

HOW DOES A LITHIUM-ION BATTERY WORK?

Lithium-based batteries power our daily lives, from consumer electronics to national defense

A lithium-ion battery is a type of rechargeable battery. It has four key parts:

- 1 The cathode (the positive side), typically a combination of nickel, manganese and cobalt oxides.
- 2 The anode (the negative side), commonly made out of graphite, the same material found in many pencils.
- 3 A separator that prevents contact between the anode and cathode.
- 4 A chemical solution known as an electrolyte that moves lithium ions between the cathode and anode.

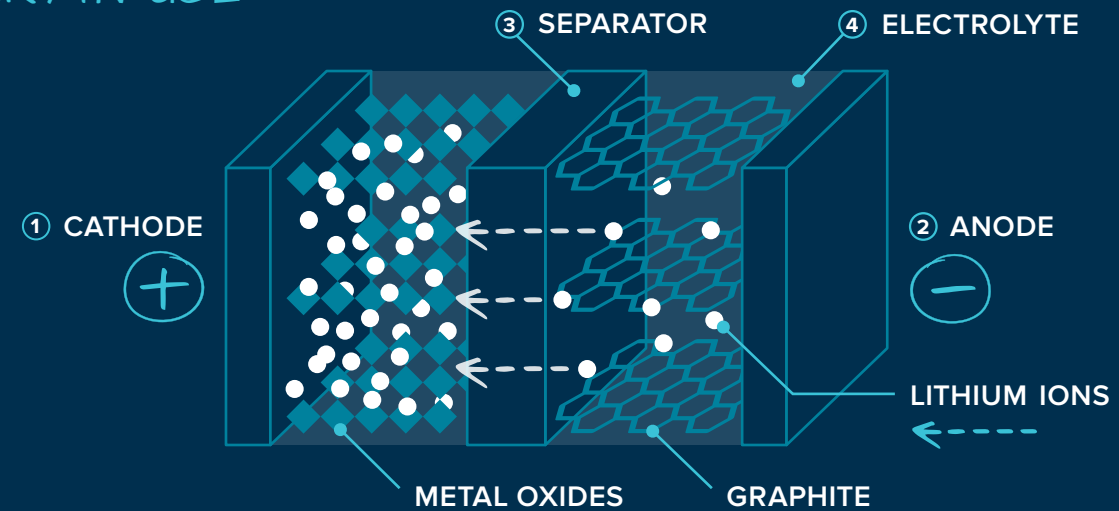
The anode and cathode store lithium.

When the battery is in use, positively charged particles of lithium (ions) move through the electrolyte from the anode to cathode. Chemical reactions occur that generate electrons and convert stored chemical energy in the battery to electrical current.

When the battery is charging, the chemical reactions go in reverse: the lithium ions move back from the cathode to the anode.

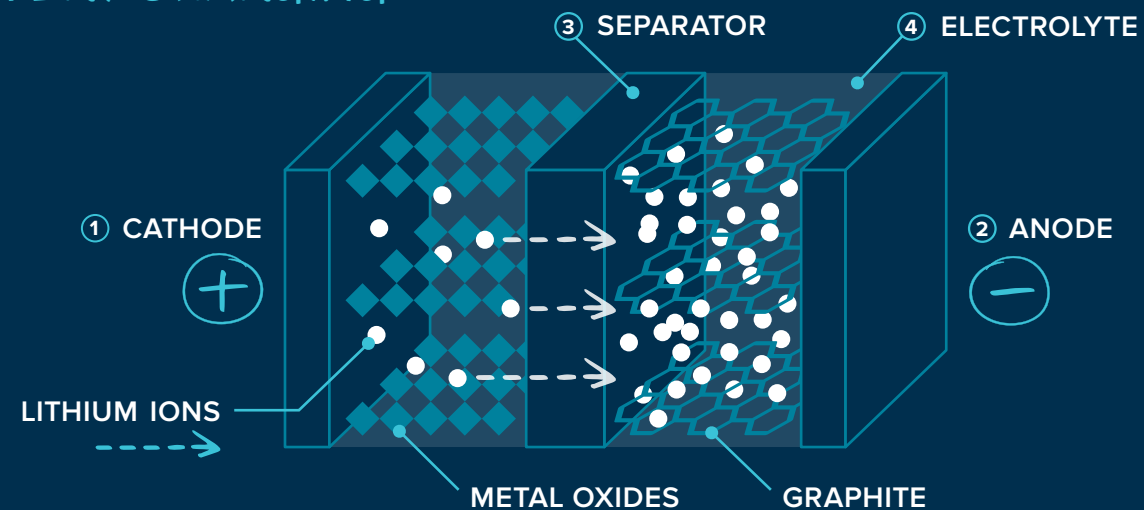
Learn more at www.anl.gov.

BATTERY IN USE



A LOOK INSIDE A RECHARGEABLE LITHIUM-ION BATTERY

BATTERY CHARGING



BATTERIES VARY BY APPLICATION

Batteries come in many different shapes and sizes, and are used in...



ELECTRIC VEHICLES



COMPUTERS



PHONES



ELECTRIC WHEELCHAIRS



E-SCOOTERS



CAMERAS



DRONES



POWER TOOLS

...and much more.