

Greensburg Community School Corporation
Curriculum
7th grade Science

Prepared by
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2006

Greensburg Community Schools

Mission Statement

The mission of the Greensburg Community School Corporation is to provide and promote lifelong learning through its commitment to quality educational programs that prepare the students to be effective, successful, and responsible citizens. This is to be accomplished in a financially prudent manner.

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# **Greensburg Community Schools** 7<sup>th</sup> grade science

## **Narrative Description**

Seventh grade science consists of a mix of earth science, physical science, and life science. Many of the concepts overlap and build on each other throughout the year allowing repetition to better enable students to retain the information.

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**Course Concepts and Generalizations**

1. The Nature of Science and Technology

*Students further their scientific understanding of the natural world through investigations, experiences, and readings. They design solutions to practical problems by using a variety of scientific methodologies.*

2. Scientific Thinking

*Students use instruments and tools to measure, calculate, and organize data. They question claims and understand that findings may be interpreted in more than one acceptable way.*

3. The Physical Setting

*Students collect and organize data to identify relationships between physical objects, events, and processes. They use logical reasoning to question their own ideas as new information challenges their conceptions of the natural world.*

4. The Living Environment

*Students begin to trace the flow of matter and energy through ecosystems. They recognize the fundamental difference between plants and animals and understand its basis at the cellular level. Students distinguish species, particularly through an examination of internal structures and functions. They use microscopes to observe cells and recognize that cells function in similar ways in all organisms.*

5. The Mathematical World

*Students apply math in scientific contexts. They use mathematical ideas in the representation and the evaluation of data.*

6. Historical Perspectives

*Students gain understanding of how the scientific enterprise operates through examples of historical events. They understand that new ideas are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and grow or transform slowly through the contributions of many different investigators.*

7. Common Themes

*Students analyze the relationships within systems. They investigate how different models can represent the same data.*

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## **Units of Study**

| UNITS/AREA OF STUDY               | LENGTH OF TIME |
|-----------------------------------|----------------|
| Unit 6 Processes that Shape Earth | 7 weeks        |
| Unit 4 Motion, Forces, and Energy | 10 weeks       |
| Unit 5 Galaxies, Stars, and Earth | 9 weeks        |
| Unit 1 The Basics of Life         | 10 weeks       |

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**Unit 6**

Volcanoes and Earthquakes

Individual Learner Objectives

Students will be able to:

- 1. identify the layers of earth’s interior
- 2. label earth’s plates and recognize the movement that occurs with these plates
- 3. identify the faults and waves of an earthquake
- 4. understand the formation of and eruptions of various volcanoes



**Unit 6 Modifications**

Modifications of instructional content in this course may include, but are not limited to, the following:

*Modified pace...as needed based on overall student understanding/comprehension*

*Modified homework assignments...for IEP students, page numbers provided*

*Modified tests...for IEP students, answer choices are modified*

*Adaptive equipment...clay models of faults, build structures to test on shaker table, create 3-D volcano image, Bill Nye video, Hawaiian Volcanoes Video, differentiated learning activity*

*Use of Resource Staff...as needed based on classroom activity*

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## Unit 6

### Volcanoes and Earthquakes Outline

#### A. Layers of the earth's interior...temperature, structure, content/make-up of each

1. Inner Core
2. Outer core
3. Mantle
4. Crust

#### B. Plates and plate movement

1. Identify the plates
  - a. boundaries versus interior areas
  - b. location on a map using deductive reasoning/process of elimination
  - c. record current earthquakes daily for one week in earthquake log
2. Types of plate movement
  - a. demonstrate in groups
  - b. explain convection and gravity's role

#### C. Earthquakes

1. Faults  
Use clay models to demonstrate various fault types
2. Waves  
Act out three wave movements
3. Measurement of earthquakes
  - a. Create buildings out of popsicle sticks, sugar cubes, and pipe cleaners (representing wood, brick, and steel structures).
  - b. Test structures to see how much they can withstand using a shaker table.
4. Other effects and/or results of earthquakes

#### D. Volcanoes

1. Forms of Volcanoes  
Compare and contrast shapes/types of volcano forms
2. Content of lava/magma  
Identify the differences between high silica and low silica eruptions

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**Unit 4 Plan**

Motion, Forces, and Energy

Individual Learner Objectives

Students will be able to:

1. understand what motion is in terms of acceleration and momentum
2. understand force through Newton’s Three Laws of Motion
3. understand what energy is as well as identify the sources of energy that cause various energy transformations
4. understand what waves are and how they move

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Unit 4 Plan Modifications

Motion, Forces, and Energy

Modifications of instructional content in this course may include, but are not limited to, the following:

Modified pace...as needed based on overall student understanding/comprehension

Modified homework assignments...for IEP students, page numbers provided

Modified tests...for IEP students, answer choices are modified

Adaptive equipment..."Virtual Lab", Bill Nye videos, internet interactive/demonstration sites, related magazine/internet articles, mini-labs, build roller coaster replica, and demonstrations

Use of Resource Staff...as needed based on classroom activity

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Unit 4 Plan

Motion, Forces, and Energy Outline

I. Motion...acceleration and momentum

- A. Visualize the motion of matter using day-to-day activities to demonstrate speed, velocity, acceleration (both positive and negative), mass, inertia, and momentum
- B. Re-enact various scenarios and identify the key terms and definitions from the chapter represented by the scenario.

