Lesson Plan Fuel Efficiency versus Fuel Conservation

"America's strength is not in our oil reserves, but in our reserves of innovation."

Senator Joseph Leiberman, upon sponsoring legilation to protect the Artic Nation Wldlife Refuge.

Q: How many professional wrestlers does it take to change a light bulb?

A: Three. One to yank the old bulb out, throw it on the floor, and try to jump onto it from a great height, and then actt surprised when it rolls out of the way at the last minute. A second to pretend to twist the new bulb in – round and round—so far it almost breaks. And some guy in a black and white striped uniform whose function is never made quite clear – to protest about something or other, to the complete indifference of the bulb changers.

A: One.

Q: How many psychics does it take to change a light bulb?

Grade Level: 6th-8th Grades

Objective: The student will learn about fuel efficiency and fuel conservation and methods for achieving each.

TEKS:

Science: 6.3(B,D), 7.3(D,B), 7.14(C), 8.3(B,D), 8.5(A)

Social studies: 6.21(A,B,C), 6.21(B,D), 6.23(A,B), 7.20(C,D), 7.21(B,E,F,G), 7.23(A,B), 8.30(B,E,F,G), 8.32(A,B)

Time: 1 class period

Materials: internet access or printed material on fuel economy from reputable sources

Vocabulary: fuel economy, hybrid, dichotomous key

Background Information:

In the last year the price of gasoline has gone up dramatically. This price-per- gallon increase has made many drivers rethink their choice of vehicle and/or their planned trips. Car-pooling numbers have increased as people choose to drive their personal car less. Purchases of vehicles that have higher miles per gallon (mpg) have also increased, as has advertising of hybrid vehicles. With the media (print and television) giving so many choices and ideas, what should the consumer do?

You should look at the facts and make the best decision for your personal situation. You should look at what you want your outcome to be as well. Do you think fuel efficiency (purchasing the most efficient car available; making your car more efficient by following simple car driving rules) or fuel conservation (driving less; combining trips) is more important?

Lots of facts are bouncing around in the media. The following facts came from reputable sources such as www.fueleconomy.gov.

Aggressive driving (speeding, rapid acceleration and braking) wastes gas. It can lower your gas mileage by 33 percent at highway speeds and by 5 percent around town. Driving the speed limit and smooth starting and stopping can save you $0.16-$1.02 per gallon.

While each vehicle reaches its optimal fuel economy at different speeds, gas mileage usually decreases rapidly at speeds above 60 mph. As a rule of thumb, you can assume that each 5 mph you drive over 60 mph is like paying an additional $0.20 per gallon of gas.

Keep your engine properly tuned and check and replace clogged air filters. This could improve your efficiency by as much as 10% or $0.31 per gallon. Not only will this increase your efficiency, but it will also protect your engine.

You can improve your gas mileage by over 3% by keeping your tires properly inflated. This can save you almost $0.10 per gallon.

Combining errands into one trip saves you time and money. Several short trips taken from a cold start can use twice as much fuel as a longer multipurpose trip covering the same distance when the engine is warm. Trip planning ensures that traveling is done when the engine is warmed-up and efficient. With a little planning, you can avoid retracing your route and reduce the distance you travel as well. You'll not only save fuel, but also reduce wear and tear on your car.

When you decide to purchase a new vehicle, selecting which vehicle to purchase is the most important fuel economy decision you'll make. The difference between a car that gets 20 MPG and one that gets 30 MPG amounts to $775 per year (assuming 15,000 miles of driving annually and a fuel cost of $3.10). That's $3,875 extra in fuel costs over five years!

This lesson will help you and your students make an informed decision based on the "facts" you have.

Setting the Stage:
Ask the students to answer the following questions by show of hands.

1. Have you read an article or seen an advertisement telling you to save gas by purchasing a new car?

2. Have you read an article or seen an advertisement telling you to save gas by driving less?

3. Have you or a parent changed your plans based on the cost of gasoline?

Now have them write an answer to the following question.

1. What would you do to save gas based on the information you know now?

Activity 1: Fuel Efficiency versus Fuel Conservation
Have the students give you some ideas of methods they could use to be more fuel efficient or to conserve fuel. Write these on the board or overhead. Give facts from this lesson or from other sources as they propose ideas. Use prompting if they have missed any key areas.

Have the students take the list you made and separate it into two categories--fuel efficiency and fuel conservation. If an item does not seem to fit into one category, discuss that item and determine if you can modify the statement to make it fit in one category. If it cannot be modified, it may need to go into two categories.

Activity 2: The Fuel Dichotomous Key
A dichotomous key is a tool scientists use to determine the species of a plant or animal by asking general questions at the beginning and making the questions more specific as they go on.

Use this dichotomous key to have the students determine which method of saving fuel is the best for them based on the discussion you just had. Copy the key for each person, or post the key and have each student go through the answers quietly and write down their answers.

1a: I think efficiency is more important when saving gas… Go to Q2
1b: I think conservation is more important when saving gas… Go to Q5
2a: I can and will purchase a new car…Go to Q3
2b: I will keep my current car… Go to Q4
3a: I will purchase the most fuel efficient car available that meets my needs.
3b: I will purchase a car that uses new technology, such as a hybrid or a fuel cell vehicle.
4a: I will drive efficiently by driving the speed limit, using my gears wisely, driving smoothly so as to limit stop-and-go driving.
4b: I will do repairs/changes on my vehicle to make my car more efficient (proper tire pressure, change the filters, etc.).
5a: I will not drive… Go to Q6
5b: I will drive… Go to Q7
6a: I will take public transit to get to the places I need to be.
6b: I will use a bicycle, scooter or walk to the places I need to go.
7a: I will combine trips and use the shortest route possible so I will drive fewer miles.
7b: I will carpool so we are collectively traveling fewer miles on the road.

Activity 3: What Does My Decision Bring?

Have each student research his or her decision on ways to save fuel through the dichotomous key exercise. Have them find ways that they can save fuel through efficiency or conservation or research a new car. Find out how much they could save based on their parents' current driving habits and vehicle (or base it on your driving habits and vehicle).

Discussion:

1. What kind of car do you or your parents drive? How many miles to the gallon does it get?

2. What other product costs might increase due to the increase in fuel prices (the cost of food and other goods will eventually go up as well because of America's reliance on cross-country truck drivers to deliver goods.)

3. Should people be required to drive more fuel efficient cars and take inefficient cars off the roads?

Resources: www.fueleconomy.gov