Tennessee STEM and STE(A)M School Designation Self-Assessment

Approved: April 2017
Revised: September 2021

Tennessee STEM and STE(A)M School Designation Process

Mission	Vision
To promote rigorous STEM/STE(A)M-related learning opportunities for all students that lead to postsecondary achievement and high-quality careers.	To advance 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.

Purpose:

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 rest on inquiry-, technology-, and project-based learning activities and lessons that are tied to the real world. STEM/STE(A)M education are diverse, interdisciplinary curriculum in which activities in one class complement those in other classes. In the STEM/STE(A)M classroom, robust partnerships reach beyond the walls of the school to include higher education and business partners in real-world lessons. STEM/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/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 environment 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. Designated schools will also be invited to share promising practices at the annual Tennessee STEM Innovation Summit and become a member of Tennessee STEM Innovation Network's group of schools. All K–12 schools serving students in Tennessee are eligible.

Application Process:

Step 1: The school should perform a self-evaluation using the STEM and STE(A)M School Self-Evaluation Rubric (located within this document) and submit the completed self-evaluation through the Intent to Apply - https://www.tsin.org/designation-step-1.

Step 2: A representative from the TSIN will contact you to schedule an initial conversation (i.e., phone call).

Step 3: The school will adjust their application plan based on recommendations provided by the representative prior to completing the full application.

Step 4: The school will complete the full online application portfolio by the application due date.

Step 5: Schools that progress will receive a site visit from the Tennessee STEM/STE(A)M Designation Review Team.

Step 6: Upon completion of the site visit, the Tennessee STEM and STE(A)M Designation Review Team will review your application and compare it with the evidence and supporting documentation from the site visit.

Step 7: Notification of Tennessee STEM and STE(A)M Designation Review Team's decision to the Tennessee Department of Education.

Redesignation:

All designated STEM/STE(A)M schools will be expected to reapply for status every five (5) years.

Self-assessment Rubric:

The rubric in the STEM and STE(A)M Designation Process Introduction provides an outline for the implementation of STEM/STE(A)M attributes in schools. STEM/STE(A)M attributes describe a quality STEM/STE(A)M education demonstrated within a school. For each attribute, there are criteria to describe an Early, Developing, Accomplishing, or Model school.

STEM/STE(A)M Attributes Implementation Rubric Self-Assessment

Infrastructure: A Tennessee Designated STEM and STE(A)M School requires a developed STEM/STE(A)M strategic 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 decision-making. Each of the following attributes promotes an infrastructure that is conducive to sustaining a well-rounded				
Levels of Implementation	**Early**	**Developing**	**Accomplishing**	**Model**
1.1 STEM Action and Sustainability Plan	Program leaders have created a **basic** STEM Action Plan in which actions toward STEM/STE(A)M attributes are outlined.	Program leaders have created a **detailed** STEM Action Plan grounded in research and defined the role the team plays in the STEM/STE(A)M planning and development prior to implementation.	Program leaders have **implemented** the STEM Action Plan and provided support to prepare teachers in the transformation of STEM/STE(A)M teaching methods.	Program leaders have **implemented** the STEM Action Plan, provided support to prepare teachers in the transformation of STEM/STE(A)M teaching methods, and have a developed presence of partnerships with postsecondary institutions and businesses to identify solutions for executing a quality STEM/STE(A)M program. The school plan includes plans for **sustainability and**
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

1.2 **Leadership Team**	The school has **no evidence** of this attribute in practice currently.	Program leaders have **included** this attribute in the school's STEM Action Plan document and are working to develop within the school.	The school leadership engages **selected** staff in action planning. The school leadership has an articulated process for staff to give input and feedback.	The school leadership engages **all** staff members in the development and decision making regarding the STEM Action Plan. The school leadership has an articulated process for staff members to give input and feedback and responds to feedback in an open setting.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
1.3 **Leadership Professional Development**	The school leadership team **rarely** participates in professional development sessions that address STEM/STE(A)M education issues.	The school leadership team participates **semi-annually** in active, online professional development sessions that introduce novice STEM/STE(A)M education issues.	The school leadership team participates **annually** in a face-to-face **and semi-annually** in active, online professional development sessions that address current STEM/STE(A)M education issues.	The school leadership team participates **quarterly** in face-to-face, active, online professional development sessions, and networks with other STEM/STE(A)M school leaders to address current STEM/STE(A)M education issues.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

