



***S²TEM Centers SC Math Institute:
Growing Teacher Leaders for Grades 3-5***

**Innovation Partnership
July 1, 2024 - June 30, 2025**

Program Overview

For questions regarding this program, please contact:
Tracey Campbell
Director of Special Projects, S²TEM Centers SC / SCCMS
at (843) 274-4087 or tcampbell@s2temsc.org.

S²TEM Centers SC is an innovation partnership managed by South Carolina's Coalition for Mathematics & Science at Clemson University. Its purposes are to improve instruction and accelerate student learning in Science, Technology, Engineering and Mathematics content areas through innovation, support, and research.

SOUTH CAROLINA'S COALITION FOR MATHEMATICS & SCIENCE

SCCMS

- Achievement by Design -

Introduction

S²TEM Centers SC/SCCMS has designed a comprehensive system of scaffolded support for elementary teachers to support their understanding and application of evidence-based instructional strategies and pedagogical practices in the mathematics classroom to improve student learning. This partnership is designed to engage teachers of grades 3-5 in professional learning experiences with embedded instructional coaching support to increase their knowledge of and ability to implement evidence-based practices in mathematics instruction.

Students in South Carolina begin their journey towards College- and Career- Readiness once they enter our schools. Throughout the program, teachers will explore mathematics content (*World-Class Knowledge*) through the lens of *World-Class Skills* and *Life and Career Characteristics* that will prepare them to make the Profile of the South Carolina Graduate come to life in their classrooms.

Program Purpose

How can we ensure that all children can benefit from high-quality elementary mathematics teaching and learning experiences?

High-quality early grade mathematical experiences ensure a solid foundation in mathematics and prepare our young students for the increasing demands of a workforce that requires a higher proficiency level (Linder, 2017). Investing in early math instruction can help put our children on track for academic success (Linder, 2017). Research confirms that children’s early math skills are greater predictors than early literacy skills for future academic success in math, science, and reading, and these connections actually grow as learners progress through school (Clements & Sarama, 2013; Linder, 2017).

In South Carolina, recent data confirms that there is a significant need to focus on mathematics achievement. The 2023 South Carolina College- and Career-Ready Assessments (SC READY) (SCDOE, 2023) indicated that only 53.6% of students in Grade 3, 47 % of students in Grade 4 and 44.7% of students in Grade 5 met or exceeded grade level expectations for mathematics. In addition, the SC READY data indicates significant differences in the performance levels of student subgroups when comparing ethnicities, disabilities, and poverty levels.

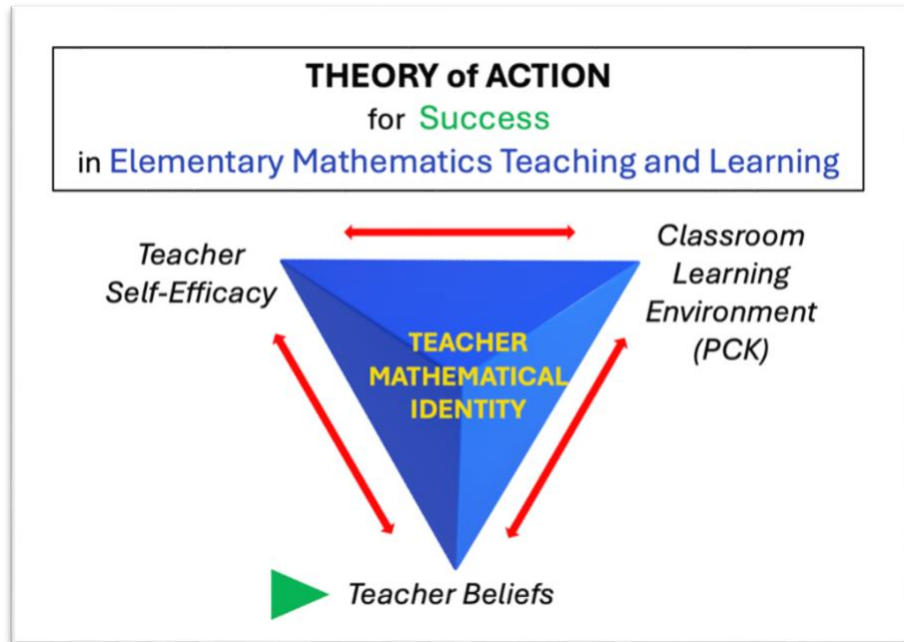
Investing in professional learning in mathematics for educators is beneficial to teach students effectively (Lee & Vongkulluksn, 2023). How math is taught in a child’s early years is just as important as what is taught (Linder, 2017). Teachers who help to create learning environments that foster engagement help children develop a positive connection with mathematics (Kaskens et al., 2020).

Teachers’ personal views or philosophies of mathematics and what it means to do mathematics influence their beliefs about mathematics teaching and learning (Hughes et al., 2019). In fact, according to this research, teacher beliefs have the strongest effect on their instructional practices, more so than content knowledge. As teachers’ mindsets evolve in the *S²TEM Centers SC Math Institute: Growing Teacher Leaders for Grades 3-5* program, concentration shifts to teacher learning and engaging in mathematics content and evidence-based instructional practices. With a firm grasp of mathematics content knowledge and a positive relationship with the content,

teachers will become more efficacious in their ability to teach and understand mathematics, thus developing a stronger mathematical identity (Heffernan & Newton, 2019).

