# STANDARDS ALIGNMENT KEY

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| ♦ | Unit is aligned as is. |
| ♦ V | Unit is aligned with the intentional use of vocabulary from the Washington Science Standards |
| ♦ R | Unit is aligned with the intentional use of the STC Children's Book |
| ♦ r | Unit is aligned with the intentional use of the readings within the unit. |
| ♦ E | Unit is aligned with the intentional use of the lesson extensions |
| ▲ | Unit needs identified changes or additions to be aligned |

# PLANT GROWTH AND DEVELOPMENT DEEP ALIGNMENT

| EALR | Grade Band | Code | Content Standard | Performance Expectation | Lesson Number | Alignment Symbol | Comments/Evidence |
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| **Systems** | 2-3 | SYSA | A *system* is a group of interacting parts that form a whole. | Give examples of simple living and physical *systems* (e.g., a whole animal or plant, a car, a doll, a set of table and chairs). For each example, *explain how* different parts make up the whole. | Addressed throughout the unit.<br><br>STC Children's Book | ♦V<br><br>♦R | This unit contains opportunities to discuss *systems* (plant, bee, watering tanks, and plant growth lights) but the teacher must be intentional about naming these as *systems* and discussing their parts.<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) |
| **Systems** | 2-3 | SYSB | A whole object, plant, or animal may not continue to *function* the same way if some of its parts are missing. | *Predict* what may happen to an object, plant, or animal if one or more of its parts are removed (e.g., a tricycle cannot be ridden if its wheels are removed).<br><br>Explain how the parts of a system depend on one another for the system to function. | Addressed throughout the unit.<br><br>STC Children's Book | ♦V<br><br>♦R | Students are asked to make *predictions* throughout the unit. The teacher needs to be intentional about discussing what might happen to the *function* of the plant, light bank, watering tank, honey bee, if a part of that *system* is missing.<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) |
| **Systems** | 2-3 | SYSC | A whole object, plant, or animal can do things that none of its parts can do by themselves. | Contrast the *function* of a whole object, plant, or animal with the *function* of the one of its parts (e.g., an airplane can fly, but wings and propeller alone cannot; plants can grow, but stems and flowers alone cannot). | Addressed throughout the unit.<br><br>STC Children's Book | ♦V<br><br>♦R | The teacher must be intentional about using the term *function* when discussing the parts and the whole *systems* in this unit. The leaf by itself will not *function* the same as it will when it is a part of the complete plant *system*<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) |

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| **Systems** | 2-3 | SYSD | Some objects need to have their parts connected in a certain way if they are to *function* as a whole. | *Explain* why the parts in a *system* need to be connected in a specific way for the *system* to *function* as a whole (e.g., batteries must be inserted correctly in a flashlight if it is to produce light). | Lesson 3 | ▲V | In Lesson 3, the teacher needs to be intentional about using the term *function*. The watering system *functions* when its parts are connected in a specific way. The teacher should talk about how the watering mat and the wick need to be in contact with one another other for the *system* to *function* correctly to water the plant. |

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| EALR | Grade Band | Code | Content Standard | Performance Expectation | Lesson Number | Alignment Symbol | Comments/Evidence |
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| **Inquiry** | 4-5 | INQA | Scientific investigations involve asking and answering *questions* and comparing the answers with *evidence* from the real world. | Identify the *questions* being asked in an investigation. Gather scientific evidence that helps to answer a *question.* | Addressed throughout the unit. | ♦ | |
| **Inquiry** | 4-5 | INQB | Scientists plan and conduct different kinds of investigations, depending on the *questions* they are trying to answer. Types of investigations include systematic *observations* and descriptions, *field studies*, *models*, and *open-ended explorations* as well as *experiments*. | Given a research *question*, plan an appropriate investigation, which may include systematic *observations, field studies, models, open-ended explorations*, or *controlled experiments*.<br><br>Work collaboratively with other students to carry out an investigation, selecting appropriate *tools* and demonstrating safe and careful use of equipment. | Addressed throughout the unit. | ♦ | This unit is strong on *systematic observation, models,* or *controlled experiments*.<br><br>Students work throughout the unit in collaborative groups. |

