



Gateway: Energy and the Environment 8th Grade

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Reviewed by the Curriculum Advisory Committee
September 17, 2014

Approved by the Board of Education
October 21, 2014

COURSE TITLE: Gateway – Energy and the Environment

GRADE LEVEL: 8th Grade

CONTENT AREA: Career and Technical Education

Course Description:

Students are challenged to think big and toward the future as they explore sustainable solutions to our energy needs and investigate the impact of energy on our lives and the world. They design and model alternative energy sources and evaluate options for reducing energy consumption.

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: Investigating Energy (14 days)	Unit 2: Sustainable Energy (15 days)	Unit 3: Making An Impact (16 days)

Essential Terminology/Vocabulary

Unit 1: biomass, british thermal unit, chemical energy, climate change, conservation, efficiency, electrical energy, electricity, energy, environment, exhaustible energy, fossil fuel, geothermal, greenhouse effect, heat energy, hydroelectric energy, hydrogen, inexhaustible energy, joule, kinetic energy, law of conservation of energy, light energy, mechanical energy, natural gas, newton-meter, non-renewable energy, nuclear energy, petroleum, photovoltaic cell, potential energy, power, power grid, renewable energy, solar energy, sustainable, watt, wind energy, wind farm, wind turbine, work

Unit 2: active solar system, alternative fuels, battery, electrolysis, electromagnetic field, electron, emissions, energy carrier, energy conservation, fuel cell, generator, hydrogen, natural resources, passive solar system, power grid, power plant, smart grid, steam reforming, sustainable engineering, transformer, turbine

Unit 3: audit, biodegradable, by product, climate change, compost, conduction, convection, energy conservation, energy efficiency, heat, incinerate, insulation, integrated waste management, landfill, organic materials, pollution, product life cycle, radiation, raw material, recycle, reduce, reuse, solid waste, sustainable engineering, temperature, thermal energy, trash, waste to energy plant

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