



Pine Grove Area

SCHOOL DISTRICT

SCIENCE

COLLEGE PREPARATORY PHYSICAL SCIENCE

April 15, 2009

I. PHILOSOPHY

The college preparatory physical science course of the Pine Grove Area School District has been structured to introduce physics and earth science at a high school level. The course will allow for the accommodation of many learning styles, motivational levels, and academic abilities.

II. CORE CONCEPTS

1. Science Skills- Describe how scientific investigation attempts to explain natural phenomena.
2. Forces and Motion- Differentiate among vector quantities, scalar quantities, and fluid mechanics.
3. Work, Power, and Machines- Define work and power and the factors that affect efficiency.
4. Energy and Heat- Explain the differences in the various forms of energy.
5. EMS and Optics- List the parts of the EMS and relate the connection between visible light and optics.
6. Electricity and Magnetism- Utilize mathematics to describe electricity and magnetism.
7. Earth's Surface and Interior- List and explain the forces that shape the Earth.
8. Weather and Climate- Describe how scientists predict weather and climate.
9. The Solar System- Describe the structure of our solar system
10. Exploring the Universe- Explain the life cycle of large stellar bodies and systems.

III. COURSE OF STUDY

A. Course Name: *College Preparatory Physical Science*

B. Grade Level: 10th

C. Length of Course: *Full year*

1. Frequency: *1 full period a day*

2. Duration: 50

D. Academic Level: College Preparatory

E. Credits: 1.0

F. Prerequisites: Successful completion of CP or PS Biology

G. Course Description:

The course provides a foundation in physical science. Physical science is the study of the physical world with a focus on chemistry, physics, and earth science. This course will explore: scientific thinking, problem solving, forces in motion, work, power, machines, energy, heat, EMS, optics, electricity, magnetism, Earth's surface and interior, weather, climate, the solar system, and the known universe.

IV. CONTENT: CP Physical Science

CORE CONCEPT 1: Science Skills

MAJOR OBJECTIVE: Describe how scientific investigation attempts to explain natural phenomena.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.1.10 E.</p> <p>Describe patterns of change in nature, physical and man made systems.</p> <ul style="list-style-type: none"> Describe how fundamental science and technology concepts are used to solve practical problems 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> Define and differentiate between science, technology, chemistry, physics, geology, astronomy, and biology. Describe how the process of science starts and ends. Relate the role of technology in science. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Student white board work. Student class discussion. Student homework assignments. Student laboratory reports/notebooks. Student workbooks. Student tests/quizzes. Student video presentations. Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA State Standard 3.2.10.A</p> <p>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> <ul style="list-style-type: none"> Differentiate between a scientific law and a scientific theory 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Student white board work. Student class discussion. Student homework assignments. Student laboratory reports/notebooks. Student workbooks. Student tests/quizzes. Student video presentations. Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

CORE CONCEPT 1: Science Skills

MAJOR OBJECTIVE: Describe how scientific investigation attempts to explain natural phenomena.

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.2.10.B.</p> <p>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> <ul style="list-style-type: none">Describe the steps in the scientific method.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Student white board work.Student class discussion.Student homework assignments.Student laboratory reports/notebooks.Student workbooks.Student tests/quizzes.Student video presentations.Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

CORE CONCEPT 1: Science Skills

MAJOR OBJECTIVE: Describe how scientific investigation attempts to explain natural phenomena.

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.2.10.C</p> <p>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> <ul style="list-style-type: none">• Utilize the scientific method to solve real world problems in a laboratory setting.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

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PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.1.10.D</p> <p>Apply scale as a way of relating concepts and ideas to one another by some measure.</p> <ul style="list-style-type: none">• Apply dimensional analysis and scale as a ratio.• Convert one scale to another.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Convert between standard and scientific notation.• Convert between to different scales.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA State Standard 3.1.10.E</p> <p>Describe patterns of change in nature, physical and man made systems.</p> <ul style="list-style-type: none">• Describe the effects of error in measurements.•	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Differentiate between precision and accuracy.• Represent scientific data graphically.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

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CURRICULUM STANDARD:

