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Lithium-Ion Batteries

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LITHIUM-ION BATTERIES
A FEW USES OF LITHIUM ION BATTERIES

- Electric Cars
- Cell Phones
- Power Tools
- Laptops
- Defibrillators

(Ehow 1-4)
The development of the lithium-ion battery dates back to the early 1900s. Lithium was viewed as the ideal metal to use in a battery. However, due to lithium’s ability to create large amounts of energy, the batteries proved to be unstable.
In the 1970s lithium-ion batteries began to appear. These early batteries could not be recharged. Development began for a rechargeable version in the 1980s. By the 1990s lithium-ion batteries started to be used in many devices using rechargeable batteries. Today the lithium-ion battery is one of the most common batteries in use.
Lithium is the lightest of all the metal elements.
Lithium has the highest energy density per kilogram of lithium.
Lithium has the greatest electrochemical potential.
This makes it ideal for batteries because the batteries will be light and hold significant amounts of energy.
In a lithium-ion battery there is a positive electrode and a negative electrode.

The anode and cathode are submerged in an electrolyte.

The cathode is made from lithium cobalt oxide (LiCoO$_2$). The anode is made of carbon.

The battery has a separator between the cathode and anode.

Lithium ions from the cathode travel through the electrolyte and separator to the anode.

(Zhao 1)
The electrons from the cathode travel through a metallic wire outside of the battery (Zhao 2)

During this process 3.7 volts are produced in the cell (HowStuffWorks 2)

In the recharging process all of this is reversed and the lithium ions are sent back to the cathode (Zhao 2)

