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- LEAP 2025 Science Assessments Support Key Shifts in Science Instruction
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### LEAP 2025 Science Assessments Support Key Shifts in Science Instruction

The operational test will assess a student’s understanding of the grade 4 LSS for Science reflecting the multiple dimensions of the standards.

#### Shift: Apply content knowledge and skills (Disciplinary Core Idea, DCI)

**In the classroom**, students develop skills and content knowledge reflected in the Performance Expectations (PE) and detailed in the Disciplinary Core Ideas (DCI), the key skills and knowledge students are expected to master by the end of the course.

**On the test**, students answer questions which require content knowledge and skills aligned to PE bundles (groupings of like PEs) and the corresponding DCIs.

#### Shift: Investigate, evaluate, and reason scientifically (Science and Engineering Practice, SEP)

**In the classroom**, students do more than learn about science: they “do” science. Simply having content knowledge and scientific skills are not enough; students must investigate and apply content knowledge to scientific phenomena. Phenomena are real world observations that can be explained through scientific knowledge and reasoning (e.g., water droplets form on the outside of a water glass, plants tend to grow toward their light source, different layers of rock can be seen on the side of the road). Science instruction must integrate the practices, or behaviors, of scientists and engineers as students investigate real-world phenomena and design solutions to problems.

**On the test**, students do more than answer recall questions about science; they apply the practices, or behaviors, of scientists and engineers as students investigate each real-world phenomenon and design solutions to problems.

#### Shift: Connect ideas across disciplines (Crosscutting Concept, CCC)

**In the classroom**, students develop a coherent and scientifically-based view of the world, they must make connections across the domains of science (life science, physical science, earth and space science, environmental science, and engineering, technology, and applications of science). These connections are identified as crosscutting concepts (CCC).

**On the test**, sets of questions assess student application of knowledge across the domains of science for a comprehensive picture of student readiness for their next grade or course in science.

### Achievement-Level Definitions

Achievement-level definitions briefly describe the expectations for student performance at each of Louisiana’s five achievement levels. The achievement levels are part of Louisiana’s cohesive assessment system and indicate a student’s ability to demonstrate proficiency on the Louisiana student standards defined for a specific course.

The following list identifies the achievement-level definitions for the LEAP 2025 assessment program.

- **Advanced:** Students performing at this level have **exceeded** college and career readiness expectations and are well prepared for the next level of studies in this content area.
- **Mastery:** Students performing at this level have **met** college and career readiness expectations and are prepared for the next level of studies in this content area.
- **Basic:** Students performing at this level have **nearly met** college and career readiness expectations and may need additional support to be fully prepared for the next level of studies in this content area.
- **Approaching Basic:** Students performing at this level have **partially met** college and career readiness expectations and will need much support to be prepared for the next level of studies in this content area.
- **Unsatisfactory:** Students performing at this level have **not yet met** the college and career readiness expectations and will need extensive support to be prepared for the next level of studies in this content area

### Achievement-Level Descriptors

Achievement-level descriptors (ALDs) are content specific and describe the knowledge, skills, and processes that students typically demonstrate at each achievement level. The Achievement-Level Descriptors Table, shown below, is color-coded to highlight the key shifts in science instruction built into the LEAP 2025 science assessments. The codes are: **SEP = blue**; **DCI = orange**; **CCC = green**

**Science and Engineering Practices (SEP)** are the practices that scientists and engineers use when investigating real world phenomena and designing solutions to problems. There are eight science and engineering practices that apply to all grade levels and content areas.

1. Asking questions (science) and defining problems (engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematical and computational thinking
6. Constructing explanations (science) and designing solutions (engineering)
7. Engaging in argument with evidence
8. Obtaining, evaluating, and communicating information

**Crosscutting Concepts (CCC)** are common themes that have application across all disciplines of science and allow students to connect learning within and across grade levels or content areas. The seven crosscutting concepts apply to all grade levels and content areas.

1. Patterns (PAT)
2. Cause and effect (C/E)
3. Scale, proportion, and quantity (SPQ)
4. Systems and models (SYS)
5. Energy and matter (E/M)
6. Structure and function (S/F)
7. Stability and change (S/C)

Grade 4 Achievement-Level Descriptors

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
<b>Investigate</b>				
<p>4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.</p> <p>CCC: E/M SEP: 3</p>	<p>Evaluate an investigation to support an explanation that energy can be transferred from place to place by sound, light, heat, and electric currents.</p>	<p>Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.</p>	<p>Identify evidence based on observations that energy can be transferred from place to place by sound, light, heat, and electric currents.</p>	<p>Identify forms of energy that can be transferred from place to place.</p>
<p>4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.</p> <p>CCC: E/M SEP: 1</p>	<p>Evaluate questions and/or predictions to construct explanations about the changes in energy that occur when objects collide.</p>	<p>Ask questions and/or support explanations of predictions about the changes in energy that occur when objects collide.</p>	<p>Identify questions or predictions about the changes in energy that occur when objects collide.</p>	<p>Identify variables about the changes in energy that occur when objects collide.</p>
<p>4-ESS2-1 Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.</p> <p>CCC: C/E SEP: 3</p>	<p>Revise an investigation on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.</p>	<p>Plan an investigation on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.</p>	<p>Classify variables in an investigation on the effects of water, ice, wind, and/or vegetation on the relative rate of erosion.</p>	<p>Organize the steps of an investigation to describe the effects of water, ice, wind, and vegetation on the relative rate of erosion.</p>

