



# **Pine Grove Area**

SCHOOL DISTRICT

**SCIENCE**

**9 TH GRADE PSSA SCIENCE REMEDIATION**

**April 15, 2009**

## **I. PHILOSOPHY**

This class was designed to improve student's collective general science skills. The main topics covered in this course are: scientific investigation, technology, changes in systems, using instruments to measure, scientific models, structure of living things, survival reproduction and heredity, organisms and ecosystems, environmental changes, renewable and nonrenewable resources, properties of matter and energy, forces and machines, Earth's processes, solar system, and the universe.

## **II. CORE CONCEPTS**

### **Core Concepts: 9<sup>th</sup> Grade Science PSSA Remediation Course**

1. Scientific Knowledge- Distinguish between a scientific and opinion and scientific fact.
- 2 Science and Technology- Describe the positive and negative intended and unintended effects of specific scientific results or technological developments.
3. Systems- Define a system and utilize ratio to describe changes.
4. Scientific Investigation – Use evidence, observations, instruments, or a variety of scales to describe relationships.
5. Models and Patterns- Describe the use of models in scientific endeavors.
6. Structures of Living Things- Describe the interdependency of substructures on the function of living things.
7. Survival, Reproduction, and Heredity- Explain how inherited structures and behaviors help organisms survive, reproduce, and adapt to different environments.
8. Organisms and Ecosystems- Explain how an ecosystem works and identify environmental changes that affect populations, and diversity among organisms.
9. Energy and Matter- Explain the interrelationship that exists between energy and matter; and identify the factors that affect conversion and conservation.
10. Earth and Space- Describe the physical processes that are part of, and the forces that shape, the Earth and the rest of the known Universe.

### III. COURSE OF STUDY

A. Course Name: *9<sup>TH</sup> Grade Science PSSA Remediation*

B. Grade Level: 9th

C. Length of Course: *full year*

1. Frequency: *daily*

2. Duration: *50 minutes*

D. Academic Level: NA

E. Credits: 1.0

F. Prerequisites: Basic or Below Basic Science 8<sup>th</sup> Grade PSSA Scores

G. Course Description:

*This course is designed to strengthen students overall science skills. The focus of this course is to bring up students science PSSA scores through a review of the 8<sup>th</sup> grade PSSA test topics.*

**IV. CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 1:** Scientific Knowledge

**MAJOR OBJECTIVE:** Distinguish between a scientific and opinion and scientific fact.

**CURRICULUM STANDARD:**

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.1.10.C</b>  <b>Apply patterns as repeated processes or recurring elements in science and technology.</b></p> <ul style="list-style-type: none"> <li>• Examine and describe recurring patterns that form the basis of biological classification, chemical periodicity, geological order and astronomical order.</li> <li>• Examine and describe stationary physical patterns.</li> <li>• Examine and describe physical patterns in motion.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>• Utilize scientific inquiry and technology to answer questions.</li> <li>• Analyze evidence to support inferences about scientific relationships.</li> <li>• Develop descriptions, explanations, predictions, and models based on scientific data.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>• Student white board work.</li> <li>• Student class discussion.</li> <li>• Student homework assignments.</li> <li>• Student laboratory reports/notebooks.</li> <li>• Student workbooks.</li> <li>• Student tests/quizzes.</li> <li>• Student video presentations.</li> <li>• Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 1:** Scientific Knowledge

**MAJOR OBJECTIVE:** Distinguish between a scientific and opinion and scientific fact.

**CURRICULUM STANDARD:**

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.2.10.A</b> <b>Apply knowledge and understanding about the nature of scientific and technological knowledge.</b></p> <ul style="list-style-type: none"><li>• Compare and contrast scientific theories and beliefs.</li><li>• Know that science uses both direct and indirect observation means to study the world and the universe.</li><li>• Integrate new information into existing theories and explain implied results.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Distinguish between scientific theory and opinion.</li><li>• Explain how a theory is supported with evidence.</li><li>• Explain how new information. data may change existing theories and practices.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 2: Science and Technology**