The *S²TEM Centers SC Math Institute: Growing Teacher Leaders for Grades 3-5* program focus is to facilitate well-designed pedagogies

that create supportive environments for students learning math. Throughout this program, teachers reflect on their own beliefs about their students and themselves as they relate to grasping math concepts. Teachers also explore strategies they can use in the classroom to alleviate learning barriers and to help students develop stronger math identities.



Program Model

Research suggests that professional development can increase content knowledge in mathematics (Lee & Vongkulluksn, 2023). Educators who experience instructional coaching and structured professional learning tend to be more capable of “improving the quality of mathematical learning and teaching” (Lee & Vongkulluksn, 2023, p.96).

S²TEM Centers SC Math Institute: Growing Teacher Leaders for Grades 3-5 program is intended to be a 3-year professional development program employing six complementary teacher actions of the Professional Teaching and Learning Cycle (Study, Select, Plan, Implement, Analyze, and Adjust). See http://txcc.sedl.org/resources/working_systemically/ptlc-intro.pdf

Components of the model for Year One include:

- Statewide professional learning experiences during a multi-day summer workshop,
- Instructional coaching (on-site and virtual) by *S²TEM Centers SC Specialist* monthly during the academic year,
- School Administrator Support and Collaboration.

Beyond Year One the above components will be continued along with opportunities to build capacity as a mentor and teacher-leader.

A *S²TEM Centers SC Specialist* will work directly with the teachers to model, observe, assist, and provide feedback in understanding and applying evidence-based mathematics instructional

strategies in the classroom through facilitated professional development, classroom observations and coaching conversations. The S²TEM Centers SC Specialist and participating teachers will collaboratively analyze data from lessons to make informed instructional decisions to accelerate student learning.

School administrator support is vital for the program's success; therefore, the principal of each participating school must engage in specific program components. In addition, school administrators should provide support in planning, observing, reflecting, and attaining resources, as needed, to ensure teacher success in the program.

District leader support is imperative for ensuring the success of school teams. If applying as a district with multiple schools participating, a district-level leader must be designated to participate in communication and collaboration with the schools and the S²TEM Centers SC staff.

Program Outcomes

S²TEM Centers SC Math Institute: Growing Teacher Leaders for Grades 3-5 program has identified the following outcomes:

1. Strong foundational teacher mathematical identity,
2. Positive teacher mathematical beliefs and perceptions of students learning mathematics,
3. Engaged mathematics classroom learning environment, which includes:
 - a. Teacher knowledge and use of evidence-based mathematics instructional strategies
 - b. Teacher mathematical content knowledge,
4. Confident teacher mathematical self-efficacy.

NOTE: By focusing on these specific outcomes with teachers, according to research, additional outcomes should include: an increase in student learning and achievement in math, an increase in student self-efficacy and beliefs about math; and the development of students' positive mathematical identities. Students will achieve their developmentally appropriate level of the South Carolina Portrait of a College- and Career- Ready Mathematics Student (SCDOE, 2015, p.10).

By the end of Year One participating teachers will demonstrate:

- 1) improved instructional practice
- 2) positive change in teacher beliefs and perceptions about mathematics
- 3) develop sense of collegiality among teachers.

Data Collection

S²TEM Centers SC Specialists will collect teacher mathematics practices data using a classroom observation protocol. Together, the specialist and teachers will review the data and cite specific evidence of teacher and/or student behavior during the lesson to determine the effectiveness of teacher use of evidence-based instructional strategies.

Teacher beliefs towards mathematics, in general, and the use of evidence-based mathematical strategies in their classrooms will be measured using pre- and post-surveys. Coaching conversations with the teachers will reveal changes in teacher thinking and behavior as they

become more adept in selecting, aligning, and implementing evidence-based mathematics instructional strategies to effectively support student learning.

Evidence of student learning increases in mathematics will be primarily quantitative. S²TEM Centers SC Specialists and teachers will review and analyze SC READY, school and district formative assessments and classroom data to determine specific learning needs of students and make instructional decisions in implementing evidence-based mathematics instructional strategies to accelerate student learning most effectively.

Eligible Schools

All South Carolina public schools serving students in grades 3, 4, and/or 5 are eligible to apply for participation in the *S²TEM Centers SC Math Institute: Growing Teacher Leaders for Grades 3-5*. Preference may be given to schools that meet the following criteria: Title I designation, diverse student population, and/or data which indicates the need for increased student achievement.

Individual School Team

A school team may apply for this program as an individual school. A school is required to submit an application for a team that includes one participating building administrator and three to six participating teachers who teach mathematics to grades 3-5. It is preferred that teachers recommended for participation represent a team that includes at least one teacher from each grade, 3-5.

District Team

A district may apply for this program on behalf of multiple schools. In addition to meeting the requirements for each school team (see above), there **must** be a district-level leader who actively participates in the program. While a district may submit multiple school teams, it is possible that all school teams will not be selected for participation in the application year.

Additional Program Documents (MOA and Application) are available at www.s2temsc.org/mathsupport

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