DCI: Energy

5.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 mat-ter (from air and water).

(5-PS3-1)
UT.5.3.2

DCI: From Molecules to Organisms: Structures and Processes

5.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.

(5-PS3-1)
UT.5.3.2

Performance Expectation

UT.5.3.2 Obtain, evaluate, and communicate information that animals obtain energy and matter from the food they eat for body repair, growth, and motion and to maintain body warmth. Emphasize that the energy used by animals was once energy from the Sun. Cellular respiration will be taught in Grades 6 through 8.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-PS3-1**

Science and Engineering Practice

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.

(5-PS3-1)
UT.5.3.2

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.5.7 - Integration of Knowledge and Ideas

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

(5-PS3-1)
UT.5.3.2

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Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.5.1 - Key Ideas and Details

Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

(5-LS1-1)
UT.5.3.1

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.5.9 - Integration of Knowledge and Ideas

Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

(5-LS1-1)
UT.5.3.1

Common Core State Standards for ELA/Literacy

W.5.1 - Text Types and Purposes

Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

(5-LS1-1)
UT.5.3.1

Crosscutting Concept

Energy and Matter

Energy can be transferred in various ways and between objects.

(5-PS3-1)
UT.5.3.2

Common Core State Standards for ELA/Literacy

Speaking & Listening

SL.5.5 - Presentation of Knowledge and Ideas

Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the develop-ment of main ideas or themes.

(5-PS3-1)
UT.5.3.2

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DCI: Matter and Its Interactions

5.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.

(5-PS1-1) **UT.5.2.1**

DCI: Matter and Its Interactions

5.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.

(5-PS1-2) **UT.5.2.4**

DCI: Matter and Its Interactions

5.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.)

(5-PS1-3) **UT.5.2.2**

DCI: Matter and Its Interactions

5.PS1.B: Chemical Reactions

When two or more different substances are mixed, a new substance with different properties may be formed.

(5-PS1-4) **UT.5.2.3**

DCI: Matter and Its Interactions

5.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 at this grade level.)

(5-PS1-2) **UT.5.2.4**

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Common Core State Standards for ELA/Literacy

W.5.7 - Research to Build and Present Knowledge

Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

(5-PS1-2), (5-PS1-3), (5-PS1-4)
UT.5.2.4, UT.5.2.2, UT.5.2.3

Common Core State Standards for ELA/Literacy

W.5.8 - Research to Build and Present Knowledge

Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

(5-PS1-2), (5-PS1-3), (5-PS1-4)
UT.5.2.4, UT.5.2.2, UT.5.2.3

Common Core State Standards for ELA/Literacy

W.5.9 - Research to Build and Present Knowledge

Draw evidence from literary or informational texts to support analysis, reflection, and research.

(5-PS1-2), (5-PS1-3), (5-PS1-4)
UT.5.2.4, UT.5.2.2, UT.5.2.3

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.5.7 - Integration of Knowledge and Ideas

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

(5-PS1-1)
UT.5.2.1

Crosscutting Concept

Scale, Proportion, and Quantity

Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

(5-PS1-2), (5-PS1-3)
UT.5.2.4, UT.5.2.2

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Common Core State Standards for Mathematics

Measurement & Data

5.MD.A.1 - Convert like measurement units within a given measurement system.

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these con-versions in solving multi-step, real world problems.

(5-PS1-2)
UT.5.2.4

Common Core State Standards for Mathematics

Measurement & Data

5.MD.C.3 - Geometric measurement: understand concepts of volume.

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

(5-PS1-1)
UT.5.2.1

Common Core State Standards for Mathematics

Measurement & Data

5.MD.C.4 - Geometric measurement: understand concepts of volume.

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

(5-PS1-1)
UT.5.2.1

Crosscutting Concept

Cause and Effect

Cause and effect relationships are routinely identified and used to explain change.

(5-PS1-4)
UT.5.2.3

Crosscutting Concept

Scale, Proportion, and Quantity

Natural objects exist from the very small to the immensely large.

(5-PS1-1)
UT.5.2.1

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Common Core State Standards for Mathematics

Number & Operations in Base Ten

5.NBT.A.1 - Understand the place value system.

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

(5-PS1-1)
UT.5.2.1

Common Core State Standards for Mathematics

Number & Operations--Fractions

5.NF.B.7 - Apply and extend previous understandings of multiplication and division.

