### Curriculum Development Course at a Glance
#### Planning for 7th Grade Science

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Science</th>
<th>Grade Level</th>
<th>7th Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Name/Course Code</strong></td>
<td><strong>Standard</strong></td>
<td><strong>Grade Level Expectations (GLE)</strong></td>
<td><strong>GLE Code</strong></td>
</tr>
<tr>
<td><strong>Physical Science</strong></td>
<td>1. Mixtures of substances can be separated based on their properties such as solubility, boiling points, magnetic properties, and densities</td>
<td>SC09-GR.7-S.1-GLE.1</td>
<td></td>
</tr>
<tr>
<td><strong>Life Science</strong></td>
<td>1. Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment</td>
<td>SC09-GR.7-S.2-GLE.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The human body is composed of atoms, molecules, cells, tissues, organs, and organ systems that have specific functions and interactions</td>
<td>SC09-GR.7-S.2-GLE.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Cells are the smallest unit of life that can function independently and perform all the necessary functions of life</td>
<td>SC09-GR.7-S.2-GLE.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Photosynthesis and cellular respiration are important processes by which energy is acquired and utilized by organisms</td>
<td>SC09-GR.7-S.2-GLE.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Multiple lines of evidence show the evolution of organisms over geologic time</td>
<td>SC09-GR.7-S.2-GLE.5</td>
<td></td>
</tr>
<tr>
<td><strong>Earth Systems Science</strong></td>
<td>1. Major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions</td>
<td>SC09-GR.7-S.3-GLE.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Geologic time, history, and changing life forms are indicated by fossils and successive sedimentation, folding, faulting, and uplifting of layers of sedimentary rock</td>
<td>SC09-GR.7-S.3-GLE.2</td>
<td></td>
</tr>
</tbody>
</table>

#### Colorado 21st Century Skills

- **Critical Thinking and Reasoning:** Thinking Deeply, Thinking Differently
- **Information Literacy:** Untangling the Web
- **Collaboration:** Working Together, Learning Together
- **Self-Direction:** Own Your Learning
- **Invention:** Creating Solutions

#### Reading & Writing Standards for Literacy in Science and Technical Subjects 6 - 12

**Reading Standards**
- Key Ideas & Details
- Craft And Structure
- Integration of Knowledge and Ideas
- Range of Reading and Levels of Text Complexity

**Writing Standards**
- Text Types & Purposes
- Production and Distribution of Writing
- Research to Construct and Present Knowledge
- Range of Writing

<table>
<thead>
<tr>
<th>Unit Titles</th>
<th>Length of Unit/Contact Hours</th>
<th>Unit Number/Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>It's All About You: From Cells to Organisms</td>
<td>7-9 weeks</td>
<td>1</td>
</tr>
<tr>
<td>Energy Transformations in Living Things</td>
<td>2-3 weeks</td>
<td>2</td>
</tr>
<tr>
<td>Mixtures &amp; Substances</td>
<td>2-3 weeks</td>
<td>3</td>
</tr>
<tr>
<td>Adaptations of Life Over Time</td>
<td>5-6 weeks</td>
<td>4</td>
</tr>
<tr>
<td>Geologic Events Through Time</td>
<td>7-9 weeks</td>
<td>5</td>
</tr>
<tr>
<td>Shake Rattle and Roll</td>
<td>3-5 weeks</td>
<td>6</td>
</tr>
</tbody>
</table>

Authors of the Sample: Grace C. Wright (Colorado Springs 11); Jonathan D. Ogg (Cheyenne Mountain 12); Nicole A. Amidei (Pueblo County 70); and Samantha Messier (Boulder Valley RE-2)
## Unit Title
It’s All About You: From Cells to Organisms

## Length of Unit
7-9 weeks

### Focusing Lens(es)
- Systems
- Structure and Function

### Standards and Grade Level Expectations Addressed in this Unit
- SC.09-GR.7-S.2-GLE.2
- SC.09-GR.7-S.2-GLE.3

### Inquiry Questions (Engaging-Debatable):
- Does structure follow function or does function follow structure in living organisms?
- How can the human body be explained as systems within systems?

