Warren County School District

PLANNED INSTRUCTION

# COURSE DESCRIPTION

## Course Title: Science 5

**Course Number:**  00533

**Course Prerequisites:**  none

Course Description: (Include “no final exam” or “final exam required”)

The Landforms Module consists of five investigations that introduce students to these fundamental concepts in earth science: change takes place when things interact; all things change over time; patterns of interaction and change are useful in explaining landforms. Students also learn about some of the tools and techniques used by cartographers and use them to depict landforms.

Humans are the only living creatures that have been able to put materials together to construct machines to do work. Our capacity to see and invent relationships between effort and work produced through simple machines has led us into a world that is becoming more technologically oriented. Knowledge of these relationships is necessary for understanding all mechanics. The Levers and Pulleys Module consists of four investigations that involve students in fundamental concepts of simple machines.

The **Water Planet Module** consists of five sequential investigations, each designed to introduce or reinforce concepts in earth science. The investigations start with Earth in the solar system, and then focus on the dynamics of weather and water cycling in Earth’s atmosphere.

Suggested Grade Level: 05

**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, and Materials:

Title:

Publisher:

ISBN #:

Copyright Date:

Date of WCSD Board Approval:

BOARD APPROVAL:

Date Written: 9/23/10

Date Approved:

Implementation Year:

Suggested Supplemental Materials: (List or insert None)

Course Standards

PA Academic Standards: (List by Number and Description)

Unifying Themes: 3.1.7A, 3.1.7.B, 3.1.7.C, 3.1.7.D, 3.1.7.E

Inquiry and Design: 3.2.7.A, 3.2.7.B, 3.2.7.C, 3.2.7.D,

Physical Science, Chemistry and Physics: 3.4.7C

Earth Science 3.5.7.A, 3.5.7.C, 3.5.7.D

Watersheds and Wetlands 4.1.7.A, 4.1.7.B

Ecosystems and their Interactions 4.6.7.B

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))

**PA Standard: 3.1 Unifying Themes**

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| --- | --- | --- | --- | --- |
|  | **Performance Indicators** | **1** | **2** | **Assessment** |
|  | 3.1.7.A Explain the parts of a simple system and their relationship to each other. |  |  |  |
|  | 3.1.7.B Describe the use of models as an application of scientific or technological concepts. |  |  |  |
|  | 3.1.7.C Identify patterns as repeated processes or recurring elements in science and technology |  |  |  |
|  | 3.1.7.D Explain scale as a way of relating concepts and ideas to one another by some measure |  |  |  |
|  | 3.1.7.E Identify change as a variable in describing natural and physical systems. |  |  |  |

**PA Standard: 3.2 Inquiry and Design**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Performance Indicators** | **1** | **2** | **Assessment** |
|  | 3.2.7.A Explain and apply scientific and technological knowledge |  |  |  |
|  | 3.2.7.B Apply process knowledge to make and interpret observations. |  |  |  |
|  | 3.2.7.C Identify and use the elements of scientific inquiry to solve problems. |  |  |  |
|  | 3.2.7.D Know and use the technological design process to solve problems. |  |  |  |

**PA Standard: 3.4 Physics**  X –

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Performance Indicators** | **1** | **2** | **Assessment** |
|  | 3.4.7.C Identify and explain the principles of force and motion. |  |  |  |

**PA Standard: 3.5 Earth Science**

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| --- | --- | --- | --- | --- |
|  | **Performance Indicators** | **1** | **2** | **Assessment** |
|  | 3.5.7.A Describe earth features and processes. |  |  |  |
|  | 3.5.7.C Describe basic elements of meteorology. |  |  |  |
|  | 3.5.7.D Explain the behavior and impact of the earth’s water systems. |  |  |  |

**PA Standard: 4.1 Watersheds and Wetlands**

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| --- | --- | --- | --- | --- |
|  | **Performance Indicators** | **1** | **2** | **Assessment** |
|  | 4.1.7.A Explain the role of the water cycle within a watershed. |  |  |  |
|  | 4.1.7.B Understand the role of the watershed. |  |  |  |

**PA Standard: 4.6 Ecosystems and their Interactions**

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| --- | --- | --- | --- | --- |
|  | **Performance Indicators** | **1** | **2** | **Assessment** |
|  | 4.6.7 B Explain the concepts of cycles. |  |  |  |

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.

