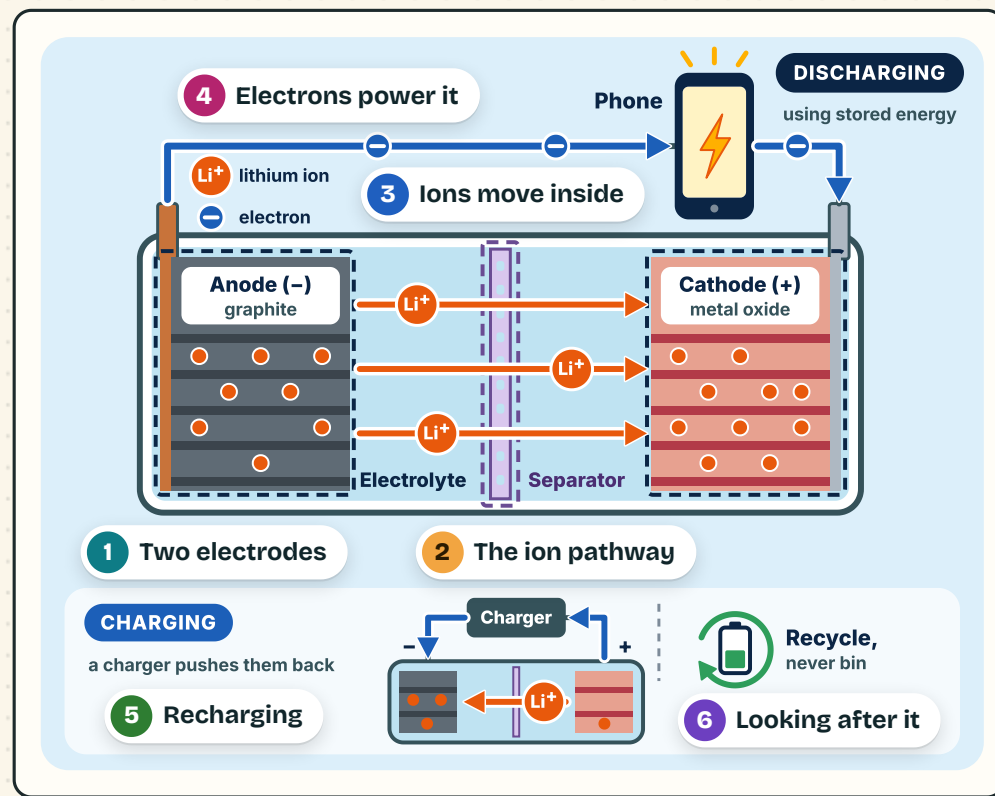


How Batteries Store Energy

Inside every phone and laptop battery, lithium ions shuttle between two electrodes while electrons do the work outside.



1 Two electrodes

The negative electrode (anode) is usually graphite, which stores lithium between its layers. The positive electrode (cathode) is a lithium metal oxide, such as lithium cobalt oxide.

2 The ion pathway

Between the electrodes is an electrolyte and a thin separator full of tiny pores. Lithium ions can pass through, but the separator keeps the two electrodes apart.

3 Ions move inside

When the battery discharges, lithium in the graphite gives up electrons. The lithium ions (Li⁺) travel through the electrolyte and separator to the cathode.

4 Electrons power it

The electrons cannot take the inside route, so they flow through the wire: out of the anode, through the phone and into the cathode. This flow is the current that runs the device.

5 Recharging

A charger drives electrons back from the cathode to the anode. Lithium ions follow inside, from the cathode back into the graphite, so energy is stored again.

6 Looking after it

A used battery still holds enough charge to start a fire if it is crushed. Never put one in a household bin: take it to a battery recycling or collection point.



mAh or Wh?

Milliampere-hours (mAh) measure charge. Watt-hours (Wh) measure energy. Multiply amp-hours by voltage to get watt-hours: an imaginary 3,000 mAh cell at 3.7 V stores $3 \times 3.7 = 11.1$ Wh.