LEARNING BY DOING

# ACTIVITY 1 - ELECTROLYSIS

In this experiment we will be converting electrical energy to chemical energy in the form of hydrogen through a process called water electrolysis. We will also find the ratio of hydrogen to oxygen production and see how this is related to the chemical name for water - H2O.

- ✓ 1st law of Conservation of Energy: Energy can be transformed from one form to another, but can never be created nor destroyed!
- ✓ Electrolysis Balanced Equation: 2H2O + Energy = O2 + 2H2

Your Turn! Draw the balanced equation for Electrolysis below.

---

## Experiment Procedure:

1. Assemble the reversible fuel cell following steps 1 & 2 in the assembly manual.
2. Take timed measurements for hydrogen & oxygen production @ 1, 2, 3, 4 and 5 minutes. Record results on the chart to the right.
3. What is the rate of Hydrogen to oxygen production during the electrolysis process?
   ___:___
4. How does the chemical name for water (H2O) related to your collected data for water electrolysis? Explain in your own words in the space below.

---

## Collected Data

Electrolysis data recording chart:

| Time (Min) | Volume of Hydrogen (ml) | Volume of Oxygen (ml) | Ratio ($H_2$ to $O_2$ volume) |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

LEARNING BY DOING

# ACTIVITY 3 - VEHICLE DESIGN & FABRICATION

In this lesson you will sketch out a design your own chassis You will then bring your designs to life by fabricating them out of recycled materials such as cardoard, wood, styrofoam, etc.

## Design Procedure:

First, you will sketch out your ideas on paper in order to help you come up with a plan of how you want to design our vehicle.

Next, you will need to source materials that are strong enough to hold the components of the fuel cell system, but light enough to allow the car to travel as far as possible.

Finally, you will build your own prototype!

## Fabrication Procedure:

1) Find a piece of suitable material from a recycled source to construct your chassis out of (cardboard is a great material to use as it is easy to find).

2) Use your custom template to trace your design onto your chassis material.

3) Use scissors or exacto knife to cut your design out of the material you have selected.

4) Find a way to secure the wheels to your custom vehicle (thumbtacks are an easy solution).

5) Place all components on your chassis and test to make sure they fit and work.