Grade 6 Science Scope and Sequence

COURSE OVERVIEW & TIMING
This section is designed to help you see the flow of the units/topics across the entire school year.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1: Matter</td>
<td>1st Quarter (Early)</td>
</tr>
<tr>
<td>Unit 2: Energy and Matter</td>
<td>1st Quarter (Late)</td>
</tr>
<tr>
<td>Unit 3: Energy and Motion</td>
<td>2nd Quarter (Early)</td>
</tr>
<tr>
<td>Unit 4: Rocks and Minerals</td>
<td>2nd Quarter (Late)</td>
</tr>
<tr>
<td>Unit 5: Rocks, Minerals and Soil</td>
<td>3rd Quarter (Early)</td>
</tr>
<tr>
<td>Unit 6: Cellular and Multicellular</td>
<td>3rd Quarter (Late) 4th Quarter (Early)</td>
</tr>
<tr>
<td>Unit 7: Cellular and Multicellular</td>
<td>4th Quarter (Late)</td>
</tr>
</tbody>
</table>

OVERALL COURSE TIMING
This section is designed to help you compare the number of available instructional days to the number of days accounted for in the Scope and Sequence.

<table>
<thead>
<tr>
<th>Course Length</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of instructional days in school year:</td>
<td>176</td>
</tr>
<tr>
<td>Total number of instructional days for all units included in Scope and Sequence:</td>
<td>160</td>
</tr>
</tbody>
</table>

Science Inquiry and Application (SIA)

During the years of 5-8, all students must become proficient in the use of the following scientific processes, with appropriate laboratory safety techniques, to construct their knowledge and understanding in all science content areas:

- Identify questions that can be answered through scientific investigations.
- Design and conduct a scientific investigation.
- Use appropriate mathematics, tools and techniques to gather data and information.
- Analyze and interpret data.
- Develop descriptions, models, explanations and predictions.
- Think critically and logically to connect evidence and explanations.
- Recognize and analyze alternative explanations and predictions.
- Communicate scientific procedures and explanations.
### FIRST QUARTER: Matter

*This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, and kinetic and potential energy.*

#### UNIT 1 STANDARDS

- **PS. 1** All matter is made up of small particles called atoms. Each atom takes up space, has mass and is in constant motion. Mass is the amount of matter in an object. Elements are a class of substances composed of a single kind of atom. Molecules are the combination of two or more atoms that are joined together chemically. Compounds are composed of two or more different elements. Each element and compound has properties, which are independent of the amount of the sample.

  **Note 1:** Appropriate background knowledge such as graphics representing the atomic composition of the substances involved or descriptions of how the matter can be formed, decomposed or separated, should accompany questions asking to classify matter as an element, compound or mixture. The nature of chemical bonding is not appropriate at this grade.

  **Note 2:** The structure of the atom, including protons, neutrons and electrons, is addressed in the high school physical science syllabus.

#### Resources

- Pearson Interactive Science Chapter 8
- Non Fiction Text
- ODE Model Curriculum

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### FIRST QUARTER: Energy and Matter

*This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, and kinetic and potential energy.*

#### UNIT 2 STANDARDS

- **PS. 2** Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion. When substances undergo changes of state, neither atoms nor molecules themselves are changed in structure. Thermal energy is a measure of the motion of the atoms and molecules in a substance. Mass is conserved when substances undergo changes of state.

  **Note:** Thermal energy can be connected to kinetic energy at this grade level.

#### Resources

- Pearson Interactive Science Chapters 7-9
- Non Fiction Text
- ODE Model Curriculum
## SECOND QUARTER: Energy and Motion

This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, and kinetic and potential energy.

### UNIT 3 LENGTH: Days/Weeks

<table>
<thead>
<tr>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Interactive Science Chapters 6-7</td>
</tr>
<tr>
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</tr>
<tr>
<td>ODE Model Curriculum</td>
</tr>
</tbody>
</table>

### UNIT 3 STANDARDS

- **PS. 3** There are two categories of energy: kinetic and potential. Objects and substances in motion have kinetic energy. Objects and substances can have energy as a result of their position (potential energy).
- **PS. 4** An object’s motion can be described by its speed and the direction in which it is moving.

