



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 LSS for Science in high school Biology 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; DCl = 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)





Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic		
	Investigate					
HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis in living organisms. CCC: S/C SEP: 3	Refine an investigation to provide evidence that feedback mechanisms maintain homeostasis in living organisms (cells).	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis in living organisms.	Compare variables in simple investigations to provide evidence that feedback mechanisms maintain homeostasis in living organisms.	Identify variables in a simple investigation to provide evidence that feedback mechanisms maintain homeostasis in living organisms (plants).		
HS-LS3-1 Formulate, refine, and evaluate questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. CCC: C/E SEP:1	Evaluate questions to clarify how the DNA and chromosome coding from parents combine to create the characteristic traits expressed in their offspring.	Refine questions to clarify how the DNA and chromosome coding from parents combine to create the characteristic traits expressed in their offspring.	Ask questions that can be used to clarify trends observed in the characteristic traits passed from parents to offspring.	Identify questions that can be used to clarify trends observed in the characteristic traits passed from parents to offspring.		
	1	Evaluate	1			
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity, biodiversity and populations of ecosystems at different scales. CCC: SPQ SEP: 5	Use mathematical and/or computational representations to evaluate explanations of factors that affect carrying capacity, biodiversity, and populations of ecosystems at different scales.	Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity, biodiversity, and populations of ecosystems at different scales.	Use graphical representations of mathematical relationships to describe factors that affect carrying capacity and populations of ecosystems at different scales.	Use graphical representations to identify factors that affect populations of ecosystems at different scales.		



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Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
HS-LS2-4	Use mathematical	Use mathematical	Use graphical	Use simple models (e.g., food
Use mathematical	representations to evaluate	representations to support	representations of	pyramid, diagrams of carbon
representations to support	claims for the cycling of	claims for the cycling of	mathematical relationships	cycle) to identify claims for
claims for the cycling of	matter and flow of energy	matter and flow of energy	to make claims about the	the cycling of matter and
matter and flow of energy	among organisms in an	among organisms in an	cycling of matter and flow of	flow of energy among
among organisms in an	ecosystem.	ecosystem.	energy among organisms in	organisms in an ecosystem.
ecosystem.			an ecosystem.	
CCC: E/M				
SEP: 5				
HS-LS2-6	Evaluate reasoning	Evaluate the claims and	Compare evidence (amount,	Identify evidence supporting
Evaluate the claims, evidence	supporting claims that the	supporting evidence that the	type) supporting claims that	claims that changing
and reasoning that the	complex interactions in	complex interactions in	changing conditions may	conditions may result in a
complex interactions in	ecosystems maintain	ecosystems maintain	result in a new ecosystem.	new ecosystem.
ecosystems maintain	relatively consistent numbers	relatively consistent numbers		
relatively consistent numbers	and types of organisms in	and types of organisms in		
and types of organisms in	stable conditions, but	stable conditions, but		
stable conditions, but	changing conditions may	changing conditions may		
changing conditions may	result in a new ecosystem.	result in a new ecosystem		
result in a new ecosystem.				
CCC: S/C				
SEP: 7				
HS-LS3-2	Refute a claim based on	Make and defend a claim	Compare evidence	Identify evidence to support
Make and defend a claim	evidence that inheritable	based on evidence that	supporting claims that	a claim that inheritable
based on evidence that	genetic variations may result	inheritable genetic variations	inheritable genetic variations	genetic variations may result
inheritable genetic variations	from: (1) new genetic	may result from: (1) new	may result from: (1) new	from: (1) new genetic
may result from: (1) new	combinations through	genetic combinations	genetic combinations	combinations through
genetic combinations	meiosis, (2) viable errors	through meiosis, (2) viable	through meiosis, (2) viable	meiosis, (2) viable errors
through meiosis, (2) viable	occurring during replication,	errors occurring during	errors occurring during	occurring during replication,
errors occurring during	and/or (3) mutations caused	replication, and/or (3)	replication, and/or (3)	and/or (3) mutations caused
replication, and/or (3)	by environmental factors.	mutations caused by	mutations caused by	by environmental factors.
mutations caused by		environmental factors.	environmental factors.	
environmental factors.				
CCC: C/E				
SEP:7				





Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
HS-LS3-3	Apply concepts of statistics	Apply concepts of statistics	Apply concepts of statistics	Apply concepts of statistics
Apply concepts of statistics	and probability to support	and probability to explain	and probability to explain	and probability to identify
and probability to explain the	quantitative explanations	and support explanations	patterns related to the	patterns related to the
variation and distribution of	related to the variation and	about the variation and	distribution of expressed	variation of expressed traits
expressed traits in a	distribution of expressed	distribution of expressed	traits in a population.	in a population.
population.	traits in a population.	traits in a population.		
CCC: SPQ				
SEP: 4				
HS-LS4-1	Evaluate scientific	Analyze and interpret	Interpret patterns	Identify patterns in scientific
Analyze and interpret	information that common	scientific information that	in scientific information to	information to illustrate that
scientific information that	ancestry and biological	common ancestry and	illustrate that common	common ancestry and
common ancestry and	evolution are supported by	biological evolution are	ancestry and biological	biological evolution are
biological evolution are	multiple lines of empirical	supported by multiple lines	evolution are supported by at	supported by at least one line
supported by multiple lines	evidence.	of empirical evidence.	least one line of empirical	of empirical evidence.
of empirical evidence.			evidence.	
CCC: PAT				
SEP: 4				
HS-LS4-3	Apply concepts of statistics	Apply concepts of statistics	Apply concepts of statistics	Apply concepts of statistics
Apply concepts of statistics	and probability (using data	and probability (using data	and probability to interpret	and probability to identify
and probability to support	from complex graphs, tables,	from complex graphs, tables,	patterns (in dual bar graphs,	patterns (in a simple line
explanations that	or text) to support	or text) to support	dual line graphs, and data	graph, bar graph, or data
populations of organisms	explanations and provide	explanations that	tables) related to populations	table) about populations of
adapt when an advantageous	quantitative evidence for	populations of organisms	of organisms adapting when	organisms adapting when an
heritable trait increases in	causality that populations of	adapt when an advantageous	an advantageous heritable	advantageous heritable trait
proportion to organisms	organisms adapt when an	heritable trait increases in	trait increases in proportion	increases in proportion to
lacking this trait.	advantageous allele increases	proportion (inversely or	to organisms lacking this	organisms lacking this trait.
CCC: PAT	in frequency in comparison	directly) to organisms lacking	trait.	
SEP: 4	to organisms lacking this	this trait.		
	allele.			



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Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
HS-LS4-5 Evaluate evidence	Evaluate reasoning	Evaluate evidence supporting	Compare evidence	Identify evidence supporting	
supporting claims that	supporting claims that	claims that changes in	supporting claims that	claims that changes in	
changes in environmental	changes in environmental	environmental conditions can	changes in environmental	environmental conditions can	
conditions can affect the	conditions can affect the	affect the distribution of	conditions can affect the	affect the distribution of	
distribution of traits in a	distribution of traits in a	traits in a population causing	distribution of traits in a	traits in a population causing:	
population causing: (1)	population causing: (1)	(1) increases in the number	population causing: (1)	(1) increases in the number	
increases in the number of	increases in the number of	of individuals of some	increases in the number of	of individuals of some	
individuals of some species,	individuals of some species,	species, (2) the emergence of	individuals of some species,	species, (2) the emergence of	
(2) the emergence of new	(2) the emergence of new	new species over time, and	(2) the emergence of new	new species over time, and	
species over time, and (3) the	species over time, and (3) the	(3) the extinction of other	species over time, and (3) the	(3) the extinction of other	
extinction of other species.	extinction of other species.	species.	extinction of other species.	species.	
CCC: C/E					
SEP: 7					
		Reason Scientifically			
HS-LS1-1	Revise an explanation based	Construct an explanation	Compare explanations based	Identify an explanation based	
Construct an explanation	on evidence for how the	based on evidence for how	on evidence for how the	on evidence for how the	
based on evidence for how	structure of DNA determines	the structure of DNA	structure of DNA determines	structure of DNA determines	
the structure of DNA	the structure of proteins	determines the structure of	the structure of proteins,	the structure or function of	
determines the structure of	which carry out the essential	proteins which carry out the	which, in turn, affects the	proteins.	
proteins which carry out the	functions of life through	essential functions of life	function of proteins.		
essential functions of life	systems of specialized cells.	through systems of			
through systems of		specialized cells.			
specialized cells.					
CCC: S/F					
SEP: 6					
HS-LS1-2	Revise a model to make or	Develop and use a model to	Use models or components	Identify components within a	
Develop and use a model to	refute claims about the	explain the hierarchical	of models to describe the	model to show the	
illustrate the hierarchical	hierarchical organization of	organization of interacting	hierarchical levels of	organization of systems	
organization of interacting	interacting systems that	systems that provide specific	organization that make up	within an organism.	
systems that provide specific	provide specific functions	functions within multicellular	systems within an organism.		
functions within multicellular	within multicellular	organisms.			
organisms.	organisms.				
CCC: SYS					
SEP: 2					
JL: . 4					





Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
HS-LS1-4 Use a model to illustrate the role of the cell cycle and differentiation in producing and maintaining complex organisms. CCC: SYS SEP: 2	Revise a model to make or refute claims about the role of the cell cycle and differentiation to produce systems that maintain complex organisms.	Use a model to explain the role of the cell cycle and differentiation to produce systems that maintain complex organisms.	Use a model to describe the changes that occur as cells differentiate to produce tissues and organs that will ultimately maintain complex organisms.	Use a model to identify the point at which differentiation occurs to produce tissues and organs that will ultimately maintain complex organisms.
HS-LS1-5 Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. CCC: E/M SEP: 2	Revise a model to make or refute claims about how photosynthesis transforms light energy into stored chemical energy.	Use a model to explain how photosynthesis transforms light energy into stored chemical energy.	Use models or components of models to describe how photosynthesis is a chemical process that transforms matter and energy.	Identify components within a model to show the flow of matter and energy due to photosynthesis.
HS-LS1-6 Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. CCC: E/M SEP: 6	Revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.	Construct an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.	Compare explanations based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine to form larger carbon-based molecules.	Identify an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine to form larger carbon-based molecules.





Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
HS-LS1-7	Revise a model to make or	Use a model to explain that	Use models or components	Identify components within a
Use a model to illustrate that	refute claims about how	cellular respiration is a	of models to describe how	model to show the flow of
cellular respiration is a	cellular respiration is a	chemical process whereby	cellular respiration	matter and energy due to
chemical process whereby	chemical process whereby	the bonds of food molecules	transforms matter and	cellular respiration.
the bonds of food molecules	the bonds of food molecules	and oxygen molecules are	energy.	
and oxygen molecules are	and oxygen molecules are	broken and the bonds in new		
broken and the bonds in new	broken and the bonds in new	compounds are formed,		
compounds are formed,	compounds are formed,	resulting in a net transfer of		
resulting in a net transfer of	resulting in a net transfer of	energy.		
energy.	energy.			
CCC: E/M				
SEP: 2				
HS-LS2-7	Evaluate and refine a solution	Design a solution for	Compare solutions for	Identify solutions for
Design, evaluate, and refine a	for reducing the impacts of	reducing the impacts of	reducing the impacts of	reducing the impacts of
solution for reducing the	human activities on the	human activities on the	human activities on the	human activities on the
impacts of human activities	environment and	environment and	environment and	environment and
on the environment and	biodiversity.	biodiversity.	biodiversity.	biodiversity.
biodiversity.				
CCC: S/C				
SEP: 6				





Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
HS-LS4-2	Revise an explanation based	Construct an explanation	Compare explanations based	Identify an explanation based
Construct an explanation	on evidence that biological	based on evidence that	on evidence that biological	on evidence that biological
based on evidence that	diversity is influenced by (1)	biological diversity is	diversity is influenced by the	diversity is influenced by
biological diversity is	the potential for a species to	influenced by (1) the	potential for a species to	competition for limited
influenced by (1) the	increase in number, (2) the	potential for a species to	increase in number,	resources and the
potential for a	heritable genetic variation of	increase in number, (2) the	competition for limited	proliferation of those
species to increase in	individuals in a species due to	heritable genetic variation of	resources, and the	organisms that are better
number, (2) the heritable	mutation and sexual	individuals in a species due to	proliferation of those	able to survive and
genetic variation of	reproduction, (3) competition	mutation and sexual	organisms that are better	reproduce in the
individuals in a species due to	for limited resources, and (4)	reproduction, (3) competition	able to survive and	environment.
mutation and sexual	the proliferation of those	for limited resources, and (4)	reproduce in the	
reproduction, (3) competition	organisms that are better	the proliferation of those	environment.	
for limited resources, and (4)	able to survive and	organisms that are better		
the proliferation of those	reproduce in the	able to survive and		
organisms that are better	environment	reproduce in the		
able to survive and		environment.		
reproduce in the				
environment.				
CCC: C/E				
SEP: 6				
HS-LS4-4	Revise an explanation based	Construct an explanation	Compare explanations based	Identify an explanation based
Construct an explanation	on evidence for how natural	based on evidence for how	on evidence for how natural	on evidence for how natural
based on evidence for how	selection and other	natural selection and other	selection leads to genetic	selection leads to changes in
natural selection and other	mechanisms lead to genetic	mechanisms lead to genetic	changes in populations.	populations.
mechanisms lead to genetic	changes in populations.	changes in populations.	- · ·	
changes in populations.				
CCC: C/E				
SEP: 6				





HS-LS1-8 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
HS-LS1-8	Evaluate and	Evaluate and communicate	Compare information about	Identify relevant information
Obtain, evaluate, and	communicate complex	information about (1) viral	(1) viral and bacterial	from a source about viral and
communicate information	evidence, concepts, and/or	and bacterial reproduction	reproduction and adaptation	bacterial reproduction and
about (1) viral and bacterial	processes about (1) viral and	and adaptation, (2) the	and (2) the body's primary	adaptation.
reproduction and adaptation,	bacterial reproduction and	body's primary defenses	defenses against infection.	
(2) the body's primary	adaptation, (2) the body's	against infection, and (3) how		
defenses against infection,	primary defenses against	these features impact the		
and (3) how these features	infection, and (3) how these	design of effective treatment.		
impact the design of effective	features impact the design of			
treatment.	effective treatment.			
CCC: SPQ				
SEP: 8				