

SUBJECT: Env. Science		GRADE: 11 & 12	
Unit Title: Water		Approximate Time Frame: 12 weeks	
UNIT OVERVIEW			
This unit will cover a variety of topics. Topics will include wetlands, groundwater, surface water sources, the water cycle, human impacts on our freshwater resources, and the distribution of resources. Local waterways are also evaluated to get real time data that is shared with others.			
LRG SKILLS AND DISPOSITIONS		STEELS STANDARDS	
Civics, leadership, and service. Communication & Empathy Critical Thinking & Problem Solving Creativity & Innovation Adaptability & Flexibility Resilience and Grit		3.4.9-12.C Analyze and interpret how issues, trends, technologies, and policies impact watersheds and water resources 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope. 3.4.9-12.E Plan and conduct an investigation utilizing environmental data about a local environmental issue.	
COMPETENCIES		LEARNING TARGETS	
I am familiar how to protect and properly use our fresh water resources.		I can better manage our water resources. 3.4.9-12.C A 3.4.9-12.D A 3.4.9-12.E P	

I am familiar how to protect and properly use our fresh water resources.	I can investigate water best management practices and employ them to conserve our natural resources. 3.4.9-12.C 3.4.9-12.C A 3.4.9-12.D A 3.4.9-12.E P
I am aware of the various water pollutants and how to avoid contaminating our local water resources.	I can take an active role in preventing water pollution. 3.4.9-12.C 3.4.9-12.C A 3.4.9-12.D A 3.4.9-12.E P
I am aware of the processes to purify our drinking water.	I can describe steps taken by Ephrata to purify our drinking water. 4.1C 3.4.9-12.E P I can purify salt water to make drinking water. 4.1C 3.4.9-12.E P
I am familiar with the process of conducting stream studies.	I can compare data collected from various locations on the Cocalico Creek. 3.4.9-12.C 3.4.9-12.E P I can conduct physical and chemical tests on the Cocalico Creek at multiple locations. 3.4.9-12.C 3.4.9-12.E P

SUBJECT: Env. Science		GRADE: 11 & 12	
Unit Title: Energy		Approximate Time Frame: 16 weeks	

UNIT OVERVIEW	
Various energy sources will be evaluated and ultimately compared with one another to determine the best application for each energy source. Benefits and drawbacks will be taken into account in order to get a more accurate picture of the source's impacts themselves. Environmental impacts will be considered, as well as monetary costs associated for each energy source. Students will also voice their opinions on the use of natural gas to the Governor's office in order to take an active role as a citizen of Pennsylvania.	
LRG SKILLS AND DISPOSITIONS	STEELS STANDARDS
Civics, leadership, and service. Communication & Empathy Critical Thinking & Problem Solving Creativity & Innovation Adaptability & Flexibility Resilience and Grit	3.3.9-12.R Evaluate or refine a technological solution that reduces the impact of human activities on natural systems. 3.3.9-12.P Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope. 3.4.9-12.H Design and evaluate solutions in which individuals and societies can promote stewardship in environmental quality and community well-being.
COMPETENCIES	LEARNING TARGETS

I can explain the benefits and drawbacks of coal.	I can describe how we obtain electricity from a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D I can analyze and describe the benefits and drawbacks of using coal to create electricity. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using oil as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D
I can explain the benefits and drawbacks of oil.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using oil as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D
I can explain the benefits and drawbacks of natural gas.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using natural gas as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D
I can explain the benefits and drawbacks of solar power.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using solar power as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D
I can explain the benefits and drawbacks of wind power.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using wind power as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D
I can explain the benefits and drawbacks of hydropower.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using hydropower as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D

I can explain the benefits and drawbacks of biomass.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using biomass as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D
I can explain the benefits and drawbacks of geothermal power.	I can explain the benefits and drawbacks, as well as demonstrate the application of this knowledge of using geothermal power as a primary source of energy. 3.3.9-12.R 3.3.9-12.P E 3.4.9-12.D A 3.4.9-12.H D

SUBJECT: Env. Science		GRADE: 11 & 12	
Unit Title: Air pollution		Approximate Time Frame: Throughout the year	
UNIT OVERVIEW			
Air pollution will be investigated. Sources of pollutants will be identified. Effects of air pollutants will be explored. Impacts of air pollutants on our fresh water sources will be taken into account.			
LRG SKILLS AND DISPOSITIONS		STEELS STANDARDS	

