



NGSS Task Force Meeting Notes

Date Wednesday, September 18, 2013

Time 10:00 – 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
- Dan Kelley, State Representative, Newton
- 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
- Kimberly Villotti, Education Consultant, Iowa Department of Education, Des Moines
- Kari Webb, Regional STEM Manager, Governor's STEM Initiative, Estherville
- Aaron Wills, Student, Central Lee Middle School, Donnellson

MEMBERS ABSENT:

- Kevin Vidergar, Director of Teaching and Learning, Perry Community School District, Perry
- Mike Wedge, Science Teacher and Science/STEM Coordinator, Sibley-Ocheyedan Community School District, Sibley

AGENDA ITEM: History of Iowa Core

Expected Outcome I understand the history behind the development of the Iowa Core.	Lead Rita Martens	Follow Up The Department of Ed will analyze feedback it has received from the school districts about implementation of the Iowa Core and will present this information to the taskforce at its next meeting.
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Notes:

Rita Martens, a lead consultant for the Iowa Core, explained to the task force the history behind the creation of the Iowa Core and that it was a result of direction from the Iowa Legislature.

Three pieces of legislation resulted in the Iowa Core:

2005 – Senate File 245 created voluntary model high school curriculum in literacy, math and science in an attempt to create a statewide understanding for schools of what is expected to be taught in those areas. The curriculum was limited to those three areas because of funding and resources.

2007 – Senate File 588 extends the voluntary curriculum to grades kindergarten through eight and added social studies and 21st Century skills, which are defined as financial, civic and health literacy, technology and employability skills.

2008 – Senate File 2216 made the curriculum mandatory for all students in order to provide a level playing field across the state of Iowa; to give students in K-12 a world-class curriculum; and to prepare students to live, work and succeed in the 21st Century.

The process in which the Iowa Core was created:

- A project lead team (representatives from the Iowa Parent Teacher Association, Institute for Tomorrow’s Workforce, Iowa Association of School Boards, School Administrators of Iowa, state universities and colleges, community colleges, the business industry and others) oversaw three different writing teams. The goal was to pull together the best minds in the state in the various areas and ask them to identify the critical content in each of these areas.

- Expert opinions were sought, and teams inquired and studied content to make sure they understood the cutting edge in research. I.e.: An expert from Harvard University spoke about how technology will play a role in the future. Teams were asked to think about what students in the future will need to know.
- There were many opportunities for review and input. As a result, pieces were selected from each of the content areas to determine what the final Core document would include.
- Surveys were conducted. There were 8,000 responses, and the information was used for one final refinement.
- The entire process took between six months to one year, depending on grade span and content area.

Essential concepts and skills were:

- Developed after a thorough investigation.
- A comprehensive set of recommendations based on national documents, research, local documents, assessments and best thinking.
- Defined as the most critical curriculum.
- Intended to foster an engaging learning environment in that they had relevance to students and engaged them to want to learn more.

The Legislature’s directives in regards to the Iowa Core were to have a plan in place for high school by 2010 and it be implemented by 2012. Elementary work came two years later with a plan in place by 2012 and implemented by 2014-15. An implementation planning guide was developed for districts.

The Department of Education will receive feedback from districts (the deadline was Sept. 1, 2013) about how the Core is being implemented. This information will be evaluated and provided to the taskforce at its next meeting.

AGENDA ITEM: Architecture of Iowa Core Science

<p>Expected Outcome I have the background of the process for how and why the science standards were developed for the Iowa Core.</p>	<p>Lead Shannon C’de Baca and Phyllis Anderson</p>	<p>Follow Up</p>
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Shannon C’de Baca, a course designer and teacher with Iowa Learning Online, and Phyllis Anderson, a science consultant with Grant Woods AEA, explained to the taskforce how the science portion of the Iowa Core was developed.

C’de Baca has worked as a science teacher and has helped to develop standards in other states. She said in Iowa those who were writing the standards wanted to ensure they had individuals involved from higher education and those who had previously worked with standards development. For her, it was important the standards make sense from the teacher’s perspective.

She initially wanted teachers to be able to see a piece of student's work that was completed based on the standards in order to better understand how they could teach that standard to the student. However, this was not possible in Iowa because of the cost associated with it.

