

# Using Energy Wisely



**RENEWABLE ENERGY**  
THE INFINITE POWER  
OF TEXAS

## For Grades 4 and 5

### OVERVIEW

This lesson introduces students to the idea that everything uses energy and the more energy we use, the more pollution we create. It also focuses on the roles of efficiency and conservation as ways to reduce overall energy needs. Students will familiarize themselves with topics in energy efficiency and conservation by engaging in an introductory class discussion, reading and discussing recommended text and the Reading Passage, furthering their knowledge by conducting library or Internet research,

conducting a Lab Activity to determine their vehicles' fuel efficiency and giving presentations of assigned topics. Each student should have a science notebook (a spiral notebook is suggested) to write their vocabulary words, information-organizing webs, and the Lab Report Form.

### OBJECTIVES

See Elementary School Teacher Resource Guide for TEKS objectives and additional information regarding this and other elementary school units.

### SUGGESTED TIMEFRAME

Teacher will determine how many class periods to devote to each activity based on the suggested timeframe and length of classes.

Day	Time	Activity Title	Content Area	Activity Task
1	<b>80 minutes total</b> 10 minutes 30 minutes 30 minutes  10 minutes	<b>Activity 1</b> – Teacher Introduction <b>Activity 2</b> – Assessment of Student Knowledge <b>Activity 3</b> – Vocabulary  <b>Activity 4</b> – Homework Assignment	Science Assessment Vocabulary & Language Arts Language Arts	Information synthesis Identify & describe learned knowledge Vocabulary development & application  Establishing a real world connection
2	<b>85 minutes total</b> 10 minutes 30 minutes 45 minutes	<b>Activity 1</b> – Collect Homework Assignment <b>Activity 2</b> – Literature Link <b>Activity 3</b> – Reading and Cooperative Group Work	Reading Language Arts	Reading for meaning Reading for meaning Looking for vocabulary in context Use of graphic organizer
3	<b>85 minutes total</b> 75 minutes 10 minutes	<b>Activity 1</b> – Internet or Library Research <b>Activity 2</b> – Homework Assignment	Science Technology	Collect, analyze & interpret information Collect information by observing & measuring
4	<b>100 minutes total</b> 20 minutes 80 minutes	<b>Activity 1</b> – Pre-Lab <b>Activity 2</b> – Lab: Energy Efficiency of Vehicles	Mathematics Science	Information synthesis Analyze & interpret information Construct simple graphs to organize, examine & evaluate information
5	<b>100 minutes total</b> 75 minutes 25 minutes	<b>Activity 1</b> – Group Presentations <b>Activity 2</b> – Assessment Questions	Language Arts Science	Application of learned knowledge in verbal & graphical format Review of learned material

## REQUIRED MATERIALS

- copy of the Reading Passage for each student
- list of vocabulary words displayed so the entire class can view it (i.e. overhead transparency, chalkboard, poster, etc.)
- copy of the Assessment Questions for each student
- copy of the Lab Report Form displayed so the entire class can view it (i.e. overhead transparency, chalkboard, poster, etc.)
- graph paper for each student
- calculator for each student
- five (5) large sheets of paper
- *The Paper Bag Prince* by Colin Thompson, Random House, 1997

## Advanced Preparation for Lab – Energy Efficiency of Vehicles

1. Send home a note to parents no less than two weeks in advance of this unit explaining the Lab Activity, “Energy Efficiency of Vehicles,” and the information students should obtain from home. During the lab, students will determine the fuel efficiency of a vehicle in their home. Parents should help students gather information during 2 consecutive trips to the gas station: TRIP 1 – vehicle’s odometer reading; TRIP 2 – vehicle’s odometer reading, gallons of gas purchased and price per gallon of gas. Students will work in small groups and share their data to compare differences and similarities in their vehicles’ fuel efficiency.
2. Collect on-line vehicle brochures from various car manufacturers’ web sites. Make a list of the tank gallon size and fuel efficiency listings of various automobiles. Students can use this list during the Lab Activity to compare actual with advertised fuel efficiency. Refer to the Teacher Resource Guide for suggested web sites.

