



WHAT IS ENERGY 2 LEARN?

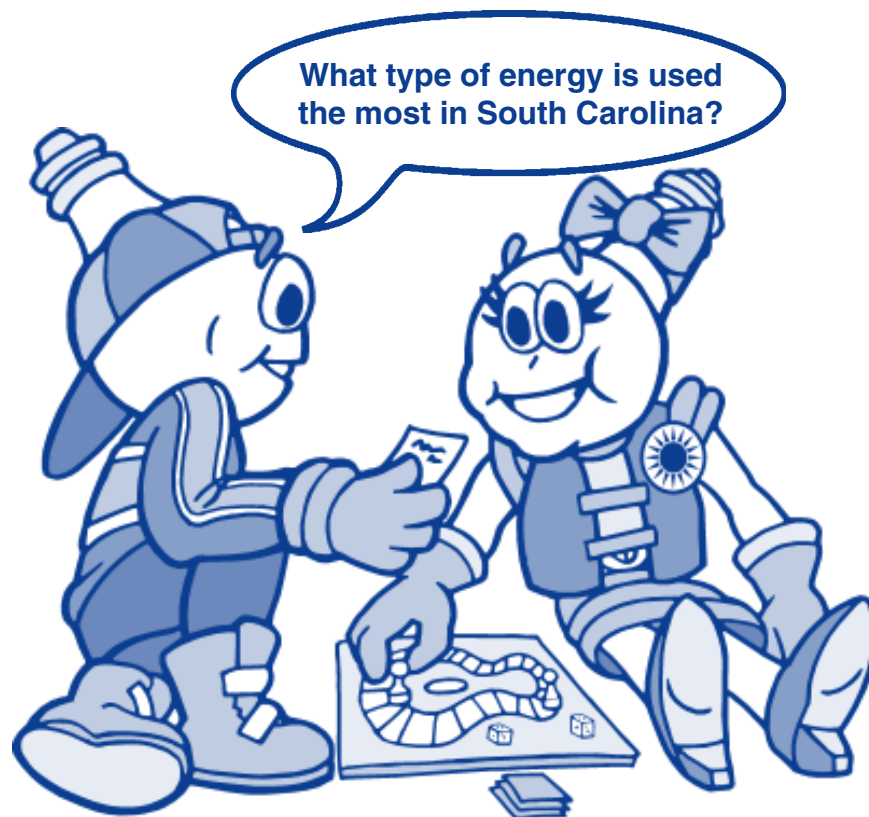
Energy 2 Learn (E2L) is a comprehensive kindergarten through 12th grade energy education program designed specifically for South Carolina students and teachers.

E2L, which includes this publication, also features correlated lessons from "**Action for a cleaner tomorrow: A South Carolina Environmental Curriculum Supplement,**" science fair projects, recognition programs for schools, students and teachers as well as other materials and resources such as special classroom presentations for sixth-grade students. Many of the materials offered include South Carolina-specific energy information only available from the E2L program that provides students a unique understanding of the state's energy usage and needs.

'E2'S ENERGY GAMES & ICEBREAKERS'

"E2's Energy Games" contains quick games to introduce and reinforce energy concepts and information. These games will energize your students to learn about energy. The games can be used in the classroom by students to teach younger students about energy or to showcase energy issues to parents and siblings at PTO and Science Fair/Club meetings.

For more information about E2L programs, resources and materials, please visit www.scdhec.gov/recycle or call 1-800-768-7348.



ENERGY SOURCE CHANTS

BIOMASS

Garbage, garbage, garbage – biomass!

Hold your nose while chanting “garbage, garbage, garbage” and during “biomass!” Shake your hands near your shoulders.

COAL

Working in a coal mine (grunt) – hard hat!

While chanting, “Working in a coal mine,” pretend that you are shoveling coal. At (grunt) “hard hat!” Throw the coal over your shoulder.

GEOHERMAL

Shhhhh – ge-o-ther-mal!

