NGSS Evidence Statements

K-PS3-1 Energy

Students who demonstrate understanding can:

K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water.] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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. Connections to Nature of Science **Scientific Investigations Use a Variety of Methods** • Scientists use different ways to study the world.	**PS3.B: Conservation of Energy and Energy Transfer** • Sunlight warms Earth's surface.	**Cause and Effect** • Events have causes that generate observable patterns.

Observable features of the student performance by the end of the grade:
Identifying the phenomenon to be investigated
1. From the given investigation plan, students describe* (with guidance) the phenomenon under investigation, which includes the following idea: sunlight warms the Earth's surface. 2. Students describe* (with guidance) the purpose of the investigation, which includes determining the effect of sunlight on Earth materials by identifying patterns of relative warmth of materials in sunlight and shade (e.g., sand, soil, rocks, water).
Identifying the evidence to address the purpose of the investigation
1. Based on the given investigation plan, students describe* (with guidance) the evidence that will result from the investigation, including observations of the relative warmth of materials in the presence and absence of sunlight (i.e., qualitative measures of temperature; e.g., hotter, warmer, colder). 2. Students describe* how the observations they make connect to the purpose of the investigation.
Planning the investigation
1. Based on the given investigation plan, students describe* (with guidance): a. The materials on the Earth's surface to be investigated (e.g., dirt, sand, rocks, water, grass). b. How the relative warmth of the materials will be observed and recorded.
Collecting the data
1. According to the given investigation plan and with guidance, students collect and record data that will allow them to: a. Compare the warmth of Earth materials placed in sunlight and the same Earth materials placed in shade. b. Identify patterns of relative warmth of materials in sunlight and in shade (i.e., qualitative measures of temperature; e.g., hotter, warmer, colder). c. Describe* that sunlight warms the Earth's surface

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K-PS3-2 Energy

Students who demonstrate understanding can:

K-PS3-2. Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.* [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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 phenomena and designing solutions.. • Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.	**PS3.B: Conservation of Energy and Energy Transfer** • Sunlight warms Earth's surface.	**Cause and Effect** • Events have causes that generate observable patterns.

Observable features of the student performance by the end of the grade:
Using scientific knowledge to generate design solutions
3. Students use given scientific information about sunlight's warming effect on the Earth's surface to collaboratively design and build a structure that reduces warming caused by the sun. 4. With support, students individually describe*: a. The problem. b. The design solution. c. In what way the design solution uses the given scientific information.
Describing* specific features of the design solution, including quantification when appropriate
3. Students describe* that the structure is expected to reduce warming for a designated area by providing shade. 4. Students use only the given materials and tools when building the structure.
Evaluating potential solutions
2. Students describe* whether the structure meets the expectations in terms of cause (structure blocks sunlight) and effect (less warming of the surface).

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K-LS1-1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world.	**LS1.C: Organization for Matter and Energy Flow in Organisms** • All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	**Patterns** • Patterns in the natural and human designed world can be observed and used as evidence.

Observable features of the student performance by the end of the grade:

Organizing data

1. With guidance, students organize the given data from observations (firsthand or from media) using graphical displays (e.g., pictures, charts), including:
    a. Different types of animals (including humans).
    b. Data about the foods different animals eat.
    c. Data about animals drinking water.
    d. Data about plants' need for water (e.g., observations of the effects on plants in a classroom or school when they are not watered, observations of natural areas that are very dry).
    e. Data about plants' need for light (e.g., observations of the effect on plants in a classroom when they are kept in the dark for a long time; observations about the presence or absence of plants in very dark places, such as under rocks or porches).

Identifying relationships

1. Students identify patterns in the organized data, including that:
    a. All animals eat food.
        i. Some animals eat plants
        ii. Some animals eat other animals.
        iii. Some animals eat both plants and animals.
        iv. No animals do not eat food.
    b. All animals drink water.
    c. Plants cannot live or grow if there is no water.
    d. Plants cannot live or grow if there is no light

Interpreting data

1. Students use the given model to represent and describe*, including:
    a. Plants need light and water to live and grow
    b. Animals need food and water to live and grow.
    c. Animals get their food from plants, other animals, or both.