**MAJOR OBJECTIVE:** Describe the positive and negative intended and unintended effects of specific scientific results or technological developments.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.2.10.C</b>  <b>Identify and apply the technological design process to solve problems.</b></p> <ul style="list-style-type: none"> <li>• Examine the problem, rank all necessary information and all questions that must be answered.</li> <li>• Propose and analyze a solution.</li> <li>• Implement the solution.</li> <li>• Evaluate the solution, test, redesign and improve as necessary.</li> <li>• Communicate the process and evaluate and present the impacts of the solution.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>• List the negative and positive impacts of technology on society.</li> <li>• Describe fundamental scientific or technological concepts that could solve practical problems.</li> <li>• Explain society’s standard of living in terms of technological advancements and their impact on agriculture.</li> <li>• Describe ways technology extends and enhances human abilities for specific purposes.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>• Student white board work.</li> <li>• Student class discussion.</li> <li>• Student homework assignments.</li> <li>• Student laboratory reports/notebooks.</li> <li>• Student workbooks.</li> <li>• Student tests/quizzes.</li> <li>• Student video presentations.</li> <li>• Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 3: Systems**

**MAJOR OBJECTIVE:** Define a system and utilize ratio to describe changes.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.1.10.A</b>  <b>Discriminate among the concepts of systems, subsystems, feedback and control in solving technological problems</b></p> <ul style="list-style-type: none"> <li>• Identify the function of subsystems within a larger system (e.g., role of thermostat in an engine, pressure switch).</li> <li>• Describe the interrelationships among inputs, processes, outputs, feedback and control in specific systems.</li> <li>• Explain the concept of system redesign and apply it to improve technological systems.</li> <li>• Apply the universal systems model to illustrate specific solutions and troubleshoot specific problems.</li> <li>• Analyze and describe the effectiveness of systems to solve specific problems.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>• Utilize ratios to describe change in a system.</li> <li>• Utilize observations, evidence, or theories to make inferences about system dynamics over time.</li> <li>• Identify dependent and independent variables.</li> <li>• Explain how a dynamically changing environment provides for the sustainability of living things.</li> <li>• Describe a system in terms of related parts that work together to achieve an observed result.</li> <li>• Distinguish between system inputs, processes, outputs, and feedback in open and closed loop systems.</li> <li>• Explain how components of natural and human made systems play different roles in a working system.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>• Student white board work.</li> <li>• Student class discussion.</li> <li>• Student homework assignments.</li> <li>• Student laboratory reports/notebooks.</li> <li>• Student workbooks.</li> <li>• Student tests/quizzes.</li> <li>• Student video presentations.</li> <li>• Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class

**CORE CONCEPT 4:** Scientific Investigation

**MAJOR OBJECTIVE:** Use evidence, observations, instruments, or a variety of scales to describe relationships

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.2.10.B</b> <b>Apply process knowledge and organize scientific and technological phenomena in varied ways.</b></p> <ul style="list-style-type: none"><li>• Describe materials using precise quantitative and qualitative skills based on observations.</li><li>• Develop appropriate scientific experiments: raising questions, formulating hypotheses, testing, controlled experiments, recognizing variables, manipulating variables, interpreting data, and producing solutions.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Utilize the scientific method to explore natural phenomena.</li><li>• Identify a design flaw in a technological system and devise possible working solutions.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class

**CORE CONCEPT 4:** Scientific Investigation

**MAJOR OBJECTIVE:** Use evidence, observations, instruments, or a variety of scales to describe relationships

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.7.10.B</b> <b>Apply appropriate instruments and apparatus to examine a variety of objects and processes.</b></p> <ul style="list-style-type: none"><li>• Describe and use appropriate instruments to gather and analyze data.</li><li>• Compare and contrast different scientific measurement systems; select the best measurement system for a specific situation.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Apply appropriate measurement systems to record and interpret</li><li>• Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, or temperature safely under a variety of conditions.</li><li>• Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, or temperature safely under a variety of conditions.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 5: Models and Patterns**

