ENGINEERING A BRIGHT FUTURE

Engineering, physics, spatial reasoning, problem solving, and creativity. It’s amazing what students can learn from seemingly simple activities as early as preschool.

In the late 90s, Sharon Doolittle, a preschool teacher in Monroe, Iowa, had an idea that took up the challenge of teaching these concepts in an early education classroom. Doolittle took this idea to a meeting for the Iowa Regents’ Center for Early Developmental Educations Teacher Practitioner Council. This idea grew into Ramps & Pathways, which received a STEM Scale-Up award from the Iowa Governor’s STEM Advisory Council for the 2016-2017 and 2017-2018 school years.

“We began a more formal investigation in the experimental school, The Freeburg Early Childhood Program, that operated from 2001-2007 on the Allen Nursing Campus. We began conducting professional learning around 2003. A National Science Foundation grant enabled us to gather more information and enhance the professional learning. We’ve been improving it every year since,” says Beth VanMeteeren, Director for the Regents’ Center for Early Developmental Education (RCede). “Ramps & Pathways has been delivered at the National Association for the Education of Young Children’s Annual Conference since 2010 and this year is being featured at the National Science Teachers’ Association Annual Conference as a short course.”

Ramps & Pathways teaches students engineering and spatial thinking skills by allowing them to build with a variety of materials and eventually use them to solve problems, like building working ramp structures. Classroom-tested and research based, the program is designed to be a developmentally-appropriate approach to integrate STEM into early education in a way that engages young children.

Now, the RCEDE has done it again with Light & Shadow, one of ten programs for the 2019-2020 STEM Scale-Up program. Light & Shadow immerses students in an environment where they practice and develop skills such as spatial thinking and engineering design. According to Dr. VanMeteeren, ‘Light & Shadow is built upon research conducted by Dr. Rheta DeVries, a former Iowa Regents’ Center Director and a seminal researcher in early education. It was selected for a Scale Up program because of young children’s deep interest in light and shadow and the opportunity for young learners to engage in first hand investigations involving light and shadow.”

Through Light & Shadow, students interact with light in unique ways, using a variety of light sources, screens, and materials to block light, diffuse light, or produce colored light and shadows. They explore the way these materials interact with light by constructing their own designs, recounting their experiences, and comparing what they learned with other students. Like with Ramps & Pathways, students are given the space to make and learn from mistakes. The award from the STEM Scale-Up program will go towards helping to implement Light & Shadow across Iowa’s early education classrooms.
“They [teachers] tell us this has impacted their teaching in all domains, not just science. They say they are better teachers for their young learners.”
- Dr. Beth VanMetereen

Educators who attend professional development are awarded course credit as well as the necessary materials to implement the course in their own classrooms. The professional learning for Light & Shadow “walks teachers of early learners through examples of light and shadow experiences that fit the definition of high quality science experiences as defined by the Next Generation Science Standards (NGSS) and supported by the National Science Teachers Association (NSTA) Science Education Position Statement.”

“Teachers who have been part of our professional learning have communicated to us that it has changed the way they teach to being student-centered, rather than teacher directed,” Dr. VanMetereen says. “They tell us this has impacted their teaching in all domains, not just science. They say they are better teachers for their young learners.”

Local Education Agencies (LEAs) can apply anytime until March 4, 2019 at https://iowastem.gov/Scale-Up-Application. Awards will be announced in mid-April.

Interested in Ramps & Pathways? You do not need to apply for a Scale-Up award to get the materials.

Materials for Ramps & Pathways can be purchased in the RCEDE’s online store:

https://cgi.access.uni.edu/cgi-bin/swStore/storeFront.cgi