

urban advantage

science initiative

Urban Advantage Professional Learning Catalog for Continuing Teachers In years 2 through 5

2018-2019

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The Council of the
City of New York



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Sections:

1. General descriptions of the four types of Professional Learning opportunities.
2. Table of Professional Learning courses offered this year
3. Detailed Descriptions of each Professional Learning offering

Category 100: Scientific Investigation Courses: Introduction to one of the 4 types of investigations:

Controlled Investigations
Field Investigations
Design Experiments
Secondary Research

Course description: Participants will learn to utilize Urban Advantage resources to inspire and/or conduct long-term science investigations. Teachers will be introduced to science practice tools (IDD and DSET) and techniques necessary to plan and carry out a particular type of investigation with a focus on a content area.

Four and two day sessions are available:

Four day courses are intended for teachers in their 2nd and 3rd years of UA. In 4 day courses participants will complete an investigation.

Two day courses are intended for teachers in their 4th and higher year in UA.

Prerequisites: These sessions are intended for teachers who have been in UA for 1 or more years with an interest in learning about a particular type of investigation that they DID NOT explore during previous PD sessions (Cycle 2 or Continuing Teacher PD).

Learning goals for this course type:

- Improve teachers ability to leverage NYC's Science-Rich Cultural Institutions and other resources outside the classroom, especially NYC's natural setting, to support and deepen students' science literacy.
- Develop and deepen teachers' capacity to design various types of investigations (field study, controlled, design and secondary research), and the teachers' ability to structure learning experiences for all students that support the design of rigorous investigations.
- Strengthen teachers' understanding of and ability to teach students how to construct rigorous scientific explanations of phenomena based on claims, evidence, and reasoning.
- Deepen teachers' understanding of science - both science content knowledge and the practice of science.
- Deepen teachers' capacity to share with, collaborate and seek assistance from their UA community.

Participation in this course will include one or more of the following activities:

- The 4 day versions of the Category 100 courses will involve an introduction to a particular investigation strategy and participant groups completing an investigation.
- The 2 day versions of the Category 100 courses will involve an introduction to a particular investigation strategy and consideration of the Investigation Design challenges associated with that strategy.
- Participants may be introduced to IDDs that have been modified for a particular type of investigation.

- Participants may use institution exhibitions to deepen content knowledge in preparation for an investigation.

Category 200: Scientific Investigation Courses: Methods and Strategies

Course description: Participants will explore techniques and scaffolding tools to help students develop strong scientific explanations around evidence gathered through investigations. Connections between Common Core State Standards in ELA or Math and Long Term Science Investigations will be explored via tools such as the “Designing a Scientific Explanation Tool (DSET).”

Prerequisites: Possible prerequisites around a particular type of investigation may apply.

Learning goals for this course type may include:

- Improve teachers ability to leverage NYC’s Science-Rich Cultural Institutions and other resources outside the classroom, especially NYC’s natural setting, to support and deepen students’ science literacy.
- Strengthen teachers’ understanding of and ability to teach students how to construct rigorous scientific explanations of phenomena based on claims, evidence, and reasoning.
- Deepen teachers’ capacity to share with, collaborate and seek assistance from their UA community.

Participation in this course will include one or more of the following activities:

- Participants may explore various strategies to support ELL students and Special Education students
- Participants may apply various strategies to analyze data sets to reflect on connections between their IV and DV
- Participants may explore various scaffolding strategies to support students as they develop their investigation skills
- Participants may explore new content areas beyond a previous experience with a particular investigation strategy

Category 300: Courses on Science Content and Science Practices

Course description: Participants will reflect on how research on learning can inform their teaching practice around supporting students' science investigations. Using research on teaching and learning, and UA Partner exhibits, participants will explore a given science topic and/or science practice, including:

- the development of science concepts across grade levels (learning progressions)
- common misconceptions
- related science practices (inquiry)

Following a variety of strategies to explore science content, we will utilize diverse resources, including the AAAS Atlas for Science Literacy, other references, and exhibits, to explore these topics.

Prerequisites: Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classrooms, and are ready to take a deeper look at current research on teaching practices, learners' needs and goals in particular science content areas.

Learning goals for this course type:

- Improve teachers' ability to leverage NYC's Science-Rich Cultural Institutions and other resources outside the classroom, especially NYC's natural setting, to support and deepen students' science literacy.
- Deepen teachers' understanding of science - both science content knowledge and the practice of science.
- Deepen teachers' capacity to share with, collaborate and seek assistance from their UA community.

Participation in this course will include one or more of the following activities:

- Participants may read from a variety of references on topics such as developmental sequences, common misconceptions, and what a scientifically literate adult should know about a content area.
- Participants may utilize resources of Science Rich Cultural Institutions to explore science content, for example doing activities in the AMNH Birds of the World Hall to explore concepts around adaptation.

Related References:

NSDL Strand Maps <http://strandmaps.nsdl.org/http://strandmaps.nsdl.org/>

American Association for the Advancement of Science
[Benchmarks for Science Literacy](#) & [Science for all Americans](#)

Curriculum Topic Study Project: <http://www.curriculumtopicstudy.org/about-cts>

[Making Sense of Secondary Science, Driver et al.](#)

[A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas \(2012\)](#)

[Surrounded by Science: Learning Science in Informal Environments \(2010\)](#)

[Teaching for Conceptual Understanding in Science, NSTA \(2015\)](#)

Category 400: Courses on Reflective Practice

Course descriptions:

Using protocols for reflecting on teaching practices, participants will engage in opportunities to discuss (or address) key questions around student learning of science content and science practices. Teachers will engage in collaborative, critical and supportive dialogue using methods that may include examinations of student work, lesson plans, a puzzle of practice and/or video of classroom teaching.

Note: These are 3-day professional development sessions

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classroom for 2 or more years and are ready to reflect on their teaching and student learning, and refine their teaching practice.

Learning goals for this course type:

- Develop and deepen teachers' capacity to design various types of investigations (field study, controlled, design and secondary research), and the teachers' ability to structure learning experiences for all students that support the design of rigorous investigations.
- Deepen teachers' capacity to reflect on and improve their pedagogical practice around supporting students in science.
- Deepen teachers' capacity to share with, collaborate and seek assistance from their UA community.

Participation in this course will include one or more of the following activities:

- Participants, with the support of protocols and community building exercises, will examine and reflect on student work with the goal of surfacing student thinking.
- Participants will engage in a collegial and collaborative learning experience where teachers will identify and develop opportunities to provide additional supports and scaffolds to their students.
- Participants will present a puzzle of practice related to science investigations and engage in a protocol to think about ways to improve their work.
- Participants will use video of themselves teaching to provide feedback to each other through protocols about specific instructional practices related to science investigations.

Urban Advantage Continuing Teacher Professional Learning for the 2018-2019 School Year

	100 Category Workshops				200 Category Workshops	300 Category Workshops	400 Category Workshops
	Controlled Experiments	Field Studies	Design Experiments	Secondary Research	Investigations & Math & ELA Common Core	Science Content & Investigations	Reflective Practice
AMNH	Science Practices in Darwin's Garden (some days at NYBG) (4 days) (128) (We 3/13, Th 3/28, Tu 4/9 & We 4/17)			Investigating Weather (133) (Su: 10/21, 11/4) Investigating Climate (134) (Sa: 12/1, 12/15)	Analyzing and Interpreting Data: Secondary Research (216) (Tu: 2/26 online work starts & Su: 3/24 face-to-face)	Evidence & Explanation & Plate Tectonics (301) (Sa: 4/13, 5/4)	Examining Student Work (3 days) (409) (Sa: 11/17, 12/1, 12/8) Examining Teacher Practice using Video Pt 2 (w/ NYSCI & BZ)(3 day equiv.) (462) (Sa: 1/26 & 2/9 + Online work due by 3/2) Reflecting on embedding literacy strategies in science curriculum (3 day equivalent) (453) (all online between 4/6 & 5/4) Advanced Reflective Practice (3 day equivalent) (416b) Th: 10/11, 11/8, 12/6, 1/10, 2/7, 3/7
BBG		Introduction to Phenology (4 day) (130) (Su: 10/14, 1/13, 3/24, 5/5)			Meet the Parents: Asking Questions about Reproduction & Heredity (222a) (Tu: 12/4, We: 12/12) (222b) (Fr: 2/1, We: 2/13)		Examining Student Work & Thinking at BBG (401) (Su: 1/27, 2/10, 3/3) Examining Student Work and Thinking at BBG Part 2 (410) (Sa: 3/16, 5/11, 5/18)
BZ				Investigating Amphibian Populations (129) (4 days) (Su: 1/6, 1/13, 1/20, 1/27)	Analyzing and Interpreting Data: Ecosystem Dynamics (203) (Tu: 10/16, Mo: 10/22)	Science Content in Adaptation & Natural Selection (302) (one day at NYBG) (We: 2/13, Tu: 2/26)	
NYAQ	Investigating Water Turbidity (111) (Sa: 10/20, 11/3)				Analyzing and Interpreting Data: Field Study Investigations (201) (Su 1/27, Su 2/10)	Exploring Evidence & Explanation for the Shark "Surge" (308a & 308b) (a: Sa: 10/27, 11/10) (b: Tu: 2/26, Mo: 3/4) Human Impact on Climate (315) (Su: 4/28, Su 5/5)	Teacher practice in coaching & guiding investigation design (3 day equivalent) (408) (Tu: 1/8, Online 1/22, We: 1/30)

