

CARLISLE AREA SCHOOL DISTRICT

Carlisle, PA 17013

GREEN TECHNOLOGY

GRADE 8

Date of Board Approval: February 16, 2017

**CARLISLE AREA SCHOOL DISTRICT
PLANNED INSTRUCTION COVER PAGE**

TITLE OF COURSE:	Green Technology	SUBJECT:	Technology Education	GRADE LEVEL:	8
COURSE LENGTH:	Semester	DURATION:	46 minutes	FREQUENCY:	5 or 6 per cycle
PREREQUISITES:	N/A	CREDIT:	N/A	LEVEL:	N/A

Course Description/Objectives: Green Technology will present all students the opportunity to explore the world around them. This course will provide an overview of various green technologies and engineering concepts related to pollution, water conservation, solar power, wind power, and the impact humans have on the earth. Students will also learn many different ways to implement green technologies, materials, and energy for their personal use through hands-on projects.

Text: None

Curriculum Writing Committee: Stephen Hvizdos Robert Over

COURSE TIME LINE

Unit 1: Introduction to Green Technology	4 days
<ul style="list-style-type: none">• What is Green Technology• Green News Articles• Green Technology and You• The Story of Stuff - Annie Leonard	
Unit 2: Garbage and Landfills	10 days
<ul style="list-style-type: none">• What is Trash/Anatomy of a Landfill• How Long will it Last• LONG Term Effects of Trash• Options for Dealing with trash• Story of Water Bottles – Annie Leonard• Reduce, Reuse, Recycle Activity – Aluminum Cans/ Plastic Bottles	
Unit 3: Pollution	10 days
<ul style="list-style-type: none">• What is Pollution• Types of Pollution• Health and Well Being• Ways to Prevent and Control Pollution• Magnetic Levitation - The Fossil Fuel Free Future of Transportation?	
Unit 4: Resources	5 days
<ul style="list-style-type: none">• Natural Resources• Renewable Energy Sources• Non Renewable Energy Sources• Use of Resources• Future Outlook	
Unit 5: Alternative Energy Sources	15 days
<ul style="list-style-type: none">• Multimeter Use and Safety• Wind Energy• Solar Energy• Hydro Energy• Geothermal• Nuclear	
	Total: 44 days

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	4 days
UNIT #1:	Introduction to Green Technology	GRADE:	8

STANDARDS:

Academic Standards for Science and Technology and Engineering:

- 3.5.7.B • Recognize earth resources and how they affect everyday life.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	4 days
UNIT #1:	Introduction to Green Technology	GRADE:	8

UNDERSTANDINGS

Choices and decisions that humans make effect the environment.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

“The Story of Stuff” Annie Leonard

KNOW

- Define and describe what the term green technology means.
- What is meant by the term sustainability?
- Know the consequences of societies past practices.
- Know that every action we take has a consequence (positive, negative, or a combination of both).

DO

- Students will be able to explain what “green technology” is.
- Students will be able to identify “green” products.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	10 days
UNIT #2:	Garbage and Landfills	GRADE:	8

STANDARDS:

Academic Standards for Science and Technology and Engineering:

- S8.B.3.3.3 • Describe how waste management affects the environment (e.g., recycling, composting, landfills, incineration, sewage treatment).

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	10 days
UNIT #2:	Garbage and Landfills	GRADE:	8

UNDERSTANDINGS

You are what you make. Garbage and landfills are a necessary evil but there are ways to make and them more efficient and environmentally friendly

COMMON ASSESSMENTS/CULMINATING ACTIVITY

‘How Long Does it Last’ activity

Repurpose an aluminum can

KNOW

- Identify the layers of a landfill.
- Identify the amount of time that is required for every day items to decompose or break down in a landfill.
- Describe the modern ways of dealing with recyclables and waste.

DO

- Complete the ‘How Long Does it Last’ activity.
- Repurpose an aluminum can and or plastic bottle using hand tools.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	10 days
UNIT #3:	Pollution	GRADE:	8

STANDARDS:

Academic Standards for Science and Technology and Engineering:

- S8.B.3.3.1 • Explain how human activities may affect local, regional, and global environments.
- S8.A.1.3.4 • Given a scenario, explain how a dynamically changing environment provides for the sustainability of living systems.
- S8.D.1.2.1 • Describe a product's transformation process from production to consumption (e.g., prospecting, propagating, growing, maintaining, adapting, treating, converting, distributing, disposing) and explain the process's potential impact on Earth's resources.
- S8.D.1.2.2 • Describe potential impacts of human made processes (e.g., manufacturing, agriculture, transportation, mining) on Earth's resources, both nonliving (i.e., air, water, or earth materials) and living (i.e., plants and animals).

