THE SCIENCE BEHIND *Batteries*

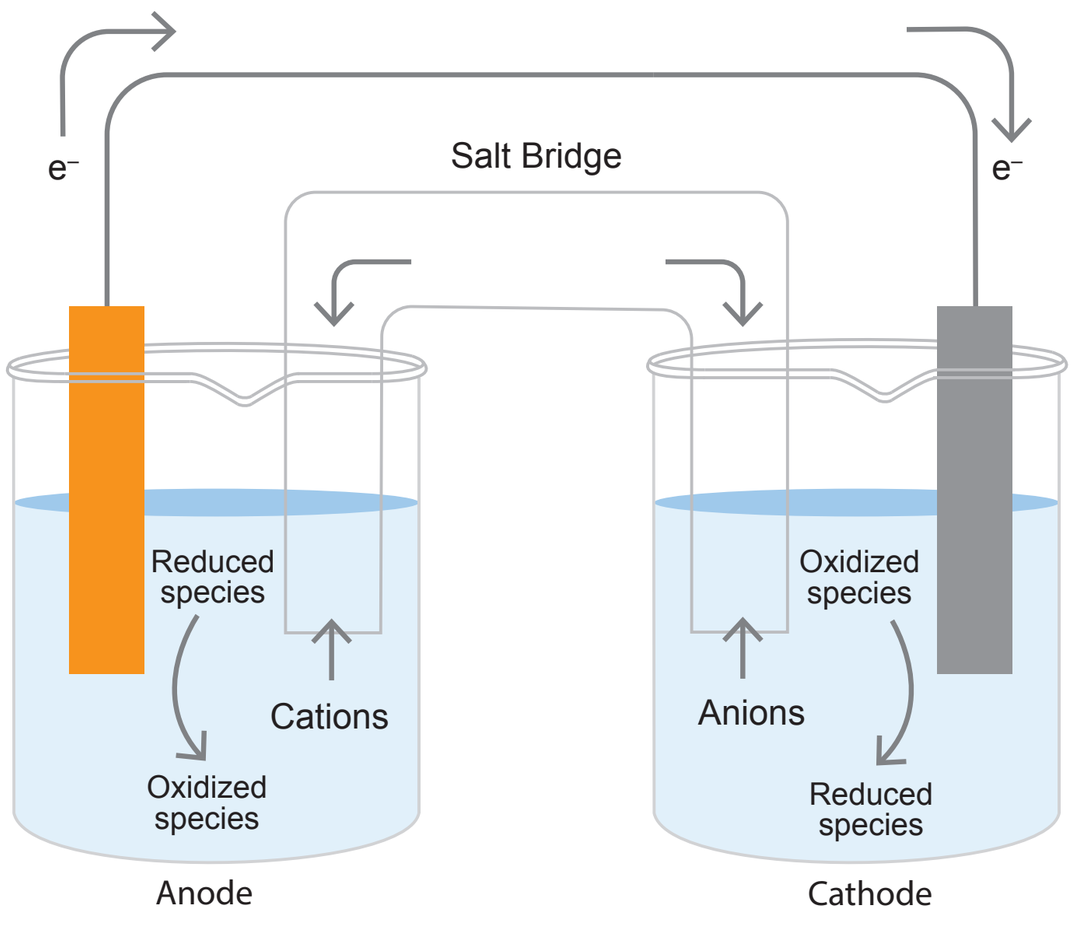
What are batteries?

A battery is an electrochemical cell known as a voltaic cell. In a voltaic cell, a spontaneous chemical reaction releases energy in the form of electricity (moving electrons). The chemical reaction that generates electricity in a battery is known as an oxidation–reduction reaction.

Generic Wet Cell Battery

To create a battery that provides electrical energy, a voltaic cell must be produced. The battery must have a substance that will be oxidized at one electrode, a substance that will be reduced, and a salt bridge that separates the two substances.

When the two electrodes are connected together with a conductive wire, the electrons generated at the oxidized electrode (also known as the anode) flow toward the reduced electrode (known as the cathode) along the conductive wire. In the process of moving through the wire, the electrons can provide energy to materials connected between the two electrodes. This "electron energy" is more commonly referred to as electricity.



Loses
Electrons
Oxidation
says

Gains
Electrons
Reduction

Oxidation is a term used to describe when a substance loses electrons. Reduction describes a process in which a substance gains electrons. In a typical "wet cell" battery, the oxidized substance is converted from a neutral metal atom into a metal cation. During reduction, a substance gains electrons and becomes more negative.

INTERESTING FACTS ABOUT **BATTERIES**

1 The first battery was developed in 1800 by Alessandro Volta. It became known as the voltaic pile. It was made of copper and zinc.

2 The name "dry cell" battery is a slight misnomer since this type of battery is not entirely dry. Instead of liquid solutions, a wet paste and gel are used. A modern 1.5-volt alkaline battery consists of a zinc powder in gel anode, a moist cathode paste, and potassium hydroxide (KOH).

3 Alkaline batteries get their names from the potassium hydroxide used in the battery. Potassium hydroxide is an alkaline electrolyte.

Parts of a Dry Cell Battery