Activity Overview

Grade Level: 9-12
Activity: HS-5

Description

Students will interpret government funding data charts, plot graphs and make inferences based on graphical observances.

Learning Outcome

Students will learn the relationship between government funding for renewable energy research and development, oil production and trends in energy consumption.

Subjects

Science, math, government, economics

Process Skills Used

Discussion, research, presentation, negotiation

Duration

2 class periods

Key Vocabulary

(Refer to supplemental vocabulary page)

Curriculum Standards

Texas (TEKS): 112.42.c.6, 112.44.c.5
Louisiana (LSCS):
SE-H-B1, SE-M-A6
Arkansas (ASCF) 4.1.28:
National (AAAS Project 2061):
The Designed World – 12th

Economics of Renewable Energy and Energy Consumption

Materials

1. "Facts About Renewable Energy" summary and "Renewable Energy Vocabulary" by the Alliance to Save Energy
2. Worksheet A – Trends in R&D Spending
3. Worksheet B – Energy Efficiency

Method

1. Read "Facts About Renewable Energy" referring to the vocabulary pages when necessary.
2. Complete Worksheets A and B

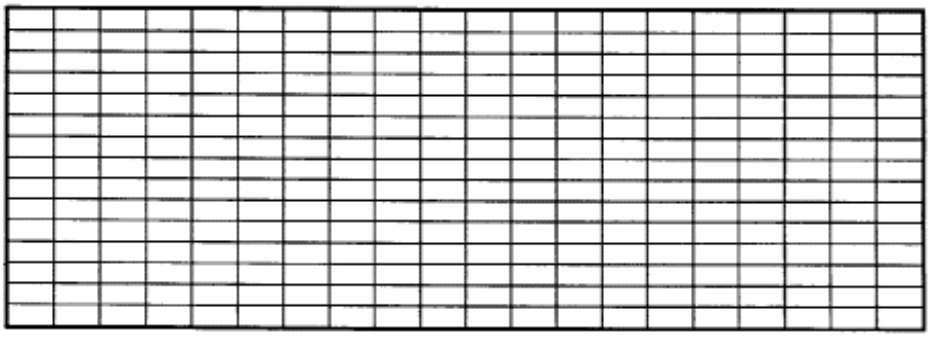
Worksheet A – Trends In R&D Spending

1. The United States Department of Energy (DOE) subsidizes research and development (R & D) in renewable energy. The data below show R & D spending since 1974 in **constant 1982 dollars.** The FY stands for fiscal year. Construct a line graph showing R & D funding by year. (Put R & D funding on the vertical axis and Fiscal Year on the horizontal axis.)

DOE Renewable Energy R & D Funding

($ millions, 1982 dollars)

FY74	$ 40	FY80	$ 850	FY86	$ 149
FY75	$ 132	FY81	$ 759	FY87	$ 123
FY76	$ 324	FY82	$ 279	FY88	$ 98
FY77	$ 513	FY83	$ 244	FY89	$ 88
FY78	$ 747	FY84	$ 192	FY90	$ 84
FY79	$ 875	FY85	$ 181	FY91	$ 114



2. Describe the trend in R & D spending that you observe.

_____

_____

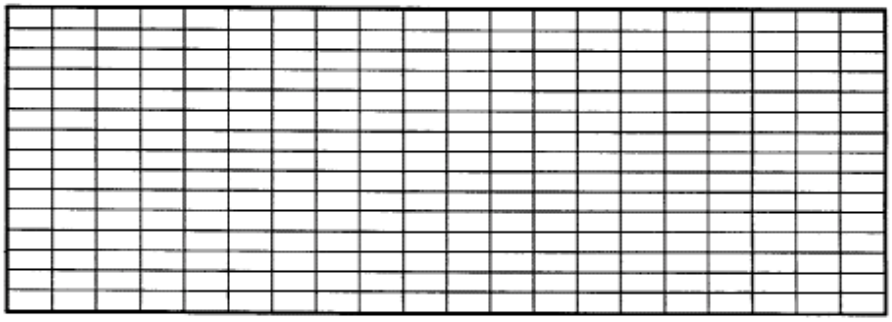
_____

_____

3. The data below give average current dollar price per barrel of oil since 1973. Price is rounded to the nearest dollar. Construct a line graph showing this data. (Put Price on the vertical axis and Fiscal Year on the horizontal axis.)

