



***Mathematical Readiness:  
Early Childhood (K-3) Teaching and Learning Program***  
**Innovation Partnership 2023-2024**

**APPLICATION AND MEMORANDUM OF AGREEMENT**

S<sup>2</sup>TEM 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.

**Application Deadline: 5:00 p.m. SEPTEMBER 22, 2023**

For questions regarding this application or the application process, please contact  
**Tracey Campbell @ (843) 274-4087 [tcampbell@s2temsc.org](mailto:tcampbell@s2temsc.org).**

Completed application and signed Memorandum of Agreement will be submitted to:  
**South Carolina's Coalition for Mathematics & Science at Clemson University via email to  
Tracey Campbell.**



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## **Part 1**

### **General Overview**

#### **Request for Applications**

This application and memorandum of agreement (MOA) contain information that serves as an invitation from S<sup>2</sup>TEM Centers SC and South Carolina’s Coalition for Mathematics and Science (SCCMS) for schools and districts to participate in the *Mathematical Readiness: Early Childhood (K-3) Teaching and Learning Program* during the 2023-2024 school year. S<sup>2</sup>TEM Centers SC and SCCMS will consider only those applications that meet the requirements outlined below under *Part I: General Overview*. Additionally, only applications that are complete and meet the deadline requirements will be reviewed.

Completed application and the affirmation signatures page must be submitted to South Carolina’s Coalition for Mathematics & Science at Clemson University **via email to Tracey Campbell** [tcampbell@s2temsc.org](mailto:tcampbell@s2temsc.org)

*NOTE: This program is supported by state-appropriated funds. In the event that sufficient funds are not available, this agreement will be terminated.*

#### **Introduction**

S<sup>2</sup>TEM Centers SC/SCCMS has designed a comprehensive system of scaffolded support for early childhood teachers to support their understanding and application of evidence-based instructional strategies in the mathematics classroom to improve student learning. This partnership is intended to be a *three-year innovation program* designed to engage K-3<sup>rd</sup> grade teachers in ongoing, face-to-face, and virtual 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**

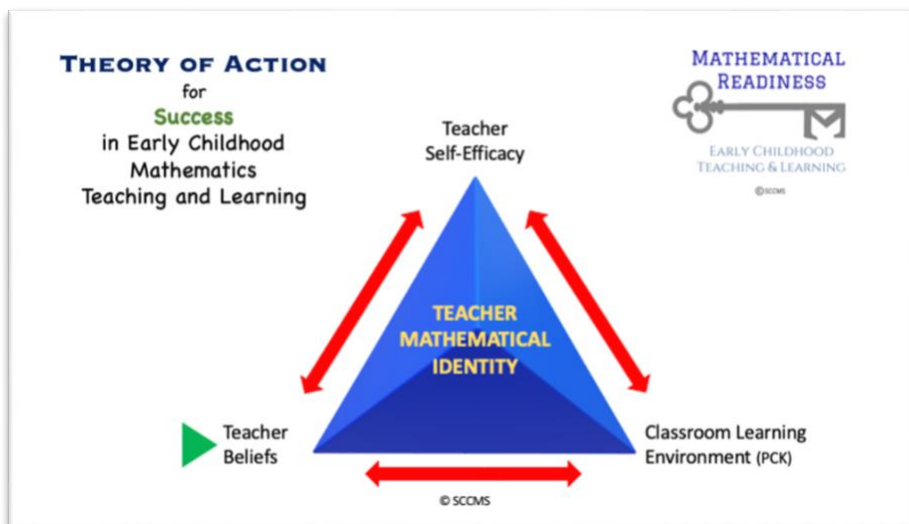
How can we ensure that all children can benefit from high-quality early mathematics teaching and learning experiences?

High-quality early mathematical experiences ensure a solid foundation in mathematics and prepare our youngest 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; Sheridan et al., 2019).

In South Carolina, recent data indicated that there is a significant need to focus on Mathematical Readiness. The 2020 South Carolina Kindergarten Readiness Assessment data (SCEOC, 2021)

revealed that 26.8% of students tested at the Demonstrating Readiness level in the Mathematics domain, meaning they entered kindergarten with sufficient skills, knowledge, and abilities to engage with kindergarten-level mathematics instruction; however, 32.9% of students tested at the Emerging Readiness level in the Mathematics domain, meaning they needed significant support to engage in kindergarten-level mathematics instruction. How math is taught in a child’s early years is just as important as what is taught (Linder, 2017). Investing in professional learning in mathematics for early childhood educators is needed to effectively intervene early on and avoid or reduce the learning gaps that are prevalent (Scott et. al, 2019; Linder 2017).

