Reading Focus: Literature, Informational
Writing Focus: Narrative, Opinion, Informative/Explanatory

Unifying Concept: Life Science
New Plants

Enduring Understandings:

Plants' basic needs must be met in order for them to develop structurally, to change and to grow. Plants need water, air, nutrients, and light. New plants can be propagated by several means: seeds, stems, bulbs, or roots.

Essential Questions:
- What do plants need to live and grow?
- What other plant parts can grow new plants?
- What changes happen to plants as they grow?
- How can we make a new plant from an old one?
- How do plants provide food for humans and animals?
- How does a seed grow?
- What data can we collect about plant growth?

Academic Vocabulary
- Alive
- Bud
- Calendar
- Fertilizer
- Flower
- Germination
- Grow
- Leaf
- Nutrients
- Plant
- Pollen
- Root
- Seedling
- Soil
- Sprout
- Stem
- Grass
- Mold
- Mow
- Same
- Structure
- Cutting
- Node
- Bulb

Standards

Highly-Leveraged Standards

Strand 4: Life Sciences (HLS - 11%)
1.S4.C1 Characteristics of Organisms: Understand that basic structures in plants and animals serve a function.

PO1. Identify the following as characteristics of living things:
- Growth and development
- Reproduction
- Response to stimulus

PO2. Compare the following observable features of living things:
- Movement – legs, wings
- Protection – skin, feathers, tree bark
- Respiration – lungs, gills
- Support – plant stems, tree trunks

PO3. Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/among different groups of animals.

Strand 4: Life Sciences (HLS - 11%)

PO1. Identify some plants and animals that exist in the local environment.

PO2. Compare the habitats (e.g., desert, forest, prairie, water, underground) in which plants and animals live.

PO3. Describe how plants and animals within a habitat are dependent on each other.

Supporting Standards

Strand 1: Inquiry Process (HLS- 33%)
PO1. Compare common objects using multiple senses.
PO2. Ask questions based on experiences with objects, organisms, and events in the environment.
PO3. Predict results of an investigation based on life, physical, and Earth and space sciences (e.g., animal life cycles, physical properties, Earth materials).

PO1. Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry.
PO2. Participate in guided investigations in life, physical, Earth and space sciences.
PO3. Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units).
PO4. Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper).

1.S1.C3 Analysis and Conclusions: Organize and analyze data; compare to predictions.
PO1. Organize (e.g., compare, classify, and sequence) objects, organisms, and events according to various characteristics.
PO2. Compare the results of the investigation to predictions made prior to the investigation.

PO1. Communicate the results of an investigation using pictures, graphs, models, and/or words.
PO2. Communicate with other groups to describe the results of an investigation.

Strand 2: History and Nature of Science
1.S2.C1 History of Science as a Human Endeavor: Identify individual and cultural contributions to scientific knowledge.
PO1. Give examples of how diverse people (e.g., children, parents, weather reporters, cooks, healthcare workers, gardeners) use science in daily life.
PO2. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Sally Ride [scientist], supports Strand 6; Neil Armstrong [astronaut, engineer], supports Strand 6.

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<tr>
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<td>• Stability &amp; Change</td>
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### Identity 1 – I know and like who I am and can talk about my family and myself and name some of my group identities. (ID.K-2.1)

### Diversity 9 – I know everyone has feelings, and I want to get along with people who are similar to and different from me. (DI.K-2.9)

### Justice 12 – I know when people are treated unfairly. (JU.K-2.12)

### Action 16 – I care about those who are treated unfairly. (AC.K-2.16)

**Teaching Tolerance Anti-Bias Framework** [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

### Adopted Texts and Materials

**Textbooks:**
- “New Plants” materials kit
- Teacher’s manual for “New Plants”
- 8 copies of New Plants (Science Stories
- *Carol and the Squash Plant* by Jan Stevens
- [Learning Progressions for K – 5 Science](https://www.fossweb.com)
- FOSS website: [www.fossweb.com](http://www.fossweb.com)

### Instructional and Assessment Guides

**Culturally Responsive Practices** ([TUSD SPARKS, SPARKS Strategies](#))

**Annotated Student Drawings:** students carefully record observations of plants found in the real world, both in human grown and naturally. Illustrations should be carefully annotated with scientific labels and short descriptions.

**Scatterplot:** use this strategy for students to express their prior knowledge and/or learning throughout the unit. Develop higher order thinking questions for students to think and talk about as they “scatter” according to what they learned. Also increases student to student talk.

Use graphic organizers for students to organize and demonstrate their earnings. At “Mowing the Lawn” students can create a “flap book” with illustrations and vocabulary to compare/contrast differences and similarities of the plan.

**Additional Instructional Resources**
- [TUSD Science Resource Center Website](#)
- Crosscutting Concept Resources
- [National Academies Press](#)
- Science and Engineering Practices
- [Learning Progressions for K – 5 Science](#)

**Understanding & Applying Science & Engineering Practices**
## Enduring Understandings:

Systems exhibit types of equilibrium and motion that include balance, spinning, and rolling. Movement can be from place to place, rotating around and around, stable and balanced positions, spinning, and rolling.

