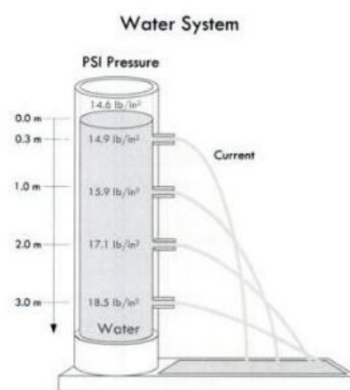
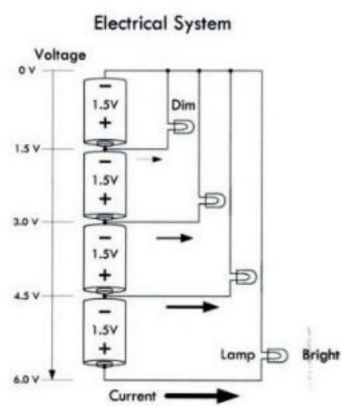
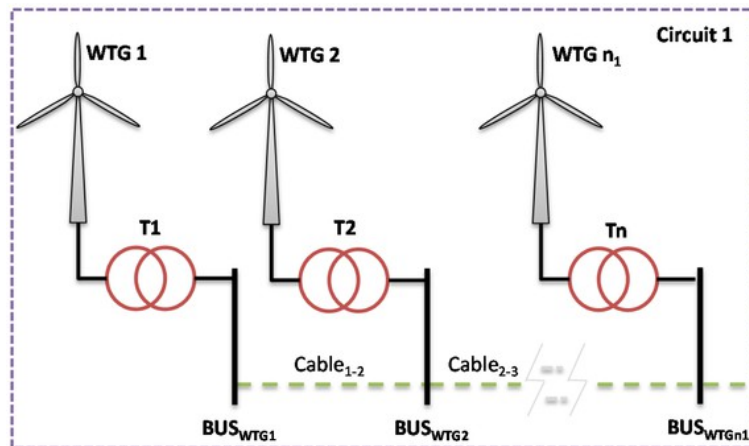
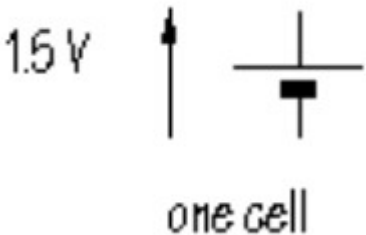

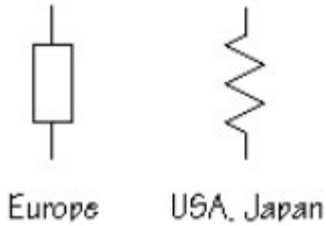

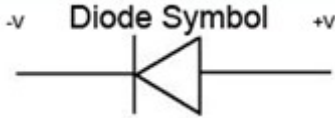
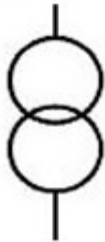


Introduction to Electricity with Lego Mindstorms


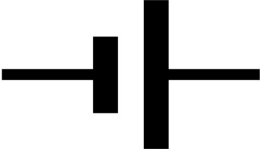



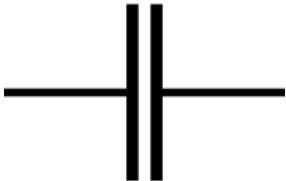


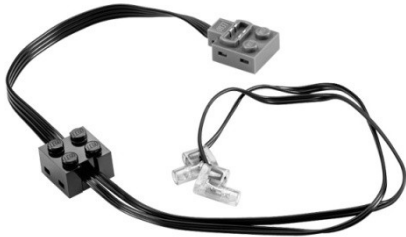

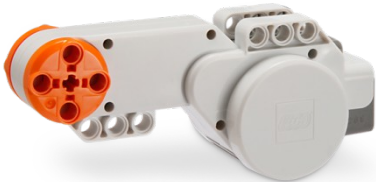
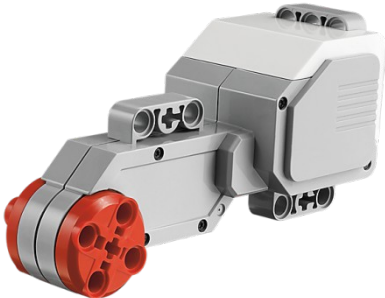




Electrical concepts

Element	Symbol	Unit	Description
Charge	q	Coulomb (C)	The fundamental electric quantity is charge. Atoms are composed of charge carrying particles: electrons and protons, and neutral particles, neutrons. The smallest amount of charge that exists is carried by an electron and a proton.
Current	I	Ampere	Current is rate of flow of negatively-charged particles, called electrons, through a predetermined cross-sectional area in a conductor.
Voltage	V 1.5V  one cell	Volt	Potential difference across two terminals in a circuit "across variable." In order to move charge from point A to point B, work needs to be done.
Wattage	W	Watt	The watt (symbol: W) is a derived unit of power in the International System of Units (SI), named after the Scottish engineer James Watt (1736–1819). The unit is defined as joule per second and can be used to express the rate of energy conversion or transfer with respect to time.
Resistor	I	Ohms 	Flow of electric current through a conductor experiences a certain amount of resistance. This behavior of materials is often used to control/limit electric current flow in

	 <p>Europe USA, Japan</p>		<p>circuits.</p> <p>A resistor is a dissipative element. It converts electrical energy into heat energy. It is analogous to the viscous friction element of mechanical system.</p>
Capacitor	 <p>Fixed capacitor</p>		<p>A capacitor is an energy storage element which is analogous to the spring element of mechanical systems.</p> <p>It can store electrical pressure (voltage) for periods of time.</p>
Diode	 <p>-v Diode Symbol +v</p>		<p>The fundamental property of a diode is its tendency to conduct electric current in only one direction.</p>
Transformer			<p>A transformer is an electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. Commonly, transformers are used to increase or decrease the voltages of alternating current in electric power applications.</p>

Electric elements with Lego

Element	Lego component	Electric circuit symbol
Battery		
Voltimeter		
Capacitor		

Lamp	 <p>A LEGO lamp assembly consisting of a black cable connected to a grey plug and a small grey light bulb component.</p>	 <p>A schematic symbol for a lamp, represented by a circle with an 'X' inside, connected to two horizontal lines.</p>
Motor	   <p>Three different LEGO motor assemblies. The first is a small grey motor with an orange output. The second is a larger grey motor with a red output. The third is a grey motor with a white output.</p>	 <p>A schematic symbol for a motor, represented by a circle with the letter 'M' inside, connected to two horizontal lines.</p>
Generator	 <p>A LEGO generator assembly consisting of a grey block with a black cable and a small grey plug.</p>	 <p>A schematic symbol for a generator, represented by a circle with a sine wave inside, connected to two horizontal lines.</p>

Switch

