2015

T-STEM Initiative

TEXAS SCIENCE TECHNOLOGY ENGINEERING AND MATHEMATICS ACADEMIES DESIGN BLUEPRINT, RUBRIC, AND GLOSSARY

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The Texas Education Agency (TEA) and Educate Texas support T-STEM Academies in order to concentrate state and local efforts for improving math and science achievement among Texas students. The T-STEM initiative ensures Texas students thrive in the 21st Century economy by studying and entering into STEM fields. The cornerstone of T-STEM Academy learning is student engagement and exposure to innovation and design in STEM-focused instruction and learning that models real-world contexts. T-STEM Academies serve as demonstration sites to inform math and science teaching and learning statewide. The T-STEM initiative aims to closely align high school curriculum with admission requirements of competitive colleges and the STEM qualifications for 21st century jobs. The Academies use the T-STEM Design Blueprint, Rubric, and Glossary as a guidepost to build and sustain T-STEM schools that address the seven benchmarks:

1) Mission driven leadership
2) School culture and design
3) Student outreach, recruitment, and retention
4) Teacher selection, development and retention
5) Curriculum, instruction, and assessment
6) Strategic alliances
7) Academy advancement and sustainability

The original T-STEM Academies Design Blueprint was written in 2005 and first revised in 2008. During 2009-10, a task force comprised of T-STEM Coaches, T-STEM Center leaders, Educate Texas, and Texas Education Agency representatives revised the T-STEM Academies Design Blueprint and added rubrics and a glossary. On July 19, 2011, Texas Administrative Code (TAC) §102.1093 rules for the "Designation of Texas Science, Technology, Engineering, and Mathematics Academies" became effective under the statutory authority of the Texas Education Code §39.407 and §39.416. TAC §102.1093 identified a T-STEM Academy as: "A secondary school established under the Texas Education Code, §39.407, to focus on improving instruction and academic performance in STEM-related subjects and on increasing the number of students who study and enter STEM-related fields. T-STEM Academies are demonstration schools and learning labs that develop innovative methods to improve STEM-related instruction." TAC §102.1093 also instituted the requirement for an annual application and designation process for any school wishing to become/retain T-STEM designation in the State of Texas. In early 2015, the T-STEM Blueprint underwent a third revision to include language specific to middle school T-STEM Academies and House Bill 5 graduation requirements.

Lead Contributors
Stacy Avery, T-STEM Program Manager at TEA
Dr. Reo Pruiett, Educate Texas Program Officer
Dr. Denise Devora, Educate Texas Program Officer
Dr. Jennifer L. Stotts, Educate Texas T-STEM Coach

T-STEM Academies Design Blueprint

The T-STEM Academies Design Blueprint is intended to serve as a road map for benchmarks, program requirements, and indicators to facilitate individual STEM Academy growth along the Blueprint Rubric Continuum of Developing, Implementing, Mature, and Role Model. Each Academy may differ in their areas of strength as evidenced by their self-evaluation and resulting Annual Action Plan; however, the following is a list of core program requirements that are non-negotiable.

Benchmark 1: Mission-Driven Leadership
1.1   Annual Action Plan
1.2   Design Team, Leadership Team, Advisory Board
1.4.A $6^{th} – 12^{th}$ Academy Leadership Teams collaborate regularly

Benchmark 2: T-STEM Culture
2.1.A   Small school
2.1.F   IGP with Endorsement and Performance Acknowledgement plan reviewed at least annually with $6^{th} – 12^{th}$ parents and students
2.3.A   Prepares students for postsecondary coursework and careers in STEM fields
2.3.E   IHE MOUs for dual credit and/or certifications/licensures
2.3.F   Graduates students with 12-30 college course credits (Dual Credit, AP, IB, etc.)

Benchmark 3: Student Outreach, Recruitment, and Retention
3.1.A   Marketing plan
3.2.A   Open access/lottery
3.3.B   Summer Bridge/Student orientation

Benchmark 4: Teacher Selection, Development, and Retention
4.1.B   Collaborative recruiting process for selecting highly qualified teachers
4.2.B   PLC with a professional development model for continuous learning
4.2.C   Teachers participate in externships with IHEs, business, industry, and community
4.3.B   Common planning time within the structure of the school day

Benchmark 5: Curriculum, Instruction, and Assessment
5.1.D   Graduates students with a Distinguished Level of Achievement; an Endorsement other than Multidisciplinary, with a primary focus on a STEM Endorsement; and a Performance Acknowledgement.
5.2.A   Develops integrated STEM curriculum, assessment and instruction for the Academy
5.2.B   Students complete 3 years of STEM electives at MS; 4 years of STEM electives at HS
5.2.F   Extracurricular STEM activities, field experiences, clubs, and competitions
5.2.G   Internship and/or capstone
5.3   Project-based and problem-based curriculum, instruction, and assessment

Benchmark 6: Strategic Alliances
6.1   Family/school partnership plan
6.2   Community/business advisory board
6.3   MOUs with business, industry, and community

Benchmark 7: Academy Advancement and Sustainability
7.1   Budget/business plan
7.1   Five year strategic plan
7.2   Annually revisits Strategic Plan and Annual Action Plan for continuous improvement

THE T-STEM ACADEMY:

1.   BENCHMARK: Mission-Driven Leadership

1.1   Program Requirement: Mission and Vision

1.1.A   Develops a shared mission and vision, which is aligned with the T-STEM mission and vision, and which reflects a consensus among superintendent, board members, design team, staff, students, parents, and community/business partners on how the Academy promotes STEM-literate graduates to support the Texas Science Technology Engineering and Mathematics Initiative.

1.1.B   Develops an *Annual Action Plan* (AAP) of goals and resources aligned to the Academy's mission and vision, the T-STEM Blueprint, and STEM-literacy; with the AAP regularly monitored and assessed.

1.2   Program Requirement: Leadership and Governance

1.2.A   Establishes a Design Team and defines the role the team plays in the planning and development of the T-STEM Academy prior to implementation.

1.2.B   Develops an Academy Leadership Team and identifies the internal role each member will play in the design, governance, operations, accountability, curriculum development, professional development, etc., as well as their external role in collaborating with the design team, outreach, and other key interest groups for continuous monitoring and improvement of the T-STEM Academy plan.

1.2.C   Develops and demonstrates support from an Advisory Board consisting of representatives from the Academy, school board, district, community, higher education, and STEM businesses to support and guide facility requirements, resource acquisition, curriculum development, internships, externships, and student/community outreach to ensure a successful 6th-20th STEM academic and career pipeline.

1.2.D   Incorporates into Annual Action Plan goals for participation and leadership of students, teachers, parents, business and community partners, institutions of higher education, and T-STEM Coaches and Centers.

1.2.E   Delineates a mission-driven decision-making structure and organization chart that is clear and understood by all stakeholders.

1.2.F   Defines the academy leader's level of autonomy in supervising the Academy.

1.2.G   Uses data to inform all leadership decisions and to annually review and revise the mission-driven T-STEM Academy Annual Action Plan.

1.3   Program Requirement: Program Review and Evaluation

1.3.A   Integrates and assesses the level of mission-driven and data-driven decision making evident in the daily work of the Academy.

1.3.B   Implements a process for program review and formative evaluation to achieve mission goals that includes metrics such as attendance, demographics, and student achievement.

1.4   Program Requirement: Leadership Development and Collaboration

1.4.A   For 6th – 12th campuses, middle school and high school leadership teams regularly collaborate to advance 6-12 alignment and student retention in STEM.

1.4.B   Participates and collaborates with the T-STEM Centers and T-STEM Coaches to support the transformation of STEM teaching methods, teacher preparation, and instruction to support continuous development and the achievement of long-term T-STEM goals.

1.4.C   Actively participates in the T-STEM Network by collaborating with other T-STEM Academies, engaging in leadership development opportunities, utilizing T-STEM Centers' resources, and promoting broad dissemination of promising practices to improve student achievement.

2. BENCHMARK: STEM Academy Culture and Design

2.1 Program Requirement: Personalization

2.1.A   Addresses in Annual Action Plan and strategic plan the details for remaining small, allowing for personalization, and maintaining collaborative learning communities of students.
2.1.B   Plans and implements a non-graded student advisory program that is regularly scheduled, noted in the master calendar/schedule, and focuses on personalizing the student experience, (builds relationships with students and parents, develops character, and fosters global literacy).
2.1.C   Develops a process for hearing and responding to student voice.
2.1.D   Arranges for a flexible school day with blocks of time that support student learning (tutorials, collaboration, meetings).
2.1.E   Celebrates high quality student work through student exhibits on-site, web-based, and/or in state and national forums.
2.1.F   Provides every 6th – 12th student with an individualized STEM-focused high school graduation plan that addresses: four years of math and science; an Endorsement in STEM, Business and Industry, Public Service, or Arts and Humanities; identifies target areas for Performance Acknowledgements; and is at least annually reviewed and revised with the counselor, student, and family.

2.2 Program Requirement: Culture

2.2.A   Collaborates with stakeholders to develop a new handbook or modify the existing handbook with clear procedures, policies, and consequences that support the development of a strong T-STEM culture.
2.2.B   Involves all stakeholders in developing a culture of respect, responsibility, trust, and meaningful adult and peer relationships throughout the Academy in order to foster positive student identities.
2.2.C   Creates a professional learning community environment of collaboration, teaming, and high expectations among administrators, teachers, and stakeholders, with a focus on and a commitment to the learning of each student.

2.3 Program Requirement: Postsecondary Success (College and Career)

2.3.A   Prepares students who graduate for post-secondary coursework and careers in science, technology, engineering, and mathematics through the integration of the Governor's economic workforce clusters and Achieve Texas STEM cluster: semiconductor industry, information and computer technology, micro-electromechanical systems, manufactured energy systems, nanotechnology, biotechnology, chemist, and engineering: aerospace, electronic, mechanical, environmental, and biomedical.
2.3.B   Regularly engages 6th – 12th students and parents in high school and college transition planning, STEM Career Exploration, College Exploration, and College Readiness preparation.
2.3.C   Develops a plan for student success on post-secondary entrance exams.
2.3.D   Creates higher education partnerships to provide mentoring, college-level courses/dual credit, professional development and technical assistance, and to foster a college-going culture.
2.3.E   Enrolls each student in 12-30 college course credits through multiple educational pathways such as dual credit, International Baccalaureate, concurrent enrollment, articulated credit, and/or Advanced Placement.
2.3.F   Provides systematic and individual tiered support to ensure that all students graduate with at least 12-30 college credits.

3.   BENCHMARK: Student Outreach, Recruitment, and Retention

3.1   Program Requirement: Recruitment

3.1.A   Develops structures and processes for marketing and recruitment to encourage participation from underserved students and families (transportation or plans for transportation to the school, child care for family events, and translation of all recruitment and marketing materials).
3.1.B   Actively partners with feeder middle and/or elementary schools to develop student interest in STEM education and to increase advancement rates from middle school STEM to high school STEM.
3.1.C   Develops a systemic recruitment plan that includes students, parents, counselors, teachers, district, and community.

3.2   Program Requirement: Open Access

3.2.A   Develops an admission policy to include an open-access, lottery-based selection process that encourages applications from all students. The application will not be based on state assessment scores, discipline history, teacher recommendation, minimum GPA, or other requirements that would be used to limit selection.
3.2.B   Consists of a population that is 50% or greater economically disadvantaged and underrepresented students.