1.4 **School Environment**	Classrooms are designed or oriented for collaborative work. Classroom locations facilitate the integration of STEM/STE(A)M content and teacher collaboration.	Classrooms are designed for collaborative work. Participating teachers foster a culture of inquiry with students through the implementation of 21st Century Learning Skills (http:/www.p21.org/) in every class.	Classrooms are designed for collaborative work. Virtual learning is used to connect students and teachers, to bring in outside STEM/STE(A)M expertise, or to exhibit student work. Classroom locations facilitate the integration of STEM/STE(A)M content and teacher collaboration. A culture of inquiry and creativity exists among teachers and students through implementation of 21st Century Learning Skills in every class.	Classrooms are designed for collaborative work. Additional spaces are identified for students to use for collaboration or work areas. Virtual learning is used a way to connect students and teachers, to bring in outside STEM/STE(A)M expertise, or to exhibit student work. Classroom locations facilitate the integration of STEM/STE(A)M content and teacher collaboration. A culture of inquiry and creativity exists among all students, teachers, and administrators through implementation of 21st Century Learning Skills in every class.
Select your level of implementation				
List supportive evidence as artifacts for the application				

1.5 **School Schedules**	Participating teachers have a common planning time within the school day.	Participating teachers have a common planning time within the school day. Scheduling supports STEM/STE(A)M integration across two or more subjects, but not on a	Participating teachers have a common planning time within the school day. Scheduling supports STEM integration across two or more subjects, i.e. block schedule, co-teaching, etc.	Schedules allow for consistent teacher collaboration, co- teaching and integration of subjects. Schedules allow ample time for projects, teacher planning, and non-
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

Curriculum and Instruction: The STEM/STE(A)M curriculum framework contains Tennessee State Standards and has articulated interconnectedness between science, technology, engineering, art, mathematics, and other content areas. Project and problem-based learning activities form a substantial part of the curriculum. Each of the following attributes strengthens a curriculum framework that is conducive to sustaining a well- rounded STEM/STE(A)M program.				
Levels of Implementation	**Early**	**Developing**	**Accomplishing**	**Model**
2.1 Frequency of PBL with Integrated Content Across Subjects	Units of PBL/Inquiry/ STEM or STE(A)M instruction is aligned to current Tennessee state standards and include integrated STEM/STE(A)M within science and mathematics and other content areas **once** a year.	Units of PBL/Inquiry/STEM or STE(A)M instruction is aligned to current TN State Standards and include integrated STEM/STE(A)M within science and mathematics and other content areas at least **twice** a year.	Units of PBL/Inquiry/STEM or STE(A)M instruction is aligned to current Tennessee state standards and include integrated STEM or STE(A)M within science and mathematics and other content areas at least **three quarters** of the year.	Units of PBL/Inquiry/STEM or STE(A)M instruction is aligned to current Tennessee state standards and include integrated STEM or STE(A)M within science and mathematics and other content areas **throughout** the academic year.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
2.2 Engineering Design Process and Design Thinking Process	The learning experience includes no requirement that students develop thinking skills required in the engineering design process.	The learning experience helps students develop or refine thinking skills that are part of the engineering design process without explicitly referencing the engineering design process.	The learning experience explicitly references the engineering design process and requires students to demonstrate thinking skills across multiple steps in the engineering design process.	The learning experience, in addition to explicitly referencing engineering design, requires students to demonstrate thinking skills in employing all steps in the engineering design process, including opportunities to experience the recursive nature of the process.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

