Louisiana Guide to Implementing OpenSciEd: Grade 8

To assist teachers with the implementation of the OpenSciEd curriculum for grade 8, this document provides guidance regarding how OpenSciEd units correlate with the Louisiana Student Standards for Science (LSSS). The OpenSciEd curriculum provides ample instructional guidance for teachers. This Louisiana Guide for Implementing OpenSciEd goes a step further to point out places in which teachers may need to make strategic decisions considering student needs.

The OpenSciEd Grade 8 may include performance expectations featured in other grade levels. These units are intentionally designed to provide students the opportunity to incrementally make sense of phenomena to build understanding and abilities over time through a coherent storyline. Modification to the sequence or content of lessons within these units could undermine the design, and therefore should be approached with caution and careful consideration.

This guidance document is considered a "living" document as we believe that teachers and other educators will find ways to improve the document as they use it. Please send feedback to STEM@la.gov so that we may use your input when updating this guide.

Updated August 7, 2024

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Overview of OpenSciEd

OpenSciEd is an effort among science educators, curriculum developers, teachers and philanthropic foundations to improve the supply of and demand for high-quality K-12 science instructional materials by producing open-sourced, freely available instructional materials designed for college and career-ready science standards. OpenSciEd works with classroom educators, experienced science curriculum developers, individual school districts, education nonprofits, and the science education community to create and pilot robust, research-based, open-source science instructional materials.

Field Testing and Release of Units

Ten partner states volunteered to join this effort including: California, Iowa, Louisiana, Massachusetts, Michigan, New Mexico, New Jersey, Oklahoma, Rhode Island and Washington. After the initial development of the OpenSciEd units, the unit prototypes or field test units underwent rigorous external review and robust field-testing in participating classrooms across partner states including seven Louisiana systems. The field test units were then revised based on the feedback and data collected and submitted to NextGenScience Peer Review Panel before being made freely and openly available to the public upon earning a quality rating. The entire middle school program (18 units total) is now available to download for free online.

Unit Design & Sample Scope and Sequence

The units in the OpenSciEd Sample Scope and Sequence include bundles of performance expectations that are built around an anchor phenomenon. The OpenSciEd units may include performance expectations from previous or future grade levels. These units are intentionally designed to provide students the opportunity to incrementally make sense of phenomena to build understanding and abilities over time through a coherent storyline. Modification to the sequence or content of lessons within these units could undermine the design, and therefore is not recommended and should be approached with caution and careful consideration.

Contact

For questions or requests for additional information on the OpenSciEd initiative and/or materials, contact info@openscied.org.

Standards by Unit

	Unit 1 Plate Tectonics & Rock Cycling OpenSciEd 6.4	Unit 2 Natural Hazards OpenSciEd 6.5	Unit 3 Energy in Chemical Reactions OpenSciEd 7.2	Unit 4 Earth's Resources & Human Impact OpenSciEd 7.6	Unit 5 Genetics OpenSciEd Unit 8.5	Unit 6 Natural Selection & Common Ancestry OpenSciEd 8.6
Unit Question	How and why does Earth's surface change?	Where do natural hazards happen and how do we prepare for them?	How can we help people make a flameless heater?	How do changes in earth's system impact our communities and what can we do about it?	Why are living things different from one another?	How could things living today be connected to things living long ago?
Standards	8-ESS1-4 8-ESS2-1 8-ESS2-2 8-ESS2-3 8-LS4-1*	8-ESS3-2	8-PS1-6	8-ESS3-1 8-ESS3-3* 6-ESS3-4 7-ESS3-5	8-LS1-5* 8-LS3-1 7-LS3-2 7-LS4-5	8-LS1-4 8-LS4-1* 8-LS4-2 8-LS4-3 8-LS4-6 7-LS4-4
Unit Materials	Complete Unit	Complete Unit	Complete Unit	Complete Unit	Complete Unit	Complete Unit

8-PS1-1, 8-PS1-3, 8-PS3-3, and 8-PS3-5 are not addressed by the Grade 8 OpenSciEd units. The performance expectations can be addressed by incorporating the Grade 8 Louisiana Sample Scope and Sequence units as needed.

*The performance expectation is partially addressed using the identified phenomenon and is addressed in multiple units.

Pacing and Unit Order Guidance

Modification of the lessons, even in the ways suggested here, should be approached with careful consideration. Additional attention should be given to navigation in lessons where adjustments are made in order to maintain coherence from the student perspective.