## DAILY ACTIVITIES

### Day 1 – 80 minutes

#### Activity 1 – Teacher Introduction (10 minutes)

Begin the unit with an anticipatory set that sparks the class’ attention and makes the subject relevant to the students’ lives. The concept of pollution from a benign substance can be demonstrated by diffusing particles, such as perfume, in a controlled environment such as a classroom. The more perfume that is sprayed, the more the air quality is compromised. Students should recognize that the perfume can be compared to energy, the diffused particles and the smell is the pollutant. Postulate over whether the air would be tolerable if the entire contents of the perfume bottled were sprayed out. (See Teacher Resource Guide for other suggestions.) Continue the introduction by telling students that for the next unit of study they will be learning about how we use energy, how it can affect the environment and how we can improve our energy usage. Remind students that on Day 4 they should bring information about their vehicle’s gas consumption (2 odometer readings, gallons of gas purchased, and price per gallon of gas).

#### Activity 2 – Assessment of Current Student Knowledge (30 minutes)

To assess what students already know, prompt a class discussion based on the 5 questions listed below. A graphic organizer (such as a web) is a good tool to use during this discussion because it allows visual learners to make connections to concepts they already know. Sample graphic organizers are included in the Teacher Resource Guide. The graphic organizer should be formatted so that information can be added to it throughout the Unit of Study.

Questions for class discussion:

1. What does it mean to be efficient?
2. Are the classroom surroundings, such as desks, windows, books, etc., created with energy?

3. Do you think we are smart about the way we use energy?
4. How is pollution created?
5. Can we do anything to reduce the amount of pollution we create?

## Activity 3 – Vocabulary Review

(30 minutes)

Have the students use dictionaries to find the definitions of the vocabulary words and record them in their science notebooks. See list of vocabulary words on page 7. They should create meaningful sentences with each word that reflect an understanding of the definition. If you began the alternative vocabulary activity suggested in the Teacher Resource Guide, ask students to pull the cards with words relevant to this unit. Students can first quiz each other using the flash cards they prepared, or students can play the board game they created, and then create sentences in their science notebooks using each word.

## Activity 4 – Homework Assignment – A Day Without Energy (10 minutes)

Have the students imagine a day without energy and write a scenario of that day. A Language Arts grade could be assigned for this assignment. TEKS classificatory writing strategies should be used to fully develop the theme.

Read the following passage as points students should consider while completing their writing assignment:

Imagine how you would spend a day without using any energy. When you wake up (to your wind-up alarm clock) you could mix some water with powdered milk to have with your dry cereal. (Oops. How much energy does it take to make cereal and powdered milk?) You could at least squeeze some oranges for juice. Remember, no electricity to watch TV or use lights; read only by daylight. No gas for the car; walk or bike everywhere. It's OK to use free, natural energy like sunshine to dry your clothes, but be sure to wash them by hand in cold water. What other ways do you use energy? What foods require energy

to cook or keep fresh? (Remember, ice cream needs electricity to keep it frozen.) How will you get to school? Does your classroom have enough windows to provide light? Will the temperature be comfortable without air conditioning or heat? Would meeting outside under a tree be better? Think how you will get through a day without energy. What you will do all day to use less energy?

## Day 2 – 85 minutes

### Activity 1 – Collect Homework

**Assignments** (10 minutes)

Ask some willing students to share a short passage from their papers.

### Activity 2 – Literature Link (30 minutes)

Read *The Paper Bag Prince* by Colin Thompson to the class. As a class discussion, have the students summarize the story and identify the main ideas. Consider the message that each main idea portrays.

### Activity 3 – Reading and Cooperative Group Work (45 minutes)

1. On the large sheets of paper, write down a topic heading and its respective questions allowing space for answers to be added (see “Group Reading Section Topics and Questions” below). Each topic with its respective questions should appear on a separate page.
2. Organize the students into 5 equal groups, attempting to cluster reading skills. Assign each group to one of the reading topics listed below based on sections from the Reading Passage. Assign the longer sections to the more advanced readers. Distribute to each group the large sheet of paper with its topic and questions written on it.
3. In the small groups, instruct the students to read aloud individual sentences or paragraphs from the assigned section of the Reading Passage.
4. Once all of the paragraphs have been read, each group should create answers to the assigned questions for their section and record them on the large sheet of paper. Instruct each group

to create a new graphic (chart, image, etc.) with a caption that illustrates the concepts described in their assigned section. Explain to the class that each group will also conduct library or Internet research on their topic to expand their knowledge. Each group will make a presentation on day 5 about the information they learned about their reading passage and their additional research. The presentation will also include information from the Lab Activity. Inform the class that assessment questions will include information from each group. (See Teacher Resource Guide for reading passage assignments and group presentation guidelines.)

