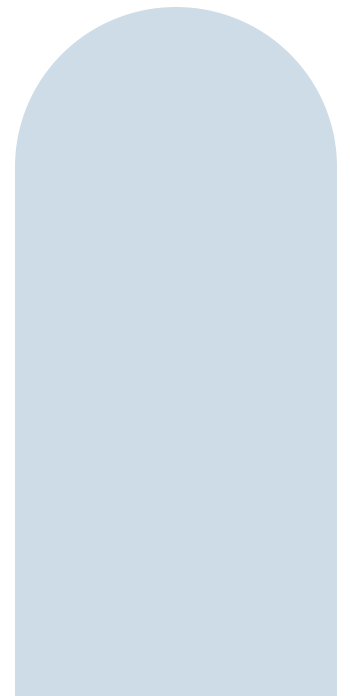
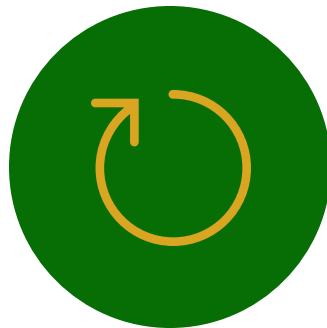


Tennessee STEM and STE(A)M Designation Guidebook

Table of Contents

Introduction	03
Purpose and Timeline	04
Eligibility Criteria and Overview	05
STEM vs STE(A)M	06
Rubric Components	07
Attribute 1: Infrastructure	08
Attribute 2: Curriculum and Instruction	09
Attribute 3 and 4: Professional Development & Achievement	10
Attribute 5: Community and Postsecondary Partnerships	11
Scoring and Designation Levels	12
Frequently Asked Questions	13



Introduction



Tennessee STEM and STE(A)M School Designation

This resource packet is designed for schools that are seeking to apply for Tennessee STEM and STE(A)M Designation. It includes the key things a school needs to know and provides a directory of links to relevant and useful content.

Pursuing Designation is a highly rewarding experience that will help you grow and continue to advance in a STEM or STE(A)M-focused school. This Guidebook outlines the application questions and can be used for pre-planning prior to submitting the online application.

What is Tennessee STEM or STE(A)M School Designation?

STEM and STE(A)M education provides an opportunity for each child to discover and learn, pursue a fulfilling post-high school path, and become a resilient, lifelong learner. STEM and STE(A)M education are integrated approaches to learning where rigorous academic concepts are explored through real-world, project-/problem-based experiences. Students use science, technology, engineering, arts/humanities, and mathematics concepts to make authentic connections between school, community, and work experiences. The Tennessee STEM and STE(A)M School Designation was created to award and recognize schools that are exemplars of this work. The list of current STEM/STE(A)M Designated Schools across the state can be found [here](#).

Once a school has earned Designation, that certification is valid for a period of 5 years. Schools are required to reapply for STEM or STE(A)M School Designation in order to verify that the primary focus for learning remains centered around STEM and/or STE(A)M principles.

To recertify, eligible schools must demonstrate advanced knowledge, skills, practice, and growth over time in the STEM/STE(A)M Designation attributes within the STEM/STE(A)M Designation rubric.

Purpose & Timeline



STEM and STE(A)M education are unique approaches to teaching and learning that foster creativity and innovative thinking in all students. STEM and STE(A)M are focused on building critical and creative thinking and analysis skills by addressing how students view and experience the world around them. Strong STEM and STE(A)M teaching and learning opportunities require opportunities for inquiry, technology, and project/problem-based learning activates and lessons that are tied to real-world issues or experiences. STEM and STE(A)M education is diverse, interdisciplinary curriculum in which activities in one class compliment those in other classes. In a STEM/STE(A)M classroom, robust partnerships reach beyond the walls of the school to include higher education and business/industry partners in real-world lessons. STEM and STE(A)M education are two of the most effective tools we possess to prepare Tennessee students for tomorrow's workforce and success in college and career.

The Tennessee STEM and STE(A)M School Designation was developed to provide a "roadmap" for schools to successfully implement a STEM or STE(A)M education plan at the local level. The tools and resources created define the attributes necessary for a school to create a comprehensive STEM or STE(A)M learning environments for its students. A school that receives Tennessee STEM and STE(A)M School Designation will be recognized by the Tennessee Department of Education for its use of STEM or STE(A)M teaching and learning strategies, and serve as a model from which other schools may visit and learn from. Designated schools will also be invited to share promising practices at the annual Tennessee STEM Innovation Summit and becoming a member of the Tennessee STEM Innovation Network's group of schools.

