

2016-2017 Science Standards Review

Vision: Middle School Integrated Learning Model

Historically, middle school science expectations in Louisiana have been organized in content-specific domains at specific grade levels. Sixth-grade expectations have focused on physical science, seventh-grade expectations on life science, and eighth-grade expectations on earth and space science. The middle school science workgroup members acknowledge that this organization of middle school science grade-level expectations presents the following challenges for students:

1. **Isolated content:** Students have limited opportunities to make interdisciplinary connections across science domains.
2. **Knowledge retention:** Large lapses in time between instruction in specific areas of content (life science, physical science, and earth and space science) prevent students' retention of knowledge and skill development, which often causes teachers to reteach standards from previous grade levels and/or leave educational gaps within students learning. For example, students take life science in seventh grade then take an end-of-course (EOC) assessment in high school Biology. This typically leaves a two-year gap between when students take life science in middle and high school.
3. **Developmental appropriateness and alignment to math standards:** Students are introduced to science skills and knowledge that is beyond their conceptual and developmental abilities, and they are dependent on math skills that are not yet acquired. This is especially evident in sixth grade physical science. The content needed in middle school physical science requires a level of math that students are often not introduced to until the seventh or eighth grade.

To address these concerns, the middle school workgroup members propose an integrated course progression for sixth, seventh, and eighth grades. The middle school workgroup members used the following criteria to arrange the standards into specific grade levels:

1. **Connected:** Each grade level includes standards for physical, life, and earth and space science.
2. **Appropriate:** Standards are organized by grade level according to content complexity and conceptual and developmental appropriateness.
3. **Aligned:** Standards are aligned with the Louisiana Student Standards for Mathematics.
4. **Coherent:** Common threads of learning occur across grade levels and within grade levels.

The chart below details the proposed topic arrangement of the middle school performance expectations.

Domains	Sixth Grade	Seventh Grade	Eight Grade
Physical Science	<p>Matter and Its Interactions PS1.A Structure and Properties of Matter</p> <p>Motion and Stability: Forces and Interactions PS2.A Forces and Motion PS2.B Types of Interactions</p> <p>Waves and Their Applications in Technologies for Information Transfer PS4.B Electromagnetic Radiation</p>	<p>Matter and Its Interactions PS1.A Structure and Properties of Matter PS1.B Chemical Reactions</p> <p>Energy PS3.A Definitions of Energy PS3.B Conservation of Energy and Energy Transfer PS3.C Relationships Between Energy and Forces PS3.D Energy in Chemical Processes and Everyday Life</p>	<p>Matter and Its Interactions PS1.A Structure and Properties of Matter PS1.B Chemical Reactions</p> <p>Energy PS3.A Definitions of Energy PS3.B Conservation of Energy and Energy Transfer</p> <p>Waves and Their Applications in Technologies for Information Transfer PS4.A Wave Properties</p>
Life Science	<p>From Molecules to Organisms: Structures and Process LS1.A Structure and Function</p> <p>Ecosystems: Interactions, Energy, and Dynamics LS2.A Interdependent Relationships in Ecosystems LS2.B Cycle of Matter and Energy Transfer in Ecosystems</p>	<p>From Molecules to Organisms: Structures and Process LS1.A Structure and Function LS1.B Growth and Development of Organisms LS1.C Organization for Matter and Energy Flow in Organisms</p> <p>Ecosystems: Interactions, Energy, and Dynamics LS2.C Ecosystems Dynamics, Functioning, and Resilience</p> <p>Biological Evolution: Unity and Diversity LS4.B Natural Selection</p>	<p>From Molecules to Organisms: Structures and Process LS1.B Growth and Development of Organisms</p> <p>Heredity: Interactions, Energy, and Dynamics LS3.A Inheritance of Traits LS3.B Variation of Traits</p> <p>Biological Evolution: Unity and Diversity LS4.A Evidence of Common Ancestry and Diversity LS4.C Adaptation</p>
Earth & Space Science	<p>Earth's Place in the Universe ESS1.A The Universe and Its Stars ESS1.B Earth and the Solar System</p> <p>Earth's Systems ESS2.C The Roles of Water in Earth's Surface Processes</p> <p>Earth and Human Activity ESS3.C Human Impacts on Earth Systems</p>	<p>Earth's Systems ESS2.C The Roles of Water in Earth's Surfaces ESS2.D Weather and Climate</p> <p>Earth and Human Activity ESS3.D Global Climate Change</p>	<p>Earth's Place in the Universe ESS1.C The History of Planet Earth</p> <p>Earth's Systems ESS1.C The History of Planet Earth ESS2.A Earth's Materials and Systems ESS2.B Plate Tectonics and Large Scale Systems Interactions</p> <p>Earth and Human Activity ESS3.A Natural Resources ESS3.B Natural Hazards ESS3.C Human Impacts on Earth Systems</p>