Urban Advantage Continuing Teacher Professional Learning for the 2018-2019 School Year

100 Category Workshops					200 Category Workshops	300 Category Workshops	400 Category Workshops
	Controlled Experiments	Field Studies	Design Experiments	Secondary Research	Investigations & Math & ELA Common Core	Science Content & Investigations	Reflective Practice
NYBG	Science Practices in Darwin's Garden (some days at AMNH) (4 Day) (128) (We 3/13, Th 3/28, Tu 4/9 & We 4/17)				Analyzing and Interpreting Data: Plant and Ecology Investigations (202) (Tu: 1/15, Th: 1/31) <hr/> Controlled Investigations with a Focus on Special Education (242) (Sa: 12/15, 1/5)	Science Content in Adaptation & Natural Selection (302) (one day at Bronx Zoo) (We: 2/13, Tu: 2/26)	Examining Student Work at NYBG: Special Ed Focus (3 days) (406) (Su: 2/10, 3/3, 3/31) <hr/> Advanced Reflective Practice (416a) (Su: 3/10, 4/7, 5/5)
NYSCI	Bounce Factor (132) (Su: 11/4, 11/18)				Rockets Discourse (208) (Su: 5/5, 5/19)	Developing Design Investigations (310) (Sa: 3/2, 3/16)	Examining Teacher Practice using Video Pt 1 (w/BZ) (452) (Tu: 10/23, We: 11/7, Online work due by 12/2)
QBG		Field Investigations with Plants (4 days) (131) (Sa: 10/13, 10/20, 10/27, 11/3)			Designing a Germination Explanation (233a & 233b) (a: Su: 1/6, 1/13) (b: Sa: 5/11, 5/25) <hr/> Exploring Scientific Explanations (234) (Th: 1/17, We: 1/30)	Plants, Practices, Pedagogy (313) (Su: 2/3, 2/10)	Examining Student Work at QBG (403) (Fr: 11/16, Mo: 12/3, We: 12/19)
SIZ		Citizen Science (135) (Th 4/11, Tu: 4/30)			Using Claim, Evidence, & Reasoning to Explore Adaptations (232) (Sa: 1/12, 1/26)		Examining Student Work at SIZ (405) (Th: 2/28, Tu: 3/12, Th: 3/28)

PD Type:	Science Investigation Course Category 100
Title:	Controlled Experiment: Investigating Water Turbidity Course number 111
Location:	New York Aquarium
Dates:	Saturdays, October 20, and November 3, 2018 (This is a 2-day course)
Time:	9:30 AM to 3:00 PM (breakfast at 9:00 AM)
Instructors:	Partner Staff: Daniel O'Shoney Lead Teacher Staff: Catherine Calogero, Caitlyn Coffey

Course description:

Use the shore as your personal classroom, while investigating reasons to explain the turbidity – or cloudiness – of our local waters. Participants will be introduced to the ecology of Coney Island, as well as the tools and techniques necessary to plan and carry out a controlled investigation at the beach. Skills to be covered include identifying variables, designing a controlled investigation, and collecting data.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about controlled experiments and those who DID NOT explore controlled experiments during previous Urban Advantage Professional Learning courses.

Learning goals for this course:

- Increase teachers' knowledge of and ability to teach students how to design controlled investigations and link scientific investigations to classroom science content.
- Reinforce and build on the use of UA tools, including the IDD and DSET.
- Help teachers understand how to integrate UA institutional resources, including field trip learning experiences to support a specific type of investigation.
- Expose teachers to new science content knowledge and related pedagogical knowledge through an investigation that promotes science practices.

PD Type:	Science Investigation Course Category 100
Title:	Field & Controlled investigations: Science Practices in Darwin’s Garden Course number 128
Location:	American Museum of Natural History and the New York Botanical Garden
Date:	Wednesday, March 13, Thursday, March 28, Tuesday, April 9 and Wednesday, April 17 (This is a 4-day course, Days 1 & 4 at NYBG, days 2 & 3 at AMNH)
Time:	9:00 AM – 3:00 PM (breakfast at 8:30 AM)
Instructors:	Partner Staff: Jay Holmes, and Mona McNamara Guest educator: David Kohn, AMNH, Director, Darwin Manuscripts Project Lead Teachers: Alicia Crawford, Lauren DeFino, Jon Franks, Deborah Sarria, and Rachelle Travis

Course description:

Participants will explore science practices and the nature of science through controlled and field investigations paralleling those conducted by Charles Darwin. We will utilize Garden and Museum exhibitions, primary source documents, and live plant dissections and observations (including microscopic observation). We will explore areas including insectivory in plants, plant movement and survival in the “weed garden.” Our focus science concepts will be Adaptation and Natural Selection.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning about plant investigations and the nature of science.

Learning goals for this course:

- Deepen ability to apply science practices in our classrooms, backyards and neighborhoods in controlled and field investigations.
- Support teachers integration of field learning experiences into science content instruction.
- Reinforce and build on the use of UA tools, including the IDD and DSET.

PD Type:	Scientific Investigation Course Category 100
Title:	Secondary Research: Investigating Amphibian Populations Course number 129
Location:	Bronx Zoo
Dates:	Sundays, January 6 th , January 13 th , January 20 th , and January 27 th , 2019 (This is a 4-day course)
Time:	9:30 AM to 3:00 PM (Breakfast at 9:00 AM)
Instructors:	Partner Staff: Jeanie Yeo Lead Teachers: Christopher Joya, Elizabeth Martinez

Course description:

Amphibians are considered to be strong indicators of environmental health and their populations have declined significantly in recent decades. In this course, participants will gain additional content knowledge and pedagogical skills to aid their students in designing strong investigations using evidence obtained from secondary data sets from FrogWatch, a citizen science program of the Association of Zoos and Aquariums. Participants will study frog and toad populations by observing amphibians at the zoo and using the secondary data to create and analyze graphs. Participants can study variables such as geographic location, species distribution, and habitat type. Participants will receive valuable resources for reference that will help them to use this free software in their classrooms and to plan field trips to the Zoo that link scientific investigations to the curriculum.

Special Reference: FrogWatch USA Data: <http://frogwatch.fieldscope.org/v3>

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students develop strong secondary research investigations and DID NOT explore secondary research during previous professional development courses. Teachers who took CTPL 115 cannot take this course.

Learning goals for this course:

- Improve teachers' ability to leverage the Bronx Zoo and other resources outside the classroom like citizen science programs, to support and deepen students' science literacy.
- Develop and deepen teachers' capacity to design a secondary research investigation using a modified IDD and data from FrogWatch USA, and teachers' ability to develop learning experiences that support their students in conducting this type of investigation.
- Strengthen teachers' understanding of and ability to teach students how to critically look at citizen science data in order to construct rigorous scientific explanations of phenomena based on claims, evidence, and reasoning.

