2014-2015 STEMscopes Early Explorer Implementation Study across a Large, Public School District PreK Program

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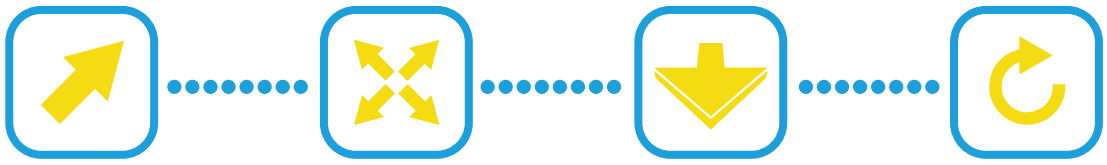
STEMscopes™ EARLY EXPLORER

About STEMscopes Early Explorer

STEMscopes Early Explorer is an inquiry-based preschool STEM curriculum that integrates STEM content with literacy, creative arts, and physical and social development to promote academic and social skills across multiple domains of school readiness. The primary goal of Early Explorer is to make STEM education accessible and easy for preschool teachers to implement, so that time spent on STEM instruction in preschool increases significantly. The curriculum is designed to be flexible and to complement common preschool daily schedules and classroom structures. Early Explorer is based on the "Ups" Model adapted from the Biological Science Curriculum Study's 5E inquiry model of instruction, known as the 5E model.



RAMP UP

Teacher introduces content during brief whole-group activities: *engage*.

ROUND UP

Students explore content through self-directed and small-group hands-on activities: *explore*.

WRAP UP

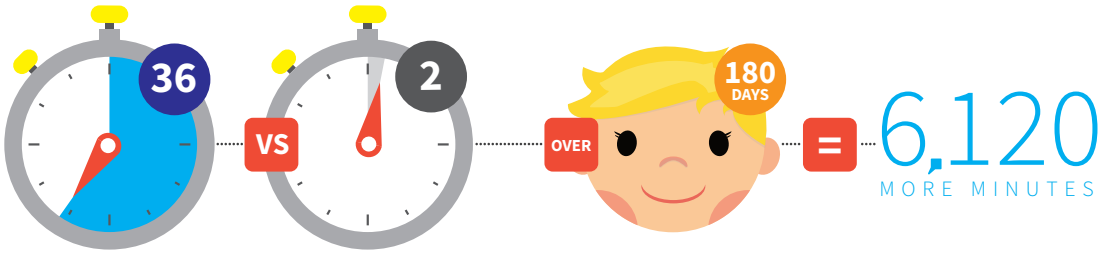
Teachers and students participate in small-group activities to gauge understanding of key concepts: *explain and evaluate*.

KEEP IT UP

Science content is presented across modules through sustained inquiry activities: *elaborate*.

Design of the Study

In the 2014-2015 school year, the research team at Accelerate Learning partnered with a public school district to implement Early Explorer in their entire preschool program. This district served 1,100 predominantly minority and economically disadvantaged preschoolers. Data were collected through surveys, interviews, and observations to examine the integration of STEM instruction using Early Explorer in publicly-funded preschool classrooms facing similar challenges and limitations to preschool classrooms across the country. Teachers implemented the 12 modules of Early Explorer, with each module lasting 2-3 weeks. The scope and sequence of the modules were created to be in alignment with the district-adopted curriculum.



Teachers reported spending 34 more minutes per day teaching STEM (36 minutes with STEMscopes EE vs. 2 minutes without STEMscopes Early Explorer). The result was that an additional 6,120 more minutes of STEM learning a year occured in the study's district across the 1,100 students observered, due to STEMscopes Early Explorer.

About Accelerate Learning, Inc.: Accelerate Learning, in conjunction with Rice University, is focused on becoming the preeminent and most effective digital Pre-K—12 STEM resource used by teachers, students, and parents, as measured by adoption and usage by schools, districts, and families. With over 1.5 million student users, Accelerate Learning has grown from a single product, STEMscopes in 2007, to a brand that now offers a variety of curriculum and professional development solutions that support early learning, NGSS, and state-aligned curriculum to districts across the United States. Accelerate Learning has earned recognition in District Administration's Top 100 Products, SIIA Innovation Incubator, and EdTech's Cool Tool Awards. Learn more at **acceleratelearning.com**.

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Results of the Study

Using Early Explorer, teachers reported spending an average of 36 minutes per day on STEM instruction, compared to the national average of 1-3 minutes spent on math and science in preschool classrooms.* Integration of STEM instruction increased over time as teachers became more comfortable with the curriculum components and including them in their daily schedule. The Ramp Up and Round Up activities were the first to be implemented, followed by Wrap Up and Keep it Up. In addition to these components, teachers reported regularly using the non-fiction and fiction big books as well as the vocabulary cards during literacy activities.

Ramp Up
Teachers incorporated the Ramp Up activities in the morning or afternoon circle times, lasting approximately 15 minutes each. At the beginning of each module, teachers introduced the content through an introductory engage activity. After the first day, teachers used the daily engage activities in whole group to remind students of the content and introduce content extensions throughout the module.

Round Up
Teachers immediately integrated activities from the 7 Round Up centers that matched the 7 existing centers in their classroom (Literacy, Writing, Math, Science, Dramatic Play, Art, and Construction/Engineering). Throughout the module, teachers would set up remaining center activities in small groups at tables or incorporate the center activity into a new or existing center. Many teachers introduced center activities as a whole group prior to putting them in the centers so that the students would understand the instructions and the purpose of the activity.

Wrap Up
These activities were done either individually with students or in small groups and gave teachers the opportunity to gauge the students' understanding of the content. There are two per module, which are usually conducted at the end of the 2-3 weeks. Teachers used the data sheets provided in the curriculum to write notes on their observations of students' mastery of the key concepts in each module.

Keep it Up
This component includes daily weather charting as well as long-term center activities that occur over time and are not tied to a specificmodule. Teachers used the weather graphing and charting activities to expand children's data collection and analysis skills. The long-term center activities were the last component of the curriculum to be implemented. Teachers reported that they planned to focus on these activities in the upcoming school year now that they were comfortable with the remaining components.

Conclusion

Teachers felt that STEMscopes Early Explorer complemented their existing curricula and resources and allowed them to incorporate STEM throughout the entire room and the entire day. Many teachers stated that before Early Explorer, STEM was their weakest area and now it is one of the biggest focuses in their classroom. As one teacher stated, "I've never seen the kids this excited about science before!" In conclusion, the results of this study show that, with resources, teacher support, and time, preschool classrooms can be transformed into STEM classrooms. At the end of the study, teachers shared their thoughts about STEMscopes Early Explorer:

"I like [the content] a lot because you can choose what you want to do. The kids can really understand…I think it's been very beneficial for them. I'm learning stuff myself, so it's really beneficial for all of us."

"It complements any other curriculum you are using."

"It's all about giving [the students] that exposure and the opportunities to explore and become scientists. It's not just about weighing things and drawing on a piece of paper but actually engaging them in different activities to help them to expand their science knowledge."

* Elizabeth Bell, PhD (2015). The Need for an Early Childhood STEM Curriculum. Available at: http://acceleratelearning.com/casestudies.