## Essential Questions:
- How can shapes be balanced?
- How do different forces affect spinning and rolling?
- How are mobiles built in stable positions?
- How can a wheel and axle system be designed to perform differently?
- How can spinning objects stay in motion?
- How can a runaway system keep a marble rolling?

## Academic Vocabulary
- Air resistance
- Arch
- Balance
- Counterbalance
- Counterweight
- Force
- Gravity
- Motion
- Pitch
- Ramp
- Roll
- Shaft
- Slope
- Sphere
- Spiral
- System
- Unstable
- Vibration
- Volume
- Weight
- Whirl

## Standards

### Highly-Leveraged Standards

1. **Strand 5: Physical Science (HLS- 22%)**
   - **1.S5.C1 Properties of Objects and Materials:** Classify objects and minerals by their observable property
   - **PO1.** Classify objects by the following observable properties:
     - Shape
     - Texture
     - Size
     - Color
     - Weight
   - **PO2.** Classify materials as solids or liquids

### Supporting Standards

1. **Strand 5: Physical Science (HLS- 22%)**
   - **1.S5.C2 Position and Motion of Objects:** Understand spatial relationships and the way objects move.
   - **PO1.** Demonstrate the various ways that objects can move (e.g., straight line, zigzag, back-and-forth, round-and-round, fast, slow).
Participate in planning and conducting investigations, and recording data.

**PO1.** Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry.

**PO2.** Participate in guided investigations in life, physical, Earth and space sciences.

**PO3.** Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units).

**PO4.** Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper).

### 1.S1.C3 Analysis and Conclusions
Organize and analyze data; compare to predictions.

**PO1.** Organize (e.g., compare, classify, and sequence) objects, organisms, and events according to various characteristics.

**PO2.** Compare the results of the investigation to predictions made prior to the investigation.

### 1.S1.C4 Communication
Communicate results of investigations.

**PO1.** Communicate the results of an investigation using pictures, graphs, models, and/or words.

**PO2.** Communicate with other groups to describe the results of an investigation.

### Strand 2: History and Nature of Science

#### 1.S2.C1 History of Science as a Human Endeavor
Identify individual and cultural contributions to scientific knowledge.

**PO1.** Give examples of how diverse people (e.g., children, parents, weather reporters, cooks, healthcare workers, gardeners) use science in daily life.

**PO2.** Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Sally Ride [scientist], supports Strand 6; Neil Armstrong [astronaut, engineer], supports Strand 6).

### Science and Engineering Practices
Practices describe a robust process for how scientists investigate and build models and theories of the natural world or how engineers design and build systems.

- Ask questions and define problems
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Use mathematics and computational thinking
- Construct explanations and design solutions
- Engage in argument from evidence
- Obtain, evaluate, and communicate information

### Crosscutting Concepts (CCC)
Cross boundaries between science disciplines and provide an organizational framework to connect knowledge from various disciplines into a coherent and scientifically based view of the world.

- Cause & Effect
- Patterns
- Systems & System Models

### Social Justice Standards

| Identity 1 | I know and like who I am and can talk about my family and myself and name some of my group identities. (ID.K-2.1) |
| Diversity 9 | I know everyone has feelings, and I want to get along with people who are similar to and different from me. (DI.K-2.9) |
| Justice 12 | I know when people are treated unfairly. (JU.K-2.12) |
| Action 16 | I care about those who are treated unfairly. (AC.K-2.16) |
Teaching Tolerance Anti-Bias Framework  [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

### Adopted Texts and Materials

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<th>Recommended Extended Texts:</th>
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<td>“Balance and Motion” materials kit</td>
<td>• <em>Mama Zooms</em> by Jane Cowen</td>
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<tr>
<td>Teacher’s manual for “Balance and Motion”</td>
<td>• <em>Fletcher More Picture Perfect Science Lessons</em> by Ansberry and Morgan</td>
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<tr>
<td>8 copies of Balance and Motion (Science Stories)</td>
<td>• <em>Roller Coaster</em> by Marla Frazee</td>
</tr>
<tr>
<td>1 copy of <em>Mirette the High Wire</em> for read aloud</td>
<td>• <em>I Fall Down</em> by Vicki Cobb</td>
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<td><em>Learning Progressions for K – 5 Science</em></td>
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### Scholastic Leveled Readers

- Mama Zooms by Jane Cowen
- Fletcher More Picture Perfect Science Lessons by Ansberry and Morgan
- Roller Coaster by Marla Frazee
- I Fall Down by Vicki Cobb

### Multicultural Inclusive Strategies

- TUSD Science Resource Center Website
- Crosscutting Concept Resources
- National Academies Press
- Science and Engineering Practices
- Learning Progressions for K – 5 Science

### Science Kit Supplemental Resources

- TUSD Science Resource Center Website
- Crosscutting Concept Resources
- National Academies Press
- Science and Engineering Practices
- Learning Progressions for K – 5 Science

