

Jessica Whisher-Hehl
Science Coordinator
Phone: (315) 433-2671
Fax: (315) 432-4523
jhehl@ocmboces.org
ocmboces.org

MEMO

To: OCM BOCES Component Districts
From: Jessica Whisher-Hehl
Date: February 27, 2017
Re: Middle School Science Standards Progression

On January 24, 2017, 56 people from 21 districts met to discuss progression options for the middle school level (grades 6 through 8) New York State Science Learning Standards (NYSSLS). This meeting was organized based on feedback from the region, which expressed a desire to work collaboratively to develop regional cohesion. The new standards are based on a learning progression, thus the high school standards are predicated on the middle school standards. Developing regional cohesion will support students that move districts and will provide the opportunity for districts to work collaboratively to plan for, implement, and work to continuously improve learning opportunities for students in the region.

The group that worked collaboratively included teachers (elementary, middle and high school), building administrators, and district administrators. The meeting began with people purposely assigned to groups to facilitate discussions across districts and between people who hold a variety of positions in the school system. The materials used to facilitate the discussion can be found on the Science Leadership [page](http://www.ocmboces.org/teacherpage.cfm?teacher=1549) (<http://www.ocmboces.org/teacherpage.cfm?teacher=1549>).

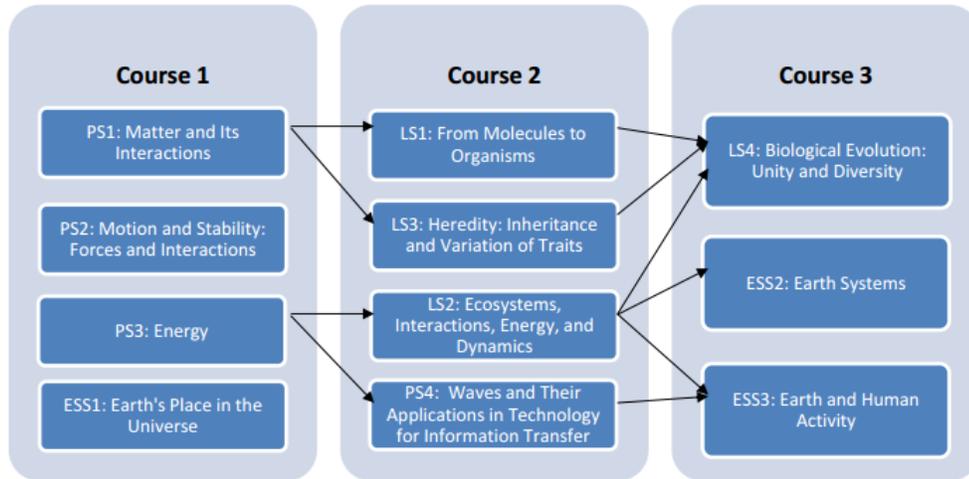
Middle School Progressions Summary

There exists two primary ways to organize the progression of performance expectations (PEs) in the Next Generation Science Standards (NGSS), from which the NYSSLS are based, into course maps. The **domain organization** groups PEs according to the science domains: Physical Science, Life Science, and Earth and Space Science. While the domain model groups PEs, it does not specify in which order each domain should be taught. The ordering of the courses would be a local decision.

The second option is the **conceptual progression organization**, which groups PEs based on the connection between disciplinary core ideas (DCIs). This model mixes the science domains at each grade level and leverages connections between the domains. Furthermore, as this model articulates which DCIs rely on other DCIs, a grade specific progression is identified. The figure below taken from Appendix K in the NGSS demonstrates the connections between DCIs in this model.

Figure 2: Organization of Disciplinary Core Ideas for Course Map 1

The figure below outlines the first step of organizing the NGSS into courses based on a conceptual progression of the science content outlined in the Disciplinary Core Ideas of the *Framework*.



(NGSS Lead States, 2013, Appendices, p. 117)

For a more complete description of the two main middle school organizational options please refer to [Appendix K](#) in the NGSS.

Meeting Framework and Outcomes

Data related to regional thinking regarding the middle school progression was collected at three points. Initially the purposeful planned mixed groups dug deep into the two main progression models and attempted to develop one that the group thought was the best. Some groups decided to adopt an existing model outright while a few developed a hybrid of their own. Regardless of the variations, the vast majority of the groups selected some form of the conceptual progressions model. It should be noted that a few groups were unable to come to consensus on a specific model and no group selected the domain model. The specific thinking the groups charted can be found in Attachment A.

After the conclusion of the mixed group work, participants were asked to meet with colleagues who held a similar position in the school system. These groups were elementary teachers, middle school teachers, high school teachers, building administrators, and district administrators. During this portion of the meeting, groups were asked to chart their wonderings, noticing, and big take a ways based on their mixed group discussions. The specific ideas charted by each group can be found in Attachment B. Interestingly, each group identified different ideas in each area. A few things that showed up more than once were rollout of professional development, the ability of the conceptual progression model to lead to improved student understanding, and the role of regional work to support the transition.

