Reframing Science Literacy through Community Engagement

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We are going to tell a story….

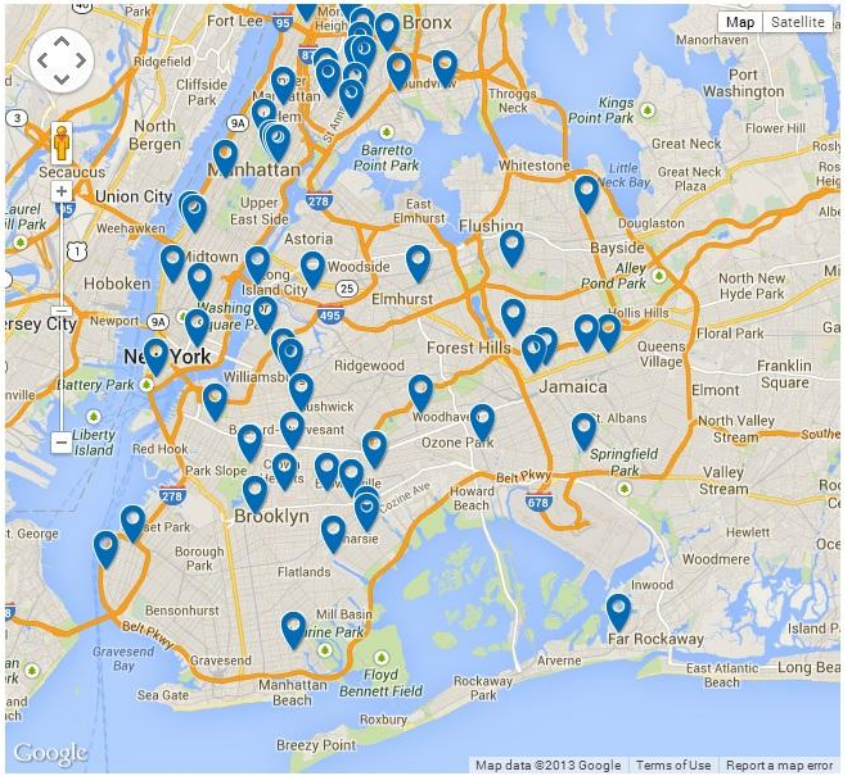
1. Background on our network and school

2. Literacy Design Collaborative initiative

3. Outcomes from LDC work

4. Current action research on engagement

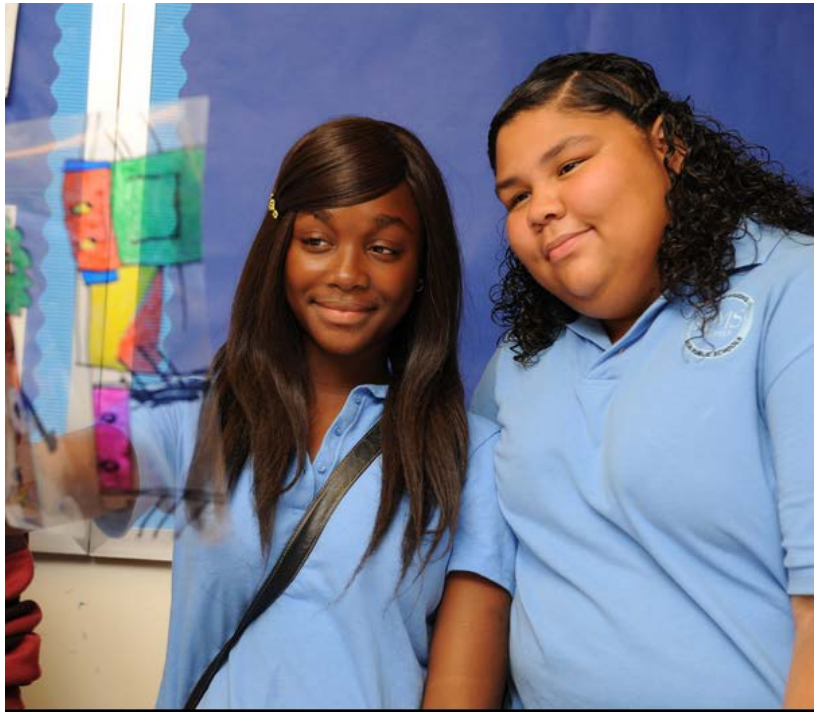
Background-
New Visions for Public Schools



Background-
New Visions for Public Schools

	District Schools (75 middle and high schools)	**Charter Schools** (6 high schools)
Special Ed	17%	18%
English Language Learners	10%	10%
Lowest third (based on 8th grade test data in ELA/math)	33%	42%

Background-
High School for Advanced Math & Science



Background-
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Year 1 2011- 2012	**Year 2** 2012- 2013	**Year 3** 2013- 2014
• 9th grade Living Environment (Biology)		

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Next step in our story...

