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 solar 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 solar energy version)

alternative energy source
alternative fuel vehicle
conduction
convection
desalinization
electromagnetic spectrum
energy system
energy efficient
evaporation
hydrogen
insulation
kilowatt
photon
photovoltaic
radiation
renewable energy
solar collector
solar oven
solar spectrum
solar still
solar thermal
water cycle

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

Benchmarks will vary according to vocabulary used. Below are the benchmarks covered by using the solar energy key words included with this activity.

			.1	.2	.3	.4	.5	.6	.7
Nature of Matter	**Standard 1**	**SC.A.1.3-**							
	Standard 2	**SC.A.2.3-**			**X**				
Energy	**Standard 1**	**SC.B.1.3-**	**X**	**X**	**X**		**X**		
	Standard 2	**SC.B.2.3-**							
How Living Things Interact With Their Environment	**Standard 1**	**SC.G.1.3-**					**X**		
	Standard 2	**SC.G.2.3-**	**X**						

Benchmark SC.A.2.3.3 - The student knows that radiation, light, and heat are forms of energy used to cook food, treat diseases and provide energy.

Grade Level Expectations

The student:

Sixth

- knows forms of radiant energy and their applications to everyday life

Seventh

- knows uses of radiation, light, and thermal energy to improve the quality of life for human beings

Eighth

- extends and refines knowledge of uses of forms of energy to improve the quality of life.

Benchmark SC.B.1.3.1 -The student identifies forms of energy and explains that they can be measured and compared.

Grade Level Expectations

The student:

Sixth

- knows different types of energy and the units used to quantify the energy
- understands that energy can be converted from one form to another

Seventh

- knows examples of uses of energy in the home and ways to measure its use

Eighth

- knows that energy can be transferred by radiation, conduction, and convection

- knows examples of natural and man-made systems in which energy is transferred from one form to another.

Benchmark SC.B.1.3.2 -The student knows that energy cannot be created or destroyed, but only changed from one form to another.
Grade Level Expectations
The student:
Sixth
- understands that energy can be changed in form
- uses examples to demonstrate common energy transformations

Benchmark SC.B.1.3.3 - The student knows the various forms in which energy comes to Earth from the Sun
Grade Level Expectations
The student:
Sixth
- knows types of radiant energy that come to Earth from the Sun

Seventh
- knows the characteristics, effects, and common uses of ultraviolet, visible and infrared light

Benchmark SC.B.1.3.5 -The student knows the processes by which thermal energy tends to flow from a system of higher temperature to a system of lower temperature.
Grade Level Expectations
The student:
Eighth
- knows the processes by which thermal energy tends to flow from a system of higher temperature to a system of lower temperature.

Benchmark SC.G.1.3.5 -The student knows that life is maintained by a continuous input of energy from the sun and by the recycling of the atoms that make up the molecules of living organisms.
Grade Level Expectations
The student:
Seventh
- knows that life on earth is dependent upon a continuous supply of energy from the sun

Benchmark SC.G.2.3.1 -The student knows that some resources are renewable and others are nonrenewable.
Grade Level Expectations
The student:
Sixth
- knows renewable and nonrenewable energy sources

Seventh
- understands the importance of informed use of natural resources

Eighth

- knows that some resources are renewable and others are nonrenewable.

Triangle Game

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

alternative energy source - an energy source other than fossil fuels

alternative fuel vehicle - a vehicle that uses a fuel other than gasoline

conduction - the movement of heat or cold through materials that are solid

convection - the movement of heat through air or in liquids

desalinization - process of removing salt and other chemicals and minerals from water

electromagnetic spectrum - the radiant energy that is emitted from the sun which is made up of varying wavelengths. From longest to shortest, these are: radio waves, radar/microwave, infrared, visible light, ultraviolet, x-rays and gamma rays.

energy system - an interacting group of items forming a unified whole

energy efficient - not wasteful of energy, more of the energy goes to the desired work

evaporation - process of changing a liquid into vapor

hydrogen - the element composed of two hydrogen atoms. Hydrogen is useful as a combustible fuel, and can also be used with a fuel cell to generate electricity.

insulation - material used to reduce heat loss or gain

kilowatt - standard measure of electric usage

photon - the unit of energy emitted by the sun

photovoltaic - the effect of producing electric current using light

radiation - the way we receive heat from the sun each day. The energy is emitted in the form of waves/particles, and can move from one object to another without heating the area in between.