Place your hands together flat (without interlocking fingers) below your waist. As you say “Shhhhh” slowly move your hands upward and on “geothermal,” separate your hands to act like a geyser.

HYDROPOWER

Falling water – hydropower, hydropower!

With your finger tips touching, hold your hands under your chin and glide your hands down like a waterfall during “falling water.” For “hydropower, hydropower” spin your hands like a turbine.

NATURAL GAS

Natural gas, gas (snap, snap) – a real gas!

After chanting, “Natural gas, gas,” snap once with your right hand, once with your left, and follow with “a real gas!”

PETROLEUM

Blup, blup – petroleum!

Begin with your hands below your waist in a cup shape facing down. As you say “Blup” move your hands upward like oil coming from the ground. When you reach “petroleum,” throw your hands in the air like an old-fashioned oil well that just struck oil.

PROPANE

Compress, compress, compress – pro-pane!

During the “compress” sequence, start with your hands apart facing each other and move them closer together. When you clasp your hands together, say “pro-pane” and begin a wave motion (like liquid).

SOLAR

Sunshine energy – yes, sunshine energy!

Make a circle with your arms over your head and as you say “sunshine energy!” Throw your hands out like rays of the sun.

URANIUM

Uranium, uranium – split goes the atom!

Begin by clenching your hands in fists and hitting your fists together like atoms splitting. When you hit the “split” take your hands and pull them apart with your fingers spread like atoms splitting.

WIND

The answer is blowin’ in the wind!

Throughout the chant, spin your arms like a windmill.

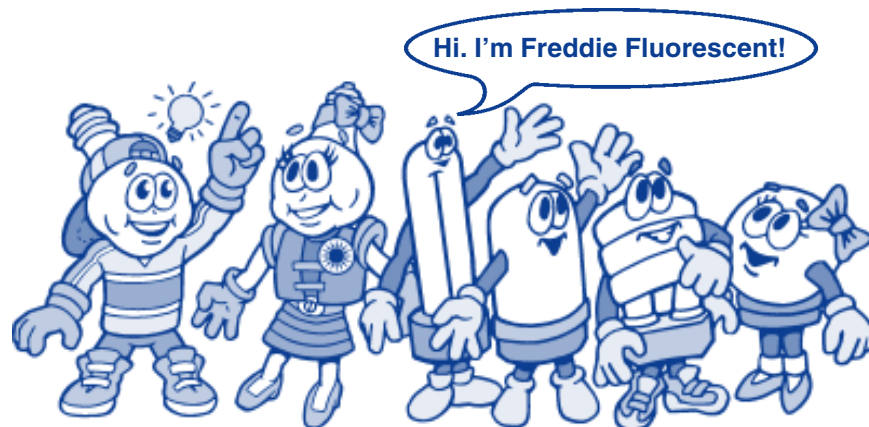
CHANGE YOUR NAME ENERGY GAME

GETTING READY: Divide into groups of no more than 10 or 12 students.

SETTING UP: Have each group sit in a circle facing inward.

START: Follow these steps.

1. The teacher tells the group they will be getting new last names. The new last name should begin with the same letter as their first name and it should be related to energy – a source of energy, an energy producing or using device or an energy word. Examples – Barbara Biomass, George Generator, Mary Microwave, etc.
2. The teacher starts by saying “Hello, my names is...” Then, the person to the left of the teacher says the teacher’s energy name and his energy name. The next person gives the teacher’s energy name, the first student’s energy name and then his energy name. This goes on until the last person has to say everyone’s name plus their own.
3. Before you start, see if anyone is having difficulty thinking of an energy name. If someone can’t think of an energy name, ask the group to try to help that student.
4. While you are playing, if someone has trouble remembering a name have the other students give clues to help that person.



CONSERVATION FOR OUR NATION

GETTING READY: Divide into groups with about 10 students each. Give a marker and a piece of poster-size paper to each group.

SETTING UP: Have the groups sit in a circle near the chalkboard or a wall where you can hang the paper. Have one person from each group be the group leader and one person from each group to be the recorder.

START: Follow these steps.