The goal of the science core curriculum was to create a document that would give students the knowledge they needed in order to successfully go on to college or directly into the work force after high school. They wanted to make inquiry a separate area, but also include life, Earth and space science, and physical science, which was an area often skipped by school districts in their teaching. There also were deficiencies in the state in the teaching of Earth and space science.

The process for writing the science standards began with research and included examining the guidelines in Science for all Americans; Benchmarks for Science Literacy; National Science Education Standards; Atlas of Science Literacy, Volumes 1 and 2; and Inquiry and the National Science Education Standards. The only theory that was not included was the flat-Earth society.

C'de Baca said content was not a problem in Iowa; it was the way science curriculum was instructed. Writers wanted inquiry as a separate standard and to also weave it into the content standards of the Iowa Core, but there was not enough time to do so. She says she thinks the Next Generation Science Standards have accomplished this and do it well.

Another goal of the science standards for the Iowa Core was to create teaching for understanding so students had a scientific understanding of solving problems and how to interact with the natural world.

One of the resulting problems of the Iowa Core was that writers did not have enough time to pare down the amount of content in it. There is too much information, according to C'de Baca, especially in the life sciences area. It could not be covered in two years of biology.

The science document was structured with the following in mind:

- Essential skills and concepts are detailed in the form of quadrants with sample activities designed to help clarify the level of rigor. The level of rigor across the state was previously all over the board.
- Grain size. The level of detail for what was taught from the structure of atoms, the structure and properties of matter chemical reactions, motions and forces, etc., had to be carefully balanced at the various grade levels.
- Inquiry was included so students could identify questions and concepts that would guide their scientific investigations; design and conduct scientific investigations; use technology and mathematics to improve investigations and communications; and more. Anderson said the goal was to enable teachers to teach students how to think, not what to think.

If the science standards could have been done differently, C'de Baca said they would have:

- Worked to build consensus with the public.

- Reduced concept load (and included more application) to the essentials of learning (specifically in life and physical sciences) and integrated the various areas of science.
- Added more inquiry examples to create a more “real world” focus (in NGSS this is called cross-cutting concepts).

C’de Baca said NGSS is more useful and answers her questions as a teacher, and is what she wishes the Iowa Core would have been, but there was not enough money at the time to improve the Iowa Core to the level writers wanted.

Taskforce member Nancy Movall from AEA Online said she was concerned about the sustainability of both the Iowa Core and NGSS, and what kind of national support there would be if the state switched to NGSS.

C’de Baca talked about what is happening in Massachusetts and how districts gave their teachers a chance to adapt to the science standards, and that as a result, the students are testing at the top in the country in science and better internationally than students in Singapore and Japan. She said students in Massachusetts spend 30 percent of their time outside the classroom doing hands-on projects and that inquiry is a critical component of their learning style.

QUESTION FROM TASKFORCE: How does NGSS mirror what’s happening in Massachusetts, and what are the problems with NGSS?

C’de Baca said the format of NGSS needs to be more user friendly (the same is true with the Iowa Core), but that Iowa can modify it to fit its needs. There also is too much content in certain areas, and it requires a reliance that students are learning and understanding certain concepts at the elementary level in order to build upon these concepts in upper grade levels.

Massachusetts used an emerging NGSS document but will be adding additional components of the final NGSS document. The teachers were ready, the political will was there, and the funding was available in order for NGSS to be implemented in that state.

C’de Baca said one of the problems in Iowa is that students thought they were prepared to tackle college math and science, but found they weren’t. Seventy-six percent of students majoring in STEM (science, technology, engineering and mathematics) areas switch majors because they hit a wall in science or math class. They change their major to become an elementary teacher because it requires less math and science sequence.

C’de Baca said switching to NGSS should not hurt Iowa school districts because those that have already implemented the Iowa Core have found they need a document with more illustrations, more integration of STEM and more guidance on how they do this in their classrooms. NGSS does that. The Iowa Core can continue; NGSS will enhance what is already happening.

Taskforce member Leslie Miller, a professor of computer science at Iowa State University, said he thinks there needs to be more emphasis on computation and the role that computers will play in the future of science.

