



Circuit Playground: D is for Diode

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<https://learn.adafruit.com/circuit-playground-d-is-for-diode>

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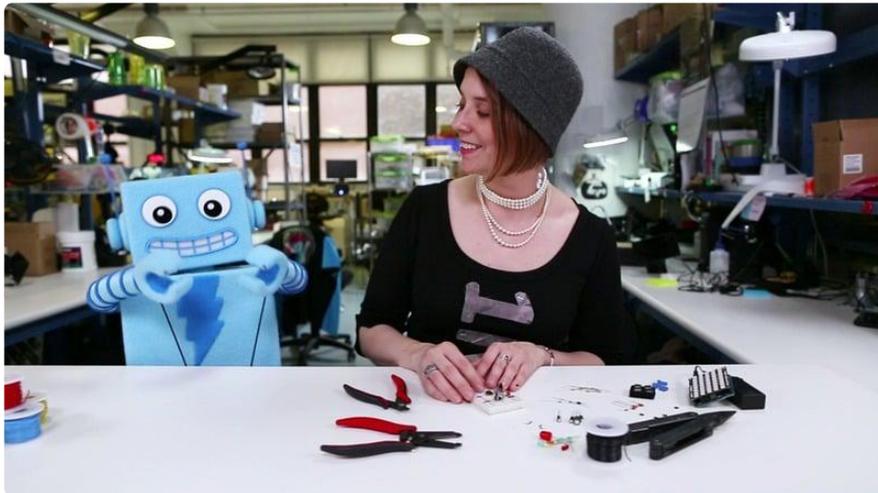
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Video

"D is for Diode" - Circuit Playground Episode 4! Learn all about electronics and how diodes work with Woz and ADABOT!

Transcript



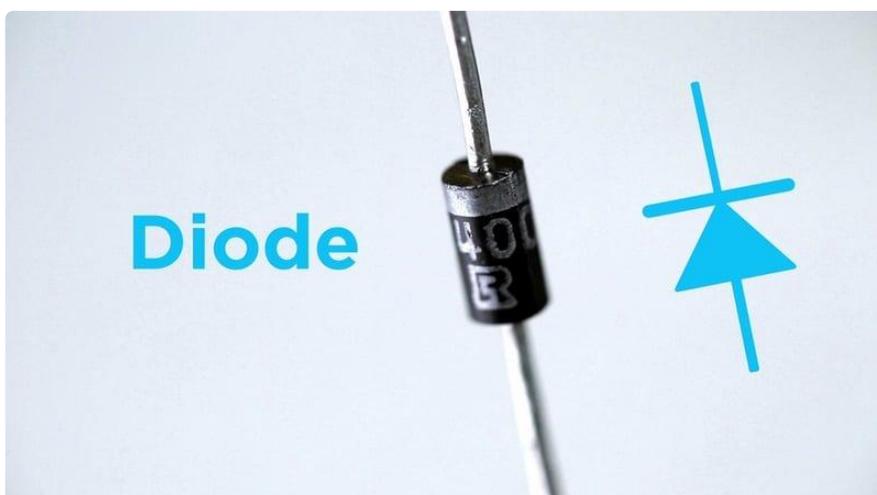
A: Hey Woz - whatcha doin'?

W: Oh hi Adabot - I was just adding some power protection to this circuit

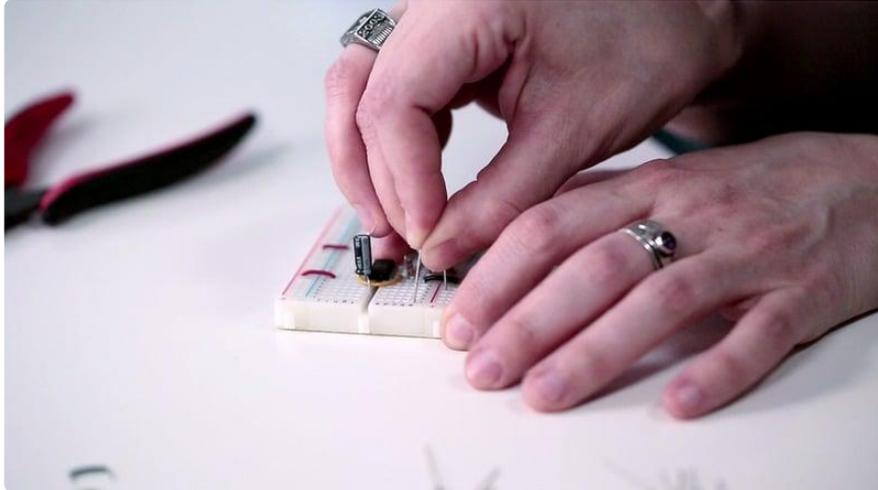
A: Interesting - why does the circuit need to be protected?