### Unit Strands
Life Science

### Concepts
- Systems, Structure, Function, Interactions, Models, Scale, Cells, Human Body, Organism, Relationship

### Generalizations

**My students will Understand that...**

<table>
<thead>
<tr>
<th>Guiding Questions</th>
<th>Factual</th>
<th>Conceptual</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the major body systems within the human body and the organs that make up each body system? (SC.09-GR.7-S.2-GLE.2-EO.a)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>What are the major components of a plant cell, animal cell, and a single-celled organism? (SC.09-GR.7-S.2-GLE.3-EO.b,c) What are the different organizational levels within an organism and examples of each? (SC.09-GR.7-S.2-GLE.3-EO.a)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>What is the difference between plant cells, animal cells, and single-celled organisms? (SC.09-GR.7-S.2-GLE.3-EO.b,c)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>What is the difference between structure and their function (SC.09-GR.7-S.2-GLE.3-EO.a; IQ.1) and (SC.09-GR.7-S.2-GLE.2-EO.b)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>What are the necessary functions for life? (SC.09-GR.7-S.2-GLE.3-EO.a; IQ.1)</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Authors of the Sample: Grace C. Wright (Colorado Springs 11); Jonathan D. Ogg (Cheyenne Mountain 12); Nicole A. Amidei (Pueblo County 70); and Samantha Messier (Boulder Valley RE-2)

7th Grade, Science

Complete Sample Curriculum – Posted: February 15, 2013

Page 2 of 13
### Critical Content:

**My students will Know...**

- The composition of the human body (atoms, molecules, cells, tissues, organs, and organ systems and their specific functions and interactions) (SC.09-GR.7-S.2-GLE.2)
- The inter-related nature of structure and function in living things (SC.09-GR.7-S.2-GLE.2, 3)
- The functions of cells as the smallest unit of life that can function independently and perform all the necessary functions of life (SC.09-GR.7-S.2-GLE.3)
- The similarities and differences between plant cells, animal cells, and single-celled organisms (SC.09-GR.7-S.2-GLE.3-EO.3)
- The development and refinement of our understanding of cells over centuries of studies by many scientists (SC.09-GR.7-S.2-GLE.3; N.1)
- How each body system contributes to supporting the life of the organism (SC.09-GR.7-S.2-GLE.2; IQ.1)
- The different body systems (SC.09-GR.7-S.2-GLE.2-EO.a)

### Key Skills:

**My students will be able to (Do)...**

- Develop and design a scientific investigation about human body systems (SC.09-GR.7-S.2-GLE.2-EO.a)
- Develop, communicate, and justify an evidence-based scientific explanation regarding the functions and interaction of the human body (SC.09-GR.7-S.2-GLE.2-EO.b)
- Gather, analyze, and interpret data and models on the functions and interactions of the human body (SC.09-GR.7-S.2-GLE.2-EO.c)
- Draw, label, describe, and explain the cell, its organelles, and their functions, in plant cells, animal cells, and single-celled organisms (SC.09-GR.7-S.2-GLE.3)
- Gather, analyze, and interpret data and models on the different types of cells, their structures, components and functions (SC.09-GR.7-S.2-GLE.3-EO.a)
- Develop, communicate, and justify an evidence-based scientific explanation regarding cell structures, components, and their specific functions (SC.09-GR.7-S.2-GLE.3-EO.b)
- Compare and contrast the basic structures and functions of plant cells, animal cells, and single-celled organisms (SC.09-GR.7-S.2-GLE.3-EO.c)
- Employ tools to gather, view, analyze, and report results for the scientific investigations of cells (SC.09-GR.7-S.2-GLE.3-EO.d)

### Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.

**EXAMPLE:** A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: “Mark Twain exposes the hypocrisy of slavery through the use of satire.”

**A student in _____________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):**

**The structure of an organ or an organelle helps it to perform its main function. For example, the heart is a muscular organ with multiple chambers that allow it to perform its function of pumping blood throughout the body.**

### Academic Vocabulary:

- systems, structure, function, interactions, models, scale, compare, contrast

### Technical Vocabulary:

- cells, human body, organism, organelle, organ system, organ, tissue, atom, molecule
## Curriculum Development Overview
**Unit Planning for 7th Grade Science**

### Unit Title
Energy Transformations in Living Things

<table>
<thead>
<tr>
<th>Focusing Lens(es)</th>
<th>Standards and Grade Level Expectations Addressed in this Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformation</td>
<td>SC.09-GR.7-S.2-GLE.4</td>
</tr>
</tbody>
</table>

### Inquiry Questions (Engaging-Debatable):
- What might be the effect of increased carbon dioxide in the air on plant and animal life?
- What would happen to life as we know it if there was no sunlight and energy transformation?

