Curriculum Development Course at a Glance
Planning for Kindergarten Science

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Name/Course Code</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>Grade Level Expectations (GLE)</td>
</tr>
<tr>
<td>1. Physical Science</td>
<td>1. Objects can move in a variety of ways that can be described by speed and direction</td>
</tr>
<tr>
<td></td>
<td>2. Objects can be sorted by physical properties, which can be observed and measured</td>
</tr>
<tr>
<td>2. Life Science</td>
<td>1. Organisms can be described and sorted by their physical characteristics</td>
</tr>
<tr>
<td>3. Earth Systems Science</td>
<td>1. The sun provides heat and light to Earth</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

### Intragrated Curriculum Design
This intradisciplinary approach matches basic elements in each of the science strands – physical, life, earth systems sciences - forming overlaps in instruction of certain topics and concepts in an authentic integrated model.

<table>
<thead>
<tr>
<th>Unit Titles</th>
<th>Length of Unit/Contact Hours</th>
<th>Unit Number/Sequence</th>
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<tbody>
<tr>
<td>Characteristics and Properties of Organisms and Objects</td>
<td>On-going</td>
<td>1</td>
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<tr>
<td>Motion</td>
<td>On-going</td>
<td>2</td>
</tr>
<tr>
<td>The Sun</td>
<td>On-going</td>
<td>3</td>
</tr>
</tbody>
</table>
### Unit Title
- Characteristics and Properties of Organisms and Objects

### Focusing Lens(es)
- Patterns

### Inquiry Questions (Engaging-Debatable):
- What would life be like if organisms had everything in common and there were no detectable patterns? (SC09-GR.K.S.2-GLE.1; IQ.1)
- Why is there strength in diversity? (SC09-GR.K.S.2-GLE.1; IQ.2)
- How do you decide which properties are most important when putting objects into groups? (SC09-GR.K.S.1-GLE.1; IQ.2)

### Standards and Grade Level Expectations Addressed in This Unit
- SC09-GR.K.S.2-GLE.1
- SC09-GR.K.S.1-GLE.1

### Generalizations

#### My students will Understand that...

**Patterns emerge through sorting of characteristics of organisms and properties of objects (SC09-GR.K.S.1-GLE.2-EO.a) and (SC09-GR.K.S.2-GLE.1-EO.a,b)**
- What is the difference between an organism and an object? (SC09-GR.K.S.1-GLE.2) and (SC09-GR.K.S.2-GLE.1)
- What is the difference between a property and a characteristic? (SC09-GR.K.S.1-GLE.2) and (SC09-GR.K.S.2-GLE.1)
- What is the difference between an object and a property? (SC09-GR.K.S.1-GLE.2) and (SC09-GR.K.S.2-GLE.1)
- What is the difference between an organism and a characteristic? (SC09-GR.K.S.1-GLE.2) and (SC09-GR.K.S.2-GLE.1)

**Characteristics group and describe organisms so that patterns can be detected (SC09-GR.K.S.2-GLE.1; IQ.2; N.1,3)**
- What does an organism look like?
- What is the same about of group of organisms?
- What is different about a group of organisms?

**Objects have and are grouped by properties (SC09-GR.K.S.1-GLE.2-EO.a;iQ.1)**
- What is the same about of group of objects?
- What is different about a group of objects?
- What does an object look like?
- What does an object feel like?

### Guiding Questions

#### Factual
- What is a pattern? (SC09-GR.K.S.2-GLE.1; IQ.1; RA.1)
- How do you sort to make a pattern? (SC09-GR.K.S.2-GLE.1; IQ.1; RA.1)

#### Conceptual
- How can organisms be described?
- How can organisms be sorted in groups?
## Critical Content:

**My students will Know...**

- The observable characteristics of organisms (SC09-GR.K-S.2-GLE.1-EO.a)
- Patterns in the natural world (SC09-GR.K-S.2-GLE.1; RA.1)
- Ways to classify a group of organisms (SC09-GR.K-S.2-GLE.1; RA.2)
- Physical properties of objects (SC09-GR.K-S.1-GLE.2-EO.a)
- How physical properties help determine an object’s uses (SC09-GR.K-S.1-GLE.2; RA.1)
- The reasons why scientists try to be clear and specific when they describe things (SC09-GR.K-S.1-GLE.2; N.1)