3.3   Program Requirement: Student Support and Retention

3.3.A   Develops and implements systemic, tiered strategies for student support and retention (outreach, early intervention strategies, mentoring, tutoring, counseling, and other supports for academic and socio-emotional growth).
3.3.B   Hosts $5^{th} - 6^{th}$ and $8^{th} - 9^{th}$ orientation session(s) and summer bridge program(s) to facilitate successful student transitions and retention into a STEM-focused, college preparatory, project-based learning environment.
3.3.C   Provides all students with opportunities and the expectation to assume roles of responsibility within the classroom, Academy, and community.
3.3.D   Supports and monitors $6^{th} - 12^{th}$ student participation in STEM activities both within and outside the classroom to ensure that all students engage in STEM clubs, STEM competitions, and STEM field experiences.
3.3.E   Hosts parent seminars to develop deep understanding and commitment to the rigor of college readiness and the high expectations of a STEM Academy.

4.   BENCHMARK: Teacher Selection, Development, and Retention

4.1   Program Requirement: Highly Qualified Teachers

4.1.A   Recruits and selects highly qualified secondary and post-secondary faculty who possess extensive subject knowledge, are willing to incorporate project based learning (PBL), and integrative STEM pedagogy.
4.1.B   Recruits and selects highly qualified secondary and post-secondary faculty who utilize relational knowledge in developing culturally responsive classrooms that successfully build self-efficacy with traditionally underrepresented students.
4.1.C   Develops teacher job descriptions and requirements that incorporate integrative content practice and research-based actions/strategies that demonstrate commitment to success for underrepresented students.
4.1.D   Uses a collaborative recruitment and selection process that includes Academy leaders, teachers, key stakeholders, T-STEM Centers, and T-STEM Coaches.

4.1.E   Designs or employs innovative programs to support the recruitment and selection of highly qualified STEM teachers.

4.2   Program Requirement: Teacher Support and Development

4.2.A   Develops a PD plan for a sustained professional development model of continuous learning based on student results, teacher development, and the short- and long-term goals of the Academy.

4.2.B   Adopts a systemic professional development model of continuous learning that addresses prioritized needs as informed and evaluated by multiple sets of quantitative and qualitative data (student assessment data, instructional/classroom evaluations, technological developments, workforce demands, demographic changes, and community/societal expectations and needs).

4.2.C   Sustains a Professional Learning Community (PLC) by instituting job-embedded ongoing opportunities for continuous learning, peer coaching/mentoring, STEM externships, and participation in STEM Teacher and Leader cadres for teachers and administrators (research-based practices, content competence, new instructional strategies, technology integration, reflective inquiry, and student artifact analysis).

4.2.D   Provides ongoing professional development for counselors, teachers, staff, and parents on strategies that support students to ensure success in a rigorous course of study, such as: IGP, interventions, and interpersonal and academic success strategies.

4.2.E   Ensures that on-staff, integrative STEM coaches are available and accessible to support both teachers and students in research-based practices, content competence, interdisciplinary STEM teaching and learning, reflective inquiry, college readiness standards, and state   standards integrated with STEM industry expectations.

4.2.F   Collaboratively builds 6th – 12th teacher and administrator expertise in developing, teaching, learning, and assessing STEM cross-content curriculum.

4.3   Program Requirement: Teacher Retention

4.3.A   Provides for flexibility in instructional practices to promote creativity and innovation while maintaining accountability.

4.3.B   Provides a common planning time, within the structure of the school day, for teachers to support results-driven, team-focused professional learning, and cross-curricular collaboration.

4.3.C   Adopts and implements a plan for new teachers to include orientation, induction, acculturation, mentoring, professional development, and administrative support.

4.3.D   Provides opportunities for ongoing professional development to improve teachers' content knowledge, technology embedded instruction, integrative STEM pedagogy, college and career readiness standards, instructional strategies for ensuring a successful P-20 pipeline, and leadership capacity.

4.3.E   Annual Action Plan includes a creative teacher incentive plan that provides release time and other incentives, such as stipends or bonuses, for teachers to contribute to and lead T-STEM education efforts (journal articles, conference presentations, attend T-STEM trainings and regional meetings, contribute to T-STEM newsletter, and populate Academy press releases).

5.   BENCHMARK: Curriculum, Instruction, and Assessment

5.1   Program Requirement: Rigor

5.1.A   Aligns curriculum, instruction, and assessment (such as, but not limited to, THECB CCRS, national and state standards, content, context, culture, cognitive level, competencies, skills, processes, 21st century skills, and STEM synthesis).

5.1.B   Develops a scope, sequence, and pacing guide for a vertically and horizontally aligned curriculum centered on state standards, career and college readiness standards, STEM integration, and industry expectations.

5.1.C   Develops an assessment and intervention plan to address gaps in student achievement and areas for extension.

5.1.D   Supports and encourages all students to successfully complete four years of mathematics, four years of science, four years of STEM electives, and at least one Endorsement in STEM, Business and Industry, Public Services, or Arts and Humanities, with a primary focus on a STEM Endorsement; and earn a Distinguished Level of Achievement as well as a Performance Acknowledgement in order to graduate college ready.

5.1.E   Offers dual credit, articulated concurrent enrollment, AP or IB courses so that all students will graduate with 12-30 college credit hours.

5.1.F   Establishes curriculum expectations, monitoring, and accountability mechanisms that are reflectively revised to ensure a constancy of mission purpose (aligned resource allocation, integrated STEM curriculum development, teacher professional growth, and student results).

5.2   Program Requirement: STEM-focused Curriculum

5.2.A   Delivers innovative STEM programs that are well-defined, embed critical thinking and problem solving, innovation, and invention, and are aligned to state, and/or national standards, and industry expectations.

5.2.B   Supports and encourages students to complete three years of STEM electives at middle school and four years of STEM electives at high school.

5.2.C   Develops performance-based and project-based assessments aligned to these innovative programs and state/national/industry standards.

5.2.D   Develops and implements a plan for supporting accelerated student achievement for students with demonstrated deficiencies or proficiencies in mathematics and science, to promote all students graduating ready for enrollment in credit-bearing postsecondary courses (e.g. Algebra I enrollment by 8th grade).

5.2.E   Incorporates into the curriculum work-based, contextual learning with a global perspective.

5.2.F   Participates in extra-curricular academic activities centered on science, technology, engineering, and mathematics; i.e. STEM field experiences, clubs, and competitions.

5.2.G   Develops $6^{th} – 12^{th}$ students' portfolios of interest in: STEM capstone projects, STEM internship opportunities, and global STEM college, degree, and career explorations. Requires all high school students to complete an internship, and/or a STEM-related capstone project, presentation, and defense; primarily focused in the state's STEM-related economic development clusters (information and computer technology, energy, petroleum refining and chemical products, advanced technologies and manufacturing, aerospace and defense, biotechnology and life sciences).

5.3   Program Requirements: Instructional Practices

5.3.A   Incorporates data-driven instruction.

5.3.B   Creates an environment for shared teacher responsibility and accountability for student learning across programs, content areas, and classrooms.

5.3.C   Organizes instruction expectations around problem-based and project-based learning with clearly defined learning outcomes for students and teachers that address state and national performance standards, college and career readiness standards, and industry expectations.

5.3.D   Ensures teachers' use of the aligned scope and sequence and integration across the disciplines.

5.3.E   Ensures teachers' use of high-quality curricular materials aligned with state and national standards, college and career readiness standards, and industry standards.

5.3.F   Provides opportunities for students to exercise choice and voice within a relevant and rigorous context.

5.4   Program Requirements: STEM Education Integration

5.4.A   Promotes instructional strategies that challenge students to think critically, innovate, and invent to solve real-world, contextual problems.

5.4.B   Exposes students to critical readings in STEM related fields and requires students to demonstrate their understanding of STEM disciplines in a work-based, contextual environment.

5.4.C   Offers standards-based STEM programs that incorporate integrative STEM literacy and innovative instructional tools.

5.4.D   Promotes applied and collaborative learning, and provides students with opportunities to present/defend their work to peers, community, industry, and university leaders.

5.4.E   Promotes a technology rich culture of natural use of current technologies to enhance instruction, curriculum, teaching, and learning, and STEM literacy.

5.5   Program Requirements: Literacy

5.5.A   Promotes technologically proficient and scientifically literate students with highly developed academic vocabulary and STEM technical vocabulary.

5.5.B   Graduates 21st Century literate students proficient in: English, reading, speaking, writing, numeracy, arts, health, sciences, and world languages; government, civics, history, and geography; environmental science; global awareness; information, communications, and media technology; financial, economic, business, and entrepreneurship.

5.5.C   Selects appropriate STEM curriculum and culturally relevant instructional materials that foster widespread use of literacy strategies within the STEM curriculum.

5.5.D   Provides opportunities for students to demonstrate the relevancy of the content through reading, writing, speaking, and presenting.

5.6   Program Requirements: Assessment

5.6.A   Uses diagnostic, ongoing, and vertically and horizontally aligned formative and summative assessments for all students to drive instructional decisions.

5.6.B   Uses state and national standards, college and career readiness standards, industry standards, and STEM program requirements to develop common benchmark assessments.

5.6.C   Employs student readiness assessments or diagnostics to identify and address gaps in learning.

5.6.D   Tracks and reports student progress using student information systems.

5.6.E   Uses performance-based assessments that allow students to demonstrate their understandings of STEM concepts.

6.   BENCHMARK: Strategic Alliances

6.1   Program Requirements: Parent and/or Family Participation

6.1.A   Includes in the Annual Action Plan a school/family/student partnership plan that is culturally responsive in reflecting the needs and demographics of the student population.

6.1.B   Provides opportunities to educate students/parents on STEM Academy expectations such as parental engagement, college connections, scholarship opportunities, mentorships, etc.

6.1.C   Establishes multiple pathways of parental communication with the Academy such as regularly scheduled parent conferences, newsletters, websites, campus visits, etc.

6.1.D   Provides opportunities for parents to share responsibility for high student performance and school decision making.

6.2   Program Requirements: Business and School Community

6.2.A   Identifies and secures key business, industry, and community partners to support STEM Academy efforts (mentorships, service learning projects, etc.).

6.2.B   Develops, implements, monitors, evaluates, and revises Annual Action Plan to introduce, inform, and engage business and community partners.

6.2.C   Identifies and secures key business and industry partners to provide STEM-related job shadowing, internships, and externships for students and teachers.

6.3   Program Requirements: Institutions of Higher Education

6.3.A   Develops a Memorandum of Understanding (MOU) for dual credit.
6.3.B   Creates with higher education partners innovative pathways for students to obtain college credit (online resources, virtual courses, distance learning, shared professor, etc.).
6.3.C   Develops crosswalk partnerships to support a college going culture and to provide STEM graduates access to college support services (college trips, college entrance aid, and P-20 initiatives).
6.3.D   Develops, implements, monitors, evaluates, and revises Annual Action Plan efforts with institutions of higher education.

6.4   Program Requirements: Communication with Alliance Members and Stakeholders

6.4.A   Annual Action Plan provides opportunities for ongoing exchanges between Academy staff, design team, and stakeholders.
6.4.B   Informs alliance members and stakeholders of Academy success in promoting the STEM college and career pipeline by tracking Academy graduates' college and career experiences.