Teachers’ personal views or philosophies of mathematics and what it means to do mathematics influences their beliefs about mathematics teaching and learning (Hughes et al., 2019). In fact, according to (Hughes et al., 2019), teacher beliefs have the strongest effect on their instructional practices, more so than content knowledge. Therefore, the program’s focus is to develop positive mathematical beliefs and perceptions that will transform early childhood teachers’ mathematics instruction. As their mindset evolves, 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). Early childhood teachers who are secure in their mathematical identity not only transfer a positive mathematical identity to students, but because they are confident as mathematics’ teachers, student self-efficacy increases, as well as student learning and achievement in mathematics (Cohrssen et al., 2016).



### Eligible Schools

All South Carolina public schools serving students in grades K, 1, 2, and/or 3 are eligible to apply for participation in the *Mathematical Readiness: Early Childhood (K-3) Teaching and Learning* Program.

Preference may be given to schools that meet the following criteria:

- Title I designation
- Diverse student population
- Data 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 a**

**minimum of two participating teachers** in grades K-3. Teachers recommended for participation are *not required* to teach in the same grade level.

All participating teachers must:

- 1) be on continuing contract; and
- 2) have obtained **at least three years but no more than ten years** teaching experience in early childhood (K-3) mathematics by the end of fiscal year 2022-2023.

### **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 will actively participate in the program. While a district may submit multiple school teams, it is possible that all school teams will not be selected for participation during 2023-2024.

### **Program Model**

Research recommends that professional development in early childhood education include learning experiences that are long-term and sustained, connected to classroom practice and customized to teachers' needs (Sarama et al., 2018; Sheridan et al, 2019). In addition, it is beneficial for early childhood mathematics educators to experience instructional coaching and structured professional learning communities (Sarama et al., 2018).

The *Mathematical Readiness: Early Childhood (K-3 Teaching & Learning 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](http://txcc.sedl.org/resources/working_systemically/ptlc-intro.pdf)

Components of the model for Phase One include (*dates are tentative*):

- Statewide professional learning experiences (Tentative Location – Columbia, SC)
  - Program Launch – two back-to-back days - mid October 2023 – exact dates TBD
  - Early Spring - two back-to-back days – early 2024 – exact dates TBD
- Small group professional learning experiences
  - Planned occasionally as needed based on school / district schedule and needs
- Instructional coaching by S<sup>2</sup>TEM Centers SC Specialist
  - On-Site Coaching (once/month)
  - Virtual Coaching (once/month)
- Online teacher community of practice to share strategies, techniques, and lessons learned and to gain access to additional resources (on-going)
- School Administrator Support
  - Program Orientation (required)
  - Quarterly meetings with the S<sup>2</sup>TEM Centers SC Specialist (required)
  - Observes participating teachers once/semester (with S<sup>2</sup>TEM Centers SC Specialist)
  - Professional learning opportunities (recommended but not required to join in teacher sessions)

A S<sup>2</sup>TEM Centers SC Specialist will work directly with the K-3<sup>rd</sup> grade 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 S<sup>2</sup>TEM 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 success of the program; therefore, the principal of each participating school is required to participate in specific program components (as noted above). 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 success of school participation. If applying as a district, there must be a district-level leader who will participate in specific parts of the program, which include:

- program orientation; and
- quarterly meetings with each school administrator and S<sup>2</sup>TEM Centers SC Specialist.

### **Program Outcomes**

The *Mathematical Readiness: Early Childhood (K-3) Teaching and Learning* Program has identified the following outcomes:

- 1) Strong foundational teacher mathematical identity
- 2) Positive teacher mathematical beliefs and perceptions
- 3) Engaged mathematics classroom learning environment, which includes:
  - Teacher knowledge and use of evidence-based mathematics instructional strategies
  - 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 Phase One:*

- 1) 90% of participating teachers will demonstrate improved instructional practice
- 2) positive change in teacher beliefs and perceptions about mathematics
- 3) develop sense of collegiality among teachers and build a learning community (whole group, regional sessions, etc.)

### **Data Collection**

S<sup>2</sup>TEM 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. S<sup>2</sup>TEM Centers SC Specialists and teachers will review and analyze available school 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.