### Unit Strands
Life Science

### Concepts
Energy, Transformation, Photosynthesis, Respiration, Process

### Generalizations

<table>
<thead>
<tr>
<th>My students will <strong>Understand</strong> that...</th>
<th>Factual</th>
<th>Guiding Questions</th>
<th>Conceptual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photosynthesis and cellular respiration are both chemical processes that support life through the transformation of light energy into a form of energy that is usable by organisms (SC.09-GR.7-S.2-GLE.4-EO.a,b; IQ.2; RA.2)</td>
<td>What are the basic reactants and products of photosynthesis and cellular respiration? (SC.09-GR.7-S.2-GLE.4-EO.a) What is the relationship between photosynthesis and cellular respiration? (SC.09-GR.7-S.2-GLE.4-EO.b) What energy transformations occur in both the processes of photosynthesis and cellular respiration? (SC.09-GR.7-S.2-GLE.4-EO.b; IQ.2)</td>
<td>How does life depend upon photosynthesis? (SC.09-GR.7-S.2-GLE.4-EO.a) Why do humans need oxygen in order to live? (SC.09-GR.7-S.2-GLE.4-EO.a) From where does a plant get most of the matter that makes up its mass? (SC.09-GR.7-S.2-GLE.4-EO.a) Why do living organisms need energy? (SC.09-GR.7-S.2-GLE.4; RA.2)</td>
<td></td>
</tr>
<tr>
<td>The process of photosynthesis uses organelles specific to plants to transform and store energy (SC.09-GR.7-S.2-GLE.4-EO.b; IQ.2)</td>
<td>How do plants transform energy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular respiration transforms and uses energy differently from photosynthesis (SC.09-GR.7-S.2-GLE.4-EO.b; IQ.2)</td>
<td>How do animal cells transform energy?</td>
<td>How are photosynthesis and cellular respiration the same and different? (SC.09-GR.7-S.2-GLE.4-EO.a; IQ.2)</td>
<td></td>
</tr>
</tbody>
</table>
### Critical Content:

My students will **Know**...

- The common process of cellular respiration in both plants and animals, and the unique (plant) process of photosynthesis (SC.09-GR.7-S.2-GLE.4).
- The inputs (reactants) of photosynthesis: light energy, carbon dioxide and water (SC.09-GR.7-S.2-GLE.4-EO.a).
- The outputs (products) of photosynthesis: sugar (glucose) and oxygen (SC.09-GR.7-S.2-GLE.4-EO.a).
- The inputs (reactants) of cellular respiration: sugar (glucose) and oxygen (SC.09-GR.7-S.2-GLE.4-EO.a).
- The outputs (products) of cellular respiration: energy, carbon dioxide and water (SC.09-GR.7-S.2-GLE.4-EO.a).
- The reasons why plants are essential for human health and the health and survival of Earth’s ecosystems (SC.09-GR.7-S.2-GLE.4; RA.1).
- How energy in the form of food comes from Sunlight via photosynthesis (SC.09-GR.7-S.2-GLE.4; RA.2).
- How fossil fuels result from the photosynthesis of organisms that lived millions of years ago (SC.09-GR.7-S.2-GLE.4; RA.3).

### Key Skills:

My students will be able to **(Do)**...

- Gather, analyze, and interpret data regarding the basic functions of photosynthesis and cellular respiration (SC.09-GR.7-S.2-GLE.4-EO.1).
- Use direct and indirect evidence to describe the relationship between photosynthesis and cellular respiration within plants – and between plants and animals (SC.09-GR.7-S.2-GLE.4-EO.2).
- Use computer simulations to model the relationship between photosynthesis and cellular respiration within plants – and between plants and animals (SC.09-GR.7-S.2-GLE.4-EO.3).
- Ask a testable question and make a falsifiable hypothesis about photosynthesis or respiration and design an inquiry-based method to find an answer (SC.09-GR.7-S.2-GLE.4; N.1).
- Design an experiment to observe photosynthesis or respiration, and clearly define controls and variables (SC.09-GR.7-S.2-GLE.4; N.2).
- Share experimental data, and respectfully discuss conflicting results emulating the practice of scientists (SC.09-GR.7-S.2-GLE.4; N.3).

