

The background of the entire image is a stylized, abstract representation of a circuit board. It features various shades of blue and teal, with intricate patterns of lines, dots, and shapes that mimic the layout of a printed circuit board (PCB). The patterns are more prominent on the left and right sides, framing a central dark blue rectangular area.

WEEK 1: INTRODUCING ELECTRONICS

CENTENARY SUBURBS MEN'S SHED – ELECTRONICS GROUP

A decorative graphic on the left side of the slide, featuring a vertical strip of white circuit lines and nodes on a blue background, extending from the top to the bottom.

AGENDA

- Introduction
- Course overview
- What is electricity?
- Important terms and how they relate
- How to make your light shine

An abstract graphic featuring white circuit-like lines and nodes on a blue background. The lines are vertical and horizontal, with some branching out. The nodes are small circles. The background has a subtle pattern of larger, lighter blue circles.



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WEEKLY FORMAT

- Start 6pm
- Introduction and theory – 20 - 30 mins
- Q & A – 5 - 10 mins
- Practical demo – 15 - 20 mins
- Work on projects – 60 mins
- Finish 8pm



COURSE CONTENTS

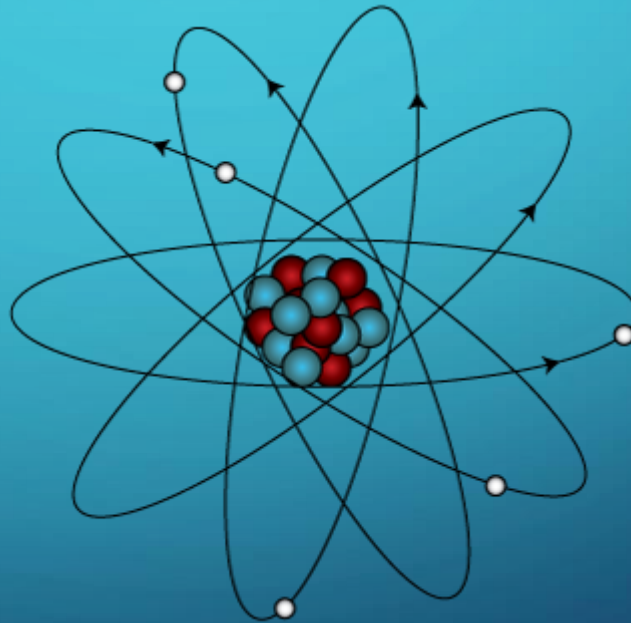
- Week 1 (5/10/20) – 3 ways to blink a light (H/W)
- Week 2 (12/10/20) - 3 ways to blink a light (S/W)
- Week 3 (19/10/20) - Resistors, capacitors and inductors (H/W)
- Week 4 (26/10/20) – learning to count, again! (S/W)
- Week 5 (02/11/20) – Diodes and transistors (H/W)
- Week 6 (09/11/20) – loops and logic (S/W)
- Week 7 (16/11/20) – AC/DC, time and frequency domains (H/W)
- Week 8 (23/11/20) – functions and arguments (S/W)
- Week 9 (30/11/20) – digital-to-analog and analog-to-digital converters (H/W)
- Week 10 (7/12/20) – arrays and strings (S/W)
- Week 11 (14/12/20) - motors and how to drive them (H/W)

WHAT IS ELECTRICITY?



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- Flow of charged particles called electrons



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WHAT IS ELECTRICITY?

- Flow of charged particles called electrons
- Measure of their potential energy is called voltage (Volts)

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WHAT IS ELECTRICITY?

- Flow of charged particles called electrons
- Measure of their potential energy is called voltage (Volts)
- Rate of flow is called current (Amperes)



WHAT IS ELECTRICITY?

- Current and voltage are related by a term called resistance (Ohms)

A decorative graphic on the left side of the slide, featuring a vertical strip of white circuit lines and circular nodes on a blue background, resembling a printed circuit board (PCB) layout.