1. Have the group brainstorm ideas on energy conservation. Each idea should be simple and no longer than five syllables. For example, "Turn off lights," "Tune-up" or "Insulate." Keep brainstorming until the group has at least the same number of ideas as there are group members.
2. Explain the game to the group with this introduction.
 - 1 Slap your thighs once with both hands and say "CON."
 - 1 Clap once and say "SER."
 - 1 Snap your right fingers and say VA and then your left and say "TION."
 - w Slap your thighs again and say "FOR."
 - w Clap your hands and say "OUR."
 - w Snap your right fingers and say "NA," and snap your left and say "TION."
 - w Slap your thighs a third time and say "READY."
 - w Clap your hands and say "BEGIN."
 - 1 This time between the snaps you must give a conservation tip.
3. After the introduction, you should give three or four conservation tips between the snaps. Do not repeat the introduction with each tip. You can reinforce the cadence by giving the instructions to the group between snaps.
4. Tell the group to study the sheet of paper because it will not be posted during the game. If someone forgets or repeats, the circle must begin again. The person who has made the mistake begins with the introduction and the game continues until you have made a complete circle with everyone giving a tip between the snaps.

ENERGY BINGO

GETTING READY: Copy as many “Energy BINGO” sheets as you need for each student in your class. Also, decide if you want to give the winner of your game a prize and what the prize will be.

SETTING UP: Give one “Energy BINGO” sheet to each student.

START: Give the group the following instructions on how to play.

1. “Energy BINGO” is similar to regular bingo, but there are a few differences. First, take a look at your “Energy BINGO” sheet and read the 16 questions at the top of the page. Soon you will be going around the room trying to get 16 people to answer these questions so you can write their names in one of the 16 boxes.
2. When you get the signal to start, get up and ask a person one of the questions at the top of your BINGO sheet. If the person gives what you believe is the correct answer, write that person’s name in the corresponding box on the lower part of the page. For example, if you ask a person question “D” and they give you what you think is a correct response, then go ahead and write the person’s name in box “D”. A correct response is important because later, if you get BINGO, that person will be asked to answer the question correctly. If he or she can’t answer the question correctly, then you lose BINGO. So if someone gives you an incorrect answer, ask someone else!
3. Try to fill all 16 boxes during the next 20 minutes. This will increase your chances of winning. After 20 minutes, sit down. Begin asking players to stand up and give their names. Are there any questions? You now have 20 minutes. Start!
4. During the next 20 minutes, move around the room to assist the players. (You can also be placed on a person’s BINGO sheet if you want. But if you do this, make sure you call on yourself later to give your name). Every five minutes or so, tell the players how many minutes are remaining in the game. Give the players a warning when just a minute remains. When the 20 minutes are up, stop the players and ask them to be seated. Then give them the following instructions.

5. Say this to the class – “Now, when I call on you, stand up and say your name. If anyone has the name of the person I call, put a big ‘X’ in the box with that person’s name. When you get four names in a row – across, down or diagonally – shout ‘Energy BINGO!’ Then I’ll ask you to come up front to verify your results.”
6. Continue by saying “Let’s start with you (point to a student). Please stand and give us your name. (Student gives name. Let’s say the student’s name was “Sue.”) OK, if any of you have Sue’s name in one of your boxes, put an ‘X’ through that box.”
7. When the first player shouts “Energy BINGO,” ask him to come to the front of the room. Ask the student to give his name. Have him tell the group how his BINGO run was made (i.e., across from A to D, down from C to O and so on).
8. Now you need to verify the bingo winner’s results. Ask the BINGO winner to call out the first person’s name on his bingo run. That player then stands and the bingo winner asks him the question that he previously answered during the 20-minute session. For example, if the question was “Can name two renewable energy sources?” the player must name two sources. If he can answer the questions correctly, the BINGO winner can call out the next person’s name on his BINGO run. If he does not answer the question correctly, the student does not have BINGO and must sit down with the rest of the players. You should continue to point to players until another person shouts “Energy BINGO.”
9. In case of a tie, ask the BINGO winners to come to the front one at a time to verify their results. If time permits, you may wish to continue the game for second- or third-place winners. You may want to change some of the questions to fit your group. Below are four extra questions to use instead.
 - 1 What is our most powerful energy source? ANSWER: THE SUN
 - 1 What are the two types of energy? ANSWER: RENEWABLE AND NON-RENEWABLE
 - 1 In South Carolina, we have been able to reduce the use of fossil fuels because of our extensive use of what type of energy? ANSWER: NUCLEAR ENERGY
 - 1 South Carolina imports what percentage of its energy needs? ANSWER: 98 PERCENT

