2 hours)
- Advanced micro:bit projects
  - Morse code machine (2-4 hours)