Kansas
Performance Level Descriptors

5th Grade

9/22/25

Contents

<table>
<tr><td>5-PS1-1.</td><td colspan="3">Develop a model to describe that matter is made of particles too small to be seen.

Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.

Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.</td></tr>
<tr><td colspan="4">Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

• Use models to describe phenomena.</td></tr>
<tr><td colspan="4">PS1.A: Structure and Properties of Matter

• Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.</td></tr>
<tr><td colspan="2">Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Given a model of matter, identify that some of the components are</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:</td><td>Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Revise a model to explain that non-visible matter (e.g., air) is still</td></tr>
</table>

representing something that is too small to be seen.	• Develop a model to describe that matter is made of particles too small to be seen.	made up of particles that are too small to be seen (i.e., focus is on presence of matter, not states of matter or specific particles).

5-PS1-2.	**Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.** Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances. *Assessment Boundary: Assessment does not include distinguishing mass and weight.*

Using Mathematics and Computational Thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

- Measure and graph quantities such as weight to address scientific and engineering questions and problems.

PS1.A: Structure and Properties of Matter

- The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.

PS1.B: Chemical Reactions

- No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished)

Level 2	**Level 3**	**Level 4**
Students at level 2 show a *basic* ability to demonstrate their knowledge and skills such as: • Given a graph that shows equal amounts before and after a type	Students at level 3 show a *proficient* ability to demonstrate their knowledge and skills such as: • Measure and graph quantities to provide evidence that regardless	Students at level 4 show an *advanced* ability to demonstrate their knowledge and skills such as: • During a reaction or change of two substances, use

of change, identify that they are equal, without explaining that this would be true for all changes in matter.	of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.	quantitative data to account for any change in mass (e.g., when mixing baking soda and vinegar, identify that the change in weight is accounted for by the gas produced).

<table>
<tr><td>5-PS1-3.</td><td colspan="3">Make observations and measurements to identify materials based on their properties.

Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.

Assessment Boundary: Assessment does not include density or distinguishing mass and weight.</td></tr>
<tr><td colspan="4">Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

• Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.</td></tr>
<tr><td colspan="4">PS1.A: Structure and Properties of Matter

• Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic scale mechanism of evaporation and condensation.)</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:</td><td colspan="2">Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Make observations and measurements to identify</td><td>Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Determine which observations and measurements provide the</td></tr>
</table>

• Use data as evidence to support that objects have observable properties.	materials based on their properties.	best evidence to identify materials based on their properties.

<table>
<tr><td>5-PS1-4.</td><td colspan="3">Conduct an investigation to determine whether the mixing of two or more substances results in new substances.</td></tr>
<tr><td colspan="4">Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

• Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.</td></tr>
<tr><td colspan="4">PS1.B: Chemical Reactions

• When two or more different substances are mixed, a new substance with different properties may be formed.</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Use observations as evidence to show how properties have changed.</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Conduct an investigation to determine whether the mixing of two or more substances results in new substances.</td><td colspan="2">Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Evaluate an investigation for the inclusion of elements that support the production of sufficient evidence to determine if mixing two or more substances results in</td></tr>
</table>

		new substances (e.g., controlled variables, number of trials).

<table>
<tr><td>5-PS2-1.</td><td colspan="3">Support an argument that the gravitational force exerted by Earth on objects is directed down.

Clarification Statement: “Down” is a local description of the direction that points toward the center of the spherical Earth.

Assessment Boundary: Assessment does not include mathematical representation of gravitational force.</td></tr>
<tr><td colspan="4">Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

• Support an argument with evidence, data, or a model.</td></tr>
<tr><td colspan="4">PS2.B: Types of Interactions

• The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center.</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Provide unsupported claims that Earth’s gravity acts on all objects.</td><td colspan="2">Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Support an argument that the gravitational force exerted by Earth on objects is directed down (i.e., supports argument that gravity affects objects, but does not need to explain why).</td><td>Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Construct an argument to support that certain phenomena appear to defy gravity but are actually being pulled down (e.g., airplanes, bouncing balls).</td></tr>
</table>

<table>
<tr><td>5-PS3-1.</td><td colspan="3">Use models to describe that energy in animals' food (used for body repair, growth, and motion and to maintain body warmth) was once energy from the sun.