**MAJOR OBJECTIVE:** Describe the use of models in scientific endeavors

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.1.10.B</b> <b>Describe concepts of models as a way to predict and understand science and technology.</b></p> <ul style="list-style-type: none"><li>• Distinguish between different types of models and modeling techniques and apply their appropriate use in specific applications (e.g., kinetic gas theory, DNA).</li><li>• Examine the advantages of using models to demonstrate processes and outcomes (e.g., blue print analysis, structural stability).</li><li>• Apply mathematical models to science and technology.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Describe how scientists use models to explore relationships in natural systems.</li><li>• Explain how engineers use models to develop new technologies to solve problems.</li><li>• Illustrate causality in a natural system.</li><li>• Predict results based on models.</li><li>• Identify and describe patterns as repeated processes or recurring elements in human made systems.</li><li>• Describe repeating structure patterns in nature or periodic patterns.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 6: Structures of Living Things**

**MAJOR OBJECTIVE:** Describe the interdependency of substructures on the function of living things.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.3.10 A</b>  <b>Explain the structural and functional similarities and differences found among living things.</b></p> <ul style="list-style-type: none"> <li>• Identify and characterize major life forms according to their placement in existing classification groups.</li> <li>• Explain the relationship between structure and function at the molecular and cellular levels.</li> <li>• Describe organizing schemes of classification keys.</li> <li>• Identify and characterize major life forms by kingdom, phyla, class and order.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>• Describe the structures of living things that help them function in effective ways.</li> <li>• Compare similarities and differences in both internal and external structures of organisms.</li> <li>• Apply knowledge of characteristic structures to identify or categorize organisms.</li> <li>• Identify levels of organization from cell to organism.</li> <li>• Describe how specific structures, which underlie larger systems, enable the system to function as a whole.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>• Student white board work.</li> <li>• Student class discussion.</li> <li>• Student homework assignments.</li> <li>• Student laboratory reports/notebooks.</li> <li>• Student workbooks.</li> <li>• Student tests/quizzes.</li> <li>• Student video presentations.</li> <li>• Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

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**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.3.10 B</b> <b>Describe and explain the chemical and structural basis of living organisms.</b></p> <ul style="list-style-type: none"><li>• Describe the relationship between the structure of organic molecules and the function they serve in living organisms.</li><li>• Identify the specialized structures and regions of the cell and the functions of each.</li></ul>	<p>Teacher will guide students:</p> <ul style="list-style-type: none"><li>• Apply knowledge of characteristic structures to identify or categorize organisms.</li><li>• Identify levels of organization from cell to organism.</li><li>• Describe how specific structures, which underlie larger systems, enable the system to function as a whole. to:</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 7: Survival, Reproduction, and Heredity**

**MAJOR OBJECTIVE:** Explain how inherited structures and behaviors help organisms survive, reproduce, and adapt to different environments.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.3.10.C</b>  <b>Describe how genetic information is inherited and expressed.</b></p> <ul style="list-style-type: none"> <li>• Compare and contrast the function of mitosis and meiosis.</li> <li>• Describe mutations' effects on a trait's expression.</li> <li>• Distinguish different reproductive patterns in living things (e.g., budding, spores, fission).</li> <li>• Compare random and selective breeding practices and their results (e.g., antibiotic resistant bacteria).</li> <li>• Explain the relationship among DNA, genes and chromosomes.</li> <li>• Explain different types of inheritance (e.g., multiple allele, sex-influenced traits).</li> <li>• Describe the role of DNA in protein synthesis as it relates to gene expression.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>• Explain how inherited structures or behaviors help organisms survive and reproduce in different environments.</li> <li>• Explain how adaptations in individuals of the same species may affect survivability or reproduction success.</li> <li>• Explain how mutations can alter a gene and are the original source of new variations.</li> <li>• Describe how selective breeding or biotechnology can change the genetic makeup of organisms.</li> <li>• Explain that adaptations are developed over time and are passed from one generation to another.</li> <li>• Identify and explain differences between inherited and acquired traits.</li> <li>• Recognize that the gene is the basic unit of inheritance and that there are dominant and recessive genes.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>• Student white board work.</li> <li>• Student class discussion.</li> <li>• Student homework assignments.</li> <li>• Student laboratory reports/notebooks.</li> <li>• Student workbooks.</li> <li>• Student tests/quizzes.</li> <li>• Student video presentations.</li> <li>• Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 8: Organisms and Ecosystems**