7.   BENCHMARK: Advancement and Sustainability

7.1   Program Requirements: Strategic Planning

7.1.A   Develops a 3-5 year strategic plan that aligns Academy mission and vision to STEM Blueprint Program Requirements (budget, year-by-year rollout of grade levels to be served, STEM pathways, projected staffing needs, instructional technology and resources, and appropriate facilities allocation through full enrollment).
7.1.B   Develops strategic plan in collaboration with design team, T-STEM Centers, T-STEM Network, T-STEM Coach, district personnel, etc.
7.1.C   Provides annual analysis, review, and revision of strategic plan and Annual Action Plan with key stakeholders.
7.1.D   Addresses sustainability in the strategic plan.
7.1.E   Plans and participates in opportunities to network and share experiences related to the school design and implementation process.

7.2   Program Requirements: Continuous Improvement and Evaluation

7.2.A   Annually reviews strategic plan and Annual Action Plan to ensure Academy meets high expectations across a broad range of performance measures as indicated by Academy mission and vision, and STEM Blueprint Program Requirements.
7.2.B   Annually reviews instructional and intervention plan to ensure continual growth on all of the required state accountability measures.
7.2.C   Develops internal indicators and checklists unique to the Academy to measure continuous improvement towards student performance goals and the state of the Academy.

7.3   Program Requirements: Sustainability and Growth

7.3.A   Maintains a fiscally responsible balanced budget.
7.3.B   Ensures that strategic plan and Annual Action Plan addresses the commitment of the Academy to continually invest in professional development for personnel (STEM pedagogy, best practices in teaching and learning, innovative course development, etc.).
7.3.C   Develops a plan for sustaining the Academy beyond the grant funding period to include strategic pursuit of additional grant opportunities.
7.3.D   Preserves the components of the small learning community (student voice, PLC for staff, parent/community/industry/higher education involvement, etc.).

7.4   Program Requirements: Program Advancement

7.4.A   Develops Academy grant writing initiatives with universities, T-STEM centers, industry, etc.
7.4.B   Works with universities, T-STEM centers, IHEs to validate effectiveness of Academy's innovative curriculum, instruction, and assessment as evidenced by student readiness for college, career, and STEM industry.

The T-STEM Academies Design Blueprint Rubric

The T-STEM Academies Design Blueprint Rubric is intended to serve as a road map for benchmarks, program requirements, and indicators to facilitate individual STEM Academy growth along the Continuum of Developing, Implementing, Mature, and Role Model. It is recommended that each T-STEM Academy use the rubric to complete a self-assessment of fidelity to the T-STEM Academies Design Blueprint prior to and following each academic year. In coordination with key stakeholders the Academy should develop recommendations for maintaining/expanding areas of strength and for addressing areas for growth in the Academy's Annual Action Plan (AAP).

Each Academy may differ in their areas of strength as evidenced by their self-evaluation and resulting AAP. However, each benchmark, program requirement, and indicator are key to the successful implementation of a T-STEM Academy. Below is a planning guide for suggested continuum growth based on year of Implementation.

(D) Developing ⟹ (I) Implementing ⟹ (M) Mature (R) Role Model	Planning Year	Year I	Year II	Year III	Year IV
Benchmark 1: Mission-Driven Leadership					
1.1.A Shared Mission and Vision	D	I	I	M	R
1.1.B Annual Action Plan	D	I	I	M	R
1.2.A-G Leadership and Governance	I	I	M	M	R
1.3.A-B Data Informs Program Review and Evaluation		D	I	M	R
1.4.A-C 6th–12th Leadership Collaboration w/ T-STEM Centers & Coaches		D	I	M	R
Benchmark 2: STEM Academy Culture and Design					
2.1.A-C Personalization: Remains small, Advisory program, Student Voice	D	I	M	R	R
2.1.D-F Personalization: Flexible day, Student exhibits, STEM IGP	D	I	M	M	R
2.2. Professional Learning Community (PLC) and Positive School Culture	D	I	M	R	R
2.3. Postsecondary Success Support (College and Career), 12-30 credit hours		D	D	I	M
Benchmark 3: Student Outreach, Recruitment, and Retention					
3.1 -3.2 Recruitment and Open Access	D	I	M	M	R
3.3 Student Support and Retention, Summer Bridge, STEM extracurricular	D	I	I	M	R
Benchmark 4: Teacher Selection, Development, and Retention					
4.1 Highly Qualified Teachers	D	I	M	R	R
4.2 Teacher Support and Development: PD plan, PLC, STEM instruction	D	D	I	M	R
4.3 Teacher Retention: Orientation/Mentoring, Common planning, Incentives	D	I	I	M	R
Benchmark 5: Curriculum, Instruction, and Assessment					
5.1 Rigor: Aligned Curriculum & Assessment, Endorsement, 12-30 college hrs.	D	D	I	I	M
5.2 STEM-focused Curriculum: STEM electives, PBL, STEM Extracurricular, Portfolios, Internship/Capstone	D	D	I	I	M
5.3 Instructional Practices: Data-driven, PBL, Student choice/voice	D	I	I	M	R
5.4 STEM Education Integration: Innovate, Invent, STEM literacy, Technology	D	I	M	M	R
5.5 Literacy: 21st Century Skills, Read, Write, Speak, Present, STEM Vocabulary	D	I	M	M	R
5.6 Assessment: Standards, Diagnostic, Summative, Performance-based, Tracks	D	I	M	R	R
Benchmark 6: Strategic Alliances					
6.1 Parent and/or Family Participation: Communication and Connection plan	D	I	M	M	R
6.2-6.3 Business and School Community; Institutions of Higher Education **6.4** Communication with Alliance Members and Stakeholders, Track Graduates	D	D	I	M	M
Benchmark 7: Advancement and Sustainability					
7.1 -7.2 Strategic Planning; Continuous Improvement and Evaluation	D	D	I	M	M
7.3 -7.4 Sustainability and Growth; and Program Advancement		D	D	I	M

Benchmark 1: Mission-Driven Leadership
Program Requirement 1.1 Mission and Vision

1.1.A   Develops a shared mission and vision, which is aligned with the T-STEM mission and vision and which reflects a consensus among superintendent, board members, design team, staff, students, parents, and community/business partners on how the Academy promotes STEM-literate graduates to support the Texas Science Technology Engineering and Mathematics Initiative.

Key Element for Success	Example Artifacts
• Written mission and vision statement	• Minutes, agenda, and title and signatures from meeting(s) with key stakeholders to develop mission and vision • Survey data to validate key stakeholders know mission and vision. • Decision-making discussion notes that refer to key elements of mission and vision • Mission and vision posted throughout Academy, on website, and in marketing materials

Developing	Implementing	Mature	Role Model
1. Mission/vision is developed by end of planning period, and aligned with T-STEM Blueprint.	1. Mission and vision is aligned to T-STEM and developed with input from some stakeholders.	1. Mission and vision is aligned with T-STEM and is developed with input from many key stakeholders.	1. Mission and vision is aligned with T-STEM and is developed and reviewed with all key stakeholders.
2. Mission and vision is sometimes used in the decision making process.	2. Some relevant data indicate that the mission and vision are being used in the decision-making process.	2. Many relevant data indicate that the mission and vision are being used regularly in the decision-making process.	2. An effective comparison data gathering process is in place to collect information from best performing similar organizations to support strategic mission-driven decision-making in all seven benchmarks.
3. Mission and vision is known by all staff.	3. Mission and vision is posted on website and is known by some key stakeholders.	3. Mission and vision is posted on website and marketing materials, and many leadership, staff, parents, and students can articulate mission and vision.	3. Nearly all leadership, staff, and parents can articulate key tenets of the mission and vision that is posted throughout the Academy, website, and marketing materials.
4. Mission and vision is scheduled to be reviewed for improvement.	4. The Academy has started to evaluate its use of the mission and vision in the decision-making process.	4. The Academy regularly evaluates its use of the mission and vision in the decision-making process and may make some changes as a result.	4. The Academy regularly evaluates its use of the mission and vision in the decision-making process and makes ongoing improvements.
	And meets criteria from Developing	*And meets criteria from Implementing*	*And meets criteria from Implementing and Mature*

Benchmark 1: Mission-Driven Leadership
Program Requirement 1.1 Mission and Vision

1.1.B Develops and incorporates *an Annual Action Plan* (AAP)into the Campus/School Improvement Plan of goals and resources aligned to the Academy's mission and vision, the T-STEM Blueprint, and STEM-literacy; with the AAP regularly monitored and assessed.

Key Element for Success	Example Artifacts
• AAP incorporated into Campus/School improvement plan	• Minutes, agenda, and attendee title and signatures from meeting(s) with key stakeholders to develop, review, and revise AAP • Resource (human and fiscal capital) allocation annotated in AAP • Decision-making discussion notes that refer to elements of AAP • Evaluation data to indicate attainment of goals in AAP

Developing	Implementing	Mature	Role Model
1. AAP is developed with minimal input from key stakeholders.	1. AAP is developed with input from *some* key stakeholders.	1. AAP is developed with input from *many* key stakeholders.	1. AAP is developed and reviewed with input from *all* key stakeholders.
2. AAP addresses STEM-literacy or a few of the T-STEM benchmarks.	2. AAP defines STEM literacy and addresses *many* of the T-STEM benchmarks.	2. AAP defines STEM literacy and *most* of the T-STEM benchmarks.	2. An effective comparison data gathering is in place to collect information from best performing similar organizations to operationalize STEM literacy and *all seven T-STEM benchmarks*.
3. AAP is sometimes used in the decision- making process.	3. *Some* relevant data indicates that the AAP is being used in the decision-making process and is shared with *some* key stakeholders.	3. *Many* relevant data indicate that the AAP is being used *regularly* in the decision-making process and is shared with *many* key stakeholders.	3. AAP evaluation column is updated *quarterly* to indicate progress and is shared with *all* key stakeholders.
4. AAP is occasionally monitored or assessed.	4. The Academy has started to evaluate its use of the AAP in the decision-making process.	4. The Academy *regularly* evaluates its use of the AAP in the decision-making and *may* make some changes as a result.	4. The Academy regularly evaluates its use of the AAP in the decision-making process and makes *ongoing* improvements.
5. Mission has some specific and measurable goals.	5. Mission has specific and measurable goals.	5. Mission goals are measured for results.	5. Conducts an Annual *SWOT* analysis of mission and goal attainment.
	And meets criteria from Developing	*And meets criteria from Implementing*	*And meets criteria from Implementing and Mature*

Benchmark 1: Mission-Driven Leadership

Program Requirement 1.2 Leadership and Governance

1.2.A   Establishes a design team (DT) and defines the role the team plays in the planning and development of the T-STEM Academy prior to implementation.

1.2.B   Develops an Academy leadership team (LT) and identifies the internal role each member will play in the design, governance, operations, accountability, curriculum development, professional development, etc., as well as their external role in collaborating with the design team, outreach, and other key interest groups for continuous monitoring and improvement of the T-STEM Academy plan.

1.2.C   Develops and demonstrates support from an advisory board (AB) consisting of representatives from the Academy, school board, district, community, higher education, and STEM businesses to support and guide facility requirements, resource acquisition, curriculum development, internship, externships, and student/community outreach to ensure a successful 6th-20th STEM academic and career pipeline.

