

**IDAHO STANDARDS FOR INITIAL CERTIFICATION OF
PROFESSIONAL SCHOOL PERSONNEL**



Idaho State Board of Education

Idaho State Department of Education

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Idaho Foundation Standards for Science Teachers

All teacher preparation programs are expected to meet the Idaho Core Teacher Standards and the standards specific to their discipline area(s). Additionally, all teacher candidates are expected to meet the requirements defined in State Board Rule (08.02.02: Rules Governing Uniformity).

The following knowledge and performance statements for the Science Teacher Standards are widely recognized, but not all-encompassing or absolute, indicators that teacher preparation programs have met the standards. The evidence validating candidates' ability to demonstrate these standards shall be collected from a variety of settings including, but not limited to, courses, practicum, and field experiences. It is the responsibility of a teacher preparation program to use indicators in a manner that is consistent with its conceptual framework and that assures attainment of the standards.

In addition to the standards listed here, science teachers must meet Idaho Core Teacher Standards and at least one of the following: (1) Idaho Standards for Biology Teachers, (2) Idaho Standards for Chemistry Teachers, (3) Idaho Standards for Earth and Space Science Teachers, (4) Idaho Standards for Natural Science Teachers, (5) Idaho Standards for Physical Science Teachers, or (6) Idaho Standards for Physics Teachers.

An important component of the teaching profession is a candidate's disposition. Professional dispositions are how candidates view the teaching profession, their content area, and/or students and their learning. Every teacher preparation program at each institution is responsible for establishing and promoting a comprehensive set of guidelines for candidate dispositions.

Standard 1: Learner Development. The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Knowledge

1. The teacher knows how students use Science and Engineering Practices and Crosscutting Concepts to develop understanding of the Disciplinary Core Ideas.
2. The teacher knows common misconceptions and/or partial understandings of scientific disciplinary core ideas and how they develop and affect student learning.

Performance

1. The teacher addresses common misconceptions and/or partial understandings of scientific disciplinary core ideas as they develop and affect student learning.
2. The teacher utilizes Science and Engineering Practices and Crosscutting Concepts to develop student understanding of the Disciplinary Core Ideas.

Standard 2: Learning Differences. The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Standard 3: Learning Environments. The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

Standard 4: Content Knowledge. The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Knowledge

1. The teacher understands the Idaho State Science Standards within their appropriate certification, including all components.
2. The teacher is familiar with how history has shaped our current understanding of the nature of science and scientific processes.
3. The teacher understands the core ideas of their respective discipline (i.e. Disciplinary Core Ideas).
4. The teacher understands the interconnectedness among the science disciplines (i.e. Crosscutting Concepts).
5. The teacher understands the processes of science (i.e. Science and Engineering Practices).

Performance

1. The teacher designs and implements lessons (e.g. activities, demonstrations, laboratory and field activities) that align with Idaho State Science Standards within their appropriate certification.
2. The teacher uses diverse examples from history to teach how our current understanding of the nature of science and scientific processes has changed.
3. The teacher uses the core ideas of their respective discipline (i.e. Disciplinary Core Ideas) to design and implement lessons.
4. The teacher designs and implements lessons (e.g. activities, demonstrations, laboratory and field activities) that align with Idaho State Science Standards within their appropriate certification.
5. The teacher models and guides students in the use of the processes of science. (i.e. Science and Engineering Practices).

Standard 5: Application of Content. *The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.*

Knowledge

1. The teacher knows how to apply science and engineering practices to propose, investigate, and evaluate possible solutions to problems.

Performance

1. The teacher designs opportunities to apply science and engineering practices to propose, investigate, and evaluate possible solutions to problems.

Standard 6: Assessment. *The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.*

Standard 7: Planning for Instruction. *The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.*

Standard 8: Instructional Strategies. *The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.*

Knowledge

1. The teacher understands how to implement Science and Engineering Practices in instructional planning.
2. The teacher understands how to use research based best practices to engage a diverse group of students in learning science (e.g. project-based learning, 5E Instruction, place-based).
3. The teacher understands how to apply mathematics and technology to analyze, interpret, and display scientific data.
4. The teacher understands technical writing as a way to communicate science concepts and processes.

Performance

1. The teacher implements Science and Engineering Practices in instructional planning.
2. The teacher uses research based practices to engage a diverse group of students in learning science (e.g. project-based learning, 5E Instruction, place-based).

3. The teacher designs lessons which allow students to utilize mathematics and technology to analyze, interpret, and display scientific data.

Standard 9: Professional Learning and Ethical Practice. The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Knowledge

1. The teacher understands the importance of keeping current on research related to how students learn science.
2. The teacher understands the importance of keeping current on scientific research findings.

Performance

1. The teacher incorporates current research related to student learning of science into instructional design.
2. The teacher incorporates current scientific research findings into instructional design.