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| **Inquiry** | 4-5 | INQC | An *experiment* involves a *comparison*. For an *experiment* to be valid and fair, all of the things that can possibly change the outcome of the *experiment* should be kept the same, if possible. | Conduct or critique an *experiment*, noting when the *experiment* might not be fair because some of the things that might change the outcome are not kept the same. | Addressed throughout the unit. | ♦ | Students consistently use the standard measuring tool of the Unifix cubes to measure the growth of the Wisconsin Fast Plant.<br><br>In Lesson 3 extension, the students plant a variety of normal seeds to serve as comparisons to the Wisconsin Fast Plant.<br><br>The teacher should be intentional to discuss how each material used in the planting process (quads, seeds, fertilizer, soil) is kept the same so that the investigation is *valid* and *fair.* All plants are planted on the same day, at the same time and placed under the same lighting system. |
| **Inquiry** | 4-5 | INQD | Investigations involve systematic collection and recording of relevant *observations* and data. | Gather, record, and organize data using appropriate units, tables, graphs, or maps. | Addressed throughout the unit. | ♦ | |
| **Inquiry** | 4-5 | INQE | Repeated *trials* are necessary for *reliability*. | *Explain that* additional *trials* are needed to ensure that the results are repeatable. | Addressed throughout the unit. | ♦ | The use of the term repeated *trials* should be used to reinforce *reliability* when students compare their plants to others' in the class. Multiple plants create multiple *trials* to examine. |

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| **Inquiry** | 4-5 | INQF | A scientific *model* is a simplified representation of an object, event, *system*, or process created to understand some aspect of the *natural world*. When learning from a *model*, it is important to realize that the *model* is not exactly the same as the thing being modeled. | Create a simple *model* to represent an event, *system*, or process.<br><br>Use the *model* to learn something about the event, *system*, or process.<br><br>*Explain how* the *model* is similar to and different from the thing being modeled. | Addressed throughout the unit. | ♦<br><br>♦V | Plant and honey bee models are created in this unit.<br><br>Teachers should ask students to explain how the honey bee or plant *(models* representing *systems)* are similar to but not exactly the same as a real plant or bee *(natural world)*. |
| **Inquiry** | 4-5 | INQG | Scientific explanations emphasize *evidence*, have logically consistent arguments, and use known scientific *principles, models*, and theories. | *Generate* a conclusion from a scientific investigation and show how the conclusion is supported by *evidence* and other scientific *principles*. | Addressed throughout the unit. | ♦ | Throughout the unit, students generate conclusions based on data *(evidence)* gathered through observations. |

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| **Inquiry** | 4-5 | INQH | Scientists communicate the results of their investigations verbally and in writing. They review and ask *questions* about the results of other scientists' work. | Display the findings of an investigation, using tables, graphs, or other visual means to represent the data accurately and meaningfully.<br><br>Communicate to peers the purpose, procedure, results, and conclusions of an investigation.<br><br>Respond non-defensively to comments and *questions* about their investigation.<br><br>Discuss differences in findings and conclusions reported by other students. | Addressed throughout the unit. | ♦ | The teacher must intentionally engage students in communicating with peers about the data collected from their observations.<br><br>Teachers will need to emphasize that scientists respond non-defensively to comments and questions about their investigation.<br><br>Teachers need to engage students in discussions about differences in findings and conclusions |

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| **Inquiry** | 4-5 | INQI | Scientists report the results of their investigations honestly, even when those results show their predictions were wrong, or when they cannot *explain* the results. | *Explain* why records of *observations* must never be changed, even when the *observations* do not match expectations. | Addressed throughout the unit. | ♦V | To meet this standard, teachers must intentionally emphasize that honesty is an important trait scientists must possess even when they predict a different outcome or when the data does not support their prediction. |
| **Inquiry** | 2-3 | INQA | Scientific investigations are *designed* to gain knowledge about the *natural world*. | Explain how observations can lead to new knowledge and new *questions* about the *natural world*. | Addressed throughout the unit. | ♦ | The teacher should intentionally take advantage of the multiple opportunities for sharing that all of the scientific observations students conduct lead to new knowledge and new *questions* about the natural world. |
| **Inquiry** | 2-3 | INQB | A scientific investigation may include making and following a plan to accurately observe and *describe* objects, events, and *organisms*; make and record measurements: and *predict* outcomes. | Work with other students to make and follow a plan to carry out a scientific investigation. Actions may include accurately observing and describing objects, events, and *organisms*; measuring and recording data; and predicting outcomes. | Addressed throughout the unit. | ♦ | In this unit, students engage in scientific investigations where they predict, observe, measure, and record. They are not asked to "make a plan". |
| **Inquiry** | 2-3 | INQD | Simple instruments, such as *magnifiers*, *thermometers*, and rulers provide more information than scientists can obtain using only their unaided senses. | Use simple instruments (e.g., metric scales or balances, thermometers, and rulers) to observe and make measurements, and record and display data in a table, bar graph, line plot, or pictograph. | Addressed throughout the unit. | ♦ | |

