Engaging Preschool Teachers in Science Professional Development
Our **learning goals** for this session are that you will leave with:

- An excitement to provide PD in early childhood STEM
- Some ideas and resources to use to get started with planning PD and/or some ideas to expand existing PD
Ellen Blinderman & Ashley Barajas
Lawrence Hall of Science, Berkeley CA

Michelle Kortenaar
ScienceCenter, Ithaca, NY

Janella Watson
New York Hall of Science, Queens, NY

Amy Eisenmann
Bay Area Discovery Museum, Sausalito, CA
Agenda

- Introduction
- Ice Breaker
- Model programs
- Hands-on Activities/Discussion
- Wrap Up
Preschool Teacher Science Attitudes and Background

Multiple studies have shown that preschool teachers:

- Express low self confidence for teaching science
- Lack knowledge about science and about how to teach science to their children
- Often blame time as a barrier to including science in their classroom
- Do not receive much science training in early childhood teacher training programs
Ice Breaker
Collaborative for Early Science Learning

- Webinar series
- Online tool kit
- Workshops
- Newsletter

This project was made possible, in part by the Institute of Museum and Library Services
Common Elements of Professional Development

- Sign-in
- Snacks
- Ice breaker
- Introductions
- Review workshop goals
- Research-based
Common Elements of Professional Development

- Hands-on activities
- Walk through activities with large group
- Small group discussions
Common Elements of Professional Development

- Evaluation
- Distribute materials, training resources, and certificates
Common Elements of Professional Development

- Focus on Science Process Skills:
  - Observing
  - Measuring
  - Communicating
  - Predicting
  - Experimenting
  - Drawing conclusions
Differences in Professional Development

- Frequency of workshops during the year
- Length of workshops
- Content/activities
- Number of participants
- Funding
Sciencenter

- Collaboration with Head Start
- Multi-year relationship
- Early Head Start, Head Start and Home Based
Webinars for Museum Professionals

Start, expand, or improve early childhood teacher professional development

- Building and Sustaining Partnerships with Head Start
  May 9, 4pm EDT

- Creating Professional Development Plans for Head Start Teachers
  May 16, 4pm EDT

- Providing Family Engagement in science, for Head Start
  May 23, 4pm EDT

Contact: CESL@sciencenter.org
Resources:

- www.museumtools.org


Families, teachers and other professionals are invited to use and share our hands-on activities guides and professional materials. The Sciencenter will continuously add relevant information to this page.

KIDS & FAMILIES

- Chemistry Activities

EDUCATORS

- Field Trips Supplemental Activities
- Chemistry Activity Lesson Plans

MUSEUM PROFESSIONALS

- Museum Tools
Collaborative for Early Science Learning

- Sciencenter, Ithaca, NY
- Maryland Science Center, Baltimore, MD
- Frost Science, Miami, FL
- Turtle Bay Exploration Park, Redding, CA
- Bay Area Discovery Museum, Sausalito, CA
- St. Louis Science Center, St. Louis, MO
Early STEM and Literacy Learning through Design-Make-Play
Design

emphasizes problem-solving and helps people discover possibilities

Make

provides confidence-building experience with materials, tools and processes

Play

promotes intrinsic motivation, deep engagement and delight
Materials Literacy & Tool Skills
Science + Math + Literacy
Purposeful Play
Sensory-Rich Experiences

Collaboration & Co-learning
Creative & Divergent Solutions
Documentation & Sharing
Design Make Play + UPK

✧ Partnership with NYC DOE, District 24 and Mosaic Centers

✧ Collaborative Planning: Listening Sessions and Needs Assessment

✧ Responsive, Comprehensive, Co-created Professional Development
Design Make Play + UPK: Emergent Goals

✧ Co-create experiences that engage the whole family in fun, science exploration, at school and at the museum, that help them continue learning together at home.

✧ Prepare teachers to ask more open-ended questions, promote inquiry and experimentation, and engage their students in authentic tasks (activities driven by the learner’s interests).

✧ Create and model sensory-rich, hands-on activities and approaches that teachers can easily implement that compliment their curricula.