2.3 (A) **Quality of Technology Integration**	Students have **limited** opportunities to use technology (e.g., drill and practice). Schools incorporate 1:1 technology or provide students with the integration of technology opportunities, but **limited** evidence exists of students utilizing technology in an investigative process.	Computer-based/virtual technology tools are integrated in lessons. Students use **some** technology in the investigative process including virtual, computer-based, mobile, and data collection devices. Schools incorporate 1:1 technology or provide students with integration of technology opportunities, **some** evidence exists of students utilizing technology in an investigative process.	Computer-based/virtual technology tools are integrated in lessons. Schools incorporate 1:1 technology or provide opportunities for investigative processes using **varied** technology. Students use **varied** technology in the investigative process including virtual, computer-based, mobile and data collection devices, web-based lessons, computer applications, researching, and reporting.	Teachers embed **varied** technology in the instructional process, including using technology as a facilitation of student learning in a transformative instructional manner. Students use **varied** technology in the investigative process including virtual, computer-based, mobile and data collection devices, web-based lessons, computer applications, researching, reporting, communicating, and collaborating in ways not possible without the technology.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

2.3 (B) **Quality of Computer Science and Computational Thinking**	**Little** evidence exists that students engage with computational thinking or computer science concepts.	Computational thinking and computer science concepts are **implied** during instruction, but there is no evidence students engage with those concepts.	Some students **engage** with computational thinking and computer science concepts, but engagement is **limited** across all students. Teachers intentionally integrate computer science or computational thinking in a content area, there is **some** evidence through teacher lesson plans. Students **create** work products through the integration of coding, mobile app development, software development, web designs, networking, and/or cyber security in conjunction with the lesson.	All students **apply** computational thinking and computer science concepts in their reading, writing, speaking, or other communication skills. It is **evident** that computer science is part of student learning. Teachers **intentionally** integrate computer science or computational thinking, and students **connect** these to a content area both inside and outside of computer science through student work products. Students **create** work products through the integration of coding, mobile app development, software development, web designs, networking, and/or cyber security **in conjunction** with the lesson. Students **analyze work products** utilizing the engineering design process, collaborating, and communicating solutions and/or findings with other students and/or industry stakeholders.
Select your level of implementation				

List supportive evidence you plan to use as artifacts for the application				
2.4 **Exploring STEM/STE(A)M Careers**	**Once** a year, students participate in career exploration activities, which include opportunities to explore STEM/STE(A)M careers, professional activities, and employability skills (e.g., online activities, guidance from teachers, guidance from business partners, career fair, etc.).	**Twice** a year, students participate in career exploration activities, which include opportunities to explore STEM/STE(A)M careers, professional activities, and skills (e.g., online activities, guidance from teachers, guidance from business partners, career fair, etc.).	**Quarterly**, students participate in career exploration activities, which include opportunities to explore STEM/STE(A)M careers, professional activities, and skills (e.g., online activities, guidance from teachers, guidance from business partners, career fair, etc.).	**Monthly,** students explore careers, including STEM/STE(A)M careers, professional activities, and skills, as a part of their coursework (e.g., online activities, guidance from teachers, guidance from business partners, career fair, etc.).

Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
2.5 **College and Career Readiness Skills**	The school **does not include** and/or does not have evidence of this attribute in practice at this time.	Work is **in progress** to develop this attribute within the school. This element is included in the school's STEM/STE(A)M planning document.	Lessons/activities require students to exercise employability skills (Tennessee Department of Education Employability Skills Checklist). Lessons/activities require students to ask questions, define problems, and analyze and interpret data. Lessons/activities encourage students to effectively communicate	Lessons/activities require students to employability skills (Tennessee Department of Education Employability Skills Checklist). Lessons/activities require students to ask questions, define problems, analyze and interpret data. Lessons/activities require students to effectively communicate and
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
2.6 **Integrity of the Academic Content (Including Cognitively Challenging Work)**	The academic content for the learning experience is **inaccurate** or is **not anchored** to the relevant academic content standards.	The academic content for the learning experience is accurately presented and appropriately anchored to at least **one** academic content standard for each content area represented.	The academic content for the learning experience is accurately portrayed and appropriately anchored to **more than one** academic content standard for each content area represented.	The academic content for the learning experience is accurately portrayed, tied to **multiple** content standards, and focused on helping students acquire deep understanding of a "big idea" or "foundational skill" critical to their future learning in the targeted discipline(s).

Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
2.7 Extended Learning STEM Activities	The school **does not include** and/or has **no evidence** of this attribute in practice at this time.	Work is **in progress** to develop this attribute within the school. This element is included in the school's STEM planning document.	The school offers extracurricular activities that are engaged in by **some** of the students. **Some** of the students participate in STEM/ STE(A)M competitions onsite/online STEM exhibits, and/or in state	The school offers extracurricular activities that are engaged in by **most** of the students. **Most** of the students participate in STEM/STE(A)M competitions on- site/online STEM exhibits, and/or in state and national STEM
Select your level of implementation				
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Professional Development: A Tennessee Designated STEM and 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 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 learning opportunities for students. Each of the following attributes creates an environment of continued learning for all that is conducive to sustaining a well-rounded STEM/STE(A)M program.				
Levels of Implementation	**Early**	**Developing**	**Accomplishing**	**Model**
3.1 **Quality STEM/STE(A)M Professional Learning**	Teachers participate in large group professional development sessions that introduce STEM/ STE(A)M teaching skills.	Teachers participate in large group professional development sessions focusing on critical STEM/ STE(A)M teaching skills.	Teachers have identified unique professional development goals and participate in large and small group and personalized learning professional development sessions. PD includes support across the school year during implementation of school-based STEM/ STE(A)M strategies. Teachers observe colleagues and engage in formal reflection and discourse regarding practice. PD sessions align with the needs of the program/school and student learning needs.	Professional development is ongoing and aligns with STEM/STE(A)M initiatives and includes support across the school year. Teachers have an articulated process for identifying unique professional development goals and opportunities. They participate in large and small group and personalized learning professional development sessions (e.g., strategies for inquiry- based instruction, for integrating STEM/STE(A)M. Teachers observe colleagues and engage in formal reflection and discourse regarding practice.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

3.2 **Designing PBLs**	Teachers participate in PD sessions that provide information and samples of project/problem-based learning STEM/STE(A)M modules.	Teachers participate in PD sessions that provide samples and information on the development of project/problem-based learning STEM/STE(A)M modules.	Teachers collaborate to custom design project/problem-based learning STEM/STE(A)M modules.	Teachers collaborate to custom design project/problem-based learning STEM/STE(A)M modules. Higher education and/or industry partners contribute to design of the school's custom built PBLs. The STEM/STE(A)M modules include the department's learning
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

Achievement: **Assessments are incorporated to measure student outcomes and teacher instruction to ensure a strong, innovative, and cohesive STEM/STE(A)M program. Each of the following attributes uses innovative assessment to sustain a well-rounded STEM/STE(A)M program.**				
Levels of Implementation	**Early**	**Developing**	**Accomplishing**	**Model**
4.1 Performance Assessments	Performance-based assessments are used to monitor student learning. State-wide data is used to drive instructional practices.	Performance-based and pre/post assessments are used to monitor student learning. Student observations are included as an assessment tool. State-wide data is used to drive instructional practices.	Teachers use performance-based assessments to determine student learning. Pre/post assessments are used to show student growth. Non-traditional assessments are used to monitor student processes. State-wide data is used to drive instructional decisions. Teachers use observation and monitor student dialogue to assess student processes in problem solving and innovation.	Teachers use performance-based assessments to determine student learning. Pre/post assessments are used to show student growth. Teachers use observation and monitor student dialogue to assess student processes in problem-solving and innovation. Students participate in self- evaluation and goal setting consistently. The school uses data from state-wide and school assessments to drive instructional decisions.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
4.2 Accountability (Data)	Teachers minimally use student data to guide instruction. Only state standardized tests are used.	Teachers and school staff use standardized test data to guide instruction. Teachers also collect formative data about	Teachers and school staff use state standardized test data, in addition to other standard assessments. Teachers collect formative	Teachers and school staff use state standardized test data, in addition to other standardized state and national, district, and classroom assessments.

