

Professional Development Intensive: Dive Deep into the World of Early Childhood Science PD

Monday, October 1, 2018: 4:15 PM - 5:30 PM

Professional Development Intensive: Dive Deep into the World of Early Childhood Science PD

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Visit our toolkit at museumtools.org

CESL



— Collaborative for —
Early Science Learning

The purpose of any evaluation should be to answer three questions:

WHAT? What are you observing, hearing?

SO WHAT? What do you think it means?

NOW WHAT? What are the implications? Do you need to change something?

Tips for designing best questions for teacher professional development surveys

- Avoid leading questions: So you really enjoyed the workshop today, right?, or close ended questions: Did you learn something today? Did you enjoy the session?
- Be careful to phrase your questions in such a way that you will get the answer in the respondent's own words: To what extent did you learn something new today?
- If you ask respondents to explain their answers make sure you provide them with ample space (questionnaire) or time (interview, focus group).
- Do not use jargon; make sure you use vocabulary your participants will understand.

Simply changing the wording of a question can lead to much more useful data. For example we posed these two questions following a teacher workshop:

What, if anything, surprised you about what you heard or did or learned today in the workshop?

Teacher response: "About how science is not just a specific subject, but a way of thinking about the world."

Please describe a new idea or technique you learned about today, that you might try in your classroom?

Teacher response: "I'm encouraged to be more hands off when presenting my class with 'maker' materials, even if my original plan was not a maker project."

Credits and rights

Developed by Evergreene Research and Evaluation for the Collaborative for Early Science Learning.

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This project was made possible in part by the Institute of Museum and Library Services

Common Questions:

How does Head Start require teachers to attend professional development workshops?

At the Sciencenter, our local Head Start partner has a professional development plan that requires their teachers to attend a certain number of professional development hours per year. Additionally, most Head Start programs require teachers to attend ongoing professional development workshops during the length of their employment. Scheduling professional development workshops in partnership with Head Start managers ensures that teachers will attend workshops and continue to complete the requirements set by Head Start.

How does Head Start require teachers and staff to help with family events?

Head Start programs are required to host family events throughout the year to promote family engagement. Work with your partner to find out what family events they already hold and how they are staffed as this may help you plan future events. The Sciencenter's Head Start partner already requires teachers to work a designated number of hours at family engagement events so we plan events to match the hours and needs required by their program. Communication and collaboration are key components to creating a program that matches the desires of both partners.

How does Head Start fund PD Workshops and Family Events?

Head Start uses grants to fund professional development, which includes PD workshops at the museum. Professional development grants for training and technical assistance also cover trainings that help families meet performance standard expectations of parent and family events. If family events support caregiver training, such as learning how to lead their children through activities or teach their children to meet development milestones, funding from professional development grants can be used to support these events..

The Sciencenter in Ithaca has compiled these answers from their local Head Start partners at Tompkins Community Action. If you are looking for more information, please reach out to Michelle Kortenaar, mkortenaar@sciencenter.org

Recommended Curricula

Head Start Science Curricula as of 2017

Curricula at a glance

Marvelous Explorations Through Science and Stories

- Free!
- 9 units with 12-16 lessons in each
- Take-Home Information/Experience Card, Head Start Domains and Indicator chart

Peep and the Big Wide World

- Free!
- 6 units with 45 lessons in each unit
- Learning Center Materials, Curriculum Planner, Teaching Strategy Tips

Great Explorations in Math and Sciencenter

- \$20-30 per lesson
- 9 units with varying numbers of lessons
- Library resources and literacy connections listed

Early Childhood Hands-On Science

- Fee that varies by unit
- 9 units with 4 lessons per unit
- Scripted lessons with additional interactive cards

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|--|--|---|--|--|
| Curriculum | Marvelous Explorations Through Science and Stories (MESS) | Peep and the Big Wide World | Great Explorations in Math and Science (GEMS) | Early Childhood Hands-On Science (ECHOS) |
| Age Group(s) | Early childhood | 3-5 with 0-2 age adaptations | Pre-K through 6th | 3-4 years old |
| Units | Animals, Insects and Spiders, Investigating Water, Kitchen Science, My Body My Senses, Our Natural World, Physical Science, Plant Life, Prehistoric Life | Color, Plants, Ramps, Shadows, Sounds, Water | Animal Defenses, Ant Homes Under Ground, Eggs Eggs Everywhere, Elephants and Their Young, Hide a Butterfly, Ladybugs, Mother Opossums and Her Babies, Penguins and Their Young, Tree Homes | Rainy Weather, Beginning Botanist, Feathered Friends, Busy Buzzing Bees, Discovering Shells, Blocks Measure Up, Water Play, Astonishing Air, Magnificent Magnets |
| Lessons Per Unit | 12 to 16 | 45 | Varies by unit | 4 |
| Additional Resources | Take-Home Information/Experience Card, Head Start Domains and Indicator chart | Learning Center Materials, Curriculum Planner, Teaching Strategy Tips | Library resources and literacy connections are listed | Interactive cards (smaller activities that complement the lessons) |
| Scripted | Outlined | Outlined | Yes | Yes |
| Cost For Entire Curriculum | FREE | FREE | \$20-30 per lesson | \$760 plus shipping |
| Cost of Pre-Made Kits | Material list provided | Material list provided | Materials list provided | Pre-made kits available with Varying cost (\$33.60 - \$189 per kit depending on unit) |
| Professional Development Tools Included | No | Yes | GEMS Associate training required for facilitator | Yes |
| Developed by | Florida Museum of Natural History | WGBH Educational Foundation | University of California, Berkeley, Lawrence Hall of Science | Frost Science |
| Collaborative for Early Science Learning partner who uses this curriculum | Sciencenter, Maryland Science Center | Sciencenter | Turtle Bay Exploratorium | Frost Science and Sciencenter |
| For more information - use these terms in your search | MESS curriculum, Marvelous Explorations Through Science and Stories, Head Start Science curriculum, contact a CESL partner | PEEP curriculum, Peep and the big wide world, WGBH science curriculum, contact a CESL partner | LHS GEMS curriculum, Berkeley science curriculum, Lawrence Hall of Science curriculum, contact a CESL partner | ECHOS science, STEM Professionals - Frost Science, Miami Science Museum curriculum, contact a CESL partner |



