LOUISIANA DEPARTMENT OF EDUCATION

Office of Assessments, Accountability, and Analytics

Grade 5 Science Achievement- Level Descriptors

This document includes the following:

- LEAP 2025 Science Assessments Support Key Shifts in Science Instruction
- Achievement-Level Definitions
- Achievement-Level Descriptors

LEAP 2025 Science Assessments Support Key Shifts in Science Instruction

The operational test will assess a student's understanding of the grade 5 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 that 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 5 Achievement-Level Descriptors

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Investigate				
5-PS1-3 Make observations and measurements to identify materials based on their properties. CCC: SPQ SEP: 3	Construct an explanation from data collected to identify materials based on their properties.	Make observations and measurements to identify materials based on their properties.	Describe data that provide evidence to identify materials based on their properties.	Make observations to identify materials based on their properties.
5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances. CCC: C/E SEP: 3	Evaluate an investigation to determine whether the mixing of two or more substances results in new substances.	Plan an investigation to determine whether the mixing of two or more substances results in new substances.	Use data to determine whether the mixing of two or more substances results in new substances.	Identify evidence that can be used to determine whether the mixing of two or more substances results in new substances.
5-LS1-1 Ask questions about how air and water affect the growth of plants. E/M CCC: E/M SEP: 1	Compare data presented in tables and graphs to construct explanations that provide evidence about how air and water affect the growth of plants.	Ask questions about data presented in tables and graphs to clarify evidence about how air and water affect the growth of plants.	Describe evidence that can answer questions about how air and other matter affect the growth of plants.	Identify evidence that can answer questions about how air and other matter affect the growth of plants.

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Evaluate				
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 amount of matter is conserved. CCC: E/M SEP: 5	Use quantities in graphs and tables to construct an explanation that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total amount of matter is conserved.	Use quantities in graphs and tables to support an explanation that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total amount of matter is conserved.	Measure mass and volume to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total amount of matter is conserved.	Use simple data sets to suggest that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total amount of matter is conserved.
5-PS2-1 Support an argument that the gravitational force exerted by the Earth is directed down. CCC: C/E SEP: 7	Construct an argument about the relationship between the direction of gravitational force and the force exerted by the Earth.	Support an argument that Earth's gravitational force results in objects being pulled toward the center of Earth.	Describe evidence that Earth's gravitational force results in objects being pulled toward the center of Earth.	Identify evidence that Earth's gravitational force results in objects being pulled toward the center of Earth.
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. CCC: SPQ SEP: 7	Construct an argument about the relationship between the apparent brightness of the sun and other stars and their relative distances from Earth.	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.	Describe evidence that the brightness of a star is due to its relative distance from Earth.	Identify evidence that the brightness of a star is due to its relative distance from Earth.

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
5-ESS1-2 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. CCC: PAT SEP: 4	Use data to construct an explanation about or compare patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Analyze data in graphical displays to describe patterns of daily 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, day and night, and the seasonal appearance of some stars in the night sky.	Use simple data displays about patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
5-ESS2-2 Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. CCC: SPQ SEP: 5	Use quantities in graphs and tables, such as the percentages of water and fresh water in various reservoirs, to construct an explanation about the distribution of water on Earth.	Use quantities in graphs and tables, such as the percentages of water and fresh water in various reservoirs, to support an explanation about the distribution of water on Earth.	Interpret graphs or data to describe and/or provide evidence about the distribution of water on Earth.	Organize simple data sets that describe and/or provide evidence about the distribution of water on Earth.
Reason Scientifically				
5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen. CCC: SPQ SEP: 2	Develop or use a model to construct explanations showing that matter is made of particles too small to be seen.	Develop or use a model to support explanations showing that matter is made of particles too small to be seen.	Use a model to describe that matter is made of particles too small to be seen.	Identify a model that illustrates that matter is made of particles too small to be seen.

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. CCC: E/M SEP: 2	Develop or use a model to construct explanations showing that energy in animals' food was once energy from the sun.	Develop or use a model to support explanations showing that energy in animals' food was once energy from the sun.	Use a model to describe that energy in animals' food was once energy from the sun.	Identify a model that illustrates that energy in animals' food was once energy from the sun.
5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. CCC: SYS SEP: 2	Evaluate or revise a model to construct an explanation showing the movement of matter among plants, animals, decomposers, and the environment.	Develop or use a model to support explanations showing the movement of matter among plants, animals, decomposers, and the environment.	Use a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Use a model that shows the movement of matter among plants, animals, decomposers, and the environment.
5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. CCC: SYS SEP: 2	Evaluate or revise a model to construct explanations about ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	Develop or use a model to support explanations about ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	Use a model to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	Use a model that shows ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
5-ESS3-1 Generate and compare multiple solutions about ways individual communities can use science to protect the Earth's resources and environment. CCC: SYS SEP: 6	Generate and evaluate multiple solutions to construct an explanation about ways individual communities can use science to protect the Earth's resources and environment.	Compare multiple solutions about ways individual communities can use science to protect the Earth's resources and environment.	Describe the effectiveness of a design solution about ways individual communities can use science to protect the Earth's resources and environment.	Identify solutions about ways individual communities can use science to protect the Earth's resources and environment.