



# ELECTRICITY

LO: TO UNDERSTAND VOLTAGE.

# WHAT IS VOLTAGE?

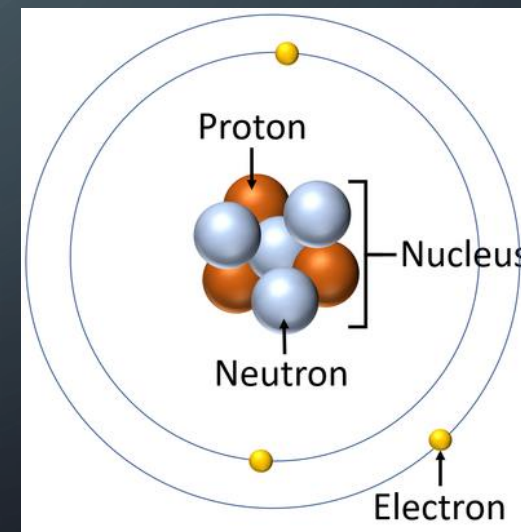
IN OUR LAST SESSIONS, WE HAVE TALKED ABOUT MAKING AND DRAWING CIRCUITS.

BUT HOW EXACTLY ARE PARTS OF THE CIRCUIT POWERED (WHAT MAKES THE LIGHTBULB LIGHT?).

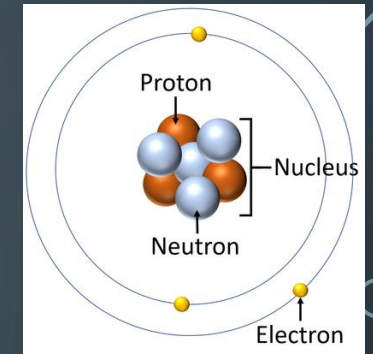
Do you remember when we talked about what electricity was?

Everything around us is made out of atoms. Atoms are made up of protons, neutrons and electrons (electrical charges).

In simple terms, electrons can 'break away' and moved though a material (conductor). When electrons flow, this creates an electrical current (measured in amps).



# SO WHAT IS VOLTAGE?



**Voltage** is what makes electric charges move. It is the 'push' that causes charges to move in a wire or other electrical conductor.

It can be thought of as a force that pushes the charges.

Imagine electrons are marbles – the voltage is how hard they are pushed.

Voltage can cause charges to move, and since moving charges is a current, voltage can cause a current of electricity.

RECAP:

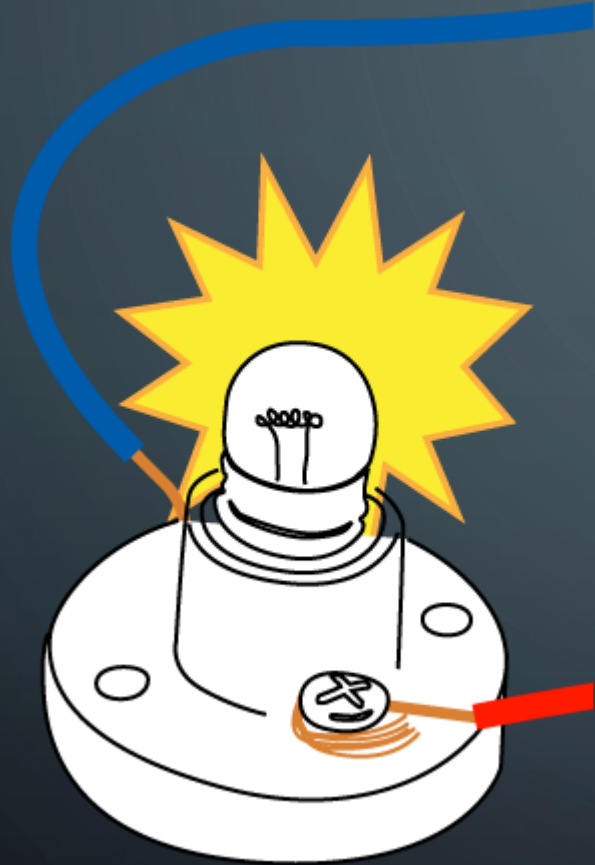
THINK OF ELECTRICITY AS RAIN.

**VOLTAGE (V)** - IS A BIT LIKE HOW HARD THE RAIN IS FALLING.

**AMPS** – IS A BIT LIKE HOW MUCH (THE VOLUME) RAIN THERE IS. IT IS THE 'FLOW' OF ELECTRICITY IN A CIRCUIT.

SO, YOU COULD HAVE LOW AMPS (A LITTLE BIT OF RAIN) WITH A HIGH VOLTAGE (RAINING DOWN HARD!).

