

2017 Idaho Science Standards White Paper

Science Standards Recommendation

We, the Executive Committee on the Idaho Science Standards Revision, recommend that the Idaho State Department of Education adopt the Idaho State Science Standards. Idaho has a long tradition of local ownership of the educational process and the revised science standards have been created by Idaho's K-16 educators for use in Idaho's science classrooms.

What is Science?

Science is the coordination of a body of knowledge about the natural world and a set of practices that enable humans to explore and understand that world. Science is truly the original human endeavor. Natural explanations for observed phenomena based on empirical evidence.

What were the weaknesses of our most recent science standards?

Last year's standards that were in place for Idaho K-12 classrooms underwent revisions. The Science Standards are in Temporary Rule status until the 2018 Legislative Session. Five standards are out for additional public comment. After negotiated rule making, the removed and revised standards will return to the 2018 Legislative Session as pending rule. The 2017 Science Standards are a much-improved set of science standards when compared to the prior science standards.

Prior Idaho Science Standards were broad and vague in nature. National and local evaluations of the prior standards indicated a lack of clarity in science content topics and practices. That made it very difficult to assess student achievement of these standards as they lack clear performance expectations. Inquiry-based learning methods are a best practice in the field of science education and were missing from the 2016 Idaho Science Standards. Standards must contain a planned scope and sequence of practices and content themes that spirals from kindergarten all the way up to high school science.

Why revise Idaho Science Standards?

Science, as a practice, is dynamic in nature. The 2016 science standards document, originally adopted in 2001, had few changes over the adoption period. In the last fifteen years, there have been significant advancements in science and technology; requiring updated science standards. Science classrooms offer a unique opportunity for students to practice 21st century learning skills that will enable them to be more scientifically industrious in future endeavors. When comparing science standards with the revised science standards, it is clear that the new science document contains updated content that provides a fresh approach to teaching science content.

Revising Idaho's science standards allows for the integration of "knowing science" and "doing science". Conceptual understanding of content will require practicing science in place of memorizing facts. Structuring science standards around performance expectations makes mastery assessment of student knowledge an embedded component of science education. Updated science standards in Idaho will allow for learning experiences that will increase content knowledge as well as scientific practices in Idaho's K-12 classrooms. Idaho's post-secondary institutions have been delivering a version of science standards similar to the revised Idaho Science Standards document in their science and science education departments, for guiding graduates in these technical fields.

Best Practices

Revised Idaho science standards provide rigor when we teach science with a new vetted approach, which means incorporating 21st Century science content and practices. These include adding the following topics into the 2017 science standards:

- Asking questions/Defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computer technology and computational thinking
- Constructing explanations/Designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information
- Identifying patterns
- Cause and effect
- Scale, proportion and quantity
- Systems and system models
- Energy and matter: flows cycles and conservation
- Structure and function
- Stability and change

Science Committee Members:

- Jason George, Vision Charter, High School Science Coordinator, National Presidential Award Recipient
- Chris Taylor, Boise School District, K-12 Science/Social Studies Coordinator
- Chris Stoker, West Ada School District, STEM Coordinator
- Melyssa Ferro, Syringa Middle, Caldwell, Science Teacher, National Presidential Award Recipient, Idaho Teacher of the Year Award
- Erin Johnson, Aberdeen Middle School Science Teacher, Idaho Science Teacher Association
- Scott Ray, Malad Middle School Science Teacher
- Joe Kelly, Science Coordinator West Ada School District
- Sarah Anderson, Boise State University Department of Education
- Tanya Elmer, Eagle High School Chemistry Teacher, West Ada School District
- Ralph Peterson, North Gem High School Science Teacher, Idaho Science Teacher Association
- Karen Abbot, Boise School District (retired), Idaho Presidential Award Recipient
- Tauna Johnson, Genesee Elementary School, National Presidential Award Recipient
- Zoe Jorgensen, Bush Elementary School Idaho Falls, Idaho Presidential Award Recipient
- Anne Siefert, Idaho National Lab K-12 STEM Coordinator, National STEM Leadership Award
- Scott Smith, State Department of Education, K-12 Science and STEM Coordinator
- Scott Cook, State Department of Education, Director, Academic Services/Support/Professional Development
- Angela Hemingway, Governor's Idaho STEM Action Center, Executive Director
- Alison Henken, Idaho State Board of Education, Accountability and Projects Program Manager
- Heidi Arrate, State Department of Education, ISAT & Science EOC Specialist
- Dr. Ken Wareham, Lewis and Clark State College Department of Education
- Xochi Campos, BSU Pre-Service Teacher and Biologist
- Marilyn Whitney, Senior Special Assistant for Education at Office of Governor Otter
- Micah Lauer, Heritage Middle School West Ada School District, National Presidential Award Recipient
- Dr. Bob Compton, veterinarian and patron, Midvale, Idaho
- Tammy Nichols, parent and patron, Middleton, Idaho