PD Type:	Science Investigation Course Category 100
Title:	Field investigations: Introduction to Phenology Course number 130
Location:	Brooklyn Botanic Garden
Date:	Sundays, October 14 th , 2018, and January 13 th , March 24 th and May 5 th , 2019 (This is a 4-day course)
Time:	10:00 AM - 3:30 PM
Instructors:	Partner Staff: Candyce Johnson, Lauren Tecosky, and Barbara Kurland Lead Teachers: TBD

Course descriptions:

Participants will learn how to collect authentic ecological data in the field to analyze alongside secondary data from citizen, as well as professional, collected sources in an investigation of natural phenomena. Phenology is the study of seasonal events in an organism's life cycle. While exploring the plant collections of Brooklyn Botanic Garden, we will build content knowledge by developing and revising mental models of native ecosystems and consider the ecological significance of the timing of life cycle events.

Prerequisites:

Intended for teachers who have been in UA for two or more years with an interest in learning about plant field investigations. This course aims to expose teachers to necessary considerations when planning a scientific field investigation with plants, as well as the role of data size when drawing conclusions.

Learning goals for this course:

- Deepen teachers' knowledge and ability to guide students in designing investigations that use secondary as well as collected phenology data.
- Support teachers thinking of how to integrate field learning experiences into science content instruction.
- Reinforce and build on the use of UA tools.
- Expose teachers to new botanical content knowledge within the context of field learning and investigation design.

PL Type:	Science Investigation Course Category 100
Title:	Field Investigations - Plant Diversity Course number 131
Location:	Queens Botanical Garden
Dates:	Saturdays, October 13, 2018, October 20, October 27, and November 3, 2018 (This is a 4-day course)
Time:	10:00 AM - 3:30 PM (Breakfast at 9:30 AM)
Instructors:	Partner Staff: Gennadyi Gurman, Miranda Gray Lead Teachers: Angelique Contona

Course Description:

From a botanical garden to an exotic rainforest to a crack in a sidewalk, plants can tell a story. Participants in this course will practice: plant identification methods, field data collection, population sampling methods, and plant specific research. These experiences are tailored to highlight the use of urban landscapes with students and provide participants with the tools and methods needed to support teaching science content via plant-based field investigations.

Prerequisites: N/A

Learning goals for this course:

- Deepen teachers' content knowledge about identification of and niches of different plant species
- Deepen teachers' knowledge of how environmental factors can affect plant species and plant growth
- Deepen teachers' knowledge of field data collection methods
- Deepen teachers' abilities to support their students in utilizing field investigations to learn science content

This course supports learning science concepts found in the following Performance Expectation:

- MS-LS-1-5 (Construct a scientific argument for how environmental and genetic factors influence the growth of organisms)

PL Type:	Science Investigation Course Category 100
Title:	Controlled Investigation: Bounce Factor Course number 132
Location:	New York Hall of Science
Dates:	Sundays, November 4th and 18 th , 2018 (This is a 2-day course)
Time:	9:30 AM - 3:30 PM
Instructors:	Partner Staff: Grace Andrews and Deon Daniels Lead Teacher: Chris Hernandez, Theresa Tonis

Course description:

This professional development focuses on the development of controlled experiments using sixth grade content.

Using NYSCI's Sports Challenge exhibit as inspiration, participants will explore how to plan and carry out controlled experiments using handballs bouncing on a variety of different surfaces. Using background research and the data collected from these experiments, participants will construct strong scientific explanations that support their experimental claim with scientific reasoning and evidence.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about controlled experiments and they DID NOT explore controlled experiments during previous PL courses.

Learning goals for this course:

- Increase teachers' knowledge of and ability to teach students how to design investigations which apply to one of the four types of UA recognized science investigations and link scientific investigations to the curriculum.
- Reinforce and build on the use of UA tools, including the IDD and DSET.
- Help teachers understand how to integrate UA institutional resources, including field trip learning experiences to support a specific type of investigation.
- Expose teachers to new science content knowledge and related pedagogical knowledge through an investigation that promotes science practices.

PD Type: Scientific Investigation Course
Category 100

Title: Secondary Research: Investigating Climate & Weather
Course number 133

Location: American Museum of Natural History

Dates: Sunday, October 21, and November 4, 2018
(This is a 2-day course)

Time: 10:00 AM - 4:00 PM (Breakfast at 9:30 AM)

Instructors: Partner Staff: Matthew Mirabello
Lead Teachers: Rachelle Travis, Josh Winterfield

Course description:

Through hands on explorations of concepts in energy, explorations in the Museum, and other resources we will develop and build a conceptual model of cause and effect relationship in a weather system. Participants will focus on planning and carrying out investigations around evidence obtained from secondary data sets of weather variables from the NOAA database (Temperature, Wind, Precipitation, Air Pressure). The investigations will focus on weather using real data collected by NOAA. We will be using a video, museum exhibits, online resources, and a powerful graphing website to build content and inquiry knowledge.

Special Reference: <http://uanyc.science/pwc>
<https://www.ncdc.noaa.gov>

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students develop strong secondary research investigations and DID NOT explore secondary research during previous professional development courses and DID NOT attend the AMNH FY16 cycle 2 on Weather & Climate.

This course is intended to complement CTPL 134 (Climate). Those who indicate both CTPL 133 & 134 as their top preferences will be given priority when assigning registrants

Learning goals for this course:

- Improve teachers' ability to leverage the museum and other resources outside the classroom like citizen science programs, to support and deepen students' science literacy.
- Develop and deepen teachers' capacity to design a secondary research investigation using a modified IDD and data from the graphing tool, and teachers' ability to develop learning experiences that support their students in conducting this type of investigation.

- Strengthen teachers' understanding of and ability to teach students how to critically look at secondary data in order to construct rigorous scientific explanations of phenomena based on claims, evidence, and reasoning.

PD Type:	Scientific Investigation Course Category 100
Title:	Secondary Research: Investigating Climate & Weather Course number 134
Location:	American Museum of Natural History
Dates:	Saturdays, December 1, and December 15, 2018 (This is a 2-day course)
Time:	10:00 AM - 4:00 PM (Breakfast at 9:30 AM)
Instructors:	Partner Staff: Matthew Mirabello Lead Teachers: Josh Winterfield

Course description:

Participants will focus on helping students design strong investigations around evidence obtained from secondary data sets on climate variables. Through explorations in the museum's newly updated climate exhibit in the Hall of Planet Earth we will build student content knowledge, construct models, and support stronger investigations. The investigations will focus on climate using real data collected by NOAA-NCDC. We will be using video, museum exhibits, online resources, and a powerful graphing website to build content and inquiry knowledge.

Special Reference: <http://uanyc.science/pwc>

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students develop strong secondary research investigations and DID NOT explore secondary research during previous professional development courses and DID NOT attend the AMNH FY16 cycle 2 on Weather & Climate.

This course is intended to complement CTPL 133 (Weather). Those who indicate both CTPL 133 & 134 as their top preferences will be given priority when assigning registrants

Learning goals for this course:

- Improve teachers' ability to leverage the museum and other resources outside the classroom like citizen science programs, to support and deepen students' science literacy.
- Develop and deepen teachers' capacity to design a secondary research investigation using a modified IDD and data from the graphing tool, and teachers' ability to develop learning experiences that support their students in conducting this type of investigation.
- Strengthen teachers' understanding of and ability to teach students how to critically look at secondary data in order to construct rigorous scientific explanations of phenomena based on claims, evidence, and reasoning.

PD Type: Science Investigation Course:
Category 100

Title: Citizen Science: Animal Behavior Field Studies in Your Schoolyard
Course number 135

Location: Staten Island Zoo

Dates: Thursday, April 11, and Tuesday, April 30, 2019
(This is a 2-day course)

Time: 9:30 AM – 3:00 PM (Breakfast at 9:00 AM)

Instructors: Partner Staff: Jessica Hartmann, Megan Molok
Lead Teachers: Naomi Weintraub, Isabelle Fiduccia, Christine Carroll

Course Description:

You can learn a lot about wildlife in your schoolyard by just observing their behavior and location in their environment. This professional learning course will explore content in animal adaptations and data collection methods while participating in citizen science. Participants will learn how to take data on species occurrences and make observations on species diversity by taking a short walk to Clove Lakes Park. We will also use Zoo exhibits to show participants how they can use the zoo to further reinforce these concepts with their students on field trips.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students develop strong scientific field studies.

