



Gateway: Magic of Electrons 8th Grade

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COURSE TITLE: Gateway – Magic of Electrons

GRADE LEVEL: 8th Grade

CONTENT AREA: Career and Technical Education

Course Description:

Through hands-on projects, students explore the science of electricity, behavior and parts of atoms, and sensing devices. They learn knowledge and skills in basic circuitry design and examine the impact of electricity on the world around them.

Taken from www.pltw.org

Course Rationale:

Through topics like robotics, flight and space, and DNA and crime scene analysis, middle school students engage their natural curiosity and imagination in creative problem solving. PLTW's Gateway program is a strong foundation for further STEM learning in high school and beyond, challenging students to solve real-world challenges, such as cleaning oil spills and designing sustainable housing solutions. Using the same advanced software and tools as those used by the world's leading companies, students learn how to apply math, science, technology, and engineering to their everyday lives.

Taken from www.pltw.org

Course Scope and Sequence

Unit 1: What is Electricity (16 days)	Unit 2: Electronics (17 days)	Unit 3: Digital Electronics (12 days)

Essential Terminology/Vocabulary

Unit 1: ampere, anode, armature, atom, atomic number, battery, cathode, circuit, commutator, conductor, continuity, coulomb, current, direct current, electromagnet, electron, electron theory, element, field magnet, generator, insulator, led, magnet, matter, molecule, motor, multimeter, neutron, nucleus, proton, resistance, semiconductors, static electricity, valence electrons, voltage

Unit 2: capacitor, circuit diagram, diode, electronic circuit, fixed resistor, light emitting diode, ohm, parallel circuit, resistor, schematic, series circuit, switch, thermistor, transistor, variable resistor, volt

Unit 3: and gate, ascii, binary code, bit, byte, decimal number, digital, flow chart, gate, inverter, logic gate, nand gate, nor gate, or gate, truth table, xor gate

Approved Course Materials and Resources:

- Gateway to Engineering: Rogers, Wright, Yates, ©2010 ISBN-13: 978-1-4180-6178-4
- Project Lead the Way's *Learning Management System (LMS)*
- Gateway VEX Kit