



Teaching and Learning

Louisiana Guide to Implementing OpenSciEd: Grade 7

To assist teachers with the implementation of the OpenSciEd curriculum for grade 7, 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 7 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.

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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 non-profits, 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 undergo rigorous external review and robust field testing in participating classrooms across partner states. The field test units are then revised based on the feedback and data collected and submitted to the NextGenScience Peer Review Panel before being made freely and openly available to the public upon earning a quality rating. The entire high school curriculum (16 units in total) is now available to download for free online.

Unit Design and Sample Scope and Sequence

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

Contact

Systems interested in piloting should reach out to STEM@la.gov for direct support. For questions or requests for additional information on the OpenSciEd initiative and/or materials, contact info@openscienced.org.

Sample Scope and Sequence

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	Thermal Energy OpenSciEd Unit 6.2	Weather, Climate, & Water Cycling OpenSciEd Unit 6.3	Chemical Reactions & Matter Transformations OpenSciEd Unit 7.1	Metabolic Reactions OpenSciEd Unit 7.3	Matter Cycling & Photosynthesis OpenSciEd Unit 7.4	Ecosystem Dynamics OpenSciEd Unit 7.5
Unit Question	How can containers keep stuff from warming up or cooling down?	Why does a lot of rain, hail, or snowfall at some times and not others?	How can we make something new that was not there before?	How do things inside our bodies work together to make us feel the way we do?	Where does food come from and where does it go next?	How does changing an ecosystem affect what lives there?
Standards	7-MS-PS1-4* 7-MS-PS3-4 8-MS-PS3-3 8-MS-PS3-5 6-MS-PS4-2*	7-MS-ESS2-4 7-MS-ESS2-5 7-MS-ESS2-6 7-MS-PS1-4*	7-MS-PS1-2 7-MS-PS1-5 6-MS-PS1-1	7-MS-LS1-3* 7-MS-LS1-7 8-MS-LS1-5*	7-MS-LS1-6 6-MS-LS2-3 8-MS-PS1-3	7-MS-LS2-4 7-MS-LS2-5 6-MS-LS2-1 6-MS-LS2-2
Unit Resources	<u>Complete Unit</u>	<u>Complete Unit</u>	<u>Complete Unit</u>	<u>Complete Unit</u>	<u>Complete Unit</u>	<u>Complete Unit</u>

† 7-LS3-2, 7-LS4-4, 7-LS4-5, and 7-ESS3-5 are not addressed by the Grade 7 OpenSciEd units. The performance expectations can be addressed by incorporating the [Grade 7 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 (This includes guidance directly from OpenSciEd as well as Louisiana-specific suggestions.)
<p>Unit 1</p> <p>Thermal Energy OpenSciEd Unit 6.2</p>	<p>No relevant guidance for LA suggested scope and sequence.</p>	<ul style="list-style-type: none"> ● LA suggestion - Lessons 2 and 3: Combine by having half of the class test cold water and the other half test hot water in identical sets of cups. ● Lesson 5: Eliminate or reduce. Condensation on the outside of the cup may not become obvious to students and will be deeply explored in the next unit, <i>Weather, Cycling, and Water Cycle</i>. ● Lesson 7: Shorten to briefly motivate the need to investigate other ways to warm up the cup, focusing students on energy transfer. ● LA suggestion - Lesson 8: Replace with a discussion of how the color/material of the cup would affect the success of the cup. This topic does not appear within grade 7 LSSS and the discussion can activate prior knowledge of light from grade 6. ● Lesson 9: Make a video of the lab in advance, watch it together as a class, and discuss the patterns in temperature data. ● Lesson 10: Eliminate the food coloring investigation. The video is sufficient for developing the idea that particles in warmer liquids are moving faster. ● Lessons 11-13: Sort the evidence as you go to eliminate the evidence sorting activity at the start of lesson 14. If students are convinced that energy transfers from hotter regions to colder ones after Lesson 13,