C’de Baca said NGSS leaves the door open so if a district thinks this is important (technological standards that were left out of the Iowa Core) it can be added.

Taskforce member David Moore, a hardware operations manager at Google in Council Bluffs, said sustainability is a big concern in two areas – the financial support and the ongoing evolution of science.

C’de Baca said she doesn’t think the Iowa Core is sustainable in its current condition for districts involved w/ the STEM groups because it doesn’t help them grow. Those districts will be looking for richer curriculum beyond the Iowa Core, which will likely lead to NGSS. For other districts, she thinks the core will sustain them for a few years, but as science advances and they realize the conceptual load in the Core, they will hit a wall, and will be asking for additional assistance from the AEA and others.

AGENDA ITEM: Panel of Iowa Core Writers

Expected Outcome I have information on how the science standards of the Iowa Core were written.	Lead Kris Kilibarda	Follow Up
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A panel of writers for the science standards of the Iowa Core answered questions and presented information. They were:

- Kari Pingel, a fifth-grade math and science in the Pella school district. She has taught for 20 years and helped write the third- through fifth-grade strand in the Iowa Core.
- Kris Kilibarda, a professor of science at Simpson College, who has a background in biology and chemistry. She served as the mediator of the panel discussion.
- Phyllis Anderson, who was a teacher for 15 years and is now a science consultant with Grant Woods AEA. She worked on kindergarten through eighth grade portion of the Iowa Core.
- Kathy McKee, the kindergarten through 12th-grade education coordinator at Blank Park Zoo. She previously worked as a consultant for the Iowa Department of Education and was part of the ninth- through 12-grade writing team of the Iowa Core.
- Shannon C’de Baca, a course designer and teacher with Iowa Learning Online, who also has been a classroom teacher and worked with other states to create science standards.

QUESTION: What are the differences between the model core and the Iowa Core?

McKee: The model core was a guideline to districts and wasn’t mandatory. It was for grades nine through 12, and was a tool districts could use to develop their curriculum.

QUESTION: What did the writers learn and see in the process?

Pingel: They learned that a lot of teachers weren't taking the time to research what was happening in science, and some students were receiving only 30 minutes of science a week. The writers wanted to find ways to get science back into the kindergarten through eighth-grade classrooms. The writing teams had lengthy discussions about how to integrate inquiry into the curriculum so that every district was teaching the concept to its students.

Anderson: Writers tried to integrate inquiry with content and give examples of how students would then be able to understand a concept. Writers wanted to go further, but they were limited with the format they had to use in writing the standards.

C'de Baca: She had hoped the model core would lead teachers to question what they were teaching and find better ways to teach it. That also was her hope for the creation of the Iowa Core. She thinks this has been successful for some districts, but others have a long way to go.

QUESTION: The Iowa Core went through many edits; how did it get better through the process?

Anderson: The writers wanted the core to include a learning progression. Months were spent putting various concepts into learning progressions, but then they had to be rewritten in a different format so the work was scrapped. The areas of "understands" and "applies knowledge" also were hang-ups in the writing process.

Pingel: Hours of discussion went into the creation of the science standards for the Iowa Core, and then the writers had the challenge of how to convey those areas to schools districts and teachers through words on paper.

QUESTION: If you had a magic wand, what would you do differently with the Iowa core?

Pingel: She wouldn't do much differently given the timeframe writers had to work with and that it represents what was happening with science at the time. She isn't well versed in NGSS yet but is impressed with the resources they had to create it. From what she has seen of it, there are great things in it.

C'de Baca: She would have less content and more integration; the core would find a way to illustrate student's work so teachers could see examples.

Kilibarda: She would create a better understanding to give teachers what they need to know in order for them to implement the learning progressions.

Anderson: She would like to give elementary teachers enough time to be able to teach science.

McKee: She would have liked kindergarten through eighth grade to be at the forefront of the implementation of the standards to ensure science was being taught at those levels, especially in kindergarten through fifth grade. She also would have liked to have found a way to incorporate inquiry throughout the science standards. She thinks NGSS does this; it shows progression and has a lot of elementary emphasis.

Taskforce member David Moore, a hardware operations manager at Google in Council Bluffs, asked how the writers defined what went into the core to make it a “world-class education.”

