# Seattle Public Schools Science Standards

## Ecosystems

(Science and Technology for Children)

**Grade 4**

### EARL #1 The student understands and uses scientific concepts and principles.

<table>
<thead>
<tr>
<th>Component</th>
<th>Benchmarks</th>
<th>Lesson #s</th>
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</thead>
</table>
| 1.1 – Use properties to identify, describe, and categorize substances, materials, and objects, and use characteristics to categorize living things. | **Basis of biological diversity**  
- sort and categorize living things using various characteristics  
- observe and describe the needs of a variety of living things (e.g., nutrients, water, and air) | 1 – 7, 13, 14 |
| 1.3 – Understand how interactions within and among systems cause changes in matter and energy. | **Life processes and the flow of matter and energy**  
- recognize that air, water, nutrients, and the chemicals in food are continually recycled (e.g., water cycle, nutrient cycle)  
- understand that energy from food is necessary for living things  
**Interdependence of life**  
- describe how an organism’s behavior and ability to survive is influenced by its environment, other life forms, and availability of food and/or other resources  
**Environmental and resource issues**  
- recognize that humans and other living things depend on the natural environment and can cause changes in their environment that affect their ability to survive (e.g., pollution experiments) | 1 – 7, 13, 14 |

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| 1.1 – Use properties to identify, describe, and categorize substances, materials, and objects, and use characteristics to categorize living things. | **Nature and properties of earth materials**  
- model and explain the water cycle | To be developed |
| 1.2 – Recognize the components, structure, and organization of systems and the interconnections within and among them. | **Components and patterns of the earth system**  
- investigate the interconnections and patterns among aquatic and terrestrial environments | 7, 13, 14 |
1.3 – Understand how interactions within and among systems cause changes in matter and energy.

**Hydrosphere/atmosphere**
- recognize that events in nature have a repeating pattern (e.g., producers, consumers and decomposers; the water cycle)

<table>
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<tr>
<th>SCIENCE SKILLS/PROCESSES</th>
<th>SCIENTIFIC THINKING</th>
<th>EARL #2 The student understands the skills and processes of science and technology.</th>
</tr>
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</table>
| 2.1 – Develop the abilities necessary to do scientific inquiry. | **Questioning**  
- ask questions about objects, organisms, and events in the environment | All lessons |
|                         | **Designing and conducting investigations**  
- plan and conduct simple investigations, using appropriate tools, measures, and safety rules | 7, 11 – 13 |
|                         | **Evidence and explanation**  
- use data to construct reasonable explanations | 12 - 16 |
|                         | **Modeling**  
- model systems, events, or processes by representing them with concrete objects, metaphors, analogies, or other conceptual or physical constructs (e.g., graphic organizers) | 2 – 7, 11 – 14 |
|                         | **Communication**  
- record and report observations, explanations, and conclusions using oral, written, and mathematical expression | All lessons |
| 2.2 – Apply science knowledge and skills to solve problems or meet challenges. | **Identifying problems**  
- identify problems found in familiar contexts in which science and technology can be or have been used to design solutions | 9 – 16 |
|                         | **Designing and testing solutions**  
- propose, design, and test a solution to a problem | 16 |
|                         | **Evaluating potential solutions**  
- evaluate how well a design or a product solves a problem | 16 |

**EARL #3 The student understands the nature and contexts of science and technology.**

|                          | **Intellectual honesty**  
- understand that all scientific observations should be reported accurately even when they contradict expectations | 12 – 16 |
|                          | **Limitations of science and technology**  
- distinguish between questions that can be answered with science and technology and those that cannot | All lessons |
|                          | **Dealing with inconsistencies**  
- explain why similar investigations may not produce similar results | 12 – 14 |
<table>
<thead>
<tr>
<th>Evaluating methods of investigation</th>
<th>Evolution of scientific ideas</th>
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<tbody>
<tr>
<td>• recognize that results of scientific investigations can come from expected and unexpected sources (e.g., through sharing the results of investigations)</td>
<td>• know that ideas in science change as new scientific thinking, theories, and evidence arise</td>
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</tbody>
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3.2 – Know that science and technology are human endeavors, interrelated to each other, to society and to the workplace.

<table>
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<tr>
<th>All peoples contribute to science and technology</th>
<th>Relationship of science and technology</th>
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<tbody>
<tr>
<td>• know that science and technology have been practiced by all peoples throughout history</td>
<td>• recognize that people have invented tools for everyday life and for scientific investigations</td>
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<th>Careers and occupations using science, mathematics, and technology</th>
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<td>• identify the knowledge and skills of science, math, and technology used in common occupations</td>
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<tr>
<th>7, 11 – 13</th>
<th>8, 9, 14 – 16</th>
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<tr>
<td>15, 16</td>
<td>7, 11 – 13</td>
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<tr>
<td>All lessons</td>
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