

Project completed by the  
Connecticut Center for  
Advanced Technology, Inc.



in partnership with CSDE,  
CCSU, and the U. of Hartford.

## Project Goals

1. Through PD, address the need for in-service science educators in CT to have **a strong and common starting point for making the transition to “next-gen science,”** i.e., science teaching and learning that represents the vision, principles, goals, and key instructional shifts called for in *A Framework for K-12 Science Education* and the *Next Generation Science Standards*.
2. Develop **a free online course** in the foundations of next-gen science for use by teams of teachers, with select portions being adaptable for use with other stakeholders.

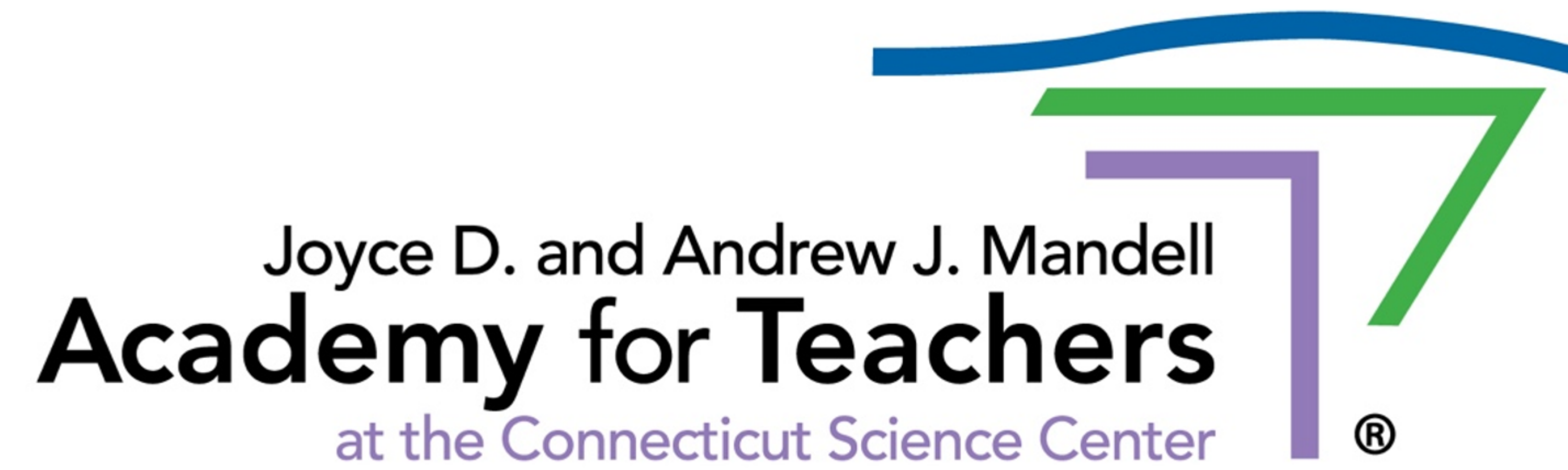
## PD Overview

- **Duration:** Over **190 hours** of blended PD (in-person, webinars, on-site support) between 4/2014 and 8/2016
- **Participants/Districts:** An average of **29 educators** from **11 districts**
- **Students Impacted:** approx. 3,000 – 3,500 per cycle

## PD Outcomes (Participants)

- Results showed substantial increases in multiple areas:
  - **NGSS Confidence:** Year 2: Pre/post ratings of **3.91 vs. 8.36 out of 10** on a Likert-style scale; Year 3: **8.78**
  - **Self-efficacy:** Year 2: Ranged **from 7.73 to 8.18 out of 10** on areas of the NGSS; Year 3: Ranged **from 8.00 to 8.44**
  - **Use of next-gen science classroom strategies:** Year 2: Pre/post ratings of **4.09 vs. 7.73 out of 10**; Year 3: **8.89**
- Changes made by teachers in their classrooms included:
  - Incorporation of SEPs into science instruction;
  - More inquiry based hands-on instruction;
  - Using more anchoring phenomenon
  - Weaving CCCs into each lesson,
  - Designing engineering based learning activities; and
  - Making a conscious decision to shift to 3D teaching and learning.
- These outcomes were supported by video footage, teacher and student work products, and survey comments.