OR, YOU COULD HAVE HIGH AMPS (LOTS OF RAIN), WITH LOW VOLTAGE (NOT FALLING HARD – LIKE DRIZZLE).



To light a bulb in a circuit, there needs to be an adequate flow of electricity.

Watch the clip below. If you want to stop and make notes, this might be helpful!

<https://www.bbc.co.uk/bitesize/clips/z6qd7ty>

## How voltage affects the illumination of light bulbs:

Batteries have a store of electrical energy – different batteries have different powers. If you used more batteries in a circuit, or used a higher powered battery, what do you think would happen to the brightness of the bulb (cell), or the loudness of a buzzer, in a circuit? Jot down your ideas.



A single rechargeable cell 1.2V



A single single alkaline cell 1.5v



A battery 9V



The slide features a dark blue background with white, stylized circuit board traces in the corners. These traces consist of thin lines that branch out and terminate in small white circles, resembling electronic components or nodes. The traces are located in the top-left, top-right, bottom-left, and bottom-right corners, framing the central text.

NOW COMPLETE THE QUESTIONS ON THE NEXT  
SLIDES.

YOU CAN EITHER PRINT THE  
NEXT TWO SLIDES, AND  
COMPLETE THE QUESTIONS,  
OR COPY AND COMPLETE THE  
ANSWERS IN YOUR BOOKS.

Use the keywords to fill in the gaps and complete the sentences below.

**Keywords:** wires, small, measured, force, electrical, volts, energy, flow, cell, battery, chemical.

**amp** – This is how electric current is \_\_\_\_\_.

**cell/battery** – A device that stores \_\_\_\_\_ as a \_\_\_\_\_ until it is needed. A \_\_\_\_\_ is a single unit. A \_\_\_\_\_ is a collection of cells.

**circuit** – A path that an \_\_\_\_\_ current can flow around.

**current** – The current is the \_\_\_\_\_ of electrons, measured in amps.

**electron** – Electrons are very \_\_\_\_\_ particles that travel around an electrical circuit.

**voltage** – The \_\_\_\_\_ that makes the electric current move through the \_\_\_\_\_. The greater the voltage, the more current will flow. Voltage is measured in \_\_\_\_\_.

Match the component names to their symbols.

lamp/bulb



motor



wire



buzzer



closed switch



cell



open switch



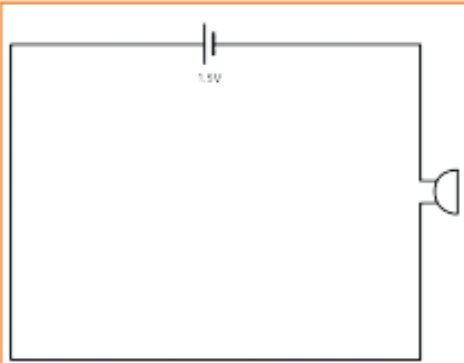
battery





Explain how voltage would affect the buzzer in each circuit.

To work, the buzzer requires between 3 and 6 volts.



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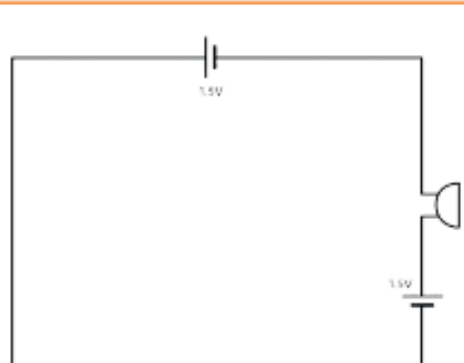
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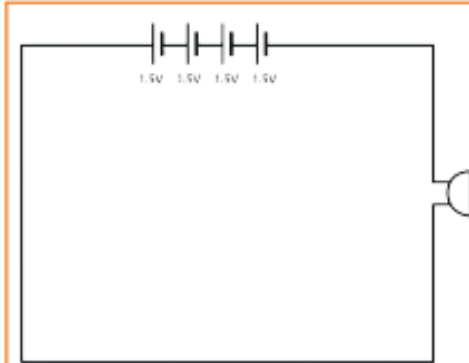
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Using symbols, draw a working circuit diagram below. The circuit must enable a motor to work.

How would using three (1.5V) cells affect the buzzer?

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What would happen to an electrical appliance that requires 3V if it was powered by 5V cell or battery?

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