



NGSS Task Force Meeting Notes

Date Wednesday, August 21, 2013

Time 9:00 – 3:00

Location Science Center of Iowa, Des Moines, Iowa

MEMBERS PRESENT:

- DeEtta Andersen, Science Teacher, Center Point-Urbana Community School District, Center Point
- Ross Brunner, Student, Marion High School, Marion
- Kelly Carr, Science Teacher, Lewis Central Community School District, Council Bluffs
- Carleigh Cass, Student, Central Lee Middle School, Donnellson
- Leslie Flynn, Professor in Science Education, University of Iowa, Iowa City
- Ken Harrison, Director of Curriculum, Instruction and Assessment, Chariton Community School District, Chariton
- Melissa Hesner, Science Consultant, Area Education Agency 267, Cedar Falls
- Jill Jennings, Parent and Substitute Teacher, Spirit Lake
- Mike Knedler, State Board of Education Member, Council Bluffs
- Jerrid Kruse, Professor of Science Education, Drake University, Des Moines
- Christopher Like, Science Teacher, Bettendorf Community School District, Bettendorf
- Mark McDermott, Senior Test Development Associate, ACT, Inc., Iowa City
- Leslie Miller, Professor of Computer Science, Iowa State University, Ames
- David Moore, Hardware Operations Manager-Council Bluffs, Google, Council Bluffs
- Scott Moran, School Improvement Coordinator, Denison Community School District, Denison
- Nancy Movall, K-12 Online Learning Specialist, Iowa's Area Education Agencies, Council Bluffs
- Denise Mulcahy, Director of Teaching and Learning, Diocese of Des Moines
- Dawn Posekany, Science Teacher, Solon Community School District, Solon
- Joseph Schwanebeck, Director of Education, Science Center of Iowa, Des Moines
- Amy Sinclair, State Senator, Allerton
- Stacey Snyder, Science Education Instructor, Wartburg College, Waverly
- Joshua Steenhoek, Elementary Teacher, Pella Community School District, Pella
- Kevin Vidergar, Director of Teaching and Learning, Perry Community School District, Perry
- Kimberly Villotti, Education Consultant, Iowa Department of Education, Des Moines
- Kari Webb, Regional STEM Manager, Governor's STEM Initiative, Estherville

- Mike Wedge, Science Teacher and Science/STEM Coordinator, Sibley-Ocheyedan Community School District, Sibley
- Aaron Wills, Student, Central Lee Middle School, Donnellson

AGENDA ITEM: Framework

Expected Outcome I can explain the first tier of the two-step process for NGSS development	Lead Tami Plein	Follow Up
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Tami Plein, a science consultant for Great Prairie Area Education Agency, provided background information about current science standards in Iowa and how they were related to the NGSS.

Standards-based reform began in the 1980s with the Nation At Risk Report. The American Association for the Advancement of Science was formed and Project 2061 was started. The result was the release of a 1985 document called Science for All Americans, which outlined what was important for the next generation to know in order to become a science-literate adult.

In 1993, the Benchmarks for Science Literacy were created. They used the information for what made a scientific-literate adult and then created an outline for what knowledge should be learned at each grade level. However, there was too much information that could be taught in 13 years of public education. Iowa school districts were allowed to select which information was taught, thus some students who changed districts repeated information or missed important elements.

In 1996, the National Research Council released the National Science Education Standards. The standards derived from the Benchmarks and were an attempt to create national science standards. However, in Iowa depending upon the school district, teachers could follow these new standards, continue with the Benchmarks or write their own curriculum based on the science textbook.

In 2005-06, a group of Iowans decided the state’s approach to standards was not appropriate for student learning. Information from the Benchmarks and the Standards documents was used to create the Iowa Core. The Iowa Core was designed to be a set of guidelines that would help districts develop curriculum, so Iowa’s school districts would be more uniform in what was being taught. The Iowa Legislature adopted the Iowa Core Curriculum in 2008. In 2012, all Iowa high schools were to have implemented the standards.

In 2010, the Common Core was introduced for math and English language arts. It does not set standards for science.

Rita Martens, a lead consultant for the Iowa Core, explained the Iowa Core was an attempt to establish uniform curriculum and align standards while still allowing Iowa’s school districts to create their own plan of implementation. She said there has not been a study or other information

about how the Iowa Core is being implemented across the state. Any information the State Department of Education has is anecdotal from the field.

In 2014, school districts will begin implementing the Iowa Core for grades kindergarten through eight.

Martens told task force members their role is to make a recommendation to the Iowa State Board of Education about whether to adopt or not adopt the NGSS. If no adoption is made, then Iowa will proceed with the concepts and skills outlined in the Iowa Core for science.

Task force member Amy Sinclair, a state senator from Allerton, questioned why the state would move forward with new standards when the Iowa Core has not yet been fully implemented.

Plein told task force members the Iowa Core is that it is based on two documents – the Benchmarks and the Standards that used data from 2 ½ decades ago. The NGSS take into account new research that has happened since the original standards documents were written. This information was used in 2010-2011 by a group of scientists, educators, engineers and others across the United State to write a document called The Framework. The Framework was used by an organization called Achieve to create the NGSS (2011-2013).

