

Ramps and Pathways

2017-2018 STEM Scale-Up Program

Overview: Ramps & Pathways (R&P) is an NSF-funded, developmentally-appropriate and classroom-tested approach to integrative STEM that engages young children. R&P is designed to nurture engineering habits of mind as children build their own technology of marble runs; a type of Rube Goldberg machine. In the process, children grapple with the laws of physics, properties of objects, how those properties affect motion and engage in spatial thinking.

Grade Levels: PreK-2nd grade

Program Summary

The R&P curriculum was designed through a collaboration of experts in child development, teachers of young children, science educators, and young children. R&P addresses the critical need to increase children's STEM literacy, cultivate STEM identities, and develop executive function skills (working memory, cognitive flexibility, and inhibitory control). R&P is inquiry based and address the NGSS and early learning standards. Place-based social studies and literacy is naturally embedded.

Program Objectives and Description

R&P is designed to provide children access to a fully integrative STEM activity that:

- Develops a working understanding of physics
- Offers opportunities to design and engineer their own technology of marble runs
- Engages children in challenges in spatial thinking
- Inspires children to learn the tools of literacy to document and communicate what they are learning and figuring out

R&P is not designed as a sequence of daily prescribed lessons in STEM. Instead, it is a framework that assists the teacher in facilitating the physical and social environment of the classroom to allow children to investigate the macro question of, "How can I get this object to move in an interesting way?" over time.

What does the program provide to the educator?

- A classroom Ramps and Pathways Kit of non-consumable materials including unit blocks, ramps, spheres, and other manipulatives worth more than \$2,000.
- Two days of professional development with one hour of University of Northern Iowa graduate credit.
- \$120 for each day (sub-pay or stipend).

What is required by the educator in order to implement this program?

The applicant will attend two non-consecutive days of Ramps and Pathways professional development, preparing them to integrate STEM within other academic disciplines and arrange their classroom setting to be conducive for inquiry in STEM as well as literacy and social studies. Participants or the school must provide transportation to site of PD and participants are on their own for lunch.

Ramps and Pathways Website: rampsandpathways.org

Iowa Early Learning Standards: <http://www.uni.edu/rampsandpathways/menu-item-container/3/meeting-early-learning-standards>

Head Start Performance Standards: <http://www.uni.edu/rampsandpathways/resources/meeting-educational-standards>

Next Generation Science Standards: <http://www.uni.edu/rampsandpathways/menu-item-container/3/meeting-next-generation-science-standards>

Program Video: <http://www.uni.edu/rampsandpathways/media-center/ramps-and-pathways-integrated-stem>