Louisiana Science Standards Review

February 7, 2017 BESE Meeting

Schedule

- Standards Review Timeline and Process
- Overview of Louisiana Student Standards for Science

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Louisiana State Standards

- Louisiana state law RS 17:24.4 requires BESE to adopt academic content standards, which are defined in the law as statements that define what a student should know or be able to accomplish at the end of a specific time period, grade level or at the completion of a course.

- The law sets forth an expectation that standards be rigorous and that they represent the knowledge and skills needed for students to successfully transition to postsecondary education and the workplace, as determined by content experts, elementary and secondary educators and school leaders, postsecondary education leaders, and business and industry leaders.

- BESE Bulletin 741, §2301 states, “The Louisiana content standards shall be subject to review and revision to maintain rigor and high expectations for teaching and learning.”

Standards Review Process

- In accordance with state law, the science standards review process is led by content experts, elementary and secondary educators, postsecondary education leaders, and business and industry leaders. BESE provided for extensive participation by parents of Louisiana school children and the general public, both through the online review portal and in standards review committee meetings.

- BESE solicited nominations statewide from several education associations, local school systems, and key stakeholder organizations representing parents and business and industry leaders. From these nominations, the board assembled a diverse group of 86 individuals representing every sector mentioned in the law, as well as every geographic region of the state.

- These volunteers are serving on a standards review committee and two content workgroups, each led by a designated chairperson.

Standards Committee & Workgroups

Standards Committee

40 members who guide process and propose standards to BESE

Science Standards Committee

Review and Feedback

Louisiana educators and the general public review drafts and provide feedback

Review and Feedback

Content Workgroups

62 Louisiana educators who draft the standards, review feedback, and propose standards to the Standards Committee

K-8 Workgroup

35 members including: educators from every grade level (K-8), special education educators, STEM educators

High School Workgroup

28 members including: educators of biology, chemistry, earth and space science, environmental science, physical science, physics, STEM, special education

Standards Committee Members

Seat	Name	District/Organization
K-2	Latrenda Knighten*	East Baton Rouge Parish School System
K-2	Bridget Corley*	Sabine Parish School System
K-2	Karen Parrino*	Livingston Parish School System
3-5	Troy Lawson*	New Orleans College Prep
3-5	Bianca Deliberto*	Zachary Community School System
3-5	Donna Reyes*	St. Charles Parish School System
6-8	Heather Howle*	West Feliciana Parish School System
6-8	Brian Fontenot*	Calcasieu Parish School System
6-8	Cathi Cox-Boniol*	Lincoln Parish School System
High School	Lydia Hill*	International High School
High School	Dr. Rhonda Matthews*	Iberville Parish School System
High School (STEM)	Dr. Paulette Perrin*	St. Tammany Parish School System
Louisiana Association of Educators (LAE)	Michael McCoy	Louisiana Association of Educators
Louisiana Federation of Teachers (LFT)	Krystal Swain	Louisiana Federation of Teachers
Associated Professional Educators of Louisiana (A+PEL)	Patrick Turk	Associated Professional Educators of Louisiana
The Louisiana Council of Engineering Deans	Dr. Michelle Sanchez	The Louisiana Council of Engineering Deans
Louisiana Association of Teachers of Mathematics	Jean May-Brett*	Louisiana Association of Teachers of Mathematics
Louisiana Academy of Sciences	Dr. Susan Sullivan	Louisiana Academy of Sciences
University	Dr. Chad Young	Nicholls State University
University: Experimental Program to Stimulate Competitive Research (EPSCOR)	Dr. Brenda Nixon	University: Experimental Program to Stimulate Competitive Research (EPSCOR)
Louisiana Science Teachers Association (LSTA)	Patrice Mire*	Louisiana Science Teachers Association
Louisiana Association of Science Leaders (LASL)	Jeff Holcomb*	Louisiana Association of Science Leaders
Louisiana Early Childhood Association (LAECA)	Dr. Michelle Joubert*	Louisiana Early Childhood Association
Louisiana Board of Regents (BoR)	Dr. Jeanne Burns	Louisiana Board of Regents
Louisiana Parent Teacher Association (PTA)	Bonita Crawford	Louisiana Parent Teacher Association
Black Alliance for Educational Options (BAEO)	Dr. RaeNell Houston	Black Alliance for Educational Options
Urban League of Greater New Orleans	Dr. Calvin Mackie	Urban League of Greater New Orleans
Louisiana Association of Principals (LAP)	Joseph David	Louisiana Association of Principals
Louisiana Association of School Superintendents (LASS)	Scott Devillier	Louisiana Association of School Superintendents
Louisiana School Board Association (LSBA)	Andre Deshotel	Louisiana School Board Association
Louisiana Association of Public Charter Schools (LAPCS)	Akhundov Elkhan*	Louisiana Association of Public Charter Schools
Louisiana Association of Business and Industry (LABI)	Michelle Savoy	Louisiana Association of Business and Industry
LSU Agricultural Center	Josh Dahlem	LSU Agricultural Center
Louisiana Stand for Children	Dr. Keith Leger	Louisiana Stand for Children
Louisiana Family Forum	Dr. Wade Warren	Louisiana Family Forum
Board of Elementary and Secondary Education (BESE)	Danny Pennington	BESE, Ouachita Parish School System
Board of Elementary and Secondary Education (BESE)	Dr. John Oller, ULL	BESE, University of Louisiana Lafayette
Board of Elementary and Secondary Education (BESE)	Joni Smith	BESE, Livingston Parish School System
Board of Elementary and Secondary Education (BESE)	Regina Chustz*	BESE, Lafourche Parish School System