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

(5-PS1-1)
UT.5.2.1

Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(5-PS1-1), (5-PS1-2), (5-PS1-3)
UT.5.2.1, UT.5.2.4, UT.5.2.2

Common Core State Standards for Mathematics

Mathematical Practices MP.4 - Model with mathematics

CCSS text

(5-PS1-1), (5-PS1-2), (5-PS1-3)
UT.5.2.1, UT.5.2.4, UT.5.2.2

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(5-PS1-2), (5-PS1-3)
UT.5.2.4, UT.5.2.2

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DCI: Ecosystems: Interactions, Energy, and Dynamics

5.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 or-ganisms (both plants or plants parts and animals) and therefore op-erate as “decomposers.” Decomposition eventually restores (recy-cles) 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. (5-LS2-1) **UT.5.3.3**

DCI: Ecosystems: Interactions, Energy, and Dynamics

5.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.

(5-LS2-1)
UT.5.3.1

Crosscutting Concept

Systems and System Models

A system can be described in terms of its components and their in-teractions.

(5-LS2-1)
UT.5.3.1

Science and Engineering Practice

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 to describe phenomena.

(5-LS2-1)
UT.5.3.1

Performance Expectation

UT.5.3.3 Develop and use a model to describe the movement of matter among plants, animals, decomposers, and the environment. Emphasize that matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Examples could include simple food chains from ecosystems such as deserts or oceans or diagrams of decomposers returning matter to the environment. Complex interactions in a food web will be taught in Grades 6 through 8.

For Clarification Statements and Assessment Boundaries, see NGSS.

5-LS2-1

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Common Core State Standards for ELA/Literacy

Reading Informational Text
RI.4.7 - Integration of Knowledge and Ideas

Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive ele-ments on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

(4-ESS2-2) **UT.5.1.1**

Common Core State Standards for ELA/Literacy

W.4.7 - Research to Build and Present Knowledge

Conduct short research projects that build knowledge through investigation of different aspects of a topic.

(4-ESS2-2)
UT.5.1.1

Common Core State Standards for ELA/Literacy

W.4.8 - Research to Build and Present Knowledge

Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

(4-ESS2-1)
UT.5.1.3

Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(5-LS1-1)
UT.5.3.1

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(5-LS1-1)
UT.5.3.1

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Common Core State Standards for ELA/Literacy

Speaking & Listening

SL.5.5 - Presentation of Knowledge and Ideas

Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the develop-ment of main ideas or themes.

(5-ESS2-1), (5-ESS2-2)
UT.5.1.4, UT.5.1.2

Common Core State Standards for ELA/Literacy

W.5.8 - Research to Build and Present Knowledge

Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

(5-ESS2-2)
UT.5.1.2

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.5.7 - Integration of Knowledge and Ideas

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

(5-ESS2-1), (5-ESS2-2)
UT.5.1.4, UT.5.1.2

Crosscutting Concept

Scale, Proportion, and Quantity

Standard units are used to measure and describe physical quantities such as weight and volume.

(5-ESS2-2)
UT.5.1.2

Crosscutting Concept

Systems and System Models

A system can be described in terms of its components and their interactions.

(5-ESS2-1)
UT.5.1.4

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Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(5-ESS2-1), (5-ESS2-2)
UT.5.1.4, UT.5.1.2

Common Core State Standards for Mathematics

Mathematical Practices MP.4 - Model with mathematics

CCSS text

(5-ESS2-1), (5-ESS2-2)
UT.5.1.4, UT.5.1.2

Common Core State Standards for Mathematics

Geometry 5.G.A.2 - undefined

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

(5-ESS2-1)
UT.5.1.4

Science and Engineering Practice

Using Mathematics and Computational Thinking

Mathematical and computational thinking at the 3–5 level 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.

(5-ESS2-2)
UT.5.1.2

Science and Engineering Practice

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.

(5-ESS2-1)
UT.5.1.4

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DCI: Earth and Human Activity

4.ESS3.A: Natural Resources

Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.

(4-ESS3-1)
UT.5.3.4

DCI: Earth and Human Activity

4.ESS3.B: Natural Hazards

A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

(4-ESS3-2)
UT.5.1.5

DCI: Earth and Human Activity

4.ETS1.B: Developing Possible Solutions

Testing a solution involves investigating how well it performs under a range of likely conditions.

(4-ESS3-2)
UT.5.3.4

Performance Expectation

UT.5.3.4 Evaluate design solutions whose primary function is to conserve Earth's environments and resources. Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution. Emphasize how humans can balance everyday needs (agriculture, industry, and energy) while conserving Earth's environments and resources.

For Clarification Statements and Assessment Boundaries, see NGSS.

4-ESS3-1

Performance Expectation

UT.5.1.5 Design solutions to reduce the effects of naturally occurring events that impact humans. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution. Emphasize that humans cannot eliminate natural hazards, but they can take steps to reduce their impacts. Examples of events could include landslides, earthquakes, tsunamis, blizzards, or volcanic eruptions.

