2021 ASEE ANNUAL CONFERENCE
Virtual Meeting | July 26–29, 2021 | Pacific Daylight Time
Paper ID #32818

I Am STEM, an Engineering Lesson Library for PK-5 Educators

Dr. Katherine C. Chen, Worcester Polytechnic Institute

Dr. Katherine C. Chen is the Executive Director of the STEM Education Center at Worcester Polytechnic Institute (WPI). Her degrees in Materials Science and Engineering are from Michigan State University and MIT. Her research interests include pre-college engineering education, teacher education, and equity in education.

Dr. Mia Dubosarsky, Worcester Polytechnic Institute

Dr. Mia Dubosarsky has been a science and STEM educator for more than 20 years. Her experience includes founding and managing a science enrichment enterprise, developing informal science curriculum for young children, supporting Native American teachers in the development of culturally responsive science and math lessons, developing and teaching graduate level courses on assessment in science education, and working with thousands of educators across the country on developing meaningful, standard-based STEM experiences for their students. Mia currently serves as the Director of Professional Development at WPI's STEM Education Center and as PI of an IES funded grant, Seeds of STEM. In these roles she oversees the development and facilitation of STEM themed professional development programs for PreK-12 teachers and administrators and the development and testing of STEM curriculum for preschool classrooms.

Dr. Dubosarsky has an undergraduate degree in Biology from Israel's Institute of Technology and a Doctorate in Curriculum & Instruction (science education) from the University of Minnesota.

Mrs. Donna Taylor, Worcester Polytechnic Institute

Donna serves as the Assistant Director of Professional Development with the STEM Education Center at Worcester Polytechnic Institute (WPI). She has 15 years of classroom experience, teaching science and STEM to students in grades 5-12. She holds National Board Certification in Early Adolescence Science and is a NASA Network of Educator Astronaut Teacher. Donna has won several awards for teaching and curriculum development. While her current position places her in many roles, she spends the majority of her time guiding and empowering educators to bring high quality, inclusive STEM to their students.

I AM STEM

An Engineering Lesson Library for PK-5 Educators (Resource Exchange)

Solve problems in storybooks
Empower students to become proud problem solvers

Read — Identify the problem(s) in the story

Brainstorm — Explore solutions to the problem

Plan — Sketch your ideas considering materials

Create — Build your chosen solution

Test — Try out your solution

Improve — Revise your solution to make it better

Communicate — Share your work with others

Digital Lesson Library

for grades PK-5

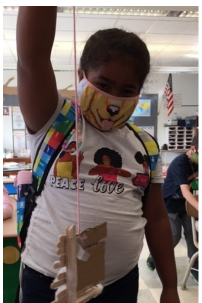
- Follows the entire problem-solving process over 5 lessons
- Aligns with grade-level Science/Engineering or Math and ELA standards and practices
- Provides teacher-created lessons
- Allows students to "see themselves in STEM"
- Includes a variety of read-aloud books with links to YouTube for easy virtual access

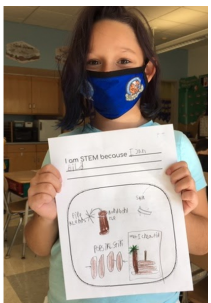
Materials List

Variety of materials for building including but not limited to...

- Craft materials like rubber bands, popsicle sticks, string, felt, clay, etc
- Household materials like spoons, cups, paper plates or bowls, foil, etc...
- Recycled materials like boxes, plastic containers, paper towel rolls, plastic bottles, bags, etc...
- Glue or Tape and Scissors

Variety of story books - New lessons added periodically!





I am STEM because...

I like helping the world

I improve my work to make it better

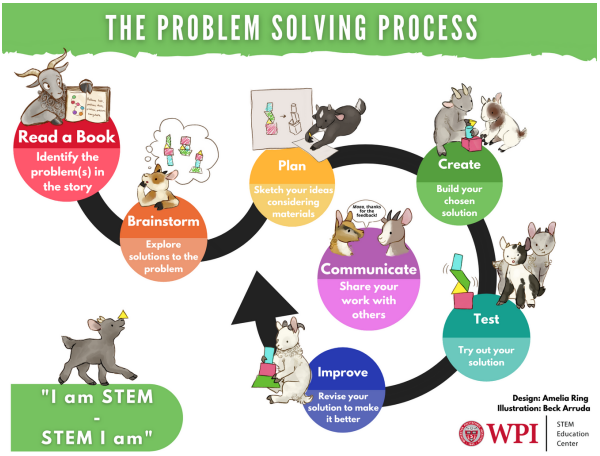
I am creative!

I WORK WITH A TEAM TO SOLVE PROBLEMS

Problem Solving Poster provided!

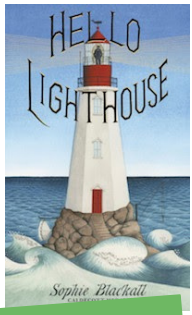
For more information, visit our website (wpi.edu/+PD) or contact Donna Taylor at dltaylor@wpi.edu

WPI STEM Education Center



EXAMPLE

Grade 2



Help the family by designing a circular room to accommodate their new baby.

Learning Targets

- **MATH** - Recognize and draw shapes having specified attributes
- Partition circles and rectangles into two, three, or four equal shares & describe the shares
- Recognize that equal shares of identical wholes need not have the same shape.
- **S/E** - Analyze data from tests of two objects designed to solve the same design problem
- **ELA** - Use the information gained from the illustrations and words in a print or digital text to demonstrate an understanding of its characters, setting, or plot

Criteria & constraints:

- The room must be circular.
- One ¼ of the room should be the staircase.
- The baby's part should not be more than ¼ of the room
- Baby's items include a bed, dresser and chair, all made up of different shapes