

HACKBOTS



3414

SUMMER STEM

Splitting Water (Electrolysis in action)

Supplies:

- 9 volt battery
- 2 electrical wires
- 2 pencils (#2) without erasers or metal
- Glass of water
- Small piece of cardboard
- Salt

Instructions:

1. Sharpen both pencils on both ends.
2. Dissolve about a tsp of salt into a glass of warm water. Let set awhile. (Salt will help conduct the electricity)
3. Cut cardboard to fit over top of the glass of water.
4. Place sharpened pencils (about an inch apart) through the cardboard, so half is submerged in glass and half is out of water.
5. Take 1 piece of electrical wire and connect 1 end with the positive end of the battery. Connect the other end of the wire with 1 of the pencil leads outside of the water.
6. Repeat step 5 with the negative end of the battery and the other pencil lead outside of the water.
7. Wait and watch! Tiny bubbles should appear in the water around the submerged pencil leads.

The Science:

Electricity is “created” when certain chemicals react together. Water is a simple chemical made from two gases — hydrogen and oxygen. Every molecule of water has two atoms of hydrogen for every atom of oxygen. H₂O is the chemical formula for a molecule of water.

If an electrical current is passed through water (in this case, salt water) between electrodes (the + and - sides of a battery), the water is split into its two parts: oxygen and hydrogen. This process is called electrolysis.

Electricity from the battery passes through and between the electrodes (the pencils). When this happens, the water splits into hydrogen and chlorine gas, which collect as the very tiny bubbles you observed around each pencil tip.

Using electricity to split hydrogen gas out of the water is similar to the process called electrolysis.