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<p>PA Standard 3.7.10.B</p> <p>Apply appropriate instruments and apparatus to examine a variety of objects and processes.</p> <ul style="list-style-type: none">• Describe and use appropriate instruments to gather and analyze data.• Compare and contrast different scientific measurement systems; select the best measurement system for a specific situation.• Explain the need to estimate measurements within error of various instruments	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

CORE CONCEPT 2: Forces and Motion

MAJOR OBJECTIVE: Differentiate among vector quantities, scalar quantities, and fluid mechanics.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.1.10.B</p> <p>Describe concepts of models as a way to predict and understand science and technology.</p> <ul style="list-style-type: none">• Apply mathematical models to science and technology.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Describe motion in terms of displacement, frame of reference, and distance.• Differentiate between instantaneous and average speed.• Graphically describe speed.• Add vector quantities.• Graphically illustrate change in motion.• Differentiate between instantaneous and constant acceleration.• Calculate acceleration.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

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CURRICULUM STANDARD:

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<p>PA Standard 3.1.10.C</p> <p>Apply patterns as repeated processes or recurring elements in science and technology.</p> <p>Examine and describe physical patterns in motion</p>	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion.</p> <ul style="list-style-type: none"> • Know Newton’s laws of motion (including inertia, action and reaction) and gravity and apply them to solve problems related to forces and mass. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • List and differentiate between the four main forces of friction • Describe how air resistance, gravity affect motion. • Define terminal velocity. • Describe projectile motion. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations/electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

CORE CONCEPT 2: Forces and Motion

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.12.C</p> <p>Apply the principles of motion and force.</p> <p>Analyze the principles of translational motion, velocity and acceleration as they relate to free fall and projectile motion.</p>	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion.</p> <ul style="list-style-type: none">• Know Newton's laws of motion (including inertia, action and reaction) and gravity and apply them to solve problems related to forces and mass.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Describe Newton's first and second law of motion.• Differentiate between weight, mass, and inertia.• Use Newton's second law to calculate acceleration, force, and mass.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations/electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

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CURRICULUM STANDARD:

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<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion.</p> <ul style="list-style-type: none">• Know Newton’s laws of motion (including inertia, action and reaction) and gravity and apply them to solve problems related to forces and mass.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Describe Newton’s Third Law of Motion and Momentum.• Use Newton’s third law to calculate momentum, mass, and velocity.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.10.B</p> <p>Analyze energy sources and transfers of heat.</p> <ul style="list-style-type: none">• Use knowledge of conservation of energy and momentum to explain common phenomena	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations/electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

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<p>PA Standard 3.1.10.E Describe patterns of change in nature, physical and man made systems.</p> <ul style="list-style-type: none">Recognize that stable systems often involve underlying dynamic changes.Describe how fundamental science and technology concepts are used to solve practical problems.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">Describe the four main universal forces.Describe how friction with the atmosphere affects the speed of an artificial satellite.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Student white board work.Student class discussion.Student homework assignments.Student laboratory reports/notebooks.Student workbooks.Student tests/quizzes.Student video presentations.Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: CP Physical Science

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<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion.</p> <ul style="list-style-type: none">• Explain fluid power systems through the design and construction of appropriate models.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Define pressure and pascal.• Calculate pressure.• Relate water depth to pressure.• Describe atmospheric pressure.• Use Pascal's Principle to describe hydraulic systems.• Utilize Bernoulli's Principle to describe the upward force know as lift.• Define buoyancy and density.• Explain and illustrate.• Archimedes' Principle.• Design a experiment to calculate buoyant force.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations/electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 3: Work, Power, and Machines

MAJOR OBJECTIVE: Define work and power and the factors that affect efficiency.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.12.C</p> <p>Apply the principles of motion and force</p> <ul style="list-style-type: none"> Propose and produce modifications to specific mechanical power systems that will improve their efficiency. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> Define work, power, joule, horse power, and the watt. Determine when a force does work. Describe how work and power are related. Utilize calculations to determine work, force, and energy. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Student white board work. Student class discussion. Student homework assignments. Student laboratory reports/notebooks. Student workbooks. Student tests/quizzes. Student video presentations. Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.12.C</p> <p>Apply the principles of motion and force</p> <ul style="list-style-type: none"> Propose and produce modifications to specific mechanical power systems that will improve their efficiency. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> Define machine, input distance, output force, work output, input force, work input, and output distance. Describe how machines make work easier. Describe how work input and work output are related. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Student white board work. Student class discussion. Student homework assignments. Student laboratory reports/notebooks. Student workbooks. Student tests/quizzes. Student video presentations. Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 3: Work, Power, and Machines