Learning goals for this course:

- Improve teachers' ability to leverage NYC's Science-Rich Cultural institutions and other resources outside the classroom, especially NYC's natural setting, to support and deepen students' science literacy.
- Develop and deepen teachers' capacity to design various types of investigations (field study, controlled, design, and secondary research), and the teachers' ability to structure learning experiences for all students that support the design of rigorous investigations.
- Deepen teachers' understanding of science—both science content knowledge and the practice of science.
- Deepen teachers' capacity to share with, collaborate and seek assistance from their UA community.

PD Type:	Scientific Investigation Courses: Methods and Strategies Category 200
Title:	Analyzing and Interpreting Data: Field Study Investigations Course number 201
Location:	New York Aquarium
Dates:	Sunday, January 27 th , and February 10 th , 2019 (This is a 2-day course)
Time:	9:30 AM - 3:00 PM (Breakfast at 9:00 AM)
Instructors:	Partner Staff: Christine DeMauro Lead Teacher Staff: Catherine Calogero, Caitlyn Coffey

Course description:

Dive into the science practices! Participants will expand on statistical skills that are necessary to analyze and interpret field study investigation data and graphs. Skills to be covered will focus on utilizing graph options more appropriate for frequency data, as well as breaking down graph interpretation. This course assumes that participants already have a basic familiarity doing field study investigations. Participants will model using the aquarium and reference data for studies that can be investigated on field trips.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students analyze and interpret data. It is recommended that the teacher DID explore field investigations during previous PL courses.

Learning goals for this course:

- Improve teachers' ability to apply science and math practice skills and knowledge in the context of a scientific investigation.
- Develop teachers' science content knowledge through the use of scientific investigations, institutional resources of UA partners, and classroom activities that promote science practices.
- Strengthen teachers' ability to implement UA tools and strategies that support the science practices across the science curriculum.

PD Type: Scientific Investigation Courses: Methods and Strategies
200 Category

Title: Analyzing and Interpreting Data: Plant and Ecology Investigations
Course number 202

Location: The New York Botanical Garden (Bronx)

Date: Tuesday, January 15, 2019
Thursday, January 31, 2019
(This is a 2-day course)

Time: 9:00 AM – 3:00 PM (Breakfast at 8:30 AM)

Instructors: Partner: Mona McNamara and Shannon Haas
Lead Teachers: Alicia Crawford

Course description:

What does your data really mean? How (and how strongly) does it support your claim? We will conduct controlled experiments using plants with a focus on understanding and using the Math CCLS to analyze and interpret data. Teachers will explore how to use both small and large data sets with students as well as consider how to integrate grade level appropriate math.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about plant based investigations.

Learning goals for this course:

- Improve teachers' ability to apply Common Core Math and/or ELA skills and knowledge in the context of a scientific investigation
- Develop teachers' science content knowledge through the use of scientific investigations, institutional resources of UA partners, and classroom activities that promote science practices
- Strengthen teachers' ability to implement UA tools and strategies that support Common Core Math and/or ELA standards across the science curriculum

PD Type:	Scientific Investigation Courses: Methods and Strategies Category 200
Title:	Analyzing and Interpreting Data: Ecosystem Dynamics Course number 203
Location:	Bronx Zoo
Dates:	Tuesday, October 16, and Monday, October 22, 2018 (This is a 2-day course)
Time:	8:30 AM - 2:00 PM (Breakfast at 8:00 AM)
Instructors:	Partner Staff: Jeanie Yeo Lead Teachers: Christine Abraham, Christopher Joya

Course description:

Help strengthen your own competency in analyzing complex data in order to develop a strong scientific explanation rooted in empirical evidence. This course will utilize authentic animal data to identify causal and correlational relationships in data by engaging in math practices, applying concepts of statistics and probability such as measures of center and variation, and writing scientific explanations that have real-world application. There will be opportunities to share ideas with colleagues and to examine student work, and each participant will receive valuable resources for reference at the conclusion of the course.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students analyze and interpret data. It is recommended that the teacher DID explore field investigations during previous PL courses.

Learning Goals for this Course:

- Improve teachers' ability to leverage the Bronx Zoo and other resources outside the classroom, to support and deepen students' science literacy.
- Teachers will deepen their ability to utilize animal data to teach students how to collect, summarize, graph, and analyze authentic data in a way that supports the science practices.
- Teachers will deepen their knowledge of strategies for guiding students to develop strong scientific explanations with accurate claims supported by appropriate evidence, including measures of center and variability.

PL Type:	Scientific Investigation Courses: Methods and Strategies Category 200
Title:	Phenomenal Rockets Course number 208
Location:	New York Hall of Science
Dates:	Saturdays, April 14th and 28 th 2019 (This is a 2-day course)
Time:	9:30 AM - 3:30 PM
Instructors:	Partner Staff: Grace Andrews, Deon Daniels Lead Teacher: Erin Sheehan, Theresa Tonis

Course description:

This professional development focuses on the use of literacy strategies to develop strong hypothesis and background information to support the construction of scientific explanations using eighth grade content around Newton's laws of motion, and aerodynamics.

Participants will focus on a number of literacy skills and strategies that scaffold citing textual evidence, and choosing relevant, well-chosen facts to develop the background information component of the long-term science investigation.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about helping students develop strong scientific arguments around a design experiment and you DID NOT explore rockets design experiments during previous PL courses.

Learning goals for this course:

- Improve teachers' ability to apply Common Core Math and/or ELA skills and knowledge in the context of a scientific investigation.
- Develop teachers' science content knowledge through the use of scientific investigations, institutional resources of UA partners, and classroom activities that promote science practices.
- Strengthen teachers' ability to implement UA tools and strategies that support phenomenon based learning.

PL Type:	Scientific Investigation Courses: Methods and Strategies Category 200
Title:	Analyzing and Interpreting Data: Secondary Research Course number 216
Location:	Blended – Online work followed up with Face-to-face session at the American Museum of Natural History
Dates:	Tuesday, February 26 th , 2019 – Thursday, March 21, 2019 (ONLINE asynchronous) Sunday, March 24, 2019 (Face-to-Face) (This is a “2-day” course, with 5 hours of online work before the in-person session)
Time:	Online work will be asynchronous, (5 hours) with due dates prior to in-person session. In-person day, (5 hours) 10:00 AM - 4:00 PM (Breakfast at 9:30 AM)
Instructors:	Partner Staff: Matthew Mirabello Lead Teachers: Rachelle Travis, Josh Winterfield

Course description:

What does your data really mean? How (and how strongly) does it support your claim? We will use secondary research investigations to focus on understanding and using the Math CCLS to analyze and interpret data. Teachers will explore how to use both small and large data sets with students as well as consider how to integrate grade level appropriate math within the context of secondary research. Science content area will be in Climate & Weather but skills are applicable to Earthquakes, Ecosystems, & other museum related content areas.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about secondary research that they DID explore during previous PL courses.

Learning Goals for this course:

- Improve teachers’ ability to apply Common Core Math and/or ELA skills and knowledge in the context of a scientific investigation.
- Develop teachers’ science content knowledge through the use of scientific investigations, institutional resources of UA partners, and classroom activities that promote science practices.
- Strengthen teachers’ ability to implement UA tools and strategies that support Common Core Math and/or ELA standards across the science curriculum.

PD Type:	Scientific Investigation Courses: Methods and Strategies Category 200
Title:	Meet the Parents: Asking Questions about Reproduction & Heredity Course number 222
Location:	Brooklyn Botanic Garden
Dates:	<u>Section A:</u> Tuesday, December 4 th and Wednesday, December 12 th , 2018 <u>Section B:</u> Friday, February 1 st , and Wednesday, February 13 th , 2019 (This is a 2-day course being offered twice. The two sections will be identical. Registrants can only take the course once.)
Time:	9:00 AM - 2:30 PM
Instructors:	Partners: Candyce Johnson, Lauren Tecosky, and Barbara Kurland

Course description:

Using research-based findings on teaching and learning, participants will focus on the practice of Asking Questions as defined in A Framework for K-12 Science Education. Keeping with the spirit of the NGSS and NYSSLS, we will be exploring naturally-occurring phenomena that arise when organisms reproduce and pass traits to offspring. We will discuss and consider how student questions can be harnessed to drive instruction that guides them toward constructing their own explanations.

Prerequisites:

Available to teachers who have completed one or more years of Urban Advantage. This course is intended for teachers who are interested in refining their ability to guide students in asking questions that can be answered using empirical data to determine the relationships between variables.

