S²TEM Centers SC

Solutions in Science, Technology, Engineering & Mathematics Education

Mathematical Readiness: Early Childhood (PK-3) Teaching and Learning Program

Innovation Partnership 2022-2023

APPLICATION AND MEMORANDUM OF AGREEMENT

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.

Application Deadline: 5:00 p.m. SEPTEMBER 30, 2022

For questions regarding this application or the application process, please contact **Tracey Campbell @ (843) 274-4087 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 online application link posted on the S²TEM Centers SC website.

South Carolina's Coalition for Mathematics & Science

SCCMS

Achievement by Design

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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^{2}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 (PK-3) Teaching and Learning Program* during the 2022-2023 school year. S^{2}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, supporting documents, and the affirmation signatures page must be submitted **by 5:00 p.m. on FRIDAY, September 30, 2022** to South Carolina's Coalition for Mathematics & Science at Clemson University **via the online application link posted on the S²TEM Centers SC website.**

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^{2}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 PK-3rd 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.

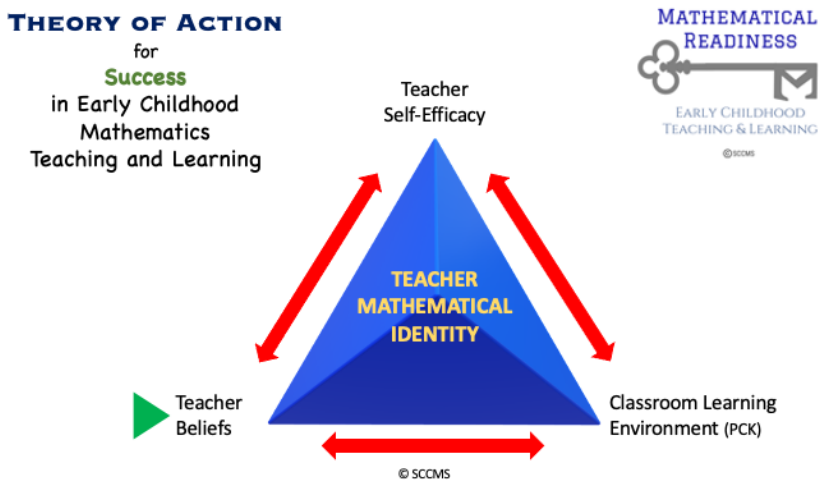
Program Purpose

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 PK, K, 1, 2, and/or 3 are eligible to apply for participation in the *Mathematical Readiness: Early Childhood (PK-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 PK-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 (PK-3) mathematics by the end of fiscal year 2021-2022.

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 2022-2023.

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 (PK-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

Components of the model for Year One include (*dates subject to change*):

- Statewide professional learning experiences (Tentative Location – Columbia, SC)
    - Program Launch – January 26-27, 2023
    - Spring – March 21, 2023

- Regional professional learning experiences
    - Three full days of professional learning within participating teachers' region: 2/21/23, 4/18/23, 5/16/23

- Instructional coaching by S^2TEM 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^{2}TEM Centers SC Specialist (required)
    - Observes participating teachers once/semester (with S^{2}TEM Centers SC Specialist)
    - Professional learning opportunities (recommended but not required)
        - Program Launch Administrator Session (January 2023)
        - Statewide Professional Learning Experience (March 2023)

A S^{2}TEM Centers SC Specialist will work directly with the PK-3rd 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^{2}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^{2}TEM Centers SC Specialist.

Program Outcomes

The *Mathematical Readiness: Early Childhood (PK-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 Year 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^{2}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^{2}TEM Centers SC Specialists and teachers will review and analyze SC READY, KRA 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 - 2022-2023 School Year

Application information should be **submitted online via S²TEM Centers SC website.** *Prior to starting the online submission, use the noted questions below for gathering and planning your responses.*

DISTRICT CONTACT INFORMATION

District
District Name:
District Address:
District Contact (individual name):
District Contact's position/job title:
District Contact email and phone:
District Superintendent:
District Superintendent's email and phone:

If we are unable to accept all schools and teachers submitted in the district application, are you interested in partial acceptance?

In the district application, how many schools will be submitted? (1 to 5 are permissible)

In the district application, how many teachers will be submitted? (a total of 2 – 10 is permissible with a **minimum of 2 per school**)

SCHOOL CONTACT INFORMATION
(Responses should be included for each school to be considered.)

School
School Name:
School Address:
Grades Served:
Principal's Name:
Principal's email and phone:

If we are unable to accept all teachers submitted for participation during the 2022-2023 school year, are you interested in partial acceptance?

Is the school designated as a Title 1 school?

SCHOOL DATA
(Responses should be included for each school submitted.)

Please insert a link to your school's most recent South Carolina School Report Card available at: https://ed.sc.gov/data/report-cards/sc-school-report-card/ .

SCHOOL NARRATIVE
(*Responses should be included for each school submitted. Editable document available.*)

Answer each of the following questions completely. Please limit responses to no more than two pages per numbered item below.

1. How might participation in the *Mathematical Readiness: Early Childhood (PK-3) Teaching and Learning* Program support the school's vision for student achievement in mathematics for grades PK-3, as well as grade levels that follow?

2. Identify [at least] one area of potential growth for early childhood mathematics teachers at your school. What indicates the need for growth in the area(s) you have identified? What are some ways you anticipate that participation in the *Mathematical Readiness: Early Childhood (PK-3) Teaching and Learning* Program will bring about desired growth?

3. What initiative has your school recently implemented that proved to be successful? What serves as evidence of your success? How might participation in the *Mathematical Readiness: Early Childhood (PK-3) Teaching and Learning* Program build on that success?