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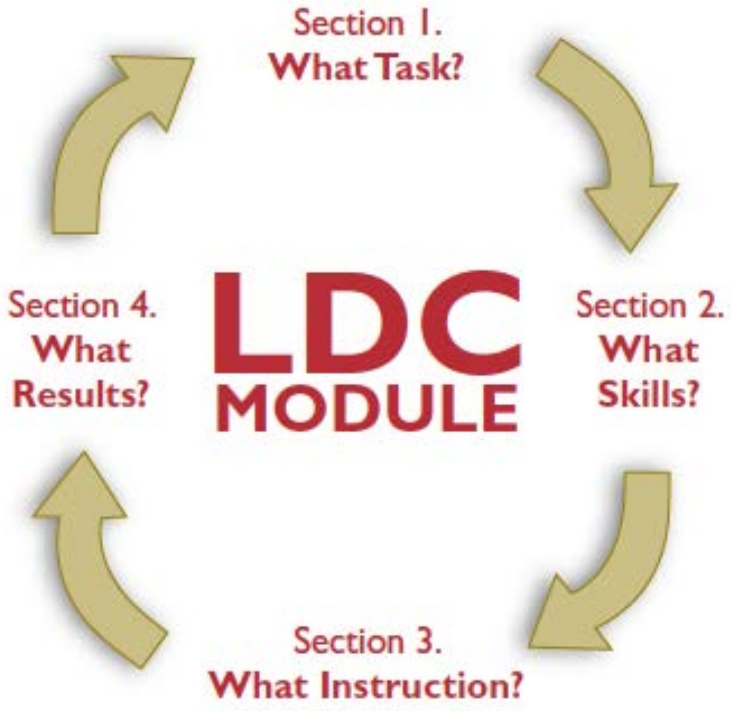
Literacy Design Collaborative (LDC) Initiative

Literacy Design Collaborative modules, based on

- LDC template tasks
- Skills ladder
- Staggered writing instruction - the “writing cascade”
- Supported by cross-disciplinary inquiry



LDC Initiative - Example Literacy Task

Species Survival Plan

Are there steps that can be taken to allow species threatened by climate change to survive?

