

## Triangle Game

### Student Objective

The student

- will be able to explain in his or her own words the meaning of fundamental term and concepts of hydrogen energy

### Materials

- Triangle game board
- instructions
- playing pieces
- tape

### Key Words:

(Key words depend on game vocabulary used. Below are the key words used in this hydrogen energy version)

biomass  
combustion  
electricity  
electrolysis  
electron  
emissions  
energy carrier  
energy source  
fuel cell  
greenhouse gas  
hydrogen  
hydrogen economy  
inexhaustible  
molecule  
oxygen  
PEM  
photovoltaics  
pollution  
power plant  
renewable energy  
transportation  
water vapor

### Time:

1 hour

### Internet Sites

<http://www.wordcentral.com/>

Merriam Webster, Word Central student dictionary

### Procedure (prior to class)

1. Cut out game pieces
2. Print out Key Words/Definitions page
3. Game board may be enlarged or laminated

**Procedure (in class)**

1. Assign students to small groups
2. Distribute a triangle game board, instruction sheet to each group
3. Place the terms at the front of the class for the teams to refer to if there are disputed answers
4. Discuss the rules of the game with the class and demonstrate a completed triangle using non-technical terms.
5. Allow 30-40 minutes for game time.

## Triangle Game

Key Words will vary depending on the vocabulary used. Below are the key words/definitions for the hydrogen energy game pieces included in this unit.

**biomass** - plant material, vegetation, or agricultural waste used as a fuel or energy source.

**combustion** - a chemical change, especially oxidation, accompanied by the production of heat and light

**electricity** - the flow of electrons, usually on a wire

**electrolysis** - chemical change, especially decomposition, produced in an electrolyte by an electric current

**electron** - an elementary particle with negative charge

**emissions** - a substance discharged into the air, especially by an internal combustion engine.

**energy carrier** - any system or substance used to transfer energy from somewhere to somewhere else

**energy source** - origins of the power used for transportation, for heat and light in dwelling and working areas, and for the manufacture of goods of all kinds, among other applications

**fuel cell** - an electrochemical cell in which the energy of a reaction between a fuel, such as hydrogen, and an oxidant, such as oxygen, is converted directly and continuously into electrical energy

**greenhouse gas** - a gas that contributes to the greenhouse effect by absorbing infrared radiation

**hydrogen** - a colorless, highly flammable gaseous element, the lightest of all gases and the most abundant element in the universe

**hydrogen economy** - a hypothetical future economy in which the primary form of stored energy for mobile applications and load balancing is hydrogen

**inexhaustible** - cannot be entirely consumed or used up

**molecule** - the smallest particle of a substance that retains the chemical and physical properties

of the substance and is composed of two or more atoms; a group of like or different atoms held together by chemical forces

**oxygen** - an element constituting 21 percent of the atmosphere by volume that occurs as a diatomic gas, O<sub>2</sub>, combines with most elements, is essential for plant and animal respiration, and is required for nearly all combustion

**PEM** - Proton Exchange Membrane. Refers to the most common type of fuel cell

**photovoltaics** - the process of turning the energy of the sun into electricity by using a solar (photovoltaic) cell

**pollution** - undesirable state of the natural environment being contaminated with harmful substances as a consequence of human activities

**power plant** - a complex of structures, machinery, and associated equipment for generating electric energy from another source of energy

**renewable energy** - energy derived from sources that do not use up natural resources or harm the environment

**transportation** - the business of conveying passengers or goods.

**voltage** - the rate at which energy is drawn from a source that produces a flow of electricity in a circuit; expressed in volts

## Triangle Game

A game to demonstrate connections between vocabulary terms

### Individual Player Version

The Object: To be the player with the most points at the end of the game.

The Set Up: Vocabulary terms are placed on small slips of paper and turned face down on the playing surface. Each player writes their name on the back of the triangle game board.

The Play:

1. The first player randomly chooses a term, defines that term, and uses it in a sentence.
2. The player then attaches (glue or tape) the term to any intersection point on the game board.
3. The next player randomly chooses a term, defines the term and uses it in a sentence. If the player is able to demonstrate a relationship between his/her term and another term, they place their term on another point of that same triangle. If the player can not demonstrate a relationship with any of the other terms on the game board they must attach their term to an intersection point on any open triangle.
4. Play continues with terms being attached to the game board.
5. When a player is able to explain a relationship between his/her term and the other two terms on the points of a triangle he/she initials the completed triangle and receives a game point.

The Winner: When the time allotted for play is complete, the player with the most game points (or completed triangles) wins.

### Team Version

The Object: To be the team with the most completed triangles at the end of the game.

The Set Up: Same as Individual Player Version

The Play: The same as Individual Player Version, except that cooperation between team members is encouraged and players do not put their initials in completed triangles.

The Winner: When the time allotted for play is complete, the team with the most completed triangles wins.

A large triangular grid for a game board. It consists of four horizontal rows of triangles. The top row has four upward-pointing triangles. The second row has three downward-pointing triangles. The third row has four upward-pointing triangles. The bottom row has three downward-pointing triangles. A title box is centered at the top.

**Triangle Game Board**

## Triangle Game

**electrolysis**

**photovoltaics**

**electron**

**fuel cell**

**renewable energy**

**PEM**

**hydrogen economy**

**oxygen**

**electricity**

**transportation**

**energy carrier**

**pollution**

**emissions**

**combustion**

**greenhouse gas**

**power plant**

**hydrogen**

**water vapor**

**energy system**

**molecule**

**biomass**

**inexhaustible**

