**Engineering Apprenticeship**

**1.** Using the equipment in the box on your table, set up the circuit below. All your team members must be involved.

Crocodile lead

Crocodile lead

3V battery pack

Light Emitting Diode (LED)

Light Dependent Resistor (LDR)

Crocodile lead

**Tips:**

* The LDR must be connected to the positive terminal of the battery.
* The longer leg of the LED must be connected next in the circuit to the LDR.

**2.** Your LED should light up. (If it does not try shining a torch on to the LDR.)

**3.** Hold your hand over the Light Dependent Resistor (LDR) and watch what happens to the Light Emitting Diode (LED).

**IMPORTANT: An LDR will only work with the LEDs or a piezo buzzer. It will NOT work with a 2.5V Bulb or a motor.**

**How it works.**

When a circuit is connected electrical current flows around it due to the movement of electrons. How quickly or slowly this happens is affected by the **RESISTANCE** in the circuit.

We can change resistance in a number of ways including:

1. **changing the type of material in a circuit**. Some materials are good conductors and some are poor or do not conduct electricity at all.
2. **changing the length of the conductor.** Longer wires have greater resistance than shorter wires.
3. **changing the temperature of the conductor.** For example, the resistance of a filament in a light bulb increases as it heats up.

The resistance of LDRs decreases as the light intensity increases. We can use this to make things such as movement sensors which turn a light off when someone or something is moved away from the LDR.

You will need to think about resistance when making any circuit to be included in your product.