Name \_\_\_\_\_ Date \_\_\_\_\_\_\_\_

**Fill in the blanks based on the reference material.**

**Fossil Fuels** are currently the world’s p\_\_\_\_\_ energy source. Two fossil fuels, c\_\_\_\_\_ and o\_\_\_\_, provide most of the daily energy that heats our homes, powers our cars, and generates our e\_\_\_\_\_.

Our fuel needs for t\_\_\_\_ and h\_\_\_\_\_\_ drive oil exploration in the harshest corners of the planet. Exploration for oil and gas has moved from land to s\_\_\_\_. The oil industry has devised oil rigs, or massive drilling platforms, that stand on the ocean floor and drill deep beneath the sea bed.

C\_\_\_\_\_ produces more than h\_\_\_\_\_ of our electrical power and accounts for \_\_\_\_\_% of our overall energy consumption. Coal is the most a(n) \_\_\_\_\_ fossil fuel on earth. Coal m\_\_\_\_\_ is vital to the economy of the United States and many other countries.

The use of coal and oil has added billions of tons of c\_\_\_\_\_ dioxide and other pollutants to our atmosphere, yet they remain the most economically efficient sources of energy.

**Internal combustion** engine b\_\_\_\_\_\_ or explodes fuel in an enclosed space. Most of these engines are on a\_\_\_\_\_\_\_, but they can be adapted to power airplanes, boats, locomotives, even whole factories.

Fuel burns in an e\_\_\_\_\_ space, and energy from expanding gases is converted into m\_\_\_\_\_ energy. Inside a f\_\_\_\_\_ stroke gasoline engine, pistons move four times for every combustion reaction.

An alternative design that generates more power is the two-stroke engine. But large amounts of unburned fuel escape through the exhaust port during the up stroke, making two stroke engines in \_\_\_\_\_\_ and environmentally hazardous.

Another type of internal combustion engine that does not run on gasoline, and it's one of the most important tools of modern industry, the d\_\_\_\_\_ engine. Some diesel engines are as big as a house. They power entire factories. Diesels also transport the goods produced in factories. Enormous diesel l\_\_\_\_ pull cargo trains. The diesel engine is named for its inventor, Rudolph Diesel, but considerably more powerful and much more efficient.

Mitsubishi is trying to introduce a new breed of internal combustion engine called gasoline direct injection, or \_\_\_\_\_. This engine runs on regular gasoline, but operates more like a diesel engine. It runs more efficiently than contemporary gasoline engines.

**Electricity:** provides a way to store and distribute energy generated in a variety of ways. We live in an electric world. Electricity may be the m\_\_\_\_\_ common form of energy we use.

N\_\_\_\_\_ have no charge and p\_\_\_\_\_ are positively charged. Both stay in the nucleus, the center of an atom. E\_\_\_\_ are negatively charged and they can jump from one atom to another. Electricity is the i\_\_\_\_\_ of electrons and protons.

Electric c\_\_\_\_ is the movement of electrons from atom to atom. Electrons can jump from one negatively charged object to a positively charged one in a discharge, which balances the charges of both objects. Energy builds up as the charges separate. The energy used when the electrons move during the discharge is the v\_\_\_\_, or potential difference, and is measured in volts.

An energy source, such as fossil fuel, moving water, or wind, is harnessed to spin a t\_\_\_\_\_ and the turbine spins a m\_\_\_\_\_ near a coil of metal wire. The movement of the magnet near the coil of wire causes electrons to move through the wire. This current flows through power lines to the outlets of electric power customers. When the direction of the current is changed several times a second, as it is in the lines of power plants, the electricity is called a(n) \_\_\_\_ current, or \_\_\_\_\_\_ electricity.

**Hydroelectric:**

W\_\_\_\_\_ rushes through giant turbines to generate massive amounts of electricity, enough to power all of the surrounding area. Hydroelectric power converts the energy of water flowing in streams and rivers into m\_\_\_\_\_ energy. Hydroelectric dams today are designed to produce much more electricity. A modern dam usually blocks a river with a concrete wall several hundred feet high. This floods the area around the dam and creates an artificial l\_\_\_\_\_. The water held behind a dam has a tremendous amount of p\_\_\_\_\_ energy, which can be converted to k\_\_\_\_\_\_ energy, or the energy of an object in motion.

In a hydroelectric dam, the force of g\_\_\_\_\_ pulls water down through large tubes called p\_\_\_\_\_. In this way, the potential energy of the lake water becomes kinetic energy as it begins to move. As the water flows through the penstocks, it spins turbines, which power electric g\_\_\_\_, which spin magnets in m\_\_\_\_\_ coils. This produces an electric current that is distributed on a power grid. The water current produces a current of electricity.

