



**Pine Grove Area
SCHOOL DISTRICT**

Science

Eighth Grade

April 15, 2009

I. PHILOSOPHY

The eighth grade science course is designed to create an exciting learning experience which encourages a liberal appreciation of Earth's geological theories and laws and a curiosity of what lies within our own universe. It will inspire active participation in the preservation of the Earth, both ecologically and environmentally. The eighth grade science curriculum allows for the accommodation and many learning styles, motivational levels and academic abilities.

II. CORE CONCEPTS

1. Scientific Method- Describe and use the scientific method to solve problems in science.
2. Constructive and Destructive Geology- Describe the processes involved in the creation of geologic features found in Pennsylvania, and how both weathering and erosion break them down
3. The Rock Cycle- Explain how metamorphic, sedimentary, and igneous rocks are formed in Pennsylvania.
4. Earth's resources- Describe how human activities affect both living and nonliving factors (biotic and abiotic).
5. Hydrology- Describe the Earth's water systems, their use as a human resource, and how they affect the Earth's geology and ecology.
6. Meteorology- Describe weather and climate and how different factors affect the climate of an area.
7. The Universe- Describe the structure and composition of the universe.
8. GIS and GPS devices- Describe how satellite positioning systems can be used in conjunction with topographic maps.

III. COURSE OF STUDY

A. Course Name: Eighth Grade Science

B. Grade Level: 8th

C. Length of Course: Full Year

1. Frequency: Daily

2. Duration: 42 minutes

D. Academic Level: eighth grade

E. Credits: none

F. Prerequisites: none

G. Course Description:

The course will allow students to obtain a proficient knowledge of the Earth structure and composition, as well as the universe that surrounds us.

IV. **CONTENT: Grade eight science**

CORE CONCEPT 1: Scientific method

MAJOR OBJECTIVE: Describe and use the scientific method to solve problems in science

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.2.10.B Apply process knowledge and organize scientific and technological phenomena in varied ways.</p> <ul style="list-style-type: none"> Describe materials using precise quantitative and qualitative skills based on observations. Develop appropriate scientific experiments: raising questions, formulating hypotheses, testing, controlled experiments, recognizing variables, manipulating variables, interpreting data, and producing solutions. Use process skills to make inferences and predictions using collected information and to communicate, using space / time relationships, defining operationally. 	<p>Teacher will guide students to:</p> <p>Utilize evidence, observations, or a variety of scales to describe relationships between open systems.</p> <p>Design a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which variables will be held constant.</p> <p>Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Group, partner & individual projects Class work Teacher observation Tests/Quizzes Independent & cooperative activities Student Journals Student demonstration and student observation analysis Oral presentations, questions and answers Concept Maps/graphic organizer, rubrics Portfolio 	<ul style="list-style-type: none"> Textbook resources Instructor generated resources Web-based and software programs Newspapers and magazines Lab materials for demonstrations Outside presenters as applicable

CONTENT: Grade eight science

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CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.2.10.A Apply knowledge and understanding about the nature of scientific and technological knowledge.</p> <ul style="list-style-type: none">• Compare and contrast scientific theories and beliefs.• Know that science uses both direct and indirect observation means to study the world and the universe.• Integrate new information into existing theories and explain implied results.	<p>Teacher will guide students to:</p> <p>Distinguish between a scientific theory and an opinion.</p> <p>Use evidences, such as observations or experimental results, to support inferences about a relationship.</p> <p>Explain how a theory is supported with evidence, and how new data/information may change existing theories or practice.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.2.10.C Apply the elements of scientific inquiry to solve problems.</p> <ul style="list-style-type: none">• Generate questions about objects, organisms and/or events that can be answered through scientific investigations.• Evaluate the appropriateness of questions.• Design an investigation with adequate control and limited variables to investigate a question.• Conduct a multiple step experiment.• Organize experimental information using a variety of analytic methods.• Judge the significance of experimental information in answering the question.• Suggest additional steps that might be done experimentally.	<p>Teacher will guide students to:</p> <p>Use space/time relationships to define concepts operationally, raise testable questions, and formulate hypothesis.</p> <p>Distinguish between testable hypothesis and one which are not testable.</p> <p>Design and conduct a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which will be held constant.</p> <p>Interpret data observations and develop relationships among variables to create models as solutions.</p> <p>Use evidence from investigations to clearly communicate and support conclusions</p> <p>Identify a design flaw in a simple technological system and devise possible working solutions.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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<p>PA Standard 3.2.10.D Identify and apply the technological design process to solve problems.</p> <ul style="list-style-type: none">• Examine the problem, rank all necessary information and all questions that must be answered.• Propose and analyze a solution.• Implement the solution.• Evaluate the solution, test, redesign and improve as necessary.• Communicate the process and evaluate and present the impacts of the solution.	<p>Teacher will guide students to:</p> <p>Determine a problem and interpret which questions are most important to answer first.</p> <p>Develop and analyze a workable hypothesis</p> <p>Draw conclusions from the experiment and either prove the hypothesis is true or develop a new testable hypothesis.</p> <p>Retest the new hypothesis and relate the data to know theories and laws.</p> <p>Describe how the solutions to the problem will lead to more beneficial results or will lead to greater negative results in the future.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CORE CONCEPT 2: Constructive and Destructive geology

