Welcome to The Power of the NGSX Experience in my Classroom

This is part of the strand hosted by the Michigan Mathematics and Science Leadership Network
Pre NGSX

- Lots of PD to learn all I could about NGSS and The Framework
- Pilots
  - University of Pittsburgh – BLOOM - NGSS and Modeling in Biology project (2013-2014)
- South Redford Schools early “adoption”
  - Slow “roll-out” of practices
During NGSX

- NGSS-ifying on the fly - we were really excited to make our students get a better experience and we worked hard to create mediocre materials (we didn’t know they were that bad yet…)
- This is not sustainable and unless you have experience with high-quality NGSS-designed materials this is likely a big waste of time (It’s hard to know what you don’t know - until you know you didn’t know it!)
After NGSX

● We were introduced to Next Generation Science Storylines  
  www.nextgenstorylines.org

● Although we missed the official pilot we were invited to join the virtual support meetings via bluejeans (similar to Zoom)

● Then the big learning happened at LWT summer 2017 !!!
Learn While Teaching

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  www.nextgenstorylines.org
- Missed the official pilot but joined the virtual support meetings
- The big learning happened at LWT summer 2017 !!!
Storylines

● We figure out the science ideas
● We figure out where we are going at each step
● We figure out how to put the ideas together over time
During the year after completing the NGSX matter pathway and the LWT pathway I started to help 5th grade teachers in our district implement storylines (Roadkill Cafe)
I also became an NGSX facilitator, and started consulting - traveling to several states over the summer to help teachers implement the storyline units.
AP Biology curriculum design using the Storylines Tools

- Anchoring Phenomenon Routine
- Navigation Routine in Connected Investigations
- Investigation Routine in Connected Investigations
- Problematizing Routine
- Putting Pieces Together Routine
AP Environmental Science and Place Based Learning

● The framework intended for lessons not to be 3-dimensional, but really 5-dimensional

● Student interest and identity are the other 2 dimensions that must be attended to in each lesson
AP Environmental Science and Place-Based and Project-Based Learning

- The Earth Force Framework
  - Stewardship Action
- George Lucas Educational Foundation - Knowledge in Action
  - AP Environmental Science Project-based curriculum
Great Lakes Watershed field
Great Lakes Watershed field

Workshop June 2017 and July 2018 (another workshop will be offered again this summer! Applications have been extended to April 15th - Click HERE to apply)
NOAA Planet Stewards

Provides support to teachers through online planning meeting and webinars to enact a Stewardship Action Project

If your grant proposal is accepted you can be awarded up to $2500
AP Environmental Science and Place Based/Project Based Learning

- Other Citizen Science efforts support projects in authentic ways
  - Rouge Education Project
  - Vernal Pool Patrol
  - Project FeederWatch
  - eBird
  - NestWatch
  - iNaturalist
  - The Midwest Invasive Species Information Network
Using the storyline tools as a framework to ensure the students are doing the figuring out - even for complex projects

- Students see the NEED to learn about the science ideas that will help them understand the problem - authentic motivation
- Students WANT to continue this work when they see they really CAN make a difference
- All storyline tools are purposeful in giving ALL students multiple opportunities to identify with the phenomenon to ensure continued interest
Michigan Natural Features Inventory and the Vernal Pool Patrol
5th grade classrooms

- “Why do Dead Things Disappear Over Time?” aka “Roadkill Cafe”
- “Where Does Our Clean Water Come from and Where Does it Go After We Make it Dirty?”
Thank you!

Each logo in this slide deck is a “clickable link” to the resource mentioned. During the MSTA presentation, we spent more time discussing where to find NGSS-designed resources and how to use these to learn what it looks like so you can be more comfortable trying this for yourself. I added the next pages of links that include lots of great info and resources.

Feel free to contact me anytime as well! holly.hereau@southredford.org or on twitter @hhereau
Goals and Talk Moves for Productive "Figuring it Out" Discussions

Teacher Tools

Talk Science Primer

Goals for Productive Discussions and Nine Talk Moves

Talk Moves Map

How are we doing?
How Can We Establish Norms & use Knowledge-Building Tools to support a Classroom Culture of "Figuring it Out?"

Establishing Norms: Laying the Foundations for Academically Productive Talk

Establishing Classroom Discussion Norms - Tips For Teachers

The Green Sheet

NGSX Key Discussion Planning Tool

Knowledge-Building Tools Primer: Tools that Support a Classroom Culture of “Figuring It Out”

Directions and Links to Talk Strategies Videos

Talk Moves Map

Four Reflection Tools

Talk Moves Reflection Tool
How Can We Establish Norms & use Knowledge-Building Tools to support a Classroom Culture of "Figuring it Out?"

Link to Stem Teaching Tools - Talk Activities Flow Chart - can also download student-facing powerpoint

Full Set - Student Talk Protocols and Flowchart

Link to Discussion Diamond (Accountability Structure for Group Talk) - detailed instructions from Ambitious Science Teaching

Talk Resource Tools - Stem Teaching Tools document with links to several tools

Talk Science Cards

Talk Resource Tools: Printable Cards Sets

Partner Conversational Supports (Side by Side and Table Tents)

Classroom Talk Pre-write and Post-write
How Can We Establish Norms & use Knowledge-Building Tools to support a Classroom Culture of "Figuring it Out?"