Unit	Relevant OpenSciEd Guidance † for Teaching Units in a Different Sequence	Relevant OpenSciEd Guidance† for Condensing (This includes guidance directly from OpenSciEd as well as Louisiana-specific suggestions.)
<p>Unit 1</p> <p>Thermal Energy OpenSciEd Unit 6.2</p> <p><i>**continued from previous page**</i></p>		<p>eliminate the butter demonstration also.</p> <ul style="list-style-type: none"> ● LA suggestion - Lessons 15-18: Reduce or eliminate. These lessons address standard 8-MS-PS3-3, constructing a device that minimizes thermal energy. If choosing to have students build a device, condense by having students reflect on how they would revise their models if they were to build again rather than rebuilding.
<p>Unit 2</p> <p>Weather, Climate, & Water Cycling OpenSciEd Unit 6.3</p>	<p>No relevant guidance for LA suggested scope and sequence.</p>	<ul style="list-style-type: none"> ● LA suggestion - Lesson 5: Reduce by doing teacher demonstrations of the soap bubble experiment so both demos are done on the same day. ● LA suggestion - Lesson 7: Reduce by discussing the bottle setups, but not actually building them. Students can analyze predetermined data and use hygrometers to compare room air and outside air humidity. ● LA suggestion - Lesson 15: Reduce by having a premade set of charts colored by the teacher and only allowing students to practice on one map.
<p>Unit 3</p> <p>Chemical Reactions & Matter Transformations OpenSciEd Unit 7.1</p>	<p>Pre-teaching the idea that atoms exist and that they make up molecules is counterproductive to the trajectory of this unit. Students may have heard of the words “atoms” and “molecules” in other contexts and should be encouraged to try to apply any ideas about the particulate nature of matter they may bring to the table in the first part of the unit.</p>	<ul style="list-style-type: none"> ● LA suggestion - Lesson 1: Since students have already been exposed to classroom norms and the typical progression of anchoring phenomena routine, time can be reduced for these. ● Lesson 13: If short of time, this lesson could be skipped. Usually there will be a category of questions around odors or smells of the bath bombs and why there are different odors, so this lesson helps to fully close out the DQB. In addition, this DCI LS1.D is spread across multiple units in OpenSciEd.

Unit	Relevant OpenSciEd Guidance † for Teaching Units in a Different Sequence	Relevant OpenSciEd Guidance† for Condensing (This includes guidance directly from OpenSciEd as well as Louisiana-specific suggestions.)
<p>Unit 4</p> <p>Metabolic Reactions OpenSciEd Unit 7.3</p>	<p>No relevant guidance for LA suggested scope and sequence.</p>	<ul style="list-style-type: none"> ● Lesson 8: There is an assessment opportunity for students to argue from evidence for the diagnosis that is most likely causing M’Kenna’s symptoms. Students also are able to give peer feedback by comparing and critiquing their peer’s arguments. The peer feedback opportunity could be skipped. ● Lesson 11: Instead of conducting the experiments “Burning Fat in Open and Closed Systems” and “Burning Fat in Closed Systems and Measuring Gases,” students could watch the videos provided to collect data and make observations. ● Lesson 14: If you are short on time, this lesson could be skipped. It is an opportunity for students to investigate if all animals do chemical reactions to get energy the same way as humans. Students investigate an organism of their choice to broaden out their model ideas and compare and contrast other living things such as spiders and bacteria.
<p>Unit 5</p> <p>Matter Cycling & Photosynthesis OpenSciEd Unit 7.4</p>	<p>No relevant guidance for LA suggested scope and sequence.</p>	<ul style="list-style-type: none"> ● Lesson 11: Construct the explanation of how a maple tree lives through the seasons either as a class or as a home learning assignment. ● Lesson 12: If you are not tasked with addressing MS-PS1-3, in this unit, consider skipping synthetic materials activities which are parts 3-6 (about a day) in the <i>Teacher Guide</i>. ● LA Suggestions - Lessons 13 and 14: Remove these lessons as they address standard MS-LS2-3 which is not a grade 7 standard. ● Lessons 14 and 15: Choose only one assessment (either the assessment from Lesson 14 or from Lesson 15) to use at the end of Lesson Set 2.

Unit	Relevant OpenSciEd Guidance † for Teaching Units in a Different Sequence	Relevant OpenSciEd Guidance† for Condensing (This includes guidance directly from OpenSciEd as well as Louisiana-specific suggestions.)
<p>Unit 6</p> <p>Ecosystem Dynamics</p> <p>OpenSciEd</p> <p>Unit 7.5</p>	<p>No relevant guidance for LA suggested scope and sequence.</p>	<ul style="list-style-type: none"> ● Lesson 5: If your students live in communities in which it is safe to make observations outdoors, you can shift some of the in-class observations to a home learning activity. ● Lessons 19 and 20: End the unit at Lesson 18. This will satisfy most students' understanding of the palm oil problem and close out the Driving Question Board. This decision will eliminate five class periods. Lessons 19 and 20 are intended to offer meaningful, community-based application of learning for students.

† 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

LDOE formative assessment resources include a library of Louisiana educator-created discrete items and sets, LEAP Practice Test Items, and LEAP Assessment Guide Items correlated to the Louisiana Student Standards for Science. These resources can be used alongside guidance from a high-quality curriculum to provide opportunities for students to showcase their learning.