Learning goals for this course:

- Improve teachers' ability to spark and use student questions to drive instruction toward explaining naturally-occurring phenomena.
- Develop teachers' science content knowledge through the use of institutional resources of UA partners.
- Strengthen teachers' ability to implement UA tools and strategies that support NYSSLS standards within the study of plant reproduction.

PD Type:	Scientific Investigation Courses: Methods and Strategies Category 200
Title:	The Skull Tells All: Using Claim, Evidence, & Reasoning to Explore Adaptations Course number 232
Location:	Staten Island Zoo
Dates:	Saturday, January 12, 2019 Saturday, January 26, 2019 (This is a 2-day course)
Time:	10:00 AM – 3:30 PM (Breakfast at 9:30 AM)
Instructors:	Partner Staff: Jessica Hartmann, Megan Molok Lead Teachers: Isabelle Fiduccia, Christine Carroll

Course Description:

You can learn a lot about an animal, simply by examining the skull! This professional learning course will explore content in animal adaptations, while developing further skills using the DSET. Participants will learn how to take several measurements focusing on specific aspects of a skull in order to determine what characteristics that species possesses to help it to survive in the wild. We will also use Zoo exhibits to reinforce how & why these adaptations evolved in order to benefit an animal in its natural habitat. Participants will use claim, evidence, and reasoning to draw conclusions about the adaptations their final “mystery animal” possessed. Participants will also understand how they can use the zoo to further reinforce these concepts with their students on field trips.

Prerequisites:

Intended for teachers in UA for 1 or more years who seek additional content in adaptations or support in developing a DSET in order to guide their students in a long term science investigation.

Learning goals for this course:

- Improve teachers’ ability to apply Common Core math and/or ELA skills and knowledge in the context of a scientific investigation.
- Develop teachers’ science content knowledge through the use of scientific investigations, institutional resources of UA partners, and classroom activities that promote science practices.
- Strengthen teachers’ ability to implement UA tools and strategies that support Common Core Math and/or ELA standards across the science curriculum.

PL Type: Scientific Investigation Courses: Methods and Strategies
Category 200

Title: Designing a Germination Explanation
Course numbers 233a and 233b

Location: Queens Botanical Garden

Dates:	233a	233b
	Sunday, January 6, 2019	Saturday, May 11, 2019
	Sunday January 13, 2019	Saturday, May 25, 2019
	(This is a 2-day course)	(This is a 2-day course)

Time: 10:00 AM -3:30 PM (Breakfast at 9:30 AM)

Instructors: Partner Staff: Marnie Rackmill
Lead Teacher: Angelique Contona

Course Description:

Explore the ins and outs of why seeds sprout and create your own design investigation! This course will use a constructivist approach that will lead to participants creating their own knowledge about seed germination. Once participants have engaged in observation, investigation, data analysis and research they will write their own scientific explanations. As we go along we'll explore ways in which teachers can support students in creating their own scientific explanations.

Prerequisites: N/A

Learning goals for this course:

- Deepen teachers' understanding of science content related to plant structure and function
- Deepen teachers' understanding of a design investigation
- Deepen teachers' ability to support students in writing scientific explanations
- Deepen teachers' ability to support students using student-centric teaching methods

This course supports student learning of science concepts found in Performance Expectations

- MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of things
- MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.

PL Type: Scientific Investigation Courses: Methods and Strategies
Category 200

Title: Exploring Scientific Explanations
Course number 234

Location: Queens Botanical Garden

Dates: Thursday, January 17, 2019
Wednesday, January 30, 2019
(This is a 2-day course)

Time: 9:00 AM - 3:00 PM (Breakfast at 8:30 AM)

Instructors: Partner Staff: Marnie Rackmill, Miranda Gray

Course Description:

This professional learning course is meant to provide teachers with multiple methods to support their students in writing scientific explanations.

Day one will be spent exploring the various components of a scientific explanation. Day two of the course will be spent working in groups to design strategies, scaffolds, and other related materials to support your students' scientific explanations.

Prerequisites:

Intended for teachers who are already familiar with and able to use at least one strategy for data analysis (for example, the I^2 or "What I See / What it Means" strategy)

Learning goals for this course:

- Deepen teachers' abilities to support students' abilities to write scientific explanations
- This course supports student learning of Constructing Scientific Explanations

PD Type: Scientific Investigation Courses: Methods and Strategies
Category 200

Title: Controlled Investigations with a Focus on Special Education
Course number 242

Location: The New York Botanical Garden (Bronx)

Date: Saturday, December 15, 2018
Saturday, January 5, 2019
(This is a 2-day course)

Time: 9:30 AM – 3:30 PM (Breakfast at 9:00 AM)

Instructors: Partner Staff: Mona McNamara and Shannon Haas
Lead Teachers: Deborah Sarria, Alicia Crawford

Course description:

Spark students’ interest in plants both in the classroom and outdoors! Participants will learn how to utilize the natural environment at The New York Botanical Garden to inspire long-term investigations with a focus on special education. Teachers will consider how to plan and carry out a controlled investigation with plants. Time will be provided to explore how to adapt UA tools and techniques to support diverse student learners.

Prerequisites:

Intended for teachers who have been in UA for 1 or more years with an interest in learning more about controlled investigations.

Learning goals for this course:

- Deepen teachers’ knowledge and ability to teach students how to design investigations with applications to the four types of science exit projects (specifically controlled investigations) and other parts of the curriculum
- Reinforce and build on the use of UA tools, including the IDD and DSET
- Help teachers understand how to integrate UA institutional resources, including field trip learning experiences to support a specific type of investigation
- Expose teachers to new science content knowledge and related pedagogical strategies through an investigation that promotes science practices

PD Type:	Courses on Science Content and Science Practices Category 300
Title	Science Content in Earth Science Investigations Course number 301
Location:	American Museum of Natural History
Dates:	Saturday, May 4 th , and May 11 th , 2019 (This is a 2-day course)
Time:	10:00 AM - 4:00 PM (Breakfast at 9:30 AM)
Instructors:	Partner Staff: Matt Mirrabello Lead Teachers: Lauren DeFino, Jon Franks

Course description:

Join us for an expedition around the world to discover the evidence for plate tectonics and the central organizing role of scientific theories. We will explore concept development and student misconceptions in the areas of plate tectonics and the role of Theories in science. Participants will reflect on how these concepts might affect our teaching practice and our students' investigations. Modelled on the Curriculum Topic Studies format we will utilize the AAAS Atlas for Science Literacy, the NYS Science Learning Standards and a variety of other resources including the AMNH exhibits to explore these topics.

Special Reference:

NSDL Strand Maps on Scientific Theories and Plate Tectonics:
<http://strandmaps.nsdl.org/?id=SMS-MAP-1216>

Prerequisites:

Intended for teachers who have been implementing UA tools in their classroom for 2 or more years and are ready to take a deeper look at this science content area and current research on learners needs and goals in these areas.

Learning goals for this course:

- Deepen teachers' understanding of scientific explanations and theories and specifically Plate Tectonic Theory
- Broaden teachers' ability to leverage museum resources and exhibition to support and deepen students' science literacy.
- To deepen the understanding of research on teaching and learning that can support pedagogical planning.

PD Type:	Courses on Science Content and Science Practices Category 300
Title:	Science Content in Adaptation and Natural Selection Course number 302
Location:	The New York Botanical Garden (Day 1) The Bronx Zoo (Day 2)
Dates:	Wednesday, February 13 th , 2019 and Tuesday, February 26 th , 2019 (This is a 2-day course)
Time:	9:00 AM - 3:00 PM (Breakfast at 8:30 AM)
Instructors:	Partner Staff: Jeanie Yeo, Mona McNamara, Shannon Haas Lead Teachers: Jessica Kuhl, Elizabeth Martinez

Course descriptions:

Following the Curriculum Topic Studies format we will utilize the AAAS Benchmarks for Science Literacy, the Atlas for Science Literacy, and a variety of other resources including institution exhibits and activities to explore the content goals and misconceptions surrounding adaptation and natural selection.

Participants will explore research based findings on what students and adults should know about this topic, deepen content knowledge and reflect on what the research tells us and how that might impact our practice and our students' long term science investigations.