MOST IMPORTANT EQUATION IN ELECTRONICS?



MOST IMPORTANT EQUATION IN ELECTRONICS?

Voltage = Current x Resistance

Or

$$V = IR$$

A VISIBLE ANALOGY

Voltage: the height of the
water tank



A VISIBLE ANALOGY

Voltage: the height of the
water tank

Current: the rate at which the water is released



A VISIBLE ANALOGY

Voltage: the height of the
water tank

Current: the rate at which the water is released

Resistance: the thickness of the water pipe

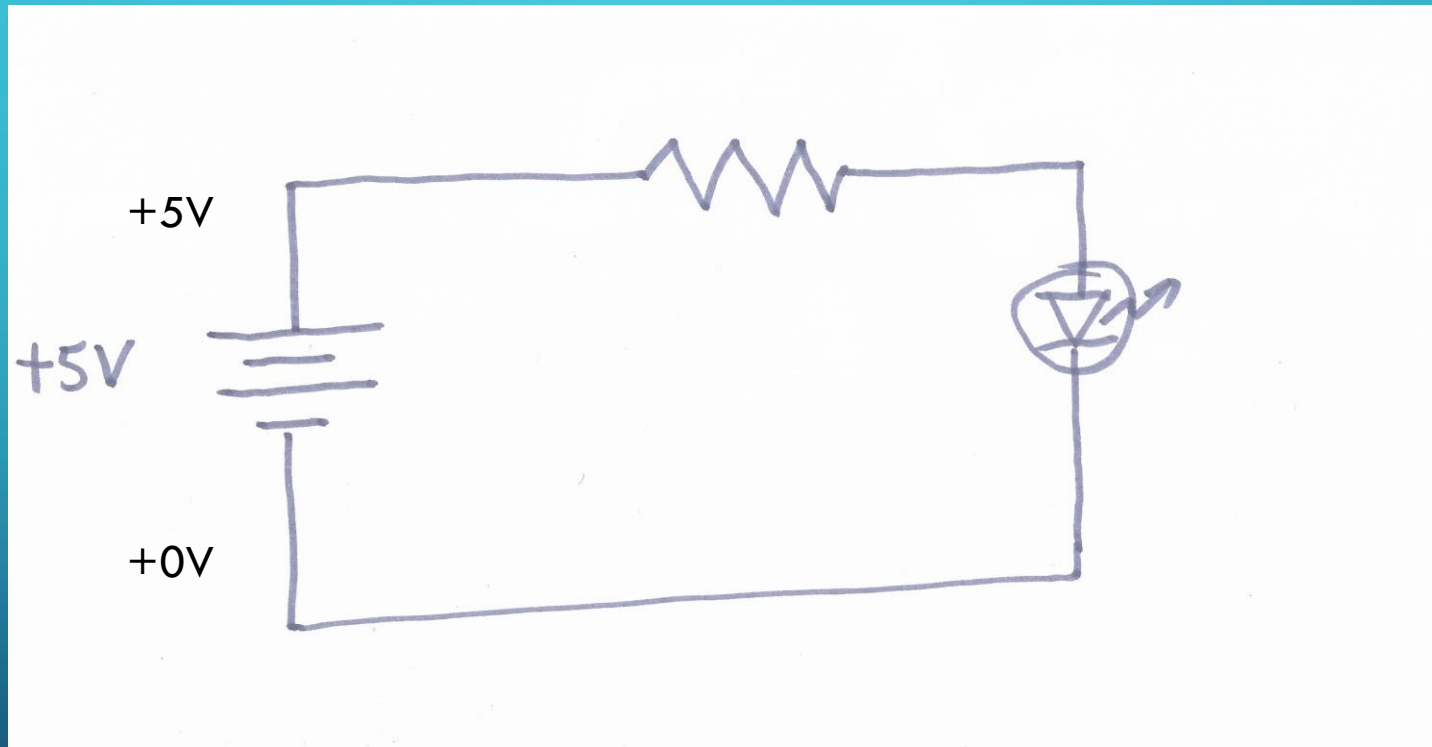




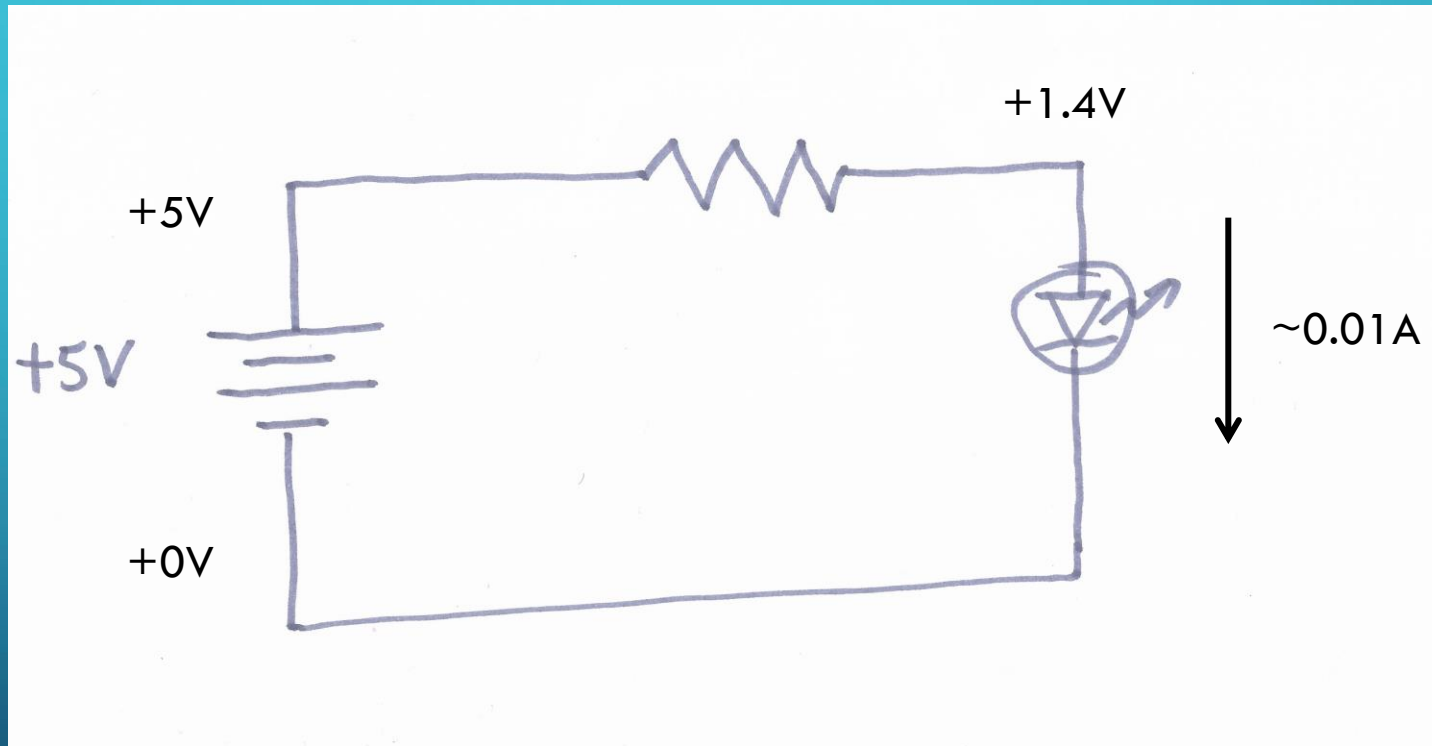
MAKING OUR LIGHT SHINE

- A simple circuit using a:
 - Power source (+5V)
 - A Light Emitting Diode (LED)
 - A resistor
- How big should the resistor be?