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)

Recommended Course Sequence

Landforms

1. Schoolyard Models

* Observe the schoolyard area and create a model of it.
* Make a representation of the school yard using a grid system to transfer information to a smaller map.
* Compare features on the models and the corresponding maps.

2. Stream Tables

* Observe and measure the effects of flowing water in the stream table.
* Compare the features created in the stream tables.
* Communicate the results of the investigations.
* Relate the processes in the stream table to the processes of erosion and deposition.

3. Go with the Flow

* Observe and measure the results of stream-table investigations.
* Experiment to find the effect of slope and floods on erosion and deposition.
* Communicate the results of experiments in a conference.
* Relate the stream-table results to natural processes.

4. Build a Mountain

* Observe features on a foam mountain and compare them to a two-dimensional representation, a topographic map.
* Organize information from a model to create a topographic map and profile of a mountain.
* Relate topographic features to symbolic representations on maps.

5. Bird’s-Eye View

* Observe and describe the types of information represented on a topographic map.
* Compare the Mt. Shasta foam mountain to the topographic map.
* Interpret aerial photographs.
* Relate information on maps and aerial photographs to the actual landforms.

Levers and Pulleys

1. Levers

* Measure the effort to lift a load when the load remains constant and the effort changes position.
* Measure the effort to lift a load when the effort remains stationary and the load moves.
* Organize observations on a record sheet.
* Discover the relationships between the parts of a lever.

2. More Leverage

* Observe the behavior of different kinds of levers
* Compare the effort to lift loads with different kinds of levers.
* Diagram the relative positions and sizes of lever components in different systems.
* Analyze tools in terms of their application as levers.

3. Pulleys

* Observe and measure the effort to lift a load with single-fixed- and single-movable-pulley systems.
* Organize information on a data sheet.
* Diagram and compare the components of four kinds of pulley systems.

4. Pulleys at Work

* Observe and measure the effort to lift a load with one- and two-pulley systems.
* Organize information on a data sheet.
* Determine the advantage of pulley systems.
* Measure and compare the distance the effort and load travels in different pulley systems.

Water Planet

1. Solar System

* Use print resources to gather information about components of the solar system.
* Compare properties of solar-system objects, and use these properties to sort and organize the objects.
* Organize information using graphic representations such as charts.

2. Water Vapor

* Plan and conduct an investigation to study the effect of surface area and air temperature on evaporation.
* Conduct an investigation to study the effect of temperature on condensation.
* Use appropriate tools to measure mass and volume in an experiment.
* Use mathematics to analyze investigation results.
* Organize and communicate findings using charts and graphs.

3. Heating Earth

* Design and conduct an investigation to study the effect of solar energy on different kinds of earth materials.
* Use appropriate tools to measure mass and volume in an experiment.
* Use mathematics to analyze investigation results.
* Organize and communicate findings using charts, graphs, and diagrams.

4. Weather

* Interpret information from a weather map.
* Consider the strengths and limitations of models and simulations.

**Objectives**

* Gain experience with models and maps.
* Gain experience with the concepts of erosion, deposition, contour and elevation.
* Observe the effect of water on surface features of the land, using stream tables.
* Plan and conduct investigations.
* Acquire vocabulary associated with landforms and the processes that create landforms.
* Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing, and relating.
* Gain experience with the concept of force and the application of force to do work as well as lever and pulley systems.
* Analyze real-world tools and machines in terms of the simple machines that make them work.
* Systematically collect and record data.
* Learn the composition and organization of the solar system.
* Investigate and analyze the effects of temperature and surface area on evaporation.
* Investigate and analyze how temperature affects the formation of dew and frost.
* Observe differential heating of water and soil.
* Describe how uneven heating results in convection currents.
* Understand that air is a mixture of gases that can be compressed.
* Learn how water is distributed worldwide.
* Understand the mechanism of the water cycle and the myriad ways it is expressed worldwide.
* Understand weather as the condition of the atmosphere in terms of three variables: heat, motion, and moisture.
* Learn the causes and effects of severe weather as well as use weather maps to make simple forecasts.

# WRITING TEAM: Sally Beckerink, Diane Finley, Susan Howe, Stephanie Massa, Rhonda Thompson.

# 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

1. 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

1. What is the academic weight of the course?

      No weight/Non credit       Standard weight

      Enhanced weight (Describe)