Example Artifacts	
• Job descriptions roles: DT, LT, AB • Minutes/action items from meetings: DT, LT, AB • Signatures & roles/titles sign off on AAP • Annual turnover rates in DT & LT • List of subcommittees, such as student, parent, IHE, facilities, outreach/partnerships • Frequency of meetings	• Meetings with T-STEM Coaches • Meetings with T-STEM Centers • High performing examples such as individual & organizational skill building & learning • Annual calendar of regularly scheduled mtgs. for DT/LT/AB • Examples of sharing of effective & innovative practices • Resources that identify shifts in STEM, education & industry • Technology manual, PBL rubric expectations

Developing	Implementing	Mature	Role Model
1. Design Team (DT) established.	1. DT positions identified with all roles defined and aligned with 7 T-STEM Benchmarks.	1. DT positions filled, and DT has developed 1 year AAP.	1. DT seeks input from key stakeholders.
2. Leadership Team (LT) established.	2. LT positions identified with all roles defined.	2. LT is a high performing team with effective communication measures and indicators aligned to mission and vision.	2. Monitoring mechanism in place to evaluate effectiveness of internal and external leadership roles.
3. Advisory Board (AB) established.	3. AB positions, and subcommittees are identified.	3. AB develops innovative and creative approaches to support Academy mission and vision.	3. AB addresses major shifts in STEM, educational standards, industry expectations, and analyzes *SWOT* of Academy, resulting in measurable Action Items.
4. Some evidence of fidelity to implementation.	4. DT, LT, AT meeting dates are regularly scheduled with majority attendance.	4. DT and LT develop policies and procedures to build and manage STEM knowledge assets.	4. DT and LT receive performance evaluations regarding fidelity to T-STEM blueprint implementation.
	And meets criteria from Developing	*And meets criteria from Implementing*	*And meets criteria from Implementing and Mature*

Benchmark 1: Mission-Driven Leadership
Program Requirement: 1.2 Leadership and Governance

1.2.D Incorporates Annual Action Plan goals for participation and leadership of students, teachers, parents, business and community partners, institutions of higher education, and T-STEM Coaches and Centers into Campus/School Improvement Plan.
1.2.E Delineates mission-driven decision-making structure and organization chart that is clear and understood by all stakeholders.
1.2.F Defines the academy leader's level of autonomy in supervising the Academy.
1.2.G Uses data to inform all leadership decisions and to annually review and revise the mission-driven T-STEM Academy Annual Action Plan (AAP).

Example Artifacts

- Organizational chart with responsibilities.

- Academy Annual Action Plan
- Written expectations of what data to use and how data will be used – data sources
- Succession planning
- Policy creation, enforcement, monitoring and evaluation protocols
- Financial audit
- Minutes/action items from site based committees, etc.
- Protocols for meetings and minutes
- Student, parent, teacher, stakeholder satisfaction surveys
- Student-led facilities tours and student developed/led clubs ex: robotics, student council, student mentors
- Information available on website and number of web hits

Developing	Implementing	Mature	Role Model
1. Annual Action Plan minimally addresses distributed leadership.	1. Students, teachers, and key stakeholders have voice in the organization.	1. Process, protocols, and documentation support capturing customer voice.	1. Customer voice processes are proactive and continuously innovative to capture unstated and anticipated requirements, expectations, and desires.
2. Academy creates a decision-making organizational chart that, at a minimum, addresses the autonomy of the Academy leader.	2. A clear organizational chart delineates authority for budget, facilities, personnel, etc.	2. Clear processes are in place to apprise key stakeholders of Academy decision-making structures and organizational chart.	2. Academy's decision-making protocols demonstrate integrity, ethics, honoring of voice, diversity, engagement, and striving for daily performance excellence.
3. Decisions are researched and validated with some data.	3. Data sources are clearly identified such as AYP, STAAR (Met & Level III), Student Achievement, Student Progress, Closing Performance Gaps, Postsecondary Readiness, Distinction Designation, Graduation rates, PSAT, Accuplacer, RTI, attendance, discipline, surveys, benchmarks, etc. *And meets criteria from Developing*	3. Students, teachers, parents, and staff participate in setting and reflecting on individual student and overall AAP goals. *And meets criteria from Implementing*	3. Data sources include tracking of value-added education via vertical scale scores, etc. *And meets criteria from Implementing and Mature*

Benchmark 1: Mission-Driven Leadership

Program Requirement: 1.3 Program Review and Evaluation

1.3.A Integrates and assesses the level of mission-driven and data-driven decision making evident in the daily work of the Academy.

1.3.B Implements a process for program review and formative evaluation to achieve mission goals that includes metrics such as attendance, demographics, and student achievement.

Key Element for Success	Example Artifacts
• Mission is posted and can be articulated by teachers, staff, students, key stakeholders, etc.	• Student Intervention plans • Classroom observations protocols and schedule • Peer-reviews • Student artifact reflections • Student, parent, community survey • Scheduled time for staff to implement program review (Reflect, Revise, Act Cycle). • Meeting/input from T-STEM Coaches, T-STEM Centers, district personnel, and other key stakeholders • Teacher, counselors, content coaches, and leadership journal notes indicate action based on reflective practice • Defined metrics such as TAKS data, # of National Merit Scholars, College acceptance rates, attendance, demographics, AP scores, college entrance scores, etc.

Developing	Implementing	Mature	Role Model
1. Little or no evidence of data-driven and mission-driven decision making.	1. Data is used to design student interventions, Annual Action Plan (AAP), and to inform teaching and learning aligned to the mission.	1. Teachers work interdependently as teams to review data across content, develop targeted interventions, and develop common formative assessments.	1. The Academy's continual analysis of results for improvement is critical to the school's system of interventions and culture of celebration.
2. Little or no process for program review.	2. Student, teacher, and Academy goals are aligned to mission with checklists and protocols to review for alignment.	2. Academy adopts a reflective culture incorporating multiple metrics to regularly evaluate overall, team level, and individual success in achieving program goals.	2. Academy implements a well-developed, systematic review process, involving formative and summative data, to ensure that processes ensure that results align with the Academy mission (e.g. resource allocation, curriculum pathways, instructional strategies, resources, marketing, outreach, professional development, goals, etc.).
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*

Benchmark 1: Mission-Driven Leadership

Program Requirement: 1.4 Leadership Development and Collaboration

1.4.A   For 6th – 12th campuses, middle school and high school leadership teams regularly collaborate to advance 6-12 alignment and student retention in STEM.

1.4.B   Participates and collaborates with the T-STEM Centers and T-STEM Coaches to support the transformation of STEM teaching methods, teacher preparation, and instruction to support continuous development and the achievement of long-term T-STEM goals.

1.4.C   Actively participates in the T-STEM Network by collaborating with other T-STEM Academies, engaging in leadership development opportunities, utilizing T-STEM Centers' resources, and promoting broad dissemination of promising practices to improve student achievement.

Key Element for Success	Example Artifacts
• MOUs with T-STEM Centers	• Academy submissions to the T-STEM newsletter • Academy member attendance at T-STEM conferences and regional convenings • AAP includes Academy member's participation in T-STEM conferences • Calendar of collaboration dates with T-STEM Centers and T-STEM Coaches • Documentation of T-STEM Centers' Resources (i.e. PDIS, technical assistance, student internships, etc.) • Agendas and minutes from vertical 6th – 12th STEM leadership meetings

Developing	Implementing	Mature	Role Model
1. Some members of the Leadership team occasionally attend T-STEM leadership conferences and regional meetings.	1. Several members of the Leadership Team participate in a regular basis at the T-STEM leadership conferences and regional meetings.	1. Academy members regularly share best practices at T-STEM conferences and regional meetings, as well as through the T-STEM portal and newsletter.	1. Academy members regularly network with other T-STEM Academies to share share best practices and improve student achievement.
2. Academy leadership occasionally collaborates with each other (6th – 12th), with T-STEM centers, and T-STEM Coaches.	2. Academy leaders and staff collaborate with each other (6th – 12th), and with T-STEM Centers and Coaches to integrate STEM teacher preparation, teaching, and learning.	2. Academy plans with regional T-STEM Center, vertical alignment teams 6th – 12th (at least quarterly), and meets with their T-STEM Coach, virtually or Face-to-Face (at least monthly).	2. Academy dialogues on a regular, ongoing basis in vertical alignment teams (6th – 12th), with T-STEM Centers and Coaches, and utilizes available T-STEM resources to improve student achievement and teacher preparation.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*

Benchmark 2: T-STEM Academy Culture and Design

Program Requirement: 2.1 Personalization

2.1.A Addresses in AAP and strategic plan the details for remaining small, allowing for personalization and maintaining collaborative learning communities of students.

2.1.B Plans and implements a non-graded student advisory program that is regularly scheduled, noted in the master calendar/schedule, and focuses on personalizing the student experience, (builds relationships with students and parents, develops character, and fosters global literacy).

2.1.C Develops a process for hearing and responding to student voice.

Key Elements for Success	Example Artifacts
• Student IGPs w/ CCRS, Endorsements, and Performance Acknowledgement plans • Master schedule for advisory • Student enrollment	• Opportunities for orientation sharing and team building activities both on- and off-site • Advisory class curriculum • Student goal setting and reflection logs • Teacher mentors assigned to students • Pre- and post-assessments of advisory class goal • Students sit on advisory board and/or have voice in student work products, clubs, competitions, governance, and course offerings • School wide activities to build/share culture • Student ambassadors serving as classroom greeters and/or guide tour groups • Teacher/student ratios, actual class sizes • Surveys documenting students' elective requests

Developing	Implementing	Mature	Role Model
1. District and Academy resources are allocated to ensure teaching staff and facilities remain small.	1. Annual Action Plan and Academy handbook address plan for maintaining personalized, small, learning communities.	1. Students are regularly afforded multiple opportunities to build relationships with staff and peers such as working in academic and/or competitive teams horizontally and vertically.	1. Protocols are developed to ensure students have a clear and documented voice in the Academy (student council, advisory committee to the director, suggestion box, etc.
2. Student advisory is regularly scheduled and focuses on relationships, building school capital, developing and fostering global literacy.	2. Advisory class has written curriculum with goals, expectations, scope, sequence, and pacing guides.	2. Teachers work in teams to develop systemic advisory programs with horizontally and vertically aligned student outcomes.	2. Annual resources are allocated to develop, revise, and sustain advisory program with input from students, teachers, parents, and external partners.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*

Benchmark 2: T-STEM Academy Culture and Design
Program Requirement: 2.1 Personalization

2.1.D   Arranges for a flexible school day with blocks of time that support student learning (tutorials, collaboration, meetings).
2.1.E   Celebrates high quality student work through student exhibits on-site, web-based, and/or in state and national forums.
2.1.F   Provides every 6th – 12th student with an individualized STEM-focused high school graduation plan that addresses: four years of math and science; an Endorsement in STEM, Business and Industry, Public Service, or Arts and Humanities; identifies target areas for Performance Acknowledgements; and is at least annually reviewed and revised with the counselor, student, and family.