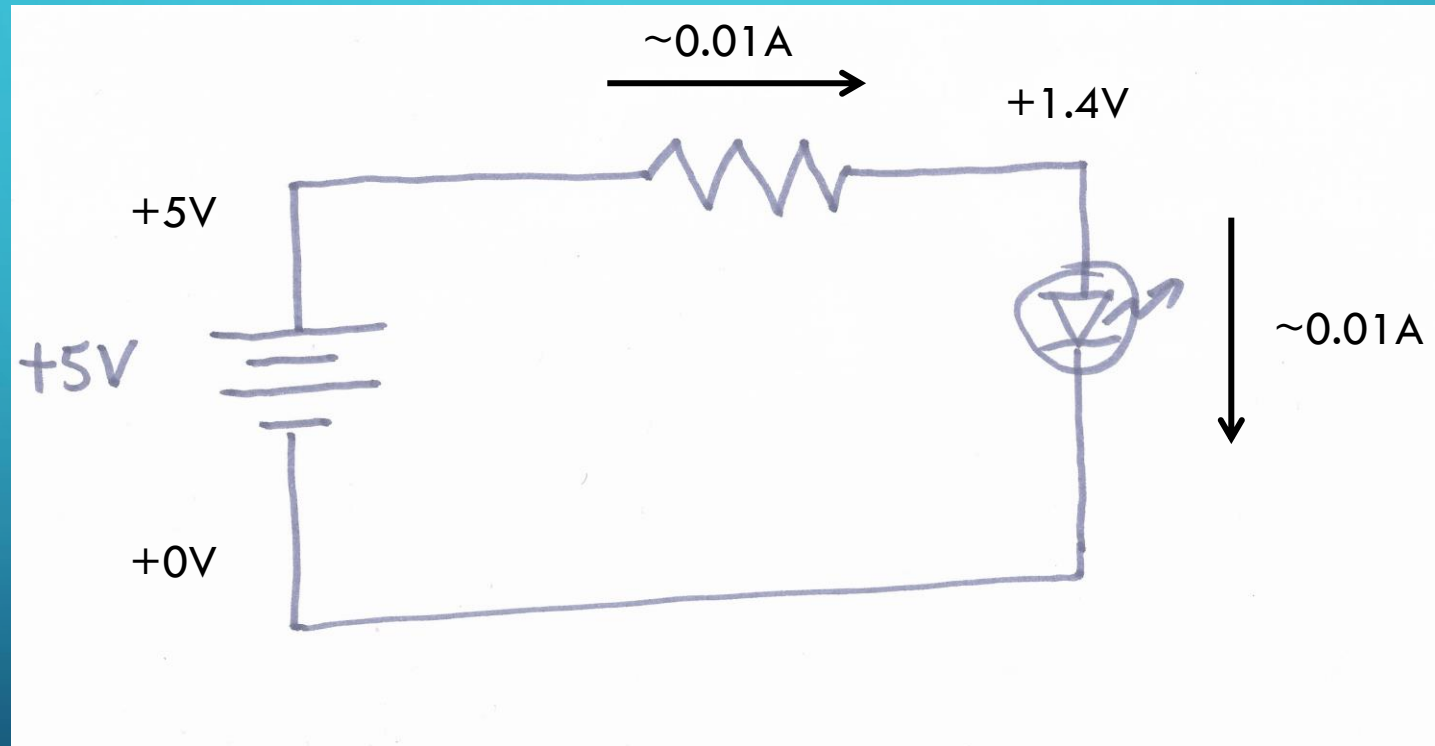
MAKING OUR LIGHT SHINE



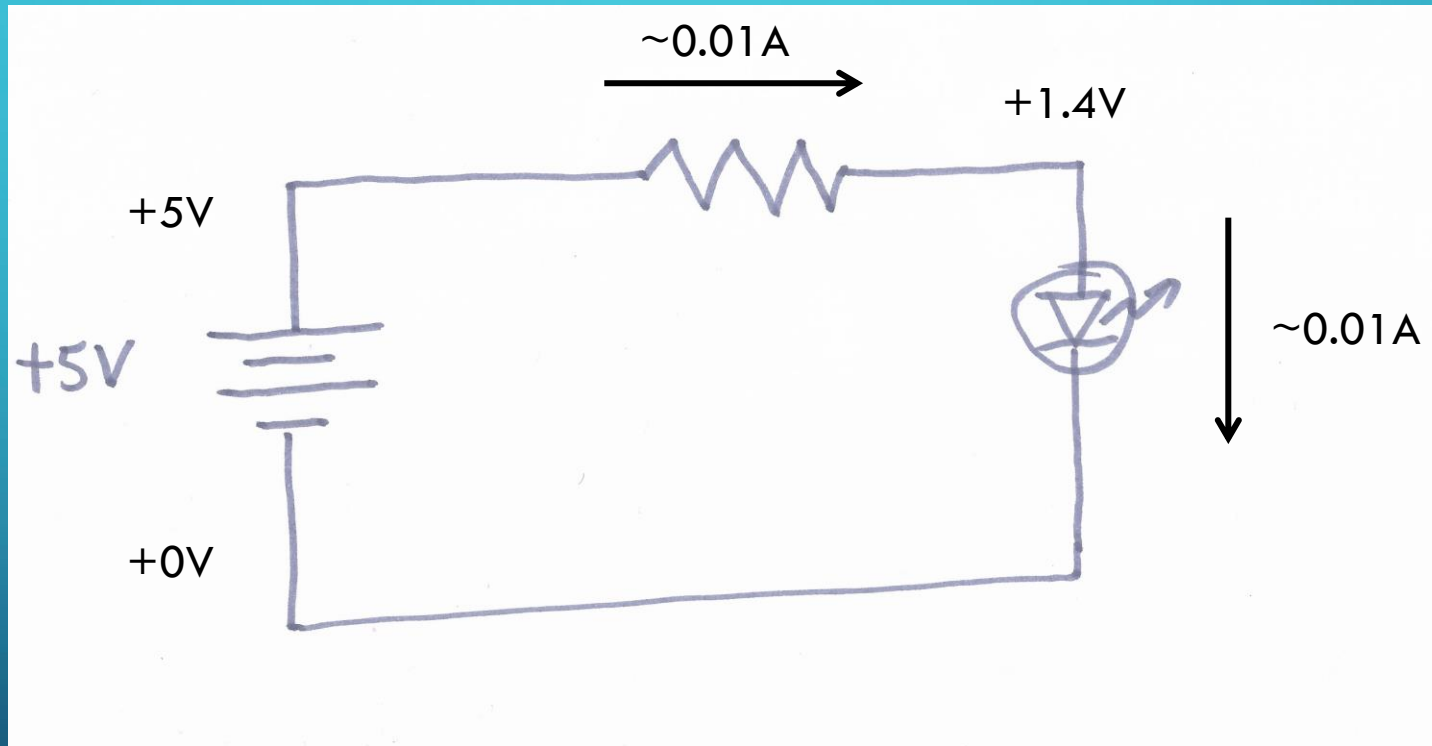
MAKING OUR LIGHT SHINE



MAKING OUR LIGHT SHINE



MAKING OUR LIGHT SHINE



$$V = I \times R$$

$$I: 0.01 \text{ A}$$

$$V: 5 - 1.4 = 3.6 \text{ V}$$

$$R = ?$$



MAKING OUR LIGHT BLINK

- Introduce a switch
- Build an oscillator
- Multivibrator
- 555 Timer

A decorative graphic on the left side of the slide, featuring a vertical strip of white circuit lines and nodes on a blue background. The lines are thin and white, forming a complex network of paths and junctions. The nodes are small white circles. The background is a gradient of blue, darker at the bottom and lighter at the top.

QUESTIONS