Average Price of Oil
(Current Dollars)

FY73	$2	FY79	$30	FY85	$28
FY74	$3	FY80	$36	FY86	$13
FY75	$10	FY81	$34	FY87	$17
FY76	$11	FY82	$32	FY88	$13
FY77	$12	FY83	$29	FY89	$16
FY78	$13	FY84	$28	FY90	$22



4. Describe oil price trends. How do they help explain the trends you observed in R&D funding?

Worksheet B – Energy Efficiency

1. Define **energy efficiency**.

   _____
   _____

2. List four ways you can be more energy efficient at *home?*

   _____
   _____
   _____
   _____

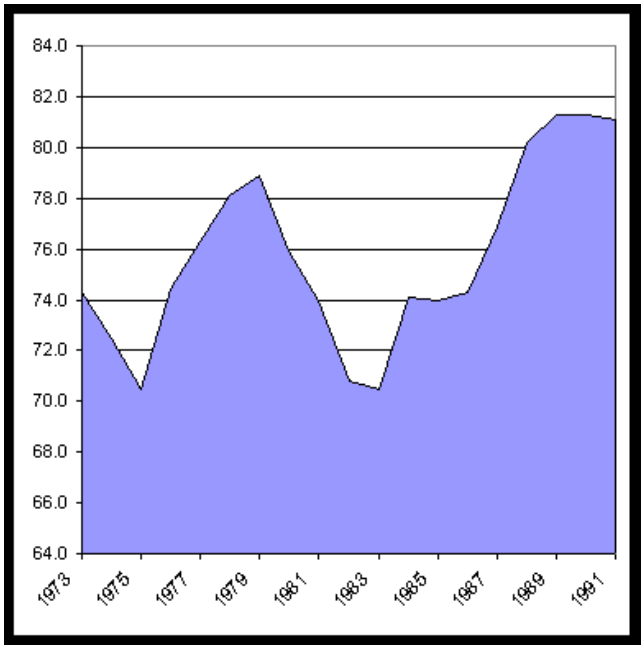
3. What are ways that a *business* can be more energy efficient?

   _____
   _____
   _____
   _____
   _____

4. The graph and chart below show total United States energy consumption from 1973 to 1991.

United States Energy Consumption (Quadrillion Btu's)

1973 Total --74.3
l974 Total --72.5
1975 Total --70.5
1976 Total --74.4
1977 Total --76.3
1978 Total --78.1
1979 Total --78.9
1980 Total --75.9
1981 Total --74.0
1982 Total --70.8
1983 Total --70.5
1984 Total --74.1
1985 Total --74.0
1986 Total --74.3
1987 Total --76.9
1988 Total --80.2
1989 Total --81.3
1990 Total --81.3
1991 Total --81.1



a. What was the increase in consumption from 1973 to 1991?

b. Compute the *percentage* increase from 1973 to 1991.

c. The Gross Domestic Produce (GDP) measures the value of all the goods and services produced in an economy in a year. Since 1973, the **real** (constant dollar) **GDP** of the United States has increased over 48 percent. Given this fact and your answer in b. above, what can you conclude about the **energy efficiency** of the United States from 1973 to 1992?

_____
_____
_____
_____
_____

5. The United States consumes more energy per unit of GDP than Japan or Italy (In 1988: United States — 18.0 thousand Btu's, Japan —11.2, Italy 13.6). Give at least two reasons for this difference

_____
_____
_____
_____

Source: Alliance to Save Energy and Indiana Department of Education, Energy Environment & Economics