### Critical Language:

*Includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.*

**EXAMPLE:** A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

A student in ___________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):

| **The products of photosynthesis (sugar and oxygen) are also the reactants of cellular respiration.** |
| **inputs, outputs, process, energy, transformation, testable question, hypothesis, control, variable, food** |
| **photosynthesis, cellular respiration, products, reactants, oxygen, carbon dioxide, sugar, glucose, light** |

Authors of the Sample: Grace C. Wright (Colorado Springs 11); Jonathan D. Ogg (Cheyenne Mountain 12); Nicole A. Amidei (Pueblo County 70); and Samantha Messier (Boulder Valley RE-2)
# Unit Planning for 7th Grade Science

## Unit Title
Mixtures and Substances

## Length of Unit
2-3 weeks

### Focusing Lens(es)
- Properties
- Classification

### Standards and Grade Level Expectations Addressed in this Unit
SC09-GR.7-S.1-GLE.1

### Inquiry Questions (Engaging-Debatable):
- What would earth be like if we were unable to separate or classify the matter that makes up a substance or mixture?
- Does the environmental impact of mining outweigh the benefits gained through extracting and separating these resources?

### Unit Strands
- Physical Science

### Concepts
- classification, properties, matter, mixture, substance, solution, density, physical size, boiling point, solubility, magnetic properties, materials, filtration, scientific investigations

### Generalizations
**My students will Understand that...**

<table>
<thead>
<tr>
<th>Factual</th>
<th>Guiding Questions</th>
<th>Conceptual</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you separate a mixture based on the physical properties of its matter? (SC09-GR.7-S.1-GLE.1-EO.a;IQ.1)</td>
<td>Why is it important and necessary to be able to separate mixtures? (SC09-GR.7-S.1-GLE.1-EO.a)</td>
<td>What properties are important in mining and oil refining processes? (SC09-GR.7-S.1-GLE.1-EO.b; RA.2)</td>
</tr>
<tr>
<td>Which properties (i.e. boiling point, density, physical size, solubility, and magnetic properties) are most useful in classifying mixtures of substances? (SC09-GR.7-S.1-GLE.1-EO.a;IQ.2)</td>
<td>How does classifying mixtures and solutions help our understanding of them? (SC09-GR.7-S.1-GLE.1-EO.a)</td>
<td>How are the method used for separation of mixtures in mining and single-stream recycling plants the same? How are they different? (SC09-GR.7-S.1-GLE.1-EO.b; RA.2)</td>
</tr>
<tr>
<td>How much difference must there be among the properties of substances for the properties to be useful in separating the substances? (SC09-GR.7-S.1-GLE.1-EO.a; IQ.3)</td>
<td>When is it useful to separate mixtures? When is it detrimental to separate mixtures? (SC09-GR.7-S.1-GLE.1-EO.a)</td>
<td>Why is separating mixtures important to industries? (SC09-GR.7-S.1-GLE.1-EO.b; RA.1, 2)</td>
</tr>
<tr>
<td>The separation of mixtures allows for purification of materials which often facilitates the creation of new materials or enhances existing products which may drive what industries manufacture (SC09-GR.7-S.1-GLE.1-EO.b; RA.1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Curriculum Development Overview
Unit Planning for 7th Grade Science

Critical Content:

My students will Know...

- The physical properties of a substance in a mixture such as boiling point, melting point, freezing point, solubility, magnetic properties, physical size, and density (SC.09-GR.7-S.1-GLE.1-EO.a;IQ,2,3)
- Matter’s physical properties which can be used to separate mixtures and solutions (SC.09-GR.7-S.1-GLE.1)
- Examples of how the separation of mixtures helps to understand the variations of matter in its composition (SC.09-GR.7-S.1-GLE.1; IQ,3;RA,1.2,3;N,2,4)
- Various techniques and tools used to separate mixtures and substances (SC.09-GR.7-S.1-GLE.1-EO.b;IQ,1.2;RA,1.2;N,1,2,4)
- Properties of matter used to determine usefulness in industrial manufacturing (SC.09-GR.7-S.1-GLE.1-EO.b;IQ,1.2;RA.1)

Key Skills:

My students will be able to (Do)...

- Identify properties of substance in a mixture that could be used to separate those substances from each other (SC.09-GR.7-S.1-GLE.1-EO.a)
- Develop and design a scientific investigation to separate the components of a mixture (SC.09-GR.7-S.1-GLE.1-EO.b)
- Use specific techniques to separate mixtures and solutions (e.g. NAME A FEW) (SC.09-GR.7-S.1-GLE.1-EO.b;IQ,1.2;RA,1.2;N,1,2,4)
- Evaluate and critique experimental procedures designed to separate mixtures (SC.09-GR.7-S.1-GLE.1; N,2)
- Describe ways in which scientists study mixtures (SC.09-GR.7-S.1-GLE.1; N,2)
- Ask testable questions and make falsifiable hypothesis to perform separation of mixtures (SC.09-GR.7-S.1-GLE.1; N,1)
- Evaluate and critique experimental procedures designed to separate mixtures (SC.09-GR.7-S.1-GLE.1; N,2)
- Share experimental data, and respectfully discuss inconsistent results (SC.09-GR.7-S.1-GLE.1; N,3)

Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.

EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: "Mark Twain exposes the hypocrisy of slavery through the use of satire."

A student in ____________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):

I can classify matter based on physical properties such as its boiling point, density, or attraction to metal.

I can separate a mixture if I know the properties of the matter in a substance.

Academic Vocabulary:
classify, compare, contrast, separate, properties, evaluate, critique, investigate, substances, inconsistent results, variation

Technical Vocabulary:
mixture, solubility, density, boiling point, melting point, freezing point, filtration, solution, matter, falsifiable hypothesis, experimental procedures, magnetic properties, physical size
### Curriculum Development Overview

**Unit Planning for 7th Grade Science**

<table>
<thead>
<tr>
<th>Unit Title</th>
<th>Adaptations of Life Over Time</th>
<th>Length of Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focusing Lens(es)</strong></td>
<td>Change/Context Environment</td>
<td></td>
</tr>
<tr>
<td><strong>Standards and Grade Level Expectations Addressed in this Unit</strong></td>
<td>SC09-GR.7-S.2-GLE.1</td>
<td></td>
</tr>
<tr>
<td><strong>Inquiry Questions (Engaging-Debatable):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Is there strength in diversity? How does diversity impact species survival?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Why can we find evidence of life on top of mountains?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Why is the relationship between nature and nurture important for survival of a species?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How would the world be different if organisms did not change over time?</td>
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</tr>
</tbody>
</table>

**Unit Strands**
- Life Science

**Concepts**
- change, evidence, time, extinction, traits, adaptation, interaction, survival, reproduction, environment, theory, biological evolution, diversity, organisms, differential survival, reproductive success, evolution, resistance, genetic traits, species

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### Generalizations

**My students will Understand that...**

<table>
<thead>
<tr>
<th><strong>Changes in environmental conditions often alter the reproductive success of individual organisms and entire species (SC.09-GR.7-S.2-GLE.5; RA.1)</strong></th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What traits must an organism express to be successful? (SC09-GR.7-S.2-GLE.1-EO.a)</td>
<td>How is the use of the word “adaptation” different in everyday usage than in biology? (SC09-GR.7-S.2-GLE.1; IQ.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What causes a species to go extinct? (SC09-GR.7-S.2-GLE.1-EO.a)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Species that do not adapt become extinct (SC.09-GR.7-S.2-GLE.5; RA.1)</strong></th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Why don’t organisms become extinct? (SC09-GR.7-S.2-GLE.1-EO.a)</td>
<td>Why do some species survive better than others? (SC09-GR.7-S.2-GLE.1-EO.a; IQ.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What happens to the system when a species becomes extinct? (SC09-GR.7-S.2-GLE.1-EO.a; IQ.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Organisms with certain traits have a higher potential for survival and reproduction within specific environments where those traits are favorable (SC.09-GR.7-S.2-GLE.1-EO.a,b,d; IQ.1)</strong></th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What determines which traits help an organism survive in its environment? (SC09-GR.7-S.2-GLE.1-EO.a; IQ.1)</td>
<td>Why are some organisms more successful at reproducing than others? (SC09-GR.7-S.2-GLE.1-EO.a,b; IQ.1, 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What positive or negative influence can humans have on a species’ ability to adapt to an environment? (SC09-GR.7-S.2-GLE.1-EO.a; IQ.1)</td>
<td>How does our knowledge of how organisms adapt to their environment help us modify organisms for human benefit (corn)? (SC09-GR.7-S.2-GLE.1-EO.a,b; IQ.1, 2; N.2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Critical Content:
My students will **Know...**

- Examples of traits that are beneficial or detrimental to the survival of a species (natural selection). (SC09-GR.7-S.2-GLE.1-EO.a)
- What adaptation means and how it impacts survival and reproductive success. (SC09-GR.7-S.2-GLE.1-EO.b)
- Reasons why biological evolution accounts for the unity and diversity of living organisms (SC09-GR.7-S.2-GLE.1-EO.d)
- Why individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment (SC09-GR.7-S.2-GLE.1-EO.a)
- Specific adaptations that provide evidence about differential survival and reproductive success (SC09-GR.7-S.2-GLE.1-EO.a, b; IQ.2)
- The relationship between an organism’s traits and its potential for survival and reproduction (SC09-GR.7-S.2-GLE.1-EO.a; IQ.1)
- The evolution of bacteria related to survival in the presence of the environmental pressure of antibiotics - giving rise to antibiotic resistance (SC09-GR.7-S.2-GLE.1; RA.1)
- Reasons why species that live with humans -such as rats and pigeons - are more common around towns and cities (SC09-GR.7-S.2-GLE.1; RA.2)

