Topic 5

PORTABLE POWER

Topic 5- Portable power

- Luigi Galvani (1700's) observed the first electricity… he called it "animal electricity".

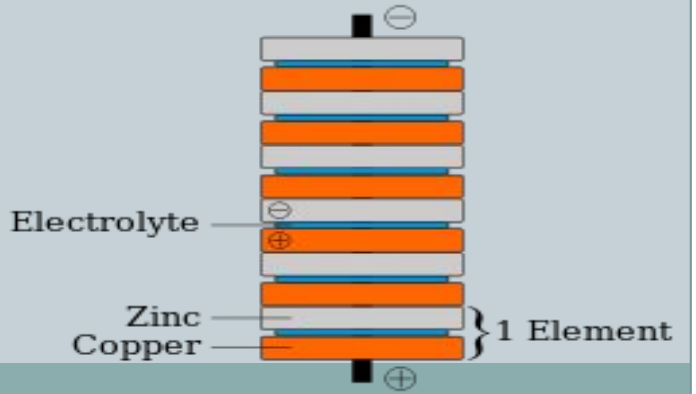
  https://www.youtube.com/watch?v=8KPz24Pqgz8

  https://www.youtube.com/watch?v=7qv34jF8rTg dancing frog legs

- Alessandro Volta later showed that the animals were not producing the electricity

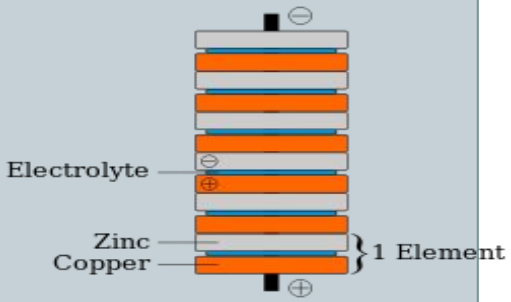
It was the two different metals in a salt or acid solution

Volta pile: First electrical battery.



Electricity can be stored chemically (*potential energy*) in an **ELECTROCHEMICAL CELL**

A battery is made up of 2 or more electrochemical cells linked together



- An electrochemical cell needs **TWO** things to work:

2 DIFFERENT ELECTRODES ELECTROLYTE

ELECTRODES

- - The two different metals (common batteries use zinc and carbon) in a cell are known as electrodes
- The different metals have a different need for the electrons
- Cells can not work if they consist of the same 2 electrodes
- Electrons flow from the negative to the positive electrode

Electrodes

-One metal is the **Negative Electrode (Anode)**

-This metal *provides* electrons to the circuit

-The other metal is the **Positive Electrode (Cathode)**

-This metal *receives* electrons

-The passing of electrons creates an electric current

Hint to remember - I'm POSITIVE you have a CAT

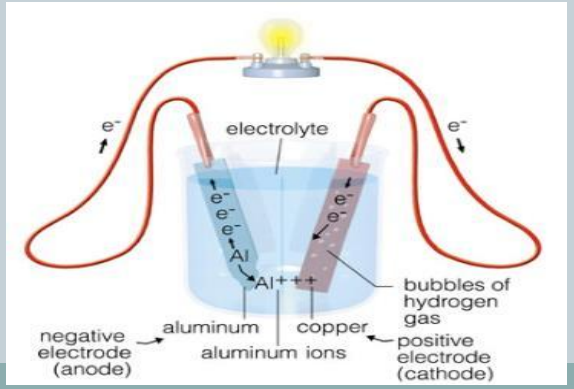
Electrolyte

- A substance that can conduct electricity is known as an electrolyte
- Often is a solution that is **highly acidic** or **contains salt**
- Molecular compounds do not conduct electricity, salt must be dissolved in the water to make it an electrolyte

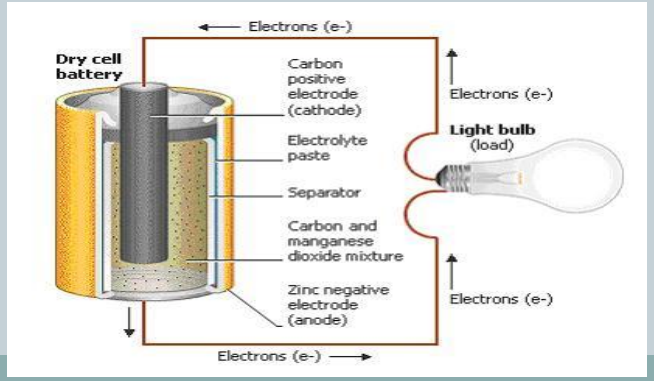
Two types of electrolytes

-If the electrolyte is a liquid it is then known as a **WET CELL**

- *ex. car batteries*



- If the electrolyte is a solid or a paste it is known as a **DRY CELL**



- VOLTAGE: The strength of the chemical reaction in a cell determines the voltage delivered by the cell.

ex. Larger D cells contain more chemicals than smaller A cells so they can store more energy and last longer

PRIMARY CELLS

Primary Cells

-are *non-rechargeable* cells

-the amount of chemical it contains determines the energy the cell can produce

SECONDARY CELLS

Secondary Cells

- are *rechargeable* cells

-the chemical reaction which produces the electricity can be reversed by forcing electricity through the dead cell

-this restores the chemicals so that the cell can continue producing electricity