MAJOR OBJECTIVE: Describe the processes involved in the creation and destruction of geologic features found in Pennsylvania

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State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.A Relate earth features and processes that change the earth.</p> <ul style="list-style-type: none"> • Illustrate and explain plate tectonics as the mechanism of continental movement and sea floor changes. • Compare examples of change to the earth’s surface over time as they related to continental movement and ocean basin formation (e.g., Delaware, Susquehanna, Ohio Rivers system formations, dynamics). • Interpret topographic maps to identify and describe significant geologic history/structures in Pennsylvania. • Evaluate and interpret geologic history using geologic maps • Correlate rock units with general geologic time periods in the history of the earth. 	<p>Teacher will guide students to:</p> <p>Compare and contrast constructive and destructive physical geology, and describe the process of how the principles of uniformitarianism allow us to explain these forces and the rates at which they occur.</p> <p>Explain how weathering and erosion form Pennsylvania’s geologic structure, and how erosion has through sedimentation created its natural resources.</p> <p>Utilize topographic maps to interpret and describe how the Earth’s structures and features have changed over time.</p> <p>Use relative dating to determine the order of events on a geologic map.</p> <p>Use geologic maps to correlate and interpret rock units located at different parts of the Earth.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Group, partner & individual projects • Class work • Teacher observation • Tests/Quizzes • Independent & cooperative activities • Student Journals • Student demonstration and student observation analysis • Oral presentations, questions and answers • Concept Maps/graphic organizer, rubrics • Portfolio 	<ul style="list-style-type: none"> • Textbook resources • Instructor generated resources • Web-based and software programs • Newspapers and magazines • Lab materials for demonstrations • Outside presenters as applicable

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CORE CONCEPT 3: The Rock Cycle

MAJOR OBJECTIVE: Explain how metamorphic, sedimentary, and igneous rocks are formed in Pennsylvania.

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<p>PA Standard 3.5.10.A Relate earth features and processes that change the earth.</p> <ul style="list-style-type: none">• Compare examples of change to the earth's surface over time as they related to continental movement and ocean basin formation (e.g., Delaware, Susquehanna, Ohio Rivers system formations, dynamics).• Explain several methods of dating earth materials and structures.• Describe and identify major types of rocks and minerals.	<p>The teacher will guide students to:</p> <p>Compare and contrast how different types of rocks are formed, destroyed, and renewed in the rock cycle.</p> <p>Compare and contrast carbon 14 and potassium argon dating as it compares to relative dating techniques.</p> <p>Utilize mineral and rock identification methods in conjunction with flow charts to identify and describe major groups of rocks and minerals.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CORE CONCEPT 4: Earth's resources

MAJOR OBJECTIVE: Describe how human activities affect both living and nonliving factors (biotic and abiotic).

