



# **Stackable Instructionally- embedded Portable Science (SIPS) Assessments Project**

## **Grade 5 Science Unit 3 End of Unit Assessment Unpacking Tools Earth Systems and the Solution of Water Problems August 2023**

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# SIPS Grade 5 Unit 3 End of Unit Assessment Unpacking Tools

**NGSS Performance Expectation: 5-ESS2-1** 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.]

	Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
<b>Foundations</b>	<p><b>SEP: Developing and Using Models</b></p> <p>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.</p> <p>Develop a model using an example to describe a scientific principle.</p>	<p><b>DCI: ESS2.A: Earth Materials and Systems</b></p> <p>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.</p>	<p><b>CCC: Systems and System Models</b></p> <p>A system can be described in terms of its components and their interactions.</p>
<b>Key Aspects</b>	<ul style="list-style-type: none"> <li>• Use a model to test cause-and-effect relationships or interactions concerning the functioning of a natural or designed system.</li> <li>• Develop a model to represent a system.</li> <li>• Identify components of a model.</li> <li>• Use a model to reason about a phenomenon.</li> <li>• Reason about the relationship between the different components of a model.</li> <li>• Select and identify relevant aspects of a situation or phenomenon to include in the model.</li> </ul>	<ul style="list-style-type: none"> <li>• Four major Earth systems interact.               <ul style="list-style-type: none"> <li>○ 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)</li> </ul> </li> <li>• Rainfall helps to shape the land and affects the types of living things found in a region.</li> <li>• Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.</li> <li>• Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.</li> <li>• Human activities affect Earth’s systems and their interactions at its surface.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand that a system is a group of related parts that make up a whole that can carry out functions its individual parts cannot.</li> <li>• Describe a system in terms of its components.</li> <li>• Describe interactions that occur between systems.</li> <li>• Models can be used to describe systems.</li> </ul>

<b>Prior Knowledge</b>	<ul style="list-style-type: none"> <li>• Develop a simple model based on evidence to represent a proposed object or tool.</li> <li>• Distinguish between a model and the actual object, process, and/or events the model represents.</li> </ul>	<ul style="list-style-type: none"> <li>• Wind and water change the shape of the land.</li> <li>• The resulting landforms, together with the materials on the land, provide homes for living things.</li> </ul>	<b>Relationships to SEPs</b> <b>2) Developing and Using Models</b>	<ul style="list-style-type: none"> <li>• Develop a simple model based on evidence to represent a proposed object or tool.</li> <li>• Distinguish between a model and the actual object, process, and/or events the model represents.</li> </ul>
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**NGSS Performance Expectation: 5-ESS2-2** 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.]*

	Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
<b>Foundations</b>	<p><b>SEP: Using Mathematics and Computational Thinking</b></p> <p>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.</p> <p>Describe and graph quantities such as area and volume to address scientific questions.</p>	<p><b>DCI: ESS2.C: The Roles of Water in Earth’s Surface Processes</b></p> <p>Nearly all of Earth’s available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.</p>	<p><b>CCC: Scale, Proportion, and Quantity</b></p> <p>Standard units are used to measure and describe physical quantities such as weight and volume.</p>
<b>Key Aspects</b>	<ul style="list-style-type: none"> <li>• Provide or research evidence about the distribution of water on Earth.</li> <li>• Interpret and/or create graphs based on percentages of the distribution of water on Earth.</li> <li>• Describe information or data you gain from this graph.</li> </ul>	<ul style="list-style-type: none"> <li>• Most of Earth’s water is salt water found in oceans.</li> <li>• A small fraction of Earth’s water is freshwater found in glaciers and groundwater, and an even smaller fraction in streams, lakes, wetlands, and the atmosphere (atmosphere is not included in this standard).</li> <li>• 96.54% salt water.</li> <li>• 1.74% freshwater from icecaps, glaciers, and permanent snow.</li> <li>• 1.69% freshwater from groundwater.</li> <li>• 0.03% freshwater above ground (such as rivers, swamps, lake, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>• Understand that water amounts can be measured and compared using percentages of total water, weight (tons/kilograms), and volume (cubic units).</li> <li>• Understand the units used to measure and compare quantities.</li> <li>• Describe relationships between natural objects which vary in size (very small to immensely large).</li> <li>• Understand scale involves not only understanding systems and processes vary in size, but also different mechanisms operate at different scales.</li> </ul>
<b>Prior Knowledge</b>	<ul style="list-style-type: none"> <li>• Ordering numbers/amounts.</li> <li>• Various types of graphs: bar, circle, etc.</li> <li>• Parts of a graph: title, scales, labels, key, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Differentiate between different bodies of water.</li> <li>• Water is present on Earth in different states (solid, liquid, gas).</li> <li>• Understand the difference between salt and freshwater.</li> <li>• The oceans on Earth are composed entirely of salt water.</li> </ul>	<p><b>Relationships to SEPs</b></p> <p><b>5) Using Mathematics and Computational Thinking</b></p> <ul style="list-style-type: none"> <li>• Ordering numbers/amounts.</li> <li>• Various types of graphs: bar, circle, etc.</li> <li>• Parts of a graph: title, scales, labels, key, etc.</li> </ul>

