# Station 1: Introduction to Electrochemical Cells

Label the following diagrams for the two types of electrochemical cells:

**Voltaic Cell**



**Electrolytic Cell**



# Station 2: Voltaic Cells

**Voltaic Cell** - a redox reaction whose two half-reactions are carried out separately, and the electrons given off by the oxidation half-reaction are used to power a device, and then given to the reduction half-reaction. ALSO CALLED A BATTERY (9v) OR CELL (AAA, AA, C, D)

**How a Voltaic Wet Cell Works**:

* Converts \_\_\_\_\_\_\_\_\_\_\_\_\_ energy to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy by the use of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move from the metal that is \_\_\_\_\_\_\_\_\_\_\_\_ to the metal that is \_\_\_\_\_\_\_\_\_\_\_\_\_
* **Flow of electrons**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Parts of a Voltaic Wet Cell:**

 **Electrode:**

**Anode:**

 **Cathode:**

**\*\*REMEMBER:**

****

 **Salt Bridge:**

 **External Circuit:**

# Station 3: Electrolytic Cells

1. Define the parts of an electrolytic cell

 **Anode:**

 **Cathode:**

 **Battery:**

 **Electrolyte:**

 **Flow of electrons:**

**Parts of an Electrolytic Cell**:

* Uses a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ redox reaction (the reaction \_\_\_\_\_\_\_\_\_\_\_\_\_ occur on its own)
* Uses \_\_\_\_\_\_\_\_\_\_\_\_ to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* This process is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Used for:

 1)

 2)

 3)

# Station 4: Hydrogen Fuel Cell vs Electric Vehicles

1. Write the oxidation and reduction half-reactions for hydrogen fuel cells.

 Oxidation Half-Reaction:

 Reduction Half-Reaction:

2. Write the oxidation and reduction half-reactions for lithium ion batteries (electric vehicle power source).

 Oxidation Half-Reaction:

 Reduction Half-Reaction:

3. What are the benefits and limitations (disadvantages) of Hydrogen Fuel Cell vehicles?

 Advantages:

 Disadvantages:

4. What are the benefits and limitations (disadvantages) of Electric vehicles?

 Advantages:

 Disadvantages:

5. What type of electrochemical cell is the hydrogen fuel cell? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. What type of electrochemical cell is the lithium ion battery (electric vehicle)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Which of these vehicles occur spontaneously? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# SUMMARY of Electrochemical Cells

**Similarities**

* 1.
* 2.
* 3.
* 4.

**Differences**