W: Well a circuit needs to be protected for a couple of reasons. One example is if I was to connect a battery to this incorrectly then electrical current might flow in the wrong direction and damage some of the components.

A: Oh - how do you make sure that doesn't happen?

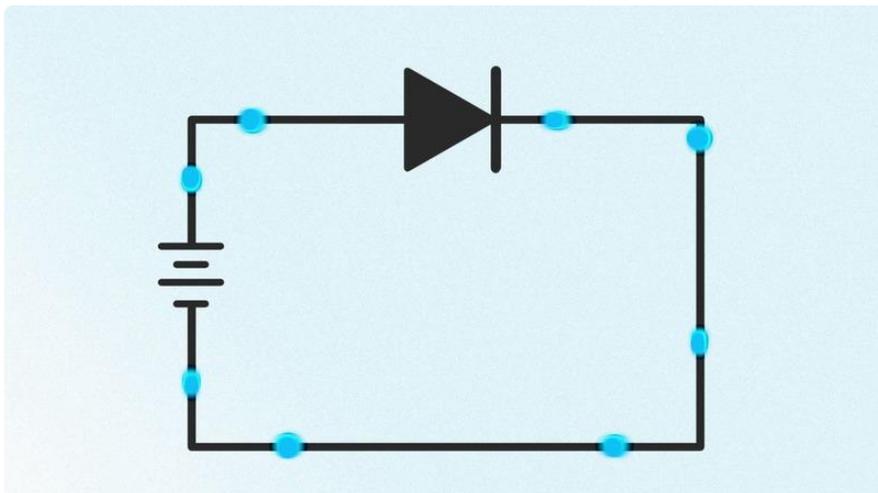


W: Well, we use a diode!

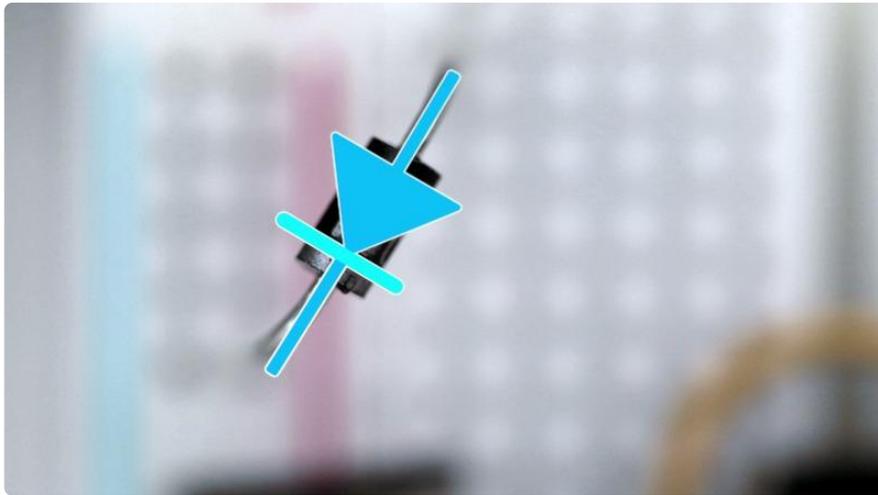


W: By placing a diode at the circuit's power input we ensure that current will only flow in one direction - the correct direction that we've designed the circuit to work with.

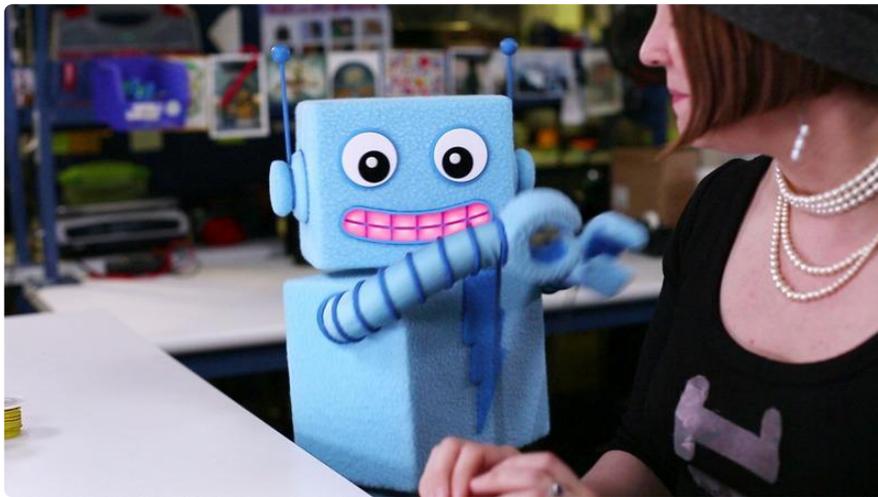
A: So - a diode is like a one way street for electrons?