Suggested Timeline

1

Late Summer:
Determine if your school will apply for STEM or STE(A)M Designation

2

Early Fall: Complete the STEM/STE(A)M Self-Assessment & Submit Intent to Apply Form

3

January: Submit STEM/STE(A)M Designation Application

4

Spring: Application Reviews & Site Visits

5

May: Announcement of STEM & STE(A)M Designated Schools

Eligibility Criteria & Overview

All K-12 schools serving Tennessee students are eligible to apply for STEM/STE(A)M Designation.

The Tennessee STEM and STE(A)M Designation process is designed to collect implementation-based evidence of model STEM or STE(A)M integration at the school or academy level. In all 5 priority areas on the Designation rubric, applicants must complete an online application showcasing model status in the following attributes: Infrastructure, Curriculum and Instruction, Professional Development, Achievement, and Community Partnerships. All components are submitted electronically through an online portfolio: Slideroom. Once the virtual application is reviewed, a site visit is scheduled. Site visits will only be granted to schools that are being considered for STEM or STE(A)M Designation based on their portfolio outcomes. The school will be notified in advance to create a schedule for the visit.

Review Process:

- **Select:** Your school should intentionally decide whether they are applying for **STEM** or **STE(A)M** Designation.
- **Intent to Apply:** Inform the Tennessee STEM Innovation Network (TSIN) of the school's intent to apply for designation status. A representative will contact the school's designated person to schedule an initial conversation.
- **Portfolio Review:** Members of the Tennessee STEM/STE(A)M School Designation Review Team will review the portfolio created from the responses of the application for the attributes of the STEM and STE(A)M School Designation and associated artifacts to make a recommendation to begin the review for recognition at the state level.
- **School Site Visit:** School site visits will be conducted to follow up on specific elements and questions generated from the portfolio review. School site visits will only be scheduled for those schools being considered for STEM or STE(A)M School Designation based on the portfolio review outcomes.
- **Tennessee Department of Education Approval:** The Tennessee STEM/STE(A)M Designation Review Team will make a recommendation for STEM and STE(A)M School Designation awardees to the Tennessee Department of Education.

STEM vs. STE(A)M

What is the difference between applying for STEM Designation versus the STE(A)M Designation?

STEM with the "A" includes:

- Sharing knowledge with communication and English Language Arts
- A working knowledge of fine arts
- Better understanding past and present cultures and aesthetics through the fine arts
- Rhythmic and emotional use of math, physics, physiology and often language with the musical arts
- Understanding sociological developments, human nature, and ethics with the liberal arts

In alignment with the Curriculum and Instruction Attribute, the best quality STE(A)M project-/problem-based learning lessons intentionally connect two aligned standards from arts and core content areas. For example, if the science standard asks students to "demonstrate" something and the art standard asks students to "apply" their skills. Schools are encouraged to align instruction to these areas to support the processes and proficiencies of student learning to enhance the connection between the science, technology, engineering, art, and mathematics.

Integrated STEM education is an effort to combine the four disciplines of science, technology, engineering, and mathematics into one class, unit, or lesson that is based on connections among these disciplines and real-world problems. More specifically, STEM integration refers to students participating in the engineering design process to develop relevant technologies/solutions that require meaningful learning through integration and application of mathematics and/or science. STE(A)M integration focuses on the same effort with the addition of intentional arts integration.

Resources:

- [Standards for Mathematical Practices](#)
- [Science and Engineering Practices](#)
- [K-12 Computer Science Framework](#)
- [Fine Arts Standards](#)
- [K-5 STEM Standards Framework](#)

Rubric Components

Component 1 - Infrastructure

A Tennessee Designated STEM/STE(A)M school requires a developed STEM Action Plan and a leadership team who collaborates frequently about the program's design and effectiveness. Teachers are highly collaborative and community members are included in the decision making. All attributes in Infrastructure promote an infrastructure that is conducive to sustaining a well-rounded STEM/STE(A)M program.

Component 2 - Curriculum and Instruction

The STEM/STE(A)M curriculum framework contains Tennessee State Standards and has articulated interconnectedness between science, technology, engineering, arts, mathematics, and other content areas. Project-based and problem-based learning activities form a substantial part of the curriculum framework that is conducive to sustaining a well-round STEM/STE(A)M program.