C’de Baca: The problem-solving component is richer and more integrated. Problem solving and critical thinking from evidence-type situations are what allow students to have richer understandings of science. “World class” requires inquiry, but the writers did not have enough time and resources to go as far with inquiry as they would have liked.

Kilibarda: Inquiry is a skill that needs to be taught, which is why it’s a separate area. Even though everything should be integrated, there are certain skills that needed to be highlighted on their own and inquiry was one of those.

Anderson: When writing the science standards, they had to be practical in what they could expect. They listened to kindergarten through second-grade teachers about what students can learn and comprehend in those grades.

Pingel: Writers paid attention to “grain size” and tried to make it so areas weren’t too specific or small that they couldn’t be taught.

McKee: They wanted districts to still have some local control and to develop their curriculum to meet the standards.

Pingel: The writers thought the progressions were helpful in giving districts the opportunity to do that.

Taskforce member Stacey Snyder, a science education instructor at Wartburg College in Waverly, said the Iowa Core becomes difficult when teachers don’t understand what to teach or the importance of progression.

Kilibarda: She is in favor of local control, but her nephew missed three consecutive years of critical skills because he changed school districts. That is what makes the progression level outlines important.

Taskforce member Amy Sinclair, a state senator from Allerton, asked what should be said to teachers who have taken the Iowa Core, put it in place, and are now being asked to do something different.

Anderson: The major topics in the Iowa Core and NGSS are very close, and she would feel confident telling a teacher that.

C’de Baca: She understands where the concern comes from. If the state chooses to proceed with NGSS, teachers will need to receive support in learning it and how to implement it, and the time to do so.

Sinclair asked how do they assure teachers that in five years, the standards won’t change.

McKee: The NGSS takes what they have in the Iowa Core and adds richness to its instruction that is more student centered with performance expectations that are not all teacher directed and are geared toward more of what they expect students to be able to do. The content is similar in both. She was a teacher, so she understands the potential questions and frustrations.

C’de Baca: It’s the same philosophy that every year the textbook changes to include better information but still some of the old information. The changes in textbook make teachers change the way they teach, so they evolve and become better teachers. The same process will occur with NGSS – if teachers understand the new document is richer and they will be become better at their craft, they’ll be more on board with it.

Pingel: Elementary teachers teach several subjects and are expected to be masters at all of them. The Iowa Core gives them the content they need, but it comes down to their teaching practice and their ability to make their students learn. It doesn’t matter what document or set of standards is put in front of them.

AGENDA ITEM: Panel of Educators

Expected Outcome	Lead	Follow Up
I understand the opportunities and challenges that educators believe exist for both the Iowa Core (science) and NGSS.	Jody Herbold	

Notes:

A panel of educators discussed the opportunities and challenges associated with the Iowa Core and NGSS. They were:

- Rob Kleinow, a science curriculum consultant at Heartland AEA, who previously taught middle school science.
- Josie Innis, a kindergarten and first-grade looping teacher at Oviatt Elementary School in Norwalk. She has taught early education for 20 years.
- Melissa Spencer, a science teacher at North High School in Des Moines with 12 years of teaching experience.
- Jim Pifer, a science teacher and the science curriculum leaders at Southeast Polk Middle School.
- Mitzi Chizek, an associate superintendent in the Dallas Center-Grimes school district and a former science teacher.

QUESTIONS: What were the opportunities of the Iowa Core?

Chizek: She’s heard that it’s all about teaching regardless of which document is being used. They need to make sure their teachers know how to teach so their students are critical learners and that what they are teaching is essential to lifelong learning. Opportunities of the Iowa Core are to continue to implement the science skills, especially in the area of inquiry and using it to help the student become a better problem solver and critical thinker.

Spencer: One of benefits is inquiry and critical thinking. It was based on the current research at the time and had rigor/relevance elements.

Innis: Science is now being discussed at the elementary level and has to be taught at that level because the state requires it. Previously, science wasn't being taught at all elementary schools in the state. She wishes science were taught more – at her school, students in grades kindergarten through second receive 45 minutes of science a week. By third grade, they have science class two times a week. Every elementary teacher is on overload because they have to know all of the standards in each of the subject areas and then be able to teach them. With the addition of science, it's frightening to teachers, but students love science, and that's the area they should be teaching from and then integrating all of the other areas into science.

