U.S. Energy Pie

Grade-level: 6th– 9th grade

Concepts: Using math to explore changes in the use of energy sources.

Definitions: This lesson looks at the use of *primary* energy sources including: coal, natural gas, petroleum, nuclear electric power, hydroelectric power, geothermal, solar, wind, and biomass. *Primary* energy sources can be converted into *secondary* energy sources like electricity and hydrogen.

Procedure:

1. Find Table 1.3 (http://www.eia.gov/totalenergy/data/annual/pdf/sec1_9.pdf) of the *Annual Energy Review* online. Find the total amount of primary energy consumption for 1970 and the most recent year in the last column of this table. How much more energy did we use in the most recent year compared to 1970?

2. Use the most recent estimates from Table 1.3 to fill in the table on page 2 (attached). Calculate the percent of total energy from coal, natural gas, petroleum, nuclear, and total renewable sources.

3. Fill in the empty pie chart on the attached sheet. Label the year, total energy consumption, and percent for each energy source.

4. Look up the uses of each energy source on the table at: http://www.eia.gov/kids/energy.cfm?page=about_sources_of_energy-basics. Then, list the uses for each energy source next to the slices of pie.

5. List the energy sources in order from most to least used for both pie charts.

6. Discuss how and why the two energy pies are different. Try to predict what the energy pie will look like in five, ten, or twenty years from now?
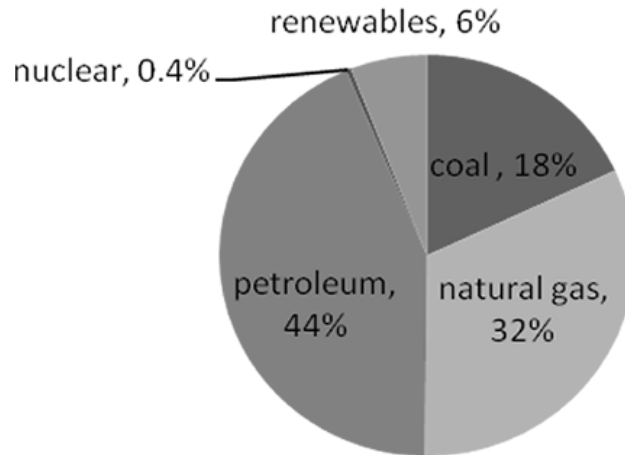
Primary Energy Consumption				
Source	1970		Recent year	
	Data Quadrillion British thermal units	% of Total	Data Quadrillion British thermal units	% of Total
Coal	12.265	18% 12.265/67.844		
Natural Gas	21.795	32% 21.795/67.844		
Petroleum(Oil)	29.795	44% 29.795/67.844		
Nuclear Electric Power	0.239	0.4% 0.239/67.844		
Renewable Energy (total)	4.076	6% 4.076/67.844		
Total	67.844	100%		

Primary Energy Consumption
1970
67.84 Quadrillion British thermal units

renewables, 6%

nuclear, 0.4%

coal , 18%

petroleum, 44%

natural gas, 32%

Primary Energy Consumption