## Group Reading Section Topics and Questions

### Group 1 – How much energy do we use?

#### Are we using energy wisely?

1. How much energy do we use every day?
2. What are 4 things we do that use energy?
3. Who uses more energy: a person in the U.S. or a person in Japan?
4. What are 3 things in our lives that could use less energy?

### Group 2 – Energy creates pollution

1. What are 3 pollutants that are made when gasoline is burned?
2. Why are pollutants bad for us?
3. How can pollution be prevented?

### Group 3 – Energy conservation and energy efficiency

1. What is energy conservation? (Give examples)
2. What is energy efficiency? (Give examples)
3. Does energy conservation mean being uncomfortable? Why or why not?

### Group 4 – Changing the way we use energy

1. Are we starting to use energy more or less wisely? Why?
2. What are 2 items in your home that are more efficient today?
3. What are 2 ways that you could use energy more efficiently today?

### Group 5 – Efficiency and conservation save money

1. What does this sentence mean: “You have a choice when you use energy.”
2. How can you save money by changing light bulbs?
3. Why does recycling save energy?

## Day 3 – 85 minutes

### Activity 1 – Cooperative Group Work for Internet or Library Research (75 minutes)

1. Refer to the Teacher Resource Guide section on “Cooperative Group Work for Internet or Library Research” for more information how to conduct this activity.
2. Working in the same groups from Day 2, students should identify one question assigned to their group and find more information about it. Students should record new information learned in their science notebooks.
3. When students return to class following the library or Internet research, they should review their findings and add new information to their large sheet of paper. Based on their findings, each group should identify 4 tips for *Using Energy Wisely* and create a graphic illustrating one of the tips.

### Activity 2 – Homework Assignment

(10 minutes)

Students should bring information about their vehicle’s gas usage from 2 consecutive trips to the gas station. Trip 1 – odometer reading; Trip 2 – odometer reading, gallons of gasoline purchased and dollar amount of gas purchase.

## Day 4 – 100 minutes

### Activity 1 – Pre-Lab (20 minutes)

Explain to the class that for the next activity they will calculate the fuel efficiency of their vehicles based on odometer and gas consumption readings that they gathered from home. The purpose of the activity is to learn how to calculate the miles per gallon their

vehicles can achieve and to translate that into an efficiency rating. Students will also determine which vehicles are the most efficient. Display the Lab Report Form with accompanying questions and instruct students to copy it into their science notebooks. Explain to the class that each student should tabulate his or her data as well as their group members' data and graph their group's results on graph paper.

## Activity 2 – Lab – Energy Efficiency of Vehicles (80 minutes)

(Note: The lab activity could be divided into 2 parts.)

- a. Organize students into the same 5 groups from the cooperative group work activity. Students will share information gathered about their vehicles' mileage and gallons of gas used.
- b. Tell each student to record his or her vehicle's information into the Data Table in the Lab Report Form. Students should then share and record into their Data Table information from each student's vehicle in their group.
- c. For each vehicle, instruct students to:
  - calculate the number of miles traveled by subtracting the 2nd (end) odometer reading from the 1<sup>st</sup> (start) odometer reading;
  - calculate the miles per gallon by dividing the number of miles traveled by the gallons of gasoline purchased;
  - record the data on their Lab Report Form.
- d. Instruct students to refer to the Fuel Efficiency Ratings Chart on the Lab Report Form. Based on the miles per gallon they calculated for each vehicle, students should record the efficiency rating in the Efficiency Rating column for each vehicle. (If you were able to obtain advertised fuel efficiency ratings from vehicle manufacturers' Web sites, instruct students to compare their actual ratings with advertised ratings.)
- e. Distribute graph paper to each student.
- f. Instruct students to make a bar graph of the miles per gallon calculation for each vehicle in their group. The x-axis should reflect the vehicle (make, model and year) and the y-axis should reflect the miles per gallon. Students

should also include by each bar graph the Fuel Efficiency Rating assigned each vehicle.