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K-ESS2-1 Earth's Systems

Students who demonstrate understanding can:

K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world.	**ESS2.D: Weather and Climate** • Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.	**Patterns** • Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

Observable features of the student performance by the end of the grade:
Organizing Data
1. With guidance, students organize data from given observations (firsthand or from media) about local weather conditions using graphical displays (e.g., pictures, charts). The weather condition data include: a. The number of sunny, cloudy, rainy, windy, cool, or warm days. b. The relative temperature at various times of the day (e.g., cooler in the morning, warmer during the day, cooler at night).
Identifying Relationships
1. Students identify and describe* patterns in the organized data, including: a. The relative number of days of different types of weather conditions in a month. b. The change in the relative temperature over the course of a day. c. The relationships between specific plants and animals and where they live (e.g., fish live in water environments, deer live in forests where there are buds and leaves, rabbits live in fields and woods where there is grass to eat and space for burrows for homes, plants live in sunny and moist areas, humans get resources from nature [e.g., building materials from trees to help them live where they want to live]).
Interpreting data
1. Students describe* and share that: a. Certain months have more days of some kinds of weather than do other months (e.g., some months have more hot days, some have more rainy days). b. The differences in relative temperature over the course of a day (e.g., between early morning and the afternoon, between one day and another) are directly related to the time of day.

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K-ESS2-2 Earth's Systems

Students who demonstrate understanding can:

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Engaging in Argument from Evidence Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s). • Construct an argument with evidence to support a claim.	**ESS2.E: Biogeology** • Plants and animals can change their environment. **ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary)	**Systems and System Models** • Systems in the natural and designed world have parts that work together.

Observable features of the student performance by the end of the grade:
Supported claims
1. Students make a claim to be supported about a phenomenon. In their claim, students include the idea that plants and animals (including humans) can change the environment to meet their needs.
Identifying scientific evidence
1. Students identify and describe* the given evidence to support the claim, including: a. Examples of plants changing their environments (e.g., plant roots lifting sidewalks). b. Examples of animals (including humans) changing their environments (e.g., ants building an ant hill, humans clearing land to build houses, birds building a nest, squirrels digging holes to hide food). c. Examples of plant and animal needs (e.g., shelter, food, room to grow).
Evaluating and critiquing evidence
1. Students describe* how the examples do or do not support the claim.
Reasoning and synthesis
1. Students support the claim and present an argument by logically connecting various needs of plants and animals to evidence about how plants/animals change their environments to meet their needs. Students include: a. Examples of how plants affect other parts of their systems by changing their environments to meet their needs (e.g., roots push soil aside as they grow to better absorb water). b. Examples of how animals affect other parts of their systems by changing their environments to meet their needs (e.g., ants, birds, rabbits, and humans use natural materials to build shelter; some animals store food for winter).

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K-ESS3-1 Earth and Human Activity

Students who demonstrate understanding can:

K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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, storyboard) that represent concrete events or design solutions. • Use a model to represent relationships in the natural world.	**ESS3.A: Natural Resources** • Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.	**Systems and System Models** • Systems in the natural and designed world have parts that work together.

Observable features of the student performance by the end of the grade:
Components of the model
2. From the given model (e.g., representation, diagram, drawing, physical replica, diorama, dramatization, storyboard) of a phenomenon involving the needs of living things and their environments, students identify and describe* the components that are relevant to their representations, including: a. Different plants and animals (including humans). b. The places where the different plants and animals live. c. The things that plants and animals need (e.g., water, air, and land resources such as wood, soil, and rocks). d.
Relationships
2. Students use the given model to represent and describe* relationships between the components, including: a. The relationships between the different plants and animals and the materials they need to survive (e.g., fish need water to swim, deer need buds and leaves to eat, plants need water and sunlight to grow). b. The relationships between places where different plants and animals live and the resources those places provide. c. The relationships between specific plants and animals and where they live (e.g., fish live in water environments, deer live in forests where there are buds and leaves, rabbits live in fields and woods where there is grass to eat and space for burrows for homes, plants live in sunny and moist areas, humans get resources from nature [e.g., building materials from trees to help them live where they want to live]).
Connections
2. Students use the given model to represent and describe*, including: a. Students use the given model to describe* the pattern of how the needs of different plants and animals are met by the various places in which they live (e.g., plants need sunlight so they are found in places that have sunlight; fish swim in water so they live in lakes, rivers, ponds, and oceans; deer eat buds and leaves so they live in the forest) b. Students use the given model to describe* that plants and animals, the places in which they live, and the resources found in those places are each part of a system, and that these parts of systems work together and allow living things to meet their needs.