Related References:

NSDL Strand Map on Natural Selection:

<http://strandmaps.nsdl.org/?id=SMS-MAP-1437>

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classrooms, and are ready to take a deeper look at research on teaching practices, learners' needs and goals in particular science content areas.

Learning goals for this course:

- Strengthen teachers' ability to teach middle school science content and/or practices in a way that is consistent with research on teaching and learning
- Develop teachers' knowledge of research findings on the teaching and learning of science content and/or practices
- Strengthen teachers' ability to develop effective teaching strategies and activities that integrate UA partner institutional resources

PD Type:	Courses on Science Content and Science Practices Category 300	
Title:	Exploring Evidence and Explanation for the Shark “Surge” Course numbers 308a and 308b	
Location:	New York Aquarium	
Dates:	308a Sat, October 27th, 2018 Saturday, November 10th, 2018 (This is a 2-day course)	308b Tues, February, 26th, 2019 Monday, March 4th, 2019 (This is a 2-day course)
Time:	308a – Saturdays 9:30 AM - 3:00 PM (Breakfast at 9:00 AM) 308b – Weekdays 9:30 AM - 3:00 PM (Breakfast at 9:00 AM)	
Instructors:	Partner Staff: Christine DeMauro Lead Teachers: Sarah Rosenblum, Catherine Calogero	

Course description:

How do we determine fact from frenzy? Making claims based on solid evidence and explanation enhances credibility. Sharks are fascinating to the public, yet media perception can cause mass misconceptions around these top ocean predators. The primary evidence being examined in this course will highlight the relationship between media coverage, shark incidents, and population changes. Shark perception will be explored in our Ocean Wonders: Sharks! exhibit. Based in the curriculum topic study (CTS) model, participants will use research findings on teaching and learning to reflect on the impact of evidence and explanations in arguments. Participants will also work towards developing effective teaching strategies for strengthening science literacy in these areas.

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classrooms, and are ready to take a deeper look at current research on teaching practices, learners’ needs, and goals in particular science content areas.

Learning goals for this course:

- Strengthen teachers’ ability to teach middle school science content and/or practices in a way that is consistent with current research on teaching and learning
- Develop teachers’ knowledge of research findings on the teaching and learning of science content and/or practices
- Strengthen teachers’ ability to develop effective teaching strategies and activities that integrate UA partner institutional resources

PL Type:	Courses on Science Content and Science Practices Category 300
Title:	Developing Design Experiments Course number 310
Location:	New York Hall of Science
Dates:	Saturday, March 6 th and March 16 th , 2019 (This is a 2-day course)
Time:	9:30 AM - 3:30 PM
Instructors:	Partner Staff: Grace Andrews, Deon Daniels Lead Teacher: Andrea Bonosoro, Theresa Tonis, Chris Hernandez

Course description:

This professional development provides participants with the opportunity to deeply examine engineering design standards, engineering practices, and research on how students approach engineering and design. We will define “design” within the context of Urban Advantage through examination of standards, collaborative experience in NYSCI Design Lab, and exploration of the instructional sequence of an Urban Advantage design experiment.

Participants gain skills and strategies that will help them to scaffold the planning and pacing of their own design experiment instructional sequence in the classroom with a focus on defining the problem, developing possible solutions, and improving designs.

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage, and you DID explore design experiments during a previous PL course. These courses are intended for teachers who have been implementing UA tools in their classrooms, and are ready to take a deeper look at current research on teaching practices, learners’ needs and goals in particular science content or practices.

Learning Goals for this course:

- Strengthen teachers’ ability to teach middle school science content and/or practices in a way that is consistent with current research on teaching and learning by:
 - a. Providing opportunities for teachers to examine research findings on the teaching and learning of science content and/or practices
 - b. Using research on teaching and learning to develop effective teaching strategies and activities that integrate UA partner institutional resources

PL Type: Courses on Science Content and Science Practices
Category 300

Title: Plant Murder Mystery – aka Plants, Practices, and Pedagogy
Course number 313

Location: Queens Botanical Garden

Dates: Sundays, February 3, and February 10, 2018
(This is a 2-day course)

Time: 10:00 AM – 3:30 PM (Breakfast at 9:30 AM)

Instructors: Partner Staff: Gennadyi Gurman and Marnie Rackmill

Course Description:

Our plants are dying! It's your job to figure out why!

Day one will allow you to explore plant structure and function designed to help you understand various aspects of plant structure and function well as a variety of environmental factors that can affect plant growth.

Day two will be spent reflecting on our experience. You will explore anchoring events and phenomenon as well as using science practices and crosscutting concepts used on Day 1. You will also work on your own lessons / lesson units.

Prerequisites: N/A

Learning goals for this course:

- Deepen teachers' understanding of science content related to plant structure and function
- Deepen teacher's understanding of science content related to the interaction of plants and the environment
- Deepen students' learning by supporting teacher's abilities to teach via science practices and anchoring events

This course supports learning science concepts found in the following Performance Expectations:

- MS-LS2-1 (Analyze and interpret data to provide evidence of resource availability on organisms and populations of organisms in an ecosystem)
- MS-LS2-4 (Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations)

PD Type:	Courses on Science Content and Science Practices Category 300
Title:	Human Impact on Climate Course number 315
Location:	New York Aquarium
Dates:	Sundays, April 25, and May 5, 2019 (This is a 2-day course)
Time:	9:30 AM - 3:00 PM (breakfast at 9:00 AM).
Instructors:	Partner Staff: Daniel O'Shoney Lead Teacher Staff: Sarah Rosenblum, Caitlyn Coffey

Course description:

How do human actions drive climate change? What effect does climate change have on New York City? How can humans work to mitigate the effects of climate change? In this course we will explore what it means to have a conceptual understanding of the cause and effects of climate change, as well as what students should understand in middle school. We will pay special attention to making learning personal and relevant, using the New York Aquarium itself to frame our learning about climate change.

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classrooms, and are ready to take a deeper look at current research on teaching practices, learners' needs and goals in particular science content areas.

Learning goals for this Course:

- Strengthen teachers' ability to teach middle school science content and/or practices in a way that is consistent with current research on teaching and learning by:
 - Providing opportunities for teachers to examine research findings on the teaching and learning of science content and/or practices
 - Using research on teaching and learning to develop effective teaching strategies and activities that integrate UA partner institutional resources

PD Type:	Courses on Reflective Practice Category 400
Title:	Examining Student Work and Thinking at BBG Course number 401
Location:	Brooklyn Botanic Garden
Dates:	Sundays, January 27 th , February 10 th , and March 3 rd , 2019 (This is a <u>3-day</u> course)
Time:	10:00 AM - 3:30 PM
Instructors:	Partners: Candyce Johnson, Lauren Tecosky, and Barbara Kurland Lead Teachers: TBD

Course description:

Using protocols, participants will have opportunities to reflect together on key questions centered around teaching practice and student learning involving long-term investigations, as well as science content and practices. Teachers will engage in collaborative, critical, and supportive dialogue as they examine authentic aspects and examples of teacher and student work.

*Please note, as this is a highly collaborative and teacher-driven course, it is expected that all teachers will share some aspect of her/his practice in either individual or group protocols.

Prerequisites:

Available to teachers who have completed two or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classroom for two or more years and are ready to reflect on student work and refine their integration of UA within their teaching practice.

Learning goals for this course:

- Familiarize teachers with the use of protocols to have managed, focused conversations about teachers' assignments and student work
- Engage teachers in reflective practice through sharing teacher and student work and collaboratively examining student thinking
- Deepen teachers' knowledge and ability to teach students to apply the tools, techniques, and critical thinking skills of science practitioners

PL Type:	Courses on Reflective Practice Category 400
Title:	Examining Teacher and Student Work at the Queens Botanical Garden Course number 403
Location:	Queens Botanical Garden
Dates:	Friday, November 16th, 2018 Monday, December 3rd, 2018 Wednesday, December 19, 2018 (This is a 3-day course)
Time:	9:00 AM - 3:00 PM (Breakfast at 8:30 AM)
Instructors:	Partner Staff: Marnie Rackmill, Miranda Gray Lead Teachers: Jebin Yohannin, Nicole Rave

Course description:

Participants will utilize protocols to engage in collaborative, critical, supportive dialogue throughout this three-day course. Participants will work together to explore student work in order to surface student thinking and ways to better support their students' learning.

