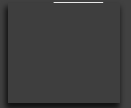


Louisiana Science Standards Review

January 25, 2017 Committee Meeting



Welcome

- Committee and workgroup members
- Educators, parents, and interested stakeholders
- Department of Education and BESE staff
- Elected officials

Purpose of Committee Meeting

- Review each workgroup's proposed standards
- Direct workgroups' next steps, where required

Meeting Procedures

- **Committee meetings:** Meetings of the Standards Committee will be advertised, open to the public, and held pursuant to the Louisiana Open Meetings Law.
- **Committee leadership:** Each committee and workgroup will be facilitated by a chairman.
- **Workgroups:** Workgroups will divide into smaller subgroups as needed to address grade level and content specific work. Content workgroup members will work together to finalize any recommended revisions or additions to standards.
- **Voting:** Votes will be taken as a slate by the committee, not by individual standard or edit, to move proposed standards forward to the committee and to BESE.
- **Voting proxies:** No proxies will be allowed for voting purposes. Participants must be in attendance to vote.
- **Public comment at meetings:** Public comment will be received during each committee meeting and prior to any votes. Members of the public may also submit written comments for the record.
- **Content of public comment:** All public comment must relate to the review and development of science standards, not other matters of policy.

Schedule

- Welcome
- Overview of the Standards Process
- Overview of Louisiana Student Standards for Science
- Workgroup Presentations
- Committee Work Time
- Committee Directives for Workgroups
- Public comment
- Closing Logistics

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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

Review Process: Timeline Overview

Meeting	Purpose	Date	Location
Standards Committee and Content Workgroups	<i>Organizational meeting</i>	Wednesday, August 31, 2016	Alexandria
Content Workgroups	<i>Finalize framework and begin draft</i>	Thursday, September 1, 2016	Alexandria
Content Workgroups	<i>Draft</i>	Monday, September 12- Tuesday, September 13, 2016	Alexandria
Content Workgroups	<i>Draft</i>	Wednesday, October 5-Thursday, October 6, 2016	New Orleans
Content Workgroups	<i>Produce first draft</i>	Monday, November 6-7, 2016	Covington
Standards Committee	<i>Review draft for public comment</i>	Thursday, November 10, 2016	Baton Rouge
Content Workgroups	<i>Revise first draft after public comment period</i>	January 12-13, 2017	Lafayette
Standards Committee	<i>Review draft and provide feedback</i>	January 25, 2017	Bossier
Content Workgroups	<i>Update draft (if needed)</i>	February 1, 2017	Baton Rouge
Standards Committee	<i>Final draft and vote</i>	February 13, 2017	New Orleans

Committee Task to Workgroup

On August 31, 2016, the committee tasked the workgroups with developing Louisiana Student Standards for Science by Tuesday, November 8, 2016, to be reviewed prior to public comment period.

These included:

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

Review Process

Educators who make up the workgroups have each spent an average of 110 hours meeting in person as groups and 40 more independently researching and reviewing drafts of standards to achieve this ambitious task.

- 14 days of in-person meetings
- 4 meeting days since the public portal closed
- Over 8,500 total hours spent

Review Process: Public Review

Step	Details
Public Review December 1, 2016- January 6, 2017	<ul style="list-style-type: none">• Standards posted on the website for public review• Parents, committee members, educators, and other citizens share their feedback on each individual standard, K-12• Content workgroups review feedback from the public and determine appropriate revisions to the proposed standards

Public Portal

The public portal was open December 1, 2016 – January 6, 2017.

- 1946 people accessed the portal
- 375 people provided feedback
- 10,272 pieces of feedback were submitted

Access the [feedback summary](#) for additional details.

The workgroups reconvened the week of January 9 and spent over 50 hours each, reviewing the public portal feedback and revising the draft standards.

Schedule

- Welcome
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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 provide focus on fewer topics with more opportunities for students to engage deeply.

Grade	Number of GLEs	Number of LSS for Science
Kindergarten	32	10
3 rd grade	62	15
6 th grade	87	18
HS Biology	58	20
HS Chemistry	63	13
HS Physics	51	12

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.