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K-ESS3-2 Earth and Human Activity

Students who demonstrate understanding can:

K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* [Clarification Statement: Emphasis is on local forms of severe weather.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. • Ask questions based on observations to find more information about the designed world. **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/or use media to obtain scientific information to describe patterns in the natural world.	**ESS3.B: Natural Hazards** • Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. **ETS1.A: Defining and Delimiting an Engineering Problem** • Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary)	**Cause and Effect** • Events have causes that generate observable patterns. --- **Connections to Engineering, Technology, and Applications of Science** **Interdependence of Science, Engineering, and Technology** • People encounter questions about the natural world every day. **Influence of Engineering, Technology, and Science on Society and the Natural World** • People depend on various technologies in their lives; human life would be very different without technology.

Observable features of the student performance by the end of the grade:
Addressing phenomena of the natural world
1. Students formulate questions about local severe weather, the answers to which would clarify how weather forecasting can help people avoid the most serious impacts of severe weather events.
Identifying the scientific nature of the question
1. Students' questions are based on their observations.
Obtaining information
1. Students collect information (e.g., from questions, grade appropriate texts, media) about local severe weather warnings (e.g., tornado alerts, hurricane warnings, major thunderstorm warnings, winter storm warnings, severe drought alerts, heat wave alerts), including that: a. There are patterns related to local severe weather that can be observed (e.g., certain types of severe weather happen more in certain places). b. Weather patterns (e.g., some events are more likely in certain regions) help scientists predict severe weather before it happens. c. Severe weather warnings are used to communicate predictions about severe weather. d. Weather forecasting can help people plan for, and respond to, specific types of local weather (e.g., responses: stay indoors during severe weather, go to cooling centers during heat waves; preparations: evacuate coastal areas before a hurricane, cover windows before storms).

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K-ESS3-3 Earth and Human Activity

Students who demonstrate understanding can:

K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.* [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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. • Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.	**ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. **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.(secondary)	**Cause and Effect** • Events have causes that generate observable patterns.

Observable features of the student performance by the end of the grade:

Communicating information

1. Students use prior experiences and observations to describe* information about:
    a. How people affect the land, water, air, and/or other living things in the local environment in positive and negative ways.
    b. Solutions that reduce the negative effects of humans on the local environment.
2. Students communicate information about solutions that reduce the negative effects of humans on the local environment, including:
    a. Examples of things that people do to live comfortably and how those things can cause changes to the land, water, air, and/or living things in the local environment.
    b. Examples of choices that people can make to reduce negative impacts and the effect those choices have on the local environment.
3. Students communicate the information about solutions with others in oral and/or written form (which include using models and/or drawings.

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1-LS3-1 Heredity: Inheritance and Variation of Traits

Students who demonstrate understanding can:

1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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 phenomena and designing solutions. • Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.	**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. **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.	**Patterns** • Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

Observable features of the student performance by the end of the grade:
Addressing phenomena of the natural world
1. Students articulate a statement that relates a given phenomenon to a scientific idea, including the idea that young plants and animals are like, but not exactly like, their parents (not to include animals that undergo complete metamorphoses, such as insects or frogs). 2. Students use evidence and reasoning to construct an evidence-based account of the phenomenon.
Evidence
1. Students describe* evidence from observations (firsthand or from media) about patterns of features in plants and animals, including: a. Key differences between different types of plants and animals (e.g., features that distinguish dogs versus those that distinguish fish, oak trees vs. bean plants). b. Young plants and animals of the same type have similar, but not identical features (e.g., size and shape of body parts, color and/or type of any hair, leaf shape, stem rigidity). c. Adult plants and animals (i.e., parents) of the same type have similar, but not identical features (e.g., size and shape of body parts, color and/or type of any hair, leaf shape, stem rigidity). d. Patterns of similarities and differences in features between parents and offspring.
Reasoning
1. Students logically connect the evidence of observed patterns in features to support the evidence-based account by describing* chains of reasoning that include: a. Young plants and animals are very similar to their parents. b. Young plants and animals are not exactly the same as their parents. c. Similarities and differences in features are evidence that young plants and animals are very much, but not exactly, like their parents. d. Similarities and differences in features are evidence that although individuals of the same type of animal or plant are recognizable as similar, they can also vary in many ways.