Example Artifacts

- Honor roll, grade level/school-wide celebrations
- Classroom and building displays
- Number of students participating in student exhibits
- Agendas/signatures for IGP meetings with students and family

- IGP, record folder/portfolio, 6th -16th course plan
- Master schedule, tutoring schedule
- Minutes/action items from site based committees, etc.
- Website showcasing student work
- Documentation of at least annual 6th – 12th IGP meetings with parents and students

Developing	Implementing	Mature	Role Model
1. Academy develops a flexible schedule that supports student success.	1. Schedule is developed with input from teachers, counselors, content coaches, extracurricular and internship/capstone requirements.	1. Teachers work in teams to adjust daily schedule to facilitate interdisciplinary PBL.	1. Schedule is adjusted to meet student needs according to data, student, teacher, and parent voice; intervention and extension plans.
2. Academy regularly schedules for students to share their knowledge and work products.	2. Students participate in panel presentations, debates, academic fairs, webinars, online challenges, competitions, design challenges, etc.	2. Resources are allocated to provide students with opportunities to participate in state and national forums, conferences, and competitions (financial, facilities, staffing, transportation, etc.).	2. Academy establishes protocols with input from key stakeholders to gauge the effectiveness of student participation in competitions, challenges, etc. towards promoting college and career readiness as well as Academy goals.
3. Academy develops IGP for each 6th – 12th student that addresses STEM pathways, THECB College and Career Readiness Standards.	3. Student, counselor, and family regularly review and revise the IGP to address student goals for courses, grades, Endorsements, Performance Acknowledgements, college entrance exams, PSAT/ACT/SAT, career aspirations, etc. *And meets criteria from Developing*	3. Annually reviews and revises IGP according to previously established protocols and timelines. *And meets criteria from Developing and Implementing*	3. Mentors are assigned to students to develop intervention contracts to address deficiencies or acceleration opportunities in IGP. *And meets criteria from Developing, Implementing, and Mature*

Benchmark 2: T-STEM Academy Culture and Design

Program Requirement: 2.2 Culture

2.2.A Collaborates with stakeholders to develop a new handbook or modify the existing handbook with clear procedures, policies, and consequences that support the development of a strong T-STEM culture.

2.2.B Involves all stakeholders in developing a culture of respect, responsibility, trust, and meaningful adult and peer relationships throughout the Academy in order to foster positive student identities.

2.2.C Creates a professional learning community environment of collaboration, teaming, and high expectations among administrators, teachers, and stakeholders, with a focus on and a commitment to the learning of each student.

Example Artifacts	
• Handbook, attendance/discipline goals/data • Customs and celebrations, modeling lessons for respect, responsibility, trust • Student, teacher, parent surveys address culture • Sharing of ideas and strategies and joint problem-solving are widespread. • School developed common vocabulary for evidence of "good teaching"	• PLC protocols and expectations (meeting times, book studies, goals, results based on interventions, reflections on results – new actions, etc.) • Collaborative planning of learning and teaching activities • Widespread teamwork involving teachers and support staff • Peer walkthroughs, lesson evaluations, and critical friends reflections

Developing	Implementing	Mature	Role Model
1. Handbook is developed to address student, parent expectations and a culture of respect, responsibility and trust.	1. Handbook addresses key tenets of cultural beliefs of Academy (student ability and achievement, efficacy and effort, power, distributed leadership, cultural sensitivity, proactive and reflective practice, etc.).	1. Handbook is developed with input from key stakeholders with clear policies, procedures, and consequences (attendance, discipline, student contracts, teacher extended days, etc.).	1. There is a high degree of commitment to school-wide professional values and a strong sense of cohesion and consistency of approach, with protocols to analyze, build, and assess effectiveness of culture.
2. Professional Learning Community (PLC) is developed which supports staff devoting effort, energy, time, and resources into incorporating valuable new strategies into their practice.	2. An inquiry-based continuous improvement orientation to practice is pervasive, with data informing practice and learning widely shared.	2. Staff regularly and consistently plans together, collaborates and shares ideas through meetings, website resources, teaming, team teaching etc., and garners input from external experts.	2. A desire to do the best for *all* students pervades the school as evidenced by protocols for regular and deep school-wide dialogue about good teaching, assessment, learning, projects, and successes of individual students.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*

Benchmark 2: T-STEM Academy Culture and Design

Program Requirements: 2.3 Postsecondary Success (College and Career)

2.3.A   Prepares students who graduate for post-secondary level coursework and careers in science, technology, engineering, and mathematics through the integration of the Governor's economic workforce clusters and Achieve Texas STEM cluster: semiconductor industry, information and computer technology, micro-electromechanical systems, manufactured energy systems, nanotechnology, biotechnology, chemist, and engineering: aerospace, electronic, mechanical, environmental, and biomedical.

2.3.B   Regularly engages $6^{th} – 12^{th}$ students and parents in high school and college transition planning, STEM Career Exploration, College Exploration, and College Readiness Preparation.

2.3.C   Develops a plan for student success on post-secondary entrance exams.

2.3.D   Creates higher education partnerships to provide mentoring, college-level courses/dual credit, professional development and technical assistance, and to foster a college-going culture.

2.3.E   Enrolls each student in 12-30 college course credits through multiple educational pathways such as dual credit, International Baccalaureate, concurrent enrollment, articulated credit, and/or Advanced Placement.

2.3.F   Provides systematic and individual tiered support to ensure that all students graduate with at least 12-30 college credits.

Key Elements for Success	Example Artifacts
• Schedule that reflects dual credit/AP/IB courses • STEM focused Endorsements & course pathways • $6^{th} – 12^{th}$ IGP plan for HS graduation, and college course plan for STEM college and career explorations	• Transcript beyond state requirements • College nights, college visits, financial aid and application seminars • Multiple college credit pathways in Academy (summer opportunities, core and elective content w/college credit, etc.) • Intervention strategies for tiered support • Tracks number/percentage of students enrolled in college credit courses • MOUs with IHE for Academy visits, counseling for parents and students re: enrollment procedures, etc. • Student and parent college readiness plan/checklist, STEM Career and college exploration portfolio • Governor's economic workforce clusters and/or Achieve Texas STEM clusters included in course pathways • Tracks number/percentage of students with a Distinguished Level of Achievement, an Endorsement, and a Performance Acknowledgement

Developing	Implementing	Mature	Role Model
1. Develops plan to ensure student success in high school to college transition, with high school IGPs initiated in 6th grade and revisited annually.	1. Systemic plan of curriculum, instruction, and intervention, is tiered to each grade level to address student preparation for college entrance criteria such as PSAT, ACT, SAT, Accuplacer, TSI, etc.	1. Systemic and ongoing efforts to develop the college navigation capital of Academy students, parents, and families.	1. Partners with industry and higher education to continually evaluate and improve course offerings and curriculum to ensure students graduate ready for post-secondary success and careers in STEM related fields.
2. Partners with higher education and other organizations to offer at least 12-30 college credits.	2. Develops school-wide tiered intervention support structures to ensure all students graduate with 12-30 college credit hours.	2. Continually explores and implements innovative pathways for students to graduate with 12-30 college credit hours such as college mentors, shared professors, transportation, and virtual courses.	2. Professional development and technical assistance is provided by higher education entities, and Academy allocates resources such as staff, support classes, tutoring, busses, etc. to sustain student success in college credit courses.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*

Benchmark 3: Student Outreach, Recruitment, and Retention

Program Requirement: 3.1 Recruitment and 3.2 Open Access

3.1.A	Develops structures and processes for marketing and recruitment to encourage participation from underserved students and families (transportation or plans for transportation to the school, child care for family events, and translation of all recruitment and marketing materials).
3.1.B	Actively partners with feeder middle and/or elementary schools to develop student interest in STEM education and to increase advancement rates from middle school STEM to high school STEM.
3.1.C	Develops a systemic recruitment plan that includes students, parents, counselors, teachers, district, and community.
3.2.A	Develops an admission policy to include an open access, lottery-based selection process that encourages applications from all students. The application will not be based on state assessment scores, discipline history, teacher recommendation, minimum GPA, or other requirements that would be used to limit selection.
3.2.B	Consists of a population that is 50% or greater economically disadvantaged and underrepresented students.

Key Elements for Success	Example Artifacts
• Written admission policy and application with lottery explained	• Recruitment schedule and locations (schools, churches, community centers, etc.) • Brochures and marketing items in English, Spanish, and/or relevant second language • Survey data (community input, enrollment trends, etc.) • STEM feeder school crosswalk recruiting curriculum • Plan to recruit with feeder schools • Documented support efforts (transportation, child care, etc.) • Needs assessment • Number and percentage of students matriculating from middle school STEM to high school STEM

Developing	Implementing	Mature	Role Model
1. Academy details a plan and process for marketing to and recruiting from appropriate communities and feeder schools to reach high need and underrepresented students.	1. Marketing and recruitment plan developed with input from key stakeholders, and targets feeder pattern, community needs, and cultural relevance.	1. Marketing plan highlights Academy's STEM pathways and Endorsements; and industry and higher education partners. Recruitment efforts include Academy staff, students, and parents. At least 80% of 8th grade MS STEM students matriculate to HS STEM Academy.	1. Students and staff from Academy collaborate with feeder schools to develop, deliver, and monitor recruitment results from STEM crosswalk engagement lessons conducted at the feeder middle schools. At least 90% of 8th grade MS STEM students matriculate to HS STEM Academy.
2. Academy has at least 50% economically disadvantaged and underrepresented students, via an open, lottery based admission policy, where the application *does not* include requirements that might deter students such as STAAR, grades, teacher recommendation, discipline, or attendance.	2. Clearly communicated admission policy that indicates target enrollment goals and implements support processes structures such as transportation, child care, etc. to meet goals. *And meets criteria from Developing*	2. Academy tracks enrollment data and indicates some increases in recruitment/enrollment rates. *And meets criteria from Developing and Implementing*	2. Academy employs a needs assessment to analyze demographic trends to ensure equitable access and recruitment of greater than 50% economically disadvantaged and underrepresented students and sustains a full complement of students at each grade level. *And meets criteria from Developing, Implementing, and Mature*

Benchmark 3: Student Outreach, Recruitment, and Retention

Program Requirement: 3.3 Student Support and Retention

3.3.A   Develops and implements systemic, tiered strategies for student support and retention (outreach, early intervention strategies, mentoring, tutoring, counseling, and other supports for academic and socio-emotional growth).

3.3.B   Hosts $5^{th} – 6^{th}$ and $8^{th} – 9^{th}$ orientation session(s) and summer bridge program(s) to facilitate successful student transitions and retention into a STEM-focused, college preparatory, project-based learning environment.

3.3.C   Provides all students with opportunities and the expectation to assume roles of responsibility within the classroom, Academy, and community.

3.3.D   Supports and monitors $6^{th} – 12^{th}$ student participation in STEM activities both within and outside the classroom to ensure that all students engage in STEM clubs, STEM competitions, and STEM field experiences.

3.3.E   Hosts parent seminars to develop deep understanding and commitment to the rigor of college readiness and the high expectations of a STEM Academy.