## Key Skills:
My students will be able to **Do...**

- Develop, communicate, and justify an evidence-based explanation for why a given organism with specific traits will or will not survive to have offspring in a given environment. SC.09-GR.7-S.2-GLE.1-EO.a)
- Analyze and interpret data about specific adaptations (SC09-GR.7-S.2-GLE.1-EO.b)
- Use information and communication tools to gather information from credible sources, analyze findings, and draw conclusions to create and justify an evidence-based scientific explanation. (SC09-GR.7-S.2-GLE.1-EO.c)
- Use computer simulations to model differential survival and reproductive success associated with specific traits in a given environment. (SC09-GR.7-S.2-GLE.1-EO.d)
- Analyze and interpret data about specific adaptations to provide evidence and develop claims about differential survival and reproductive success (SC09-GR.7-S.2-GLE.1-EO.b)
- Use information and communication technology tools to gather information from credible sources, analyze findings, and draw conclusions to create and justify an evidence-based scientific explanation (SC09-GR.7-S.2-GLE.1-EO.c)
- Use computer simulations to model differential survival and reproductive success associated with specific traits in a given environment (SC09-GR.7-S.2-GLE.1-EO.d)

---

### Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.

**EXAMPLE:** A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: "Mark Twain exposes the hypocrisy of slavery through the use of satire."

### A student in _________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):

<table>
<thead>
<tr>
<th>Academic Vocabulary:</th>
<th>Technical Vocabulary:</th>
</tr>
</thead>
<tbody>
<tr>
<td>interpret, survive, relationship, potential, environment, evidence, theory, claims, consequences, critique, analyze, interaction, diversity</td>
<td>traits, adaptations, organisms, reproduction, evolution, extinction, survival, environment, resistance, genetic traits, populations, species.</td>
</tr>
</tbody>
</table>

---

**Organisms interact with their environment and adapt to its changing conditions or become extinct, which has happened throughout the history of Earth.**
# Curriculum Development Overview
## Unit Planning for 7th Grade Science

### Authors of the Sample:
- Grace C. Wright (Colorado Springs 11)
- Jonathan D. Ogg (Cheyenne Mountain 12)
- Nicole A. Amidei (Pueblo County 70)
- Samantha Messier (Boulder Valley RE-2)

### 7th Grade, Science Complete Sample Curriculum – Posted: February 15, 2013

### Unit Title
Geologic Events Through Time

### Length of Unit
7-9 weeks

### Focusing Lens(es)
- Change
- Time

### Standards and Grade Level Expectations Addressed in this Unit
- SC.09-GR.7-S.3-GLE.2
- SC.09-GR.7-S.2-GLE.5

### Inquiry Questions (Engaging-Debatable):
- How would the world be different if organisms and the environment did not change over time?
- How is it helpful to our understanding of time and Earth’s history to track time through geology?
- Why is it challenging for people to think in terms of geologic time?

### Unit Strands
- Earth Science, Life Science

### Concepts
Order, Change, Evolution, Time, Interaction, organism, environment, extinction, structure, scale, traits, evidence