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1-ESS1-2 Earth's Place in the Universe

Students who demonstrate understanding can:

1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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.	**ESS1.B: Earth and the Solar System** • Seasonal patterns of sunrise and sunset can be observed, described, and predicted.	**Patterns** • Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

Observable features of the student performance by the end of the grade:
Identifying the phenomenon under investigation
1. Students identify and describe* the phenomenon and purpose of the investigation, which include the following idea: the relationship between the amount of daylight and the time of year.
Identifying evidence to address the purpose of the investigation
1. Based on the given plan for the investigation, students (with support) describe* the data and evidence that will result from the investigation, including observations (firsthand or from media) of relative length of the day (sunrise to sunset) throughout the year. 2. Students individually describe* how these observations could reveal the pattern between the amount of daylight and the time of year (i.e., relative lightness and darkness at different relative times of the day and throughout the year).
Planning the investigation
1. Based on the given investigation plan, students describe* (with support): a. How the relative length of the day will be determined (e.g., whether it will be light or dark when waking in the morning, at breakfast, when having dinner, or going to bed at night). b. When observations will be made and how they will be recorded, both within a day and across the year.
Collecting the data
1. According to the given investigation plan, students collaboratively make and record observations about the relative length of the day in different seasons to make relative comparisons between the amount of daylight at different times of the year (e.g., summer, winter, fall, spring).

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2-PS1-1 Matter and Its Interactions

Students who demonstrate understanding can:

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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.	**PS1.A: Structure and Properties of Matter** • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.	**Patterns** • Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

Observable features of the student performance by the end of the grade:
Identifying the phenomenon under investigation
1. Students identify and describe* the phenomenon under investigation, which includes the following idea: different kinds of matter have different properties, and sometimes the same kind of matter has different properties depending on temperature. 2. Students identify and describe* the purpose of the investigation, which includes answering a question about the phenomenon under investigation by describing* and classifying different kinds of materials by their observable properties.
Identifying evidence to address the purpose of the investigation
1. Students collaboratively develop an investigation plan and describe* the evidence that will be collected, including the properties of matter (e.g., color, texture, hardness, flexibility, whether is it a solid or a liquid) of the materials that would allow for classification, and the temperature at which those properties are observed. 2. Students individually describe* that: a. The observations of the materials provide evidence about the properties of different kinds of materials. b. Observable patterns in the properties of materials provide evidence to classify the different kinds of materials.
Planning the investigation
1. In the collaboratively developed investigation plan, students include: a. Which materials will be described* and classified (e.g., different kinds of metals, rocks, wood, soil, powders). b. Which materials will be observed at different temperatures, and how those temperatures will be determined (e.g., using ice to cool and a lamp to warm) and measured (e.g., qualitatively or quantitatively). c. How the properties of the materials will be determined. d. How the materials will be classified (i.e., sorted) by the pattern of the properties. 2. Students individually describe* how the properties of materials, and the method for classifying them, are relevant to answering the question.
Collecting the data
1. According to the developed investigation plan, students collaboratively collect and record data on the properties of the materials.

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2-PS1-2 Matter and Its Interactions

Students who demonstrate understanding can:

2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Analyze data from tests of an object or tool to determine if it works as intended.	**PS1.A: Structure and Properties of Matter** • Different properties are suited to different purposes.	**Cause and Effect** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. --- **Connections to Engineering, Technology, and Applications of Science** **Influence of Engineering, Technology, and Science on Society and the Natural World** • Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.