ENERGY BINGO

A can name an energy source.

B can name a fossil fuel.

C can name two ways to increase a car's miles per gallon (mpg).

D can name two renewable energy sources.

E visited a power plant.

F can name two ways to save energy at home.

G uses a hand-operated can opener.

H knows the cost of a kilowatt/hour.

I recycles aluminum cans.

J has taken a cold shower.

K has seen a photovoltaic cell.

L knows how natural gas is transported.

M has seen a windmill.

N uses a solar clothes dryer.

O knows which fuel is used in gas grills.

P knows how uranium atoms gives off energy.

A ----- name	B ----- name	C ----- name	D ----- name
E ----- name	F ----- name	G ----- name	H ----- name
I ----- name	J ----- name	K ----- name	L ----- name
M ----- name	N ----- name	O ----- name	P ----- name

ENERGY BINGO

A can name an energy source.

B can name a fossil fuel.

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A ----- name	B ----- name	C ----- name	D ----- name
E ----- name	F ----- name	G ----- name	H ----- name
I ----- name	J ----- name	K ----- name	L ----- name
M ----- name	N ----- name	O ----- name	P ----- name

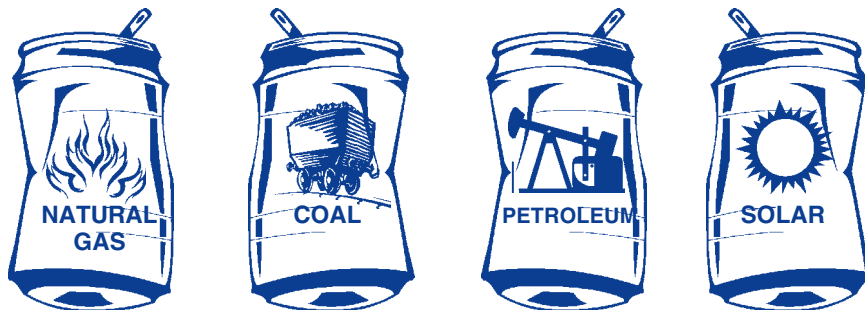
ENERGY KNOCKDOWN

GETTING READY: Follow these steps.

1. Get 10 empty aluminum cans and a small foam ball.
2. Make copies of the can labels that are provided on pages 12 through 16, cut them apart and wrap each of the cans with a can label. HINT: Use one color paper for the renewable resources and a different color for the nonrenewable resources. Also make copies of the “Energy Bucks” on page 17 and cut them out.
3. Review the “Energy Definitions” on page 24.

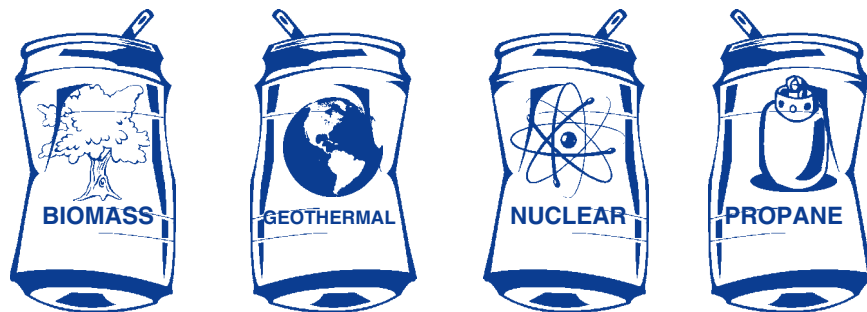
SETTING UP: Place the cans on a table (alternate renewable and nonrenewable cans). Leave some space between the cans, but place them close enough together so that it is a challenge to knock down only one can. Depending on the age and ability of the students, mark a throwing line on the floor with a piece of tape.

