Warren County School District

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Science 6

Course Number: 00303

Course Prerequisites: _____

Course Description: (Include "no final exam" or "final exam required")
This course focuses on processes, both natural and human, that impact the earth and its resources. It explains the relationships among and between organisms in different ecosystems along with their abiotic and biotic components.

Suggested Grade Level: Grade 6

Length of Course: _____ One Semester X Two Semesters _____ Other (Describe)

Units of Credit: None (Insert ***NONE*** if appropriate.)

PDE *Certification and Staffing Policies and Guidelines (CSPG)* Required Teacher Certification(s)
(Insert certificate title and CSPG#) Chemistry, Biology, Earth and Space, General Science, Middle Level Science, Physics

Certification verified by WCSD Human Resources Department:
X Yes _____ No

Board Approved Textbooks, Software, Materials:
Title:
Publisher:
ISBN #:
Copyright Date:
Date of WCSD Board Approval:

BOARD APPROVAL:

Date Written: September 2009

Date Approved: _____

Implementation Year: _____

Suggested Supplemental Materials: (List or insert **None**)

Course Standards

PA Academic Standards: (List by Number and Description)

3.1.7 Unifying Themes
- A. Explain the parts of a simple system and their relationship to each other.
- B. Describe the use of models as an application of scientific or technological concepts.
- C. Identify patterns as repeated processes or recurring elements in science and technology.
- D. Explain scale as a way of relating concepts and ideas to one another by some measure.
- E. Identify change as a variable in describing natural and physical systems.

3.2.7 Inquiry and Design
- A. Explain and apply scientific and technological knowledge.
- B. Apply process knowledge to make and interpret observations.
- C. Identify and use the elements of scientific inquiry to solve problems.

3.5.7 Earth Sciences
- A. Describe earth features and processes.
- B. Recognize earth resources and how they affect everyday life.
- C. Describe basic elements of meteorology.
- D. Explain the behavior and impact of the earth's water system.

3.7.7 Technological Devises
- A. Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.
- B. Use appropriate instruments and apparatus to study materials.

3.8.7 Science, Technology and Human Endeavors
- B. Explain how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.
- C. Identify the pros and cons of applying technological and scientific solutions to address problems and the effect upon society.

4.1.7 Watershed and Wetlands
- C. Explain the effects of water on the life of organisms in a watershed.
- D. Explain and describe characteristics of a wetland.

4.4.7 Agriculture and Society
- A. Explain society's standard of living in relation to agriculture.
- B. Investigate how agricultural science has recognized the various soil types found in Pennsylvania.
- C. Explain agricultural systems' use of natural and human resources.

4.5.7 Integrated Pest Management
- C. Explain various integrated pest management practices used in society.

4.6.7 Ecosystems and their Interactions
- A. Explain the flows of energy and matter from organism to organism within an ecosystem.

WCSD Academic Standards: (List or **None**)
None

Industry or Other Standards: (List, Identify Source or **None**)
None

WCSD EXPECTATIONS

WCSD K-12 Expectations for instruction in writing, reading, mathematics and, technology have been developed and revised annually. The teacher will integrate all WCSD Expectations into this planned instruction.

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

SPECIFIC EDUCATIONAL OBJECTIVES/CORRESPONDING STANDARDS AND ELIGIBLE CONTENT WHERE APPLICABLE

(List Objectives, PA Standards #'s, Other Standards (see samples at end))

SIXTH GRADE SCIENCE ASSESSMENT ANCHORS

S8A The Nature of Science

S8.A.1 Reasoning and Analysis

S8.A.1.1 Explain, interpret and apply scientific, environmental, or technological knowledge presented in a variety of formats (e.g., visuals, scenarios, graphs).

PA Standard References: ***3.2.7.A, 3.2.7.B***

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.1.1.1** Distinguish between a scientific theory and an opinion, explaining how a theory is supported with evidence, or how new data/ information may change existing theories and practices.			
B.	**S8.A.1.1.2** Explain how certain questions can be answered through scientific inquiry and/or technological design.			
C.	**S8.A.1.1.3** Use evidence, such as observations or experimental results, to support inferences about a relationship.			
D.	**S8.A.1.1.4** Develop descriptions, explanations, predictions, and models using evidence.			

S8.A.1.2 Identify and explain the impacts of applying scientific, environmental, or technological knowledge to address solutions to practical problems.

PA Standard References: 3.2.7.C, 3.8.7.A, 3.8.7.B, 4.3.7.A

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.1.2.1** Describe the positive and negative, intended and			

	unintended, effects of specific scientific results or technological developments (e.g., air/space travel, genetic engineering, nuclear fission/fusion, artificial intelligence, lasers, organ transplants).			
B.	**S8.A.1.2.2** Identify environmental issues and explain their potential long-term health effects (e.g., pollution, pest controls, vaccinations).			
C.	**S8.A.1.2.3** Describe fundamental scientific or technological concepts that could solve practical problems (e.g., Newton's Laws of motion, Mendelian genetics).			
D.	**S8.A.1.2.4** Explain society's standard of living in terms of technological advancements and how these advancements impact on agriculture. (e.g., transportation, processing, production, storage).			

S8.A.1.3 Identify evidence that certain variables may have caused measurable changes in natural or human-made systems.

PA Standard References: 3.1.7.E, 4.7.7.C, 4.8.7.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.1.3.1** Use ratio to describe change (e.g., percents, parts per million, grams per cubic centimeter, mechanical advantage).			
B.	**S8.A.1.3.2** Use evidence, observations, or explanations to make inferences about change in systems over time (e.g., carrying capacity, succession, population dynamics, loss of mass in chemical reactions, indicator fossils in geologic time scale) and the variables affecting these changes.			
C.	**S8.A.1.3.3** Examine systems changing over time, identifying the possible variables causing this change, and drawing inferences about how these variables affect this change.			
D.	**S8.A.1.3.4** Given a scenario, explain how a dynamically changing environment provides for the sustainability of living systems.			

S8.A.2 Processes, Procedures and Tools of Scientific Investigations

S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems.

PA Standard References: 3.2.7.B, 3.2.7.D, 3.1.7.C, 3.1.7.D

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.2.1.1** Use evidence, observations, or a variety of scales (e.g., mass, distance, volume, temperature) to describe relationships.			
B.	**S8.A.2.1.2** Use space/time relationships, define concepts operationally, raise testable questions, or formulate hypotheses.			
C.	**S8.A.2.1.3** Design a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which variables will be held constant.			
D.	**S8.A.2.1.4** Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions.			
E.	**S8.A.2.1.5** Use evidence from investigations to clearly communicate and support conclusions.			
F.	**S8.A.2.1.6** Identify a design flaw in a simple technological system and devise possible working solutions and devise possible working solutions.			

S8.A.2.2 Apply appropriate instruments for a specific purpose and describe the information the

instrument can provide.

PA Standard References: 3.3.7.A, 3.7.7.B, 3.1.7.D

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**3.A.2.2.1**Describe the appropriate use of instruments and scales to accurately and safely measure time, mass, distance, volume, or temperature under a variety of conditions.			
B.	**S8.A.2.2.2** Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions.			
C.	**S8.A.2.2.3** Describe ways technology (e.g., microscope, telescope, micrometer, hydraulics, barometer) extends and enhances human abilities for specific purposes.			

S8.A.3 Systems, Models and Patterns

S8.A.3.1 Explain the parts of a simple system, their roles, and their relationships to the system as a whole.

PA Standards Referenced: 3.1.7.A, 3.4.7.B, 4.3.7.C, 4.2.7.D, 4.6.7.A

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.3.1.1** Describe a system (e.g., watershed, circulatory system, heating system, agricultural system) as a group of related parts with specific roles that work together to achieve an observed result.			
B.	**S8.A.3.1.2** Explain the concept of order in a system [e.g., (first to last: manufacturing steps, trophic levels); (simple to complex: cell, tissue, organ, organ system)].			
C.	**S8.A.3.1.3** Distinguish between system inputs, system processes, system outputs, and feedback (e.g., physical, ecological, biological, informational).			
D.	**S8.A.3.1.4** Distinguish between open loop (e.g., energy flow, food web)and closed loop (e.g., materials in the nitrogen and carbon cycles, closed switch) systems.			
E.	**S8.A.3.1.5** Explain how components of natural and human-made system play different roles in a working system.			

S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts.

PA Standard Reference: 3.1.7.B, 3.2.7.B, 4.1.7.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.3.2.1** Describe how scientists use models to explore relationships in natural systems (e.g., an ecosystem, river system, or the solar system).			
B.	**S8.A.3.2.2** Describe how engineers use models to develop new and improved technologies to solve problems.			
C.	**S8.A.3.2.3** Given a model showing simple cause and effect relationships in a natural system, predict results that can be used to test the assumptions in the model (e.g., photosynthesis, water cycle, diffusion, infiltration).			

S8.A.3.3 Describe repeated processes or recurring elements in scientific and technological patterns.

PA Standard References: 3.1.7.C, 3.2.7.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.A.3.3.1** Identify and describe patterns as repeated processes or recurring elements in human-made systems (e.g., trusses, hub and spoke system in communications and transportation systems, feedback controls in regulated systems).			
B.	**S8.A.3.3.2** Describe repeating structure patterns in nature (e.g., veins in a leaf, tree rings, crystals, water waves) or periodic patterns (e.g., daily, monthly, annually).			

S8.B. Biological Sciences

S8.B.3 Ecological Behavior and Systems

S8.B.3.1 Explain the relationships among and between organisms in different ecosystems and their abiotic and biotic components.

PA Standard Reference: 4.4.7.B, 4.6.7.A, 4.1.7.C, 4.4.7.D

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.B.3.1.1** Explain the flow of energy through an ecosystem (e.g., food chains, food webs).			
B.	**S8.B.3.1.2** Identify major biomes and describe abiotic and biotic components (e.g., abiotic: different soil types, air, water, sunlight; Biotic: soil microbes, decomposers).			
C.	**S8.B.3.1.3** Explain relationships among organisms (e.g., producers/consumers, predator/prey, in an ecosystem).			

S8.B.3.3 Explain how renewable and nonrenewable resources provide for human needs or how these needs impact the environment.

PA Standard Reference: 3.6.7.A, 4.4.7.A, 4.4.7.C, 4.5.7.C, 3.8.7.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
B.	**S8.B.3.3.2** Explain how renewable and nonrenewable resources provide for human needs (i.e., energy food, water, clothing, and shelter).			
C.	**S8.B.3.3.3** Describe how waste management affects the environment (e.g., recycling, composting, landfills, incineration, sewage treatment).			

S8.D. Earth and Space Sciences

S8.D.1 Earth Features and Processes that Change Earth and Its Resources

S8.D.1.1 Describe constructive and destructive natural processes that form different geologic structures and resources.

PA Standard Reference: 3.5.7.A, 4.4.7.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.D.1.1.1** Explain the rock cycle as changes in the solid earth and rock types (igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss).			
B.	**S8.D.1.1.2** Describe natural processes that change Earth's surface (e.g., landslides, volcanic eruptions, earthquakes, mountain building,			

	new land being formed, weathering, erosion, sedimentation, soil formation).			
C.	**S8.D.1.1.3** Identify soil types (i.e., humus, topsoil, subsoil, loam, loess, and parent material) and their characteristics (particle size, porosity, permeability) found in different biomes and in Pennsylvania and explain how they formed.			
D.	**S8.D.1.1.4** Explain how fossils provide evidence about plants and animals that lived long ago throughout Pennsylvania's history (e.g., fossils provide evidence of different environments).			

S8.D.1.2 Describe the potential impact of human made processes on changes to Earth's resources and how they affect everyday life.

PA Standard Reference: 3.5.7.B, 3.6.7.A, 4.2.7.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.D.1.2.1** Describe a product's transportation process from production to consumption (e.g., prospecting, propagating, growing, maintaining, adapting, treating, converting, distributing, disposing) and explain the process's potential impact on Earth's resources.			
B.	**S8.D.1.2.2** Describe potential impacts of human made processes (e.g., manufacturing, agriculture, transportation, mining on Earth's resources, both nonliving (i.e., air, water, or earth materials) and living (i.e., plants and animals).			

S8.D.1.3 Describe characteristic features of Earth's water systems or their impact on resources.

PA Standard Reference: 3.5.7.B, 4.3.7.B, 4.1.7.A, 4.1.7.B, 4.1.7.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.D.1.3.1** Describe the water cycle and the physical processes on which it depends (i.e., evaporation, condensation, precipitation, transpiration, runoff, infiltration, energy inputs, and phase changes).			
B.	**S8.D.1.3.2** Compare and contrast characteristics of freshwater and saltwater systems on the basis of their physical characteristics (i.e., composition, density, electrical conductivity) and their use as natural resources.			
C.	**S8.D.1.3.3** Distinguish among different water systems (e.g., wetland systems, ocean systems, river systems, watersheds) and describe their relationships to each other as well as to landforms.			
D.	**S8.D.1.3.4** Identify the physical characteristics of a stream and how these characteristics determine the types of organisms found within the stream environment (e.g., biological diversity, water quality, flow rate, tributaries, surrounding watershed).			

S8.D.2 Weather, Climate and Atmospheric Processes

S8.D.2.1 Explain how pressure, temperature, moisture, and wind are used to describe atmospheric conditions that affect regional weather or climate.

