Attending to Special Education and Equity with NGSS

11-09-19
Connecticut Science Teachers Annual Conference
Introductions

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Let’s find out a little bit about you ....
Goals for today

- Make connections between conceptual shifts of the NGSS and application to different groups of students
- Be aware of all of the nondominant groups considered by the Framework authors and NGSS lead states during the writing of the NGSS
- Use more UDL to improve education for all students
Professional Learning Expectations

We will...

• Honor each other’s **expertise**

• Engage actively as **adult learners** in model three-dimensional science lessons (i.e., wear our “Adult Learner Hat”)

• Have **opportunities to “step back”** and examine related NGSS documents, unpack the pedagogy, and discuss implications for instruction (i.e., wear our “Teacher Hat”)

• Be **patient** with ourselves and each other

• Be **creative** in thinking about transfer to our grade level & courses

• Ask **questions**
Let’s get to work!

What do you think?
Is this an equitable student environment?
How do we plan?

• What are all the different groups we need to consider when planning for instruction? Jot down your ideas.

• What are your biggest challenges around attending to student needs (any and all) as you implement NGSS?
How can we promote equity?

• Read STEM Teaching Tool #15
• Note questions that you have from the reading
Let’s get to work!

What can we do?
What groups did we identify for consideration when planning for instruction?

The NGSS Diversity and Equity Team wrote case studies highlighting 7 non-dominant groups:

Case Study 1: Economically Disadvantaged
Case Study 2: Race and Ethnicity
Case Study 3: Students with Disabilities
Case Study 4: English Language Learners
Case Study 5: Girls
Case Study 6: Alternative Education
Case Study 7: Gifted and Talented Students
How many students are affected?

- > 50%
- 22% in poverty, 48% get free or reduced lunch
- 45% racial and ethnic minorities
- 13% students with disabilities
- 21% non-English at home, 11% limited English proficiency
- 49% girls
- Unknown alternative education; many are also economically disadvantaged, racial and ethnic minorities, and ELL
- Unknown GAT, estimated at 6%

Percentages don’t add to 100 because of course, some students belong to multiple groups

“Dominant” groups enjoy privilege and prestige with or without a numeric majority
“Non-dominant” groups are traditionally underserved by educational systems
## NGSS Equity Case Studies

<table>
<thead>
<tr>
<th>Case #</th>
<th>Nondominant group</th>
<th>Grade and subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Economically disadvantaged students</td>
<td>9, chemistry</td>
</tr>
<tr>
<td>2</td>
<td>Students from major racial and ethnic groups</td>
<td>8, life science</td>
</tr>
<tr>
<td>3</td>
<td>Students with disabilities</td>
<td>6, space science</td>
</tr>
<tr>
<td>4</td>
<td>Students with limited English proficiency</td>
<td>2, Earth science</td>
</tr>
<tr>
<td>5</td>
<td>Girls</td>
<td>3, engineering</td>
</tr>
<tr>
<td>6</td>
<td>Students in alternative education programs</td>
<td>10 and 11, chemistry</td>
</tr>
<tr>
<td>7</td>
<td>Gifted and talented students</td>
<td>4, life science</td>
</tr>
</tbody>
</table>
Designing for the margins instead of the average helps everyone

**Engagement:** For purposeful, motivated learners, stimulate interest and motivation for learning.

**Representation:** For resourceful, knowledgeable learners, present information and content in different ways.

**Action & Expression:** For strategic, goal-directed learners, differentiate the ways that students can express what they know.
How is UDL used with NGSS?

For the next 15 minutes:

• Closely read to the top of page 4 up through the italicized writing

• Italicized writing is a research-based strategy for all students but particularly for students with disabilities

• Note on your blank UDL organizer where this strategy would fit

• Note any other instructional practices from the vignette so far you think fit in the UDL organizer

• Continue reading/noting through page 7
More research-based strategies for equity

- Facilitate student-generated: topics, questions, problems, solutions, and research
- Let students create and revise their representations over time as learning progresses
- Use multiple SEPs and CCCs, driven by phenomena and problems, to engage students, put science into context, and challenge misconceptions
- Use engineering to help students see the practical applications of science in their communities
- Reduce assessment bias including language difficulties and stereotype threat by assessing performances, not just written tests
- Use connections CCSS to facilitate learning science, ELA, and math simultaneously
- Preassess to not only reveal misconceptions that students have, but also to assess interest and attitudes related to a topic
- Engage students with authentic, community-based questions or problems, that are student-chosen, or with which they have prior experience
- Bring in community role models (e.g. of similar race, culture, or gender)
- Create a learning environment where it is safe to take risks
- Connect to culture, e.g. with informal discourse or paralleling informal and formal discourse
- Use strategic grouping of students, e.g. group at different times into groups that are: heterogeneous, or related by student interest, student ability, of gender. At times, let students explore as individuals.
- Use technology to support multiple modes of representations
- Give students opportunities to sometimes set their own working groups, goals, and/or pace
More perspectives for equity

1. Provide opportunities for student control and ownership
2. Support and promote intellectual engagement
3. Provide students experience with how knowledge is built and communicated in the real world
4. Uncover and develop student ideas
5. Incorporate real world connections and applications
Why NGSS?

Research says:

• There are four strands of proficiency needed for all students to learn science:
  • Know, use, and interpret scientific explanations of the natural world
  • Generate and evaluate scientific evidence and explanations
  • Understand the nature and development of scientific knowledge
  • Participate productively in scientific practices and discourse

• Learning science involves thought, discourse, and practice

• Phenomenon-driven, 3D teaching and learning supports this type of learning

• In other words: equity is built into NGSS!
How can we communicate this to kids?

Youtube.com → search for “equity and equality”, video uploaded by Matt CG
Final Reflections

Questions and Survey
Take a moment to consider:

• Can any of these strategies help with the challenges you listed for yourself at the beginning of our seminar together?

• Are there different accommodations that might be appropriate for different categories of special needs that might fit better with UDL and phenomenon-driven, 3D teaching and learning? How could these be brought up?
Our current thinking on equity in NGSS

- What is a thought that has shifted for you as a result of this presentation?
- What is a next step you might take?
- Questions? – come find me later too
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• Be aware of all of the nondominant groups considered by the *Framework* authors and NGSS lead states during the writing of the NGSS

• Use more UDL to improve education for all students
The vision of the Framework is that kids are making sense of their world, not just learning about it.

This is because the research tells us that this leads to enduring, transferrable understandings for all students.
Thanks so much for attending!

Please complete a quick survey