	Data is only tracked for special populations.	students.	data. All student data is tracked down to the individual student's needs, possibly through use of individual learning plans or specialized software. Data walls and a variety of other data tracking systems are employed.	Teachers collect formative data and maintain records for all students. All student data is tracked down to the individual students needs and each student has an individual education plan. Data walls and a variety of other data tracking systems are employed. Student data conferences are provided to help students understand their data.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

Community and Postsecondary Partnerships: Community and postsecondary STEMSTE(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 high-level STEM skills and knowledge inside and outside of the classroom and increase their readiness for college and careers. These attributes are essential in creating connections between what is taught and real-world settings to sustain a well-rounded STEM/STE(A)M program.				
Levels of Implementation	**Early**	**Developing**	**Accomplishing**	**Model**
5.1 **Partners Support Instruction**	Work **is in progress** to develop this attribute within the school. School has **at least 1 outside partnership established** in either short or long-term nature that helps shape the school's culture.	Partners from industry, institutes of higher education, and technical centers are **utilized** to extend student learning. School has established at **least 1 long-term partner outside of the school district** that showcases multiple touch points throughout the school year.	Partners from industry, institutes of higher education, and technical centers **participate** in extended learning opportunities as a part of the school's work towards STEM/STE(A)M implementation. School has established at least **1 long-term partner outside of the school district** that showcases multiple touch points throughout the school year.	Students **have more than 1 long-term** direct experience with STEM/ STE(A)M professionals in authentic environments. Field experiences involving industry partners are **embedded** within the design process and implementation of PBLs to provide authentic, real-world STEM/STE(A)M content and industry skills to classroom instruction. Industry partners are **integrated** in the PBL design and decision-making process through the co-creation of lesson plans or essential questions to guide the student experience.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

5.2 **Work Based Learning**	Students **rarely** have an active, work-based learning experience with an external STEM/ STE(A)M industry partner, either during or outside of the school day.	Students have at least **1** active, work-based learning experience **annually** with an external STEM/STE(A)M industry partner, either during or outside of the school day. The WBL experience promotes industry and career awareness.	Students have **2** active, work-based learning experiences **annually** with an external STEM/STE(A)M industry partner, either during or outside of the school day. The WBL experiences promote industry and career awareness and exploration.	Students **regularly** have an active, work-based learning experience **annually** with an external STEM/STE(A)M industry partner, either during or outside of the school day. The WBL experiences promote industry and career awareness and exploration, and experience in career preparation and training.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				
5.3 **Postsecondary Opportunities** ***High School Only**	An early postsecondary opportunity (EPSO) plan is **developed** to encourage student success in high school to college transition. Online courses are **not available**. Workforce Ready classes are **not** available.	An early postsecondary opportunity (EPSO) plan **introduces** and offers at least **6** college credits. A technology plan is **established** to provide online learning for students. A Workforce Ready plan is **established** and working toward implementation.	An early postsecondary opportunity (EPSO) plan is **established** and offers at least **12** college credits. High school courses are **reinforced** by technology-based teaching methodologies and opportunities to obtain certifications (e.g. flipped class model, blended learning, MOOCs). A Workforce Ready plan is **implemented**, and **some** students participate and	An early postsecondary opportunity (EPSO) plan is **integrated** and offers at least **15** college credits. **Partner** with industry and i higher education to collaborate with the high school staff to **continually evaluate** and **improve** course offerings. High school courses are **enhanced** by technology-based teaching methodologies and opportunities to obtain

			earn credentials.	certifications (e.g. flipped class model, blended learning, MOOCs). A Workforce Ready plan is **implemented**, and some students participate and earn **industry credentials**.
Select your level of implementation				
List supportive evidence you plan to use as artifacts for the application				

The Tennessee Department of Education will only certify 'Model' Implementation STEM and STE(A)M Schools. 'Model' implemented STEM/STE(A)M Schools must demonstrate implementation of at least 90 percent of the STEM/STE(A)M attributes in order to obtain STEM/STE(A)M Designation. Schools will not receive designation if they receive a 1 or 2 in any of the attributes.

Elementary or Middle School		**High School**	
65-72 points	*'Model'*	*69-76 points*	*'Model'*
56-65 points	*'Accomplishing'*	*60-68 points*	*'Accomplishing'*
47-55 points	*'Developing'*	*53-59 points*	*'Developing'*
≤ 46 points	*'Early'*	*≤52 points*	*'Early'*