### Generalizations

<table>
<thead>
<tr>
<th>My students will Understand that...</th>
<th>Factual</th>
<th>Guiding Questions</th>
<th>Conceptual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisms interacting with their environment and adapting to its changing conditions over time influence the survival or extinction patterns of species. (SC.09-GR.7-S.2-GLE.5; RA.1)</td>
<td>What causes a species to go extinct? (SC.09-GR.7-S.2-GLE.5-EO.b)</td>
<td>How do the patterns of survival of one organism impact survival of others? (SC.09-GR.7-S.2-GLE.5-EO.a)</td>
<td></td>
</tr>
<tr>
<td>Geologic time, observed in land formations and rock layers, indicate major change events in Earth’s history (SC.09-GR.7-S.3-GLE.2-EO.b,c,d; IQ.1; RA.1)</td>
<td>How can major geologic events be attributed to plate movement? (SC.09-GR.7-S.3-GLE.1;IQ.1)</td>
<td>Why is understanding Earth’s geologic history important today? (SC.09-GR.7-S.3-GLE.2-EO.c)</td>
<td></td>
</tr>
<tr>
<td>Evidence is used to determine the order of events in geologic time. (SC.09-GR.7-S.3-GLE.2-EO.d)</td>
<td>How do people know which layer of rock is older? (SC.09-GR.7-S.3-GLE.2-EO.c; RA.1;N.2)</td>
<td>Why are fossils important in understanding geologic history? (SC.09-GR.7-S.3-GLE.2-EO.c; RA.1;N.2)</td>
<td></td>
</tr>
<tr>
<td>Similar traits of modern organisms and their predecessors provide evidence for evolution (SC.09-GR.7-S.2-GLE.5-EO.a; IQ.1)</td>
<td>How does the fossil record show how organisms have evolved? (SC.09-GR.7-S.2-GLE.5-EO.a; IQ.1) and (SC.09-GR.7-S.3-GLE.2-EO.c; RA.1;N.2)</td>
<td>What evidence is there that supports the theory of evolution? (SC.09-GR.7-S.2-GLE.5-EO.a; IQ.1) and (SC.09-GR.7-S.3-GLE.2-EO.c; RA.1;N.2)</td>
<td></td>
</tr>
<tr>
<td>What might life on Earth have been like in the distant past, and what evidence is there for this?</td>
<td>What does the evidence about the way life has evolved on Earth over long periods of time tell us? (SC.09-GR.7-S.2-GLE.5-EO.a; IQ.1) and (SC.09-GR.7-S.3-GLE.2-EO.c; RA.1;N.2)</td>
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<td></td>
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</tbody>
</table>

### Authors of the Sample:
Grace C. Wright (Colorado Springs 11); Jonathan D. Ogg (Cheyenne Mountain 12); Nicole A. Amidei (Pueblo County 70); and Samantha Messier (Boulder Valley RE-2)
### Critical Content:
My students will **Know**...

- Major events in Earth’s geologic history (SC.09-GR.7-S.3-GLE.2-EO.c)
- The causes and effects of mass extinction (SC09-GR.7-S.2-GLE.5-EO.c,d)
- Fossil records used to study the geological/biological history of the Earth (past and present) (SC.09-GR.7-S.2-GLE.5-EO.a)
- The difference between absolute and relative fossil dating (SC.09-GR.7-S.3-GLE.2; RA.2)
- The geologic time scale and sequence of geologic events (SC.09-GR.7-S.3-GLE.2-EO.a)
- The difference between direct and indirect evidence (SC.09-GR.7-S.3-GLE.2-EO.d)

### Key Skills:
My students will be able to **(Do)**...

- Identify, describe, and determine the sequence of major events in Earth’s geologic history by examining rock layers, fossil records, and other geologic evidence. (SC.09-GR.7-S.3-GLE.2-EO.c,d)
- Analyze and interpret data that show human evolution. (SC09-GR.7-S.2-GLE.5-EO.c)
- Trace lines of evolution using a variety of resources and media (SC.09-GR.7-S.2-GLE.5-EO.a,c)
- Analyze and critique causes and effects of mass extinction and use technology to share findings (SC.09-GR.7-S.2-GLE.5-EO.b,d)
- Describe the geologic time scale and why it is used (SC.09-GR.7-S.3-GLE.2-EO.a)
- Identify and describe the impact of major geologic events on life on Earth (SC.09-GR.7-S.3-GLE.2-EO.b)
- Identify and describe major events in Earth’s geologic history (SC.09-GR.7-S.3-GLE.2-EO.c)
- Use direct and indirect evidence to determine the sequence of events in geologic time (SC.09-GR.7-S.3-GLE.2-EO.d)
- Interpret and analyze data from the fossil record to support a claim that organisms and environments have evolved over time (SC.09-GR.7-S.2-GLE.5-EO.a)

### Critical Language:
Includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.

**EXAMPLE:** A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *“Mark Twain exposes the hypocrisy of slavery through the use of satire.”*

**A student in ______________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):**

- Geologic time is shown and scaled through rock layers, fossil records, and other geological evidence.

**Academic Vocabulary:** theory, time scale, layers, analyze, succession, sequence, simulation, models

**Technical Vocabulary:** geologic time, fossil record, fossil, lithosphere, sedimentation
## Unit Title
Shake, Rattle and Roll

### Length of Unit
3-5 weeks

<table>
<thead>
<tr>
<th>Focusing Lens(es)</th>
<th>Interactions Patterns</th>
<th>Standards and Grade Level Expectations Addressed in this Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SC09-GR.7-S.3-GLE.1</td>
</tr>
</tbody>
</table>

### Inquiry Questions (Engaging-Debatable):
- If Earth’s tectonic plates are constantly interacting, why don’t people feel the movement?
- Why do some countries have mountains and not others? Canyons?