✧ Encourage teachers to think of themselves as creative problem-solvers.
Design Make Play + UPK

✧ Workshops with site directors and teacher leaders

✧ In-school Lesson Modeling and Science Coaching

✧ Field Trips

✧ Family Celebrations
Design Make Play + UPK: Pre-K Foundations for the Common Core

Domain 1 - Approaches to Learning

Domain 2 - Physical Development and Health

Domain 3 - Social and Emotional Development

Domain 4 - Communication, Language, & Literacy

Domain 5 - Cognition and Knowledge of the World
Oh no!
Pete stepped in a large pile of blueberries!

What color did it turn his shoes?
Dynamic Dyes and Mud Painting
Dynamic Dyes
Dynamic Dyes
The Pigeon Needs a Bath!

I do not.

I feel clean.

Maybe you need a bath!
Bathtub Toys for Pigeon
Bathtub Toys for Pigeon
Empowering Teachers as Curious Learners and Design-Thinkers
Ms. Olaechea’s Classroom

Pre-K
Mosaic Pre-K Center at 50-15 44 Street
Woodside, NY

Make a donation Ms. Olaechea can use on her next classroom project.

Foster learning with a monthly donation
Ms. Olaechea will be able to use your donations for her future classroom projects.

Give monthly

Projects 6
Supporters

PAST PROJECTS 1

We're a charity that makes it easy for anyone to help a classroom in need. Your gift is tax-deductible.
My students will have the ability to create by using their knowledge of Science, Technology, Engineering and Math. Their learning in these areas will be extended with the right tools which we are requesting. STEM learning should begin in Pre-K! Why wait? Give little minds the right tools to create by using trial and error and higher level thinking. What will I make? How will it work? How will I make it work? Why did it do that? How can I make it better? These are questions that children will ask themselves as they create in their "Tinkering Station". We will update you with photos of our creations and tell you what inspired them.
PLAN: Case Study, Parents

Amy Eisenmann, Early Education Advisor
Parent Workshops

• Parent advocacy organization
• Train the trainer format
• Curriculum for workshops:
  • Technology
  • Engineering
  • Math
  • Literacy
Project Timeline

- Agreement on work plan
- BADM developed content
- PLAN provided feedback
- BADM revised
- PLAN final feedback and approval
- BADM provided train the trainer and final curriculum documents
- PLAN trains parent facilitators and runs workshops
Resources for Facilitators

- Songs
- Posters & Handouts
- Supply list
- Facilitation tips
- Set up tips
- Background info
Resources for Parents

- Make and take
- Activities collection
- Websites, etc.

Fort Building

**Activity overview:** In this activity, kids will plan, build, and improve forts using materials found around the house.

**What will children gain from this activity?**
- Practice with the engineering design process: making a plan, testing it, and improving the design
- Practice using tools and materials in new ways
- Build communication and collaboration skills as the family works together
- Gain awareness of spatial reasoning, a key math concept about how things fit together in space and how to describe their relative location (over, under, through, next to, above, inside of)

Time: 60-90 minutes
Technology Activities for Parents

• Rainy Day Technology Scavenger Hunt
• Technology at the Park
Lawrence Hall of Science

Professional Development

- Fee for service
- Community grants
- Conference presentations
- College course
Early Learning in Math and Science (ELMS) course

- NSF funded undergraduate course
- Community college audience
- Pre-service teachers and working professionals
- 3-unit semester (17 sessions)
- Integrates science and math
- Focus on children ages 2-6
How can we help future early childhood teachers to feel more excited, confident, and prepared to teach STEM?

How can we help early childhood faculty overcome obstacles to teaching fun science and math methods courses that model best practices?
Key Elements and Philosophy

- Constructivist approach
- Learning by doing
- Collaborative learning
- DAP principles
- Math Resources from the Erikson Institute
- Focus on equity
Early Learning in Math and Science

Website

elmscourse.org

- Instructor guides
- PowerPoints
- Exemplar science activities
- Sample syllabus
- Course Reader
- And more!

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“The one thing I learned about myself from taking this class is that even though throughout school science and math were areas I avoided, I don’t need to avoid them as a teacher with young children. I learned that I am doing math and science on a daily basis. I have a newfound enjoyment for both science and math.”