Component 3 - Professional Development

A Tennessee Designated STEM/STE(A)M School ensures a systemic professional development model that provides continuous learning based on student results, teacher development, and the short-and-long term goals of the school. The PD model, including the school-level and personalized plans, creates an environment that allows educators to continue to learn and pursue opportunities that build the capacity to provide better STEM/STE(A)M learning opportunities for students. Each attribute creates an environment of continued learning for all that is conducive to sustaining a well-rounded STEM/STE(A)M program.

Component 4 - Achievement

Assessments are incorporated to measure student outcomes and teacher instruction to ensure a strong, innovative, and cohesive STEM/STE(A)M program. Each attributes use innovative assessments and reflection to sustain a well-rounded STEM/STE(A)M program.

Component 5 - Professional Development

Community and postsecondary STEM/STE(A)M partnerships are established and provide connections between curriculum taught in the classroom and practical applications outside of school. These partnerships have created an environment in which students develop a high-level STEM/STE(A)M skills and knowledge inside and outside of the classroom and increase their readiness for college and careers. The attributes are essential in creating connections between what is taught and real-world settings to sustain a well-rounded STEM/STE(A)M program.

Attribute 1 - Infrastructure

Attribute 1.1 STEM Action and Sustainability Plan - Create a detailed strategic plan grounded in research and in which actions toward the Tennessee STEM and STE(A)M Attributes are outlined. STEM Action and Sustainability Plan template found [here](#).

Attribute 1.2 Leadership Team - Establish a leadership team who collaborate and engage in dialogue frequently about the STEM Action Plan's design and effectiveness. School leaders provide the opportunity for staff members to exhibit responsibility and commitment to the success of the school. The staff contributes to and has a say in decisions regarding the school. The staff collaborates for continued improvement.

Attribute 1.3 Leadership Professional Development - School leadership team participate in professional development that addresses STEM/STE(A)M education issues to develop concepts of innovation leadership practices, enhance capacities to promote best practices across the curriculum, develop strategies to promote staff effectiveness and improve teaching and learning environments to prepare leaders with the procedures and policies to promote success.

Attribute 1.4 School Environment- Facilities are adapted or designed for STEM/STE(A)M learning. Spaces are available for collaboration and project/problem work. Obvious efforts have been made to make resources available to students for use in learning, design, and project/problem effort.

Attribute 1.5 School Schedules - School leaders create a school schedule that allows consistent teacher collaboration; co-teaching and integration of subjects; ample time for projects, teacher planning, and non-traditional courses.

Review the [Tennessee STEM/STE\(A\)M Designation Rubric](#) to determine the level of implementation your school is providing.

Attribute 2 - Curriculum & Instruction

Attribute 2.1 Project-Based and Problem-Based Learning:

STEM/STE(A)M learning experiences are student-led, engaged in real-world content and multiple solutions for promoting student collaboration and carefully custom designed to help students intergrade knowledge and skills from science, technology, engineering, art, and mathematics. Learning experiences at a STEM or STE(A)M Designated School require a through process of inquiry, knowledge building, and solution development. Curriculum includes projects and problem-solving tasks, often interdisciplinary from short-to-long term, which are focused on solving an authentic problem.

Attribute 2.2 Engineering Design Process and the Design Thinking Process:

STEM/STE(A)M learning experiences require students to demonstrate knowledge and skills fundamental to the engineering design process and design thinking.

Attribute 2.3 Quality of Technology Integration:

Technology is seamlessly embedded within the lesson and activities of all content areas and is not demonstrated as a separate entity, providing a student-centered environment that encourages personalized and blended learning.

Attribute 2.4 Exploring STEM/STE(A)M Careers:

STEM/STE(A)M learning experiences help students better understand and personally consider STEM/STE(A)M careers.

Attribute 2.5 College and Career Readiness Skills:

Students use the employability skills of communication, creativity, collaboration, leadership, critical thinking, and technological proficiency to create and consume in authentic ways. Reference the Employability Skills Checklist [here](#).

Attribute 2.6 Integrity of Academic Content:

STEM/STE(A)M learning experiences are content accurate, anchored to the relevant content standards, and focused on big ideas and foundational skills critical to future learning in the targeted discipline(s).

Attribute 2.7 Enrichment Learning Activities:

Students are given the opportunity to participate in STEM or STE(A)M enrichment activities that take place before, after, or during school hours.

Review the [Tennessee STEM/STE\(A\)M Designation Rubric](#) to determine the level of implementation your school is providing.

Attribute 3 & 4 - Professional Development & Achievement

Attribute 3.1 Quality STEM/STE(A)M Professional Learning:

Professional learning aligns with STEM and STE(A)M initiatives and is provided throughout the year to support the school's STEM Action Plan.