This session supported by:



# Next-Gen Science CT

## From PD to Online Course

Project Coordinator: Nicholas Balisciano, [nbalisciano@ctsciencecenter.org](mailto:nbalisciano@ctsciencecenter.org)  
Course Site: <http://ngss.ccat.us> Help Email: [nextgensciencect@gmail.com](mailto:nextgensciencect@gmail.com)

## Online Course Overview

### Basic Facts

Launched in November 2015  
Over 2,200 registered users as of September 2017

### Benefits

**Basic** foundation for Next Generation Science Standards  
**Free** for CT educators through July 2022  
**Flexible** scheduling  
**Useful** for local PLCs  
**Certificate** of completion (emailed)

### Format and Features

Short videos followed by “Think and Discuss” PLC prompts  
Embedded video quizzes and end-of-module checkpoints  
Badges and “XP” for progress and for doing extra  
Discussion forums for each module  
Downloadable course and module resources

## PD Outcomes (Student Indicators)

- An average of **82%** of students of participating teachers scored at or above proficient in science on state science tests. The average rate for all students in the participating districts was **57%**.
- Teachers rated the impact of the implementation of NGSS as “high” on a **student interest** in science as an area of study (**7.44 out of 10**), b) **achievement** of students in the science class (**7.67 out of 10**), and c) **engagement** in science learning activities (**8.33 out of 10**).
- Student survey respondents indicated: “*In my science classroom...*”
  - o students work together to answer questions and solve problems. (94%)
  - o students analyze and interpret data needed to answer science questions and solve science problems. (86%)
  - o students understand what they are doing in science class. (84%)
  - o students understand that science is important in and relevant to everyday life. (83%)
  - o students do investigations to solve problems and answer science questions. (82%)
  - o students use evidence to explain ideas. (82%)
  - o students use scientific explanations to understand and solve science problems. (80%)
  - o students use multiple sources to assess science information for credibility, accuracy, and possible bias. (80%)

## Online Course Modules

### Core Modules (Done in Sequence)

- 1 Course Introduction (0.33—1.5 hours)
- 2 Overview of Next-Gen Science (1.5—6 hours)
- 3 Next-Gen Practices Overview (1.75—8.25 hours)
- 4 New/High Priority Practices (3.5—16 hours)

### Flex Modules (Can Do in Any Sequence after Mod. 4)

- 5 Disciplinary Core Ideas (1—3 hours)
- 6 Crosscutting Concepts (0.67—1.5 hours)
- 7 Nature of Science (1.5—3 hours)
- 8 Engineering (2—4.5 hours)
- 9 Equity and Diversity (2.5—8 hours)
- 10 NGSS Architecture (2—6 hours)

### Final Module

- 15 Wrap-Up (1—2.5 hours) — 18 to 60 hours total

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## Online Course Challenges

Challenges that were fully addressed:

- Selecting an appropriate platform, production tools
- Determining how best to get pre-release input
- Determining eligibility and terms of use
- Designing it to require minimal tech. support
- Building in mechanisms to provide feedback for participants and gather data for the project team

Challenges that were partially addressed:

- Building in “minds-on” mechanisms to maximize attention, reflection, discussion, and application
- Balancing breadth with depth
- Balancing flexibility with fidelity

Challenges that are ongoing:

- Informing the state about the course and its benefits, tradeoffs, and scope
- Encouraging and helping people to form PLC groups and providing guidance to facilitators
- Educating stakeholders about do’s and don’ts of effective course use
- Motivating participants to enroll and continue
- Studying the outcomes of the course

## Special Thanks

The project team made everything possible:

**CCAT** - Nick Balisciano (now at CT Science Center), Gail Emilsson (now at CT Science Center), Kristal Atkinson (now at UConn)

**CCSU** - Drs. Marsha Bednarski, Kristine Larsen, and Jeffrey Thomas

**U. of Hartford** - Dr. Joan Pedro (now at U. of Houston, Clear Lake)

**CSDE** - Elizabeth Buttner (now retired), Ron Michaels  
**CRE** - Theresa Bruckerhoff, Project Evaluator

The following provided input on the online course, with support from local leadership:

Barbara Marroquin - Kaynor Technical High School  
Catherine Kapa - Manchester  
Christine Lawlor-King - East Hartford  
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Eric Sawyer - Abbott Technical High School  
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Michael Catanese - Simsbury

Michael Gomola - Waterbury

Rachael Manzer - Hartford

Richard Pelczar - Middletown

Shannon Karlowicz - East Granby

Stella Ross - East Granby

Susan Kosinski - Simsbury

Susan Burbank - Hartford

Theresa Pearce - Platt Technical High School

Vincent Buccilli - New Britain