- g. Inform students that they should include their results in their presentation on Day 5.

## Day 5 – 100 minutes

### Activity 1 – Group Presentations

(75 minutes)

1. Allow students 5-10 minutes to meet in their groups from Day 3 and review the material they will include in their presentation (answers from their group discussion questions and research, 4 tips to Use Energy Wisely, and results of their Lab Activity).
2. Bring students together as a class and have each group present their topic (allow 15 minutes for each group). Remind the students that everyone will be assessed on the topics from the presentations, so they should all pay close attention.
3. After all the student groups have presented their information, refer to the graphic organizer created on Day 1. With the entire class, add to the graphic organizer any new concepts that the students learned. Be sure to include any information required for answering the Assessment Questions.

### Activity 2 – Assessment Questions

(25 minutes)

Distribute the handout of Assessment Questions to each student. Working individually, students should write down answers to the questions in the space provided. Once everyone has completed the questions, review the answers with the entire class.

## ADDITIONAL ACTIVITIES

### 1. Determine your ecological footprint (mathematics)

This activity involves determining the impact of our energy usage on the environment (also known as our "ecological footprint"). Display the following points so the entire class can view

them (i.e. overhead transparency, chalkboard, poster, etc.) and review with the class:

- Families use energy in many ways. We burn gasoline in our cars and cook dinner in our ovens. We also use energy when we purchase something, such as a sofa, that took energy to make. Working this exercise will give you an idea of how much carbon dioxide air pollution your family makes by using energy.
- An average Texas home uses about 1,000 kilowatt hours (kWh) of electricity per month. An average kWh produced in Texas creates 1.54 pounds of carbon dioxide (CO<sub>2</sub>).
- An average Texas home uses 12 therms of natural gas per month. Burning one therm of natural gas releases 39 pounds of CO<sub>2</sub>.
- An average new car gets 27.5 miles per gallon and travels 15,000 miles per year. Each gallon of gasoline burned emits 5 pounds of CO<sub>2</sub>.

Have students complete as many of the following tasks as time allows:

- a. Instruct students to add up the total pollution created by an average Texas home and car.
- b. Have students ask their parents how much electricity their home used in the past month (kilowatt hours will be listed on their electric bill). Then have students calculate how much pollution their home created based on their electric consumption.
- c. Ask students if they could replace any of the energy they used with clean, renewable

energy resources? How much less pollution would be produced?

- d. Estimate the number of households in your city in order for students to see the magnitude of this ecological situation.
- e. Extend this by getting similar information for the school's energy use and determining your school's ecological footprint.

## 2. Watt Watchers of Texas

Using the Internet, have students explore the Texas Watt Watchers Program at <http://wattwatchers.org> and explore the various activities located on this web site.

## 3. Paper Bag Messages

This activity builds on concepts taught in *The Paper Bag Prince*. Ask students to consider that the old man in the story is called the Paper Bag Prince because he has an especially big collection of paper grocery bags he has collected from the dump. Bring to class (or ask students to bring) used paper grocery bags. Have your students decorate the grocery bag with messages supporting renewable energy and/or the environment. Contact a local grocery store that would be willing to participate, and take the bags created by your students to the grocery store for reuse. This activity helps spread the message of reduce, reuse and recycle throughout your community.

## 4. Display

Create a hall or class display (poster, bulletin board, etc.) that summarizes the Tips to Using Energy Wisely as determined by the small groups. The display should include the graphics created by each group.

# TEACHER ANSWER KEY

## Vocabulary Words

**carbon dioxide** – a colorless, odorless, non-combustible gas formed during respiration, combustion, and organic decomposition

**carbon monoxide** – a colorless, odorless, highly poisonous gas formed by the incomplete combustion of carbon material, such as gasoline

**(compact) fluorescent (light) bulb** – a bulb that produces visible light by electromagnetic radiation; a glass tube whose inner wall is coated with a material that lights when an electrical current causes a vapor within the tube to discharge electrons

**conservation** – a careful preservation and protection of something; planned management of a natural resource to prevent exploitation, destruction, or neglect

