Webinar

STEM-sational Learning: What to Look for in Early Childhood Programming

March 19, 2015

Start time: 
2:00 p.m. ET
1:00 p.m. CT
12:00 p.m. MT
11:00 a.m. PT

End time: 
3:00 p.m. ET
2:00 p.m. CT
1:00 p.m. MT
12:00 p.m. PT

Presenter

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Moderator

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STEM-sensational Learning: What to Look for in Early Childhood

Presented by:

Susan B. Gunnewig
Webinar Goals

• Classroom Science & Math Instruction Studies

• STEM National Interest and Focus

• What is STEM?

• What does STEM look like in the classroom?
The Lay of Land

**What does research tells us about math and science instruction in preschool?**

“Despite the existence of standards and some curricular support for incorporating science and math there are very few math and science experiences available in the preschool classroom.” (Brenneman, Boyd, Frede, 2007)

Two studies demonstrate that this fact.

- In 40 hours of classroom observation math and science we non-existent. (Rudd, et.al., 2008)
- 3 minutes of math instruction per day/China 30 minutes per day. (Starkey & Klein, 2004)
If Math & Science Exist What Does it Look Like?

• Sink and float
• Plant Cycle
• Animals
• Living & Non Living
• Weather
• Science based Field Trips
STEM in Prekindergarten

• Announced in 2009
• Barack Obama & Joe Biden’s Plan for National Science Foundation’s Discovery Plan included prekindergarten
• National Foundations and Corporations Funding (Ford, Honda, Motorola & others)

(Source: Brenneman, K. (2011))
National Focus

• NAEYC Standards
• National Head Start Frameworks (2009)
• Most States Early Childhood Standards
• National Council of Mathematics
• National Science of Teachers Assn.
What is STEM?

• **S** = Science
• **T** = Technology
• **E** = Engineering
• **M** = Mathematics
Why is STEM in Early Childhood Vital?

“Development research demonstrates preschool children possess content knowledge that roughly maps onto the scientific principle of physics, chemistry and biology. They have begun to reason to form foundations for scientific thinking.”

As educators we must tap into this ability to prepare them for what is ahead of them. If not, it is a missed opportunity to prepare children for kindergarten.

(Source: Deshi, Schweingruber & Shouse, IES, 2007)
STEM and Common Core Standards

• Kindergarten and First Grade Common Core for Mathematical Practice:

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments & reasoning

(Source: Common Core State Standards for Mathematics, 2009)
STEM and Common Core Standards

• Kindergarten and First Grade Common Core for Literacy:
  1. They comprehend as well as critique.
  2. They value evidence.
  3. They build strong content knowledge.
Guiding Principle

“Helping children to explore, observe, ask, questions, predict, integrate their learning.”

(Source: Lillian M. Katz (an interview about PreK STEM, 2012)
What Does Early Childhood STEM Look Like:

- **SCIENCE**
- **TECHNOLOGY**
- **ENGINEERING**
- **MATH**
STEM - Science

Example: Studying Gravity

Integrated Model:

- Reading Aloud a Book about Gravity
- Developing Vocabulary with Word Cards
- Folding Paper Airplanes & Blowing Bubbles &
- Ramps
- Predicting, Comparing, Contrasting
- Making conclusions
- Writing conclusions on chart paper
- Paint with Gravity

Home Connection: During bath time, have children take plastic cups, bowls, mugs, and pour water in to the bath water. Ask what is causing the water to fall down. Talk about the word gravity.
STEM-Technology
STEM-Technology
Example: Studying Robotics

Integrated Model

- Reading Aloud a book about robots
- Developing Vocabulary with pictures
- Making own robot, naming it, & writing about it
- Constructing robot with legos, etc.
- Play with cubelets

Home Connection: Use recycled materials to make a robot at home for a robot parade in the classroom.
Stamping Geometric Shapes
Reading About Robots
Building Real Robots with Cubelets
An object’s volume tells us how much space it uses. More volume means that an object is “bigger” or “fuller.” Less volume means that an object is “smaller” or “emptier.”
Math Foundation Skills Connected to STEM

• Numeral recognition
• Sequence counting
• Patterning
• Sorting
• Objects in a Set
• Adding and Subtracting Objects in a Set
• Spatial Thinking
• Measurement (ruler)

(Source: Mathematics in Early Childhood, NRC, 2009)
STEM-Mathematics
STEM-Mathematics
STEM for Toddlers
STEM for Toddlers  (University of Washington)

Training Materials Archive
Looking for information about CQEL’s upcoming presentations and events? Check out our Upcoming Events page.

Past Presentations
2013 WAEYC Keynote
Director Gail Joseph, Ph.D., presented the lunchtime keynote at the 2013 Washington Association for the Education of Young Children annual conference on 11/15, entitled “Bridging the Gap.” This presentation covers the four major gaps in early childhood education: 1) Achievement/Opportunity/Preparation Gap, 2) Research to practice gap; 3) PreK to Kindergarten Gap; 4) Caretaking Gap, and the Four C’s that can help bridge those gaps.

Download: “Bridging the Gap” - Keynote Slides (PDF)

2014 Early Achievers Institutes
Early STEM
Infant & Toddler STEM - PowerPoint Handout (PDF)
Infant & Toddler STEM Group Activity Matrix - Handout (PDF)
Every Baby Knows the Scientific Method - Handout (PDF)
NAEYC Article “Math Talk with Infants & Toddler” - Handout (PDF)

http://depts.washington.edu/cqel/Presentations.php
QUESTIONS?
Thank You for Attending!

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STEAM & the Maker Mentality for School-age Youth
April 16, 2015
2:00 p.m. ET / 1:00 p.m. CT
Presented by Amy Koester, Skokie Public Library