K-8 Workgroup

Seat	Name	District/Organization
Kindergarten	Karen Parrino*	Livingston Parish School System
Kindergarten	Latrenda Knighten*	East Baton Rouge Parish School System
1st grade	Dawn Barnett	East Feliciana Parish School System
1st grade	Emily Swenson	Rapides Parish School System
2nd grade	Rebecca Jones	Franklin Parish School System
2nd grade	Rachel Loque	St. James Parish School System
K-2nd grades	Bridget Corley*	Sabine Parish School System
3rd grade	Bianca Deliberto*	Zachary Community Schools
3rd grade	Ashly Rathburn	Allen Parish School System
4th grade	Emily McGrath	KIPP Public Charter Schools
4th grade	Alvester Barfield	Red River Parish School System
5th grade	Kizzy Crockett	West Baton Rouge Parish School System
5th grade	Troy Lawson*	New Orleans College Prep
3rd-5th grades	Donna Reyes*	St. Charles Parish School System
6th grade	Shannon Lafont	Lafourche Parish School System
6th grade	Sheila Banks	Orleans Parish School System
7th grade	Lyndsey Ewing	Monroe City Schools
7th grade	Jodi Sanchez	Lusher Charter School
8th grade	Charlene Byrd	Jefferson Parish School System
8th grade	Kyle Duhon	Jefferson Davis Parish School System
Elementary	Kendra Pullen	Caddo Parish School System
Elementary	Jessica Church	Natchitoches Parish School System
Middle school	Brian Fontenot*	Calcasieu Parish School System
Middle school	Wendy DeMers	Homer A. Plessy Community School
K-8th grades	Cathi Cox-Boniol*	Lincoln Parish School System
Louisiana Science Teachers Association (LSTA)	Shavonne Garner-Price	Louisiana Science Teachers Association
University	Dr. Brenda Nixon	Louisiana State University
Louisiana Association of Early Childhood (LAECA)	Dr. Michelle Joubert*	Louisiana Association of Early Childhood
Elementary special education	Marsha Medine	Assumption Parish School System
Middle school special education	Annice Greer	Sabine Parish School System
Louisiana Association of Teachers of Mathematics (LATM)	Jessica Rivero	Louisiana Association of Teachers of Mathematics
Technology	Cecilia Lanier	Tangipahoa Parish School System
K-8 STEM	Heather Howle*	West Feliciana Parish School System
K-8 STEM	Loren Klein	Iberia Parish School System
High School Science	John Provost	Acadia Parish School System

High School Workgroup Members

Seat	Name	District/Organization
Biology	Lydia Hill*	International High School
Biology	Casey McMann	Plaquemines Parish School System
Biology	Jed Pitre	Lafourche Parish School System
Biology	Regina Chustz	Terrebonne Parish School System
Chemistry	Cody Cole	Beauregard Parish School System
Chemistry	Mamie Brauer	Vernon Parish School System
Chemistry	Dr. Rhonda Matthews*	Iberville Parish School System
Chemistry	Anthony McElligott	Collegiate Academies
Earth Science	Rene Naquin	Terrebonne Parish School System
Earth Science	James Oubre	St. John Parish School System
Environmental Science	Lisa Nance	Caddo Parish School System
Environmental Science	Jean May-Brett*	Louisiana Association of Teachers of Mathematics
Astronomy	John Sorrel	St. Mary Parish School System
University	Dr. Waneene Dorsey	Grambling State University
Physical Science	Conrad Browne	St. Bernard Parish School System
Physical Science	Stephen Knight	St. Martin Parish School System
Physics	Suzanne Prince	Lafayette Parish School System
Physics	Catherine Raziano	Zachary Community School System
STEM	Lisa Ranney	Lafayette Parish School System
STEM	Nathan Cotten	Terrebonne Parish School System
STEM	Akhundov Elkhan*	Kenilworth Charter School
STEM	Dr. Paulette Perrin*	St. Tammany Parish School System
General Science	Patrice Mire*	Vermilion Parish School System
Louisiana Association of Science Leaders (LASL)	Jeff Holcomb*	Louisiana Association of Science Leaders
High school special education	Tracy Hoffman	St. Tammany Parish School System
Technology	Steve Babcock	University Laboratory School – Louisiana State University
Laser Interferometer Gravitational-wave Observatory (LIGO)	Dr. Amber Stuver	Laser Interferometer Gravitational-wave Observatory
Cyber Innovation Center (CIC)	John Ownby	Cyber Innovation Center

Committee Task to Workgroup

On August 31, 2016, the committee tasked the workgroups with developing Louisiana Student Standards for Science.

