# TEACHER'S GUIDE
## Activity 2 - Energy Through The Ages

### OBJECTIVE
Determine the energy required to run various appliances

### ANSWER KEY

| APPLIANCE | DAILY WATTS* | HOURS USED PER MONTH | WATTS USED PER MONTH | EQUIVALENT KWH |
|---|---|---|---|---|
| TELEVISION | 113 | X 60 HOURS | =6,780 | =6.78 |
| COMPUTER & MONITOR | 270 | X 120 HOURS | =32,400 | =32.4 |
| CLOTHES WASHER | 425 | X 20 HOURS | =8,500 | =8.5 |
| CLOTHES DRYER | 3,400 | X 20 HOURS | =68,00 | =68 |
| | | | TOTAL MONTHLY KWH | =115.68 |

1. (Total Monthly kWh x 3,400); 115.68 x 3,400 = 393,312 Btu
2. (Total Btu ÷ 1,031); 393,312 ÷ 1,031 = 381.49 cubic feet of natura l gas

### CHALLENGE ANSWERS FOR THE PROS AND CONS CHART MIGHT INCLUDE:

| TYPE OF FUEL | PROS | CONS |
|---|---|---|
| COAL | ■ Inexpensive<br>■ Well established<br>■ Large amounts available for many years<br>■ Can be used to generate electricity | ■ Air pollution<br>■ Nonrenewablle<br>■ Negative impacts of mining<br>■ Safety issues<br>■ Restoration issues |
| OIL | ■ Widely available<br>■ Well established distribution network<br>■ Cars are currently designed to run on gasoline | ■ Air pollution<br>■ Nonrenewablle<br>■ Getting more expensive<br>■ Increase worldwide demand (e.g., China, India) affects price |
| NATURAL GAS | ■ Widely available<br>■ Burns more cleanly than coal and oil (lower $CO_2$ emissions)<br>■ Easily transported | ■ Cleaner burning than others but still has emissions<br>■ Nonrenewablle<br>■ Price fluctuates |

### NATIONAL STANDARDS

#### Science
Standard 9. Understands the sources and properties of energy
Standard 12. Understands the nature of scientific inquiry

#### Math
Standard 1. Uses a variety of strategies in the problem-solving process
Standard 2. Understands and applies basic and advanced properties of the concepts of numbers
Standard 3. Uses basic and advanced procedures while performing the processes of computation
Standard 9. Understands the general nature and uses of mathematics

#### Geography
Standard 7. Knows the physical processes that shape patterns on Earth's surface
Standard 14. Understands how human actions modify the physical environment
Standard 16. Understands the changes that occur in the meaning, use, distribution, and importance of resources
Standard 18. Understands global development and environmental issues

### TIME CONSIDERATIONS
Approximately one class period