Unit	Relevant OpenSciEd Guidance for Teaching Units in a Different Sequence †	Relevant OpenSciEd Guidance for Condensing † *Includes guidance directly from OpenSciEd as well as Louisiana-specific suggestions.*
Unit 1 **Plate Tectonics & Rock Cycling** **OpenSciEd 6.4**	No relevant guidance in this section for the suggested unit sequence for Louisiana.	• **Lesson 1:** Instead of having two different Scientist Circle sessions following the initial models, the students could still develop their initial model at the same points in the lesson, but only develop the class model once after both initial models are individually developed. • **Lesson 6:** This lesson has multiple investigations students are carrying out and is written to take three days. To reduce to two days, investigations could be done as demos for the whole class with the students suggesting different ways to move the foam pieces representing the plates. The diagrammatic models that are developed in small groups and gallery walks could be streamlined so that the models are being developed while this investigation is being demonstrated. Note that, while not losing coherence, this will reduce the individual sense making students do around how plates move and how this movement is related to what we see at the surface.
Unit 2 **Natural Hazards** **OpenSciEd 6.5**	No relevant guidance in this section for the suggested unit sequence for Louisiana.	• **Lesson 2:** Conduct mapping and graphing exercises as a whole class. Project maps and graphs onto a whiteboard and ask students to volunteer to annotate a shared class map or graph using a dry erase marker. • **Lesson 2 & 3:** Wait to build Tsunami Chain of Events in one pass at the end of Lesson 3 or beginning of Lesson 4. • **Lesson 5:** Use the prefilled design matrix with the rankings already provided instead of having students make one. • **Lesson 10:** Replace the communication project with an individual written explanation that includes information about the hazard (what it is, where it happens, what time of year it happens, why it happens), information about the

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		community and stakeholders at risk, and at least three design solutions or technologies that can be used to help protect and prepare communities
Unit 3 **Chemical Reactions & Energy** **OpenSciEd 7.2**	It is not necessary to introduce the students to the concept of a Driving Question Board and a shared set of classroom norms since this is done in other OpenSciEd units. This unit is not taught directly after the Bath Bombs unit (7.1 Chemical Reactions & Matter), so consider explicitly revisiting the safety protocols found in that unit.	• **Lesson 2:** If you are unable to carry out the flameless heater demonstrations in your classroom, Timelapse of MRE Heater Set Up and Timelapse of Hand Warmer Set Up are available for students to make the necessary observations. • **Lesson 7:** To keep the focus of sharing and feedback on identifying successes, pair teams that had similar levels of success in Lesson 6 and determine and post partner teams before class. Additionally, provide students with some sentence or question starters to help them begin the discussion in a timely manner. • **Lesson 9:** Consider pairing teams that had similar levels of success in Lesson 6 and determine partner teams before class or during the time they are revising their instructions. Additionally in Lesson 9, there is an opportunity for students to individually complete a teamwork self-assessment. The self-assessment may be assigned as home learning.
Unit 4 **Natural Resources and Human Impact** **OpenSciEd 7.6**	No relevant guidance in this section for the suggested unit sequence for Louisiana.	• **Lesson 3:** If students engaged with the Storms Unit in Grade 7, they do not need to repeat the temperature and humidity lab, though the setup here is slightly modified compared to that unit. You can leverage their prior experience of the lab, then provide data for analysis. • **Lessons 5 or 6:** Choose only one assessment (either the assessment from Lesson 5 or from Lesson 6) to use at the end of Lesson Set 1. • **Lesson 9:** Eliminate the lab experience, and have students explore the long-term (800,000 years) CO_2 data by analyzing the given graphs in the StoryMap.

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Unit 4 **Natural Resources and Human Impact** **OpenSciEd 7.6** ***continued***		• **Lesson 10:** Have students explore the more recent CO_2 data using graphs provided in the student edition instead of using Tuva. • **Lesson 11:** Choose a more scaffolded version of the carbon system model to reduce time needed to fully develop the model. There are three options offered in Guidance on Carbon System Model Templates. • **Lesson 15:** Reduce the total number of solutions to even fewer than 12 and reduce the number of solutions to be read by individual students. • **Lesson 16:** Review and analyze two community plans as a class instead of analyzing in groups.
Unit 5 **Genetics** **OpenSciEd 8.5**	No relevant guidance in this section for the suggested unit sequence for Louisiana.	• **Lesson 2:** If you have evidence that students already have a solid understanding of muscle structures, skip the video and reading and start at the gallery walk comparing the muscles from organisms with typical muscles to those with extra-big muscles. Your students will miss an opportunity to practice integrating qualitative scientific information in written text with that contained in media and visual displays to clarify claims and findings. If you make this adjustment, be sure to still put "protein" on the Word Wall and discuss examples such as myosin and actin to support students' understanding of proteins before Lessons 5 and 6, specifically. • **Lesson 3:** If students have an understanding that dietary protein and exercise both influence muscle growth, skip readings 1 and 2 and instead begin with readings 3 and 4 where the class splits into two groups to determine the specific role of each of these environmental factors. Readings 1 and 2 could be assigned as home learning prior to Lesson 3. • **Lesson 9:** Have students do the three readings as a jigsaw activity where students each read only one article. Continue with the comparison discussion as written in the Teacher Guide. This adjustment will reduce the time the lesson requires, but it will also limit students' experience with a new element of SEP 8: "Evaluate data, hypotheses, and/or conclusions in scientific and