MAJOR OBJECTIVE: Define work and power and the factors that affect efficiency.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.B</p> <p>Analyze energy sources and transfers of heat.</p> <ul style="list-style-type: none">• Determine the efficiency of a system by applying mathematical formulas.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Define mechanical advantage, and efficiency.• Differentiate between actual and ideal mechanical advantage.• Calculate ideal and real mechanical advantage.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.10.C</p> <p>Apply the principles of motion and force</p> <ul style="list-style-type: none">• Identify elements of simple machines in compound machines.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• List and describe the six main types of simple machines.• Define fulcrum, input and output arm, and compound machine.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 4: Energy and Heat

MAJOR OBJECTIVE: Explain the differences in the various forms of energy.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.12.C</p> <p>Apply the principles of motion and force</p> <ul style="list-style-type: none">Propose and produce modifications to specific mechanical power systems that will improve their efficiency.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">Describe how energy and work are related.Differentiate among energy, kinetic energy, potential energy, gravitational potential energy, elastic potential energy, mechanical energy, thermal energy, chemical energy, electrical energy, electromagnetic energy, and nuclear energy.Calculate kinetic and potential energy.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Student white board work.Student class discussion.Student homework assignments.Student laboratory reports/notebooks.Student workbooks.Student tests/quizzes.Student video presentations.Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 4: Energy and Heat

MAJOR OBJECTIVE: Explain the differences in the various forms of energy.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.1.10.E</p> <p>Describe patterns of change in nature, physical and man made systems.</p> <ul style="list-style-type: none">Describe how fundamental science and technology concepts are used to solve practical problems	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">Explain the role of energy conversion in the Law of Conservation of Energy.Utilize Einstein's equation to describe the relationship between matter and energy.List the speed of light.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Student white board work.Student class discussion.Student homework assignments.Student laboratory reports/notebooks.Student workbooks.Student tests/quizzes.Student video presentations.Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 4: Energy and Heat

MAJOR OBJECTIVE: Explain the differences in the various forms of energy.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.8.10.A</p> <p>Analyze the relationship between societal demands and scientific and technological enterprises</p> <ul style="list-style-type: none">• Identify past and current tradeoffs between increased production, environmental harm and social values (e.g., increased energy needs, power plants, automobiles).• Compare technologies that are applied and accepted differently in various cultures (e.g., factory farming, nuclear power).• Describe and evaluate social change as a result of technological developments.• Assess the social impacts of a specific international environmental problem by designing a solution that applies the appropriate technologies and resources.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• List and describe the four main types of nonrenewable energy sources.• List and describe the current sources of renewable energy• Explain the environmental impact of utilizing nonrenewable and renewable energy sources.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 4: Energy and Heat

MAJOR OBJECTIVE: Explain the differences in the various forms of energy.

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State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.8.10.C</p> <p>Evaluate possibilities consequences and impacts of scientific and technological solutions.</p> <ul style="list-style-type: none">• Compare and contrast potential solutions to technological, social, economic and environmental problems.• Analyze the impacts on society of accepting or rejecting scientific and technological advances.		<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 4: Energy and Heat

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.1.10.A</p> <p>Discriminate among the concepts of systems, subsystems, feedback and control in solving technological problems</p> <ul style="list-style-type: none"> • Identify the function of subsystems within a larger system (e.g., role of thermostat in an engine, pressure switch). • Describe the interrelationships among inputs, processes, outputs, feedback and control in specific systems. • Explain the concept of system redesign and apply it to improve technological systems. • Apply the universal systems model to illustrate specific solutions and troubleshoot specific problems. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Explain heat, temperature, absolute zero, thermal expansion, specific heat, and calorimetry. • Calculate heat. • Describe conduction, convection, and radiation. • Explain how a combustion engine works. • Explain a central heating system in terms of inputs and outputs. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 5: EMS and Optics

