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# Lithium-Ion Batteries

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# LITHIUM-ION BATTERIES

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# A FEW USES OF LITHIUM ION BATTERIES

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

(Ehow 1-4)

# HISTORY OF LITHIUM-ION BATTERIES

- 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

# HISTORY OF LITHIUM-ION BATTERIES

- 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

# WHY LITHIUM-ION

- 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

# HOW DO THEY WORK

- 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 ( $\text{LiCoO}_2$ )
- 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

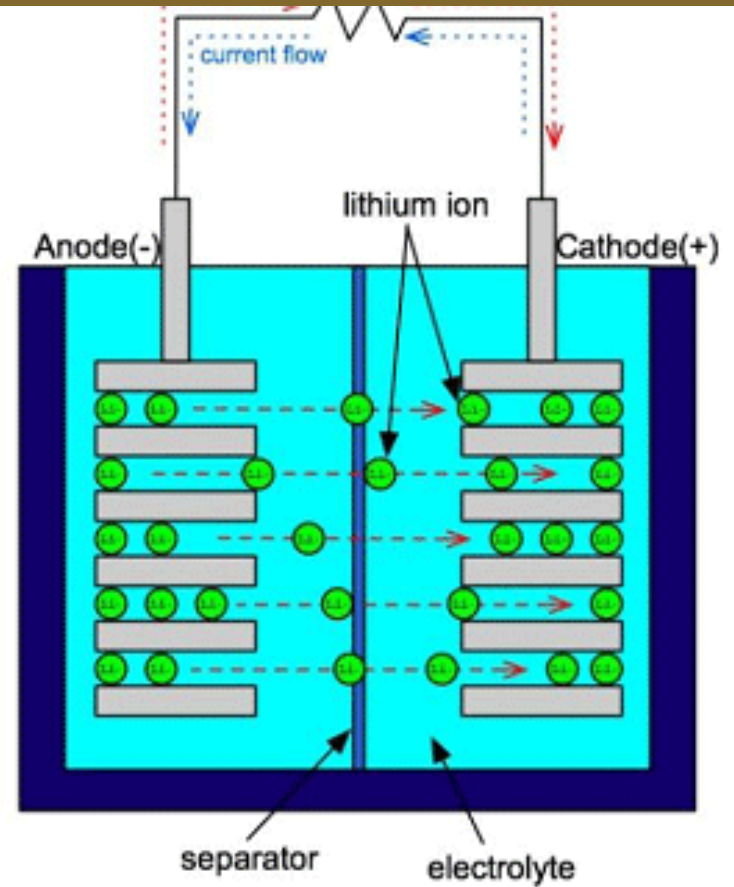
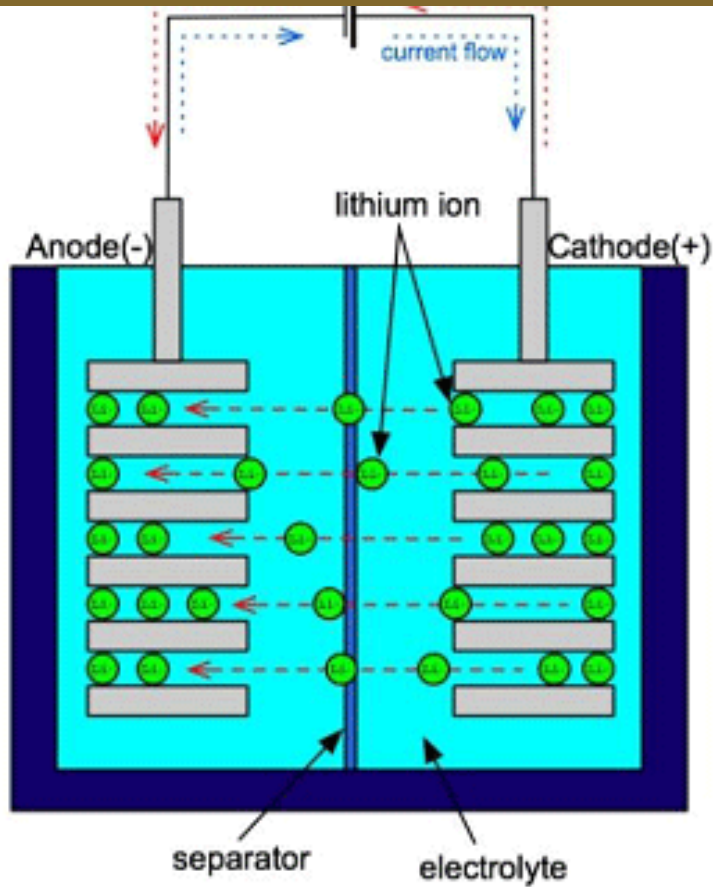
(Zhao 1)



# HOW DO THEY WORK

- 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)

# HOW DO THEY WORK



# CITATIONS

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