Standard 10: Leadership and Collaboration. The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

Standard 11: Safety - The science teacher demonstrates and maintains chemical safety, safety procedures, and the ethical treatment of living organisms needed in the science classroom appropriate to their area of licensure.

Knowledge

1. The teacher knows how to design activities that demonstrate the safe and proper techniques for the preparation, storage, dispensing, supervision/inventory, and disposal of all materials used within their subject area science instruction.
2. The teacher understands how to design activities that demonstrate an ability to implement emergency procedures and the maintenance of safety equipment, policies and procedures that comply with established state and/or national guidelines.
3. The teacher understands how to ensure safe science activities appropriate for the abilities of all students.
4. The teacher understands how to design activities that demonstrate ethical decision-making with respect to the treatment of all living organisms in and out of the classroom. They emphasize safe, humane, and ethical treatment of animals and comply with the legal restrictions on the collection, keeping, and use of living organisms.

5. The teacher knows how to evaluate a facility for compliance with safety regulations.
6. The teacher knows how to procure and use Material Safety Data Sheets (MSDS).

Performance

1. The teacher designs activities that demonstrate the safe and proper techniques for the preparation, storage, dispensing, supervision/inventory, and disposal of all materials used within their subject area science instruction.
2. The teacher designs activities that demonstrate an ability to implement emergency procedures and the maintenance of safety equipment, policies and procedures that comply with established state and/or national guidelines.
3. The teacher ensures safe science activities appropriate for the abilities of all students.
4. The teacher designs activities that demonstrate ethical decision-making with respect to the treatment of all living organisms in and out of the classroom. They emphasize safe, humane, and ethical treatment of animals and comply with the legal restrictions on the collection, keeping, and use of living organisms.
5. The teacher demonstrates the ability to evaluate a facility for compliance to safety regulations.
6. The teacher demonstrates the ability to procure and use Material Safety Data Sheet (MSDS).

Standard 12: Laboratory and Field Activities - The science teacher demonstrates competence in conducting laboratory, and field activities.

Knowledge

1. The teacher knows a variety of laboratory and field techniques appropriate to their content area.
2. The teacher knows a variety of strategies to develop students' laboratory and field skills.

Performance

1. The teacher engages students in a variety of laboratory and field techniques appropriate to their content area.
2. The teacher uses a variety of instructional strategies in laboratory and field experiences to engage students in developing their understanding of the natural world.

Idaho Standards for Earth and Space Science Teachers

All teacher preparation programs are expected to meet the Idaho Core Teacher Standards and the standards specific to their discipline area(s). In addition to the standards listed here, earth and space science teachers must meet Idaho Foundation Standards for Science Teachers. Additionally, all teacher candidates are expected to meet the requirements defined in State Board Rule (08.02.02: Rules Governing Uniformity).

The following knowledge and performance statements for the earth and space science teacher standards are widely recognized, but not all-encompassing or absolute, indicators that teacher preparation programs have met the standards. The evidence validating candidates' ability to demonstrate these standards shall be collected from a variety of settings including, but not limited to, courses, practicum, and field experiences. It is the responsibility of a teacher preparation program to use indicators in a manner that is consistent with its conceptual framework and that assures attainment of the standards.

An important component of the teaching profession is a candidate's disposition. Professional dispositions are how candidates view the teaching profession, their content area, and/or students and their learning. Every teacher preparation program at each institution is responsible for establishing and promoting a comprehensive set of guidelines for candidate dispositions.

Standard 1: Learner Development. The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard 2: Learning Differences. The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Standard 3: Learning Environments. The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

Standard 4: Content Knowledge. The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Knowledge

1. The teacher understands the major underlying theories and principles of Earth's place in the universe including; the universe and its stars, Earth and the solar system, the history of planet Earth, radiometric dating, and electromagnetic radiation.

2. The teacher understands major underlying theories and principles of Earth's systems including; plate tectonics, Earth materials and systems, the roles of water in Earth's surface processes, weather and climate, and biogeology.
3. The teacher understands the major underlying theories and principles of Earth and human activity including; natural resources, natural hazards, human impacts on Earth systems, and global climate change.

Performance

1. The teacher develops lessons based on the major underlying theories and principles of Earth's place in the universe including; the universe and its stars, Earth and the solar system, the history of planet Earth, radiometric dating, and electromagnetic radiation.
2. The teacher develops lessons based on the major underlying theories and principles of Earth's systems including; plate tectonics, Earth materials and systems, the roles of water in Earth's surface processes, weather and climate, and biogeology.
3. The teacher develops lessons based on the major underlying theories and principles of Earth and human activity including; natural resources, natural hazards, human impacts on Earth systems, and global climate change.

Standard 5: Application of Content. The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Standard 6: Assessment. The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Standard 7: Planning for Instruction. The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Standard 8: Instructional Strategies. The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Standard 9: Professional Learning and Ethical Practice. The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Standard 10: Leadership and Collaboration. The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.