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 our 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 must be based on empirical evidence.

What are the weaknesses of our current science standards?

Science standards are currently in place for K-12 classrooms in Idaho. These standards are very broad and vague in nature. National and local evaluations of these current standards indicate a lack of clarity in science content topics. This makes it very difficult to assess student achievement of these standards because there are not clear performance expectations embedded in them. Inquiry-based learning methods are a best-practice in the field of science education yet they are missing from the Idaho Science document. Another valid criticism of the current science document that that it fails to adequately link math and English Language Arts practices to key scientific applications. Standards should contain a planned scope and sequence of practices and content themes that spirals from kindergarten all the way through to high school and yet the current standards are compartmentalized and full of gaps.

Why do we need to revise our science standards?

Science as a practice is dynamic in nature. Our current science standards document was originally adopted in 2001 with few significant changes in the interim. In the last fifteen years, there have been significant advancements in science and technology; therefore updated science standards are necessary. Science classrooms offer a unique opportunity for students to practice 21st century learning skills that will enable them to be more productive in their future endeavors. When comparing our current science standards with the revised science standards, it becomes clear that the document does not contain new content but is instead driven by a new approach to teaching that 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 this state will allow for learning experiences that will increase both content knowledge as well as scientific and engineering practices over time. This will eliminate the gaps and compartmentalization that is endemic in the current document.

National movement towards an updated version of science standards that is similar to Idaho's revised science standards document is dictating that professional development opportunities and curricular materials that are in development will align better with the revised document than with the current standards. Many of Idaho's post-secondary institutions are already using a version of science standards similar to the revised Idaho Science Standards document in their science and their science education departments to train potential graduates in these fields.

Our science standards are strengthened when we teach science with a Three-Dimensional approach. Teaching three dimensionally means incorporating science content with crosscutting concepts and science and engineering practices. These include adding the following topics into our 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

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