Jessica Whisher-Hehl
Science Coordinator
Phone: (315) 433-2671
Fax: (315) 432-4523
jhehl@ocmboces.org
ocmboces.org

The work concluded with people meeting with their district colleagues and once again providing written feedback on the options. The responses from this part of the work can be found in Attachment C. Of the districts that made a selection, all picked the conceptual progressions model. The rationales for the selection focused on improved student learning opportunities resulting in deeper student understanding. Additionally, many districts identified that this model would be a fundamental shift in how science is currently taught, which could decrease the likelihood of assimilation and be a catalyst for facilitating the required instructional changes. However, this deviation from current practices means there is a need for significant professional development for middle school teachers. This professional development needs to be focused on the standards, pedagogy, and science content. Many districts also noted that regional coherence would support the transition by improving the ability of OCM BOCES to provide regional professional development and opportunities for districts to collaborate to write curriculum.

Recommendations

Considering the feedback received regarding the middle school progressions options, OCM BOCES is making the following recommendations:

1. The regional professional development offerings and related standards support will focus on the conceptual progressions model for grades 6 through 8. We are suggesting districts in the region adopt the **conceptual progressions organization** to maximize the opportunity to take advantage regional options related to middle school science. Specifically, we are advocating that the region initially adopt the example bundling (grouping PEs into cohesive units) articulated by Achieve (<http://www.nextgenscience.org/resources/bundling-ngss>). This will offer us a strong foundation and focus to build from. There will still be plenty of work required regionally to understand the bundles and develop curriculum and instructional practices. Additionally, work needs to be done to include the difference between the NYSSLS and the NGSS for which the bundles were designed. Thus, having regional cohesion around an existing model will allow us to thoughtfully leverage existing resources and develop and provide sufficient regional professional development options related to specific bundles. Over time, as we develop a deeper understanding of the standards, instructional practices, and how student learning develops, we can work collaboratively to adjust the bundles to support continuous improvement.
2. We propose implementing a rollout model in middle school that includes one unit or bundle per year, per grade level. To be clear, we do not plan to provide curriculum materials for grades 7 and 8 as our elementary curriculum materials program is focused on grade K-6. The starting bundle for each grade level will be determined by analyzing alignment of content to current eighth grade assessment and areas of interconnectedness between bundles at a grade level. Thus, if there is a bundle that includes concepts that other bundles in the grade level are dependent on, it will be introduced first. The existing bundling examples include approximately 20 weeks of instruction over five units for 6th grade, 26 weeks of instruction over six units for 7th grade, and 30 weeks of instruction over three units for 8th grade. Therefore, as we progress towards full implementation we may need to adjust some of the bundles to more evenly distribute instructional time between the three grades. Additionally, as we begin implementation, we may find that the anticipated instructional time estimated by Achieve is not accurate. The available bundles are a suggested starting point, not an identified endpoint.

Jessica Whisher-Hehl
Science Coordinator
Phone: (315) 433-2671
Fax: (315) 432-4523
jhehl@ocmboces.org
ocmboces.org

3. We suggest two days of professional development for administrators this summer to develop an understanding of the instructional shifts and teacher learning needs to support the new science standards.
4. Continue work with Science Leadership Network and BCIC. It is important to develop district capacity to support the day-to-day operations in schools throughout and beyond the transition. These two groups are the “eyes and ears on the ground”. Thus, their feedback is vital to our progress and continuous improvement.
5. A second “It’s Go Time” science and lesson study conference to support our region’s robust discussions around the new standards based on shared experiences observing student learning aligned to the standards. The next conference is being planned for November 7, 2017.

Conclusion

We understand districts will also want to explore acceleration options for middle level science. We decided to first focus on the progression for middle level science for all students. A major focus and guiding principle of the new science standards is providing high quality and cohesive science learning opportunities for all students in grades K-12. In the future, we will provide the opportunity for the region to discuss and develop middle level science acceleration options. Achieve has developed example accelerated course model pathways based on work with Advanced Placement (AP) educators and NGSS writers. More information can be found here: <http://nextgenscience.org/news/ngss-accelerated-model-course-pathways>.

Additionally, we do plan to provide regional opportunities to discuss potential high school course mapping for the new standards. However, we are not yet sure about the assessment framework and specific timeline of changes to the current Regent Exam structure. Thus, we propose waiting until we have more concrete assessment information before working on developing high school course progressions. We do plan to offer professional development opportunities for secondary science teachers in the near future to support them in the standards transition.

The dedication of the region’s Science Leadership Network has been instrumental in our regional progress. We at OCM BOCES will continue to strive to support the transition to the new science standards in a planned, intentional, systematic, and informed manner. Our districts’ ideas, comments, and suggestions are always welcomed and encouraged, so please never hesitate to call or email us.