Lemon Cell

Have you ever heard of a potato clock? If so, you may believe that this device uses two potatoes to generate the energy to power a clock. Right? Wrong. The potatoes don’t generate the electrical flow. The potatoes are merely solid structures though which charges can flow. The parts that produce the flow of charges are the two different metals that are stuck into the potato.

Materials
- A lemon
- A copper penny
- Steel wool
- A knife
- A strip of zinc (obtained from hardware store)
- A current meter (assembled in "Meet a Meter;”)

To Do
Use the steel wool to polish the surfaces of the penny and the zinc strip. File down any sharp edges on the zinc strip.
Use the knife to punch two small slits into the lemon’s tough skin. The slits should be about 1/2 inch (12.5 mm) in length and placed about 1/4 inch (6 mm) apart.
Insert the penny into one of the slits. Insert the zinc strip into the other slit. Make sure that the metals don’t touch.
Touch the leads of the current meter to the exposed metals. What happens to the magnetized needle? Can you explain your observation?

The Science
There is a natural tendency for electric charges to travel between different metals (in this case, copper and zinc). Within the lemon, the acid environment offered a partial route for the travel of charges. The route was completed by the external circuit, which included the coiled wire. As the current travelled through this coil, it produced a magnetic field. This field deflected the needle from its original pointing direction.
Check It Out! Can other pairs of metals produce a detectable current? Try replacing the zinc with an old silver coin or a wad of aluminum foil.