MAJOR OBJECTIVE: List the parts of the EMS and relate the connection between visible light and optics.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion</p> <ul style="list-style-type: none">• Identify the relationship of electricity and magnetism as two aspects of a single electromagnetic force.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• List and explain the four main properties of waves.• List and describe the main types of mechanical waves.• Explain the roles of reflection, refraction, diffraction, and interference in wave behavior.• Locate nodes and antinodes on waves.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.12.C</p> <p>Apply the principles of motion and force</p> <ul style="list-style-type: none">• Evaluate wave properties of frequency, wavelength and speed as applied to sound and light through different media.	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations/electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 5: EMS and Optics

MAJOR OBJECTIVE: List the parts of the EMS and relate the connection between visible light and optics.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion</p> <ul style="list-style-type: none">• Describe sound effects (e.g., Doppler effect, amplitude, frequency, reflection, refraction, absorption, sonar, seismic).• Describe and measure the motion of sound, light and other objects.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• List and explain the properties of sound.• Explain the use of ultrasound devices.• Define the Doppler Effect.• Calculate wavelength and frequency.• Explain the duality between particle and wave motion.• List and differentiate between the parts of the EMS.• Differentiate between AM and FM radio waves.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 5: EMS and Optics

MAJOR OBJECTIVE: List the parts of the EMS and relate the connection between visible light and optics.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion</p> <ul style="list-style-type: none"> • Describe light effects (e.g., Doppler effect, dispersion, absorption, emission spectra, polarization, interference). • Describe and measure the motion of sound, light and other objects. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Explain color in terms of dispersion, pigment, and light. • Describe how a rainbow is created. • List the six common sources of light and their generation mechanisms. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.12.C</p> <p>Apply the principles of motion and force</p> <ul style="list-style-type: none"> • Evaluate wave properties of frequency, wavelength and speed as applied to sound and light through different media. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Explain the Law of Reflection. • List the main types of mirrors and their affect on light. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: Physical Science

CORE CONCEPT 5: EMS and Optics

MAJOR OBJECTIVE: List the parts of the EMS and relate the connection between visible light and optics.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion</p> <ul style="list-style-type: none"> • Describe light effects (e.g., Doppler effect, dispersion, absorption, emission spectra, polarization, interference). • Describe and measure the motion of sound, light and other objects. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Differentiate between concave and convex lenses. • Explain the index of refraction, critical angle, and total internal reflection. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.10.C</p> <p>Distinguish among the principles of force and motion</p> <ul style="list-style-type: none"> • Describe light effects (e.g., Doppler effect, dispersion, absorption, emission spectra, polarization, interference). 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • List and describe the two main types of telescopes. • Explain how a camera, fiber optics, a microscope, and a telescope work. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 6: Electricity and Magnetism

MAJOR OBJECTIVE: Utilize mathematics to describe electricity and magnetism.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.B</p> <p>Analyze energy sources and transfers of heat.</p> <ul style="list-style-type: none">• Explain resistance, current and electro-motive force (Ohm's Law).	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• State the law of conservation of charge.• Define electric charge, electric force, electric field, static electricity, and induction.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 6: Electricity and Magnetism

MAJOR OBJECTIVE: Utilize mathematics to describe electricity and magnetism.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.B</p> <p>Analyze energy sources and transfers of heat.</p> <ul style="list-style-type: none">• Explain resistance, current and electro-motive force (Ohm's Law).	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Differentiate between the two types of current.• List several types of insulators and conductors.• Explain how voltage, current, and resistance are related.• Calculate power from power and voltage.• Draw diagrams of parallel and series circuits.• Calculate Electric energy from power and time.• Name five safety devices used with electric current.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 6: Electricity and Magnetism

MAJOR OBJECTIVE: Utilize mathematics to describe electricity and magnetism.

