

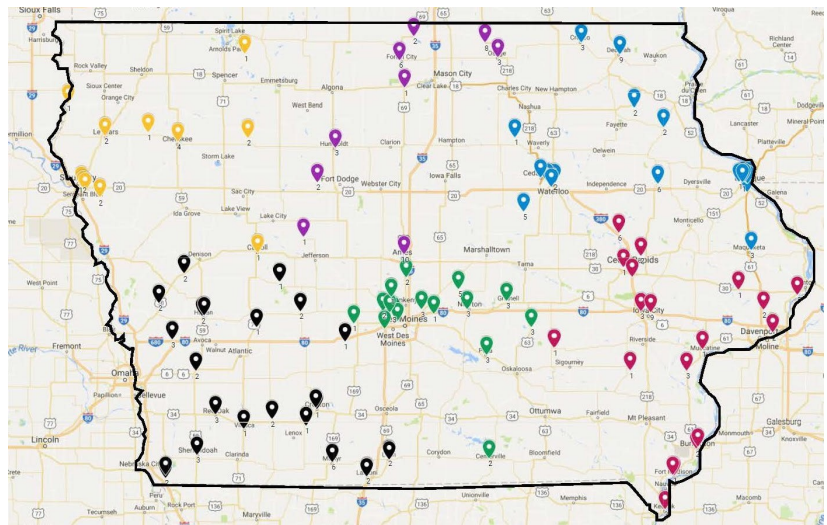


BRINGING ENGINEERING TO A PRESCHOOL NEAR YOU

Force and motion, spatial thinking, light and shadow, chemistry, and physics give you the idea of a high tech laboratory, when in reality, this could be a preschool classroom just down the street from where you live.

Dr. Beth Van Meeteren, Director for the Regents' Center for Early Developmental Education, has been taking on the challenge of bringing these concepts to the PreK-2nd grade classrooms through the Ramps and Pathways (R&P) program. R&P was recently awarded one of nine STEM Scale-Up Awards from the Iowa Governor's STEM Advisory Council for the 2017-2018 academic year. This award will go toward pulling R&P into Iowa's early childhood classrooms. R&P was originally funded by the National Science Foundation. The program is designed to be developmentally-appropriate and classroom-tested approach to integrative STEM that engages young children. With Ramps and Pathways, the Regents' Center has been able to reach about 300 teachers across the state of Iowa, who are able to receive course credit for the professional development and then receive materials to implement the program in their classrooms.

Up until recently, students have been taught the traditional *Engineering Design Process* which is easy to teach and prescriptive, providing step by step instructions as to how to create and test something. However, after interviewing several engineers, Beth found that this process is not how engineers really solve problems. This disconnect sparked the development of the Ramps and Pathways program which takes a different approach to teaching engineering. The National Academy of Engineering believes that the most important thing to grow engineers is instilling Engineering Habits of the Mind which involve systems thinking, creativity, optimism, collaboration, communication and attention to ethical consideration and Beth agrees. Beth also consults with Yvonne Ng, a mechanical engineer in Minneapolis who respects the importance of early engineering experiences that are authentic and meaningful to children. These experiences allow time for play and practice figuring out how things work and to understand why they work. Her website, Engineers Playground, was developed to "provide resources... to make STEM – particularly engineering and technology – accessible and fun". This website encourages a more organic approach to early education by allowing children to figure things out on their own.



Location of Educators across Iowa who received Ramps & Pathways training to bring engineering to their classrooms.

Within Ramps and Pathways, the Engineering Habits of the Mind have been translated to be appropriate for early childhood education. Children are already doing engineering from a very young age without even thinking about it. They build with blocks, stack cans, and move sand in the sandbox, all of which are engineering design. The engineering at this stage makes sense to the child and it is from this existing point that educators, such as Beth, want to start supporting the thought and design process and expand on it.

The Regents' Center for Early Developmental Education has National Recognition from the National Science Teacher's Association and educators for its developmentally appropriate methods and materials. Educators across the nation are seeing the Regents' Center as a leader in early STEM education and consequently fill rooms at national conferences to learn what the Center is doing and how they are doing it. This recognition has led to other institutions asking the Center to be consultants with writing grants for their own projects, being invited to the STEM Symposium at the White House and giving inspiration for other conferences such as one directed by Susan Wood at the Child Center at Cal-Tech in Anaheim, California. For the 2017 Iowa Scale-Up Schools, Ramps & Pathways will make a difference in these classrooms this year and for years to come.