START: Read these instructions to the group – “You have five minutes to knock down cans and answer energy questions. Please select a member of your team for the first toss. We will take turns so that everyone gets a chance to toss. Once a member of your team tosses the ball and knocks down only one can, your team will get an energy question. If more than one can is knocked over, please help set up the cans so you can try again. You will receive one energy buck for each correct answer.”

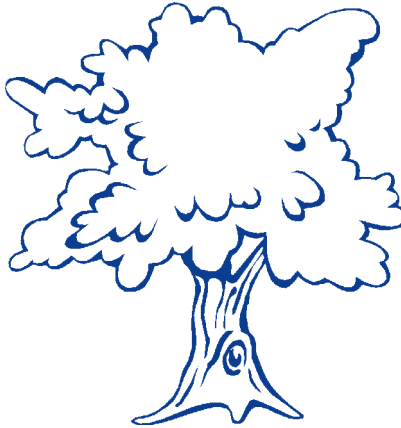


KNOCKDOWN QUESTIONS & ANSWERS

1. Name two fossil fuels (formed from the remains of dead plants and animals). **ANSWERS: Coal, petroleum, natural gas, propane**
2. Name two things energy does for us. **ANSWERS: It provides light, heat, makes things move, makes things grow, powers machines, enables us to do work and other reasonable answers that mean the same thing.**
3. Gasoline comes from which energy source? **ANSWER: Petroleum or oil**
4. Which energy source looks like a black rock and is used to make electricity? **ANSWER: Coal**
5. Name two renewable sources of energy. **ANSWERS: Solar, wind, hydropower, geothermal, biomass**
6. When you dry your clothes outside, which source of energy are you using? **ANSWER: Solar and/or wind**
7. How do most people use natural gas at home? **ANSWER: They use it for heating and cooking.**
8. Name two ways to save energy at home. **ANSWERS: Turn off the lights; save hot water by taking shorter showers; turn off the television; turn off the computer; and other reasonable answers.**