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<p>PA Standard 3.5.10B Explain sources and uses of earth resources.</p> <ul style="list-style-type: none">• Compare the locations of strategic minerals and earth resources in the world with their geologic history using maps and global information systems.• Demonstrate the effects of sedimentation and erosion before and after a conservation plan is implemented.• Evaluate the impact of geologic activities/hazards (eg, earthquakes, sinkholes, landslides)• Evaluate land use (eg, agricultural recreational residential, commercial) in Pennsylvania based upon soil characteristics	<p>The teacher will guide students to:</p> <p>Utilizing the geologic time scale, historical geology and GIS to relate how the locations of the Earth's resources are directly related to the conditions that they historically formed under.</p> <p>Describe how humans can affect non-living and living factors such as soil formation through the implementation of conservation projects.</p> <p>Describe how geologic events affect the areas where people live, the construction of buildings, and the manipulation of landscapes.</p> <p>Describe how different areas of Pennsylvania use the varied soil types to enhance living conditions in specific areas.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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<p>PA Standard 4.2.10.A Explain that renewable and nonrenewable resources supply energy and materials.</p> <ul style="list-style-type: none">• Identify alternative sources of energy.• Identify and compare fuels used in industrial and agricultural societies.• Compare and contrast the cycles of various natural resources.• Explain food and fiber as renewable resources.	<p>The teacher will guide students to:</p> <p>Compare and contrast the benefits of alternative sources of energy including solar, wind, and geothermal energy</p> <p>Distinguish between various types of fuels and how they are used in different societies, including both industrial and agricultural societies.</p> <p>Describe the cycle of utilization of a natural resource from development to harvesting.</p> <p>Describe how consumable and potable goods are utilized as renewable resources.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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<p>PA Standard 4.2.10.B Evaluate factors affecting availability of natural resources.</p> <ul style="list-style-type: none">• Describe natural occurrences that may affect the natural resources.• Analyze technologies that affect the use of our natural resources.• Evaluate the effect of consumer desires on various natural resources.	<p>The teacher will guide students to:</p> <p>Explain how different kinds of natural events may change the types and amounts of natural resources available in certain areas of the world.</p> <p>Compare and contrast how different types of resource harvesting and distribution have affected natural resources, including various types of technologies.</p> <p>Use the Opal Creek National forest as an example of how supply and demand has devastated the area of old growth forest.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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<p>PA Standard 4.2.10.C Analyze how man-made systems have impacted the management and distribution of natural resources.</p> <ul style="list-style-type: none">• Explain the complete cycle of a natural resource, from extraction to disposal, detailing its uses and effects on the environment.• Analyze energy uses and energy conservation in different regions.• Examine conservation practices in different countries.• Analyze the costs and benefits of different man-made systems and how they use renewable and nonrenewable natural resources.• Analyze the impact of information systems on management and distribution of natural resources.	<p>The teacher will guide students to:</p> <p>Explain all the steps of coal mining processes in Pennsylvania and the effects on local environments.</p> <p>Develop energy usage grids to describe the various consumption and conservation trends day to day.</p> <p>Compare and contrast how different areas of the world react to conservation legislations.</p> <p>Use a hydro-electric model to compare the benefits and disadvantages of manmade energy systems.</p> <p>Describe how modern information systems and communication devices have made individual human conservation more possible.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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<p>PA Standard 4.2.10.D Explain different management alternatives involved in recycling and solid waste management.</p> <ul style="list-style-type: none">Analyze the manufacturing process (before, during and after) with consideration for resource recovery.Compare various methods dealing with solid waste (e.g., incineration, compost, land application).Differentiate between pre/post-consumer and raw materials.Illustrate how one natural resource can be managed through reduction, recycling, or reuse.	<p>The teacher will guide students to:</p> <p>Explain how different manufacturing processes conserve natural resources.</p> <p>Compare and contrast the different methods of waste disposal systems.</p> <p>Explain the difference between what the natural resource looks like before it becomes a usable product and what it looked like before production.</p> <p>Explain how plastic water bottles use reduction, recycling and reuse conserves petroleum based resources.</p> <p>Illustrate how one natural resource can be managed through reduction, recycling, or reuse.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Group, partner & individual projectsClass workTeacher observationTests/QuizzesIndependent & cooperative activitiesStudent JournalsStudent demonstration and student observation analysisOral presentations, questions and answersConcept Maps/graphic organizer, rubricsPortfolio	<ul style="list-style-type: none">Textbook resourcesInstructor generated resourcesWeb-based and software programsNewspapers and magazinesLab materials for demonstrationsOutside presenters as applicable

