Energy Summary Reference Material Worksheet

1. Name six forms of energy. Name a source for EACH form of energy.

2. Read through all the “Energy Units” listed on page 1 and then, define the following units:

1. BTU
2. Kilocalorie
3. Kilowatt-hour

3. Study the graph of “U.S. Historical Energy Mix” on page 2. List the most used fuels STARTING FROM 1775 TO THE PRESENT. In other words, in 1775, name the fuel that was used the most. Then, give the approximate date that another particular fuel became most used. Continue to do this until after 1975.

4. Look at the year 1975 on the graph of “U.S. Historical Energy Mix” and list the types of fuels in order of most used to least used.

5. Read the section page 3, including the chart “Prices for Energy and Other Commodities.” What generalization can be made from that section concerning the importance of Energy in our society?

6. Copy and label the circle graphs on pages 3 and 4 OR make a chart listing the top FIVE Energy Consumers in the world and then, the top NINE Energy Producers in the world.

7. Where does the United States get most of its Petroleum (*oil*) resources from … copy the circle graph on page 4. Be sure to define “Domestic” and “OPEC.”

8. Study the chart on page 5, “Flow of Energy in the U.S. Economy: 1973”. Then, read and copy the “inferences” at the bottom of the page in your notebook.

9. Draw the diagram of Electrical Generation on page 6. Label the basic parts of electrical generation including: A. Using Steam (#1-4), turbine, generator, condenser, cooling water and water. Be sure you define or understand each of the terms and mechanisms.

10. Name three other sources (*given on page 6*) that are used to produce electricity.

11. Name TWO types of Energy Production that are being researched and utilized today. Define these two processes.

12. Answer the three questions listed at the bottom of page 7 based on “A Comparison of Wind-Powered Generators.”

Answer Key

1. Name six forms of energy. Name a source for each form of energy.

#  *Thermal = SUN, EARTH Radiant = SUN*

 *Chemical = FUELS Mechanical = SUN, WATER*

#  *Electrical = ALL SOURCES Nuclear = FUELS, EARTH*

1. Read through all the “Energy Units” listed on page 1 and then, define the following units: Btu, Kilocalorie and kilowatt-hour.

*Btu: British Thermal Unit… quantity of HEAT necessary to raise the temperature of one pound of water one degree Fahrenheit (252 calories)*

*Kilocalorie: 1000 calories; called Calorie; used as food calorie*

*Kilowatt-hour: the amount of energy equivalent to one Kilowatt of power being used for one hour; 3,413 Btu; 860 Kcal*

1. Study the graph of “U.S. Historical Energy Mix” on page 2. List the most used fuels STARING FROM 1775 TO THE PRESENT. In other words, in 1775, name the fuel that was used the most. Then give the approximate date that a another particular fuel became most used. Continue to do this until after 1975.

 *1975 = Wood 1910 = coal 1940 = (1) oil (2) Natural Gas*

1. Look at the year 1975 on the graph of “U.S. Historical Energy Mix” and list the types of fuels in order of most used to least used.

## Oil, natural gas, coal, hydropower, nuclear, wood

1. Read the selection on the second half of page 2, including the chart “Prices for Energy and Other Commodities.” What generalization can be made from that selection concerning the importance of Energy in our society.

*Availability and cost of energy is highly unstable and can change quickly.*

1. Copy and label the circle graphs on page 3 OR make a chart listing the top five Energy consumers in the world and then, the top nine Energy Producers in the world.

## See page 3 of reference material

1. Where does the United States get most of its Petroleum (oil) resources from…copy the circle graph on page 4. Be sure to define “Domestic: and “OPEC.”

*See page 4 of reference material*

*“Domestic” literally means “home” = United States*

*OPEC = Organization of Petroleum Exporting Countries*

1. Study the chart on page 4. Then, read and copy the “inferences” at the bottom of the page in your notebook.
2. *Coal’s major use was for electrical generation.*
3. *2/3 of all energy used to generate electricity was lost in generation or transmission.*
4. *Transportation was the least efficient sector of our economy.*
5. *2/3 of all energy used in society ends as WASTE*
6. *We need to develop more efficient energy to get less waste:*

*a) Resource recovery: recycling, reuse, composting, source separation, and source reduction*

*b) Alternative Energy: solar (photovoltaics) energy, hydropower, wind energy*

1. Draw the diagram of Electrical Generation on page 5. Label the basic parts of electrical generation including: A. Steam (#1-4), turbine, generator, condenser, cooling water and water. Be sure you define or understand each of the terms and mechanisms.

#  *See drawing on page 5 of reference material*

1. Name three other sources (given on page 5) that are used to produce electricity.

## Hydropower, OTEC (Ocean Thermal Energy Conversion), Photovoltaics

1. What two types of Energy Production that are being researched and utilized today. Define these two processes.

*Gasification: using coal to produce synthetic natural gas*

*Liquefaction: using coal to produce synthetic crude oil*

*Cogeneration: dual production of electricity and useful heat energy from a common source*.

1. Answer the three questions listed at the bottom of page 7 based on “A Comparison of Wind-Powered Generators.”

1. What two factors most effect the amount of energy that a wind powered generator can produce?

## Tower Height and wind speed

1. What assumption can you make concerning wind speed and the height a tower is above the ground? In other words, as the tower height increases above the ground, what happens to the wind speed?

*The higher the tower is above the ground, the greater the wind speed.*

1. Is the relationship between wind speed to height above the ground the same as the relationship between wind speed and elevation? Support you answer.

*Pretty much. As one would climb a mountain where elevation increases, the wind speed also increases. When you climb a tree, there tends to be more wind than on the ground.*