For Clarification Statements and Assessment Boundaries, see NGSS.

4-ESS3-2

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Science and Engineering Practice

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 other reliable media to explain phenomena.

(4-ESS3-1)
UT.5.3.4

Crosscutting Concept

Cause and Effect

Cause and effect relationships are routinely identified, tested, and used to explain change.

(4-ESS3-2)
UT.5.1.5

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

(4-ESS3-2) **UT.5.1.5**

Crosscutting Concept

Cause and Effect

Cause and effect relationships are routinely identified and used to explain change.

(4-ESS3-1)
UT.5.3.4

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Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.4.1 - Key Ideas and Details

Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

(4-ESS3-2)
UT.5.1.5

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.4.9 - Integration of Knowledge and Ideas

Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

(4-ESS3-2)
UT.5.1.5

Common Core State Standards for ELA/Literacy

W.4.7 - Research to Build and Present Knowledge

Conduct short research projects that build knowledge through investigation of different aspects of a topic.

(4-ESS3-1)
UT.5.3.4

Common Core State Standards for ELA/Literacy

W.4.8 - Research to Build and Present Knowledge

Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

(4-ESS3-1)
UT.5.3.4

Common Core State Standards for ELA/Literacy

W.4.9 - Research to Build and Present Knowledge

Draw evidence from literary or informational texts to support analysis, reflection, and research.

(4-ESS3-1)
UT.5.3.4

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Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(4-ESS3-1), (4-ESS3-2)
UT.5.3.4, UT.5.1.5

Common Core State Standards for Mathematics

Mathematical Practices MP.4 - Model with mathematics

CCSS text

(4-ESS3-1), (4-ESS3-2)
UT.5.3.4, UT.5.1.5

Common Core State Standards for Mathematics

Operations & Algebraic Thinking

4.OA.A.1 - Use the four operations with whole numbers to solve problems.

Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

(4-ESS3-1),(4-ESS3-2) **UT.5.3.4, UT.5.1.5**

Common Core State Standards for Mathematics

Measurement & Data

5.MD.A.1 - Convert like measurement units within a given measurement system.

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

(5-LS1-1)
UT.5.3.1

Common Core State Standards for Mathematics

Mathematical Practices MP.4 - Model with mathematics

CCSS text

(5-LS1-1)
UT.5.3.1

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DCI: Earth's Systems

4.ESS2.A: Earth Materials and Systems

Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.

(4-ESS2-1)
UT.5.1.3

DCI: Earth's Systems

4.ESS2.B: Plate Tectonics and Large-Scale System Interactions

The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth.

(4-ESS2-2)
UT.5.1.1

DCI: Earth's Systems

4.ESS2.E: Biogeology

Living things affect the physical characteristics of their regions.

(4-ESS2-1)
UT.5.1.3

Performance Expectation

UT.5.1.3 Ask questions to plan and carry out investigations that provide evidence for the effects of weathering and the rate of erosion on the geosphere. Emphasize weathering and erosion by water, ice, wind, gravity, or vegetation. Examples could include observing the effects of cycles of freezing and thawing of water on rock or changing the slope in the downhill movement of water.

For Clarification Statements and Assessment Boundaries, see NGSS.

4-ESS2-1

Performance Expectation

UT.5.1.1 Analyze and interpret data to describe patterns of Earth's features. Emphasize most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans while major mountain chains may be found inside continents or near their edges. Examples of data could include maps showing locations of mountains on continents and the ocean floor or the locations of volcanoes and earthquakes.

For Clarification Statements and Assessment Boundaries, see NGSS.

4-ESS2-2

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Common Core State Standards for Mathematics

Measurement & Data

4.MD.A.1 - Solve problems involving measurement and conversion of measurements.

Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.

(4-ESS2-1) **UT.5.1.3**

Common Core State Standards for Mathematics

Measurement & Data

4.MD.A.2 - Solve problems involving measurement and conversion of measurements.

Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

(4-ESS2-1), (4-ESS2-2) **UT.5.1.3, UT.5.1.1**

Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(4-ESS2-1)
UT.5.1.3

Common Core State Standards for Mathematics

Mathematical Practices MP.4 - Model with mathematics

CCSS text

(4-ESS2-1)
UT.5.1.3

Common Core State Standards for Mathematics

Mathematical Practices MP.5 - Use appropriate tools strategically

CCSS text

(4-ESS2-1)
UT.5.1.3

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Science and Engineering Practice

Analyzing and Interpreting Data

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

Analyze and interpret data to make sense of phenomena using logical reasoning.