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CORE CONCEPT 4: Earth's resources

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.3.10.A Describe environmental health issues.</p> <ul style="list-style-type: none"> • Identify the effects on human health of air, water and soil pollution and the possible economic costs to society. • Explain the costs and benefits of cleaning up contaminants • Explain how common household cleaning products are manufactured and how to dispose of their by-products after use. 	<p>The teacher will guide students to:</p> <p>Describe how different types of pollutants affect the health of humans and how they relate to the economic costs.</p> <p>Use the Exxon Valdez oil spill to describe the affects of contaminant spill and clean up successes and failures.</p> <p>Explain the EPA protocol for the removal of certain common household chemicals.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Group, partner & individual projects • Class work • Teacher observation • Tests/Quizzes • Independent & cooperative activities • Student Journals • Student demonstration and student observation analysis • Oral presentations, questions and answers • Concept Maps/graphic organizer, rubrics • Portfolio 	<ul style="list-style-type: none"> • Textbook resources • Instructor generated resources • Web-based and software programs • Newspapers and magazines • Lab materials for demonstrations • Outside presenters as applicable

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<p>PA Standard 4.3.10.B Explain how multiple variables determine the effects of pollution on environmental health, natural processes and human practices.</p> <ul style="list-style-type: none"> • Explain how human practices affect the quality of the water and soil. • Identify evidence of natural events around the world and their effects on environmental health (e.g., Yellowstone National Park fires). • Identify local and state environmental regulations and their impact on environmental health. • Identify and explain ways of detecting pollution by using state-of-the-art technologies. 	<p>The teacher will guide students to:</p> <p>Compare and contrast various human practices and the effects on water and soil quality.</p> <p>Describe how the eruption of Mt. Saint Helens affected the weather and air quality across all North America.</p> <p>Describe how the coal industry in Schuylkill County has been affected by the environmental regulations that govern it.</p> <p>Identify state environmental regulations and their impact on environmental health</p> <p>Describe water quality detection methods located at USGS river monitoring stations and how feedback is used to release buffers into the watershed.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Group, partner & individual projects • Class work • Teacher observation • Tests/Quizzes • Independent & cooperative activities • Student Journals • Student demonstration and student observation analysis • Oral presentations, questions and answers • Concept Maps/graphic organizer, rubrics • Portfolio 	<ul style="list-style-type: none"> • Textbook resources • Instructor generated resources • Web-based and software programs • Newspapers and magazines • Lab materials for demonstrations • Outside presenters as applicable

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<p>PA Standard 4.3.10.C Explain biological diversity as an indicator of a healthy environment.</p> <ul style="list-style-type: none">• Explain species diversity.• Analyze the effects of species extinction on the health of an ecosystem.	<p>The teacher will guide students to:</p> <p>Use the tropical rain forest model to describe the importance to species diversity and how it impacts human life.</p> <p>Describe and explain how the extinction of species has a trickle down affect on all animals in the ecosystem.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CORE CONCEPT 4: Earth's resources

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<p>PA Standard 4.8.10.A Analyze how society's needs relate to the sustainability of natural resources.</p> <ul style="list-style-type: none">• Explain why some societies have been unable to meet their natural resource needs.• Compare and contrast the use of natural resources and the environmental conditions in several countries.• Describe how uses of natural resources impact sustainability.	<p>The teacher will guide students to:</p> <p>Compare and contrast how developed and underdeveloped nations utilize natural resources</p> <p>Utilized a supply&demand model to show how the estimated oil supplies on Earth relate the demand over the next 50 years.</p> <p>Describe how the supply and demand market does not apply to the sustainability of a resource.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CORE CONCEPT 4: Earth's resources

MAJOR OBJECTIVE: Describe how human activities affect both living and nonliving factors (biotic and abiotic).

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<p>PA Standard 4.8.10.B Analyze the relationship between the use of natural resources and sustaining our society.</p> <ul style="list-style-type: none">• Explain the role of natural resources in sustaining society.• Analyze the effects of a natural resource's availability on a community or region.	<p>The teacher will guide students to:</p> <p>Compare and contrast various natural resources and their role in sustaining society.</p> <p>Analyze how the availability of natural resources can lead to various problems within a community or region.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CORE CONCEPT 4: Earth's resources

MAJOR OBJECTIVE: Describe how human activities affect both living and nonliving factors (biotic and abiotic).

