DCI Ecosystems Interactions, Energy, and Dynamics

2.LS2.A: Interdependent Relationships in Ecosystems

Plants depend on water and light to grow.

(2-LS2-1)

UT.1.2.1

DCI Ecosystems Interactions, Energy, and Dynamics

2.LS2.A: Interdependent Relationships in Ecosystems

Plants depend on animals for pollination or to move their seeds around.

(2-LS2-2)

DCI Ecosystems Interactions, Energy, and Dynamics

2.ETS1.B: Developing Possible Solutions

Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.

(2-LS2-2)

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Performance Expectation

2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Clarification Statement: None.

Assessment Boundary: Assessment is limited to testing one variable at a time.

Performance Expectation

1.2.1 Plan and carry out an investigation to determine the effect of sunlight and water on plant growth. Emphasize investigations that test one variable at a time.

For Clarification Statements and Assessment Boundaries, see NGSS.

2-LS2-2

Common Core State Standards for ELA Literacy

Speaking & Listening

SL.2.5 - Presentation of Knowledge and Ideas

Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

(2-LS2-2)

Common Core State Standards for ELA Literacy

W.2.7 - Research to Build and Present Knowledge

Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

(2-LS2-1)
UT.1.2.1

Common Core State Standards for ELA Literacy

W.2.8 - Research to Build and Present Knowledge

Recall information from experiences or gather information from provided sources to answer a question.

(2-LS2-1)
UT.1.2.1

Science and Engineering Practice

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.

(2-LS2-1) **UT.1.2.1**

Science and Engineering Practice

Developing and Using Models

Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Develop a simple model based on evidence to represent a proposed object or tool.

(2-LS2-2)

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DCI Waves and Their Applications in Technologies for Information Transfer

1.PS4.A: Wave Properties

Sound can make matter vibrate, and vibrating matter can make sound.

(1-PS4-1)

UT.1.3.1

DCI Waves and Their Applications in Technologies for Information Transfer

1.PS4.B: Electromagnetic Radiation

Objects can be seen if light is available to illuminate them or if they give off their own light.

(1-PS4-2)

UT.1.3.2

DCI Waves and Their Applications in Technologies for Information Transfer

1.PS4.B: Electromagnetic Radiation

Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.)   (1-PS4-3) **UT.1.3.3**

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Performance Expectation

UT.1.3.1 Plan and carry out an investigation to show the cause and effect relationship between sound and vibrating matter. Emphasize that vibrating matter can make sound and that sound can make matter vibrate.

For Clarification Statements and Assessment Boundaries, see NGSS.

1-PS4-1

Performance Expectation

UT.1.3.2 Use a model to show the effect of light on objects. Emphasize that objects can be seen when light is available to illuminate them or if they give off their own light.

For Clarification Statements and Assessment Boundaries, see NGSS.

1-PS4-2

Science and Engineering Practice

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to sim-ple investigations, based on fair tests, which provide data to support expla-nations or design solutions. **Plan and conduct investigations collaboratively to produce evidence to answer a question.**

(1-PS4-1), (1-PS4-3) **UT.1.3.1, UT.1.3.3**

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions.

Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

(1-PS4-2) **UT.1.3.2**

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions.

Use tools and materials provided to design a device that solves a specific problem.

(1-PS4-4) **UT.1.3.4**

DCI Waves and Their Applications in Technologies for Information Transfer

1.PS4.C: Information Technologies and Instrumentation

People also use a variety of devices to communicate (send and receive information) over long distances.

(1-PS4-4) **UT.1.3.4**

Crosscutting Concept

Cause and Effect

Simple tests can be designed to gather evidence to support or refute student ideas about causes.

(1-PS4-1), (1-PS4-2), (1-PS4-3) **UT.1.3.1, UT.1.3.2, UT.1.3.3**

Common Core State Standards for Mathematics

Measurement & Data

1.MD.A.1 - Measure lengths indirectly and by iterating length units.

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

(1-PS4-4)

UT.1.3.4

Common Core State Standards for Mathematics

Measurement & Data

1.MD.A.2 - Measure lengths indirectly and by iterating length units.

Express the length of an object as a whole number of length units, by lay-ering multiple copies of a shorter object (the length unit) end to end; under-stand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. (1-PS4-4) **UT.1.3.4**

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(1-PS4-4)

UT.1.3.4

Performance Expectation

UT.1.3.3 Plan and carry out an investigation to determine the effect of materials in the path of a beam of light. Emphasize that light can travel through some materials, can be reflected off some materials, and some materials block light causing shadows. Examples of materials could include clear plastic, wax paper, cardboard, or a mirror.

For Clarification Statements and Assessment Boundaries, see NGSS.

1-PS4-3

Performance Expectation

UT.1.3.4 Design a device in which the structure of the device uses light or sound to solve the problem of communicating over a distance. Define the problem of communicating over a distance. Define the problem by asking questions and gathering information, convey designs through sketches, drawings, or physical models, and compare and test designs. Examples of devices could include a light source to send signals, paper-cup-and-string telephones, or a pattern of drum beats.