Observable features of the student performance by the end of the grade:
Organizing data
1. Using graphical displays (e.g., pictures, charts, grade-appropriate graphs), students use the given data from tests of different materials to organize those materials by their properties (e.g., strength, flexibility, hardness, texture, ability to absorb).
Identifying relationships
1. Students describe* relationships between materials and their properties (e.g., metal is strong, paper is absorbent, rocks are hard, sandpaper is rough). 2. Students identify and describe* relationships between properties of materials and some potential uses purpose (e.g., hardness is good for breaking objects or supporting objects; roughness is good for keeping objects in place; flexibility is good to keep a materials from breaking, but not good for keeping materials rigidly in place).
Interpreting data
1. Students describe* which properties allow a material to be well suited for a given intended use (e.g., ability to absorb for cleaning up spills, strength for building material, hardness for breaking a nut). 2. Students use their organized data to support or refute their ideas about which properties of materials allow the object or tool to be best suited for the given intended purpose relative to the other given objects/tools (e.g., students could support the idea that hardness allows a wooden shelf to be better suited for supporting materials placed on it than a sponge would be, based on the patterns relating property to a purpose; students could refute an idea that a thin piece of glass is better suited to be a shelf than a wooden plank would be because it is harder than the wood by using data from tests of hardness and strength to give evidence that the glass is less strong than the wood). 3. Students describe* how the given data from the test provided evidence of the suitability of different materials for the intended purpose.

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2-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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.	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on water and light to grow.	**Cause and Effect** • Events have causes that generate observable patterns.

Observable features of the student performance by the end of the grade:
Identifying the phenomenon under investigation
1. Students identify and describe* the phenomenon and purpose of the investigation, which include answering a question about whether plants need sunlight and water to grow.
Identifying the evidence to address the purpose of the investigation
1. Students describe* the evidence to be collected, including: a. Plant growth with both light and water. b. Plant growth without light but with water. c. Plant growth without water but with light. d. Plant growth without water and without light. 2. Students describe* how the evidence will allow them to determine whether plants need light and water to grow.
Planning the investigation
1. Students collaboratively develop an investigation plan. In the investigation plan, students describe* the features to be part of the investigation, including: a. The plants to be used. b. The source of light. c. How plants will be kept with/without light in both the light/dark test and the water/no water test. d. The amount of water plants will be given in both the light/dark test and the water/no water test. e. How plant growth will be determined (e.g., observations of plant height, number and size of leaves, thickness of the stem, number of branches). 2. Students individually describe* how this plan allows them to answer the question.
Collecting the data
1. According to the investigation plan developed, students collaboratively collect and record data on the effects on plant growth by: a. Providing both light and water, b. Withholding light but providing water, c. Withholding water but providing light, or d. Withholding both water and light.

**Unless otherwise specified, "descriptions" referenced in evidence statements could include but are not limited to written, oral, pictorial, and kinesthetic descriptions*

2-LS4-1 Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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 which can be used to make comparisons. **Connections to Nature of Science** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world.	**LS4.D: Biodiversity and Humans** • There are many different kinds of living things in any area, and they exist in different places on land and in water.	

Observable features of the student performance by the end of the grade:
Identifying the phenomenon under investigation
1. Students identify and describe* the phenomenon and purpose of the investigation, which includes comparisons of plant and animal diversity of life in different habitats.
Identifying the evidence to address the purpose of the investigation
1. Based on the given plan for the investigation, students describe* the following evidence to be collected: a. Plant growth with both light and water. b. Plant growth without light but with water. c. Plant growth without water but with light. d. Plant growth without water and without light. 2. Students describe* how the evidence will allow them to determine whether plants need light and water to grow.
Planning the investigation
1. Students collaboratively develop an investigation plan. In the investigation plan, students describe* the features to be part of the investigation, including: a. Descriptions* based on observations (firsthand or from media) of habitats, including land habitats (e.g., playground, garden, forest, parking lot) and water habitats (e.g., pond, stream, lake). b. Descriptions* based on observations (firsthand or from media) of different types of living things in each habitat (e.g., trees, grasses, bushes, flowering plants, lizards, squirrels, ants, fish, clams). c. Comparisons of the different types of living things that can be found in different habitats. 2. Students describe* how these observations provide evidence for patterns of plant and animal diversity across habitats.
Planning the investigation
1. Based on the given investigation plan, students describe* how the different plants and animals in the habitats will be observed, recorded, and organized.
Collecting the data
1. Students collect, record, and organize data on different types of plants and animals in the habitats.

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