ENERGY KNOCKDOWN CAN LABELS



BIOMASS



COAL

ENERGY KNOCKDOWN CAN LABELS



GEO THERMAL

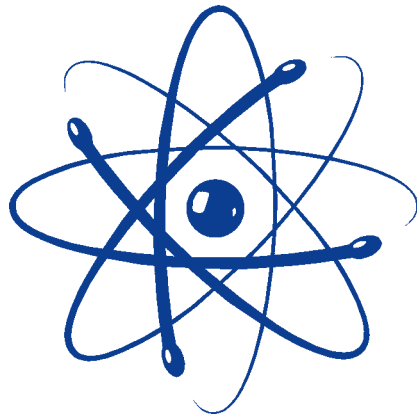


HYDROPOWER

ENERGY KNOCKDOWN CAN LABELS



NATURAL GAS

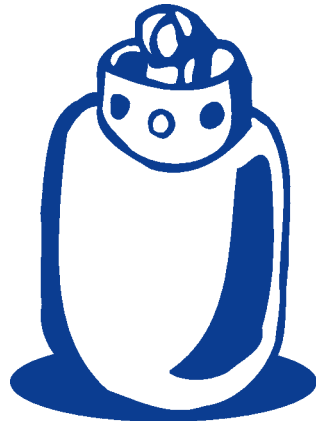


NUCLEAR

ENERGY KNOCKDOWN CAN LABELS

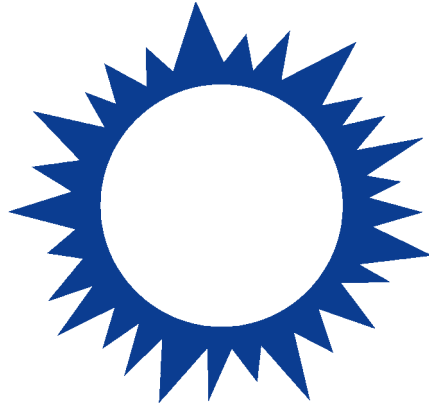


PETROLEUM



PROPANE

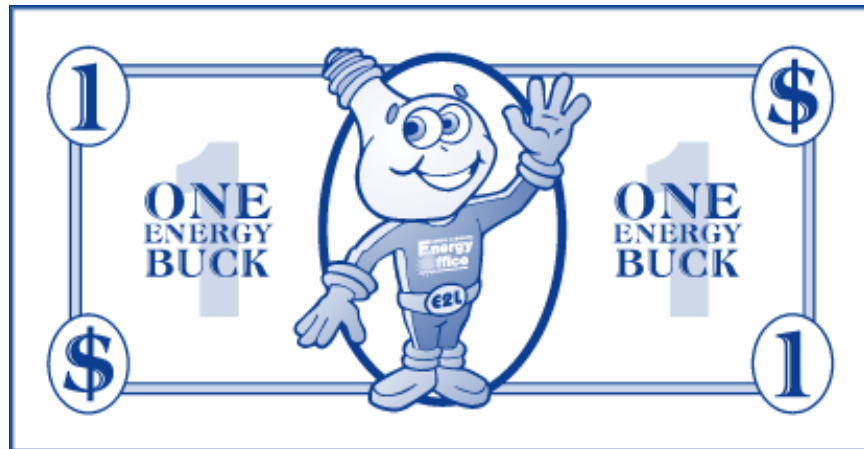
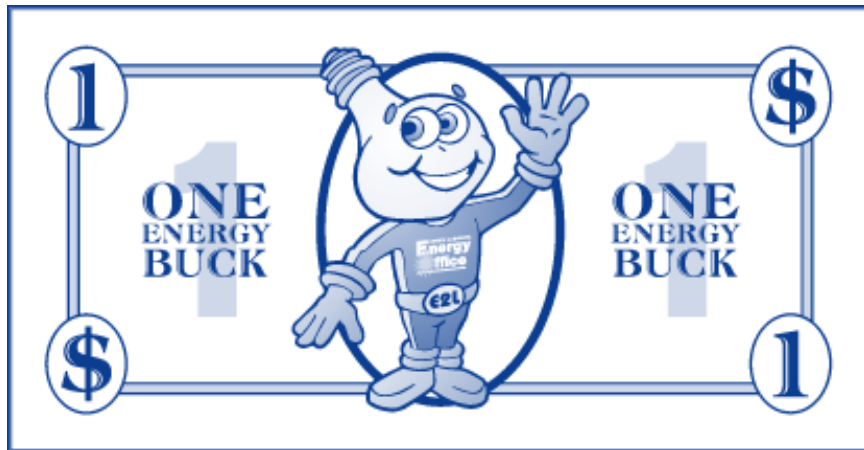
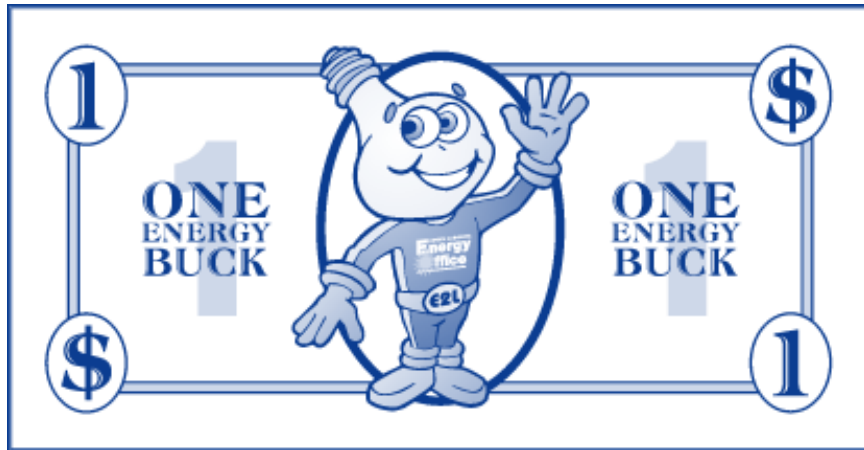
ENERGY KNOCKDOWN CAN LABELS



SOLAR



WIND



ENERGY JUMBLES

GETTING READY: Follow these steps.