Observations

Baking Soda and Vinegar Reactions

Objective: Children will make careful observations while experimenting with baking soda and colored vinegar

Materials

- Pie tins
- Baking soda
- Vinegar
- Food coloring
- Dropper bottles

Setup

Put a scoop of baking soda in a pie tin. Create colored vinegar mixes and put into dropper bottles or have cups and medicine droppers.



Let's Try This!

Step 1: Let children choose a color of vinegar to start. Invite them to drop some vinegar onto the pan filled with baking soda.

Step 2: Make observations together! What do you notice? Try adding more colors.

Interacting and Exploring

Supporting Science Connections

Observe children interacting during this activity. When you see children practicing any of the process skills, point it out to them using science talk.

Things you can say:

- By doing _____ you are doing science!
 - For example: If a child says, "I hear the baking soda sizzling!" you can tell them "By making that observation, you are doing science!"
- "Scientists make observations (predictions, categorize, etc) like you all the time!"

Ask children these questions to support the activity:

- What do you notice?
- What colors do you see?
- What do you hear?
- What do you smell?
- What textures do you see?
- What does this remind you of?



Using Tools Activity

Ice Excavations

Description: Families will experiment with different ways to melt ice by using different tools.

Materials

- Ice cubs with items in them
- Salt
- Dixie cups for salt
- Plastic spoons
- Droppers
- Cups filled with water
- Trays
- Magnifying glasses
- Tweezers
- Popsicle sticks
- Question cards



Try This!

- Invite families to explore how water melts by using a variety of different tools
- Families start by choosing which ice cube or piece they would like to melt – then experiment with how to melt the ice and free the object inside

Science Process Skills

Primary: Using Tools

Secondary: Making Observations Problem Solving

Interacting with families

Supporting Science Connections

Observe families interacting during this activity. If you see children practicing any of the process skills, point it out to their parents.

Things you can say:

- By doing _____ your child is doing science!
 - For example: If a child says, “The salt makes it melt faster” you can tell the parent “By making that observation, your child is doing science”
- “Scientists use different tools like you all the time!”

While families are exploring you can model open-ended questions for parents by asking:

- What do you notice happening?
- How do you think you could get the item out of the ice?
- What changes have happened?
- What would happen if...?

Prompts:

If families ask for a suggestion about what to do, you can mention

- Explore the effects each different tool has on the ice and try different combinations of tools.
- Once you have melted the ice, explore the water on the tray and talk about the difference between water and ice.
- Experiment with moving the ice around the tray, watching it melt.

Starting a Lending Library

A lending library is a great way to encourage teachers to bring science into their classrooms through access to pre-assembled science activities. Some of the kits in the Lending Library at Turtle Bay Exploration Park are based off curriculum guides that have materials lists, like GEMS. For other curricula, like Project Learning Tree and Growing Up Wild, we created our own kits by selecting materials and activities that would supplement some of the written lesson plans within the guide. We also created kits that allow teachers access to high quality educational tools without having to worry about the cost or storage. For all of the kits, we try to include a literacy component by adding suitable children's books.

Things we look for when we source materials:

- Quality materials that will last a long time if they are not consumable
- Inexpensive consumables
- Developmentally age-appropriate scientific tools
- Materials/activities that address science concepts including physical science, life science, and earth science
- Materials/activities that address skills including: scientific inquiry, observing, role playing, problem solving, exploring, comparing, sorting, etc.

Websites that we've used:

www.kodokids.com

www.carolina.com

www.nature-watch.com

www.discountsschoolsupply.com

www.learningresources.com

<http://artfelt.net/warehouse/front.htm>

www.educationalinnovations.com

www.smartfoodservice.com

www.lakeshorelearning.com

We also use Amazon, Michaels, Oriental Trading Company, etc

Curricula resources:

Lawrence Hall of Science: www.lawrencehallofscience.org/programs_for_schools/curriculum

Project Learning Tree: www.plt.org

Growing Up Wild Activity Resources: www.fishwildlife.org/afwa-inspires/project-wild/growing-wild/activity-resources

My Sky Tonight: <https://www.astrosociety.org/education/early-learners-2/>