### Unit Strands
Earth Science

### Concepts
change, time, interaction, motion, force, tectonic plates, patterns, geologic events,

### Generalizations

**My students will Understand that...**

<table>
<thead>
<tr>
<th><strong>Tectonic plates, which are in constant motion, interact to induce geologic events due to forces within the Earth (SC.09-GR.7-S.3-GLE.1-EO.a)</strong></th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What evidence supports the theory of plate tectonics? (SC.09-GR.7-S.3-GLE.1; IQ.2)</td>
<td>How does the movement of plates affect life on Earth? (SC.09-GR.7-S.3-GLE.1-EO.b; IQ.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What are the effects of plate movement along plate boundaries? (SC.09-GR.7-S.3-GLE.1; IQ.3)</td>
<td>Why do people continue to live at or near plate boundaries? (SC.09-GR.7-S.3-GLE.1; IQ.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What are the constructive and destructive forces associated with volcanoes? (SC.09-GR.7-S.3-GLE.1)</td>
<td>Why do most earthquakes and volcanoes occur at plate boundaries? (SC.09-GR.7-S.3-GLE.1; IQ.3)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Major events (changes) in geologic time form patterns evidenced in land formations and rock layers (SC.09-GR.7-S.3-GLE.1-EO.d)</strong></th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
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<tr>
<td></td>
<td>How can major geologic events be attributed to plate movement? (SC.09-GR.7-S.3-GLE.1; IQ.1)</td>
<td>Why is understanding Earth’s geologic history important today? (SC.09-GR.7-S.3-GLE.1; RA.1)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interactions between tectonic plates and landforms result in natural events which can (positively or negatively) impact communities (SC.09-GR.7-S.3-GLE.1-EO.d; RA.2)</strong></th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What types of natural hazards would one witness due to plate tectonics? (SC.09-GR.7-S.3-GLE.1-EO.c)</td>
<td>How does the movement of tectonic plates cause natural hazards? Would these hazards still exist if the tectonic plates did not move? (SC.09-GR.7-S.3-GLE.1-EO.c; RA.1)</td>
<td></td>
</tr>
</tbody>
</table>
# Critical Content:
*My students will **Know**...*

- The components of the lithosphere (e.g., plates that move and interact) (SC.09-GR.7-S.3-GLE.1)
- The movements of tectonic plates and their effects (e.g., earthquakes, volcanoes, mountain formation, and mid-ocean ridges) (SC.09-GR.7-S.3-GLE.1)
- The major geologic events that attributed to plate movements (SC.09-GR.7-S.3-GLE.1; IQ.1)
- The effects of plate movement along plate boundaries (SC.09-GR.7-S.3-GLE.1; IQ.2)
- Geologic “hot spots” and how they are used in building design (SC.09-GR.7-S.3-GLE.1-EO.c; RA.2)

# Key Skills:
*My students will be able to **Do**...*

- Identify, interpret, and explain models of plate motions on Earth and how they cause major geologic events (SC.09-GR.7-S.3-GLE.1-EO.b)
- Gather, analyze, and communicate data that explains Earth’s plates, plate motions, and the results of plate motions (SC.09-GR.7-S.3-GLE.1-EO.a)
- Use maps to locate likely geologic “hot spots”, using evidence of earthquakes and volcanic activity (SC.09-GR.7-S.3-GLE.1-EO.c)
- Use web-based or other technology tools to show connections and patterns in data about tectonic plate boundaries and earthquakes, volcanic eruptions, and mountain formation ((SC.09-GR.7-S.3-GLE.1-EO.d)
- Trace the development of a scientific theory using the theory of plate tectonics (SC.09-GR.7-S.3-GLE.1; N.2)
- Describe the ethical traditions of science: value peer review; truthful reporting of methods and outcomes; making work public; and sharing a lens of professional skepticism when reviewing the work of others (SC.09-GR.7-S.3-GLE.1; N.3)

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### Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.

**EXAMPLE:** A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: "Mark Twain exposes the hypocrisy of slavery through the use of satire."

A student in **_____________** can demonstrate the ability to apply and comprehend critical language through the following statement(s):

- Earth is composed of plates that interact and move in various ways, causing major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formations. (SC.09-GR.7-S.3-GLE.1)

### Academic Vocabulary:
- theory, time scale, layers, analyze, simulation, models

### Technical Vocabulary:
- lithosphere, sedimentation, eruption, earthquake, volcano, plate, plate boundaries, mid-ocean ridges, folding faulting, plate tectonics