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| **Inquiry** | 2-3 | INQE | *Models* are useful for understanding *systems* that are too big, too small, or too dangerous to study directly. | Use a simple *model* to study a *system*. *Explain how* the *model* can be used to better understand the system. | Lesson 13 & 14 | ♦ | Plant and honey bee models are created in this unit. |
| **Inquiry** | 2-3 | INQF | Scientists develop explanations, using *observations (evidence)* and what they already know about the world. Explanations should be based on *evidence* from investigations. | Accurately *describe* results, referring to the graph or other data as *evidence*. Draw a conclusion about the *question* that motivated the study using the results of the investigation as *evidence*. | Lessons 7,16 | ♦ | In Lesson 7, students are asked to discuss the growth spurt of the Fast Plant and draw conclusions about the predictions they had made in the previous lesson.<br><br>In Lesson 16, students compare the yields from their harvest to their original number of seeds. Later in the lesson, they compare the pollinated and not pollinated seed yield and draw conclusions about the effect of pollination. |

# PLANT GROWTH AND DEVELOPMENT DEEP ALIGNMENT

| EALR | Grade Band | Code | Content Standard | Performance Expectation | Lesson Number | Alignment Symbol | Comments/Evidence |
|---|---|---|---|---|---|---|---|
| **Application** | 4-5 | APPA | *Technology* involves changing the *natural world* to meet human needs or wants. | *Describe* ways that people use *technology* to meet their needs and wants (e.g., text messages to communicate with friends; use bicycles or cars for transportation). | STC Children's Book | ♦R | STC Children's Book: *Are You Wearing a Plant?* (pgs. 16-17). |
| **Application** | 4-5 | APPB | People in different cultures all around the world use different materials or *technologies* to solve the same problems. | Give examples of how people around the world use different materials or technologies to solve the same problem. (e.g., in some countries, people use forks for eating, while in other countries they use chopsticks; people in different countries use different materials to build their houses.) | STC Children's Book | ♦R | STC Children's Book: *Natural Medicines* (pgs. 12-13) and *Tracking New Medicines* (pgs. 14-15). |
| **Application** | 4-5 | APPG | Science and technology have greatly improved food quality and quantity, transportation, health, sanitation, and communication. | Describe specific ways that science and technology have improved the quality of the students' lives. | STC Children's Book | ♦R | STC Children's Book: *Tracking New Medicines* (pgs. 14-15) and *A Farmer's Friend* (pgs. 31-33). |
| **Application** | 4-5 | APPH | People of all ages, interests, and abilities engage in a variety of scientific and technological work. | *Describe* several activities or careers that require people to *apply* their knowledge and abilities in *science*, *technology*, engineering, and mathematics. | STC Children's Book | ♦R | STC Children's Book: Part 1-*Plants Make Life Possible* (pgs. 7-20), Part 2- *Plants are Amazing* (pgs. 22-37), Part 3-*Plants and Animals Living Together* (pgs. 39-51), and Part 4-*Plants in Danger* (pgs. 53-64). |

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| **Application** | 2-3 | APPB | Scientific ideas and discoveries can be applied to solving problems. | Give an example in which the application of scientific knowledge helps solve a problem (e.g., use electric lights to see at night). | Lesson 3 reading selection | ♦r | Lesson 3: *Fast Plants for Fast Times* discusses how Dr. Williams designed a solution for making a plant's life cycle faster. |
| **Application** | 2-3 | APPC | People in all cultures around the world have always had problems and invented tools and techniques (ways of doing something) to solve problems. | Describe a problem that people in different cultures around the world have had to solve and the various ways they have gone about solving that problem. | STC Children's Book | ♦R | STC Children's Book: *Natural Medicines* (pgs. 12-13). |