(4-ESS2-2)
UT.5.1.1

Crosscutting Concept

Patterns

Patterns can be used as evidence to support an explanation.

(4-ESS2-2)
UT.5.1.1

Crosscutting Concept

Cause and Effect

Cause and effect relationships are routinely identified, tested, and used to explain change.

(4-ESS2-1)
UT.5.1.1

Science and Engineering Practice

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 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/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (4-ESS2-1) **UT.5.1.3**

Science and Engineering Practice

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. (5-LS1-1) **UT.5.3.1**

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Performance Expectation

UT.5.1.2 Use mathematics and computational thinking to compare the quantity of saltwater and freshwater in various reservoirs to provide evidence for the distribution of water on Earth. Emphasize reservoirs such as oceans, lakes, rivers, glaciers, groundwater, and polar ice caps. Examples of using mathematics and computational thinking could include measuring, estimating, graphing, or finding percentages of quantities.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-ESS2-2**

Common Core State Standards for ELA/Literacy

Speaking & Listening

SL.5.5 - Presentation of Knowledge and Ideas

Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

(5-LS2-1)
UT.5.3.1

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.5.7 - Integration of Knowledge and Ideas

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

(5-LS2-1)
UT.5.3.1

Common Core State Standards for Mathematics

Mathematical Practices

MP.4 - Model with mathematics

CCSS text

(5-LS2-1)
UT.5.3.1

Common Core State Standards for Mathematics

Mathematical Practices MP.2 - Reason abstractly and quantitatively

CCSS text

(5-LS2-1)
UT.5.3.1

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Crosscutting Concept

Energy and Matter

Matter is transported into, out of, and within systems.

(5-LS1-1)
UT.5.3.1

DCI: From Molecules to Organisms: Structures and Processes

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

Plants acquire their material for growth chiefly from air and water.

(5-LS1-1)
UT.5.3.1

Performance Expectation

UT.5.3.1 Construct an explanation that plants use air, water, and energy from sunlight to produce plant matter needed for growth. Emphasize photosynthesis at a conceptual level and that plant matter comes mostly from air and water, not from the soil. Photosynthesis at the cellular level will be taught in Grades 6 through 8.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-LS1-1**

Performance Expectation

UT.5.2.3 Plan and carry out investigations to determine the effect of combining two or more substances. Emphasize whether a new substance is or is not created by the formation of a new substance with different properties. Examples could include combining vinegar and baking soda or rusting an iron nail in water.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-PS1-4**

Performance Expectation

UT.5.2.4 Use mathematics and computational thinking to provide evidence that regardless of the type of change that occurs when heating, cooling, or combining substances, the total weight of matter is conserved. Examples could include melting an ice cube, dissolving salt in water, and combining baking soda and vinegar in a closed bag.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-PS1-2**

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DCI: Earth's Systems

5.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.

(5-ESS2-1) **UT.5.1.4**

DCI: Earth's Systems

5.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.

(5-ESS2-2) **UT.5.1.2**

Performance Expectation

UT.5.1.4 Develop a model to describe interactions between Earth's systems including the geosphere, biosphere, hydrosphere, and/or atmosphere. Emphasize interactions between only two systems at a time. Examples could include the influence of a rainstorm in a desert, waves on a shoreline, or mountains on clouds.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-ESS2-1**

Performance Expectation

UT.5.2.2 Ask questions to plan and carry out investigations to identify substances based on patterns of their properties. Emphasize using properties to identify substances. Examples of properties could include color, hardness, conductivity, solubility, or a response to magnetic forces. Examples of substances could include powders, metals, minerals, or liquids.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-PS1-3**

Performance Expectation

UT.5.2.1 Develop and use a model to describe that matter is made of particles on a scale that is too small to be seen. Emphasize making observations of changes supported by a particle model of matter. Examples could include adding air to expand a balloon, compressing air in a syringe, adding food coloring to water, or dissolving salt in water and evaporating the water. The use of the terms atoms and molecules will be taught in Grades 6 through 8.

For Clarification Statements and Assessment Boundaries, see NGSS. **5-PS1-1**

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Science and Engineering Practice

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 to describe phenomena.

(5-PS1-1)
UT.5.2.1

Science and Engineering Practice

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 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.

(5-PS1-3) **UT.5.2.2**

Science and Engineering Practice

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.

(5-PS1-4) **UT.5.2.3**

Science and Engineering Practice

Using Mathematics and Computational Thinking

Mathematical and computational thinking at the 3–5 level 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.

(5-PS1-2)
UT.5.2.4

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