**efficiency** – being effective with minimum waste, expense, or unnecessary effort

**incandescent** – a bulb that emits visible light when a metal wire is heated

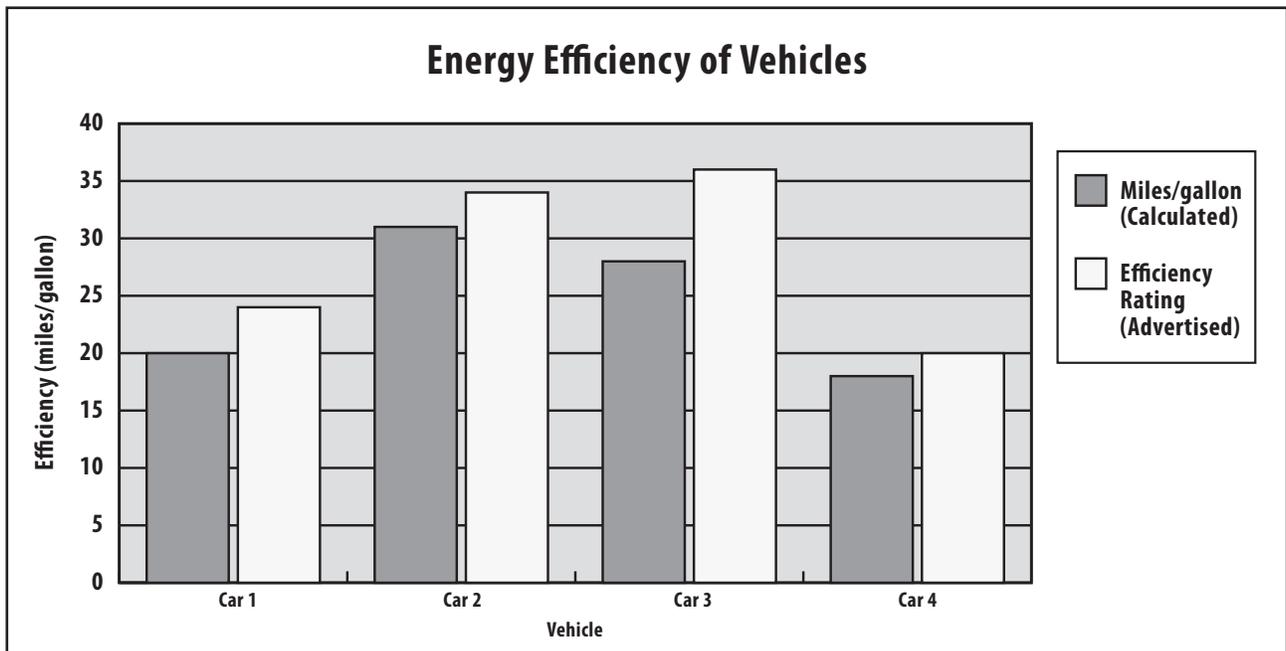
**nitrogen oxide** – a poisonous, brown gas often found in smog and automobile exhaust fumes

**pollution** – a material that is harmful to living things

**recycling** – the act of using an item again instead of throwing it away

**sulfur dioxide** – a colorless, irritating gas generated in many industrial processes and in the production of electricity from coal

**therm** – a unit of heat equal to 1000 large calories



**SAMPLE BAR GRAPH**

## Group Reading Section Questions

### Group 1 – How much energy do we use? Are we using it wisely?

1. Every person in the US uses as much energy as 7 gallons of gasoline every day.
2. Things that we do that use energy include: growing food; lighting buildings; cooking food; driving; making products; and keeping buildings cool or warm.
3. A person in the US uses more energy than a person in Japan.
4. Things in our lives that could use less energy include: cars, light bulbs, factories, and homes.

### Group 2 – Energy creates pollution

1. When gasoline is burned, carbon dioxide, sulfur dioxide, nitrogen oxide and carbon monoxide are created.
2. Pollutants are bad for us because they make the air dangerous to breathe and make some people sick.
3. Pollution can be prevented by saving energy and not using it.

