Name _____TEACHER KEY_____ Period _____ Date _____

Chapter 17.1 Environmental Science – ENERGY RESOURCES AND FOSSIL FUELS Chart

Directions: Fill in the information from the classroom or online chart.

Environmental Science Standard and element:

SEV4. Students will understand and describe availability, allocation and conservation of energy and other resources.

a.) Differentiate between renewable and nonrenewable resources including how different resources are produced, rates of use, renewal rates, and limitations of sources. Distinguish between natural and produced resources.

STUDENT CHECKLIST

1.) Put the chart in your Science Notebook behind the Chapter 16 Word Study after it has been checked. _____yes _____no

2.) The CHART was accurate and complete with no abbreviated information. _____yes _____no

3.) The Information was written neatly and large and dark enough to be easily seen. _____yes _____no

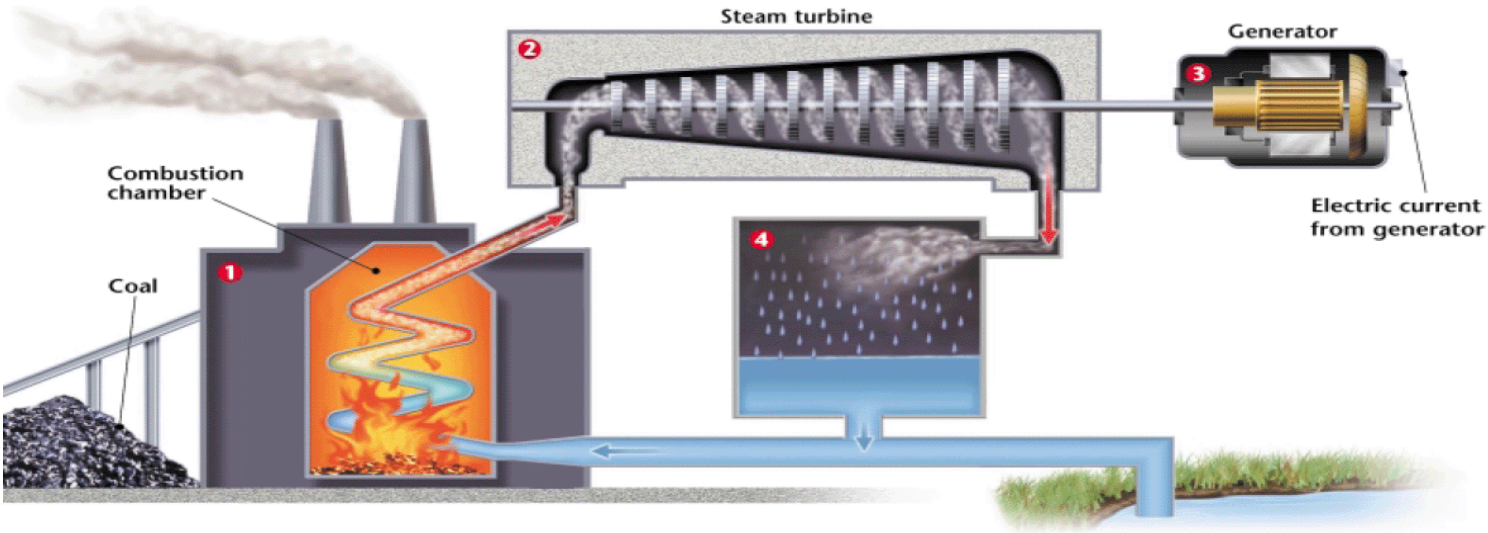
4.) All information was complete with no grammar or spelling errors. _____yes _____no

Fossil fuels are the remains of plants and animals that changed into coal, oil, or natural gas. There are four things needed to produce fossil fuels; a special recipe of dead plants and animals, millions of years of time, extreme heat, and extreme pressure. Fossil fuels are nonrenewable resources because when we dig, pump, or pipe the last amounts that we can find out of the Earth's crust, there will be none left to use.

FACTORS THAT INFLUENCE WHY AND HOW WE USE FUELS

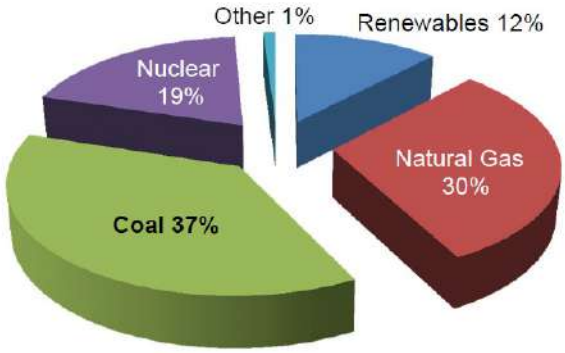
Coal	Cooking, generating electricity
Petroleum (oil)	Cooking, transportation, manufacturing, heating and cooling buildings, generating electricity
Natural Gas	Cooking, manufacturing, heating and cooling buildings, generating electricity
Nuclear	Cooking, manufacturing, heating and cooling buildings, generating electricity
Wind	Generating electricity
Solar	Generating electricity
Geothermal	Generating electricity
Hydroelectric	Generating electricity
Biomass	Cooking, heating buildings
Tidal Power	Generating electricity

HOW A COAL-FIRED POWER PLANT WORKS



1. Burning fossil fuels release energy in the form of heat, which is used to boil water and produce high-pressure steam.
2. The steam is directed against the blades of a turbine, which is set into motion.
3. The turbine is connected to an electric generator. The turbine sets the generator in motion, generating electricity.
4. Steam from the turbine is directed to a condenser where it cools and becomes liquid water to be cycled again.

U.S. Electricity Generation by Fuel, 2012 (Source: EIS)



ENERGY USE

World Patterns	• People use more energy in developed societies than people in developing countries
Energy Use in the United States	• The United States uses more energy per person than any other country in the world except Canada and United Arab Emirates. • Part of the reason we use so much energy is because 25% of its energy is used to transport goods from one end of the country to the other and the U.S. is a large country. • Residents in the United States and Canada have some of the lowest gasoline taxes in the world because gasoline is readily available so there is little incentive to conserve.

HOW FOSSIL-FUEL DEPOSITS FORM

Coal Formation	• Coal forms from the remains of plants that lived in swamps millions of years ago. • As ocean levels rose and fell, these swamps were covered with sediments which were compressed and heated in the Earth's crust forming coal.
Oil and Natural Gas Formation	• Oil and natural gas result from the decay of tiny marine organisms that accumulated on the bottom of oceans millions of years ago. • Over time these organisms were covered with sediments and compressed then heated in the Earth's crust forming oil or natural gas.

ADVANTAGES AND DISADVANTAGES OF COAL, OIL, & NATURAL GAS AS ENERGY SOURCES

	Advantages	Disadvantages
Coal	• Plentiful in the U.S. • A lot of technology for using coal is available • Cheap	• Carbon dioxide and sulfur dioxide are emitted when burned causing harmful air pollution • Coal is nonrenewable
Petroleum (Oil)	• Widely available • A lot of technology for using oil is available • Best method available to use for transportation	• The greenhouse gas carbon dioxide is released as well as other air pollutants when it is burned • Oil is nonrenewable • Spills damage the environment for decades
Natural Gas	• Cleanest fossil fuel available • Economical because the U.S. has enough to last about 100 years	• Although cleaner than other fossil fuels it is still produces air pollution when burned • Natural gas is nonrenewable • Very flammable and the fumes are dangerous to breathe