## References

- Clements, D. H., & Sarama, J. (2013). *Math in the early years: A strong predictor for later school success* (The Progress of Education Reform Vol. 14, No. 5). Education Commission of the States. <http://www.ecs.org/clearinghouse/01/09/46/10946.pdf>
- Cohrssen, C., Church, A., & Tayler, C. (2016). Play-based mathematics activities as a resource for changing educator attitudes and Practice. *SAGE Open*, 6(2), 1–14. <https://doi.org/10.1177/2158244016649010>
- Heffernan, K. A., & Newton, K. J. (2019). Exploring mathematics identity: An intervention of early childhood preservice teachers. *Journal of Early Childhood Teacher Education*, 40(3), 296–324.
- Hughes, P., Swars Auslander, S., Stinson, D. W., & Fortner, C. K. (2019). Elementary teachers' mathematical beliefs and mathematics anxiety: How do they shape instructional practices? *School Science and Mathematics*, 119(4), 213–222.
- Linder, S.M. (2017). *Early childhood mathematics: Making it count*. Institute for Child Success – Early Childhood Research. <https://www.instituteforchildsuccess.org/publication/early-childhood-mathematics/>
- Scott, A.M., Rusnak, S. & Carolan, M. (2019). *South Carolina early childhood data report*. Institute for Child Success. <https://www.instituteforchildsuccess.org/publication/2019-sc-databook/>
- Sheridan, K. M., Banzer, D., Pradzinski, A., & Wen, X. (2019). Early math professional development: Meeting the challenge through online learning. *Early Childhood Education Journal*, 48(2), 223-231.
- South Carolina Department of Education (SCDOE). (2015). *South Carolina College- and Career- Ready Standards for Mathematics*. <https://ed.sc.gov/instruction/standards-learning/mathematics/standards/scccr-standards-for-mathematics-final-print-on-one-side/>
- South Carolina Education Oversight Committee (SCEOC). (2021). *Kindergarten Readiness Assessment (KRA): Analysis of the Fall 2020 Results*. SC First Steps. <https://www.scfirststeps.org/media/aopjxdrd/kra-report-14-june-final.pdf>



**Part 2**  
**Program Application - 2023-2024 School Year**

An editable application document is available at [www.s2temsc.org/mathematicalreadiness](http://www.s2temsc.org/mathematicalreadiness) and can be completed offline. The completed application should be **submitted via email to Tracey Campbell**.

If applying as a district, each school applying to participate as part of the district team should complete the School Contact, School Data, School Narrative and Teacher Information sections of the application.

In preparation for completing the application documents, note that the following information will be requested.

**DISTRICT CONTACT INFORMATION**

*(for superintendent and program lead)*

**SCHOOL CONTACT INFORMATION**

*(for principal)*

*(NOTE: if applying as a district, responses should be included for each school submitted)*

**SCHOOL DATA**

*(Title 1 designation, enrollment, demographics)*

*(NOTE: if applying as a district, responses should be included for each school submitted)*

**SCHOOL NARRATIVE**

*(brief statement to affirm interest in project)*

*(NOTE: if applying as a district, responses should be included for each school submitted)*

**PARTICIPATING TEACHER INFORMATION**

*(NOTE: A total of 2-10 teachers is permissible per application. Each school team is required to have **at least two** participating teachers in grades K-3; teachers are not required to teach in the same grade level. All teachers recommended for participation must be on continuing contract AND have a **minimum of three years but no more than ten years** of teaching experience in early childhood (K-3) education.)*



**Part 3**  
**Memorandum of Agreement - 2023-2024 School Year**

**SCCMS reserves the right to terminate this partnership if it is determined that the teacher(s), school and/or district are not in compliance with the terms identified in the Memorandum of Agreement.**

**I. Financial Obligations**

*a. S<sup>2</sup>TEM Centers SC/SCCMS Financial Obligations\**

- i. S<sup>2</sup>TEM Centers SC/SCCMS will provide support for overnight travel expenses (including lodging and meal during sessions) associated with the participation of the teachers in four (4) days of professional development. (tentatively planned as two back-to-back days in mid-October 2023 and two back-to-back days in early 2024, expected location: Columbia, SC)
- ii. S<sup>2</sup>TEM Centers SC/SCCMS will provide support to the *S<sup>2</sup>TEM Center SC Specialist* for all travel and training materials expenses associated with statewide training and on-site support.

*\* S<sup>2</sup>TEM Centers SC/SCCMS financial contributions estimated @ \$5,000 per participant.*

*b. District and/or School Financial Obligations*

- i. The district and/or school will support teacher release time for whole group learning and any other release time mutually determined to be necessary during the school year.
- ii. The district and/or school will provide funding for teacher substitutes for participating teachers to attend four (4) full day professional learning sessions. (tentatively planned for mid-October 2023 and early 2024)
- iii. The district and/or school will provide support for necessary travel expenses (mileage and meals not provided) associated with the participation of the teachers and school/district administrators for four (4) days of professional development. (tentatively planned as two back-to-back days in mid-October 2023 and two back-to-back days in early 2024, expected location: Columbia, SC)
- iv. The district and/or school will provide any instructional materials mutually determined to be necessary.

*NOTE: All dates listed are subject to change.*

**II. Roles and Responsibilities**

*a. S<sup>2</sup>TEM Centers SC Specialist Roles and Responsibilities*

- Develops effective strategies for evidence-based mathematics instruction.