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.8.10.C Analyze how human activities may cause changes in an ecosystem.</p> <ul style="list-style-type: none">Analyze and evaluate changes in the environment that are the result of human activities.Compare and contrast the environmental effects of different industrial strategies (e.g., energy generation, transportation, logging, mining, agriculture).	<p>The teacher will guide students to:</p> <p>Describe how global warming and the greenhouse effect relate to a variety of industrial strategies and how these processes are being accelerated by human activities.</p> <p>Describe how different cultural and geographic locations view the importance of environmental protections and their impact on their economies.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Group, partner & individual projectsClass workTeacher observationTests/QuizzesIndependent & cooperative activitiesStudent JournalsStudent demonstration and student observation analysisOral presentations, questions and answersConcept Maps/graphic organizer, rubricsPortfolio	<ul style="list-style-type: none">Textbook resourcesInstructor generated resourcesWeb-based and software programsNewspapers and magazinesLab materials for demonstrationsOutside presenters as applicable

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CORE CONCEPT 4: Earth's resources

MAJOR OBJECTIVE: Describe how human activities affect both living and nonliving factors (biotic and abiotic).

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<p>PA Standard 4.8.10.D Explain how the concept of supply and demand affects the environment.</p> <ul style="list-style-type: none">• Identify natural resources for which societal demands have been increasing.• Identify specific resources for which human consumption has resulted in scarcity of supply (e.g., buffalo, lobsters).• Describe the relationship between population density and resource use and management.	<p>The teacher will guide students to:</p> <p>Describe how demands on certain natural resources have placed strains on the sustainability of the resource.</p> <p>Identify specific resources for which human consumption has resulted in scarcity of supply and high costs to consumers.</p> <p>Describe how human activities have led to the extinction or scarcity of certain natural resources.</p> <p>Compare and contrast resource use in a highly populated region and a low population area.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

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CORE CONCEPT 5: Hydrology

MAJOR OBJECTIVE: Describe the Earth’s water systems, their use as a human resource, and how they affect the Earth’s geology and ecology.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.D Assess the value of water as a resource.</p> <ul style="list-style-type: none"> • Compare specific sources of potable water (e.g., wells, public systems, rivers) used by people in Pennsylvania. • Identify the components of a municipal/agricultural water supply system and a wastewater treatment system. • Relate aquatic life to water conditions (e.g., turbidity, temperature, salinity, dissolved oxygen, nitrogen levels, pressure). 	<p>The teacher will guide students to:</p> <p>Describe the water cycle and the physical properties on which it depends.</p> <p>Compare and contrast specific sources of water used by people in Pennsylvania including: wells, public systems, rivers.</p> <p>Compare and contrast the characteristics of freshwater and saltwater systems on the basis of their physical characteristics and their use as a natural resource.</p> <p>Identify the components of a municipal/agricultural water supply system and a wastewater treatment system.</p> <p>Identify the physical characteristics of different water types and how these characteristics determine the types of organisms found in an aquatic environment.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Group, partner & individual projects • Class work • Teacher observation • Tests/Quizzes • Independent & cooperative activities • Student Journals • Student demonstration and student observation analysis • Oral presentations, questions and answers • Concept Maps/graphic organizer, rubrics • Portfolio 	<ul style="list-style-type: none"> • Textbook resources • Instructor generated resources • Web-based and software programs • Newspapers and magazines • Lab materials for demonstrations • Outside presenters as applicable

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CORE CONCEPT 6: Meteorology

MAJOR OBJECTIVE: Describe weather and climate and how different factors affect the climate of an area.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.C Interpret meteorological data.</p> <ul style="list-style-type: none">Analyze information from meteorological instruments and online sources to predict weather patterns.Describe weather and climate patterns on global levels.	<p>Teacher will guide students to:</p> <p>Analyze information gleaned from meteorological instruments to predict weather patterns.</p> <p>Describe the impact of weather systems on the local area and/or the climate of a region and the world</p> <p>Explain how cloud types and formation, wind direction and barometric changes affect the weather of certain geographic areas of the country.</p> <p>Describe how global patterns of atmospheric movement influence regional weather and climate.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Group, partner & individual projectsClass workTeacher observationTests/QuizzesIndependent & cooperative activitiesStudent JournalsStudent demonstration and student observation analysisOral presentations, questions and answersConcept Maps/graphic organizer, rubricsPortfolio	<ul style="list-style-type: none">Textbook resourcesInstructor generated resourcesWeb-based and software programsNewspapers and magazinesLab materials for demonstrationsOutside presenters as applicable