Prerequisites:

This course is intended for teachers who have been implementing UA tools in their classroom for 2 or more years and are ready to reflect on student work and refine their teaching practice.

This course is meant for teachers who have not yet had the opportunity to share their student work in a "Courses on Reflective Practice" also known as "Workshop on Examining Student Work and Student Thinking."

Note: All teachers will be sharing their student work.

Learning goals for this course:

- Participants, with the support of protocols and community building exercises, will examine and reflect on student work with the goal of surfacing student thinking.
- Participants will engage in a collegial and collaborative learning experience where teachers will identify and develop opportunities to provide additional supports and scaffolds to their students.

PD Type: Courses on Reflective Practice
Category 400

Title: Examining Student Work at the Staten Island Zoo
Course number 405

Location: Staten Island Zoo

Dates: Thursday, February 28, 2019
Tuesday, March 12, 2019
Thursday, March 28, 2019
(This is a 3 day course)

Time: 9:30 AM – 3:00 PM (Breakfast at 9:00 AM)

Instructors: Partner Staff: Jessica Hartmann, Megan Molok
Lead Teachers: Naomi Weintraub, Isabelle Fiduccia, Christine Carroll

Course Description:

Using protocols, participants will engage in opportunities to reflect together on key questions that arise for them and their students when they undertake field study investigations focused on animal behavior. Teachers will engage in collaborative, critical, and supportive dialogue as they examine authentic aspects of their teaching practice and their students’ work that arise in these unique types of long term investigations.

Prerequisites:

Available to teachers who have completed two or more years of Urban Advantage and at least 1 year of Animal Behavior Field Studies. These courses are intended for teachers who have been implementing UA Animal Behavior Field Study tools in their classroom for 1 or more years and are ready to reflect on student work and refine their teaching practice using animal behavior field studies.

Learning goals for this course:

- Participants, with the support of protocols and community building exercise, will examine and reflect on student work with the goal of surfacing student thinking.
- Participants will engage in collegial and collaborative learning experience where teachers will identify and develop opportunities to provide additional supports and scaffolds to their students.

PD Type:	Courses on Reflective Practice 400 Category
Title:	Examining Student Work at NYBG: Special Education Focus Course number 406
Location:	The New York Botanical Garden (Bronx)
Dates:	Sundays, February 10, March 3, and March 31, 2019 (This is a 3-day course)
Time:	9:30 AM - 3:30 PM (Breakfast at 9:00 AM)
Instructors:	Partners: Mona McNamara, Shannon Haas Lead Teachers: Deborah Sarria, Alicia Crawford, Cristine Maisano

Course description:

Using professional learning protocols, participants will engage in opportunities to reflect together on key questions around teaching practice and student learning in Special Education contexts. Teachers will share their students' work and engage in collaborative, critical and supportive dialogue around focused examination of that work.

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classroom for 2 or more years and are ready to reflect on student work and refine their teaching practice.

Learning goals for this course:

- Participants, with the support of protocols and community building exercises, will examine and reflect on student work with the goal of surfacing student thinking.
- Participants will engage in a collegial and collaborative learning experience where teachers will identify and develop opportunities to provide additional supports and scaffolds to their students.

PD Type:	Courses on Reflective Practice Category 400
Title:	Teacher Practice in Guiding Investigation Design Course number 408
Location:	Blended - Face-to-face at the New York Aquarium plus online
Dates:	Tuesday, January 8, 2019 (at New York Aquarium) Tuesday, January 22, 2019 (ONLINE) Wednesday, January 30, 2019 (at New York Aquarium) (This is a "3-day" course, with one day of online work between the first and second in-person course)
Time:	For in-person days, 9:30 AM - 3:00 PM (breakfast at 9:00 AM). Online work will be asynchronous, with a due date prior to the second in-person session.
Instructors:	Partner Staff: Daniel O'Shoney, Christine DeMauro Lead Teacher Staff: TBD

Course description:

Teachers will engage in a blended professional development course centered on teacher-led coaching and questioning that will lead students to create rigorous and scientifically supported long term investigations. This course emphasizes teacher collaboration and support from lead teachers in order to improve the implementation of science investigations in the classroom. Teachers will engage in collaborative, critical and supportive dialogue as they examine the strategies and artifacts they use to guide and support students in the design of their investigations.

Prerequisites:

Available to teachers who have completed 3 or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classroom for 3 or more years and are ready to reflect on and refine their teaching practice with regard to the guidance and coaching of students during a long term science investigation.

Learning goals for this course:

- Participants, with support from lead teachers and community building exercises, will examine and reflect on student work with the goal of developing effective coaching strategies to strengthen student investigation design
- Participants will reflect on their own practice in regards to the initial introduction of long term science investigations in their classroom

- Participants will engage in a collegial and collaborative learning experience where teachers will identify and develop opportunities to provide additional supports and scaffolds to their students

PD Type:	Courses on Reflective Practice Category 400
Title	Examining Student Work at AMNH Course 409
Location:	American Museum of Natural History
Dates:	Saturdays, November 17, December 1 and December 8, 2018 (This is a 3-day course. All 3 days are required for course credit)
Time:	9:30 AM - 3:30 PM (Breakfast at 9:00 AM)
Instructors:	Partner: Tina Glover Lead Teachers: Lauren Couto, Jon Franks

Course description:

Using resources from National School Reform Faculty (<https://www.nsrffharmony.org/>) and other strategies, teachers will engage in opportunities to reflect together on key questions around teaching practice and student learning. Teachers will share their work and the work of their students to engage in collaborative, critical and supportive dialogue around focused examination of that work.

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These CFG or PLC groups are intended for teachers who wish to discuss and examine student work and pedagogical strategies at use in their classroom.

Learning goals for this CFG:

- Teachers, with the support of protocols and community building exercises, will examine and reflect on student work with the goal of surfacing student thinking. Each teacher will present work, in a small group, supported by a facilitator and a protocol.
- Participants will engage in a collegial, collaborative and supportive experience to identify and develop opportunities to provide additional supports and scaffolds to students.

PD Type:	Courses on Reflective Practice Category 400
Title:	Examining Student Work and Thinking at BBG Course number 410
Location:	Brooklyn Botanic Garden
Dates:	Saturdays, March 16 th , May 11 th , and May 18 th , 2019 (This is a <u>3-day</u> course)
Time:	10:00 AM - 3:30 PM
Instructors:	Partners: Candyce Johnson, Lauren Tecosky, and Barbara Kurland Lead Teachers: TBD

Course description:

Using protocols, participants will have opportunities to reflect together on key questions centered around teaching practice and student learning involving long-term investigations, in addition to science content and practices. Participant-submitted work will be the focal point of collaborative, critical, and supportive dialogue as we examine authentic aspects and examples of teacher and student work. Therefore this advanced reflective practice course requires that all teachers come prepared with student work and/or teaching plans. All teachers will be expected to participate in a self-selected protocol within a small group setting.

Prerequisites:

Available to teachers who have completed three or more years of Urban Advantage. These courses are intended for teachers who have been implementing UA tools in their classroom for three or more years and have already taken one of the following introductory Examining Student Work and Thinking courses: 401, 403, 405, 406, 408, or 409.

Learning goals for this course:

- Familiarize teachers with the use of protocols to have managed, focused conversations about teachers' assignments and student work
- Engage teachers in reflective practice through sharing teacher and student work and collaboratively examining student thinking
- Deepen teachers' knowledge and ability to teach students to apply the tools, techniques, and critical thinking skills of science practitioners

PD Type:	Courses on Reflective Practice Category 400
Title:	Advanced Reflective Practice at NYBG Course number 416a
Location:	The New York Botanical Garden
Dates:	Sundays, March 10, April 7, May 5, 2019 (This is a 3-day course)
Time:	9:30 AM - 3:30 PM
Instructors:	Partners: Mona McNamara Lead Teachers: TBD

Course description:

This course will provide an opportunity for participants to create a supportive, collaborative community, building on the work done in 406 or 409. Participants will learn about a variety of protocols for looking at student work, working through dilemmas and discussing texts, and will develop the skills to facilitate these protocols. This course is for participants who are committed to sharing their student work and their teaching practice, to giving and receiving supportive, critical feedback, and who are open to reflecting deeply on their practice.