renewable energy - fuel sources that can be replenished

solar collector - a device that collects and traps solar energy

solar oven - a device that uses the heat from the sun to cook food

solar spectrum - the spectrum of colors in the visible light from the sun

solar still - a device that uses solar energy to evaporate a liquid

solar thermal - using the sun's energy to heat something. Common uses include water heaters and pool heaters.

water cycle - the system of water recycling on our earth - water, evaporation, clouds, precipitation

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

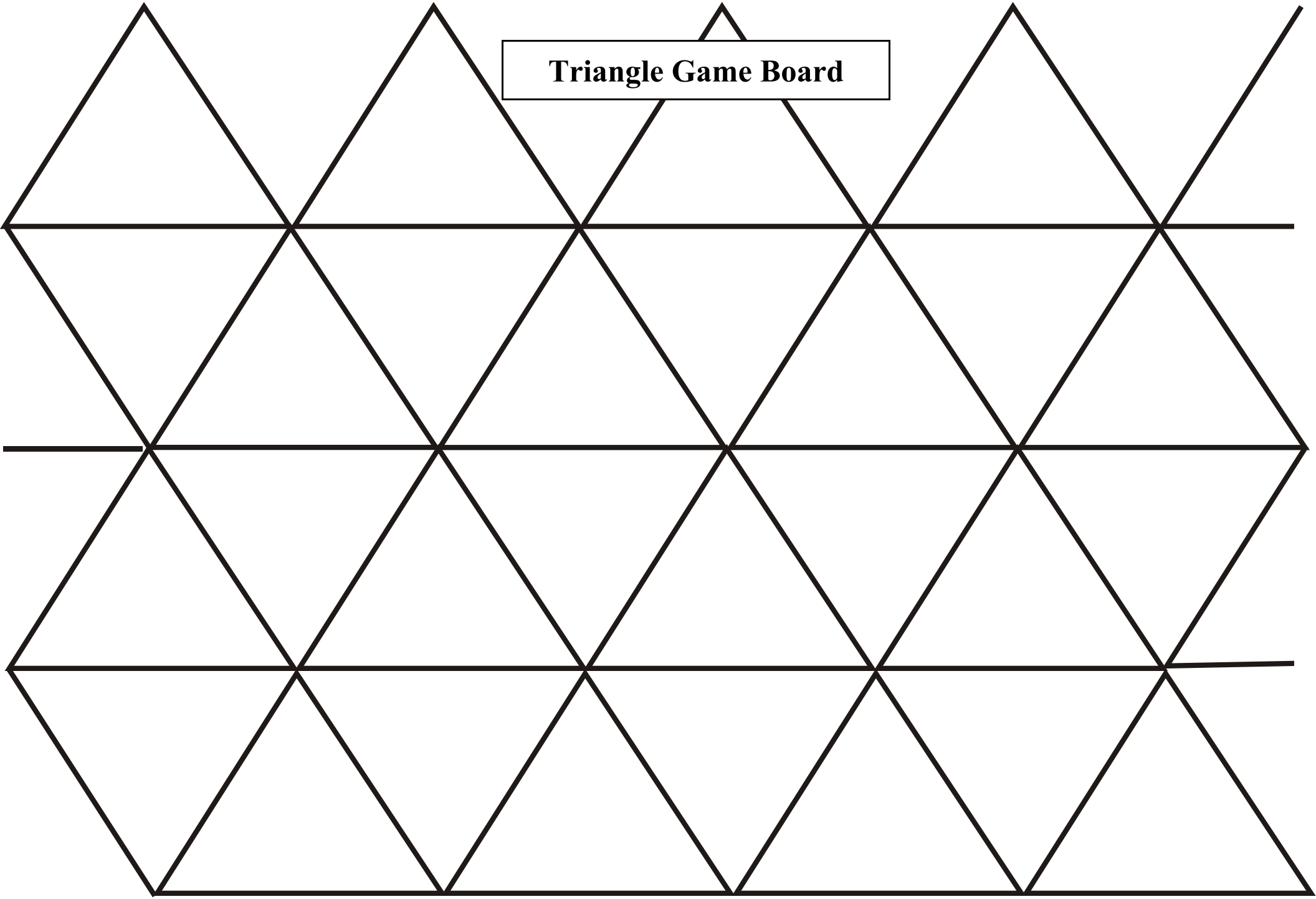
The Object: To be the team with the most completed triangles at the end of the game.

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.

Triangle Game Board



Triangle Game

electromagnetic spectrum

photovoltaic

radiation

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renewable energy

desalinization

evaporation

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solar collector

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energy efficient

hybrid

compact fluorescent

kilowatt

energy system

water cycle

solar oven

solar spectrum