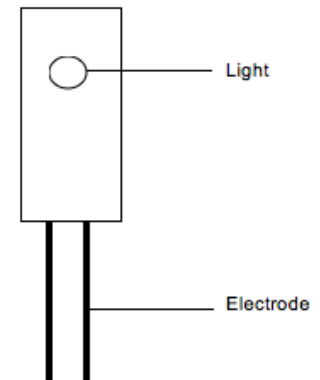


Drawing Circuits

- You have been asked to build your own conductivity meter. You have been given the following materials:
- A light bulb
- Wires coated in plastic
- Two pieces of copper for the electrodes
- A resistor
- A battery
- **We drew this one on the board**



A big one!

- A flashlight uses a 3.7 V battery and requires 2.0 A of current. The components of the flashlight are connected in series.
- Draw a diagram of the electrical circuit for the flashlight. Your diagram must include electrical wires, a battery, a light bulb and a switch. **We drew this one on the board**
- Calculate the resistance of the circuit. **$3.7\text{V}/2\text{A} = 1.85\Omega$**
- Calculate the energy (KWh) consumed by the flashlight in 5 min.

$$P = 3.7\text{V} \times 2\text{A} = 7.4\text{W} = 0.0074 \text{ KW}$$

$$5 \text{ min} / 60 = 0.08 \text{ h}$$

$$E = P \times t = 0.0074 \text{ KW} \times 0.08\text{h} = 0.0006\text{KWh}$$

Energy Efficiency

- The table below shows the quantity of energy required to move an elastic-propelled race car in an isolated system.

Energy provided by the elastic	0.9 J
Energy consumed by the vehicle	0.2 J
Energy lost by the system (rolling resistance and air resistance)	0.7 J

- What is the race car's energy efficiency?**
- 22%
- 40%
- C) 60%
- D) 78%

- If the SMART uses 3.0 A of current and 5V in 1 hour, but consumes a total of 20 Wh of energy. What is the energy efficiency of the SMART board?

$$P = 3.0 \text{ A} \times 5\text{V} = 15 \text{ W} \times 1\text{h} = 15 \text{ Wh}$$

$$\% = (15\text{Wh}/20\text{Wh}) \times 100 = 75\%$$