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)

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)

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)

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)

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)

Performance Expectation

5-LS1-1: 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.
Assessment Boundary: none

Performance Expectation

5-PS1-1: Develop a model to describe that matter is made of particles too small to be seen.

Clarification Statement: Examples of evidence 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.

Performance Expectation

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.

Performance Expectation

5-PS1-3: 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.

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)

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)

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)

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)

Crosscutting Concept

Energy and Matter

Matter is transported into, out of, and within systems. (5-LS1-1)

Crosscutting Concept

Scale, Proportion, and Quantity

Natural objects exist from the very small to the immensely large. (5-PS1-1)

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)

Crosscutting Concept

Scale, Proportion, and Quantity

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Connection to Engineering, Technology, and Applications of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Science assumes consistent patterns in natural systems. (5-PS1-2)

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)

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)

Common Core State Standards for ELA/Literacy

Card Type name

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)

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)

Common Core State Standards for Mathematics

Mathematical Practices

MP.2 - Reason abstractly and quantitatively

CCSS text (5-LS1-1)

Common Core State Standards for Mathematics

Mathematical Practices

MP.4 - Model with mathematics

CCSS text (5-LS1-1)

Common Core State Standards for Mathematics

Mathematical Practices

MP.5 - Use appropriate tools strategically

CCSS text (5-LS1-1)