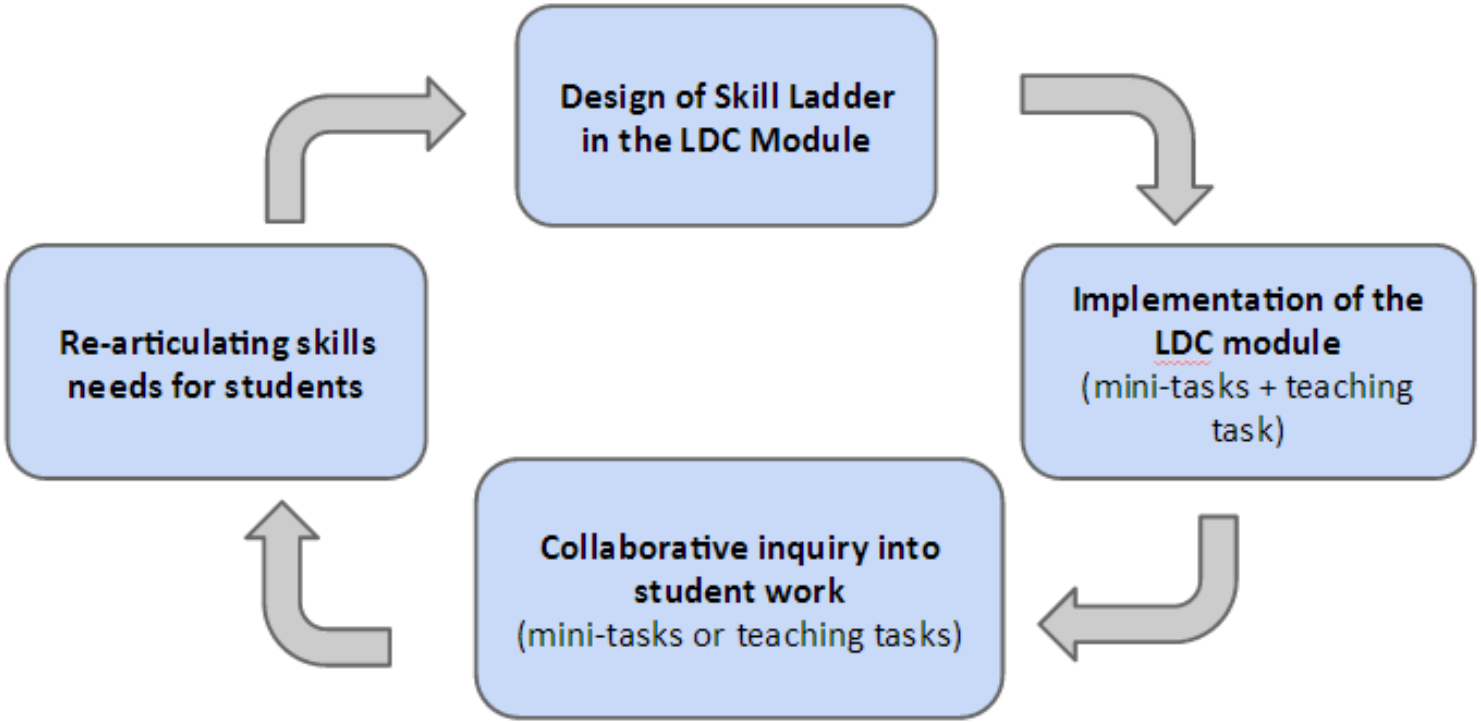
After reading background information and population data sets about a species you selected (coral, Adelie penguins, Rocky Mountain Pine Trees) write a plan for the survival of that species, that describes how it might survive, given current knowledge about climate change, and addresses the question. Support your discussion with evidence from the text(s).

(Informational or Explanatory/Description)

LDC - Example Writing Cascade

	Social Studies	ELA	Science	Math
Week 2- 4	**Informational** *Interview with a religious leader*			
Week 4- 6		**Informational** *What can you work to change?*		
Week 6- 8			**Informational** *Is there life on Mars?*	
Week 8- 10				**Narrative Procedural** *Cell Phone Task*

LDC Initiative - Teacher Inquiry



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Which NGSS Practices are a part of this LDC task?

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Practice 8 - Obtaining, evaluating, and communicating information.

LDC Initiative - Example Writing Task

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Practice 4 - Analyzing and interpreting data.

LDC Initiative - Example Writing Task

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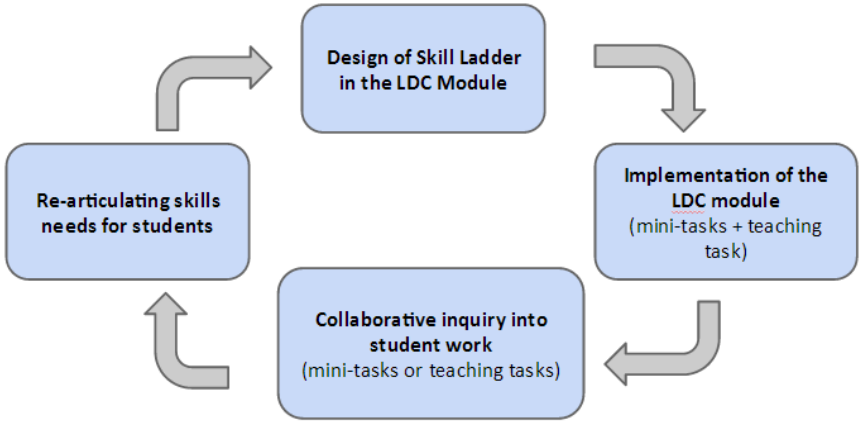
Practice 7 - Engaging in argument from evidence.

Outcomes of LDC Work at AMS



- Challenges of looking at student work across disciplines
- Struggles to meet the needs of our students in the lowest third

39% of students in year one didn't complete or start the writing task!