### Culturally Responsive Practices (TUSD SPARKS, SPARKS Strategies)

**Pre/Post Unit Assessment:**
Class Concept Map: pre and post with linking phrases to indicate relationships of concepts and processes

**Formative/Performance Assessment**
Examples:
- Quick writes and drawings in notebooks (e.g. draw and label different balls)
- Use scientific vocabulary to describe properties of balls.
- Compare and contrast different types of balls and tell/write about their purposes.
- Design and Conduct an experiment and report the results, (e.g. which balls bounce the highest, or which ball bounces the most)
### Reading Focus: Literature, Informational
### Writing Focus: Narrative, Opinion, Informative/Explanatory

**Unifying Concept: Physical Science**  
**Pebbles, Sand, and Silt**  
**Suggested Duration: 11 weeks**

### Enduring Understandings:
Rocks are the solid natural materials of the earth. Rocks can be identified and sorted by certain properties: color, size, hardness, shape. They have a variety of uses.

### Essential Questions:
- How are rocks the same? How are rocks different?
- How can a mixture of rocks be separated?
- What can be made with clay?
- How could rocks be sorted?
- How do pebbles, sand and silt compare in size?
- How are bricks made?
- How do people use earth materials?
- What is in dirt?

### Academic Vocabulary
- Collection
- Crystal
- Dust
- Geologist
- Rock
- Rough
- Smooth
- Sort
- Mixture
- Particle
- Pebble
- Sand
- Screen
- Separate
- Settle
- Shake
- Silt
- Asphalt
- Build
- Coarse
- Concrete
- Alike
- Ingredient
- Sample
- Soil

### Standards

#### Highly-Leveraged Standards

**Strand 6: Earth and Space Science (HLS-22%)**

1. **S6.C1 Properties of Earth Materials**: Identify the basic properties of Earth materials.
   - **PO1**: Describe the following basic Earth materials:
     - Rocks
     - Soil
     - Water
   - **PO2**: Compare the following physical properties of basic Earth materials:
     - Color
     - Texture
     - Capacity to retain water
   - **PO3**: Identify common uses (e.g., construction, decoration) of basic Earth materials (i.e., rocks, water, soil)
   - **PO4**: Identify the following as being natural resources:
     - Air
     - Water
     - Soil
     - Trees

#### Supporting Standards

**Strand 3: Science in Personal and Social Perspectives**

1. **S3.C2 Science and Technology in Society**: Understand the impact of technology
   - **PO1**: Identify various technologies (e.g., automobiles, radios, refrigerators) that people use.
   - **PO2**: Describe how suitable tools (e.g., magnifiers, thermometers) help make better observations and measurements.
## 2018-2019 Science Curriculum Map, Kindergarten

### Wildlife

**POS5.** Identify ways to conserve natural resources (e.g., reduce, reuse, recycle, find alternatives).

### Constant Standards

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- PO1. Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry.
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## Crosscutting Concepts (CCC)

Cross boundaries between science disciplines and provide an organizational framework to connect knowledge from various disciplines into a coherent and scientifically based view of the world.

- Structure & Function
- Scale, Proportion, & Quantity

## Social Justice Standards

- **Identity 1** – I know and like who I am and can talk about my family and myself and name some of my group identities. (ID.K–2.1)
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## Teaching Tolerance Anti-Bias Framework

[https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

## Adopted Texts and Materials

**Textbook:**
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- Teacher’s manual for “Pebbles, Sand & Silt”
- 8 copies of “Pebbles, Sand & Silt” (Science Stories)
- [Learning Progressions for K – 5 Science](https://www.fossweb.com)
- FOSS website: [www.fossweb.com](http://www.fossweb.com)

**Recommended Extended Texts:**
- *More Picture Perfect Science Lessons* by Ansberry and Morgan
- *If you Find a Rock* by P. Christian
- *Rocks: Hard, Soft, Smooth and Rough* by N. Rosinky
- *Everybody Needs a Rock* by Byrd Baylor

**Multicultural Book aligned with Pebbles, Sand and Silt Science Kit**
- *This House is Made of Mud* (1994) *(PreK–3)* A family builds an adobe house in the Southwest desert.
## 2018-2019 Science Curriculum Map, Kindergarten

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1. **Highly-Leveraged Standards** are essential for students to learn because they have endurance (knowledge and skills relevant throughout a student’s lifetime); leverage (knowledge and skills used across multiple content areas); and essentiality (knowledge and skills necessary for success in future courses or grade levels).*

2. **Supporting Standards** are emphasized during the quarter as they are integral to achieve mastery of the Highly Leveraged Standards. Mastery of these standards are used measured using classroom assessments.

3. **Constant Standards** are repeatedly addressed to reinforce grade-level mastery.

*This definition for Highly-Leveraged Standards was adapted from the “power standard” definition on the website of the Millis Public Schools, K-12, Massachusetts, USA, 201