- Delivers on-site professional development and support as an instructional coach for participating teachers in partnering schools once per month per seven (7) months.
  - Provides virtual support to participating teachers once per month for seven (7) months.
  - Develops and implements a statewide 2-day Program Launch and a 2-day mid-year professional learning session for participating school and district staff.
  - Observes and records data of participating teachers/students during mathematics classroom lessons.
  - Meets quarterly with school administrator (and district leader, as applicable).
- b. Participating Teacher(s) Roles and Responsibilities*
- Engages in Professional Teaching and Learning Cycle actions (Study, Select, Plan, Implement, Analyze and Adjust) focused on implementing evidence-based mathematics instructional strategies.
  - Participates in:
    - Program Launch - two (2) days of statewide professional learning.
    - Mid-Year Session – two (2) days of statewide professional learning,
    - Participating teachers will earn professional development hours for participation in group professional development.
  - Participates in instructional coaching conversations with the S<sup>2</sup>TEM Centers SC Specialist once per month for seven (7) months in person and once per month for seven (7) months virtually.
  - Shares strategies, resources, and instructional materials in a virtual, asynchronous learning community.
- c. School Administrator Roles and Responsibilities*
- Observes and reviews participating teachers’ performance in the use of evidence-based mathematics instructional strategies not less than once per semester with the S<sup>2</sup>TEM Centers SC Specialist.
  - Provides computer and internet access to be used by the participating teachers for access to the online learning community.
  - Provides the participating teachers with adequate opportunities during the school day for coaching support with the S<sup>2</sup>TEM Centers SC Specialist.
  - Participates in program orientation (Fall 2023)
  - Participates in quarterly school team meetings with S<sup>2</sup>TEM Centers SC Specialist.
  - Ensures that documentation of permission to take digital videos and still images of students, teachers, principals, and district instructional leaders are current and up to date for use by S<sup>2</sup>TEM Centers SC/SCCMS as deemed necessary. Informs S<sup>2</sup>TEM Centers SC Staff of any changes regarding the permission documentation.
  - Provides access to data necessary to assess the effectiveness of the program.
- d. District Leadership Roles and Responsibilities*

- All Districts:
    - Ensures the school principal and participating teachers attend required professional learning sessions.
    - Provides access to data necessary to assess the effectiveness of the program.
  - Additionally, District Applicants – must assign a district leader who:
    - Participates in program orientation (Fall 2023);
    - Participates in quarterly team meetings with school principal and S<sup>2</sup>TEM Centers SC Specialist; and
- e. S<sup>2</sup>TEM Centers SC/SCCMS Roles and Responsibilities*
- Provides timely and accurate information to the participating teachers, school, and district.
  - Monitors and assesses the effective engagement of the S<sup>2</sup>TEM Centers SC Specialist.
  - Provides the training, leadership, and coordination needed for the S<sup>2</sup>TEM Centers SC Specialist to develop the instructional capacity of the participating teachers.
  - Monitors data and reports to the participating teachers, school, and district on the effectiveness of the program.

### **III. Termination of the Agreement**

- a. Funding Unavailable - This program is supported by state-appropriated funds. In the event that sufficient funds are not available, this agreement will be terminated.
- b. Termination by the School or District – The school or district may terminate this agreement if the participating teacher(s) are reassigned to another school, subject area or grade level or are otherwise employed. The school or district may also terminate this agreement if SCCMS or the S<sup>2</sup>TEM Centers SC Specialist does not fulfill the roles and responsibilities designated in this agreement.
- c. Termination by SCCMS - SCCMS may terminate this agreement if the participating teacher(s) school and/or district are not in compliance with the terms identified in this Memorandum of Agreement.
- d. Notice of termination shall become effective on the date specified on the notice letter.

### **IV. Amendments**

This agreement constitutes the whole agreement between the parties, and no prior representatives, negotiation, or agreements by any party shall affect the construction and operation of this agreement. This agreement may be amended only by a written instrument signed by all parties.

**NOTE: This program is supported by state-appropriated funds. In the event that sufficient funds are not available, this agreement will be terminated.**

**Part 4**  
**Signature Page**

**AFFIRMATION OF MEMORANDUM OF AGREEMENT**

*I hereby affirm that all of my statements in this application are true and accurate. Additionally, I have read and will comply with the terms of this agreement.*

Signatures and Dates needed from:

District Instructional Leader \_\_\_\_\_

Title: \_\_\_\_\_

School Principal \_\_\_\_\_

SCCMS Signature \_\_\_\_\_

**Submit the complete application and MOA Signature page by 5:00 p.m. FRIDAY, September 22, 2023, to South Carolina’s Coalition for Mathematics & Science via [S<sup>2</sup>TEM Centers SC](#) Website.**

**Note: If applying as a district on behalf of multiple schools, each school requires a separate MOA page to be uploaded with the application.**

**NOTE: This program is supported by state-appropriated funds. In the event that sufficient funds are not available, this agreement will be terminated.**