Example Artifacts	
• Student, parent, staff contracts • Student retention and persistence plan • Orientation and bridge agendas • Exit interviews • IGPs Minutes from persistence meetings, retention/attrition data	• Program adjustments due to student and community voice • Copies of trainings and participation of parents/community • Satisfaction/interest surveys from students, parents, community, staff, etc. • Lists of clubs, service learning projects, STEM activities, STEM field experiences, and planned competitions

Developing	Implementing	Mature	Role Model
1. Academy develops a strategic plan for student retention and persistence, and maintains persistence rates above 70%.	1. Student persistence rates range between between 70-80% and the strategic plan addresses research-based supports such as annual IGP review, parental involvement, tiered interventions, and cultural relevance.	1. Student persistence rates range between 81-90%, and the strategic plan includes yearly metrics, analysis of why students leave, and a plan to identify and prevent at-risk students from leaving.	1. Campus engages in ongoing dialogue to address persistence data (lack of course credit, leaving the Academy) and uses data to ensure persistence rates above 90%.
2. Academy develops student orientation/summer bridge program(s), student clubs, and plans for external STEM activities and competitions.	2. The orientation/summer bridge program sets priorities and includes a timeline with skills, tools, and resources for students to successfully transition to a STEM environment.	2. The orientation/summer bridge program is implemented as planned and continually refined annually, with a complete scope and sequence and supporting materials.	2. The orientation/summer bridge program monitors initial student success, identifies struggling students early on, and ensures those students have additional support.
3. Students can select from a small number of leadership opportunities available.	3. The staff encourages students to select leadership opportunities.	3. The staff monitors student involvement in leadership and STEM activities, clubs, and competitions; and develops interventions for students who have minimally participated.	3. Student leadership is evidenced in nearly every non-classroom related initiative or event and at least 90% of students participate in leadership and/or STEM activities, clubs and competitions.
4. Academy creates STEM Academy orientation for parents and stakeholders.	4. Opportunities exist for parents and stakeholders to participate in service learning, and/or attend student presentations.	4. At least bi-annual opportunities exist for parents and stakeholders to participate in STEM activities.	4. Annual parent and stakeholder participation goals are developed and monitored for continued improvement.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*

Benchmark 4: Teacher Selection, Development, and Retention

Program Requirement4.1 Highly Qualified Teachers

4.1.A Recruits and selects highly qualified secondary and post-secondary faculty who possess extensive subject knowledge, are willing to incorporate project based learning (PBL), and integrative STEM pedagogy.

4.1B Recruits and selects highly qualified secondary and post-secondary faculty who utilize relational knowledge in developing culturally responsive classrooms that successfully build self-efficacy with traditionally underrepresented students.

4.1.C Develops teacher job descriptions and requirements that incorporate integrative content practice and research-based actions/strategies that demonstrate commitment to success for underrepresented students.

4.1.D Uses a collaborative recruitment and selection process that includes Academy leaders, teachers, key stakeholders, T-STEM Centers, and T-STEM Coaches.

4.1.E Designs or employs innovative programs to support the recruitment and selection of highly qualified STEM teachers.

Example Artifacts	
• Written recruiting plan	• Needs assessment
• Interview questions and rubrics	• Evaluation results of recruiting measures
• Academy has hiring authority (is not required to hire from pool unless best candidate)	• Feedback from candidates regarding interview process
• Advertisement for positions (STEM listservs, social networking sites etc.)	• Teacher effectiveness surveys from students, peer staff, administrators, and parents
• Interview panel consists of staff, key stakeholders, etc.	• Student achievement and school participation numbers (clubs, competitions, etc.) per teacher
• Teacher turnover rates	

Developing	Implementing	Mature	Role Model
1. Academy has authority to hire "best" qualified for goals of the Academy and STEM blueprint requirements.	1. Develops a written plan for creative recruiting to ensure highly qualified, effective teachers.	1. Develops annual needs assessment and actively implements a teacher recruitment and placement program.	1. Resources are allocated for recruitment of best qualified candidates, with the Academy partnering with teacher preparation programs such as UTeach, to recruit highly qualified teachers for Academy needs.
2. Academy develops a collaborative interview process.	2. Rubrics for interviewing are developed and revised in collaboration with key stakeholders such as district, higher education, industry, T-STEM Network, Centers, Coaches, etc.	2. Collaborative interview includes outside stakeholders such as the T-STEM Coach.	2. Evaluates effectiveness of recruitment practices to ensure highly qualified, effective teachers.
3. Job descriptions are developed for all positions serving the Academy.	3. Job description addresses unique expectations of STEM teacher responsibilities such as culturally relevant STEM curriculum development, interdisciplinary planning, professional learning community expectations, extended days, summer PD, and outside classroom duties.	3. Job descriptions are developed for all staff in collaboration with key stakeholders and address expectation of strong content knowledge and success with underrepresented and at-risk students.	3. Candidates indicate success with job description criteria through innovative interview processes such as student panels, teaching a lesson, submission of a lesson plan for an interdisciplinary STEM project, participation in team meeting, etc.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing and Mature*

Benchmark 4: Teacher Selection, Development, and Retention
Program Requirement: 4.2 Teacher Support and Development

4.2.A   Develops a PD plan for a sustained professional development model of continuous learning based on student results, teacher development, and the short- and long-term goals of the Academy.

4.2.B   Adopts a systemic professional development model of continuous learning that addresses prioritized needs as informed and evaluated by multiple sets of quantitative and qualitative data (student assessment data, instructional/classroom evaluations, technological developments, workforce demands, demographic changes, and community/societal expectations and needs).

4.2.C   Sustains a PLC by instituting job-embedded ongoing opportunities for continuous learning, peer coaching/mentoring, STEM externships, and participation in STEM teacher and leader cadres for teachers and administrators (research-based practices, content competence, new instructional strategies, technology integration, reflective inquiry, and student artifact analysis).

4.2.D   Provides ongoing professional development for counselors, teachers, staff, and parents on strategies that support students to ensure success in a rigorous course of study, such as: IGP, interventions, and interpersonal and academic success strategies.

4.2.E   Ensures that school-based, integrative STEM coaches are available and accessible to support both teachers and students in research-based practices, content competence, interdisciplinary STEM teaching and learning, reflective inquiry, college readiness standards, and state standards integrated with STEM industry expectations.

4.2.F   Collaboratively builds 6th – 12th teacher and administrator expertise in developing, teaching, learning, and assessing STEM cross-content curriculum.

Example Artifacts

- PD plan
- Coach job descriptions, calendar of trainings
- Professional Learning Community
- 6th – 12th Vertical planning dates/outcomes

- School-wide student outcomes, criteria for quality work, etc.
- Partnerships, number, length, results of teacher externships
- Well-developed curriculum with supporting website and podcasts
- Facilitates STEM sessions at T-STEM Best Practices Conference

Developing	Implementing	Mature	Role Model
1. Develops PD plan with clear pedagogy expectations, aligned with mission goals, teacher needs, and student needs.	1. Academy regularly uses diverse assessment tools/processes, enhanced media, adult learning theories, professional reflection time, problem-solving protocols, and self-paced learning with computer and human interaction for support, coaching, mentoring, and collegial interaction.	1. Needs assessment and PD plan address teacher and student retention to include teacher, student, and parent voice in decision-making process.	1. Meaningful partnerships with external organizations ensure progressive expectations for educators' application of content knowledge, curriculum design, and delivery.
2. Develops a PLC plan that identifies ways in which teachers will work in collaborative teams to build shared knowledge and formative/summative data.	2. Teachers collaboratively develop 6th – 12th common essential student outcomes which reflect their efforts to build shared knowledge regarding best practice, (STEM integration, college and career readiness, 21st Century Skills).	2. Teachers collaboratively clarify the criteria they use to judge quality of student work and criteria is consistently applied horizontally and vertically.	2. Teachers participate in externships and mentorships with higher education and industry. PLC plan is annually monitored, evaluated, and revised for effective practice.
3. Teacher/Student Support: Coaches motivate and support instruction and curriculum development aligned to Academy mission and vision.	3. Coaches systematically plan and appropriately pace professional development to address data-informed instruction and learning, Academy short- and long-range goals, individual teacher goals, technology integration, PBL development, and STEM integration.	3. Coaches actively partner with industry and higher education for instruction and curriculum development and share experiences with T-STEM network (website outreach, mentorships, partnerships, podcasts, conferences, etc.).	3. Academy and coaches purposefully employ a variety of fair and credible assessments to systematically evaluate adult progress on teaching and learning goals and next steps.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing and Mature*

Benchmark 4: Teacher Selection, Development, and Retention
Program Requirement: 4.3 Teacher Retention

4.3.A Provides for flexibility in instructional practices to promote creativity and innovation while maintaining accountability.
4.3.B Provides a common planning time, within the structure of the school day, for teachers to support results-driven, team-focused professional learning, and cross-curricular collaboration.
4.3.C Adopts and implements a plan for new teachers to include orientation, induction, acculturation, mentoring, professional development, and administrative support.
4.3.D Provides opportunities for ongoing professional development to improve teachers' content knowledge, technology embedded instruction, integrative STEM pedagogy, college and career readiness standards, instructional strategies for ensuring a successful P-20 pipeline, and leadership capacity.
4.3.E *Annual Action Plan* includes a creative teacher incentive plan that provides release time and other incentives, such as stipends or bonuses, for teachers to contribute to and lead T-STEM education efforts (journal articles, conference presentations, attend T-STEM trainings and regional meetings, contribute to T-STEM newsletter, and populate Academy press releases).

Key Element for Success	Example Artifacts
• Master schedule with common planning time	• Orientation checklists (facilities tour, email, website expectation, discipline, attendance, management, culture, instruction, STEM, etc.) • Incentive plan ex: stipends, extended contract • Scheduling changes for release time, flexible instruction, etc., • Annual staff retention percentages • Academy press releases, T-STEM website stories • Participation in STEM trainings and convenings • Participation in T-STEM Network and Center PD trainings and convenings • Needs assessment and individual PD plans • Evidence of variety of instructional strategies adapted to student needs • Teacher mentoring program

Developing	Implementing	Mature	Role Model
1. Incentive plan with teacher input regarding flexible schedule, innovative instruction, and release time.	1. Retention plan addresses teacher voice in ongoing, job-embedded development to improve teacher content knowledge, technology embedded instruction, integrative STEM pedagogy, college and career readiness standards, instructional strategies, and leadership capacity.	1. Partnerships with industry and higher education facilitate staff leadership capacity and align instructional strategies to ensuring a successful P-20 pipeline.	1. Incentive plan supports T-STEM education efforts (journal articles, conference presentations, attend T-STEM PDI trainings and regional meetings, contribute to T-STEM newsletter, and populate Academy press releases).
2. Common Planning time within the school day focuses on PLC collaboration.	2. Teams develop team-time norms, set goals and evaluate effective use of team-time for curriculum development, student artifact reflection, parental involvement, etc.	2. Teams develop common metrics to measure and inform, in order to identify strengths and weakness in their individual practice, and to collaboratively improve their individual and collective efforts to help all students learn.	2. Collaborative school-level planning is judged Effective as evidenced by student learning outcomes.
3. Develops an Orientation plan aligned to Academy mission and vision, and teacher enculturation.	3. Induction plan addresses Academy expectations for instructional skills; interactions with students, parents, and community; classroom management; assessment of learning; technology; professional development; and mentoring.	3. Induction process is clearly enunciated, consistently practiced, and evaluated and revised for effectiveness.	3. Each new teacher participates in the induction process, is assigned a mentor teacher, understands the strategic goals of the Academy, and completes a Needs Assessment that identifies areas for individual professional development.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing and Mature*