An object's position and speed can be measured and graphed as a function of time.

**Note 1:** Kinetic and potential energy should be introduced at the macroscopic level for this grade. Chemical and elastic potential energy should not be included at this grade; this is found in PS grade 8.

**Note 2:** This begins to quantify student observations using appropriate mathematical skills.

**Note 3:** Velocity and acceleration rates should not be included at this grade level; these terms are introduced in high school.

### ELA

| Venn Diagram, Use of other Graphic Organizers, Acquisition of Vocabulary, Informational Text, Write Expository Paragraph, Compare and Contrast |

### MATH

| NS.8, EE.1, EE.2.a-b, EE.9, NS.3, SP.1,SP.2, SP.3, SP.4.a-d, RP.1,RP.2, RP.3.a-d, SP.6, SP.7,SP.8 |
| Order of Operations, Graphing, Algebra, Measurement (distance equals speed over time) |

### Spiraling

- Pearson Interactive Science Chapters 6-7
- Non Fiction Text
- ODE Model Curriculum

## SECOND QUARTER: Rocks and Minerals

This topic focuses on the study of rocks, minerals and soil, which make up the lithosphere. Classifying and identifying different types of rocks, minerals and soil can decode the past environment in which they formed.

### UNIT 4 LENGTH: Days/Weeks

<table>
<thead>
<tr>
<th>Resources</th>
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</thead>
<tbody>
<tr>
<td>Pearson Interactive Science Chapter 3</td>
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<td>Non Fiction Text</td>
</tr>
<tr>
<td>ODE Model Curriculum</td>
</tr>
</tbody>
</table>

### UNIT 4 STANDARDS

- **ES. 1** Minerals have specific, quantifiable properties. Minerals are naturally occurring, inorganic solids that have a defined chemical composition. Minerals have properties that can be observed and measured. Minerals form in specific environments.

- **ES. 2** Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.

Most rocks are composed of one or more minerals, but there are a few types of sedimentary rocks that contain organic material, such as coal.

The composition of the rock, types of mineral present, mineral arrangement, and/or mineral shape and size can be used to identify the rock and to interpret its history of formation, breakdown (weathering) and transport (erosion).

### ELA

| Venn Diagram, Use of other Graphic Organizers, Acquisition of Vocabulary, Informational Text, Write Expository Paragraph, Compare and Contrast |

### MATH

| NS.8, EE.1, EE.2.a-b, EE.9, NS.3, SP.1,SP.2, SP.3, SP.4.a-d, RP.1,RP.2, RP.3.a-d, SP.6, SP.7,SP.8 |
| Order of Operations, Graphing, Algebra, Measurement (distance equals speed over time) |

### Spiraling

- Pearson Interactive Science Chapter 3
- Non Fiction Text
- ODE Model Curriculum
### THIRD QUARTER: Rocks, Minerals and Soil

This topic focuses on the study of rocks, minerals and soil, which make up the lithosphere. Classifying and identifying different types of rocks, minerals and soil can decode the past environment in which they formed.

#### UNIT 5 STANDARDS

- **ES. 3** Igneous, metamorphic and sedimentary rocks form in different ways. The rock cycle can be used for a general explanation of the conditions required for igneous, metamorphic and sedimentary rocks to form, but additional information should be added for relevancy.
- **ES. 4** Soil is unconsolidated material that contains nutrient matter and weathered rock. Soil formation occurs at different rates and is based on environmental conditions, types of existing bedrock and rates of weathering.
- **ES. 5** Rocks, minerals and soils have common and practical uses. Nearly all manufactured material requires some kind of geologic resource. Most geologic resources are considered nonrenewable. Rocks, minerals and soil are examples of geologic resources that are nonrenewable.

