

Louisiana Student Standards for Science

The Louisiana Student Standards for Science were created by over eighty content experts and educators with input from parents and teachers from across the state. Educators envisioned what students should know and be able to do to compete in our communities and created standards that would allow students to do so. The Louisiana Student Standards for Science provide appropriate content for all grades or courses, maintain high expectations and create a logical connection of content across and within grades.

The Louisiana Student Standards for Science represent the knowledge and skills needed for students to successfully transition to postsecondary educations and the workplace. The standards call for students to:

- Apply content knowledge
- Investigate, evaluate, and reason scientifically
- Connect ideas across disciplines

The Louisiana Student Standards do not dictate curriculum or teaching methods. Decisions about how to teach these expectations are left to local districts, schools, and teachers.

Structure and Components of the Standards

The Louisiana Student Standards for Science are arranged by grade levels for kindergarten through grade 8 and content areas for high school. The standards include:

- **Performance expectations** define what students should be able to do by the end of the year.
- **Science and engineering practices** are the practices that scientists and engineers use when investigating real world phenomena and designing solutions to problems. There are eight science and engineering practices that apply to all grade levels and content areas.
 1. Asking questions (science) and defining problems (engineering)
 2. Developing and using models
 3. Planning and carrying out investigations
 4. Analyzing and interpreting data
 5. Using mathematical and computational thinking
 6. Constructing explanations (science) and designing solutions (engineering)
 7. Engaging in argument with evidence
 8. Obtaining, evaluating, and communicating information
- **Disciplinary Core Ideas** describe the most essential ideas (content) in the major science disciplines that students will learn. Disciplinary Core Ideas are grouped into five science domains.
 1. Physical Science (PS)
 2. Life Science (LS)
 3. Earth and Space Science (ESS)
 4. Environmental Science (EVS)
 5. Engineering, Technology, and Applications of Science (ETS)
- **Crosscutting Concepts** are common themes that have application across all disciplines of science and allow students to connect learning within and across grade levels or content areas. The seven crosscutting concepts apply to all grade levels and content areas.
 1. Patterns
 2. Cause and effect
 3. Scale, proportion, and quantity
 4. Systems and System Models
 5. Energy and matter
 6. Structure and function
 7. Stability and change
- **Clarification statements** provide examples or additional explanation to the performance expectation.

Interpreting Standard Codes

Each performance expectation is identified by a code and descriptor. The coding is derived by the following formula: Grade level-Domain and Topic Number- Performance Expectation Number (space)

| | |
|---|--|
| 3-PS2-1 Motion and Stability: Forces and Interactions | The grade level is 3, the domain is Physical Science, the topic number is 2, and the performance expectation number is 1. The descriptor is, "Motion and Stability: Forces and Interactions." |
| 7-MS-ESS2-4 Earth's Systems | The grade level is 7, the standard is middle school, the domain is Earth and Space Science, the topic number is 2, and the performance expectation is 4. The descriptor is, "Earth's Systems." |
| HS-LS1-1 From Molecules to Organisms: Structures and Processes | The standard is high school, the domain is Life Science, the topic number is 1, and the performance expectation number is 1. The descriptor is, "From Molecules to Organisms: Structures and Processes." |

Diagram illustrating the components of a standard code and the structure of the Louisiana Student Standards Science document.

Standard Code: 8-MS-PS1-1

- Grade Level:** 8 (indicated by a green circle)
- Domain:** MS (Middle School)
- Topic Number:** 1 (indicated by a green circle)
- Performance Expectation:** 1 (indicated by a green circle)

Descriptor: Matter and Its Interactions

Document Structure:

| Performance Expectation | Clarification Statement |
|--|--|
| Develop models to describe the atomic composition of simple molecules and extended structures. | Emphasis is on developing models of molecules that vary in complexity. Examples of extended structures could include minerals such as but not limited to halite (NaCl), agate (SiO ₂), calcite (CaF ₂), or sapphire (Al ₂ O ₃). Examples of molecular-level models could include drawings, 3-D models, or computer representations showing different molecules with different types of atoms. |

Science & Engineering Practices

- Asking questions (for science) and defining problems (for engineering)
- Developing and using models: Modeling in 6–8 builds on K–5 experiences and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
 - Develop and/or use a model to predict and/or describe phenomena.
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

STRUCTURE AND PROPERTIES OF MATTER
Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS.PS1A.a)
Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS.PS1A.e)

Crosscutting Concepts

SCALE, PROPORTION, AND QUANTITY
Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

DEPARTMENT of EDUCATION
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1

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