## Key Skills:

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

- Communicate and justify an evidence-based scientific rationale (SC09-GR.K-S.2-GLE.1-EO.b)
- Ask questions about physical characteristics that will help them sort organisms (SC09-GR.K-S.2-GLE.1; N.1)
- Share scientific ideas verbally in a clear way (SC09-GR.K-S.2-GLE.1; N.2)
- Question peers about reasons for how they sort organisms and encourage them to use evidence to support their ideas. (SC09-GR.K-S.2-GLE.1; N.3)
- Use scientific tools such as magnifying glasses and rulers in investigations and play (SC09-GR.K-S.2-GLE.1; N.4)
- Observe, describe and investigate how objects can be sorted using their physical properties (SC09-GR.K-S.1-GLE.2-EO.a)
- Explain why objects are sorted into categories (SC09-GR.K-S.1-GLE.2-EO.b)
- Sort a set objects based on their physical characteristics (SC09-GR.K-S.1-GLE.2-EO.c)
- Share clear and precise observations with others like scientist (SC09-GR.K-S.1-GLE.2; N.2)

## 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>Living things can be sorted in many different ways.</th>
<th>Things can be sorted by how they look and feel.</th>
</tr>
</thead>
</table>

**Academic Vocabulary:**

- same, different, sort, observe, describe, investigate, explain, communicate

**Technical Vocabulary:**

- organism, living thing, fur, feathers, scales, objects, hard, smooth, shiny characteristic, attribute, properties
## Unit Planning for Kindergarten Science

### Current Development Overview

**Unit Title:** Motion  
**Length of Unit:** On-going  
**Focusing Lens(es):** Change  
**Standards and Grade Level Expectations Addressed in this Unit:** SC09-GR.K-S.1-GLE.1

#### Inquiry Questions (Engaging-Debatable):
- What can change how fast or slow an object travels?  
- What indicates which objects will be easier or harder to move?

#### Unit Strands
- Physical Science

#### Concepts
- speed, direction, object, push, pull, force

### Generalizations
<table>
<thead>
<tr>
<th>My students will <strong>Understand</strong> that...</th>
<th>Factual</th>
<th>Guiding Questions</th>
</tr>
</thead>
</table>
| Speed and direction can change an object’s motion (SC09-GR.K-S.1-GLE.1) | What is speed?  
What is direction?  
What is motion? (SC09-GR.K-S.1-GLE.1-EO.a) | How does changing an objects speed influence its motion? (SC09-GR.K-S.1-GLE.1-EO.a; IQ.1; RA.2)  
How does changing an objects direction influence its motion? (SC09-GR.K-S.1-GLE.1-EO.a; IQ.1; RA.2) |

<table>
<thead>
<tr>
<th>My students will <strong>Know</strong>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>- That objects can move (SC09-GR.K-S.1-GLE.1-EO.a)</td>
</tr>
<tr>
<td>- That objects move in different directions (SC09-GR.K-S.1-GLE.1-EO.b)</td>
</tr>
<tr>
<td>- That objects move at different speeds (SC09-GR.K-S.1-GLE.1-EO.b)</td>
</tr>
</tbody>
</table>

#### Critical Content:

#### Key Skills:

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

- Observe, investigate, and describe how different objects move (SC09-GR.K-S.1-GLE.1-EO.a)  
- Describe the motion of a child who is sitting versus playing (SC09-GR.K-S.1-GLE.1-EO.b)  
- Recognize that scientists try to be clear and specific when they describe things (SC09-GR.K-S.1-GLE.1; N.1)
Curriculum Development Overview
Unit Planning for Kindergarten Science

| 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): |
| An object moves by pushing or pulling. |

| Academic Vocabulary: | observe, investigate, describe, recognize |
| Technical Vocabulary: | object, speed, direction, motion, push, pull |
## Curriculum Development Overview
### Unit Planning for Kindergarten Science

