

## Coal to Electricity in the Home

Name \_\_\_\_\_

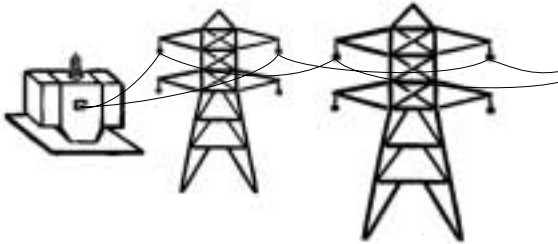
Electrical energy in Alberta comes primarily from coal. In other parts of Canada, hydroelectric power and nuclear power are used.

**Challenge:** Cut apart the blocks below. Arrange the pictures and corresponding text in an alternating manner to make a book that illustrates and explains how electricity is produced and the process of how it gets into your home. Staple the left side to keep the pages intact and color the pictures to create an electrifying mini book.

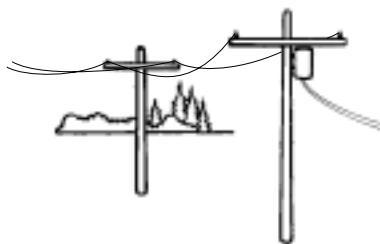
**Hint:** Start with the Power Plant picture.



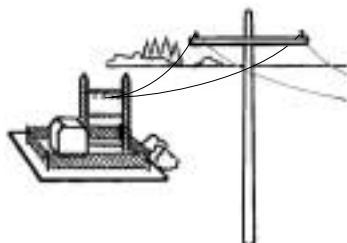
When you switch on a **LAMP** or appliance, you complete or close an electric circuit permitting electricity to flow.



Electricity leaves the power plant at 13,800 volts into a nearby transmission substation. Here a **LARGE TRANSFORMER** boosts the electricity up to 240,000 volts, which helps to move it throughout the province. Tall transmission towers keep the lines off the ground. Very high voltage makes these power lines extremely dangerous.

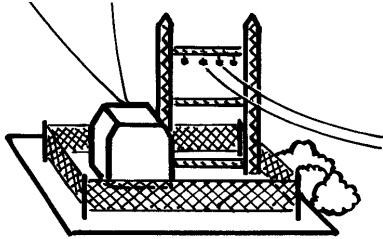


Somewhere in a **NEIGHBOURHOOD** there is another smaller **TRANSFORMER** connected to a Distribution Line, where the voltage is lowered even more. This transformer steps-down or lowers the voltage to 120/240 volts, which is the voltage required to run lights and appliances in your home.

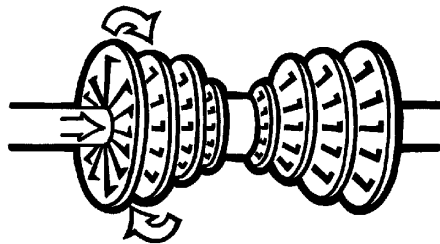


Electricity leaves the High Voltage Distribution Substation at 13,800 or 25,000 volts on **DISTRIBUTION LINES** (wood poles or underground cables). High voltage also makes these power lines very dangerous.

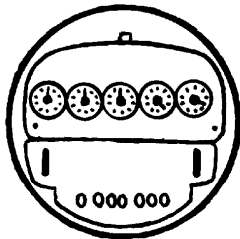
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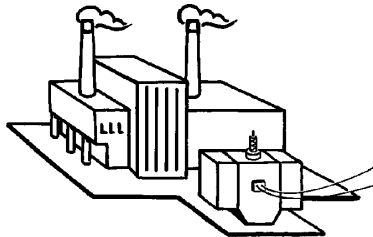
Wherever electricity is to be used, there is a **HIGH VOLTAGE DISTRIBUTION SUBSTATION** with transformers, which reduces the very high voltage to lower levels (typically 13,800 or 25,000 volts). This voltage is still too high to be used in houses.



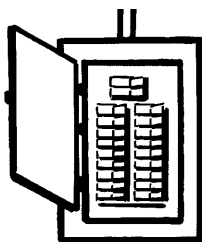
The **TURBINE** spins 3,600 revolutions per minute. The spinning turbine is connected to a metal rod or shaft, which turns a large magnet/coil surrounded by coils of copper wire. This moving magnet causes electrons to move in the surrounding coils creating what we call electricity.



Electricity comes to your house through an **ELECTRIC METER** located outside the house. When electricity passes through the meter, a disc rotates causing the pointers on the dials to move. These pointers show how much electricity your family uses in the house.



Electricity is generated in **POWER PLANTS** by using different fuels like coal and natural gas. The fuel is burned to heat water and create steam. The steam moves across the blades of a giant metal pinwheel called a turbine, causing it to turn.



Electricity goes through a meter to a **BREAKER PANEL** inside of your home. This panel controls the distribution of electricity throughout the house and is the starting point for all electrical wires in your home. Each series of wires has its own breaker which allows the power to be turned off in an emergency or when servicing outlets and lights.