**MAJOR OBJECTIVE:** Explain how an ecosystem works and identify environmental changes that affect populations, and diversity among organisms.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 4.2.10 C</b>  <b>Analyze how man-made systems have impacted the management and distribution of natural resources.</b></p> <ul style="list-style-type: none"> <li>Explain the complete cycle of a natural resource, from extraction to disposal, detailing its uses and effects on the environment.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>Explain the flow of energy through an ecosystem.</li> <li>Identify major biomes.</li> <li>Describe abiotic and biotic components of an ecosystem.</li> <li>Explain the relationship of organisms in an ecosystem.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>Student white board work.</li> <li>Student class discussion.</li> <li>Student homework assignments.</li> <li>Student laboratory reports/notebooks.</li> <li>Student workbooks.</li> <li>Student tests/quizzes.</li> <li>Student video presentations.</li> <li>Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>
<p><b>PA Standard 4.3.10 C</b>  <b>Explain biological diversity as an indicator of a healthy environment.</b></p> <ul style="list-style-type: none"> <li>Explain species diversity. Analyze the effects of species extinction on the health of an ecosystem.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>Explain factors that affect changes in populations.</li> <li>Explain how diversity affects the ecological integrity of natural systems.</li> <li>Describe the response of organisms to environmental changes.</li> <li>Describe how environmental changes effect organism survival.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>Student white board work.</li> <li>Student class discussion.</li> <li>Student homework assignments.</li> <li>Student laboratory reports/notebooks.</li> <li>Student workbooks.</li> <li>Student tests/quizzes.</li> <li>Student video presentations.</li> <li>Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 9: Energy and Matter**

**MAJOR OBJECTIVE:** Explain the interrelationship that exists between energy and matter; and identify the factors that affect conversion and conservation.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.4.10.A</b> <b>Explain concepts about the structure and properties of matter</b></p> <ul style="list-style-type: none"><li>• Apply knowledge of mixtures to appropriate separation techniques.</li><li>• Describe and conduct experiments that identify chemical and physical properties.</li><li>• Describe various types of chemical reactions by applying the laws of conservation of mass and energy</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Explain the difference among elements, compounds, and mixtures.</li><li>• Utilize physical and chemical properties to distinguish one substance from another.</li><li>• Identify and describe reactants and products of simple chemical reactions.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

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**CORE CONCEPT 9: Energy and Matter**

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<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 4.2.10 A</b> <b>Explain that renewable and nonrenewable resources supply energy and materials.</b></p> <ul style="list-style-type: none"><li>• Identify alternative sources of energy.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Distinguish among forms and sources of energy.</li><li>• Explain how energy is transferred through conduction, convection, and radiation.</li><li>• Describe how one form of energy can be converted into a different form of energy.</li><li>• Identify the sun as a major source of energy that impacts the environment.</li><li>• Compare and contrast the time spans of renewability for fossil and alternative fuels.</li><li>• Describe the waste derived from the use of renewable and nonrenewable resources and their potential impact on the environment.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 9:** Energy and Matter

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**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.4.10 B</b> <b>Analyze energy sources and transfers of heat.</b></p> <ul style="list-style-type: none"><li>• Use knowledge of and momentum to explain common phenomena</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Describe forces acting on objects</li><li>• Explain the conservation of momentum.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

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**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.4.10 C</b> <b>Distinguish among the principles of force and motion.</b></p> <ul style="list-style-type: none"><li>• Know Newton’s laws of motion (including inertia, action and reaction) and gravity and apply them to solve problems related to forces and mass.</li><li>• Determine the efficiency of mechanical systems by applying mathematical formulas.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Distinguish between kinetic and potential energy.</li><li>• Explain mechanical advantage.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 10:** Earth and Space

