Instructions for Teacher Prep

Create models ahead of class:

- Use directions on student Handout: How to Build a Working Model that Creates Hydrogen Gas. You can also watch Video: Experiment Set Up
- Set up your own working model ahead of time. This way you will have collected quite a bit of hydrogen gas by the time students finish their models. You can use tape to hold your battery, paper clips and test tube in place.
- Set up the parts for a second model that you can use to demonstrate the steps as the students build their models.

Prepare materials for students:

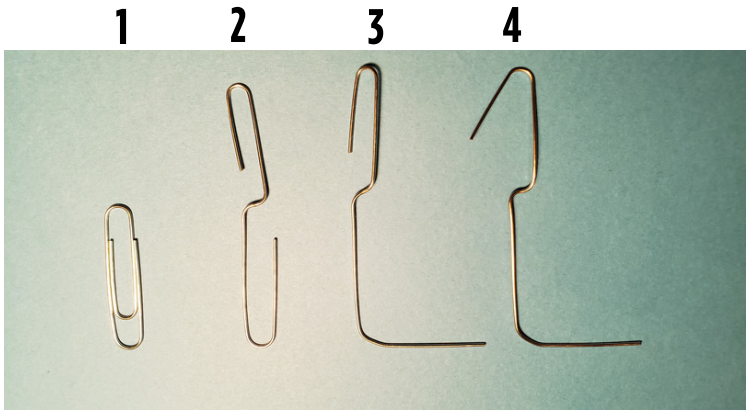
- Prepare 1 cup of slightly salty water for each pair of students. Adding a little bit of salt to tap water will help the reaction happen more rapidly.
- Add about a teaspoon of salt to every gallon of water or just throw a pinch of salt into each cup.

Please contact Allison Bischoff, Director of Customer Service, at allison@rozzylearningcompany.com or 314-272-2560 with questions.

How to Build a Working Model that Creates Hydrogen Gas

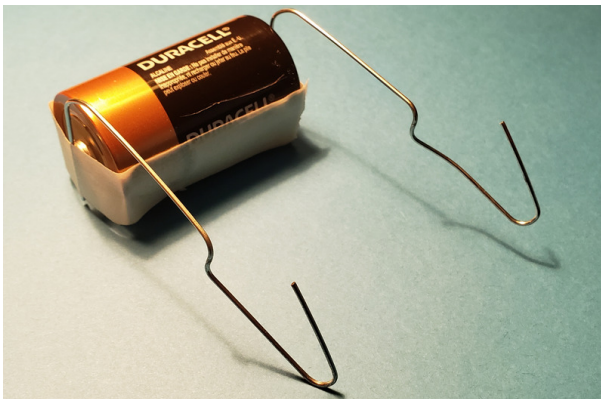
Step 1: Bend paper clips into hooks.

- Unfold paper clip using the steps in the picture below:



Step 2: Attach paper clips to battery using masking tape.

- Make sure that the paper clips do not touch each other.



Step 3: Hold the paperclips tightly to the battery as you lower the hooks into the cup of water.

- Make sure the hooks do not touch each other in the water.
- Try not to let the tips of the hooks come out of the water.
- Take turns holding the paperclips tightly to the battery to make sure you have a good connection.
- One hook should show a change happening faster than the other hook. Is that hook attached to the + or – end of the battery?

Step 4: Collecting the hydrogen gas.

- Now that your model is creating hydrogen, you need to capture the hydrogen.
    - Fill your test tube with clean water.
    - Put your thumb over the opening of the test tube.
    - Turn the test tube upside down (no water comes out because your thumb is there, right!?!)
    - Put your thumb and test tube under the top surface of the water.
    - Remove your thumb and the water should still stay in the test tube.
    - Guide the test tube over the hook that is creating hydrogen
    - You are now collecting hydrogen gas! (The oxygen is just bubbling out into the air.)

Step 5: Monitoring Gas Collection

- Collect as much hydrogen gas as you can. The longer you can leave your experiment running, the more gas you will collect!
- Be careful not to let the test tube come out of the water.

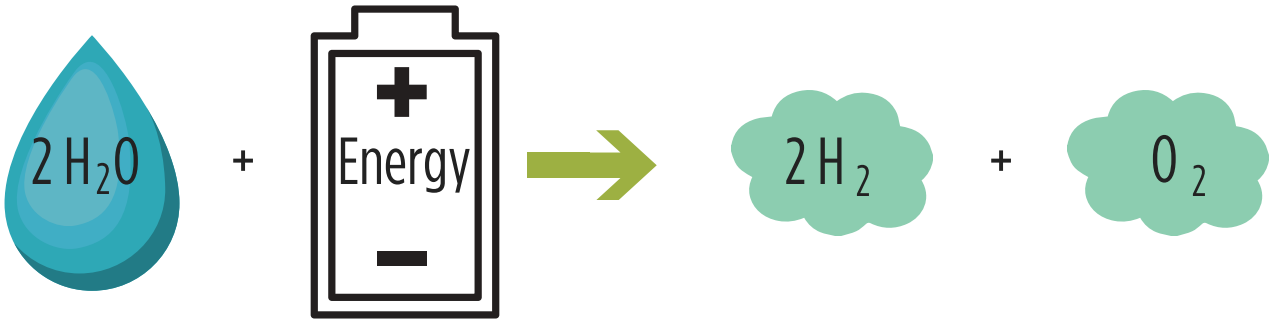
Step 6: Removing the Test Tube

- When you are done collecting hydrogen gas, carefully remove the hooks of the paper clips from the water without removing the test tube.
- The hydrogen gas will stay safely at the top of the test tube.

Making Hydrogen Gas

What is actually happening to produce hydrogen gas from water?

When two water molecules are given energy from the sun, or in this case, a battery, they react. The water molecules break apart and rejoin to form two molecules of hydrogen gas and one molecule of oxygen gas.



Or look at it this way: