Warren County School District

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Science Kindergarten

Course Number: _____

Course Prerequisites: _____

Course Description: (Include "no final exam" or "final exam required")

Kindergarten science covers the various aspects of biological, physical, earth, and environmental sciences using an activity-based approach. Unifying themes, inquiry and design are incorporated within the areas of study.

Suggested Grade Level: Kindergarten

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#) _____

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

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

BOARD APPROVAL:

Date Written: _____

Date Approved: January 11, 2010

Implementation Year: 2010-2011

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

Course Standards

PA Academic Standards: (List by Number and Description)

3.1.4 Unifying Themes
- A. Know that natural and human-made objects are made up of parts.
- B. Know models as useful simplifications of objects or processes.
- C. Illustrate patterns that regularly occur and reoccur in nature.
- E. Recognize change in natural and physical systems.

3.2.4 Inquiry and Design
- A. Identify and use the nature of scientific and technological knowledge.
- B. Describe objects in the world using the five senses.
- C. Recognize and use the elements of scientific inquiry to solve problems.

3.3.4 Biological Sciences
- A. Know the similarities and differences of living things.
- B. Know that living things are made up of parts that have specific functions.

3.4.4 Physical Science, Chemistry and Physics
- A. Recognize basic concepts about the structure and properties of matter.
- C. Observe and describe different types of force and motion.

3.5.4 Earth Sciences
- C. Know basic weather elements.

3.6.4 Technology Education
- A. Know that biotechnologies relate to propagating, growing, maintaining, adapting, Treating and converting.
- B. Know that information technologies involve encoding, transmitting, receiving, storing, retrieving and decoding.
- C. Know physical technologies of structural design, analysis and engineering, finance, production, marketing, research and design.

3.7.4 Technological Devices
- A. Explore the use of basic tools, simple material and techniques to safely solve problems.
- B. Select appropriate instruments to study materials.

3.8.4 Science, Technology and Human Endeavors
- C. Know the pros and cons of possible solutions to scientific and technological problems in society.

4.1.4 Watersheds and Wetlands
- A. Identify various types of water environments
- D. Identify a wetland and the plants and animals found there.
- E. Recognize the impact of watersheds and wetlands on animals and plants.

4.2.4 Renewable and Nonrenewable Resources

C. Know that some natural resources have limited life spans.

4.3.4 Environmental Health

A. Know that plants, animals and humans are dependent on air and water.
B. Identify how human actions affect environmental health.
C. Understand that the elements of natural systems are interdependent.

4.4.4 Agriculture and Society

B. Identify the role of the sciences in Pennsylvania agriculture.
C. Know that food and fiber originate from plants and animals.

4.5.4 Integrated Pest Management

C. Understand society's need for integrated pest management.

4.6.4 Ecosystems and their Interactions

A. Understand that living things are dependent on nonliving things in the environment for survival.
B. Understand the concept of cycles.
C. Identify how ecosystems change over time.

4.7.4 Threatened, Endangered and Extinct Species

B. Know that adaptations are important for survival.

4.8.4 Humans and the Environment

A. Identify the biological requirements of humans.
C. Explain how human activities may change the environment.
D. Know the importance of natural resources in daily life.

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))

S41. The Nature of Science

S4 A.1 Reasoning and Analysis

S4A.1.1 Identify and explain the pros and cons of applying scientific, environmental, or technological knowledge to possible solutions to problems.

PA Standards: 3.2.4.A, 3.2.4.C, 3.8.4.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.A.1.1.1** Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results			

	(e.g., a scientific act can be supported through making observations).			
B.	**S4.A.1.1.2** Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment.			

S.4.A.2 Processes, Procedures and Tools of Scientific Investigations

S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to a problem

PA Standard: 3.2.4.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.A.2.1.1** Generate questions about objects, organisms, or events that can be answered through scientific investigations.			
B.	**S4.A.2.1.2** Design and describe an investigation (a fair test) to test one variable.			
C.	**S4.A.2.1.3** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations.			
D.	**S4.A.2.1.4** State a conclusion that is consistent with the information.			

S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide

PA Standards: 3.7.4.A, 3.7.4.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.A.2.2.1** Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length-ruler, mass-balance scale, volume-beaker, temperature-thermometer; making observations: hand lens, binoculars, telescope).			

S4.A.3 Systems, Models and Patterns

S4.A.3.1 Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle).

PA Standards: 3.1.4.A, 4.4.4.C, 4.6.4.B, 3.6.4.A, 3.6.4.B, 3.6.4.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.A.3.1.1** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electric circuits, plant anatomy, water cycle).			
B.	**S4.A.3.1.2** Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium, bicycle).			
C.	**S4.A.3.1.3**Categorize the parts of an ecosystem as either living or no-living and describe their roles in a system.			
D.	**S4.A.3.1.4** Identify the parts of the food and fiber system as they relate to agricultural produces from the source to the consumer.			

S4.A.3.2 Use models to illustrate simple concepts and compare the models to what it represents.

PA Standards: 3.1.4 B, 4.3.4.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.A.3.2.1** Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps how relationships of ideas).			

B.	**S4.A.3.2.2** Use models to make observations to explain systems work (e.g., water cycle, sun-Earth-moon system).			
C.	**S4.A.3.2.3** Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).			

S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.

PA Standards: 3.3.4.A, 3.3.4.B, 4.3.4.A, 4.3.4.C, 4.6.4.A

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.A.3.3.1** Identify and describe observable patterns (e.g., growth patterns in plans, weather, water cycle).			
B.	**S4.A.3.3.2** Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases).			

S4.B Biological Science

S4.B.1 Structure and Function of Organisms

S4.B.1.1 Identify and describe similarities and differences between living things and their life processes.

PA Standards: 3.3.4A, 3.3.

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.1.1** Identify life processes of living things (e.g., growth, digestion, respiration.			
B.	**S4.B.1.1.2** Compare similar functions of external characteristics of organisms (e.g., anatomical characteristics of organisms (e.g., anatomical characteristics: appendages, types of covering, body segments).			
C.	**S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food).			
D.	**S4.B.1.1.4** Describe how different parts o f a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).			
E.	**S4.B.1.1.5** Describe the life cycles of different organisms (e.g., moth, grasshopper, frog, seed producing plants).			

S4.B.2 Continuity of Life

S4.B.2.1 Identify and explain how adaptations help organisms to survive.

PA Standards: 4.7.4.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.B.2.1.1** Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).			
B.	**S4.B.2.1.2** Explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water).			

S4.B.3 Ecological Behavior and Systems

S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction.

PA Standards: 4.6.4.A

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.B.3.1.1** Describe the living and nonliving components of a local			

	ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park or playground).			
B.	**S4.B.3.1.2** Describe interactions between living and nonliving components (e.g., plants – water, soil, sunlight, carbon dioxide, temperature; animals – food, water, shelter. Oxygen, temperature) of a local ecosystem.			

S4.B.3.2 Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.
PA Standards: 4.2.4.C, 4.3.4.C, 4.6.4.C, 3.1.4.E

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.B.3.2.1** Describe what happens to a living thing when its habitat is changed.			
B.	**S4.B.3.2.2** Describe and predict how changes in the environment (e.g., fire, pollution, flood, building dams) can affect systems.			
C.	**S4.B.3.2.3** Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).			

S4.B.3.3 Identify or describe human reliance on the environment at the individual or the community level.
PA Standards: 4.3.4.B, 4.4.4.B, 4.5.4.C, 3.8.4.C

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.B.3.3.5** Describe the effects of pollution (e.g., litter) in the community.			

S4.C. Physical Sciences

S4.C.1 Structure, Properties, and Interaction of Matter and Energy
S4.C.1.1 Describe observable physical properties of matter.
PA Standards: 3.4.4.A, 3.2.4.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.C.1.1.1** Use physical properties (e.g., mass, shape, size, volume, color, texture, magnetic property, state (solid, liquid, or gas), conductivity (electrical or heat) to describe matter.			
B.	**S4.C.1.1.2** Categorize/ group objects using physical characteristics.			

S4.C.3 Principles of Motion and Force
S4.C.3.1 Identify and describe different types of force and motion, or the effect of the interaction between force and motion.
PA Standards: 3.4.4.C, 3.6.4.C, 3.2.4.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.C.3.1.3** Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up).			

S4.D. Earth and Space Sciences

S4.D.1 Earth Features and Processes that Change Earth and Its Resources
S4.D.1.1 Describe basic landforms in Pennsylvania.
PA Standards: 3.5.4.1

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.D.1.1.2** Identify various Earth structures (e.g., mountains,			

	watersheds, peninsulas, lakes, rivers, valleys) through the use of models.			

S4.D.1.3 Describe Earth's different sources of water or describe changes in the form of water.
PA Standards: 4.1.4.A, 4.1.4.D, 4.1.4.E

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.D.1.3.2** Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).			

S4.D.2 Weather, Climate and Atmospheric Processes
S4.D.2.1 Identify basic weather conditions and how they are measured.
PA Standards: 3.5.4.C, 3.7.4.B, 3.2.4.B

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.D.2.1.1** Identify basic cloud types (cirrus, cumulus, stratus, cumulonimbus) and make connections to basic elements or weather (e.g., changes in temperature and precipitation).			
B.	**S4.D.2.1.2** Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction, wind speed, cloud types, precipitation).			

S4.D.3 Composition and Structure of the Universe
S4.D.3.1 Describe Earth's relationship to the Sun and the Moon.
PA Standards: 3.4.4.D

X – performance assessed during that semester

	Performance Indicators	1	2	Assessment
A.	**S4.D.3.1** Describe motions of the Sun – Earth – Moon system.			
B.	**S4.D.3.2** Explain how the motion of the Sun – Earth- Moon system relates to time (e.g., days, months, years).			
C.	**S4.D.3.3** Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis.			

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.

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

- Teacher observation
- Illustrations
- Sorting and classifying
- Graphing
- Models
- Oral
- Open ended questions

- Venn Diagrams
- Connections with literature
- Creating patterns
- Predictions/inferences
- Conclusions from data
- Role playing

Summative Assessment

- Teacher observation
- Illustrations
- Sorting and classifying
- Graphing
- Models
- Oral
- Open ended questions
- Venn Diagrams
- Connections with literature
- Creating patterns
- Predictions/inferences
- Conclusions from data
- Role playing

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)

Content Sequence	Dates
I. Biological sciences	12 weeks
A. Living and nonliving	
B. Physical characteristics of organisms	
C. Needs of living things	
D. Seasonal changes	
E. Conservation of resources	
F. Pollution	
II. Physical Sciences	12 weeks
A. Properties of matter	
B. Changes of matter	
C. Motion of objects	

D Energy types and sources
E. Magnetic force
F. Sound

III. Earth Science 12 weeks
A. Earth forms
B. Water
C. Seasons
D. Weather
E. Space

IV. The Nature of Science—To be taught all year

Objectives:

1. The student will distinguish between fact and fiction.
2. The student will identify repeating patterns that occur in nature.
3. The student will observe natural phenomena, record observations, and make predictions based on observations and information.
4. The student will compare and contrast living and nonliving things.
5. The student will identify the ways living things change.
6. The student will identify changes in nature and physical systems.
7. The student will identify three states of matter and describe how matter changes.
8. The student will apply knowledge of motion to toys and objects.
9. The student will identify types of energy such as heat, wind motion, and sunlight.
10. The student will identify magnetic and nonmagnetic objects.
11. The student will identify sources of sound, pitch and volume.
12. The student will identify earth forms, such as land, rivers, lakes and mountains.
13. The student will distinguish between rock, soil and sand.
14. The student will identify sources of water.
15. The student will identify seasonal changes.
16. The student will identify types of precipitation and clouds.
17 The student will name features found in space such as planets, moons, stars and sun.
18. The student will explain the conservation of resources.
19. The student will describe the effects of pollution.

WRITING TEAM: Susan Kibbey, Barb McAvoy

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?

   _____Yes __X__ 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? _____ Yes __X__ No
6. What is the academic weight of the course?

__X__ No weight/Non credit _____ Standard weight

_____ Enhanced weight (Describe)