

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



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TESLA



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)
 - University of Michigan - NGSS Ecology and Climate Change Curriculum Pilot (2013-2014)
- South Redford Schools early “adoption”
 - Slow “roll-out” of practices



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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 !!!



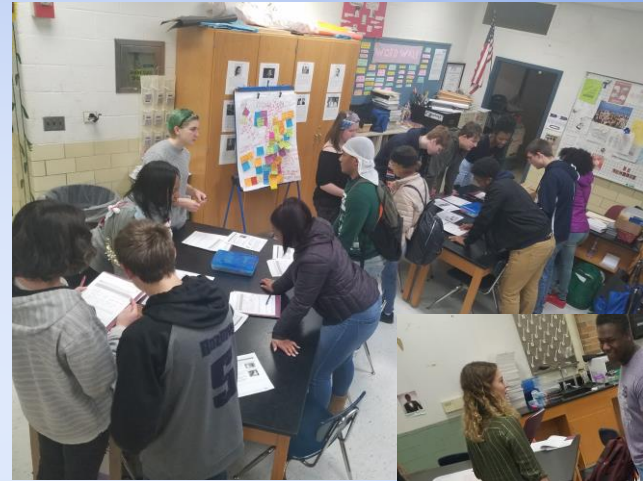
Learn While Teaching

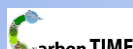
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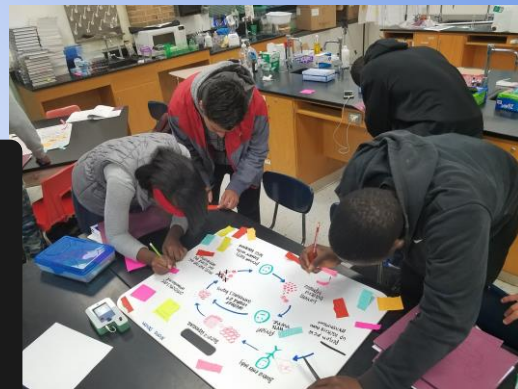
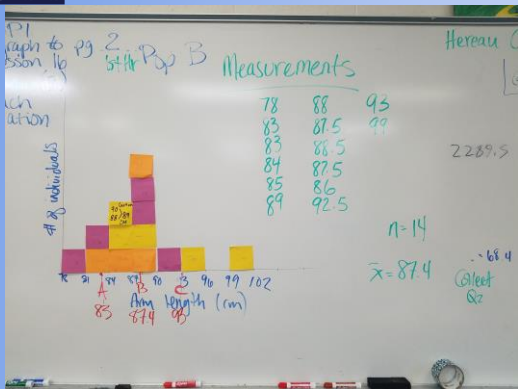
Storylines

- 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

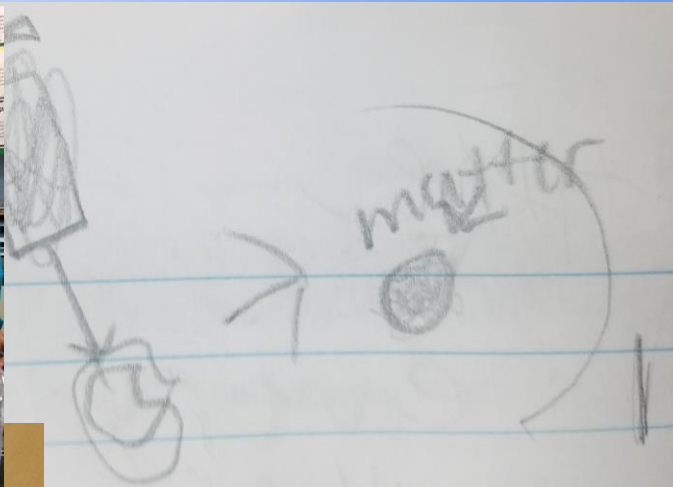
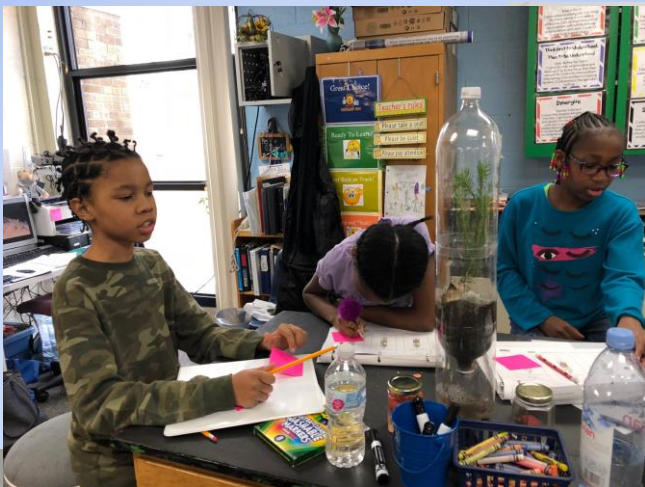




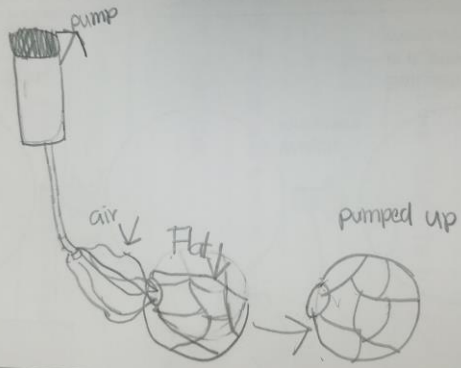
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During the year after completing the NGSX matter pathway and the LWT pathway I started to help 5th grade teachers in our district implement storylines (Roadkill Cafe)