Civics, leadership, and service. Communication & Empathy Critical Thinking & Problem Solving Creativity & Innovation Adaptability & Flexibility Resilience and Grit	3.3.9-12.S Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. 3.3.9-12.R Evaluate or refine a technological solution that reduces the impact of human activities on natural systems
COMPETENCIES	LEARNING TARGETS
I can describe the major causes of our weather patterns. 4.6B	I can explain what causes weather patterns and how these causes affect the weather. 3.3.9-12.S A
I am familiar with how to prevent the release of greenhouse gasses that cause Global Warming.	I can identify the sources of greenhouse gasses and what can be done to prevent them from being generated. 3.3.9-12.R 3.3.9-12.S A
I am familiar with how air pollutants travel.	I can identify patterns and trends that allow pollutants to migrate. 3.3.9-12.R 3.3.9-12.S A
I am familiar with how we can prevent and/or reduce air pollution.	I can provide alternatives to non-renewable energy sources that would alleviate the production of unnecessary greenhouse gasses. 3.3.9-12.R 3.3.9-12.S A

SUBJECT: Env. Science		GRADE: 11 & 12	
Unit Title: <u>Humans and Their Environment</u>		Approximate Time Frame: Throughout the course of the year.	
UNIT OVERVIEW			
What impact does the human population have on the environment?			
LRG SKILLS AND DISPOSITIONS		STEELS STANDARDS	
Civics, leadership, and service. Communication & Empathy Critical Thinking & Problem Solving Creativity & Innovation Adaptability & Flexibility Resilience and Grit		3.3.9-12.O Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity 3.3.9-12.Q Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity 3.3.9-12.R Evaluate or refine a technological solution that reduces the impact of human activities on natural systems. 3.4.9-12.A Analyze and interpret how issues, trends, technologies, and policies impact agricultural, food, and environmental systems and resources.	
COMPETENCIES		LEARNING TARGETS	

I can explain the impacts of the human population on the environment.	I can describe how the human population can abuse our natural resources and provide options to avoid the misuse of these valuable assets. 3.3.9-12.O C 3.3.9-12.Q C 3.3.9-12.R E
I can explain how human impacts should be lessened to decrease the impacts of the environment.	I can describe alternatives to lessen the impacts of our actions on the planet. 3.3.9-12.O C 3.3.9-12.Q C 3.3.9-12.R E 3.4.9-12.A A
I can compare the environmental costs of producing different types of food. 4.4C	I can describe how the addition of chemicals and fertilizers affect our local waterways. 3.3.9-12.O C 3.3.9-12.Q C 3.4.9-12.A A
I can successfully identify the causes and possible solutions to the current loss of farmland. 4.4B	I can describe the impact of urban sprawl on our local farmlands. 3.3.9-12.O C 3.3.9-12.Q C 3.4.9-12.A A
I can describe fertile soil. 4.4	I can identify different types of soil and use my observations as a means to evaluate the soil. 3.3.9-12.O C 3.4.9-12.A A
I can distinguish between pesticides, herbicides, and fungicides. 4.4B, 4.4D	I can explain how pesticides, herbicides, and fungicides can be used properly. 3.3.9-12.O C
I can explain how over harvesting affects the supply of aquatic organisms used for food. 4.4B	I can describe the impacts that over fishing has on our aquatic ecosystems. 3.3.9-12.O C

SUBJECT: Env. Science		GRADE: 11 & 12	
Unit Title: <u>Earth Systems and Natural Occurrences</u>		Approximate Time Frame: Throughout the year	

UNIT OVERVIEW	
What changes does the Earth constantly undergo, and what causes these changes?	
LRG SKILLS AND DISPOSITIONS	STEELS STANDARDS
Civics, leadership, and service. Communication & Empathy Critical Thinking & Problem Solving Creativity & Innovation Adaptability & Flexibility Resilience and Grit	
COMPETENCIES	LEARNING TARGETS
I can define/describe the Earth occurrences that help to shape the Earth.	I can explain how the Earth is constantly changing.
I can describe how the various processes of the Earth help to shape it into what it is today.	I can explain the movement of plates within the Earth.

I can describe how wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity	I can explain how erosion and the weathering process can shape the Earth.
I can explain the processes that take place at plate boundaries and how these processes continue to shape Earth.	I can describe what causes volcanoes and earthquakes.
I can analyze features caused by the interaction of processes that change Earth's surface.	

SUBJECT: Env. Science		GRADE: 11 & 12	
Unit Title: <u>Environmental Stewardship</u>		Approximate Time Frame: Throughout the year	
UNIT OVERVIEW			
How can we be better stewards to our environment through our actions?			

LRG SKILLS AND DISPOSITIONS	STEELS STANDARDS
Civics, leadership, and service. Communication & Empathy Critical Thinking & Problem Solving Creativity & Innovation Adaptability & Flexibility Resilience and Grit	3.4.9-12.H Design and evaluate solutions in which individuals and societies can promote stewardship in environmental quality and community well-being. 3.4.9-12.I Analyze and interpret data on a regional environmental condition and its implications on environmental justice and social equity.
COMPETENCIES	LEARNING TARGETS
I can design and evaluate solutions in which individuals and societies can promote stewardship in environmental quality and community well-being.	
I can analyze and interpret data on a regional environmental condition and its implications on environmental justice and social equity.	