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| **Physical Science** | 4-5 | PS3A | *Energy* has many forms, such as *heat*, light, sound, *motion*, and electricity. | Identify different forms of *energy* (e.g., *heat*, light, sound, *motion*, electricity) in a given *system*. | Lesson 4<br><br>STC Children's Book | ▲<br><br>♦R | Teachers must be intentional about pointing out that plants need *energy* in the form of *heat* and *light* to grow.<br><br>In Lesson 4, final activities, an opportunity exists to discuss those elements needed for plant growth (*heat* and *light* as forms of *energy*).<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) and *Making Food out of Air* (pgs. 28-30). These reading selections identify sunlight as the source of energy for all plants as they produce their own food through the process of photosynthesis. |
| **Life Science** | 4-5 | LS1B | Each animal has different structures and behaviors that serve different *functions*. | List parts of an animal's body and *describe* how it helps the animal meet its basic needs (e.g., the bones support the body so it can move; the blood carries food and oxygen throughout the body).<br><br>Given an animal behavior (e.g., salmon swim upstream to spawn, owls hunt at night), *describe* the *function* that it serves. | Lessons 9, 11, and 14<br><br>STC Children's Book | ♦r<br><br>♦R | Students observe the parts of the honey bee. The teacher must be intentional about discussing how the body parts help the honey bee *function* (e.g., tongue, eyes, antenna, pollen baskets).<br><br>Lesson 11: *The Bee and the Brassica: Interdependence*<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) |

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| **Life Science** | 4-5 | LS1C | Certain structures and behaviors enable plants and animals to respond to changes in their *environment*. | Give examples of how plants and animals respond to their *environment* (e.g., many plants grow toward the light, animals hide when they see a predator). | Lesson 3, 9<br><br>STC Children's Book | ▲r<br><br>▲<br><br>♦R | Lesson 3, *Fast Plants for Fast Times*: discuss with students Dr. Williams' success with selective breeding to produce a variety of plant that can grow rapidly to study environmental effects, plant diseases, etc.<br><br>In Lesson 9 Teachers' Background Information, *The Worker Bee's Body* contains information about the structures and functions of the parts of a bee and how those parts are used to change their environment.<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) and *Desert Survivors* (pgs. 44-45). |
| **Life Science** | 4-5 | LS1D | Plants and animals have structures and behaviors that respond to internal needs. | Give examples of how plants and animals respond to internal needs (e.g., plants wilt when they don't have water; animals seek food when they are hungry). | Lesson 4, 6<br><br>Lesson 11 reading selection<br><br>STC Children's Book | ♦<br><br>♦r<br><br>♦R | Lesson 4: This is the only opportunity for students to observe the roots of their plants. Teachers must be intentional about discussing that roots help plants access water.<br><br>Lesson 11: *The Bee and the Brassica: Interdependence*<br><br>Note: The plant has internal needs such as to reproduce, to draw up water, to take in nutrients from the soil, and make their own food. The honey bee has internal needs such as to reproduce, to gather pollen and nectar, to control the hive temperature.<br><br>STC Children's Book: *Desert Survivors* (pgs. 44-45). |

# PLANT GROWTH AND DEVELOPMENT DEEP ALIGNMENT

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| **Life Science** | 4-5 | LS2A | An *ecosystem* includes all of the plant and animal *populations* and *nonliving resources* in a given area. Plants and animals depend on one another and the nonliving resources in their *ecosystem* to help them survive. | Identify the living and nonliving parts of an ecosystem.<br><br>Give examples to show how the plants and animals depend on one another for survival (e.g., worms *decompose* waste and return *nutrients* to the soil, which helps plants grow).<br><br>*Describe* how the plants and animals in an *ecosystem* depend on nonliving resources. | Lesson 10<br><br>Lesson 14 Extension | ♦<br><br>♦E | Note: This unit does not have a focus on ecosystems. However, in the reading in Lesson 11 *The Bee and the Brassica: Interdependence* an example of how the plant (Brassica) and the animal (bee) depend on one another for survival.<br><br>Lesson 14 Extension contains an opportunity for students to act out the interdependent relationships between plant and animal. |
| **Life Science** | 4-5 | LS2B | Plants make their own food using energy from the sun. Animals get food by eating plants and/or other animals that eat plants. Plants make it possible for animals to use the energy of sunlight. | *Explain that* plants make their own food, and animals, including humans, get food by eating plants and/or eating other animals. | Lesson 2<br><br>STC Children's Books | ♦<br><br>♦R | Note: In the teachers' background information on Lesson 2, a brief statement is made on how the leaves assist the plant "in manufacturing its own food."<br><br>STC Children's Book: *It Takes Teamwork* (pgs. 22-23) and *Making Food out of Air* (pgs. 28-30). |
| **Life Science** | 4-5 | LS2C | Plants and animals are related in *food webs* with *producers* (plants that make their own food), *consumers* (animals that eat producers and/or other animals), and *decomposers* (primarily bacteria and fungi) that break down wastes and dead *organisms*, and return *nutrients* to the soil. | Given a list of three *common organisms*, draw arrows properly in a simple *food web* and identify the *producers* and *consumers*.<br><br>Compare the roles of *producers, consumers*, and *decomposers* in an *ecosystem*. | STC Children's Books | ♦R | STC Children's Book: *Lions and Zebras and Chimps, Oh My!* |