CURRICULUM STANDARD:

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<p>PA Standard 3.7.10.A Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.</p> <ul style="list-style-type: none">• Select and safely apply appropriate tools, materials and processes necessary to solve complex problems.• Apply advanced tool and equipment manipulation techniques to solve problems.	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 6: Electricity and Magnetism

MAJOR OBJECTIVE: Utilize mathematics to describe electricity and magnetism.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.B</p> <p>Analyze energy sources and transfers of heat.</p> <ul style="list-style-type: none"> • Explain resistance, current and electro-motive force (Ohm’s Law). 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Explain how electronic signals convey information. • Explain how vacuum tubes control electron flow. • List the two types of semiconductors and explain how are they used. • Explain the benefits of using microchips in communication devices. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.10.B</p> <p>Analyze energy sources and transfers of heat.</p> <ul style="list-style-type: none"> • Explain resistance, current and electro-motive force (Ohm’s Law). 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Define magnetic force, magnetic pole, magnetic field, magnetosphere, magnetic domain, ferromagnetic material. • Describe how to determine the magnetic field direction from the direction of electron flow. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations/electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 7: Earth’s Surface and Interior

MAJOR OBJECTIVE: List and explain the forces that shape the Earth.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.1.12.E</p> <p>Evaluate change in nature, physical systems and man made systems.</p> <ul style="list-style-type: none"> Analyze how models, systems and technologies have changed over time (e.g., germ theory, theory of evolution, solar system, cause of fire). 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> List the three main layers of the earth. Define geology, uniformitarianism, crust, silicates, mantle, lithosphere, asthenosphere, mesosphere, and the core. Describe the characteristics of Earth’s principal layers. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Student white board work. Student class discussion. Student homework assignments. Student laboratory reports/notebooks. Student workbooks. Student tests/quizzes. Student video presentations. Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.5.10.A</p> <p>Relate earth features and processes that change the earth.</p> <ul style="list-style-type: none"> Describe and identify major types of rocks and minerals. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> List and describe the main properties of minerals. List the three main groups of rocks. Draw and explain the rock cycle. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> Student white board work. Student class discussion. Student homework assignments. Student laboratory reports/notebooks. Student workbooks. Student tests/quizzes. Student video presentations/electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 7: Earth's Surface and Interior

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.A</p> <p>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.• Explain several methods of dating earth materials and structures.• Correlate rock units with general geologic time periods in the history of the earth.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Explain the role of plate tectonics in continental drift.• Describe the roles of sea-floor spreading and subduction in plate tectonics.• List the types of plate boundaries and their characteristics.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 7: Earth's Surface and Interior

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.B</p> <p>Explain sources and uses of earth resources.</p> <ul style="list-style-type: none">Evaluate the impact of geologic activities/hazards (e.g., earthquakes, sinkholes, landslides).	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">Define earthquakes, seismic waves, stress, fault, fold, focus, epicenter, P waves, S waves surface waves, and seismograph.Explain the causes of earthquakes and how they are measured.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Student white board work.Student class discussion.Student homework assignments.Student laboratory reports/notebooks.Student workbooks.Student tests/quizzes.Student video presentations.Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 7: Earth's Surface and Interior

MAJOR OBJECTIVE: List and explain the forces that shape the Earth.

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.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Explain and describe the different types of volcanoes.• List and explain the processes involved in the water cycle.• Explain where the Earth's fresh water found.• Differentiate among erosion, weathering, and mass movement.• Identify the following land features by their description: flood plain, meander, oxbow lake, alluvial fan, delta, stalactite, stalagmite, glacier, cirques, moraines, dunes, and loess.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 7: Earth’s Surface and Interior

MAJOR OBJECTIVE: List and explain the forces that shape the Earth.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.B</p> <p>Explain sources and uses of earth resources.</p> <ul style="list-style-type: none"> • Demonstrate the effects of sedimentation and erosion before and after a conservation plan is implemented. 	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.5.10.B</p> <p>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. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Describe how geologists determine the relative and absolute ages of rock layers. • Explain the basis for the geologic time scale. • Describe the major divisions of Earth’s history. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations/electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 7: Earth's Surface and Interior

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA State Standard 3.1.10.C</p> <p>Apply patterns as repeated processes or recurring elements in science and technology.</p> <p>Examine and describe recurring patterns that form the basis of biological classification, chemical periodicity, geological order and astronomical order.</p>	<p>Teacher will guide students to:</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 8: Weather and Climate