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Unit 5 **Genetics** **OpenSciEd 8.5** ***continued***		technical texts in light of competing information or accounts". You could also choose to skip the step where students look up some of the sources cited in a reading to develop the habit of checking for credibility, again at the expense of the practice with obtaining and evaluating information. • **Lesson 12:** Replace the classroom lab extraction of genetic material from strawberries in favor of watching the provided video. Students could also view the provided video of the negative control investigation instead of seeing it as an in-person classroom demonstration. • **Lesson 13:** If students are already secure in the knowledge that flowers are the part of the plant involved in making seeds and that seeds are plant offspring, students can move straight to observing seeds in fruits. The flower dissection can be skipped but students should still use the plant structures diagram to label plant parts as reproductive structures. Finally, choose only one opportunity for students to explain what they've figured out about plant reproduction--peer feedback with a partner or completing the exit ticket--rather than doing both.
Unit 6 **Natural Selection & Common Ancestry** **OpenSciEd 8.6**	No relevant guidance in this section for the suggested unit sequence for Louisiana.	• **Lesson 1:** If students are familiar with penguins, consider skipping the live penguin cameras. They will gather more information about penguins from the Data Cards for Modern Penguins and Pedro. • **Lesson 7:** If your high school uses the Galápagos finch case as an anchoring phenomenon, consider using just the fish, moths, mustard plants, and swallows cases in this unit.

† Adapted from the OpenSciEd TeacherBackground Knowledge for "How will I need to modify the unit if taught out of sequence?" and "How do I shorten or condense the unit if needed? How can I extend the unit if needed?" for each unit.

LDOE Formative Assessment Resources

Created by Louisiana educators to support formative assessment in the classroom, the LDOE has released a library of discrete items and item sets correlated to the Louisiana Student Standards for Science. These items, along with LEAP 2025 Practice Test Items, may be used in conjunction with guidance from high-quality curriculum as opportunities for students to demonstrate what they have learned. LDOE Formative Assessment Resources can be found on the K-12 Science Resources web page.

Unit	Discrete Items	Item Sets and Practice Test Items
Plate Tectonics & Rock Cycling Unit 6.4	Fossils (8-MS-ESS1-4) South America (8-MS-ESS2-1) Mushroom Rock (8-MS-ESS2-2) Pangaea (8-MS-ESS2-3) Geo_Time_Scale (8-MS-LS4-1)	North Carolina Landslides (8-MS-ESS2-2, 8-MS-ESS3-2)
Natural Hazards Unit 6.5	Cascadia (8-MS-ESS3-2)	Tsunamis & the Louisiana Coast (8-MS-ESS2-1, 8-MS-ESS3-2) Tornadoes (8-MS-ESS3-2)
Energy in Chemical Reactions Unit 7.2	Items Coming Soon	Items Coming Soon
Earth's Resource & Human Impact Unit 7.6	Petroleum (8-MS-ESS3-1)	Opal (8-MS-ESS3-1, 8-MS-ESS3-3)
Genetics Unit 7.6	Daisies (8-MS-LS1-5) Miles Davis (8-MS-LS3-1)	Glowing Jellyfish (8-LS3-1, 8-MS-LS4-6)
Natural Selection & Common Ancestry Unit 8.6	Scotch Broom (8-MS-LS1-4) Horses (8-MS-LS4-2) Embryo Development (8-MS-LS4-2) Bats (8-MS-LS4-2) Comparing Embryos (8-MS-LS4-3) Hummingbird (8-MS-LS4-6)	Surviving in Desert Landscapes (8-LS1-5, 8-LS1-4)

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Plate Tectonics & Rock Cycling Unit 6.4	Fossils (8-MS-ESS1-4) South America (8-MS-ESS2-1) Mushroom Rock (8-MS-ESS2-2) Pangaea (8-MS-ESS2-3) Geo_Time_Scale (8-MS-LS4-1)	North Carolina Landslides (8-MS-ESS2-2, 8-MS-ESS3-2)