Clarification Statement: Examples of models could include diagrams, and flow charts.</td></tr>
<tr><td colspan="4">Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

• Use models to describe phenomena.</td></tr>
<tr><td colspan="4">PS3.D: Energy in Chemical Processes and Everyday Life

• The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water).

LS1.C: Organization for Matter and Energy Flow in Organisms

• Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary)</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Identify on a model the direct source of energy for an organism (e.g., given a food chain that</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Use models to describe that energy in animals' food (used for body repair, growth, and</td><td colspan="2">Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Develop a model to show the transfer of energy in food chains and food webs to explain how</td></tr>
</table>

includes a rabbit, identify the organism the rabbit eats as the rabbit's source of energy).	motion and to maintain body warmth) was once energy from the sun.	organisms get their energy to repair, grow, move their bodies, and maintain body warmth from the sun.

<table>
<tr><td>5-LS1-1.</td><td colspan="3">Support an argument that plants get the materials they need for growth chiefly from air and water.

Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.</td></tr>
<tr><td colspan="4">Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

• Support an argument with evidence, data, or a model.</td></tr>
<tr><td colspan="4">LS1.C: Organization for Matter and Energy Flow in Organisms

• Plants acquire their material for growth chiefly from air and water.</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Make a claim that plants are able to grow without soil.
• Make a claim that plants will not grow without air and water.</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Support an argument that plants get the materials they need for growth chiefly from air and water.</td><td colspan="2">Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Construct an argument that plants require air and water to grow, but that some materials needed to grow can be found in soil or added to water.
• Use evidence to support a claim that plants do not need soil to grow (e.g., comparing weight of</td></tr>
</table>

		soil before and after plant growth).

5-LS2-1.	**Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth. *Assessment Boundary: Assessment does not include molecular explanations.*

Developing and Using Models

Modeling in 3–5 builds on K–2 models and progresses to building and revising simple models and using models to represent events and design solutions.

- Develop a model to describe phenomena.

LS2.A: Interdependent Relationships in Ecosystems

- The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

• Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment.		
Level 2 Students at level 2 show a *basic* ability to demonstrate their knowledge and skills such as: • Use a model to describe the role of a specific organism in moving matter through an ecosystem. • Identify interactions in a given model in which matter is exchanged among plants, animals, decomposers, and the environment. • Identify components of a given model that are relevant to describing the movement of matter in an ecosystem.	**Level 3** Students at level 3 show a *proficient* ability to demonstrate their knowledge and skills such as: • Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	**Level 4** Students at level 4 show an *advanced* ability to demonstrate their knowledge and skills such as: • Use a model to describe how the movement of matter may change given real-world disruptions to an ecosystem (e.g., newly introduced species disrupts food web). • Use a model to predict how the health of an ecosystem may change after a disruption. • Identify limitations of a model in describing the movement of matter in an ecosystem.

5-ESS1-1.	**Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.** *Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).*

Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Support an argument with evidence, data, or a model.

ESS1.A: The Universe and its Stars

- The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth.

Level 2	**Level 3**	**Level 4**
Students at level 2 show a *basic* ability to demonstrate their knowledge and skills such as: • Make a claim that the sun is the nearest star to Earth. • Make a claim that stars vary in distance from Earth. • Make a claim that stars vary in apparent brightness.	Students at level 3 show a *proficient* ability to demonstrate their knowledge and skills such as: • Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.	Students at level 4 show an *advanced* ability to demonstrate their knowledge and skills such as: • Evaluate the strength of evidence, data, or a model in supporting an argument for the relationship between apparent brightness and relative distance of stars (e.g., not all stars are the same brightness).