Benchmark 5: Curriculum, Instruction, and Assessment
Program Requirement: 5.1 Rigor

Example Artifacts

- Course syllabi, lesson plans, unit lessons, PBL, scope, sequence, pacing guides
- Lessons include STEM standards, state standards, national standards, college and career readiness standards, 21st century skills
- Benchmark schedule, course passing rates, retention rates

- Student portfolios, IGPs, counseling, advising, college crosswalk, and feedback loop
- Plans for PSAT, Accuplacer, TSI, CTE, interventions, etc.
- Horizontal and vertical alignment of curriculum
- Students graduate with Endorsements & Performance Acknowledgements

In Benchmark 5, all program requirements are scored individually. There are no separate metrics. Assess the level of implementation for the program requirements below according to the standards to the right.	**Developing** Investigate, Research, and Create	**Implementing** Formalize, Revise, and Publish	**Mature** Data-driven evaluation of effectiveness of program requirements	**Role Model** Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance
5.1.A Aligns curriculum, instruction, and assessment (such as, but not limited, the THECB CCRS, national and state standards, content, context, culture, cognitive level, competencies, skills, processes, 21st century skills, and STEM synthesis).	☐	☐	☐	☐
5.1.B Develops a scope, sequence, and pacing guide for a vertically and horizontally aligned curriculum centered on state standards, career and college readiness standards, STEM integration, and industry expectations.	☐	☐	☐	☐
5.1.C Develops an assessment and intervention plan to address gaps in student achievement and areas for extension.	☐	☐	☐	☐
5.1.D Supports and encourages all students to successfully complete four years of mathematics, four years of science, four years of STEM electives, and at least one Endorsement in STEM, Business and Industry, Public Services, or Arts and Humanities, with a primary focus on a STEM Endorsement; and earn a Distinguished Level of Achievement as well as a Performance Acknowledgement in order to graduate college ready.	☐	☐	☐	☐
5.1.E Offers dual credit, articulated concurrent enrollment, AP or IB courses so that all students will graduate with 12-30 college credit hours.	☐	☐	☐	☐
5.1.F Establishes curriculum expectations, monitoring, and accountability mechanisms that are reflectively revised to ensure a constancy of mission purpose (aligned resource allocation, integrated STEM curriculum development, teacher professional growth, and student results).	☐	☐	☐	☐

Benchmark 5: Curriculum, Instruction, and Assessment
Program Requirement: 5.2 STEM-focused Curriculum

Example Artifacts

- Defined engineering coursework (Infinity Project, PLTW)
- Student journals, student presentations, peer performance assessment rubrics , and peer mentors
- Self-paced learning, student contracts, progress reports, exit interviews, parent/teacher/student conferences
- Lessons include work force clusters, expert practitioners, field-based learning, research of current issues, PBLs, guest speakers, differentiation, intervention and acceleration plans, student choice

- Number of offerings and number of students participating in co-curricular activities, clubs, academic teams, and competitions (UIL, Brain Bowl, Science Olympiad, Model UN, FIRST, BEST, Vex etc.)
- Design conceptual internships, identify STEM opportunities, business partners, scientific organizations, and universities
- IGP w/capstone project (research, annual review, and analysis)

In Benchmark 5, all program requirements are scored individually. There are no separate metrics. Assess the level of implementation for the program requirements below according to the standards to the right.	**Developing** Investigate, Research, and Create	**Implementing** Formalize, Revise, and Publish	**Mature** Data-driven evaluation of effectiveness of program requirements	**Role Model** Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance
5.2.A Delivers innovative STEM programs that are well-defined, embed critical thinking and problem solving, innovation and invention, and are aligned to state and/or national standards and industry expectations.	☐	☐	☐	☐
5.2.B Supports and encourages students to complete three years of STEM electives at middle school and four years of STEM electives at high school.	☐	☐	☐	☐
5.2.C Develops performance-based and project-based assessments aligned to these innovative programs and state/national/industry standards.	☐	☐	☐	☐
5.2.D Develops and implements a plan for supporting accelerated student achievement for students with demonstrated deficiencies or proficiencies in mathematics and science to promote all students graduating ready for enrollment in credit-bearing postsecondary courses (e.g. Algebra I enrollment by 8th grade).	☐	☐	☐	☐
2.E Incorporates into the curriculum work-based, contextual learning with a global perspective.	☐	☐	☐	☐
5.2.F Participates in extra-curricular academic activities centered on science, technology, engineering, and mathematics; i.e. STEM field experiences, clubs, and competitions.	☐	☐	☐	☐
5.2.G Develops 6th – 12th students' portfolios of interest in: STEM capstone projects, STEM internship opportunities, and global STEM college, degree, and career explorations. Requires all high school students to complete an internship, and/or a STEM-related capstone project, presentation, and defense; primarily focused in the state's STEM-related economic development clusters (information and computer technology, energy, petroleum refining and chemical products, advanced technologies and manufacturing, aerospace and defense, biotechnology and life sciences.)	☐	☐	☐	☐

Benchmark 5: Curriculum, Instruction, and Assessment
Program Requirement: 5.3 Instructional Practices

<table>
<tr><td colspan="2" align="center">Example Artifacts</td></tr>
<tr>
<td>
• Peer observations, mentors, cross-curricular teams
• Walkthroughs, observations, model lessons
• Data informs scaffolding, reteach, and extension
• Team planning that defines student products, assessments, rubrics, and standards for cross-curricular and other PBLs, teacher research on STEM field expectations, current issues, and technology.
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• Student presentations include digital materials, peer and internal/external expert evaluation
• Academy teachers have mentors at university and industry level that provide input to curriculum development
• Year-at-a-glance checklist documenting course coverage of state standards, 21st century skills, college readiness standards throughout grading period
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In Benchmark 5, all program requirements are scored individually. There are no separate metrics. Assess the level of implementation for the program requirements below according to the standards to the right.	**Developing** Investigate, Research, and Create	**Implementing** Formalize, Revise, and Publish	**Mature** Data-driven evaluation of effectiveness of program requirements	**Role Model** Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance
5.3.A Incorporates data-driven instruction.	☐	☐	☐	☐
5.3.B Creates an environment for shared teacher responsibility and accountability for student learning across programs, content areas, and classrooms.	☐	☐	☐	☐
5.3.C Organizes instruction expectations around problem-based and project-based learning with clearly defined learning outcomes for students and teachers that address state and national performance standards, college and career readiness standards, and industry expectations.	☐	☐	☐	☐
5.3.D Ensures teachers' use of the aligned scope and sequence and integration across the disciplines.	☐	☐	☐	☐
5.3.E Ensures teachers' use of high-quality curricular materials aligned with state and national standards, college and career readiness standards, and industry standards.	☐	☐	☐	☐
5.3.F Provides opportunities for students to exercise choice and voice within a relevant and rigorous context.	☐	☐	☐	☐

Benchmark 5: Curriculum, Instruction, and Assessment
Program Requirement: 5.4 STEM-Education Integration

Example Artifacts	
• PBL - Project Based Learning • Systemic expectations for number of presentations per class, documentation of students presenting to internal and external panels	• Design teams, group projects, multiage projects, simulations, robotics teams, green teams, • Project scenarios based on real-world issues, (e.g. Future City, FIRST, Odyssey of the Mind, etc.)

In Benchmark 5, all program requirements are scored individually. There are no separate metrics. Assess the level of implementation for the program requirements below according to the standards to the right.	**Developing** Investigate, Research, and Create	**Implementing** Formalize, Revise, and Publish	**Mature** Data-driven evaluation of effectiveness of program requirements	**Role Model** Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance.
5.4.A Promotes instructional strategies that challenge students to think critically, innovate and invent to solve real-world, contextual problems.	☐	☐	☐	☐
5.4.B Exposes students to critical readings in STEM related fields and requires students to demonstrate their understanding of STEM disciplines in a work-based, contextual environment.	☐	☐	☐	☐
5.4.C Offers standards-based STEM programs that incorporate integrative STEM literacy and innovative instructional tools.	☐	☐	☐	☐
5.4.D Promotes applied and collaborative learning, and provides students with opportunities to present/defend their work to peers, community, industry, and university leaders.	☐	☐	☐	☐
5.4.E Promotes a technology rich culture of natural use of current technologies to enhance instruction, curriculum, teaching, and learning, and STEM literacy.	☐	☐	☐	☐

Benchmark 5: Curriculum, Instruction, and Assessment
Program Requirement: 5.5 Literacy

Example Artifacts	
• Academy developed process in place to identify STEM and content relevant vocabulary and just-in-time literature • Plan for vertical and horizontal expectations, per grade level, of STEM vocabulary and relevant literature • Literature and language rich environment which includes technical language journals, articles, periodicals, current events newspapers, online resources, webinars, and texts	• STEM Focused strategies and activities such as word walls, student journals, literature circles, mock trials, student forums, and debates • Stakeholder input into selection of STEM instructional materials, student goals and reflections (literacy in STEM, 21st century skills, technology, etc.) • Integrative instruction and instructional materials

In Benchmark 5, all program requirements are scored individually. There are no separate metrics. Assess the level of implementation for the program requirements below according to the standards to the right.	**Developing** Investigate, Research, and Create	**Implementing** Formalize, Revise, and Publish	**Mature** Data-driven evaluation of effectiveness of program requirements	**Role Model** Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance.
5.5.A Promotes technologically proficient and scientifically literate students with highly developed academic vocabulary and STEM technical vocabulary.	☐	☐	☐	☐
5.5.B Graduates 21st Century literate students proficient in: English, reading, speaking, writing, numeracy, arts, health, sciences, and world languages; government, civics, history, and geography; environmental science; global awareness; information, communications, and media technology; financial, economic, business, and entrepreneurship.	☐	☐	☐	☐
5.5.C Selects appropriate STEM curriculum and culturally relevant instructional materials that foster widespread use of literacy strategies within the STEM curriculum.	☐	☐	☐	☐
5.5.D Provides opportunities for students to demonstrate the relevancy of the content through reading, writing, speaking, and presenting.	☐	☐	☐	☐

Benchmark 5: Curriculum, Instruction, and Assessment
Program Requirement: 5.6 Assessment

Example Artifacts

- Data informs instruction, plan for gaps and extension
- Curriculum aligned with standards, STEM, industry, and higher education
- Formative, diagnostic, & summative assessments, lesson redesign
- Student artifact reflection is used to inform diagnostic tools and processes
- Pre/post tests, cumulative folders, parent conferences, parent portal, student learning logs
- Student benchmark learning logs with goals
- Pre-assessments/ post-assessments, course offerings for interventions, grades, end of course exams, student presentations, narrative assessments, oral assessments, product based assessment

- IGPs, progress reports, student information sheets, home visits, PEIMS info, call logs, counseling schedule/visits
- Student designed projects, project rubrics, peer reviews, panel reviews, adult/expert reviews
- Project lists knowledge & skills, 21st century skills and levels of skill mastery; course syllabus provides list of performance-based assessments; PD for teachers on developing PBLs

In Benchmark 5, all program requirements are scored individually. There are no separate metrics. Assess the level of implementation for the program requirements below according to the standards to the right.	**Developing** Investigate, Research, and Create	**Implementing** Formalize, Revise, and Publish	**Mature** Data-driven evaluation of effectiveness of program requirements	**Role Model** Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance.
5.6.A Uses diagnostic, ongoing, and vertically and horizontally aligned formative and summative assessments for all students to drive instructional decisions.	☐	☐	☐	☐
5.6.B Uses state and national standards, college and career readiness standards, industry standards, and STEM program requirements to develop common benchmark assessments.	☐	☐	☐	☐
5.6.C Employs student readiness assessments or diagnostics to identify and address gaps in learning.	☐	☐	☐	☐
5.6.D Tracks and reports student progress using student information systems.	☐	☐	☐	☐
5.6.E Uses performance-based assessments that allow students to demonstrate their understandings of STEM concepts.	☐	☐	☐	☐

Benchmark 6: Strategic Alliances

Program Requirement: 6.1 Parent and/or Family Participation

6.1.A	Includes in the Annual Action Plan a school/family/student partnership plan that is culturally responsive in reflecting the needs and demographics of the student population.
6.1.B	Provides opportunities to educate students/parents on STEM Academy expectations such as parental engagement, college connections, scholarship opportunities, mentorships, etc.
6.1.C	Establishes multiple pathways of parental communication with the Academy such as regularly scheduled parent conferences, newsletters, websites, campus visits, etc.
6.1.D	Provides opportunities for parents to share responsibility for high student performance and school decision making.