For Clarification Statements and Assessment Boundaries, see NGSS.

1-PS4-4

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Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions.

Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

(1-LS3-1) **UT.1.2.3**

DCI   eredity Inheritance and Variation of Traits

1.LS3.A: Inheritance of Traits

Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents.

(1-LS3-1)

UT.1.2.3

DCI   eredity Inheritance and Variation of Traits

1.LS3.B: Variation of Traits

Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.

(1-LS3-1)

UT.1.2.3

Patterns

Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

(1-LS3-1) **UT.1.2.3**

Performance Expectation

UT.1.2.3 Obtain, evaluate, and communicate information about the patterns of plants and nonhuman animals that are alike, but not exactly like, their parents. An example could include that most carrots are orange and shaped like a cone but may be different sizes or have differing tastes.

For Clarification Statements and Assessment Boundaries, see NGSS.

1-LS3-1

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DCI **rom Molecules to Organisms Structures and Processes**

Not included in 1st Grade UT Standards

1.LS1.A: Structure and Function

All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

Not included in 1st Grade UT Standards

(1-LS1-1)

DCI **rom Molecules to Organisms Structures and Processes**

1.LS1.B: Growth and Development of Organisms

Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.

(1-LS1-2)
UT.1.2.4

DCI **rom Molecules to Organisms Structures and Processes**

Not included in 1st Grade UT Standards

1.LS1.D: Information Processing

Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also re-spond to some external inputs.

Not included in 1st Grade UT Standards

(1-LS1-1)

Crosscutting Concept

Patterns

Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

(1-LS1-2)
UT.1.2.4

Not included in 1st Grade UT Standards

Crosscutting Concept

Structure and Function

The shape and stability of structures of natural and designed objects are related to their function(s).

(1-LS1-1)

Not included in 1st Grade UT Standards

Performance Expectation

1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears. **Assessment Boundary:** none

Performance Expectation

UT.1.2.4 Construct an explanation of the patterns in the behaviors of parents and offspring which help offspring to survive. Examples of behavioral patterns could include the signals that offspring make such as crying, chirping, and other vocalizations or the responses of the parents such as feeding, comforting, and protecting the offspring.

For Clarification Statements and Assessment Boundaries, please see NGSS.

1-LS1-2

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions. Use materials to design a device that solves a specific problem or a solution to a specific problem.

(1-LS1-1)

Science and Engineering Practice

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.

Read grade-appropriate texts and use media to obtain scientific in-formation to determine patterns in the natural world.

(1-LS1-2) **UT.1.2.4**

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Common Core State Standards for ELA Literacy

W.1.7 - Research to Build and Present Knowledge

Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

(1-ESS1-1), (1-ESS1-2)
UT.1.1.1, UT.1.1.2

Common Core State Standards for ELA Literacy

W.1.8 - Research to Build and Present Knowledge

With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

(1-ESS1-1), (1-ESS1-2)
UT.1.1.1, UT.1.1.2

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(1-ESS1-2)
UT.1.1.2

Science and Engineering Practice

Analyzing and Interpreting Data

Analyzing data in K–2 builds on prior experiences and progresses to collect-ing, recording, and sharing observations.

Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

(1-ESS1-1)
UT.1.1.1

Science and Engineering Practice

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

Make observations (firsthand or from media) to collect data that can be used to make comparisons.

(1-ESS1-2) **UT.1.1.2**

Common Core State Standards for Mathematics

Operations & Algebraic Thinking

1.OA.A.1 - Represent and solve problems involving addition and subtraction.

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and com-paring, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

(1-ESS1-2) **UT.1.1.2**

Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(1-ESS1-2)
UT.1.1.2

Common Core State Standards for Mathematics

Mathematical Practices

MP.4 - Model with mathematics

CCSS text

(1-ESS1-2)
UT.1.1.2

Crosscutting Concept

Patterns

Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

(1-ESS1-1), (1-ESS1-2)
UT.1.1.1, UT.1.1.2

Common Core State Standards for Mathematics

Measurement & Data

1.MD.C.4 - Represent and interpret data.

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in an-other.

(1-ESS1-2)
UT.1.1.2

Common Core State Standards for ELA Literacy

W.1.7 - Research to Build and Present Knowledge

Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

(1-LS3-1)
UT.1.2.3

Common Core State Standards for ELA Literacy

W.1.8 - Research to Build and Present Knowledge

With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

(1-LS3-1)
UT.1.2.3

Common Core State Standards for ELA Literacy

Reading Informational Text

RI.1.1 - Key Ideas and Details

Ask and answer questions about key details in a text.