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	10 days
UNIT #3:	Pollution	GRADE:	8

UNDERSTANDINGS

Choices and decisions humans make effect the environment.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Pollution facts PowerPoint

Magnetic levitation vehicle

KNOW

- Define the consequences of pollution.
- Identify the number of premature deaths where pollution is a contributing factor.
- Define the ways to reduce our carbon footprint.
- Describe the principals of magnetic levitation.
- Describe the formula- efficiency (length of track * pennies) / time.

DO

- Complete the carbon footprint activity.
- Create an informative PowerPoint presentation.
- Develop a plan to reduce pollution in Carlisle.
- Design, build and test a magnetic levitation vehicle.
- Calculate the efficiency of their magnetic levitation vehicle.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	5 days
UNIT #4:	Resources	GRADE:	8

STANDARDS:

Academic Standards for Science and Math:

- S8.B.3.3.2 • Explain how renewable and non renewable resources provide for human needs (i.e., energy, food, water, clothing, and shelter).
- S8.C.2.2.2 • Compare the time span of renewability for fossil fuels and the time span of renewability for alternative fuels.
- S8.C.2.2.3 • Describe the waste (i.e., kind and quantity) derived from the use of renewable and nonrenewable resources and their potential impact on the environment.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	5 days
UNIT #4:	Resources	GRADE:	8

UNDERSTANDINGS

There are a limited amount of available resources on Earth. Proper use and management of resources is required to sustain life.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

KNOW

- Describe how resources are used today.
- Define ways to conserve resources.
- Identify the consequences of population growth.
- Define cause and effect resource consumption.

DO

- Research future projections for consumption of resources.
- Develop a graph of how resources are being used .
- Watch “The Story of Solutions” and answer questions.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	15 days
UNIT #5:	Alternative Energy Sources	GRADE:	8

STANDARDS:

Academic Standards for Science and Math:

- S8.C.2.1.1 • Distinguish among forms of energy (e.g., electrical, mechanical, chemical, light, sound, nuclear) and sources of energy (i.e., renewable and nonrenewable energy).
- S8.C.2.2.1 • Describe the Sun as the major source of energy that impacts the environment.

KNOW, UNDERSTAND, DO

COURSE:	Green Technology	TIME FRAME:	15 days
UNIT #5:	Alternative Energy Sources	GRADE:	8

UNDERSTANDINGS

There are viable alternatives to our current energy policy. Understand that the use of alternative energy will help save our planet, quality of life, and natural resources for years to come.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Solar powered car activity

Wind turbine activity

KNOW

- Identify the most abundant energy source.
- Describe the proper use of a multimeter.
- Define the pros and cons of alternative energy sources.
- Describe the cost effectiveness of alternate energy sources.
- Identify the safety and environmental impacts of alternate energy sources.
- Define the public's perception regarding alternative energy.

DO

- Students will know how to use a multimeter to measure volts, ohms, and amperage.
- Students will be able to design, build, and test a solar powered vehicle.
- Students will be able to design, build, and test a wind turbine.

Adaptations/Modifications for Students with I.E.P.s

Adaptations or modifications to this planned course will allow exceptional students to earn credits toward graduation or develop skills necessary to make a transition from the school environment to community life and employment. The I.E.P. team has determined that modifications to this planned course will meet the student's I.E.P. needs.

Adaptations/Modifications may include but are not limited to:

INSTRUCTION CONTENT

- Modification of instructional content and/or instructional approaches
- Modification or deletion of some of the essential elements

SETTING

- Preferential seating

METHODS

- Additional clarification of content
- Occasional need for one to one instruction
- Minor adjustments or pacing according to the student's rate of mastery
- Written work is difficult, use verbal/oral approaches
- Modifications of assignments/testing
- Reasonable extensions of time for task/project completion
- Assignment sheet/notebook
- Modified/adjusted mastery rates
- Modified/adjusted grading criteria
- Retesting opportunities

MATERIALS

- Supplemental texts and materials
- Large print materials for visually impaired students
- Outlines and/or study sheets
- Carbonless notebook paper
- Manipulative learning materials
- Alternatives to writing (tape recorder/calculator)