11: How can we fit more and more air into the ball.
 In our last experiment, we saw that the weight of a ball increases when we push more air inside the ball.
 We used a model of the air inside the pump and the ball to help show what makes the weight of the ball increase when we push air into it:



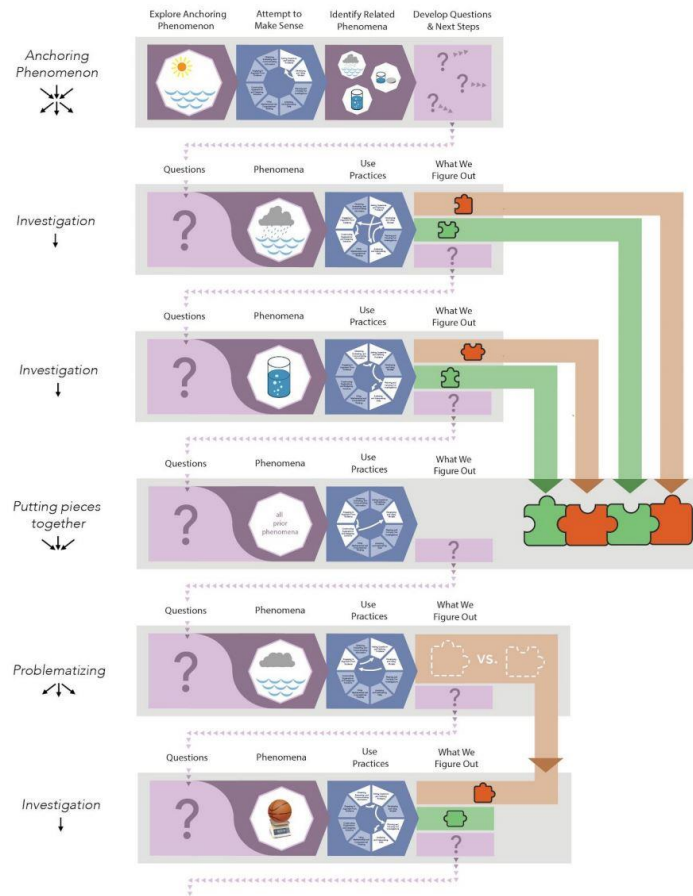
I also became an NGSX facilitator, and started consulting - traveling to several states over the summer to help teachers implement the storyline units.

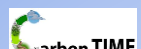


AP Biology curriculum design using the Storylines Tools

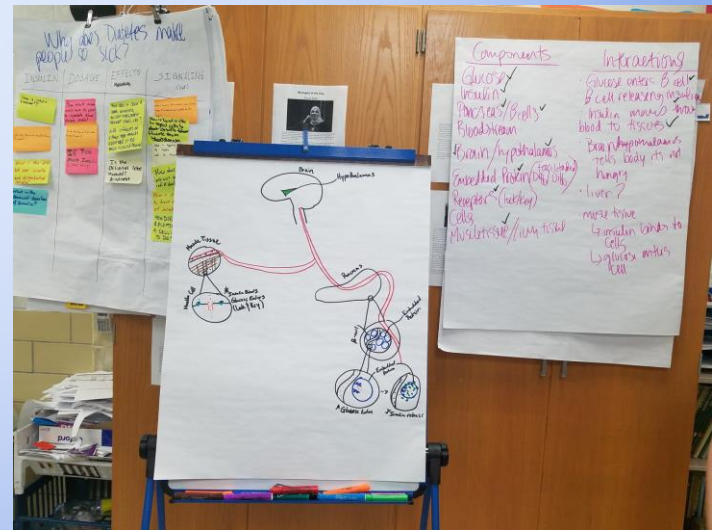
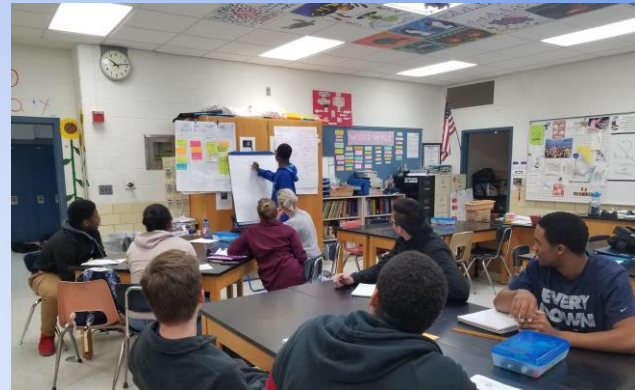
- Anchoring Phenomenon Routine
- Navigation Routine in Connected Investigations
- Investigation Routine in Connected Investigations
- Problematizing Routine
- Putting Pieces Together Routine

A Storyline Uses the Five Classroom Routines in Combination to Support Coherence for Students





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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





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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)**





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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





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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



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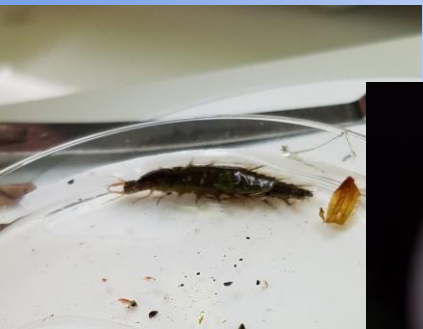
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Michigan Natural Features Inventory and the Vernal Pool Patrol





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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?”



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<https://youtu.be/mM3GSjPvr7k>

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](https://twitter.com/hhereau)



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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" \(A Big Picture View of 3-Dimensional Science\)](#)
- [Developing and Using Models - Free download from Schwartz, C., Passmore, C., & Reiser, B. J., Eds.\(2016\) Helping Students Make Sense of the World Through Next Generation Science and Engineering Practices, NSTA Press](#)
- [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.