**NGSS Performance Expectation: 5-ESS3-1** Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

	Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
<b>Foundations</b>	<p><b>SEP: Obtaining, Evaluating, and Communicating Information</b></p> <p>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.</p> <p>Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.</p>	<p><b>DCI: ESS3.C: Human Impacts on Earth Systems</b></p> <p>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.</p>	<p><b>CCC: Systems and System Models</b></p> <p>A system can be described in terms of its components and their interactions.</p> <p><u>Connections to Nature of Science</u></p> <p><b>Science Addresses Questions About the Natural and Material World</b></p> <p>Science findings are limited to questions that can be answered with empirical evidence.</p>
<b>Key Aspects</b>	<ul style="list-style-type: none"> <li>• Comprehend appropriate complex texts/media.</li> <li>• Summarize what is read and supported by evidence.</li> <li>• Compare/combine texts to support science ideas.</li> <li>• Compare/combine text and other data to support science ideas.</li> <li>• Read and combine information from tables, diagrams, and charts.</li> <li>• Read and combine information from books/media to explain a phenomenon.</li> <li>• Communicate in written or oral form using tables, diagrams, and charts.</li> <li>• Ask questions.</li> <li>• Design solutions.</li> <li>• Analyze and interpret data.</li> <li>• Describe evidence as supported by text.</li> <li>• Communicating information about ideas and methods to explain phenomena or solutions.</li> <li>• Evaluating the accuracy and merit of ideas and methods found in resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Human activities have major effects on land, water, atmosphere, and outer space.</li> <li>• Human activities can protect our resources.</li> <li>• Human activities can protect our environment.</li> <li>• People use scientific ideas to protect resources and the environment.</li> <li>• Loss of habitat.</li> <li>• Change in population.</li> <li>• Weathering and erosion.</li> <li>• Water and air pollution.</li> <li>• Conservation efforts.</li> <li>• Endangered species protection.</li> <li>• Water treatment facilities.</li> <li>• Human activities impact Earth’s resources and environments.</li> <li>• There are ways science is used to protect Earth’s resources and environment and mitigate the impact of human activities.</li> <li>• Information from multiple resources about human activities can be used to explain the impact of those activities on resources and the environment.</li> <li>• Human impact on resources and the</li> </ul>	<ul style="list-style-type: none"> <li>• A system is a group of related parts.</li> <li>• Related parts make up a whole (system).</li> <li>• Each system carries out a function that the individual parts cannot.</li> <li>• Describe the components of the system and what they do.</li> <li>• Describe the system and how it works.</li> <li>• Analyze data/text and make a claim by using evidence when an environment changes.</li> <li>• Identify the components of systems.</li> <li>• The parts of the system are related.</li> <li>• The parts of the system make up the whole system.</li> <li>• Describe the interactions of the parts in the system, cause-and-effect.</li> <li>• Systems can do things that the individual parts can’t.</li> <li>• Models can be used to show the parts and relationships in a system.</li> </ul>

	<ul style="list-style-type: none"> <li>• Obtain information from books or reliable media to explain phenomena or solutions.</li> <li>• Combine information from books or reliable media to explain phenomena or solutions.</li> <li>• Identify the evidence that supports particular points in an explanation.</li> </ul>	<p>environment varies by region.</p> <ul style="list-style-type: none"> <li>• Individuals and communities are doing things to protect resources and the environment.</li> <li>• The Earth looked different in the past compared to now.</li> <li>• Communities/individuals are doing things to help protect Earth’s resources and environment. <ul style="list-style-type: none"> <li>○ Examples: treating sewage, reducing materials used, regulating sources of pollution.</li> </ul> </li> <li>• Some resources are renewable, and some are not.</li> </ul>	
<p><b>Prior Knowledge</b></p>	<ul style="list-style-type: none"> <li>• Understand how to read/make tables, charts, and diagrams.</li> <li>• Know how to locate reliable, appropriate media resources.</li> <li>• Communicate basic information or research by writing/drawings or speaking.</li> </ul>	<ul style="list-style-type: none"> <li>• People have done things to affect our environment negatively.</li> <li>• People have done things to affect our environment in positive ways.</li> <li>• People can make choices on positive or negative things that affect our environment.</li> <li>• Reduce, reuse, recycle.</li> </ul>	<p><b>Relationships to SEPs</b></p> <p><b>8) Obtaining, Evaluating, and Communicating Information</b></p> <ul style="list-style-type: none"> <li>• Understand how to read/make tables, charts, diagrams.</li> <li>• Know how to locate reliable, appropriate media resources.</li> <li>• Communicate basic information or research by writing/drawings or speaking.</li> </ul>