MAJOR OBJECTIVE: Describe how scientists predict weather and climate.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.C</p> <p>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. • Evaluate specific adaptations plants and animals have made that enable them to survive in different climate 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Describe the major layers of the atmosphere. • List the two ways in which Earth moves • Explain how the Earth’s surface is divided into zones based on latitude. • Describe what causes seasons. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.5.10.C</p> <p>Interpret meteorological data.</p> <ul style="list-style-type: none"> • Describe weather and climate patterns on global levels. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Describe what happens to the energy the Earth receives from the sun. • Explain what causes wind and the difference between local and global winds. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 8: Weather and Climate

MAJOR OBJECTIVE: Describe how scientists predict weather and climate.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10.C</p> <p>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> <ul style="list-style-type: none">List and describe the major types of clouds.Describe the major forms of precipitation.Describe how technologies help meteorologists predict weather.Identify the data found on a weather map.Describe how climate is different from weather.Describe how Earth's climate has changed over time.Explain how human activities affect Earth's climate.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">Student white board work.Student class discussion.Student homework assignments.Student laboratory reports/notebooks.Student workbooks.Student tests/quizzes.Student video presentations.Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 9: The Solar System

MAJOR OBJECTIVE: Describe the structure of our solar system.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.D</p> <p>Explain essential ideas about the composition and structure of the universe.</p> <ul style="list-style-type: none">• Explain the impact of the Copernican and Newtonian thinking on man’s view of the universe.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Differentiate between geocentric and heliocentric models of the solar system.• Describes what keeps the planets in orbit around the sun.• List the heavenly bodies that make up the solar system.• Explain how the solar system is explored today.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

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CURRICULUM STANDARD:

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<p>PA Standard 3.4.10.D</p> <p>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).	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Describe how the moon's temperature vary widely.• List the main features are found on the moon's surface.• Explain how the moon formed.• Explain the different types of lunar phenomena.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

CORE CONCEPT 10: Exploring the Universe

MAJOR OBJECTIVE: Explain the life cycle of large stellar bodies and systems.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.D</p> <p>Explain essential ideas about the composition and structure of the universe</p> <ul style="list-style-type: none">• Describe the structure and life cycle of star, using the Hertzsprung-Russell diagram.• Describe the nuclear processes involved in energy production in a star.• Explain the “red-shift” and Hubble’s use of it to determine stellar distance and movement.	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Describe how the sun produces energy.• List the important features of the sun.• Explain how the distance to a star be measured.• Interpret the H-R diagram.• Describe the life cycle of a star.	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Student white board work.• Student class discussion.• Student homework assignments.• Student laboratory reports/notebooks.• Student workbooks.• Student tests/quizzes.• Student video presentations.• Student electronic portfolios.	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

CONTENT: C.P. Physical Science

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.4.10.D</p> <p>Explain essential ideas about the composition and structure of the universe</p> <ul style="list-style-type: none"> • Compare absolute versus apparent star magnitude and their relation to stellar distance. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Explain how stars are distributed in space. • Describe the characteristics of each type of star cluster. • List the types of galaxies. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>
<p>PA Standard 3.4.12.D</p> <p>Analyze essential ideas about the composition and structure of the universe</p> <ul style="list-style-type: none"> • Analyze the Big Bang Theory’s use of gravitation and nuclear reaction to explain a possible origin of the universe. • Compare the use of visual, radio and x-ray telescopes to collect data regarding the structure and evolution of the universe. 	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Explain how astronomers know that the universe is expanding. • Explain Hubble’s Law. • Describe the big bang theory, and the evidence that supports it. • Explain how dark matter is detected. 	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Student white board work. • Student class discussion. • Student homework assignments. • Student laboratory reports/notebooks. • Student workbooks. • Student tests/quizzes. • Student video presentations. • Student electronic portfolios. 	<p>Textbook Resources</p> <p>Computer programs/web sites</p> <p>Journals or notebooks</p> <p>Supplemental materials</p> <p>Scientific Calculators</p>

V. EXPECTED LEVELS OF ACHIEVEMENT

A. Students are expected to reach the proficient level (C or above) of achievement, including all of the skills noted in the specific content area of this curriculum.

B. Grading system C.P. Physical Science is as follows:

Grading Scale	
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 performing below 70%.