Plein told task force members that the Iowa Core and the new NGSS align in the sense that they both were written based on the Benchmarks and Standards documents, but the NGSS take into account new research.

The Framework has three components:

- The Vision – science education combined with guiding assumptions and organization.
- The 3 Dimensions – practices, crosscutting concepts and disciplinary core ideas.
- Realizing the Dream – how to implement the standards; suggestions for the future; integrations; guidance for standards’ developers; diversity and equity issues.

The Framework is built on learning progressions through the grade levels, the idea that everything cannot be covered, students need to have a purpose for why they are learning something, and that the concepts learned need to be placed in an appropriate context to teach students why they need to learn it.

Yvette McCulley, the science consultant for the Iowa Department of Education, explained the purpose of the Framework as a skeleton for creating the standards. The assessment of the standards, the curricula for teaching them, the way they are taught and how teachers are trained to teach them is all yet to be created. Iowa’s school districts will still have the authority to do these things under NGSS.

AGENDA ITEM: Standard writing and Iowa participation

Expected Outcome I can articulate the Iowa lead state vetting process used during development of the NGSS	Lead Yvette McCulley	Follow Up
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Yvette McCulley, the science consultant for the Iowa Department of Education, explained to task force members Iowa’s involvement in the creation of NGSS.

Forty-one writers worked together through Achieve to examine the Framework and write the NGSS. States were asked whether they wanted to have input along the way in the process. Iowa’s former state education director Jason Glass decided Iowa would be one of 26 states involved in the process of reviewing the standards and providing feedback which writers would take into account during the editing process. Other stakeholders included the National Science Teachers Association and business and physics teachers. Iowa was part of the college and career readiness group and sent college teachers to examine the standards early in the process.

In Iowa, there were three review periods – Fall and Winter 2012 and Winter 2013 – in which between 6,000 and 7,000 Iowans came together to review the standards and provide feedback.

Several concerns and issues were expressed during the nationwide review process. In the end, this is what happened:

- There were concerns there was too much material, so 33 percent was taken out.
- The language/meanings weren’t clear enough, so clarification statements were added.
- There were concerns about including engineering and technology because engineering is new in science curriculum. This is now called engineering design and is defined as how something can be done in a better way.
- They wanted to know how and what support school districts and states would receive to implement NGSS. This is currently still being determined.

After all of the changes were made, the National Research Council reviewed the NGSS and determined it met its vision of the Standards document.

Task force members wanted to know if Iowans had already participated in the process, then why were they once again being asked to review them.

Rita Martens, a lead consultant for the Iowa Core, said the standards have already been created; the task force’s duty is to determine whether the NGSS are appropriate for Iowa and make a recommendation to the State Board of Education.

AGENDA ITEM: Dimensions and architecture

Expected Outcome I can understand the architecture well enough to investigate individual standards	Lead Phyllis Anderson	Follow Up
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Phyllis Anderson, a science consultant for the Grant Wood Area Education Agency, explained to the task force the dimensions and architecture of the Iowa Core and the NGSS.

According to the NGSS performance expectations, there are three dimensions of what students will be able to do after they have learned the content:

- Science and engineering practices, which was listed before as “inquiry” and in a separate section.
- Disciplinary core ideas, which were previously in the back of the book and not looked at.
- Crosscutting concepts.

If these three things are done together, research suggests students have a better chance of understanding how science works and at a deeper level.

Anderson then asked task force members to create a list of what scientists and engineers do. Task force members came up with most of the items on Anderson’s list:

- Ask questions and define problems.
- Develop and use models.
- Plan and carry out investigations.
- Analyze and interpret data.
- Use math, information and computer technology, and computational thinking.
- Construct explanations and design solutions.
- Engage in argument from evidence.

Anderson explained how which core ideas were made part of NGSS. For content to be considered core (for grades kindergarten through 12), it had to:

- Have a broad importance across multiple disciplines or be a key thing for that discipline.
- Be a key tool for developing more complex ideas.
- Relate to students and their concerns.
- Be teachable and learnable over multiple grades with more depth and concentration.

Anderson also explained that there are appendices in NGSS that explain how to teach the various standards to a wide range of diverse students: i.e. special education, English Language Learners and gifted students.

AGENDA ITEM: Conceptual Shifts

Expected Outcome I can appreciate the educational shifts that are apparent in the NGSS	Lead Kim Wise	Follow Up
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Kim Wise, science consultant for the Green Hills Area Education Agency, explained the conceptual shifts involved with NGSS:

- K-12 science education should reflect the interconnected nature of science as it is practiced and experienced in the real world.
- NGSS are student performance expectations, not curriculum.
- Science concepts build coherently from grades kindergarten through 12.
- NGSS focuses on deepening the understanding of content as well as the application of content.
- Science and engineering are integrated in NGSS from grades kindergarten through 12.
- NGSS content is focused on preparing students for the next generation workforce.
- NGSS and common core state standards (English language arts and math) are aligned.

Yvette McCulley, the science consultant for the Iowa Department of Education, explained that with the NGSS, it opens a national discussion about science standards that is difficult to do otherwise because Iowa's standards do not align with other states'. She said she is already seeing state-to-state discussion and interaction regarding task forces that are meeting to discuss these standards. She also said national discussion is already occurring in English language arts and math, where Iowa's standards to align with other states.