These included:

- Standards for Kindergarten through 8th grade
- Standards for Biology, Chemistry, Physics, Earth and Space Science, and Environmental Science

Review Process: Timeline Overview

Meeting	Date	Location	Objective
Committee and Workgroups	August 31, 2016	Alexandria	Committee discussed process and tasked the workgroups; workgroups began the review process
Workgroups	September 1, 2016	Alexandria	Workgroups generated a preliminary draft of the K-12 standards for science for consideration of the committee on November 10, 2016
Workgroups	September 12-13, 2016	Alexandria	
Workgroups	October 5-6, 2016	New Orleans	
Workgroups	November 6-7, 2016	Covington	
Committee	November 10, 2016	Baton Rouge	Committee reviewed the preliminary draft of the standards and voted to release them for public review
Public Portal	December 1 – January 6	Virtual	Standards were posted for public review; parents, committee members, educators, and other citizens shared their feedback on each individual standard, K-12

Review Process: Timeline Overview

Meeting	Date	Location	Objective
Workgroups	January 11-14, 2017	Lafayette	Workgroups analyzed the public review comments and revised the draft of the standards for consideration of the committee on January 25
Committee	January 25, 2017	Bossier	Committee reviewed the revised draft of the standards and provided feedback for final revisions
Workgroups	February 1-3, 2017	Baton Rouge	Workgroups revised the draft standards
Committee	February 13, 2017	New Orleans	Committee reviews and votes on the final draft of the Louisiana Student Standards for Science; Committee recommends standards to BESE for adoption

Review Process

Educators who make up the workgroups have spent many hours drafting the standards, reviewing public comment, revising the drafts, meeting with committee members to discuss their work, and meeting with educators in the field to solicit feedback.

- Each workgroup member spent an average of 140 hours attending review meetings
- Each workgroup member spent an average of 40 hours independently researching and reviewing drafts of standards
- Committee chairs spent 80 hours in addition to the meetings, on average, preparing for meetings, reviewing materials, and doing independent research
- Workgroup members met for 17 days of in-person meetings
- Workgroup members spent over 10,000 total hours working on the Louisiana Student Standards for Science

Schedule

- Standards Review Timeline and Process
- Overview of Louisiana Student Standards for Science

Overview of Standards

As tasked, the workgroups drafted a set of standards that:

- Define what a student should know or be able to accomplish at the end of a specific time period, grade level or completion of a course.
- Represent the knowledge and skills needed for students to successfully transition to postsecondary education and the workplace.
- Build on skills learned in previous years and avoid repetition from year to year.
- Connect across grades and within grades.

Overview of Standards

Coding and Descriptor (example: 2-PS1-3 Matter and Its Interactions)		
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.

Overview of Standards

- Quality standards provide focus on fewer topics with more opportunity for students to engage deeply.
- Quality standards identify key student knowledge and skills that students should demonstrate by the end of the year.
- Quality standards connect learning within and across grades.

Past Science Instruction	Drafted Louisiana Student Standards for Science
Focus on content acquisition	Students develop and apply knowledge in new situations
Many topics, little depth	Fewer topics, more depth
Teacher dominated discourse and instruction	Students engage in developmentally appropriate experiences using similar behaviors as a scientist

Overview of Standards

Quality standards identify key student knowledge and skills that students should demonstrate by the end of the year.

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.

Overview of Standards

Quality standards connect learning within and across grade levels.

HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Physical Science: Emphasis is on qualitative evaluations of devices. Constraints could include use of renewable energy forms and efficiency. Emphasis is on devices constructed with teacher approved materials. Examples of devices can be drawn from chemistry or physics clarification statements below.

Chemistry: Emphasis is on both qualitative and quantitative evaluations of devices. Constraints could include use of renewable energy forms and efficiency. Focus of quantitative evaluations is limited to total output for a given input. Emphasis is on devices constructed with teacher approved materials. Examples of devices in chemistry could include hot/cold packs and batteries.

Physics: Emphasis is on both qualitative and quantitative evaluations of devices. Constraints could include use of renewable energy forms and efficiency. Focus of quantitative evaluations is limited to total output for a given input. Emphasis is on devices constructed with teacher approved materials. Examples of devices in physics could include Rube Goldberg devices, wind turbines, solar cells, solar ovens, and electric motors.

SEP	DCI	CC

Overview of Standards

Presentations from workgroup chairs

- Kindergarten through grade 8 (Heather Howle)
- High School (Dr. Rhonda Matthews)

Overview of Standards

Kindergarten through grade 8 (Heather Howle)

- Multi-dimensional standards
- Developmentally appropriate content progressions
- Consistently rigorous
- Intentional placement by grade to ensure optimal integration
- Intentional integration in middle school considering developmental appropriateness, math standards and content progressions

Overview of Standards

High School (Dr. Rhonda Matthews)

- Multi-dimensional standards
- Consistently rigorous
- Strong vertical alignment elementary standards
- Organized to help students make connections across science disciplines and allow content to be placed in developmentally appropriate and mathematically appropriate grade
- Strategic alignment between high school courses