II. Force and Newton's Laws of Motion

- A. Exemplify various forces (balanced, unbalanced, friction, air resistance, action, reaction) through hands-on/daily activities
- B. Use "Thought Experiments" to predict the outcomes due to various forces
- C. Calculate students' body weight on other planets using the internet in order to better understand gravity and its pull on objects in various locations

III. Energy

- A. Differentiate between kinetic and potential energy using pictures of various activities
- B. Identify the effects on the energy of motion due to position, mass, and speed
- C. Visualize various forms of energy and the transformations that convert one form of energy to another

IV. Waves

- A. Demonstrate the action and motion of waves by doing "the wave"
- B. Use a slinky to differentiate between transverse and compressional waves as well as to identify the parts/characteristics of a wave (crest, trough, amplitude, frequency)
- C. Use mirrors and internet demonstrations to display the difference in the reflection, refraction, and the diffraction of light

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Unit 5...Minerals and Rocks

Individual Learner Objectives

Students will be able to:

1. recognize a mineral based on its four characteristics
2. identify minerals using the mineral tests
3. understand how minerals are used in every day life
4. understand the rock cycle
5. differentiate between igneous, metamorphic, and sedimentary rocks
6. understand how glaciers form and how glaciers have helped to shape Indiana

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**Unit 5 Plan Modifications**

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*Modified pace...as needed based on overall student understanding/comprehension*

*Modified homework assignments...for IEP students, page numbers provided*

*Modified tests...for IEP students, answer choices are modified*

*Adaptive equipment..."Virtual Lab", Bill Nye videos, internet interactive/demonstration sites, related magazine/internet articles, and demonstrations*

*Use of Resource Staff...as needed based on classroom activity*

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## Unit 5 Plan

### Minerals and Rocks Outline

#### I. Characteristics of Minerals

- A. Students will collaborate using dictionaries to define the meaning of the words used to describe the four mineral characteristics.
- B. Students will utilize everyday objects and personal qualities to display the meaning of the four mineral characteristics through simplistic pictures.

#### II. Mineral Identification

- A. Display how to conduct the various tests to identify minerals.
- B. Conduct a mineral identification lab where students use the tests to identify 8-10 mystery minerals.

#### III. Mineral Uses

- A. Identify key uses of minerals that are common to every day.
- B. Research and conduct a debate of asbestos to determine whether students feel it is better to leave asbestos or remove asbestos from locations.

#### IV. Rock Cycle

- A. Utilize various weather predictions and simulations with rocks to demonstrate how rocks are affected through the rock cycle.
- B. Discuss as a class and then have students draw and give a written summary in their own words representing the rock cycle in the *Science Rocks* notes book created by students throughout this chapter.

#### V. Igneous, Sedimentary, and Metamorphic Rocks

- A. Students will create a book of notes, called *Science Rocks*, that compares and contrasts the formations and classifications of the three types of rocks.
- B. Students will select an Indiana State Park and demonstrate their understanding of the three types of rocks by displaying how the park formed, what types of rocks are

found in the park, and what types of land formations have been created as a result of the rock cycle process.

#### VI. Glaciers

- A. Students will sequence the formation of a glacier.
- B. Students will view internet and Powerpoint images of glacier formations to better understand how glaciers shaped Indiana.

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**Unit 1...Cells**  
Individual Learner Objectives

Students will be able to:

1. properly understand and use a microscope
2. recognize and identify the structure of a cell
3. understand the connection between chemistry and life science
4. identify how objects move through cells
5. compare and contrast photosynthesis and respiration
6. differentiate between mitosis and meiosis as well as DNA and RNA
7. understand how Louis Pasteur aided the world in his study of viruses

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Unit 1 Plan Modifications

Modifications of instructional content in this course may include, but are not limited to, the following:

Modified pace...as needed based on overall student understanding/comprehension

Modified homework assignments...for IEP students, page numbers provided

Modified tests...for IEP students, answer choices are modified

Adaptive equipment...Bill Nye videos, internet interactive/demonstration sites, related magazine/internet articles, labs, and demonstrations

Use of Resource Staff...as needed based on classroom activity

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Unit 1 Plan

Cells

I. Microscopes

- A. Students will view a microscope and label the parts and functions using the textbook information.
- B. Students will familiarize themselves with the parts and functions of a microscope by viewing various objects under the microscope.

II. Cell Structure

- A. Students will use the interactive internet site provided to gain an understanding of the various parts of the cell.
- B. Students will associate each cell part and function with various food items or objects and their functions in order to better understand how a cell works.
Then, students will have the option of creating an “edible cell” representing their understanding of the parts of a cell.

III. Connecting chemistry and life science

- A. Students will compare and contrast molecular parts, mixtures, and organic and inorganic compounds.
- B. Through class discussion, students will understand how various organic and inorganic compounds are necessary for life in the human body...making chemistry relevant to their daily life.

IV. Moving objects through cells

- A. Students will gain an understanding of how objects move throughout a cell and between two cells.
- B. Acting out diffusion, equilibrium, and osmosis will help students better understand and remember the processes involved in transporting cellular materials.

V. Photosynthesis and Respiration

- A. Students will compare and contrast the processes, reactants, and products of photosynthesis and respiration (as well as fermentation) to show how they are related.

B. Students will identify the energy processes used by living things on earth and trace them back to the sun.

VI. Cell Reproduction

- A. Mnemonic devices for the steps of mitosis and meiosis will be shared through note-taking to help students better understand and remember the processes of cell reproduction.
- B. Students will demonstrate their understanding of the reproductive processes of mitosis through a visual representation using yarn and pencil drawings.

VII. Louis Pasteur and Viruses

Students will complete an internet based scavenger hunt revealing the details of Louis Pasteur's studies and contributions to the development of science...specifically vaccines.