Kleinow: He is not a fan of NGSS; he sees the Iowa Core as offering a number of opportunities even though it's often criticized for not being specific enough. There are 200 performance expectations in NGSS. Yes, it would be nice to put the Iowa Core standards into little squares, but science is a way of knowing by asking questions and learning that way. The Iowa Core allows a freer way to be able to do that.

Pifer: He wasn't thrilled with NGSS when he first looked at it. But as he goes through it, he thinks it's a lot closer to the Iowa Core than he first thought.

QUESTIONS: What are the opportunities of NGSS for teachers and students?

Pifer: Their district is a growing district and wanted to be one of the lead districts in exploring NGSS. He knows veteran teachers are known for saying "In three years, they'll be doing something different." But he views this as an opportunity to review and a chance to redo areas of the Iowa Core. He's been through all of the NGSS appendices and created summaries. The more he looks at NGSS, the more he sees that the performance expectations match up with the Iowa core; there are multiple connections within the two documents. And in some cases there are fewer units under NGSS than there were in the Iowa Core.

Innis: From the elementary perspective, she sees more practices throughout and not just content. She is excited about the engineering component. She had some STEM students working in her first-grade class, and the thinking and problem solving that were going on was electrifying to watch. She thinks NGSS will allow for more opportunities like that.

Spencer: Views NGSS as the next progression. They've progressed since the Iowa Core and are now looking at where they need to go next in science education. She likes the learning progressions of what they should be teaching and when, as well as the engineering aspect.

Kleinow: NGSS will provide a standardized system throughout the state, but he won't say whether that's a good thing.

Chizek: She sees more specificity with NGSS. Some of DC-G's teachers aligned their current Iowa core curriculum with NGSS to see the changes in how they would have to teach things.

She's not completely sold on NGSS, but for teachers who are not sure in the content or their skills, it could be beneficial.

QUESTIONS: What are the challenges in the Iowa Core for teachers and students?

Innis: Elementary teachers are supposed to be a master of all areas, and there is a lot of time involved in becoming so. There is more content in the Iowa Core than they could teach in a school day. The biggest issue at the elementary level is teacher training. Elementary teachers are not science teachers and don't have the background, so there needs to be ways to support them.

Kleinow: The challenge is what they want students to know and be able to do versus what they want schools to be, which is everything for everybody. This creates the challenge of what to do when something is not specifically identified, which is what happens in the Iowa Core.

Chizek: At DC-G this year all students will take the first semester of chemistry. It is being taught as a college course, and administrators aren't sure of the outcome. They know some students will leave the class after a semester. They are seeing that it's a challenge to be able to move quickly enough through the course material, yet help those who don't get it the first time and need more instruction.

Spencer: She thinks they have worked through a lot of the challenges and are set up well for the NGSS.

Pifer: The Iowa Core has the word "Iowa" in it, and Iowa is no longer a leader in education, and that's a bad thing. NGSS says they are moving forward – it's very competitive for careers and colleges.

QUESTION: What are challenges for teachers and students with NGSS?

Spencer: Getting familiar with the document. It is a bit daunting at first. There is a lot on the pages, and school districts and teachers need to learn how to interpret the information and figure out what the standard is on each page.

Chizek: The vocabulary changes could become frustrating. At DC-G, they are in the final stages of implementing the Iowa Core. She is now hearing from teachers that maybe they should stop because the standards will change. The answer is no; they'll continue because it's good for kids. There will be frustrations in adopting another set of expectations. She hasn't done an in-depth study of NGSS, but it's possible school districts would need to review and change their graduation requirements.

Innis: Getting teachers on board. When the two documents are compared, much of the content is already being covered. Assessment is a big piece – if practices are changed, what will the assessments be, what will the curriculum look like and what does it mean for instruction in the classroom?

Kleinow: Patience.

Pifer: Patience but also having the willingness to not throw hands up right away and give up. There will be those who will have difficulty with the changes.