Attribute 3.2 Designing PBLs:

Teachers participate in professional development that addresses integrated content, community/industry partnerships, and connections with postsecondary education, pedagogy, art and design opportunities, and digital learning to develop custom designed PBLs that are relevant learning for the school's student population by providing opportunities to research challenges within the community.

Attribute 4.1 Performance Assessments:

A variety of assessments are incorporated to measure student outcomes and teacher instruction to endure a strong, innovative, and cohesive STEM/STE(A)M program. The assessment plan includes rubric-based performance assessments that require students to demonstrate knowledge of STEM/STE(A)M concepts and skill in completing authentic tasks that model performances in work-based learning.

Attribute 4.2 Accountability (Data):

Diagnostic, ongoing, and vertically and horizontally aligned formative and summative assessments are used for all to drive instructional decisions to promote student achievement.

Review the [Tennessee STEM/STE\(A\)M Designation Rubric](#) to determine the level of implementation your school is providing.

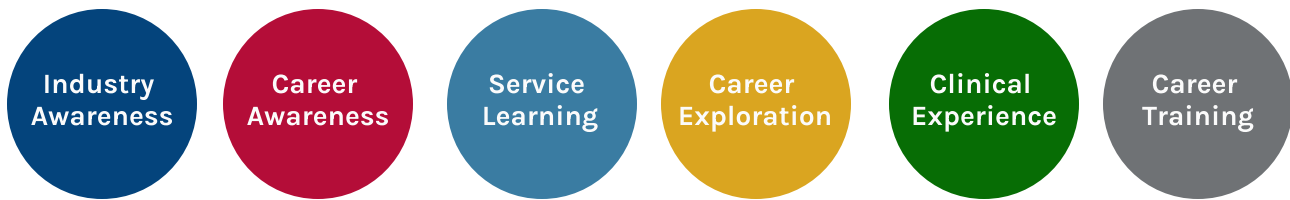
Attribute 5 - Community & Postsecondary Partnerships

Attribute 5.1 Partners Support Instruction:

Direct experiences with STEM/STE(A)M professionals, STEM/STE(A)M work environments, and/or physical applications of STEM/STE(A)M content, including experiences that incorporate innovative design and art immersion led by professionals within the arts community, during and/or outside school are available to students.

Attribute 5.2 Work-Based Learning:

STEM/STE(A)M work-based learning experiences increase interests and abilities in fields requiring STEM/STE(A)M skills.



K-5 continuing to upper grades	6-8 continuing to upper grades	9-12 continuing to postsecondary
Foster career and workplace awareness	Deepen career and work readiness knowledge	Develop technical knowledge and skills necessary for entry into specific occupation
Promote career exploration	Develop personal qualities and workplace readiness skills	Strengthen industry and career awareness
Strengthen motivation and informed decision-making skills	Impart beginning professional skills	Strengthen career exploration, preparation, and training
Service learning projects	Service learning projects	Service learning projects

Attribute 5.3 College Opportunities (high school only):

The high school provides courses (online courses included) for preparation in college courses and career training; develop time management, prioritization, and organization skills.

Review the [Tennessee STEM/STE\(A\)M Designation Rubric](#) to determine the level of implementation your school is providing.

Scoring & Designation Levels

Tennessee schools applying for STEM/STE(A)M School Designation, will complete the online application in Slideroom, which requires a written response for each attribute within the rubric. The school may provide supportive evidence and artifacts in lieu of a written response to create a comprehensive portfolio. Artifacts and evidence must have sharing settings turned on in order for the STEM/STE(A)M Designation Review Team to be able to access documents submitted.

Designation Levels

Early (1 point)	Developing (2 points)	Accomplishing (3 points)	Model (4 points)
STEM/STE(A)M implementation has started	School has met some components, but still needs further development	School meets many of the expectations	Highest level of implementation of a STEM/STE(A)M school

Elementary or Middle School

Points	Level
65-72 points	Model
56-64 points	Accomplishing
47-55 points	Developing
< 46 points	Early

High School

Points	Level
69-76 points	Model
60-68 points	Accomplishing
53-59 points	Developing
< 52 points	Early

The Tennessee Department of Education will only certify 'Model' Implementation STEM and STE(A)M Schools. 'Model' Implemented STEM and STE(A)M Schools must demonstrate implementation of 90% of the STEM and STE(A)M attributes to obtain STEM or STE(A)M Designation.

Schools will not receive designation if they receive a 1 or 2 in an attribute.

