

Electricity the Mysterious Force:

- Atoms: Smallest unit of matter
 - Protons: Found _____ the nucleus (the _____ of an atom)
 - Have a _____ electrical charge
 - Electrons: _____ around at great _____ from the nucleus
 - Have a _____ electrical charge
- Please draw and label a sketch of the second Carbon Atom.

- _____: a force within the particles of an atom.
- Opposite charges _____ each other
- Electrons usually remain in a relatively _____ distance from the nucleus in regions calls _____.
 - Each level can hold a certain amount of _____. The closest level can hold _____ electrons. The most electrons an energy level can hold is _____.
- The electrons in the levels closest to the nucleus have a _____ force of _____ to the protons. The electrons in the _____ level do not.
- Applying a _____ can make electrons move from one atom to another.
- _____ is moving electrons.

Magnets Can Produce Electricity:

- A _____ can move electrons.
- _____ like copper have electrons that are easily pushed from their _____, creating electricity.
- _____: electricity and magnetism are related because magnets can create electricity and electricity can create a magnetic field.
- Power plants use _____ to make electricity.
- _____ is used to spin a turbine
 - To create the spin we can burn _____ or _____ to make steam (Fossil Fuel)
 - We can also split _____ to heat water into steam. (Nuclear Power)
 - _____ from a dam (Hydropower) or the energy from _____ can also spin a turbine.
- The turbine is attached to a _____ in a generator.
- A _____ has magnets and coils of copper wire in it.
- The turbine can either spin the _____ inside the coils or spin the _____ inside the magnet to create a magnetic field, which _____ and _____ the electrons in the copper wire.

- Please draw and label the diagram of the turbine generator.

- The moving electrons then flow into _____ which bring electricity to our homes.

Batteries Produce Electricity:

- Battery:

- A _____ between the metals frees electrons in one of the metals. These electrons can move along wires (electricity!)
- What is a load?:

- An example of a load is _____.

Electricity Travels in Circuits:

- What is a circuit?

- Electricity must have a _____ path before electrons can move.
- When we flip on a light switch we _____ the circuit, allowing electricity to flow.
- When we flip a switch off we _____ the circuit, no electricity can flow.
- Sketch and label the closed and open circuit diagrams:

Secondary Energy Source

- Electricity is a _____ of energy.
- A secondary source of energy means that we must use _____ to make it.
- Electricity cannot be classified as _____ or _____.
- Coal is an example of a _____ energy source.
- Hydropower is an example of a _____ energy source.
- Non-renewable resources cannot be re-used, once we burn coal, we can't get it back. A renewable resource can continue to be used, like running water. Due to the water cycle (rain), the water is constantly renewed so we can use it again.

Generating Electricity

- Power plants use many _____ to produce electricity.
- _____ power plants use coal, biomass, petroleum, or natural gas to _____ water into steam.
- Nuclear power plants use _____ to produce heat to create steam.
- _____ power plants use heat from the earth to create steam.
- _____ use the kinetic energy in wind to generate electricity.
- _____ plants use the energy in moving water.
- **WHATEVER TYPE OF POWER PLANT IS USED, THE ENERGY MADE IS USED TO SPIN A TURBINE TO CREATE ELECTRICITY!**

Moving Electricity

- The path of electricity:
 1. Electricity is generated by a _____

2. Travels through wire to a _____, which _____ the voltage (this is so less electricity is lost)
 3. It is then sent to a network of _____.
 4. Then to _____ that have step-down transformers that reduce the voltage from 350000 volts to _____ volts.
 5. Finally to _____ lines that deliver the electricity to your home.
- Before the electricity can be used in your home, it is reduced again by a transformer to _____ volts.
 - Please draw and label the Transporting Electricity diagram:

Fuels that Make Electricity:

- Fossil Fuel Power Plants
 - Burn _____, _____, or _____.
 - These are called _____ fuels because they were formed from the remains of ancient sea plants and animals.
 - Fossil fuels are used create _____.
 - The steam is used to _____ turbine generators.

- _____ are produced that can pollute the air and contribute to climate change.
- Fossil fuel plants are also called _____ because they use heat to make electricity.
- Nuclear Power Plants
 - Also a type of _____ power plant
 - The fuel used is _____, which isn't burned.
 - A nuclear power plant _____ the nuclei of uranium atoms to make smaller atoms in a process called _____.
 - This produces _____ which is used to turn water into steam.
 - Nuclear power plants produce _____.
 - Nuclear waste must be stored carefully to prevent _____.
- Hydropower Plants
 - Use the energy of _____.
 - Hydropower is a renewable energy source because it is renewed by _____.

What is a Watt?

- Watt is a measure of _____ an appliance uses.
- A kilowatt is _____ watts.
- _____ measures the amount of electricity used in one hour.
- A kilowatt is the _____ of electric flow.
- A kilowatt-hour is the _____ of electricity.

Cost of Electricity:

- Cost of electricity depends on:
 1. _____ cost: Hydropower is the _____. _____ power is the most expensive.
 2. _____ cost: A power plant may be expensive to build but the low cost of the fuel can make it _____. (Coal plants are cheap to build but their fuel is expensive. Nuclear plants are costly to build but their fuel is cheap).
 3. _____: the amount of useful energy you get out of a system. Changing one form of energy into another always involves a loss of _____.
- Most power plants use _____ units of fuel to produce one unit of electricity.
- Most of the energy loss is _____.
- Most power plants are _____% efficient. For every 100 units of energy that go in, _____ units are lost. Only 35 units of energy are produced to do _____.
- Please draw and label the "Efficiency of a Power Plant" diagram.