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
<p>4-ESS2-3 Ask questions that can be investigated and predict reasonable outcomes about how living things affect the physical characteristics of their environment.</p> <p>CCC: C/E SEP: 1</p>	<p>Evaluate questions that can be investigated and/or predictions to construct explanations about how living things affect the physical characteristics of their environment.</p>	<p>Ask questions that can be investigated and/or support explanations of predictions about how living things affect the physical characteristics of their environment.</p>	<p>Identify questions that can be investigated or reasonable predictions about how living things affect the physical characteristics of their environment.</p>	<p>Identify variables that can be investigated about how living things affect the physical characteristics of their environment.</p>
<b>Evaluate</b>				
<p>4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p> <p>CCC: SYS SEP: 7</p>	<p>Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>	<p>Support an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>	<p>Identify the functions of the internal and external structures that support survival, growth, behavior, and reproduction in plants and animals.</p>	<p>Identify the internal and external structures that function to support survival, growth, behavior, and reproduction in plants and animals.</p>
<p>4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth's features.</p> <p>CCC: PAT SEP: 4</p>	<p>Use data from maps to construct claims about patterns of Earth's features.</p>	<p>Use data from maps to support claims about patterns of Earth's features.</p>	<p>Interpret data from displays to describe patterns of Earth's features.</p>	<p>Use pictures or drawings to identify patterns of Earth's features.</p>
<b>Reason Scientifically</b>				
<p>4-PS3-1 Use evidence to construct an explanation relating the speed of an object to the energy of that object.</p> <p>CCC: E/M SEP: 6</p>	<p>Use evidence to construct an explanation relating the speed of an object to the energy of that object.</p>	<p>Use evidence to support an explanation relating the speed of an object to the energy of that object.</p>	<p>Identify an explanation relating the speed of an object to the energy of that object.</p>	<p>Identify the relationship between the speed of an object and the energy of that object.</p>

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. CCC: E/M SEP: 6	Apply scientific ideas to design, test, and/or refine a device that converts energy from one form to another.	Use a device to explain how energy is converted from one form to another.	Identify in a device the point at which energy is converted from one form to another.	Identify the type(s) of energy produced by a device.
4-PS4-1 Develop a model of waves to describe patterns in terms of amplitude and wavelength and to show that waves can cause objects to move. CCC: PAT SEP: 2	Develop and/or use a model of waves to construct explanations describing patterns in terms of amplitude and wavelength and to show that waves can cause objects to move.	Develop and/or use a model of waves to describe patterns in terms of amplitude and wavelength and to show that waves can cause objects to move.	Use models of waves to compare patterns in terms of amplitude/energy or wavelength/frequency.	Use a model of waves to identify patterns in terms of amplitude and wavelength.
4-PS4-2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. CCC: C/E SEP: 2	Develop and/or use a model to construct an explanation that light reflecting from objects and entering the eye allows objects to be seen.	Develop and/or use a model to support an explanation that light reflecting from objects and entering the eye allows objects to be seen.	Compare models that describe how light reflecting from objects and entering the eye allows objects to be seen.	Identify a model that illustrates that light reflecting from objects and entering the eye allows objects to be seen.
4-LS1-2 Construct an explanation to describe how animals receive different types of information through their senses, process the information in their brains, and respond to the information in different ways. CCC: C/E SEP: 6	Use evidence to construct an explanation to describe how animals receive different types of information through their senses, process the information in their brains, and respond to the information in different ways.	Use evidence to support an explanation to describe how animals receive different types of information through their senses, process the information in their brains, and respond to the information in different ways.	Use information from data to identify how information animals receive through their senses affects their responses.	Identify how information animals receive through their senses affects their responses.

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time. CCC: PAT SEP: 6	Use evidence from patterns in rock formations and fossils in rock layers to construct an explanation for changes in landforms over time.	Use evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time.	Identify evidence from patterns in rock formations and fossils in rock layers.	Identify evidence from patterns in fossils in rock layers.
4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. CCC: C/E SEP: 6	Construct multiple solutions to reduce the impacts of natural Earth processes on humans, considering limitations.	Compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Describe the effectiveness of a solution to reduce the impacts of natural Earth processes on humans.	Identify a solution to reduce the impacts of natural Earth processes on humans.

4-ESS3-1 may be assessed and would be reported as part of the overall score. This particular PE does not fit neatly into any one of the three categories; rather, it partly touches all three categories.

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment. CCC: C/E SEP: 8	Use information to construct explanations that energy and fuels are derived from renewable and non-renewable resources and of how their uses affect the environment.	Obtain and combine information to support explanations that energy and fuels are derived from renewable and non-renewable resources and of how their uses affect the environment.	Compare information to describe that energy and fuels are derived from renewable and non-renewable resources.	Identify the types of energy derived from renewable and non-renewable resources.