Louisiana Believes

Understanding Louisiana Student Standards for Science
Supervisor and Principal Implementation Support
June 2017

DEPARTMENT of EDUCATION

Schedule

The framework

Instructional shifts

LDOE implementation support

Framework of LSS for Science

Coding and Descriptor:		
Performance Expectation:		
Clarification Statement:		
Science and Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:

Framework of LSS for Science

How does this framework exemplify 3-dimensional learning?

Coding and Descriptor		
Performance Expectation: States what students should be able to do to demonstrate that they have met the standard. Performance expectations are built on the foundation of the science and engineering practices, disciplinary core ideas, and crosscutting concepts.		
Clarification Statement: Provides examples or additional clarification of the performance expectation.		
Science and Engineering Practices: Detail the behaviors that students should engage in that mimic those of scientists and engineers.	Disciplinary Core Ideas: Describe the most essential ideas (content) in the major science disciplines.	Crosscutting Concepts: Ideas that have applications across all areas of science.

Framework of LSS for Science

7-MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. CS: Emphasis is on recognizing patterns in data, making inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes in ecosystems.		
SEP: 7. Engaging in argument from evidence: Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.	DCI: Ecosystem Dynamics, Functioning, and Resilience Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.	CC: Stability and Change: Small changes in one part of a system might cause large changes in another part.

Science and Engineering Practices

The standards are explicit about which practice is the focus on the performance expectation. However, all practices should be integrated into instruction of all performance expectations. Using the given worksheet, identify which practice is particularly stressed in the performance expectation.

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 mathematics and computational thinking
6. Constructing explanations (science) and designing solutions (engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Domain	Topics
Physical Science	PS1: Matter and its interactions PS2: Motion and stability: Forces and Motions PS3: Energy PS4: Waves and their applications in technologies for information transfer
Life Science	LS1: From molecules to organism: Structures and processes LS2: Ecosystems: Interactions, energy, and dynamics LS3: Hereditary: Inheritance and variation of traits LS4: Biological evolution: Unity and diversity
Earth and Space Science	ESS1: Earth's place in the universe ESS2: Earth's systems ESS3: Earth and Human activity
Environmental Science	EVS 1: Resources and Resource Management EVS 2: Environmental Awareness and Protection EVS 3: Personal Responsibility
Engineering, Technology, and Applications of Science	ETS1: Engineering design ETS2: Links among engineering, technology, science, and society

Crosscutting Concepts

Unlike the practices, the performance expectations are rarely explicit in calling out the crosscutting concepts. However, educators familiar with the standards will begin to see obvious links. Using the given worksheet, discuss which of the crosscutting concepts correlate to the given performance expectations.

1. Patterns
2. Cause and effect
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Schedule

The framework

Instructional shifts

LDOE implementation support

Instructional Shifts

The Louisiana Student Standards for Science represent the knowledge and skills needed for students to successfully transition to postsecondary educations and the workplace. The standards call for science students to:

- Apply Content Knowledge
- Investigate, Evaluate, and Reason Scientifically
- Connect Ideas Across Disciplines

Analyze the “shifts” page. Define, in your own words, what each of these “shifts” mean.

Louisiana Student Standards for Science

The new standards call for changes in the science classroom. Key shifts called for by the Louisiana Student Standards for Science:

Apply content knowledge	Content knowledge is critical and evident in the standards in the Disciplinary Core Ideas, the key ideas in science that have broad importance within or across multiple science or engineering disciplines. However, simply having content knowledge is not enough. Students must investigate and apply content knowledge to scientific phenomenon.
Investigate, evaluate, and reason scientifically	Scientists do more than learn about science; they "do" science. Science instruction must integrate the practices, or behaviors, of scientists and engineers as they investigate real-world phenomenon and design solutions to problems.
Connect ideas across disciplines	For students to 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). The crosscutting concepts have applications across all domains.

Three Dimensional Learning: the integration of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in science instruction

Contact LousianaStandards@la.gov with questions.

Instructional Shifts

Review the video.

Red-winged blackbird

As a table, discuss how the instructional shifts were exhibited in the unit and the benefit of using phenomena-based instruction.

- Apply Content Knowledge
- Investigate, Evaluate, and Reason Scientifically
- Connect Ideas Across Disciplines

Instructional Shifts

Review the videos.

Video 1: elementary

Video 2: high school

As a table, discuss how the instructional shifts were exhibited in the lesson.

- Apply Content Knowledge
- Investigate, Evaluate, and Reason Scientifically
- Connect Ideas Across Disciplines

Instructional Shifts

Evaluate the standards: HS-LS2-4 and HS-PS3-3

- How can you use the crosscutting concepts to help students connect their understanding of a life science and physical science system?
- How do the crosscutting concepts help students understand the disciplinary core ideas of each standard?

Schedule

The framework

Instructional shifts

LDOE implementation support

Louisiana Student Standards for Science

The Department will provide multiple phases of support as districts and teachers work to implement the Louisiana Student Standards for Science.

PHASE	TIMELINE	FOCUS
Phase 1	*Spring – Summer 2017*	• Framework and make-up of the standards • Shifts in science instruction • Progressions of learning
Phase 2	*Fall 2017*	• Educators begin implementation of the new standards, practice implementing aligned tasks, pilot 3-dimensional lessons • LDOE releases scope and sequence documents, revised instructional tasks, sample EAGLE items
Phase 3	*Spring –Summer 2018*	• Quality curriculum piloted • Suite of assessment items/item sets released on EAGLE • Field test in grades 3-8

Contact LousianaStandards@la.gov with questions.

Louisiana Student Standards for Science

Area	Support and Timeline
Curriculum and Resources LouisianaStandards@la.gov	**Instructional Materials Review** ● Rubric released and call for submissions ● TLA's: hiring (applications due June 13) and training (June 28-29) ● First review released - *Fall 2017* **New Standards Tools** ● Connections to ELA and math standards* ● Key shifts and instructional implications* ● Middle School sample transition plan - *June 2017* ● Sample scope and sequence documents - *Summer 2017* *To access standards tools, click on the links above, click "download" next to "K-12 Louisiana Student Standards for Science (2017)," then open the zip file that downloads on your computer.

Louisiana Student Standards for Science

Area	Support and Timeline
Professional Development LouisianaStandards@la.gov	**Self-paced Learning** Live and recorded webinars on new standards • Monday, June 19 @ 9:00 a.m. - LSS Science Series Part 1: Overview of the Louisiana Student Standards for Science • Monday, June 26 @ 9:00a.m. - LSS Science Series Part 2: Instructional Shifts • Monday, July 10 @ 9:00 a.m. - LSS Science Series Part 3: Three-Dimensional Learning • Monday, July 17 @ 9:00 a.m. - LSS Science Series Part 4: Learning Progressions • Monday, July 24 @ 9:00 a.m. - LSS Science Series Part 5: Phenomenon-Based Instruction **Summer Opportunities** • Louisiana Tech will provide intensive four-day summer training institutes this summer in both north and south Louisiana • LSU Cain Center will provide summer training in an intensive two-day workshop to be held in June in Baton Rouge **Collaborations** • Sessions at 2017-2018 collaborations

Louisiana Student Standards for Science

Area	Support and Timeline
Assessment Email assessment@la.gov with questions	**Previous RFP secured vendor for assessment development** ● Field test for grades 3-8 – *Spring 2018* ● Operational test – *Spring 2019* ● Platform the same as ELA, Math, Social Studies, and EAGLE **EAGLE Assessment Tool** ● Teacher Leader Advisors, who will help create sample assessment items, hired and trained Summer 2017 ● EAGLE items created throughout the 2017-2018 school year