<table>
<thead>
<tr>
<th>Unit Title</th>
<th>The Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Unit</td>
<td>On-going</td>
</tr>
<tr>
<td><strong>Focusing Lens(es)</strong></td>
<td>Interdependence</td>
</tr>
<tr>
<td><strong>Standards and Grade Level Expectations Addressed in this Unit</strong></td>
<td>SC09-GR.K.S.3-GLE.1</td>
</tr>
<tr>
<td><strong>Inquiry Questions (Engaging-Debatable):</strong></td>
<td>• What would happen to Earth if there was no Sun?</td>
</tr>
<tr>
<td></td>
<td>• If the Earth did not rotate around the Sun, would the Earth have light?</td>
</tr>
<tr>
<td><strong>Unit Strands</strong></td>
<td>Earth Science</td>
</tr>
<tr>
<td><strong>Concepts</strong></td>
<td>sun, temperature, heat, light, rotation</td>
</tr>
</tbody>
</table>

### Generalizations

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

<table>
<thead>
<tr>
<th>The Sun influences the temperature on Earth due to Earth’s rotation (SC09-GR.K.S.3-GLE.1-EO.b,c; IQ.1)</th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the temperature during the day? (SC09-GR.K.S.3-GLE.1-EO.b,c; IQ.1; N.1)</td>
<td></td>
<td>Why is the temperature different during the day and at night? (SC09-GR.K.S.3-GLE.1-EO.b,c; IQ.1; N.1)</td>
<td></td>
</tr>
<tr>
<td>What is the temperature at night? (SC09-GR.K.S.3-GLE.1-EO.b,c; IQ.1; N.1)</td>
<td></td>
<td>How does the Sun impact Earth? (SC09-GR.K.S.3-GLE.1; IQ.1)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Sun provides the heat and light upon which life on Earth depends (SC09-GR.K.S.3-GLE.1-EO.a)</th>
<th><strong>Factual</strong></th>
<th><strong>Guiding Questions</strong></th>
<th><strong>Conceptual</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is heat?</td>
<td></td>
<td>Why does the Earth need heat? (SC09-GR.K.S.3-GLE.1-EO.a;IQ.2; RA.1,2)</td>
<td></td>
</tr>
<tr>
<td>What is light?</td>
<td></td>
<td>Why does the Earth need light? (SC09-GR.K.S.3-GLE.1-EO.a;IQ.2; RA.1,2)</td>
<td></td>
</tr>
<tr>
<td>What happens with the Sun’s light is blocked? (SC09-GR.K.S.3-GLE.1; IQ.2)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Critical Content:
**My students will Know...**
- The difference between heat and light (SC09-GR.K-S.3-GLE.1-EO.a)
- The differences in temperature during the day and at night (SC09-GR.K-S.3-GLE.1-EO.b)
- Reasons why light and heat from the sun may change (e.g., when the sun is blocked by clouds, buildings, etc.) (SC09-GR.K-S.3-GLE.1-EO.c, d)

### Key Skills:
**My students will be able to (Do)...**
- Investigate, explain, and describe the difference between heat and light (SC09-GR.K-S.3-GLE.1-EO.a)
- Analyze and interpret temperature data between day and night (SC09-GR.K-S.3-GLE.1-EO.b)
- Investigate and communicate findings about what happens when the Sun’s light is blocked (SC09-GR.K-S.3-GLE.1-EO.c)
- Investigate and communicate the effect of varying heat and light on the growth of plants through a scientific study (SC09-GR.K-S.3-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):**

**The Sun gives us heat and light.**

### Academic Vocabulary:
- investigate, interpret, explain, question, communicate

### Technical Vocabulary:
- heat, light, Earth, Sun, temperature, day, night, cool, warm, hot