Hoover dam is one of the world’s most famous hydroelectric dams. It is an excellent example of how to harness efficient, r\_\_\_\_ and c\_\_\_\_ hydroelectric energy. However, the energy produced by the three gorges dam comes with a heavy price. Building the dam created a body of water nearly 600 feet deep and as long as Lake Superior. This artificial lake d\_\_\_\_\_ 13 major cities, as well as hundreds of towns and villages.

**Nuclear Power:**

One of the most efficient forms of energy comes from the splitting or fusing of atoms in what is known as nuclear power. Physicists recognized that a(n) \_\_\_\_\_\_ contain substantial energy. An enormous amount of e\_\_\_\_\_\_ could be obtained from a small amount of matter.

During the process of nuclear f\_\_\_\_\_\_, the nuclei of atoms are joined together under extremely hot temperatures. This is when the atoms release large amounts of energy. Typically, h\_\_\_\_\_\_ atoms combine to form h\_\_\_\_\_\_ atoms.

Nuclear energy can also be generated by splitting atoms. The process of splitting atoms and releasing energy is called f\_\_\_\_. Nuclear fission of u\_\_\_\_\_\_ is the most common method of producing nuclear power. Neutrons are shot at the uranium which splits the uranium nuclei and releases more neutrons. The neutrons split other uranium nuclei in a c\_\_\_\_ reaction. If enough uranium is used, a self-sustaining or continuous chain reaction will cause the release of large amounts of heat that can generate electricity. One ton of uranium produced as much energy as more than a million tons of coal or a million barrels of oil, but splitting atoms creates hazardous r\_\_\_\_\_ particles that may cause c\_\_\_\_\_ and genetic mutations.

Today, more than 400 nuclear power plants account for about \_\_\_\_\_\_% of the world’s electricity. More than 100 such power plants are operating today in the United States.

**Biosphere: Irene Curie** conducted research into radioactive elements that paved the way for n\_\_\_\_ power plants. But Irene’s research took a toll on her health, just as it had on her mother’s (Marie). She died of leukemia in 1956, the victim of her pioneering experiments in r\_\_\_\_\_ elements. But her work lives on. Scientists continue to find uses for artificial radioactive isotopes in energy production and m\_\_\_\_\_.

**Solar Power:**

The energy of the sun can generate electricity and provide heat. Solar power is available everywhere; it’s renewable and clean. Solar p\_\_\_\_\_ generate electricity based on the photovoltaic effect. P\_\_\_\_ voltaic panels convert the sun’s energy into electricity, which we then use in the home.

Most systems will store the electricity in b\_\_\_\_\_\_.

**Student Inventor:**

A solar-powered house that uses active and passive solar power to make the most efficient house that’s architecturally sound.

Active solar power is just photo\_\_\_\_\_\_ cells that absorb the sunlight and then produce all of the energy that’s needed in the house.

Passive solar power: In the northern hemisphere, sunlight comes from the south. So, putting panels on the southern side of the house maximizes e\_\_\_\_ to sunlight.

**Wind power:** captures energy in the a\_\_\_\_\_\_. The air that surrounds our planet is in m\_\_\_\_\_. Wind is caused by differences in air p\_\_\_\_\_. High pressure air moves toward low-pressure air to balance the pressures. Anything that moves has energy.

New models of wind turbines are spinning their way toward clean electricity around the world. Some turbines have a fan diameter over 100 meters long, roughly the length of a football field. As air flows across the blades, it causes the fan to rotate, which powers an electrical generator. A single wind turbine can generate as much as \_\_\_\_\_\_ megawatts, enough electricity for hundreds, even thousands of homes.

Clusters of wind turbines are called wind f\_\_\_\_\_.

**Hydrogen fuel cells**

Hydrogen. the m\_\_\_\_\_ abundant element in the universe and the energy source of stars, is a colorless, odorless flammable gas at room temperature, but it can power an internal combustion engine. Hydrogen fuel can also generate electricity in a fuel cell, a device that converts c\_\_\_\_\_ energy into e\_\_\_\_ energy. A series of chemical reactions splits hydrogen into protons and a current of electrons, and then combines them with oxygen, which produces w\_\_\_\_\_. The flow of electrons is electric current. A fuel cell will produce an electric current by stripping the e\_\_\_\_ from hydrogen, passing them through a wire, and producing water molecules.

**Before you know it:** Name some emerging energy inventions.