Innis: A challenge exists for elementary teachers who have students who have not gone to preschool and have to focus on their letters and letter sounds. But if more science can be taught at the elementary level, students will have a better foundation for when they get into junior high.

QUESTION: As educators, what type of support do you need for the Iowa Core or NGSS, and is that support different?

Spencer: Similar types of support are needed to look at how current course offerings align. Professional development will be needed to learn a new document, so teachers and staff can become comfortable with both the Iowa Core and NGSS.

Chizek: Assessments and examples of assessments. She likes the assessment boundaries in NGSS. I.e. the what does this really mean aspect. But she wants to know what long-term assessments would be expected by the state.

Pifer: What will assessments look like?

Questions for the panelists from the taskforce

QUESTION: What is the state of implementation of the Iowa Core in your district? Are you already shifting to NGSS?

Chizek: She feels good about the implementation of the Iowa Core. This will be the first year that all DC-G students will be meeting all parts of the Iowa Core in science. It is not as strong at the elementary level. With NGSS, it was the desire of teachers to compare what they were doing to NGSS and see how it aligned. Even if NGSS isn't adopted, there are still good practices in it.

Pifer: Southeast Polk has implemented the Iowa Core for sixth through 12th grades. They are examining NGSS because they want to be a leader and at the forefront of what is happening.

QUESTION: If Iowa doesn't adopt NGSS would they still move forward?

Pifer: Southeast Polk would still move forward with the Iowa Core, but their curriculum would have a STEM influence in their science teaching.

Spencer: North High School has fully implemented the Iowa Core. Some individual teachers are dipping into NGSS. Even if they don't move forward with NGSS, there will be some teachers who will still use some of those performance expectations.

Innis: Norwalk also wants to be at the forefront. Regardless of whether NGSS is implemented, there are good practices in it, especially with the engineering component.

Kleinow: Implementation of the Iowa Core varies greatly from district to district. Their mantra is they continue to follow best practices.

QUESTION: What is being done for students who learn in non-traditional ways?

Spencer: They have moved to standards' based grading at North (no longer letter grades), which allows students to demonstrate what they learn inside and outside the classrooms.

Pifer: They have some students who really excel in the classroom and others who need different ways to show how they learn. They are doing more outdoor learning with an environmental learning center for science and math. The district is providing more opportunities for students who don't take a traditional approach in the classroom.

QUESTION: There's currently too much flexibility on when things can be taught and students who switch schools or districts can relearn things they have already been taught. Would this change with NGSS?

Kleinow: This could happen with NGSS, too. Or Algebra I could be taught differently from building to building even within the same district. It's a balancing act. It's hard to write policy to account for all of the individual differences.

Spencer: The first priority in Des Moines was to make sure high schools and middle schools followed the same curriculum. The next question is whether this is moved up to the state level.

AGENDA ITEM: Comparison of Core and NGSS

Expected Outcome I'm able to list and discuss advantages and disadvantages of the Iowa Core.	Lead Peg Christensen	Follow Up
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Notes:

Peg Christensen, a science consultant with Heartland AEA, asked taskforce members to work in groups to list and discuss advantages and disadvantages to the Iowa Core.

Advantages:

Grade-banded so it allows for flexibility in schools

Research-based

Attends to Iowa's need to have local control

Teachers and districts are already familiar with it

Districts will not be required to change their materials, practices, course offerings, graduation requirements or licensing; thus, this could save money

Teachers can broadly present the science concepts and have more latitude

Disadvantages:

Teachers may not bring or have the content knowledge to teach science concepts

Implemented from the top down – i.e. started with high school before it went to elementary levels

Could have negative effects on transient population

Grade-banded means science might not be taught at every grade level or there could be a delay in when science is taught

Old research was used

All of the writers were from Iowa

Inquiry standing alone could be disconnected from the content and be taught in isolation

Inconsistency between districts and schools under local control

There's no data to show the state of implementation, so the state doesn't know how effective a change would be. A system needs to be in place to monitor implementation and future revisions to take into account updates in technology and new research

Teachers from other states are not familiar with the Iowa Core; no ability to collaborate with other states

Curricular subsets are not integrated – i.e. life sciences and physical sciences separated

No information about computation or how to address emerging technology