W: Exactly - the electrons can only flow through the diode in one direction and they have a really hard time going back the other way.



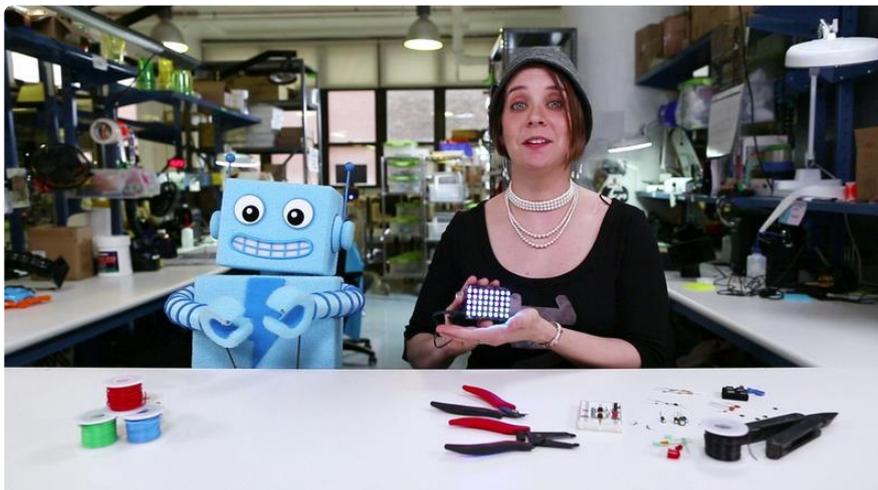
W: The stripe indicates which end of the diode acts like a wall to block the electrons.



A: Diode! Protector of circuits!

W: Yes, but diodes do more than just protect circuits, Adabot.

A: Oh? What else do they do?



W: Some diodes emit light when we pass current through them. We like to call these “light emitting diodes” or L-E-Ds for short. Maybe you’ve heard of them?

A: LEDs? I love LEDs!!

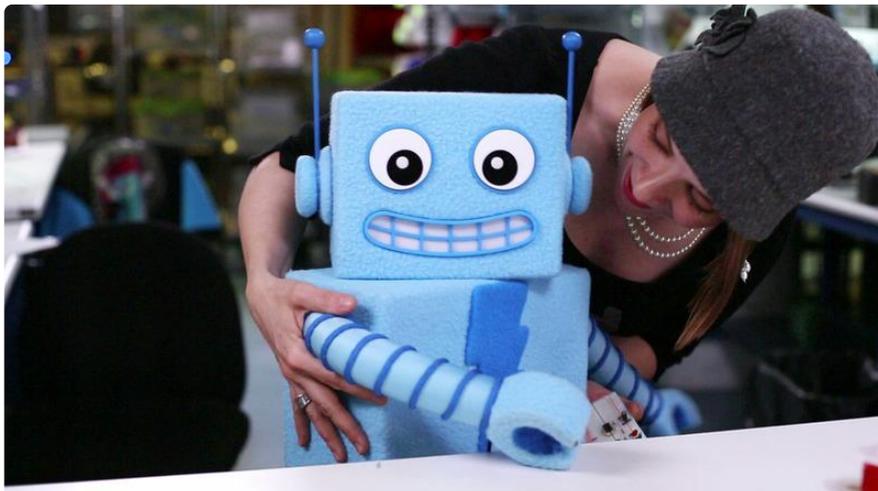
W: I thought so!



A: So that’s what “D” stands for in LED. D is for - Diode!

W: That’s right.

W: Well, looks like this circuit’s all done - how about we go test it out?



W: Adabot - are you coming?

A: Sorry Woz - I’m an electron in a diode - I only go in one direction!

A: Ow ... Ow ...

W: Oh Adabot, let's go.