• Support an argument that luminous objects may appear brighter up close, and dimmer from far away (e.g., nearby streetlights compared to distant streetlights).		• Use provided evidence to compare objects from outside our solar system that appear similar in brightness but emit very different amounts of light. • Construct an argument based on given evidence that the sun appears larger and brighter than other stars because it is the closest star to Earth.

<table>
<tr><td>5-ESS1-2.</td><td colspan="3">Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.

Assessment Boundary: Assessment does not include causes of seasons.</td></tr>
<tr><td colspan="4">Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

• Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.</td></tr>
<tr><td colspan="4">ESS1.B: Earth and the Solar System

• The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Identify graphical displays that display data collected by</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Represent data in graphical displays to reveal patterns of daily</td><td>Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Use data to describe how changes in shadows and the appearance of</td></tr>
</table>

observing sunrise/sunset times throughout the year, without identifying a pattern. • Identify graphical displays that display observations of length and direction of shadows over the course of the day, without identifying a pattern. • Analyze or interpret data to identify that some stars are only visible in the night sky at certain times.	changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. • Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows. • Represent data in graphical displays to reveal patterns of changes in day and night. • Represent data in graphical displays to reveal patterns in the seasonal appearance of some stars in the night sky.	stars can serve as evidence of Earth's rotation and orbit. • Represent data in graphical displays to reveal patterns about the stars that are visible in the night sky at certain times of the year. (e.g., the position of Earth in its orbit around the sun in relation to the stars that are observed). • Identify daily patterns in data to reveal relationships between Earth and the sun (e.g., shadows are shorter at noon and longer at the beginning and end of the day).

<table>
<tr><td>5-ESS2-1.</td><td colspan="3">Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.

Assessment Boundary: Assessment is limited to the interactions of two systems at a time.</td></tr>
<tr><td colspan="4">Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

• Develop a model using an example to describe a scientific principle.</td></tr>
<tr><td colspan="4">ESS2.A: Earth Materials and Systems

• Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.</td></tr>
<tr><td colspan="2">Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:</td><td>Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:</td></tr>
</table>

• Identify components in a given model that represent an Earth system (geosphere, hydrosphere, atmosphere, biosphere). • Use a model to identify which Earth systems are involved in an observed phenomenon.	• Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	• Use a model to predict how altering a component of an individual Earth system may affect the function of another Earth system. • Revise a model to explain how the Earth systems work together to contribute to the overall function of the system.

<table>
<tr><td>5-ESS2-2.</td><td colspan="3">Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.</td></tr>
<tr><td colspan="4">Using Mathematics and Computational Thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

• Describe and graph quantities such as area and volume to address scientific questions.</td></tr>
<tr><td colspan="4">ESS2.C: The Roles of Water in Earth’s Surface Processes

• Nearly all of Earth’s available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:

• Organize data sets to identify that most of the water on Earth is found in oceans and is saltwater.</td><td>Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:

• Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.</td><td colspan="2">Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:

• Use patterns in quantitative data to describe how the distribution of water between the ocean and smaller reservoirs impacts resource availability.</td></tr>
</table>

		• Organize data to compare the scale of relationships between water reservoirs (e.g., glaciers hold most of the fresh water, but very little of the overall water).

<table>
<tr><td>5-ESS3-1.</td><td colspan="3">Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.</td></tr>
<tr><td colspan="4">Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.
Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.</td></tr>
<tr><td colspan="4">ESS3.C: Human Impacts on Earth Systems
Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments.</td></tr>
<tr><td>Level 2

Students at level 2 show a basic ability to demonstrate their knowledge and skills such as:
Use reliable media to identify Earth’s resources and the parts of the environment that need to be protected.</td><td colspan="2">Level 3

Students at level 3 show a proficient ability to demonstrate their knowledge and skills such as:
Obtain and combine information about ways individual communities use science ideas to</td><td>Level 4

Students at level 4 show an advanced ability to demonstrate their knowledge and skills such as:
Compare information across texts to describe how human activities affect the environment in positive and negative ways, and how</td></tr>
</table>

	protect Earth's resources and environment.	science informs strategies for protection.