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Current Action Research at AMS

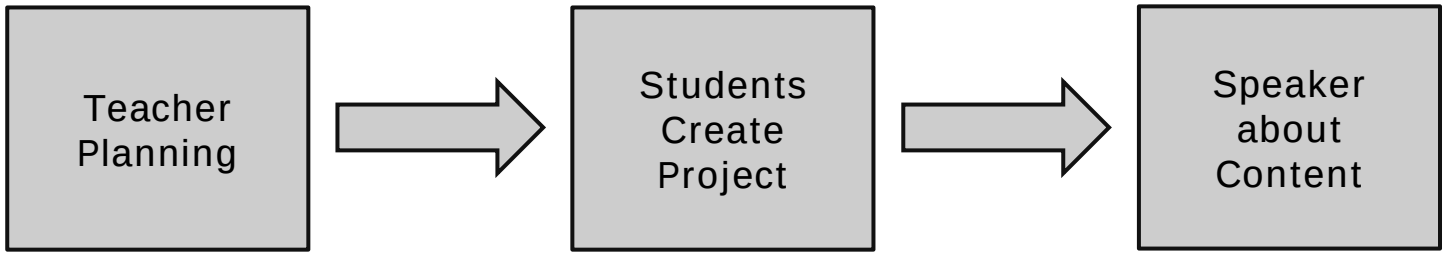
- How do we make science literacy accessible?
- What teacher and student practices need to be in place to support student engagement?
- What is the role of the community in our science classrooms?

Current Action Research at AMS

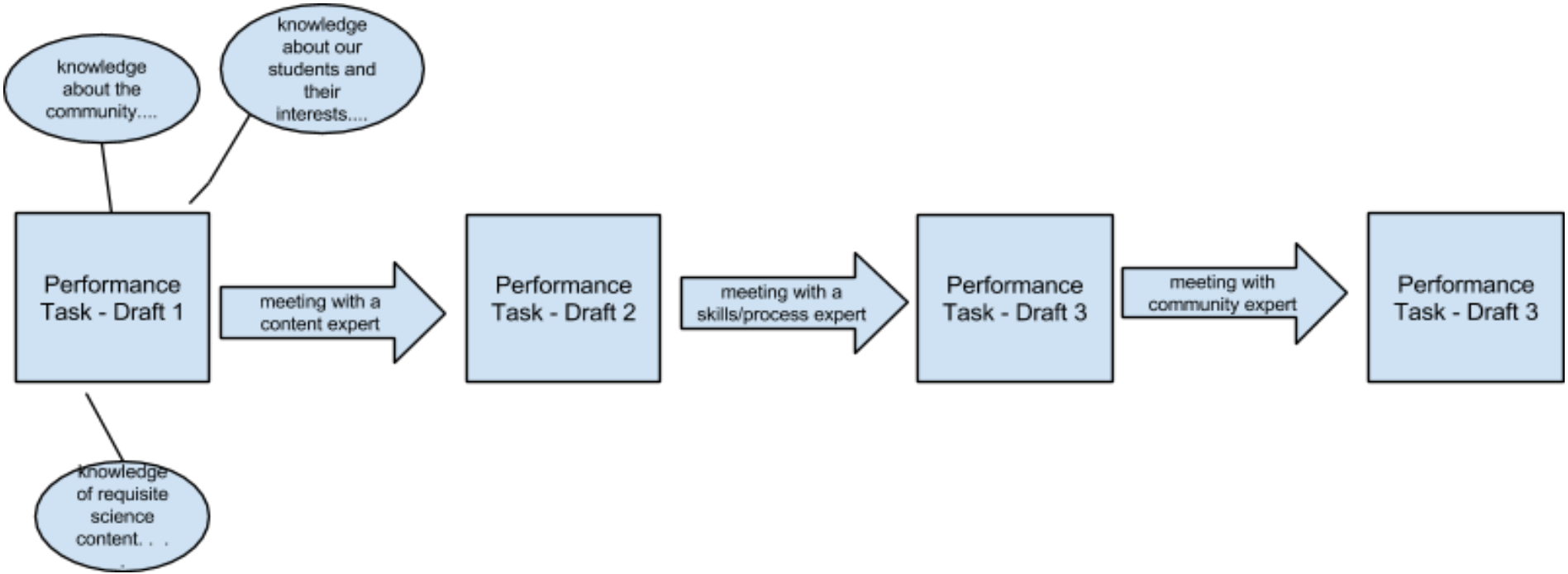
Year 1 2011- 2012	Year 2 2012- 2013	Year 3 2013- 2014
• design of the writing cascade • using LDC template tasks to design literacy instruction • cross-disciplinary inquiry in support	• refining LDC teaching tasks by integrating Next Generation Practices • more frequent writing; less emphasis on stand-alone modules. • focus on teacher capacity (Elmore *et al*) through planning with community members	• studying student engagement through the lens of motivation • focus on 1-2 Practices at a time as drivers for LDC modules • continuing to focus on teacher capacity but incorporate community members into classroom community