# PLANT GROWTH AND DEVELOPMENT DEEP ALIGNMENT

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| **Physical Science** | 2-3 | PS2A | Objects have *properties*, including size, *weight*, hardness, color, shape, texture, and magnetism. Unknown substances can sometimes be identified by their *properties*. | Given an object, list several of its *properties*.<br><br>Given several objects, select one that best matches a list of *properties*.<br><br>Sort objects by their *functions*, shapes and the materials they are composed of. | Addressed throughout the unit. | ♦ | |
| **Physical Science** | 2-3 | PS3A | *Heat*, light, *motion*, electricity, and sound are all forms of energy. | Use the word *energy* to *explain* everyday activities (e.g., food gives people energy to play games). Give examples of different forms of energy as observed in everyday life: light, sound, and *motion*.<br><br>*Explain how* light, sound, and *motion* are all energy. | STC Children's Book | ♦R | STC Children's Book: *It Takes Teamwork* (pgs. 22-23) and *Making Food out of Air* (pgs. 28-30). These reading selections identify sunlight as the source of energy for all plants as they produce their own food through the process of photosynthesis. |
| **Life Science** | 2-3 | LS1A | Plants have *life cycles* that include sprouting, growing to full size, forming fruits and flowers, shedding seeds (which begins a new cycle), and eventually dying. The details of the *life cycle* are different for different plants. | *Describe* the *life cycle* of a *common* type of plant (e.g., the growth of a fast-growing plant from seed to sprout, to adult, to fruits, flowers, and seeds). | Addressed throughout the unit. | ♦ | |

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| **Life Science** | 2-3 | LS1B | Animals have *life cycles* that include being born, developing into children, adolescents, then adults, reproducing (which begins a new cycle), and eventually dying. The details of the *life cycle* are different for different animals. | *Describe* the *life cycle* of a common type of animal (e.g., the development of a butterfly or moth from egg, to larva, to pupa, to adult; or the development of a frog from egg to tadpole to adult frog). | Lesson 8-11 | ▲ | In Lessons 8-11, children learn about the honeybee, its life cycle and the interdependence the bee has with the Wisconsin Fast Plant. Teachers should be intentional about sharing the **background information** from Lesson 9, found in the teachers' guide on the life cycle of the honey bee. Also, to further support this standard, many children have studied other animal life cycles such as the ladybug or the Painted Lady butterfly. The opportunity should not be missed to review with students what they have already learned and to make comparisons from organism to organism. |
| **Life Science** | 2-3 | LS3A | There are *variations* among the same kinds of plants and animals. | Give examples of *variations* among individuals of the same kinds of plants and animals within a *population* (e.g., tall and short pine trees, black cats and white cats, people with blue eyes or brown eyes, with freckles or without). | Lesson 4, 7, 12 | ♦ | |
| **Life Science** | 2-3 | LS3B | The offspring of a plant or animal closely resembles its parents, but close inspection reveals differences. | *Compare* the offspring of a plant or animal with its parents, listing features that are similar and that are different. | Addressed throughout the unit. | ♦<br>♦r | The teachers must be intentional about communicating with students that each seed of the Wisconsin Fast Plant contains the inherited information from the parent plant to produce a new plant that will resemble its parent.<br><br>Lesson 3, *Fast Plants for Fast Times*, teachers should discuss the differences Dr. Williams found in each generation of plants. |