Learn More

What is a diode?

[from Wikipedia \(\)](#)

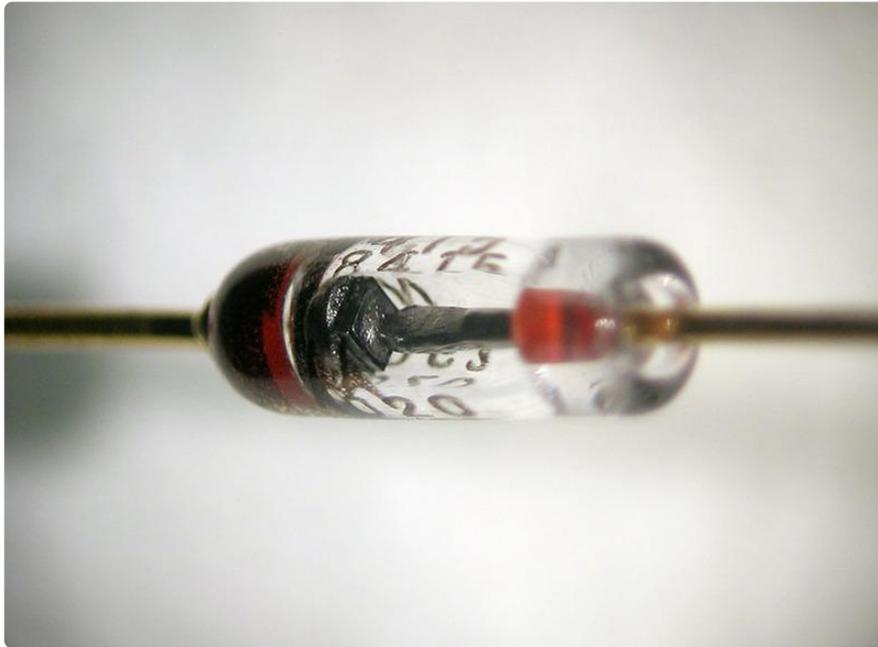
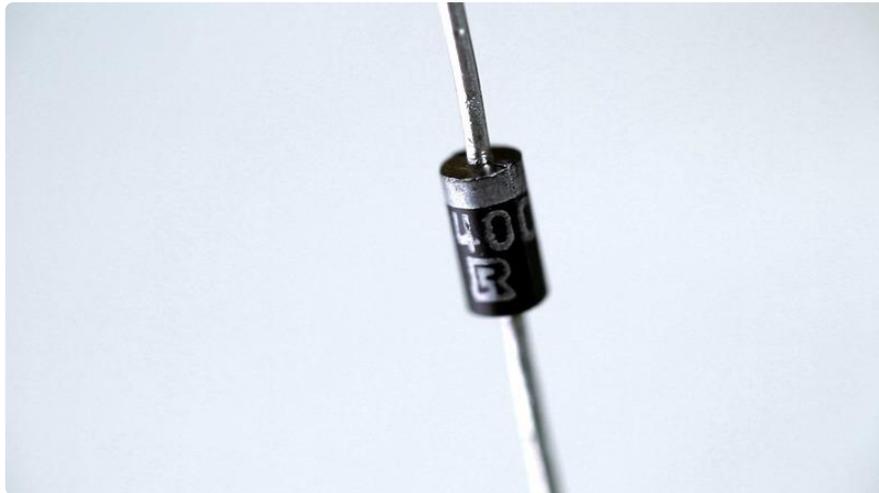


photo by [John Maushammer \(\)](#)

In electronics, a diode is a two-terminal electronic component with asymmetric conductance; it has low (ideally zero) resistance to current in one direction, and high (ideally infinite) resistance in the other. A semiconductor diode, the most common type today, is a crystalline piece of semiconductor material with a p–n junction connected to two electrical terminals.

A vacuum tube diode has two electrodes, a plate (anode) and a heated cathode. Semiconductor diodes were the first semiconductor electronic devices. The discovery of crystals' rectifying abilities was made by German physicist Ferdinand Braun in 1874. The first semiconductor diodes, called cat's whisker diodes, developed around 1906, were made of mineral crystals such as galena. Today, most diodes are made of silicon, but other semiconductors such as selenium or germanium are sometimes used.

What are diodes used for?



Diodes have many applications in the world of electronics. Here's some of the most common:

- Radio demodulation
- Power conversion
- Over-voltage protection
- Logic gates
- Waveform clipping
- Temperature measurements
- and more!