Scaffolds for Talk and Writing (from Ambitious Science Teaching)

A Discourse Primer for Science Teachers (from Ambitious Science Teaching)

Student Rights (from Ready, Set, Science! p. 95 - 96)

Making Thinking Visible: Talk and Argument (Chapter 5 from Ready, Set, Science!)

Making Thinking Visible: Modeling and Representation (Chapter 6 from Ready, Set, Science!)
Resources and Tools

These text resources and website links are for you and your colleagues. We've organized them in terms of general topics. Feel free to suggest additional resources and make comments in the discussion box below. This is your space to support you and your students as you participate in the LWT Project.

Resources about the Framework and NGSS

- NGSS Website
- Framework for the Next Generation Science Standards
- Search the Next Generation Science Standards
- NSTA Readers Guide to NGSS - Chapter 3
- An Overview of NGSS for Principals
- Reading NGSS Performance Expectations
- Three Dimensions of the Framework
- NSTA Article on Engaging in Argument and Explanation
- Cindy Passmore (2015) NSTA Blog
- Order the NSTA Reader's Guide to the NGSS from NSTA
- Five Characteristics of Models
- Page 6 of NGSS Appendix F: Science and Engineering Practices: Developing and Using Model
- Moving Beyond "Knowing" (A Big Picture View of 3-Dimensional Science)
- Framework for K-12 Science, Chapter 3 (full chapter)
- Box 3-2 from the Framework for K-12 Science, Chapter 3
- Resources NSTA is putting together to help teachers with NGSS (Check out the virtual conference coming up this weekend - Wayne and I are hosting the High School breakout!)
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Tools

- The Knowledge-Building Tools Primer
- Summary Table of Discussion Types
- Goals and Moves for Productive Discussions
- Goals and Moves for Small Group Work
- How Are We Doing? Reflection Tool
- The "Green Sheet" -- One Teacher's Norms
- STEM Teaching Tools - There is SO much good stuff here

Resources about Productive talk

- Overview Text on Establishing Discussion Norms
- Article on Establishing Norms
- Talk Science Primer
- Research Evidence on Student Learning and Productive Talk
- Discussion as a Form of Productive Talk
- First Draft and Exploratory Talk
- Summary Table of Discussion Types
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Useful Articles, Chapters, and Blogs

- Suzanne Wilson (2013) in *Science*
- Cindy Passmore (2015) NSTA Blog
- Research Evidence on Student Learning and Productive Talk
- Misconceptions May be Necessary Stepping Stones
- Moving Beyond "Knowing" (A Big Picture View of 3-Dimensional Science)
- NSTA Article on Engaging in Argument and Explanation
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Supports for Teachers working with storylines and/or want to actively engage in more NGSS learning (this is a living document and will continually be updated as needed and by request)

- Check out the STEM Teaching Tools, which include 1 page practice briefs helpful in understanding and implementing NGSS. Use these in PD. Share them with your colleagues. Volunteer to write a new one.

- Click here to view the NGSS Storylines Website, nextgenstorylines.org

- Click here to join FB group where you can find out about NGSS resources.

- Click here to follow Holly (@hhereau) and Wayne (wewrigt1234) on Twitter.

- Interested in talking about NGSS with other Science Teachers? Join #NGSSChat on twitter.
Supports to Share With Administrators

Guide to Implementing NGSS for School Leaders

This helpful guide, is written for principals, coaches, district and state leaders. The guide offers recommendations for supporting teachers, students, and school leaders in implementing NGSS. It is based on research of the last several decades of implementing standards.

Free Download

Guide to NGSS for Principals

From Achieve -- "The purposes of this document are to introduce principals to the Next Generation Science Standards (NGSS) and provide a general overview of the key instructional and conceptual shifts required by the NGSS."

Download
Supports to Share With Administrators

Supporting Successful District Implementation of New Science Standards

"Implementing new science standards is a complex process that intersects with many other elements in the educational system. What’s more, successfully implementing science standards based on the NRC Framework requires major changes to the way science instruction is conceived of, structured, supported, and resourced. To help with these challenges, and with extensive feedback from successful district-level science education leaders, Achieve has developed a set of three new resources to support district leaders to strategically implement science standards." STEM Teaching Tools Practice Brief 51 includes links for these 3 resources:

**District Implementation Indicators:** The District Implementation Indicators take a broad view of science standards implementation, identifying 13 categories that illustrate what successful implementation looks like and providing concrete end goals that districts can work toward. Each category also includes example actions that districts might take up to further that indicator and use to create milestones to use when monitoring progress.

**District Implementation Workbook:** The District Implementation Workbook is designed to help district leaders think more comprehensively and concretely about their own contexts. A combination of self-assessments and exercises, this workbook describes the common issues and challenges associated with standards implementation and presents key questions, timelines, decisions, and considerations for implementation leaders.

**Lessons Learned From the CA NGSS Early Implementer Districts:** This report includes stories from the initial experiences of nine districts in California working to implement the new standards, focusing on the critical areas of professional learning and instructional materials.