### Group 3 – Energy conservation and energy efficiency

1. Energy conservation is doing things that save energy, such as turning off lights when leaving the room, setting the heater to a lower temperature in the winter or setting the air conditioner to a higher temperature in the summer.
2. Energy efficiency is replacing items that are not energy efficient with ones that are, such as changing to compact fluorescent bulbs or buying an efficient refrigerator.
3. When done the right way, energy conservation will not be noticed.

### Group 4 – Changing the way we use energy

1. We are starting to use energy more wisely, because the efficiency of most things is getting better.
2. Items that are more efficient today include: refrigerators, windows, and cars.
3. Ways to use energy more efficiently include: hanging clothes outside to dry; buying newer, more efficient appliances and vehicles; buying new efficient windows.

### Group 5 – Efficiency and conservation save money

1. You can choose to use items that use less energy.
2. Compact fluorescent light bulbs use much less electricity, so the utility bill will be lower.
3. Requires students to draw a conclusion: reusing and recycling save energy because new items will not have to be manufactured, which consumes production energy.

### Assessment Questions

(descriptive answers may vary)

- A.1. The U.S. has about 5% of the world's population and consumes about 25% of the world's energy.
- A.2. Possible activities that require energy include: lighting buildings, cooking food, drying clothes in a dryer, washing clothes in a washing machine, driving to school, keeping homes cool or warm, and manufacturing products.
- A.3. Automobile efficiency is defined by the miles per gallon rating.
- A.4. These three chemical compounds are poisonous to living creatures and pollute the air we breathe making some people sick.
- A.5. Some products that use energy efficient technologies are refrigerators and clothes dryers, windows, air conditioning and heating units, and compact fluorescent light bulbs.
- A.6. Consumers can purchase products that use less energy for the same effect such as compact fluorescent light bulbs; turn off lights when not in a room; walk to the store instead of driving; turn off the water when brushing their teeth; keep the refrigerator door shut as much as possible; dry clothes outside on a clothes line and only wash a full load of clothes.
- A.7. An incandescent light bulb gives off the same light as a compact fluorescent bulb but uses much more energy. It also has a shorter lamp life, thereby requiring more frequent replacement, and therefore embodies a higher life cycle cost.
- A.8. The compact fluorescent bulb is more efficient.
- A.9. Some of the ways people can conserve energy without giving up comfort is to install fans in their homes and use less air conditioning, put on a sweater and turn the heat down, and let the sun and wind dry their clothes.

# Using Energy Wisely



**RENEWABLE ENERGY**  
THE INFINITE POWER  
OF TEXAS

## HIGHLIGHTS

- Almost everything uses energy
- Energy conservation and energy efficiency mean less energy used
- Less energy, less pollution
- Changing the way we use energy
- Energy efficiency saves money

## HOW MUCH ENERGY DO WE USE?

Imagine how much energy your family car would use in 156 years. That is how much the world uses every second. In the time it takes you to snap your fingers, the world

uses the same amount of energy as 85,000 gallons of gasoline.

That means that you and I and every person in the United States use as much energy as seven gallons of gasoline every day.

Everything we do uses energy:

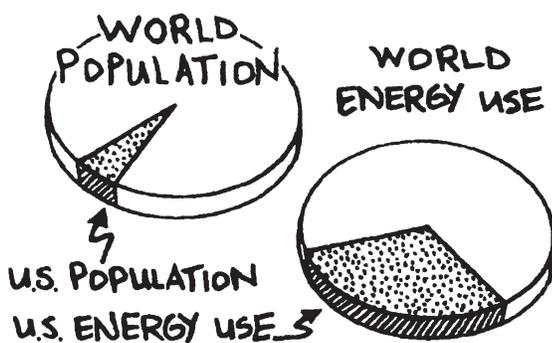
- growing our food
- lighting our schools
- cooking our food
- driving to our offices
- making products
- keeping our homes cool or warm

Energy is such a big part of our lives, we could not make it through the day without it.