#### Resources

- Pearson Interactive Science Chapters 3-5
- Non Fiction Text
- ODE Model Curriculum

### Resources

- **ELA**
  - Graphic Organizers, Research, Short Stories, Acquisition of Vocabulary, Informational Text, Poetry, Venn Diagram

- **MATH**
  - NS.8, EE.1, EE.2.a-b, EE.9, NS.3, SP.1, SP.2, SP.3, SP.4a-d, RP.1, RP.2, RP.3.a-d, SP.6, SP.7, SP.8

### Spiraling

- **ELA**
  - Graphic Organizers, Research, Short Stories, Acquisition of Vocabulary, Informational Text, Poetry, Venn Diagram

### THIRD & FOURTH QUARTER: Cellular and Multicellular

This topic focuses on the study of the basics of Modern Cell Theory. All organisms are composed of cells, which are the fundamental unit of life. Cells carry on the many processes that sustain life. All cells come from pre-existing cells.

#### UNIT 6 STANDARDS

- **LS. 1** Cells are the fundamental unit of life. All living things are composed of cells. Different body tissues and organs are made of different kinds of cells. The ways cells function are similar in all living organisms.
  - **Note 1:** Specific information about the organelles that need to be addressed at this grade level will be found in the model curriculum.
  - **Note 2:** Emphasis should be placed on the function and coordination of these components, as well as on their roles in overall cell function.

- **LS. 2** All cells come from pre-existing cells. Cells repeatedly divide resulting in more cells and growth and repair in multicellular organisms.

- **LS. 3** Cells carry on specific functions that sustain life. Many basic functions of organisms occur in cells. Cells take in nutrients and energy to perform work, like making various molecules required by that cell or an organism. Every cell is covered by a membrane that controls what can enter and leave the cell. Within the cell are specialized parts for the transport of materials, energy capture and release, protein building, waste disposal, information feedback and movement.

#### Resources

- **Pearson Interactive Science Chapters 10-12**
- **Non Fiction Text**
- **ODE Model Curriculum**

### Resources

- **ELA**
  - Graphic Organizers, Research, Short Stories, Acquisition of Vocabulary, Informational Text, Poetry, Venn Diagram

- **MATH**
  - NS.8, EE.1, EE.2.a-b, EE.9, NS.3, SP.1, SP.2, SP.3, SP.4a-d, RP.1, RP.2, RP.3.a-d, SP.6, SP.7, SP.8

### Spiraling

- **ELA**
  - Graphic Organizers, Research, Short Stories, Acquisition of Vocabulary, Informational Text, Poetry, Venn Diagram

- **MATH**
  - NS.8, EE.1, EE.2.a-b, EE.9, NS.3, SP.1, SP.2, SP.3, SP.4a-d, RP.1, RP.2, RP.3.a-d, SP.6, SP.7, SP.8
## FOURTH QUARTER: Cellular and Multicellular

This topic focuses on the study of the basics of Modern Cell Theory. All organisms are composed of cells, which are the fundamental unit of life. Cells carry on the many processes that sustain life. All cells come from pre-existing cells.

### UNIT 7 STANDARDS

- LS. 1 Cells are the fundamental unit of life.
- LS. 2 All cells come from pre-existing cells.
- LS. 3 Cells carry on specific functions that sustain life.
- LS. 4 Living systems at all levels of organization demonstrate the complementary nature of structure and function.

The level of organization within organisms includes cells, tissues, organs, organ systems and whole organisms.

Whether the organism is single-celled or multicellular, all of its parts function as a whole to perform the tasks necessary for the survival of the organism.

Organisms have diverse body plans, symmetry and internal structures that contribute to their being able to survive in their environments.

### Resources

- Pearson Interactive Science Chapters 10-14
- Non Fiction Text
- ODE Model Curriculum

### Spiraling

**ELA**
- Graphic Organizers, Research, Short Stories, Acquisition of Vocabulary, Informational Text, Poetry, Venn Diagram

**MATH**
- NS.8, EE.1, EE.2.a-b, EE.9, NS.3, SP.1,SP.2, SP.3, SP.4a-d, RP.1,RP.2, RP.3.a-d, SP.6, SP.7,SP.8