Reframing Community Engagement in Science

The old model of community engagement . . .



Reframing Community Engagement in Science - Task Design



Planning a Science Performance Task

Pests in the City

What can we do to safely eradicate pests that are a problem in our urban lives? Pick one of the following: mosquitoes, bed bugs, roaches, lice, or stink bugs.

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Content Connections	Science Practices

Planning a Science Performance Task

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Content Connections	Science Practices

● reproduction
  ○ asexual and sexual
  ○ life cycle
● evolution and pesticide resistance
● life cycles
● body systems - immune, respiratory
● ecosystem dynamics and extinction
● food chains
	2. Developing and Using Models
	
	6. Designing Solutions (Engineering)

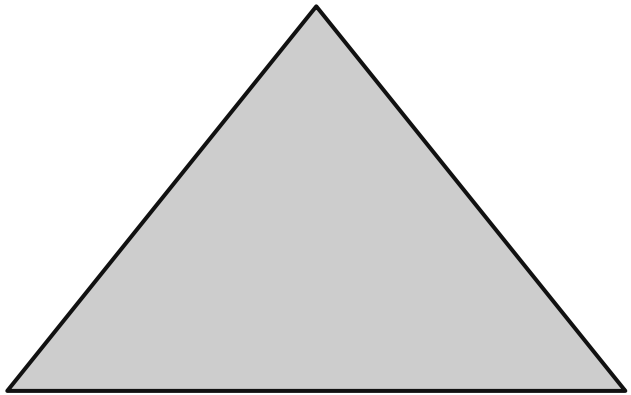
Planning a Science Performance Task

One aha moment was. . .

- **realizing how the habitat could be used as a vehicle to drive a rich unit in tri 3!**
- **the idea of your apartment or classroom being an ecosystem.**

Instructional Core (Elmore)

Raise the **level of content** that students are taught.



Increase the **teachers' skill & knowledge** that they bring to teaching of that content

Increase the **level of students' active** learning (engagement) of the content

"To promote students' framing what they are doing as finding out something, we suggest making that the beginning of the activity, and proceeding from there. That is, classroom activities should focus, at least at the outset, on the questions that argumentation could answer rather than on the structure of the students' discourse."

(Berland & Hammer, 2012, p.90)

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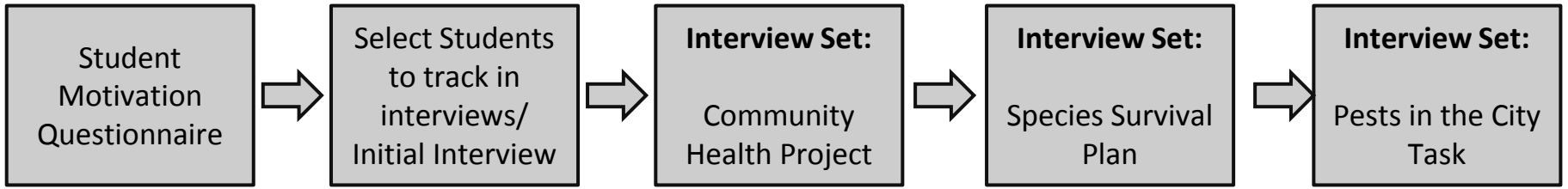
Reframing Community Engagement in Science
Current Action Research



Challenges and Next Steps

- High-stakes state exams (NY Regents) not aligned with these practices
- Shifting planning time towards working with community partners requires a different school set-up
- Iterative curriculum design requires huge amounts of teacher time

Thank you!

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