1. You will need balloons (two colors), a circular button with pin, answer key, “Energy Jumbles” on pages 20-23 and pencils.
2. Choose two energy jumbles, make copies and cut them out. Also make copies of the “Energy Bucks” on page 17 and cut them out.
3. Roll up the jumbles, stuff them inside the balloons and blow up the balloons. Each different jumble should be stuffed inside a different colored balloon. Prepare one set of jumbles for each round.

SETTING UP: Depending on the ability of the group, mark a tossing line on the floor with tape. To pop the balloon, tape a circular button on the table (bending the pin so that it points straight up).

START: Read these instructions to the team playing the game – “You have five minutes to unscramble two “Energy Jumbles.” The jumbles are inside the balloons. Each balloon contains a different jumble. Choose a team member to toss the first balloon onto the pin to pop it. Team members can take turns tossing and retrieving the balloons until both balloons are popped. As each balloon is popped, team members can begin unscrambling the words. You will receive one energy buck for each word you unscramble.”

ENERGY JUMBLES ANSWER KEY

<p>#1 NONRENEWABLE</p> <p>A G S G A S</p> <p>O A C L C O A L</p> <p>L O I O I L</p>	<p>#3 ELECTRICITY</p> <p>W R P E O P O W E R</p> <p>O T A M A T O M</p> <p>N E L I L I N E</p>
<p>#2 RENEWABLE</p> <p>N S U S U N</p> <p>T W E A R W A T E R</p> <p>N W D I W I N D</p>	<p>#4 WHAT ENERGY DOES</p> <p>E T H A H E A T</p> <p>T N O M I O M O T I O N</p> <p>R W O G G R O W</p>

ENERGY JUMBLE #1

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ENERGY JUMBLE #2

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ENERGY JUMBLE #3

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ENERGY JUMBLE #4

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R W O G

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ENERGY DEFINITIONS

BIOMASS: Biomass is grasses, trees, garbage or yard waste - basically anything that is or was plant fiber.

COAL: Coal comes from deep inside the earth and is burned for heat or to make electricity.

ELECTRICITY: Electricity is a secondary energy source because it is produced from other forms of energy such as coal, natural gas, hydropower, fuel cells or photovoltaic (PV) cells.

ENERGY: The ability or capacity for doing work by a body or a system. The measurement of the total heat in a system. Heat can be converted between a number of forms including light, motion, electricity and warmth.

ENERGY CONSERVATION: The practice of extending the useful life of the earth's energy resources through wise and efficient management.

GEOTHERMAL: Geothermal energy comes from heat within the earth and is used to make electricity and provide heating.

HYDROGEN: Hydrogen gas is the simplest element known to man. When used as a fuel, its only by-product is water.

HYDROPOWER: Hydropower is energy produced by moving water. It often is used to generate electricity.

NATURAL GAS: Natural gas is a fossil fuel which most scientists believe formed millions of years ago from the remains of dead plants and animals. It often is used to heat homes or to power stoves and water heaters.

NUCLEAR ENERGY: Nuclear energy is used to provide electricity.

PETROLEUM: Petroleum, a fossil fuel formed from plants and animals, is used to power cars and trucks.

PROPANE: Propane comes from natural gas and petroleum wells. It is used to fuel appliances such as ranges, ovens, space heaters, furnaces, air conditioners and outdoor grills.

SOLAR: Solar energy is the light and heat provided by the sun.

WIND: Wind provides energy to turn windmills and turbines to generate electricity.