**MAJOR OBJECTIVE:** Describe the physical processes that are part of, and the forces that shape, the Earth and the rest of the known Universe.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.5.10A</b>  <b>Relate earth features and processes that change the earth.</b></p> <ul style="list-style-type: none"> <li>• Illustrate and explain plate tectonics as the mechanism of continental movement and sea floor changes.</li> <li>• 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).</li> <li>• Interpret topographic maps to identify and describe significant geologic history/structures in Pennsylvania.</li> <li>• Evaluate and interpret geologic history using geologic maps.</li> <li>• Explain several methods of dating earth materials and structures.</li> <li>• Correlate rock units with general geologic time periods in the history of the earth.</li> <li>• Describe and identify major types of rocks and minerals.</li> </ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> <li>• Explain the rock cycle as changes in the solid earth and rock types found in Pennsylvania.</li> <li>• Describe natural processes that change the Earth’s surface.</li> <li>• Identify soil types and their characteristics found in different biomes and in Pennsylvania.</li> <li>• Explain how the fossils provide evidence about plants and animals that lived long ago throughout Pennsylvania history.</li> </ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> <li>• Student white board work.</li> <li>• Student class discussion.</li> <li>• Student homework assignments.</li> <li>• Student laboratory reports/notebooks.</li> <li>• Student workbooks.</li> <li>• Student tests/quizzes.</li> <li>• Student video presentations.</li> <li>• Student electronic portfolios.</li> </ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 10:** Earth and Space

**MAJOR OBJECTIVE:** Describe the physical processes that are part of, and the forces that shape, the Earth and the rest of the known Universe.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 4.1.10.A</b> <b>Describe changes that occur from a stream's origin to its final outflow.</b></p> <ul style="list-style-type: none"><li>• Identify Pennsylvania's major watersheds and their related river systems.</li><li>• Describe changes by tracing a specific river's origin back to its headwaters including its major tributaries.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Describe the water cycle and the physical processes on which it depends.</li><li>• Compare and contrast characteristics of freshwater and saltwater systems.</li><li>• Distinguish among different fresh water systems.</li><li>• Describe the relationship between different water systems and land formations.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

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**CORE CONCEPT 10:** Earth and Space

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<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 4.1.10.C</b> <b>Describe the physical characteristics of a stream and determine the types of organisms found in aquatic environments.</b></p> <ul style="list-style-type: none"><li>Describe and explain the physical factors that affect a stream and the organisms living there</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>Identify physical characteristics of a stream.</li><li>Explain how the physical characteristics of a stream determine the types of organisms found within the stream environment.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>Student white board work.</li><li>Student class discussion.</li><li>Student homework assignments.</li><li>Student laboratory reports/notebooks.</li><li>Student workbooks.</li><li>Student tests/quizzes.</li><li>Student video presentations</li><li>Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

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State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 4.1.10.B</b> <b>Explain the relationship among landforms, vegetation and the amount and speed of water.</b></p> <ul style="list-style-type: none"><li>• Explain the influence of mountains on precipitation.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Explain the impact of water systems on the local weather or the climate of a region.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**CONTENT: 9<sup>th</sup> Grade Science PSSA Remediation Class**

**CORE CONCEPT 10:** Earth and Space

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<p><b>PA Standard 3.5.10.C</b> <b>Interpret meteorological data.</b></p> <ul style="list-style-type: none"><li>• Describe weather and climate patterns on global levels.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Identify how global patterns of atmospheric movement influence regional weather and climate.</li><li>• Identify how cloud types, wind directions, and barometric pressure changes are associated with weather patterns in different regions of the United States.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

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State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 3.4.10.D</b> <b>Describe essential ideas about the composition and structure of the universe and the earth's place in it.</b></p> <ul style="list-style-type: none"><li>• Compare the basic structures of the universe (e.g., galaxy types, nova, black holes, neutron stars).</li><li>• Identify and analyze the findings of several space instruments in regard to the extent and composition of the solar system and universe.</li></ul>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"><li>• Describe patterns of Earth's movements in relation to the noon and sun.</li><li>• Describe the role of gravity as the force that governs the movement of the solar system and universe.</li><li>• Compare and contrast characteristics of celestial bodies found in the solar system.</li></ul>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"><li>• Student white board work.</li><li>• Student class discussion.</li><li>• Student homework assignments.</li><li>• Student laboratory reports/notebooks.</li><li>• Student workbooks.</li><li>• Student tests/quizzes.</li><li>• Student video presentations.</li><li>• Student electronic portfolios.</li></ul>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p>

**V. EXPECTED LEVELS OF ACHIEVEMENT**

A. Students are expected to improve on their collective science skills. These skills include all of those noted in the specific content area of this curriculum.

B. Grading system for this course is as follows:

<b>Grading Scale</b>	
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

C. Each student's grade will be determined at the conclusion of each marking period. Progress notes will be issued half-way throughout each marking period for students who are performing below 70%.