(1-LS3-1)
UT.1.2.3

Common Core State Standards for ELA Literacy

Speaking & Listening
SL.1.1 - Comprehension and Collaboration

Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

(1-PS4-1), (1-PS4-2), (1-PS4-3)
UT.1.3.1, UT.1.3.2, UT.1.3.3

Common Core State Standards for ELA Literacy

W.1.7 - Research to Build and Present Knowledge

Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

(1-PS4-1), (1-PS4-2), (1-PS4-3), (1-PS4-4)
UT.1.3.1, UT.1.3.2, UT.1.3.3, UT.1.3.4

Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(1-LS3-1)

UT.1.2.3

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(1-LS3-1)

UT.1.2.3

Common Core State Standards for Mathematics

Measurement & Data
1.MD.A.1 - Measure lengths indirectly and by iterating length units.

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

(1-LS3-1)

UT.1.2.3

Common Core State Standards for ELA Literacy

W.1.2 - Text Types and Purposes

Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.

(1-PS4-2)

UT.1.3.2

Common Core State Standards for ELA Literacy

W.1.8 - Research to Build and Present Knowledge

With guidance and support from adults, recall information from expe-riences or gather information from provided sources to answer a question.

(1-PS4-1), (1-PS4-2), (1-PS4-3)

UT.1.3.1, UT.1.3.2, UT.1.3.3

Common Core State Standards for Mathematics

Measurement & Data
2.MD.D.10 - Represent and interpret data.

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

(2-LS2-2)

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(2-LS2-1)
UT.1.2.1

Common Core State Standards for Mathematics

Mathematical Practices
MP.4 - Model with mathematics

CCSS text

(2-LS2-1), (2-LS2-2)
UT.1.2.1

Common Core State Standards for ELA Literacy

Reading Informational Text
RI.1.1 - Key Ideas and Details

Ask and answer questions about key details in a text.

(1-LS1-2)
UT.1.2.4

Common Core State Standards for ELA Literacy

Reading Informational Text
RI.1.10 - Range of Reading and Level of Text Complexity

With prompting and support, read informational texts appropriately complex for grade 1.

(1-LS1-2)
UT.1.2.4

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Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(2-LS2-1)

UT.1.2.1

Common Core State Standards for ELA Literacy

W.1.7 - Research to Build and Present Knowledge

Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

(1-LS1-1)

Crosscutting Concept

Cause and Effect

Events have causes that generate observable patterns.

(2-LS2-1)

UT.1.2.1

Crosscutting Concept

Structure and Function

The shape and stability of structures of natural and designed objects are related to their function(s).

(2-LS2-2)

Common Core State Standards for ELA Literacy

Reading Informational Text
RI.1.2 - Key Ideas and Details

Identify the main topic and retell key details of a text.

(1-LS1-2)

UT.1.2.4

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Common Core State Standards for Mathematics

1.NBT.C.4 - undefined

Add within 100, including adding a two-digit number and a one-digit num-ber, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

(1-LS1-2) **UT.1.2.4**

Common Core State Standards for Mathematics

1.NBT.C.6 - undefined

Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

(1-LS1-2)
UT.1.2.4

Performance Expectation

UT.1.1.3 Design a device that measures the varying patterns of daylight. Define the problem by asking questions and gathering information, convey designs through sketches, drawings, or physical models, and compare and test designs. Examples could include sundials for telling the time or tracking the movement of shadows throughout the day.

This standard has no NGSS equivalent.

Common Core State Standards for Mathematics

1.NBT.B.3 - undefined

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

(1-LS1-2)
UT.1.2.4

Common Core State Standards for Mathematics

1.NBT.C.5 - undefined

Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

(1-LS1-2)
UT.1.2.4

DCI Earth s Place in the Universe

1.ESS1.B: Earth and the Solar System

Seasonal patterns of sunrise and sunset can be observed, de-scribed, and predicted.

(1-ESS1-2)
UT.1.1.2

DCI: Earth's Place in the Universe

1.ESS1.A: The Universe and Its Stars

Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.

(1-ESS1-1)
UT.1.1.1

Performance Expectation

UT.1.2.2 Construct an explanation by observing patterns of external features of living things that survive in different locations. Emphasize how plants and nonhuman animals, found in specific surroundings, share similar physical characteristics. Examples could include that plants living in dry areas are more likely to have thick outer coatings that hold in water, animals living in cold locations have longer and thicker fur, or most desert animals are awake at night.

This standard has no NGSS equivalent.

Performance Expectation

UT.1.1.2 Obtain, evaluate, and communicate information about the patterns observed at different times of the year to relate the amount of daylight to the time of year. Emphasize the variation in daylight patterns at different times of the day and different times of the year. Examples could include varying locations and regions throughout the state, country, and world.

For Clarification Statements and Assessment Boundaries, see NGSS.

UT.1.1.2

Performance Expectation

UT.1.1.1 Obtain, evaluate, and communicate information about the movement of the Sun, Moon, and stars to describe predictable patterns. Examples of patterns could include how the Sun and Moon appear to rise in one part of the sky, move across the sky, and set; or how stars, other than the Sun, are visible at night but not during the day.

For Clarification Statements and Assessment Boundaries, see NGSS.

1-ESS1-1