Example Artifacts

- Documents in Spanish and English
- Service learning and field projects for students and families, culturally responsive pedagogy
- Schedule of parental involvement events
- Parent Sessions and # attending (college readiness, financial aid, rigor, careers etc.)
- Parent conferences, website hits, satisfaction surveys

Developing	Implementing	Mature	Role Model
1. Develops family engagement plans.	1. Family engagement plans developed to include monitoring schedules, checklists, and evaluation criteria.	1. Engagement planning is conducted and reviewed annually. Revisions are included in AAP.	1. Engagement plans are continuously assessed and metrics data is used to validate performance. Corresponding actions are implemented to correct deficiencies in performance.
2. Minimal strategic communications with parents and families.	2. Regularly scheduled distribution of communications is planned and presented to key stakeholder groups.	2. Strategic communications are timely and and are developed ad hoc as conditions warrant. Key messages are presented by leadership emphasizing the importance of the communication to the intended audiences, via community town halls, PTO meetings, advisory board meetings, and school board presentations.	2. Real time communications are evident via communications technologies such as websites, newsletter articles, and media presentations using the community's public service forums, (public television and radio. Leadership is easily accessible and continuously engages partnerships with stakeholders in community and student families.
3. Minimal parent participation on school committees and leadership positions.	3. Parent participation is encouraged and actively visible via parent volunteer activities within the school (teacher aids, booster club leadership, etc.).	3. Parents participate as key stakeholders and leaders in Academy in diverse areas, such as school support functions, academics, and extracurricular activities.	3. Parent participation is an integral component of Academy operations. Parents take leadership roles and participate in school committees and teams. Transparency and accountability of operations is vetted through parent partnerships with Academy leadership.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing and Mature*

Benchmark 6: Strategic Alliances
Program Requirements: 6.2 Business and School Community
6.3 Institutions of Higher Education
6.4 Communication with Alliance Members and Stakeholders

6.2.A	Identifies and secures key business, industry, and community partners to support STEM Academy efforts (mentorships, service learning projects, etc.).
6.2.B	Develops, implements, monitors, evaluates, and revises AAP to introduce, inform, and engage business and community partners.
6.2.C	Identifies and secures key business and industry partners to provide STEM-related job shadowing, internships, and externships for students and teachers.
6.3.A	Develops a Memorandum of Understanding (MOU) for dual credit.
6.3.B	Creates with higher education partners innovative pathways for students to obtain college credit (online resources, virtual courses, distance learning, shared professor, etc.).
6.3.C	Develops crosswalk partnerships to support a college going culture and to provide STEM graduates access to college support services (college trips, college entrance aid, GEAR UP and P-20 initiatives).
6.3.D	Develops, implements, monitors, evaluates, and revises AAP efforts with institutions of higher education.
6.4.A	Annual Action Plan provides opportunities for ongoing exchanges between Academy staff, design team, and stakeholders.
6.4.B	Informs alliance members and stakeholders of Academy success in promoting the STEM college and career pipeline by tracking Academy graduates' college and career experiences.

Example Artifacts

• Number of student/teacher internships, job shadowing, mentorships, externships, etc. • Marketing outreach plan and materials • Website info, discussion boards, podcasts, webinars, minutes, etc. • Dual credit MOU	• Agreements for crosswalk services with universities, campus visits, P-20 committee meetings, AAP for alliances • Student Tracking protocols and storing system for after high school MOUs, college credit course offerings

Developing	Implementing	Mature	Role Model
1. Initiates a few partnerships with business, community, and industry. 2. Initial contact made and some support is provided by higher education organizations. Some courses are available to enhance STEM curriculum integration. 3. Academy has a plan to track graduate students for college and career experiences.	1. Initial contact made and some support it provided by community business partners. Business and industry relationships are limited to onsite mentoring activities and some minor financial support. 2. Develops Higher Ed connections to facilitate MOUs, crosswalk plans, teacher mentors, and externships. 3. Academy coordinates student tracking efforts with TEA and Educate Texas.	1. Partnership with business and industry is formalized via established agreements. Outcomes and expectations are concrete and regularly reviewed. Partnership is evident by two-way communication of goals and vision as to what the STEM program provides. 2. Partnerships and MOUs with higher education communities is an integral component of Academy delivery model. 3. Academy utilizes a systemic tracking and reporting system to annually capture graduating student data both within-state and out-of-state.	1. Each major academic area is sponsored by corporate or community partners. Industry representation is a key component of the STEM strategic planning process. Integration of Academy students in business and community activities is visible. 2. College credit is given to STEM students upon completion of academic work sanctioned by accredited colleges. Admission rates for STEM students to IHE exceed the normalized rates for all students within the sponsor school system. 3. Academy tracks graduates for ten years and and regularly surveys graduates to analyze Academy's strengths and areas for improvement in order to successfully graduate students into the STEM college and career pipeline.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing and Mature*

Benchmark 7: Advancement and Sustainability
Program Requirements: 7.1 Strategic Planning
7.2 Continuous Improvement and Evaluation

7.1.A	Develops a 3-5 year strategic plan that aligns Academy mission and vision to STEM Blueprint Program Requirements (budget, year-by-year rollout of grade levels to be served, STEM pathways, projected staffing needs, instructional technology and resources, and appropriate facilities allocation through full enrollment).
7.1.B	Develops strategic plan in collaboration with design team, T-STEM Centers, T-STEM Network, T-STEM, District Personnel, etc.
7.1.C	Provides annual analysis, review, and revision of strategic plan and Annual Action Plan with key stakeholders.
7.1.D	Addresses sustainability in the strategic plan.
7.1.E	Plans and participates in opportunities to network and share experiences related to the school design and implementation process.
7.2.A	Annually reviews strategic plan and Annual Action Plan to ensure Academy meets high expectations across a broad range of performance measures as indicated by Academy mission and vision, and STEM Blueprint Program Requirements.
7.2.B	Annually reviews instructional and intervention plan to ensure continual growth on all of the required state accountability measures.
7.2.C	Develops internal indicators and checklists unique to the Academy to measure continuous improvement towards student performance goals and the state of the Academy.

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Example Artifacts

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• 3-5 year strategic plan • Annual Action Plan • Documents networking participation/leadership and number of staff participating • Log of participation in T-STEM network	• Protocols and timelines for review of strategic plan and AAP • Internal indicators and checklists to measure Academy's goal(s) attainment

Developing	Implementing	Mature	Role Model
1. Mission, vision, goals, objectives, and strategic plans, correspond with the operation of the Academy.	1. Strategic planning initiated and outline defined. Vision, goals, and metrics developed. Participates in networking opportunities.	1. Clear alignment of STEM planning activities in support of strategic plan. Vertical alignment of metrics in support of higher level objectives. Actionable metrics provide leading indicators of performance.	1. Routine and regular reviews and modifications of strategic plans based on changing variables. Responsive to environmental, political, and budgetary policy changes.
2. Develops continuous improvement processes/protocols with indicators and checklists.	2. Scheduled reviews of all processes and data for process improvement initiatives. Data collected to assess key areas requiring process improvement implementation.	2. Systematic approach to campus improvement and data collection which provides real time assessment of effectiveness.	2. Systematic school improvement and data collection are embedded in normal operations. Metrics are designed as leading indicators of trends and for analysis and identification of areas in need of immediate improvement. The majority of processes are measured and reviewed for program accountability and effectiveness.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing and Mature*

Benchmark 7: Advancement and Sustainability
Program Requirements: 7.3 Sustainability and Growth
7.4 Program Advancement

7.3.A	Maintains a fiscally responsible balanced budget.
7.3.B	Ensures that strategic plan and Annual Action Plan addresses the commitment of the Academy to continually invest in professional development for personnel (STEM pedagogy, best practices in teaching and learning, innovative course development, etc.).
7.3.C	Develops a plan for sustaining the Academy beyond the grant funding period to include strategic pursuit of additional grant opportunities
7.3.D	Preserves the components of the small learning community (student voice, PLC for staff, parent/community/industry/higher education involvement, etc.).
7.4.A	Develops Academy grant writing initiatives with universities, T-STEM centers, industry, etc.
7.4.B	Works with universities, T-STEM centers, IHEs to validate effectiveness of Academy's innovative curriculum, instruction, and assessment as evidenced by student readiness for college, career, and STEM industry.

Example Artifacts

- Budget/audit report developed and reviewed by campus leadership team
- Log of grant writing initiatives and success rate
- Strategic plan and Annual Action Plan allocate resources to remain a SLC
- Documentation of input and review by external experts of curriculum, instruction, assessment, resources, etc.
- Resources set aside for continuous professional development (e.g. time, funds, peer observations, etc.)

- Logs of professional development and results/changes
- Campus centered protocols and processes for budget requests, review, and allocations
- Plans for annual Academy growth, staffing, facilities, budget, etc.

Developing	Implementing	Mature	Role Model
1. Maintains a balanced budget.	1. Guidance relating to the alignment of program budget requirements, strategic goals, actual costs, and performance outcomes.	1. Integration of planning and performance in all phases of the budget formulation and execution process.	1. Standardized processes and data continually adjust and align budget, planning, and results information to mission and goals.
2. Develops contacts for alternative funding sources such as grants and other monetary awards.	2. Grants and other sources of funding are acquired for near term requirements.	2. Systematic and continuing sources of funding identified and reacquired from year to year. Long term grants and funding sources documented and programmed into out-year funding allocations.	2. Funding of Academy activities is normalized and additional funding of new and changing requirements is regularly documented and acquired using a standardized approach.
3. Grant applications and grant writing professionals are included in the staff of STEM academy.	3. Grants are an integral funding source for STEM operations. Ad hoc applications submitted to meet funding needs.	3. Long term grants and other funding implements secured and managed via budget funding applications. Renewal of funding programs is systematic and included as permanent line items in district funding documents.	3. Grants are routinely provided to the STEM academy based on past performance and excellence in delivery of services. Complex grant justification process is easily managed and success rate for awards applied for is very high.
	And meets criteria from Developing	*And meets criteria from Developing and Implementing*	*And meets criteria from Developing, Implementing, and Mature*