PA Standard Reference: 3.5.7.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.D.2.1.1** Explain the impact of water systems on the local weather or the climate of a region (e.g., lake effect snow, land/ocean breezes).			
B.	**S8.D.2.1.2** Identify how global patterns of atmospheric movement influence regional weather and climate.			

C.	**S8.D.2.1.3** Identify how cloud types, wind directions and barometric pressure changes are associated with weather patterns in different regions on the country.			

S8.D.3 Composition and Structure of the Universe

S8.D.3.1 Explain the relationships between and among the objects of our solar system.

PA Standard Reference: 3.4.7.D

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S8.D.3.1.1** Describe patterns of Earth's movements (i.e., rotation, revolution) in relation to the moon and sun (i.e., phases, eclipses, and tides).			
B.	**S8.D.3.1.2** Describe the role of gravity as the force that governs the movement of the solar system and universe.			
C.	**S8.D.3.1.3** Compare and contrast characteristics of celestial bodies found in the solar system (e.g., planets, moons, asteroids, comets, meteors, meteoroids, meteorites, inner and outer planets).			

ASSESSMENTS

PSSA Assessment Anchors Addressed: The teacher must be knowledgeable of the PDE Assessment Anchors and/or Eligible Content and incorporate them into this planned instruction. Current assessment anchors can be found at pde@state.pa.us.

Suggested Formative Assessments: The teacher will develop and use standards-based assessments throughout the course.

- Pre-Assessments of prior knowledge (e.g. entrance cards or KWL chart)
- Labs/lab reports
- Bell ringers/Problems of the Day(PODs)
- Discussions
- Teacher observation/Questioning
- Graphic organizers (e.g. Venn diagrams, word mapping, webbing, KWL chart, etc.)
- Summarizing
- Retelling
- Notetaking
- Problem-based learning modules
- Authentic assessment
- Oral presentations
- Outlining
- Journaling
- Student presentations/projects
- Open-ended response
- Quizzes/tests
- Activities
- Classroom Performance System (CPS)
- White boards

Suggested Summative Assessments:

- Essays

- Open-Ended Responses
- Projects
- Quizzes/tests
- Student presentations
- Portfolios
- Lab Practical
- Lab Report

District Approved Assessment Instruments

- PSSA Tests-Grades 4, 8 and 11 only

Portfolio Assessment: _____ Yes __X__ No

District-wide Final Examination Required: _____ Yes __X__ No

Course Challenge Assessment (Describe):

REQUIRED COURSE SEQUENCE AND TIMELINE

(Content must be tied to objectives)

This is a topical outline. Specific content is identified in the assessment anchors.

Content Sequence	Dates
I. Natural processes, geological structures and resources	**9 Weeks**
A. Rock cycle	
B. Rock types	
C. Processes that change Earth's surface	
D. Soil types	
E. Fossil evidence in Pennsylvania	
II. Human Impact on Earth's Resources	**3 Weeks**
A. Product's transformation process from production to consumption	
B. Impact of human-made processes on Earth's resources	
III. Features of Earth's Water Systems	**9 Weeks**
A. Water cycle	
B. Characteristics of fresh water and salt water systems	
C. Fresh water systems	
D. Stream characteristics	
1. Physical	
2. Biological	
IV. Weather and Climate	**6 Weeks**

A. Impact of water systems on local weather and climate
B. Global weather patterns
C. Factors that affect weather patterns

V. Ecological Behavior and Systems **9 Weeks**
A. Energy flow through ecosystems
B. Major biomes
1. Biotic
2. Abiotic
C. Relationships among organisms
D. Renewable and nonrenewable resources
E. Waste management

Objectives:

A. Describe natural processes that form different geological structures and resources.
B. Describe human impact on Earth's resources.
C. Describe features of Earth's water systems.
D. Distinguish among different water systems.
E. Explain the relationships among and between organisms in different ecosystems and their abiotic and biotic components.
F. Explain how renewable and nonrenewable resources provide for human needs or how these needs impact the environment.

WRITING TEAM: Phil Heubach, Diane Finley, Matt Madigan, Stephanie Massa,

WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination? _____ Yes __X__ No
2. Does this course issue a mark/grade for the report card?

   __X__Yes _____ No
3. Does this course issue a Pass/Fail mark? _____Yes __X__ No
4. Is the course mark/grade part of the GPA calculation?

   _____Yes __X__ No
5. Is the course eligible for Honor Roll calculation? __X__ Yes _____ No
6. What is the academic weight of the course?

   __X__ No weight/Non credit _____ Standard weight

   _____ Enhanced weight (Describe)