## ARE WE USING ENERGY WISELY?

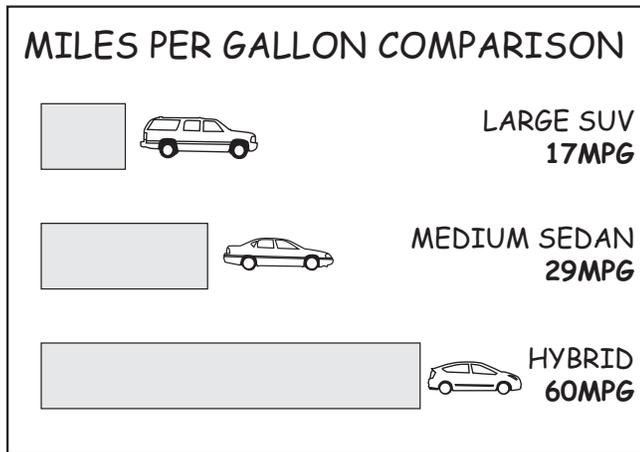
In many cases, the answer is no. A person in the United States uses twice as much energy as someone in Japan or Germany. The U.S. has only 5 percent of the world's population, but uses about 25 percent of the world's energy.

Scientists say that everything from cars, to light bulbs, to factories, to our homes could use less energy than it does now. Using less energy to do the same thing is called



**WORLD vs. U.S.** The United States has about 5% of the world's population, yet uses about 25% of the world's energy.

energy efficiency. We could have the same level of comfort while using one-half of the energy we do now.

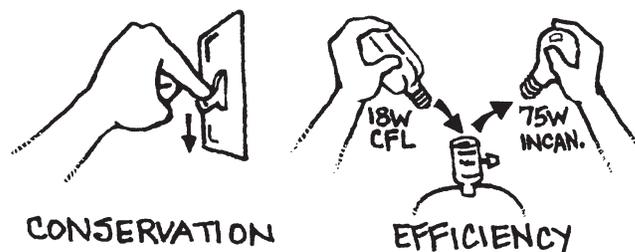


**FUEL EFFICIENCY OF DIFFERENT CARS** Some cars are more efficient than most cars we see on the road today. Hybrid cars, which use gas and electric motors, are more than 3 times as efficient as large SUVs.

## ENERGY CREATES POLLUTION

Imagine every person at your school and in your city using as much energy as seven gallons of gasoline every day. Now imagine burning seven gallons of gasoline at an assembly in your school. Not only would it be dangerous, but it also would create a lot of pollution.

The air in your school would be filled with pollutants such as carbon dioxide, sulfur dioxide, nitrogen oxide and carbon monoxide. Some of these gas pollutants are dangerous for people to breathe and make some people sick.



**CONSERVATION & EFFICIENCY** Conservation is using energy without waste. Efficiency is using items that use less energy.

Using energy creates pollution. Saving energy prevents pollution.

## WHAT ARE ENERGY CONSERVATION AND ENERGY EFFICIENCY?

Energy conservation is doing things that save energy. It means that you turn off the lights when you leave the room. It means that you set your heater to a lower temperature in the winter and wear a sweater around the house. It could also mean that you set your air conditioner to a higher temperature in the summer and use a ceiling fan. Energy conservation means that you do not use energy when you do not have to.

Energy efficiency is replacing items that are not energy efficient with ones that are. It means switching from a regular light bulb to a compact fluorescent bulb that uses less energy or buying an efficient refrigerator.

Some people think energy conservation means keeping their house too cold in the winter or too hot in the summer. But you do not have to be uncomfortable when conserving energy or using it more efficiently. When done the right way, conservation and efficiency will not even be noticed. Energy conservation and energy efficiency are important ways to use our energy wisely.

# CHANGING THE WAY WE USE ENERGY

Students in school today will be the most energy efficient group of people in history! The energy efficiency of almost every thing you use is getting better. We are starting to use energy more wisely.

Once you start saving energy, you will find that there are some things in your home that you might not need to use at all. Instead of using a clothes dryer, for example, you can dry your clothes outside in the sun.

New refrigerators are three times as efficient as old refrigerators. Today you can buy windows that keep your house cooler in the summer and warmer in the winter because of the type of glass they use. You can buy a car today that drives nearly 65 miles on a gallon of gasoline.

Even more efficient models of these items and others are on the way. Soon there will be cars that can drive from coast to coast on one tank of gas, windows that

cloud up on hot days to keep the heat out, and refrigerators that use one-half the electricity of today's most efficient ones.

