About Seeds of STEM

https://seedsofstem.org/

Seeds of STEM is a year-long problem-based STEM curriculum, developed in alignment with four sets of standards: The **Next Generation Science Standards** (kindergarten), the **Common Core standards for Mathematics** (Kindergarten), the **Massachusetts Science, Technology, and Engineering (STE) frameworks** (Pre-K and kindergarten), and the **Head Start's Early Learning Outcomes Framework (ELOF)**. The curriculum was developed by researchers from Worcester Polytechnic Institute (WPI), the College of the Holy Cross, and teachers from the Worcester Child Development Head Start Program. The development was guided by an advisory board that included engineers, experts in EC education, experts in teacher PD, and researchers with expertise in study design and STEM stereotypes.
The development process followed a rigorous iterative process of development, testing, and revision, in which 40 teachers (in nearly 20 classrooms) provided feedback after teaching each one of the curricular units in their classrooms.

The Seeds of STEM Curriculum. *Seeds of STEM* includes **eight units**. Each unit integrates **science** and **engineering** and provides authentic **math** opportunities. During the first part of each unit, children unpack the relevant science concepts through experimentation, games, stories, and self-directed activities, while the second part of each unit includes an **authentic problem** related to the science concepts. The problem is introduced to the children by the curriculum's main character, Problem Panda. For example, during a unit about ice and water, Problem Panda asks the children to help him get a ring out of a block of ice. The children help Panda solve each unit's problem by following the Engineering Design Process (EDP). With guidance from the teacher, the children **define and research the problem**, **brainstorm** possible solutions, **sort** the solutions into testable/non-testable in a classroom setting, **plan** a selected solution, **create** the solution, test it against the criteria for successful solutions, **revise** the solutions, and **share** the final solutions with Problem Panda and a classroom guest. Throughout the process the children share their work (ideas, plans, prototypes) with their peers. See a description of the units on the following page.

Teacher Professional Development (PD). The *Seeds of STEM* intervention includes a two-day PD workshop intended to train and empower early childhood educators to lead high-quality STEM experiences in their classrooms. The PD introduces teachers to the framework of high-quality STEM and the problem-solving process, and guides teachers in unpacking each curriculum unit. The training is co-facilitated by an expert PD provider and a *Seeds of STEM* developer teacher, who shares with participants her own experience teaching the curriculum in the classroom.

Seeds of STEM Unit Overview

Unit	Science	Engineering	Main problem
1	Introduction to the problem-solving process		Help Panda get out of a box
2	Ice and water (solids & liquids)	Identify problem, brainstorm, sort & vote on solutions	Panda dropped a ring into a cup of water that froze! Help Panda get the ring out of the ice
3	Habitats	Plan and create models	Panda's friend is coming to visit! Plan a habitat for Sally Squirrel
4	The 5 senses	Test and improve solutions	Panda wants to play with his friend Design a toy for a blind friend
5	Forces and motion	Share solutions with others	Panda broke his leg! Design a device that helps Panda move
6	Properties of materials	The entire process	Design a container to send cookies to a friend who lives across the river
7	Plant parts and needs	The entire process	Gladys Goat ate Panda's plant! Design a barrier to protect plants
8	Light and shadow	The entire process	Panda wants to play outside but it is too hot and bright! Design a shade for Panda

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Questions? seedsofstem@gmail.com