CONTENT: Grade 8 science

CORE CONCEPT 6: Meteorology

MAJOR OBJECTIVE: Describe weather and climate and how different factors affect the climate of an area.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.1.10.A Discriminate among the concepts of systems, subsystems, feedback and control in solving technological problems.</p> <ul style="list-style-type: none">Describe the interrelationships among inputs, processes, outputs, feedback and control in specific systemsDescribe the interrelationships among inputs, processes, outputs, feedback and control in specific systemsExplain the concept of system redesign and apply it to improve technological systems.Analyze and describe the effectiveness of systems to solve specific problems.	<p>Teacher will guide students to:</p> <p>Describe a system as a group of related parts with specific roles that work together to achieve an observed result.</p> <p>Explain the concept of order in a system.</p> <p>Distinguish between system inputs, system processes, system outputs and feedback.</p> <p>Describe how engineers use systems to develop new and improved technologies to solve problems.</p> <p>Distinguish between open-loop and closed-loop systems.</p> <p>Explain how components of a natural and human made system play different roles in a working system.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Group, partner & individual projectsClass workTeacher observationTests/QuizzesIndependent & cooperative activitiesStudent JournalsStudent demonstration and student observation analysisOral presentations, questions and answersConcept Maps/graphic organizer, rubricsPortfolio	<ul style="list-style-type: none">Textbook resourcesInstructor generated resourcesWeb-based and software programsNewspapers and magazinesLab materials for demonstrationsOutside presenters as applicable

CONTENT: Grade 8 science

CORE CONCEPT 7: The Universe

MAJOR OBJECTIVE: Describe the structure and composition of the universe

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.D Explain essential ideas about the composition and structure of the universe.</p> <ul style="list-style-type: none">• Compare the basic structures of the universe (e.g., galaxy types, nova, black holes, neutron stars).• Describe the structure and life cycle of star, using the Hertzsprung-Russell diagram.• Explain the impact of the Copernican and Newtonian thinking on man's view of the universe.	<p>Teacher will guide students to:</p> <p>Compare and contrast the characteristics of celestial bodies in the solar system</p> <p>Compare and contrast stages in the evolution of a star.</p> <p>Describe the role of gravity as the force that governs the movement of the solar system and the universe.</p> <p>Describe the impact of the Copernican and Newtonian thinking on man's view of the universe.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

CONTENT: Grade 8 science

CORE CONCEPT 8: GIS and GPS devices

MAJOR OBJECTIVE: Describe how satellite positioning systems can be used in conjunction with topographic maps.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.A Relate earth features and processes that change the earth</p> <ul style="list-style-type: none">• Interpret topographic maps to identify and describe significant geologic history/structures in Pennsylvania.	<p>Teacher will guide students to:</p> <p>Use GPS and GIS systems to navigate with topographic maps in Pennsylvania.</p> <p>Utilize topographic maps to describe how the Earth's structures and features have changed over time.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Group, partner & individual projects• Class work• Teacher observation• Tests/Quizzes• Independent & cooperative activities• Student Journals• Student demonstration and student observation analysis• Oral presentations, questions and answers• Concept Maps/graphic organizer, rubrics• Portfolio	<ul style="list-style-type: none">• Textbook resources• Instructor generated resources• Web-based and software programs• Newspapers and magazines• Lab materials for demonstrations• Outside presenters as applicable

V. EXPECTED LEVELS OF ACHIEVEMENT

A. Students are expected to reach the eighth grade level of achievement in science. These skills include all of those noted in the specific content area of this curriculum.

B. Grading system for all eighth grade science classes is as follows:

Grading Scale	
A	90-100
B	80-89
C	70-79
D	60-69
F	Below 60

C. Each student's grade will be determined at the conclusion of each marking period.