Frequently Asked Questions



Why is the Tennessee Department of Education offering a STEM and STE(A)M Designation?

To promote rigorous STEM/STE(A)M related learning opportunities for all students that leads to postsecondary achievement and high-quality careers. To advocate Tennessee as the leading state in STEM/STE(A)M education, developing a workforce able to compete and succeed in the current and emerging global economy.

Who is eligible to apply?

All K-12 schools serving students in the state of Tennessee are eligible.

How long is the STEM and STE(A)M Designation valid?

STEM and STE(A)M School Designation will be valid for a 5-year period before reapplication is required.

Who makes up the Tennessee STEM Designation Review Team?

The Tennessee STEM and STE(A)M Designation Review Team is comprised of members from the Tennessee Department of Education, the Tennessee STEM Innovation Network, and a group of experienced, diverse STEM/STE(A)M experts from across the state who are administrators, district leaders, and teachers.

How are schools evaluated for STEM and STE(A)M Designation?

There are 18 attributes for elementary and middle school and 19 attributes for high school that will be scored. Each attribute is evaluated using a 4-point rubric (1-Early, 2-Developing, 3-Acchomplishin, 4-Model). A school must demonstrate 90% 'Model' implementation to obtain designation. A school that receives a "1" or "2" in any attribute will not be designated.

What does a site visit consist of?

The site visit will be schedule two weeks in advance. The Tennessee STEM and STE(A)M Designation Review Team will be seeking to determine if the portfolio submitted aligns with the school activities, observe classroom environment, and will be interviewing teachers, students, and community partners regarding STEM/STE(A)M activities and learning experiences that are used within the school. The Review Team will use the attribute rubric to score their findings and observations.

Frequently Asked Questions



Are there any supports being offered to help schools reach STEM and STE(A)M Designation?
Schools may request STEM-STE(A)M implementation support through the Tennessee STEM Innovation Network. Schools can also take advantage of the Mentorship Model. The TSIN will pair schools applying for designation with current SEM/STE(A)M schools for support.

Will there be training or information sessions on the designation process?

Yes, TSIN/TDOE will host informational sessions throughout each summer and academic school year to schools applying for STEM/STE(A)M School Designation. Latest webinar calendars can be found on www.tsin.org

Additional FAQs can be found on the Tennessee STEM Innovation Network website:
www.tsin.org



Additional Designation Support

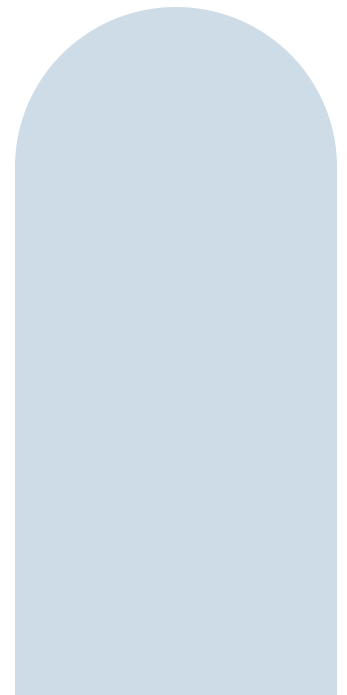
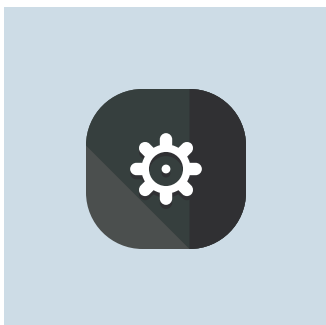


The Tennessee Department of Education and Tennessee STEM Innovation Network will host designation webinars and information sessions throughout each summer and during the academic year to provide support to schools seeking STEM/STE(A)M School Designation.

Those offerings will be shared through department and network communications. Current webinar schedules for the current designation year can be found on the Tennessee STEM Innovation Network website. Sessions will be recorded and archived for future reference at www.tsin.org.

If you have additional questions, please refer to the Tennessee Department of Education and Tennessee STEM Innovation Network contact information on the next page.

Thank you for prioritizing STEM and STE(A)M education.



Contact Us With Questions

Statewide STEM/STE(A)M Directors:

Audra Block, TN Department of Education

audra.block@tn.gov

Brandi Stroecker, TN STEM Innovation Network

stroecker@battelle.org

615-727-1361

STEM/STE(A)M Program Specialist:

Kristin McQueen

mcqueenk@battelle.org

Website: www.tsin.org Twitter: [#theTSIN \(#TNSTEM\)](https://twitter.com/theTSIN)