4. What initiatives are or will be in place during the 2022-2023 school year that might impact participation in the *Mathematical Readiness: Early Childhood (PK-3) Teaching and Learning* Program?

STUDENT DATA

Total student enrollment (2022-2023):

Grade Level Enrollment

Indicate the number of students enrolled for 2022-2023 in each grade level for PK–3:

PK K 1 2 3

Student Demographics

Indicate the percentage of total school student enrollment for 2022-2023 represented by each descriptor:

African American
American Indian
Asian Pacific Islander
Caucasian
Hispanic

English Learners (ELs)
Disabled
Economically Disadvantaged

Student Assessment Data

Kindergarten Readiness Assessment (KRA) in Mathematics (based on the 2021-2022 data)
Indicate the percentage of students who were:

Demonstrating Approaching Emerging

Students On Track for Success in Mathematics (refer to most recent School Report Card Data)

Grade 1 Grade 2

SC READY 2022 Mathematics
Percentage of students met or exceeding expectations

Grade 3 Grade 4 Grade 5

PARTICIPATING TEACHER INFORMATION

Each school team is required to have ***at least two*** participating teachers in grades PK-3; teachers are not required to teach in the same grade level. All teachers recommended for participation in the *Mathematical Readiness: Early Childhood (PK-3) Teaching and Learning Program* must be on continuing contract AND have a **minimum of three years but no more than ten years** of teaching experience in early childhood (PK-3) mathematics by the end of the fiscal year 2021-2022. The list submitted represents teachers who are expected to participate as of the application date. We realize staffing may change prior to the start of this program; therefore, final confirmation of participating teachers will be requested from S^2TEM Center SC staff **on or before November 1, 2022**. The online application form will allow submission without teacher names.

*(*NOTE: A total of 2 - 10 teachers is permissible, with a minimum of two per school.)*

Teacher Name

School Assignment

Current Teaching Assignment (PK, K, 1, 2, 3)

Teacher Contact Info (Email, Phone)

Continuing Contract (Yes, No)

Early Childhood Mathematics Teaching Experience (3, 4, 5, 6, 7, 8, 9, or 10 years)

Teaching Setting (In-person, Virtual, Hybrid)

Part 3
Memorandum of Agreement - 2022-2023 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. S²TEM Centers SC/SCCMS Financial Obligations**

i. S²TEM Centers SC/SCCMS will provide support for overnight travel expenses (including lodging and meal during sessions) associated with the participation of the teachers in a two (2) day Program Launch: January 26-27, 2023 (Expected location: Columbia, SC)

ii. S²TEM Centers SC/SCCMS will provide support for overnight travel expenses (including lodging and meals during sessions) associated with the participation of the teachers in the Spring statewide professional learning session: 03/21/23.

iii. S²TEM Centers SC/SCCMS will provide meals during sessions associated with the participation of the teachers in regional professional learning sessions: 02/21/23, 04/18/23, and 05/16/23.

iv. S²TEM Centers SC/SCCMS will provide support to the *S²TEM Center SC Specialist* for all travel and training materials expenses associated with statewide training and on-site support.

** S²TEM 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 professional learning sessions. These dates include:
   1. Statewide Program Launch: January 26-27, 2023
   2. Statewide Professional Learning: 03/21/23
   3. Regional Professional Learning: 02/21/23, 04/18/23, and 05/16/23

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:
   1. Statewide Program Launch: January 26-27, 2023 (Expected location: Columbia, SC)
   2. Spring Statewide Professional Learning Session: 03/21/23.

iv. The district and/or school will provide support for necessary travel expenses (mileage) with the participation of the teachers in regional professional learning sessions: 02/21/23, 04/18/23, and 05/16/23. (Location TBD by participating schools/districts.)
v. 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^2TEM Centers SC Specialist Roles and Responsibilities

- Develops effective strategies for evidence-based mathematics instruction.
- Delivers on-site professional development as an instructional coach for participating teachers in partnering schools once per month per nine (9) months.
- Provides virtual support to participating teachers once per month for four (4) months.
- Develops and implements a statewide 2-day Program Launch and a 1-day Spring professional learning session for participating school and district staff.
- Develops and implements three 1-day regional professional learning sessions that will occur on the third Tuesday in February, April, and May.
- 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;
    - Spring Session – one (1) day of statewide professional learning; and
    - Regional Sessions – three (3) days of professional learning.
    - Participating teachers may earn *up to 36* professional development hours
- Participates in instructional coaching conversations with the S^2TEM Centers SC Specialist once per month for four (4) months in person and once per month for four (4) 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^2TEM 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^{2}TEM Centers SC Specialist.
- Collaborates with participating schools in the region and the S^{2}TEM Centers SC Specialist to secure a location for regional sessions (a minimum of one month prior to the date).
- Participates in program orientation (Late Fall 2022 or January 2023)
- Participates in quarterly school team meetings with S^{2}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^{2}TEM Centers SC/SCCMS as deemed necessary. Informs S^{2}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 (Late Fall 2022 or January 2023);
    - Participates in quarterly team meetings with school principal and S^{2}TEM Centers SC Specialist; and
    - Collaborates with participating schools and/or districts in the region and the S^{2}TEM Centers SC Specialist to secure a location for regional professional learning sessions (a minimum of one month prior to the date).

e. S^{2}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^{2}TEM Centers SC Specialist.
- Provides the training, leadership, and coordination needed for the S^{2}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^2TEM 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 30, 2022, to South Carolina's Coalition for Mathematics & Science via S²TEM 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.