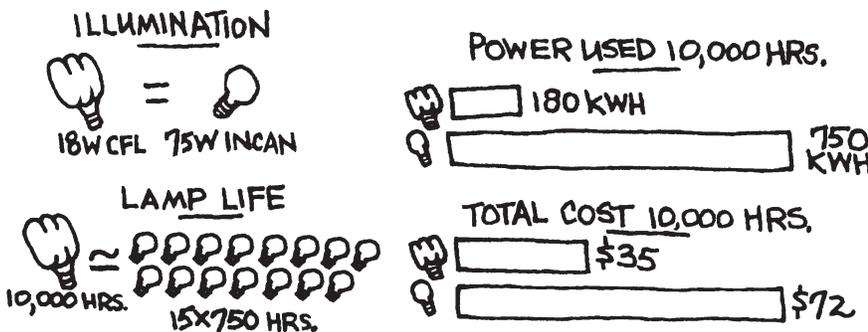
## EFFICIENCY AND CONSERVATION SAVE MONEY

You have a choice when you use energy. Think about light bulbs. Some light bulbs use much less energy than others. You also have a choice in air conditioners, most appliances and cars. You may already be using products that conserve energy and save money.

A 75-Watt incandescent light bulb can be replaced with an 18-Watt compact fluorescent light bulb. Both produce the same amount of light. But using a light bulb that uses less energy will save you money while enjoying the same amount of light.

When the cost of energy is included, the cheapest product is the one with the lowest cost to own and use. Not only does the compact fluorescent light bulb save money, but it also reduces pollution. Look for efficient products and figure out how much

energy they will use. And remember to turn off lights or the TV or radio when you are not using them. Riding your bike, walking or taking the bus instead of getting into a car and driving somewhere saves a lot of energy. Reusing and recycling things saves energy, too. Choose to use energy wisely.



**COMPACT FLUORESCENT BULBS vs. INCANDESCENT BULBS** You have a choice when you use energy, like choosing light bulbs that save energy and money.

Lab Title \_\_\_\_\_

Date \_\_\_\_\_

Purpose of this lab is to \_\_\_\_\_

**Data Table. Energy Efficiency of Vehicles**

Year	Make/Model	Visit # 1 Odometer Reading (Start)	Visit # 2 Odometer Reading (End)	Number of Gallons of Gasoline Purchased	Miles per Gallon (calculated)	Efficiency Rating

**Fuel Efficiency Rating Chart**

Cost per gallon of gas today is \$\_\_\_\_\_

Poor	5 mpg to 15 mpg
Moderate	16 mpg to 25 mpg
Improved	26 mpg to 35 mpg
Very Good	36 mpg to 47 mpg
Excellent	48 mpg to 62 mpg

In each column above, write down the information needed. Record the same information for each vehicle in your group.

- Which is the most efficient model vehicle? \_\_\_\_\_
- Which is the most efficient year vehicle? \_\_\_\_\_
- What is the difference in the cost of gasoline (energy fuel) when it was \$0.85 per gallon versus today's cost per gallon of \$\_\_\_\_\_ per gallon? \_\_\_\_\_
- What does this extra cost for energy use mean to you? \_\_\_\_\_  
\_\_\_\_\_

1. How much of the world's total energy does the United States use? \_\_\_\_\_
2. List five activities that require energy:
  - 1 \_\_\_\_\_
  - 2 \_\_\_\_\_
  - 3 \_\_\_\_\_
  - 4 \_\_\_\_\_
  - 5 \_\_\_\_\_
3. How do you figure out the efficiency of a vehicle?  
\_\_\_\_\_  
\_\_\_\_\_
4. How do sulfur dioxide, nitrogen dioxide and carbon monoxide affect your health?  
\_\_\_\_\_  
\_\_\_\_\_
5. What are some products that are energy efficient?  
\_\_\_\_\_  
\_\_\_\_\_
6. How can you conserve energy?  
\_\_\_\_\_  
\_\_\_\_\_
7. What is the difference between an incandescent light bulb and a compact fluorescent light bulb?  
\_\_\_\_\_  
\_\_\_\_\_
8. Which type of light bulb is more energy efficient? \_\_\_\_\_
9. What are some of the ways people can conserve energy without giving up comfort?  
\_\_\_\_\_  
\_\_\_\_\_





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**RENEWABLE ENERGY**  
THE INFINITE POWER  
OF TEXAS

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