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

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

SEP	DCI	CC
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Feedback Summary

Total Reviews: 10,272					
Keep Standard As Drafted	7,952	K-12 Administrator	266	<p>Suggest Changes 22%</p> <p>Keep As Drafted 78%</p>	
		Institution or Higher Education Faculty	855		
		Other Educator (not administrator or higher education)	5,598		
		Member of Organization	159		
		Parent/Guardian	93		
		Student	1		
		Other	980		
		Suggest Changes to Standard	2,320		K-12 Administrator
Institution or Higher Education Faculty	90				
Other Educator (not administrator or higher education)	1,752				
Member of Organization	72				
Parent/Guardian	106			Remove	385
Student				Move to a Different Level	1308
Other	121			Rewrite	627

Access the full feedback summary [here](#).

Feedback Summary

Grade/Course	Count of Feedback	Count of Keep As Drafted	Percent of Keep As Drafted	Count of Suggest Changes	Percent of Suggest Changes
Kindergarten	505	420	83%	85	17%
1 st grade	350	296	85%	54	15%
2 nd grade	627	567	90%	60	10%
3 rd grade	642	535	83%	107	17%
4 th grade	930	777	84%	153	16%
5 th grade	675	604	89%	71	11%
6 th grade	1,038	702	68%	336	32%
7 th grade	1,336	713	53%	623	47%
8 th grade	1,111	725	65%	386	35%
HS Life Science	1,374	1189	87%	185	13%
HS Chemistry	625	530	85%	95	15%
HS Physics	293	190	65%	103	35%
HS Earth and Space Science	290	271	93%	19	7%
HS Environmental Science	476	433	91%	43	9%

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	Annicc 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

K-8 Workgroup

Revisions included:

- Refinement for clarity and consistency
- Intentional placement by grade to ensure optimal integration
- Intentional integration in middle school considering developmental appropriateness, math standards, content progressions and teacher expertise in middle school

Grade	Physical Science	Life Science	Earth and Space Science	Total Number	Aligned to Previous Organization
6 th grade	*10	5	4	19	53%
7 th grade	5	*9	4	18	50%
8 th grade	5	6	*7	18	39%

Note: Due to the cumulative nature of previous state assessments, 8th grade teachers have historically focused on all disciplines during instruction.

K-8 Workgroup

Areas requiring additional attention:

- Detailed vertical alignment analysis of science and engineering practices, disciplinary core ideas, and cross cutting concepts
- Final analysis of middle school organization, paying particular attention to vertical alignment
- Final review of earth and space science standards to ensure language is clear and concise
- Ensure vertical alignment of environmental DCIs K-8

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

High School Workgroup

Revisions included:

- Refinement for clarity and consistency
- Drafted high school physical science standards
- Decreased total number of standards
- Strategic alignment between high school courses

High School Workgroup

Areas requiring additional attention:

- Detailed vertical alignment analysis of science and engineering practices, disciplinary core ideas, and cross cutting concepts
- Full review of Physical Science clarification statements
- Final review of earth and space science standards to ensure language is clear and concise

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Questions for Consideration

Louisiana's standards should prepare students for college and careers.

- Do you have feedback about how effectively these standards prepare students?
- What would you like the workgroups to consider as they revise this draft to ensure they represent preparation for graduation?
- Do you see gaps in learning or unnecessary duplication of skills throughout this draft?

What role should engineering play in the standards?

- Keep DCIs integrated as proposed?
- Edit additional performance expectations to integrate more engineering DCIs?
- Add specific engineering performance expectations?

Committee Work

In groups, see the distributed handout, consider the questions posed, and prepare to return to the full group for a discussion.

Groups will have 45 minutes to consider their responses.

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Committee Recommendations

The committee directs the content workgroups to:

1. Meet February 1-3 to produce the final draft of the standards and consider:
 - Vertical alignment
 - Polishing of High School Physical Science and K-12 Earth Science standards
 - Engineering integration
 - Other
2. Submit a final draft to the committee for review by February 7

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Public Comment

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Closing Logistics

- Review minutes from today's meeting. They will be posted by Wednesday, February 1.
- Review the revised standards, which will be sent by Tuesday, February 7.
- Attend the final standards committee meeting Monday, February 13, in New Orleans.