

Lemon battery

Concept—Food contains stored chemical energy

Curriculum Link:

Science Curriculum—Living Things and Energy and Forces strands

Experiment

You will need:

- Three fresh lemons
- Three copper coins
- Three zinc washers (purchase from a DIY store)
- Six paper clips
- Four pieces of wire with stripped ends (available from electronics shops)
- Low-current LED (light emitting diode—available from electronics shops).

1. Make two slits in the skin of each lemon.
2. Push a copper coin and a zinc washer into the slits of each of the lemons.
3. Attach the wires as shown in the diagram to make a circuit—coin to washer, coin to washer and so on.
4. The long lead of the LED must be connected to the copper coin.
5. Use the paper clips to keep the wires touching the copper coins and washers.
6. When the circuit is complete the LED will shine.

A chemical reaction takes place between the metals (copper and zinc) and the acid of the lemon, causing a current to flow. The lemons are acting as a battery that is a store of chemical energy. In the circuit the chemical energy is converted into electrical energy.

Note: It can be difficult to get the LED to light. In this case you could also connect the circuit to a voltmeter to get a reading of the voltage of electricity being produced.

You can replace the lemons with other fruits and even vegetables (potatoes work well), and see which ones store the most energy (give the highest reading on the voltmeter).



Lemon battery diagram