Prerequisites:

Participants must have completed CTPL 406 or 409.

Learning goals for this course:

- Participants will actively collaborate with colleagues to create and maintain a community that is safe, supportive and responsive to the needs of all members.
- Participants will engage in at least one protocol as a presenter to examine student work, a teaching dilemma, or some other element of their practice.
- Participants will facilitate at least one protocol for a colleague.
- Teachers will work together in an ongoing reflective process to examine the relationship between their teaching practice and the learning experienced by their students.

PD Type:	Courses on Reflective Practice Category 400
Title:	Advanced Reflective Practice at NYBG: (course 416b)
Location:	American Museum of Natural History
Dates:	October 11, November 8, and December 6, 2018, January 10, February 7, and March 7, 2019 (This is a 6-day course, 2.5 hours per session)
Time:	5:00 PM - 7:30 PM
Instructors:	Partners: Mona McNamara, Tina Glover Lead Teachers: TBD

Course description:

This CFG will provide an opportunity for participants to create a supportive, collaborative community, building on the work done in 406 or 409. Participants will learn about a variety of protocols for looking at student work, working through dilemmas and discussing texts, and will develop the skills to facilitate these protocols. This course is for participants who are committed to sharing their student work and their teaching practice, to giving and receiving supportive, critical feedback, and who are open to reflecting deeply on their practice.

Prerequisites:

Participants must have completed CTPL 406 or 409.

Learning goals:

- Participants will actively collaborate with colleagues to create and maintain a community that is safe, supportive and responsive to the needs of all members.
- Participants will engage in at least one protocol as a presenter to examine student work, a teaching dilemma, or some other element of their practice.
- Participants will facilitate at least one protocol for a colleague.
- Teachers will work together in an ongoing reflective process to examine the relationship between their teaching practice and the learning experienced by their students.

PD Type:	Courses on Reflective Practice Category 400
Title:	Examining Teacher Practice Using Video Course number 452
Location:	Onsite sessions: New York Hall of Science Online sessions: https://www.teachingchannel.org (Teaching Channel access will be provided via email after registration is complete).
Dates:	This is a blended course with two onsite sessions and ongoing asynchronous online work. Work associated with this course is comparable to a 3-day session and enrolled teachers will be paid a stipend for 3 days of professional learning (15 hours).
Onsite sessions:	Tuesday, October 23, 2018 & Wednesday, November 7, 2018
Online sessions:	The online work must be completed by December 2, 2018.
Time:	Onsite sessions (4 hours per day; 8 hours total): 9:30 AM -2:00 PM (Breakfast at 9:00 AM) Online sessions (7 hours): Asynchronous
Instructors:	Partner Staff: Paloma Krakower (WCS BZ), Michaela Labriole (NYSCI), Grace Andrews (NYSCI), Deon Daniels (NYSCI) Lead Teachers: Jessica Kuhl

Course description:

Watching and analyzing videos with UA colleagues can enhance professional learning and enable you to learn new strategies. In this course, participants will use protocols to view and analyze videos demonstrating implementation of Urban Advantage tools and resources. Using protocols, participants will engage in opportunities to reflect together on videotaped lessons using a powerful platform for sharing and analyzing videos developed by the Teaching Channel. Participants will be expected to videotape classroom work and analyze the work online with other participants. Teachers will engage in collaborative, critical, supportive dialogue around teaching.

Prerequisites:

Available to teachers who have completed 2 or more years of Urban Advantage. These courses are intended for teachers who: 1) Have been implementing UA tools in their classroom for 2 or more years. 2) Are ready to reflect on and refine their teaching practice by sharing a videotaped lesson to be analyzed with UA colleagues. 3) Are prepared to think deeply and critically when watching the videotaped lessons of their colleagues in order to provide meaningful feedback.

Learning goals for this course:

- Deepen teachers' ability to reflect on and improve their pedagogical practice by analyzing video to better support students in science.

- Deepen teachers' capacity to share with, collaborate and seek assistance from their Urban Advantage colleagues using Teaching Channel as a resource.

PD Type:	Courses on Reflective Practice Category 400
Title:	Reflecting on embedding literacy strategies in science curriculum Course number 453
Location:	This course is entirely online.
Dates:	Activities associated with this course are comparable to a three-day course and enrolled teachers who complete the course in its entirety will be paid a stipend for three days of professional development (15 hours).
Online sessions:	Online tasks must be completed between April 6 and May 4, 2019
Time:	Deadlines for assignments will be communicated prior to start date.
Instructors:	Partner Staff: Ali Irwin (AMNH), Jay Holmes (AMNH)

Course description:

The purpose of this course is to help teachers reflect on their use of literacy strategies learned in previous PD. Participants will briefly review the strategies and corresponding resources and select the strategy which they would like to have more practice embedding as part of a long-term science investigation. Next they will discuss plans for implementation and get support and feedback from their peers and UA staff. They will modify and implement a lesson of their choosing with a selected literacy strategy. Finally, they will share an artifact of student work to analyze with the group. As this course is entirely online, a minimum number of posts will be required to receive credit for completion, including the posting of a student work artifact.

Prerequisites:

Available to teachers who have completed two or more years of Urban Advantage. This course is intended for teachers who: 1) have been implementing UA tools in their classroom for two or more years; 2) are ready to reflect on and refine their teaching practice by sharing a lesson plan and a sample of student work to be analyzed with UA colleagues; and 3) are prepared to think deeply and critically when reviewing the lesson plans and student work of their colleagues in order to provide meaningful feedback.

Learning goals for this course:

- Deepen teachers' ability to reflect on and improve their use of literacy strategies by analyzing lesson plans and student work to better support students in science.
- Deepen teachers' capacity to share with, collaborate and seek assistance from their Urban Advantage colleagues.

PD Type:	Courses on Reflective Practice Category 400
Title:	Examining Teacher Practice Using Video (Part II) Course number 462
Location:	Onsite sessions: American Museum of Natural History. Online sessions: https://www.teachingchannel.org (Teaching Channel access will be provided via email after registration is complete).
Dates:	This is a blended course with two onsite sessions and an ongoing asynchronous online session. Work associated with this course is comparable to a 3-day session and enrolled teachers will be paid a stipend for 3 days of professional learning (15 hours). Onsite sessions: Saturdays January 26 & February 9, 2019 Online sessions: The work must be completed by March 2, 2019.
Time:	Onsite sessions (4 hours per session; 8 total): 9:30 AM - 2:00 PM (Breakfast at 9:00 AM) Online sessions (7 hours total): Asynchronous
Instructors:	Partner Staff: Paloma Krakower (WCS BZ), Michaela Labriole (NYSCI), Grace Andrews (NYSCI), Deon Daniels (NYSCI) Lead Teachers: Chris Hernandez, Christine Abraham, Elizabeth Martinez

Course description:

In this second part of course 452, participants will deepen their ability to analyze videos to reflect on their practice with UA colleagues. This is an exciting opportunity for teachers to apply the technological and pedagogical knowledge gained in the previous course, to take a much deeper dive into a specific puzzle of practice focused on Urban Advantage tools and strategies they implement in their classrooms. Participants will strengthen their knowledge of the tools and protocols used to gather evidence and record and analyze videos. Participants will also gain additional experience with using the Teaching Channel as a resource for reflecting on and modifying pedagogical techniques. Participants will once again, be expected to videotape classroom work and analyze the work online with other participants. Teachers will continue to engage in collaborative, critical, supportive dialogue around teaching.

Prerequisites:

Available to teachers who have completed CTPL 452 only. This course is intended for teachers who have been implementing UA tools in their classroom for 2 or more years and are prepared to continue the work they started in CTPL 452. Teachers should be ready to reflect on and refine their teaching practice by sharing a videotaped lesson to be analyzed with UA colleagues. Teachers should also be prepared to think deeply and critically when watching the videotaped lessons of their colleagues in order to provide meaningful feedback.

Learning goals for this course:

- Deepen teachers' ability to apply the technological and pedagogical knowledge gained in CTPL 452 by focusing on a specific puzzle of practice related to Urban Advantage tools and strategies being implemented in the classroom.
- Deepen teachers' capacity to share with, collaborate and seek assistance from an expanded network of Urban Advantage colleagues using the Teaching Channel as a resource