Unit	Discrete Items	Sets
<p>Thermal Energy</p>	<p><u>LDOE Formative Assessment Items (Password-Educate2020):</u></p> <ul style="list-style-type: none"> Brass Experiment, Jeff’s Models (7-MS-PS1-4) Temperature Increase (7-MS-PS3-4) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> 22 (7-MS-PS1-4) 40 (7-MS-PS3-4) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> N/A 	<p><u>LDOE Formative Assessment Sets (Password-Educate2020):</u></p> <ul style="list-style-type: none"> N/A <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> Item Set: Melting Icebergs (7-MS-PS1-4, 7-MS-PS3-4) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> Task Set: Properties of water (7-MS-PS1-4, 7-MS-PS3-4)
<p>Water Cycling & Weather</p>	<p><u>LDOE Formative Assessment Items (Password-Educate2020):</u></p> <ul style="list-style-type: none"> Water Cycle (7-MS-ESS2-4) Washington Rainfall (7-MS-ESS2-5) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> 21 (7-MS-ESS2-4) 23 (7-MS-ESS2-6) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> Weather fronts (7-MS-ESS2-5) 	<p><u>LDOE Formative Assessment Sets (Password-Educate2020):</u></p> <ul style="list-style-type: none"> N/A <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> Item Set: Arizona Monsoon (7-MS-ESS2-5, 7-MS-ESS2-6) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> N/A

Unit	Discrete Items	Sets
<p>Chemical Reactions & Matter Transformations</p>	<p><u>LDOE Formative Assessment Items</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • Two Solids, Hydrogen Iodide (7-MS-PS1-2) • Pesticides (7-MS-PS1-5) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 14, 34, 37 (7-MS-PS1-2) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • Properties of substances (7-MS-PS1-2) 	<p><u>LDOE Formative Assessment Sets</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> • Item Set: Volcanic Carbon (7-MS-PS1-5, 7-MS-ESS3-5)+ <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • N/A
<p>Metabolic Reactions</p>	<p><u>LDOE Formative Assessment Items</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • Artificial Windpipe (7-MS-LS1-3) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 15, 41 (7-MS-LS1-3) • 33 (7-MS-LS1-7) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • N/A 	<p><u>LDOE Formative Assessment Sets</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • N/A
<p>Matter Cycling & Photosynthesis</p>	<p><u>LDOE Formative Assessment Items</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • Dandelions (7-MS-LS1-6) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 32 (7-MS-LS1-6) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • N/A 	<p><u>LDOE Formative Assessment Sets</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> • Item Set: Louisiana Swamplands (7-MS-LS1-7, 7-MS-LS1-6) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • N/A

Unit	Discrete Items	Sets
<p>Ecosystem Dynamics</p>	<p><u>LDOE Formative Assessment Items</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 38 (7-MS-LS2-4) • 13 (7-MS-LS2-5) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • Kudzu (7-MS-LS2-4) • Desertification (7-MS-LS2-5) 	<p><u>LDOE Formative Assessment Sets</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • Coral (7-MS-LS2-4, 7-MS-LS4-4) • Dead Zone (7-MS-LS1-7, 7-MS-LS2-5) <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> • Task Set: Zebra Mussels (7-MS-LS2-4, 7-MS-LS2-5) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • N/A
<p>Genetics and Inheritance of Traits (Louisiana Scope and Sequence Unit)</p>	<p><u>LDOE Formative Assessment Items</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • Whiptails, Siblings, Cystic Fibrosis, Amoebas (7-MS-LS3-2) • Anoles, Feral Chickens (7-MS-LS4-4) • Arctic Apples, Shar Pei (7-MS-LS4-5) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 35 (7-MS-LS4-4) • 39 (7-MS-LS4-5) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • N/A 	<p><u>LDOE Formative Assessment Sets</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • Coral (7-MS-LS2-4, 7-MS-LS4-4) <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> • Item Set: Spider Plants (7-MS-LS3-2, 7-MS-LS4-4) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • Item Set: Reintroduction of the Takhi (7-MS-LS4-4, 7-MS-LS4-5)
<p>Additional Standards</p>	<p><u>LDOE Formative Assessment Items</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • White Chuck Glacier (7-MS-ESS3-5) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 36 (7-MS-ESS3-5) 	<p><u>LDOE Formative Assessment Sets</u> (Password-Educate2020):</p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Practice Test Sets:</u></p> <ul style="list-style-type: none"> • N/A

Unit	Discrete Items	Sets
Additional Standards <i>cont.</i>	<u>LEAP Assessment Guide Items:</u> <ul style="list-style-type: none"> • N/A 	<u>LEAP Assessment Guide Sets:</u> <ul style="list-style-type: none"> • N/A

*set includes a performance expectation from a previous unit

+set includes a performance expectation not fully covered in this scope and sequence