

2010

**Texas High School Project
T-STEM Initiative**



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

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The Texas High School Project funds the T-STEM initiative 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 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; and 7) academy advancement and sustainability.

The original T-STEM Academies Design Blueprint was written in 2005 and revised in 2008. During 2009-10, a task force comprised of T-STEM Coaches, T-STEM Center leaders, Texas High School Project and Texas Education Agency representatives revised the T-STEM Academies Design Blueprint and added rubrics and a glossary.

2009-10 Design Blueprint Revision Timeline

September 2009	<ul style="list-style-type: none"> • Task force formed • Stakeholder input gathered • Revision tasks and timeline developed at Dallas meeting.
November 2009	<ul style="list-style-type: none"> • Key writer, Jennifer Stotts, assigned • Task force met and to conduct gap analysis, identify glossary items, and gather input
November 2010 to February 2010	<ul style="list-style-type: none"> • First draft developed • First draft shared at Best Practices Conference in Lubbock
May 2010	<ul style="list-style-type: none"> • Feedback on first draft collected • Feedback incorporated into second draft • Pilot test with a sample of schools
June 2010	<ul style="list-style-type: none"> • Second draft shared at Leadership Conference in Dallas • Feedback collected via electronic response system at conference
Summer/Fall 2010	<ul style="list-style-type: none"> • Continued refining, and collection of feedback from stakeholders on subsequent versions of the blueprint

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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

Benchmark 2: T-STEM Culture

- 2.1.A Small school
- 2.1.G IGP with Texas Higher Education Coordinating Board (THECB) College and Career Readiness Standards
- 2.3.A Distinguished Graduation Plan
- 2.3.C Dual Credit and/or AP and/or IB
- 2.3.E MOU

Benchmark 3: Student Outreach, Recruitment, and Retention

- 3.1.A Marketing plan
- 3.2.A Open access/lottery
- 3.3.B Distinguished Graduation Plan

Benchmark 4: Teacher Selection, Development, and Retention

- 4.1.B Collaborative recruiting process for selecting highly qualified teachers
- 4.2.B Professional development model with continuous learning
- 4.2.C Teacher externships
- 4.3.B Common planning time within the structure of the school day

Benchmark 5: Curriculum, Instruction, and Assessment

- 5.1 Develops integrated STEM curriculum, assessment and instruction for the Academy
- 5.2 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

Benchmark 7: Academy Advancement and Sustainability

- 7.1 Budget/business plan
- 7.1 Five year strategic plan
- 7.2 STEM professional development

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

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 student with an individual STEM-focused graduation plan that addresses THECB College and Career Readiness standards and is regularly reviewed and revised with the student, counselor, 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 postsecondary 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 Develops a plan for student success on postsecondary entrance exams.
- 2.3.C Provides high-quality, college preparation for students and families.
- 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 underrepresented 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 Includes grades 6-12 or actively works with feeder middle or elementary schools to develop student interest in STEM education.
- 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 orientation session(s) and summer bridge program(s) to facilitate successful student transition into rigorous college-prep curriculum and a STEM focused classroom 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 Provides all students access and expectations to engage in purposeful school-sponsored activities.
- 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 postsecondary 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 postsecondary 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 Builds 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 cluster 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.

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- 5.1.D Supports and encourages all students to successfully complete four years of mathematics, four years of science, and four years of STEM electives in order to graduate college ready on the recommended or distinguished high school graduation plan.
- 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 Develops performance-based and project-based assessments aligned to these innovative programs and state/national/industry standards.
- 5.2.C 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.
- 5.2.D Incorporates into the curriculum work-based, contextual learning with a global perspective.
- 5.2.E Participates in extracurricular academic activities centered on science, technology, engineering, and mathematics.
- 5.2.F Requires all students to complete an internship, and/or a STEM-related senior capstone project, presentation, and defense primarily focused in the state's STEM-related economic development clusters (biotechnology, engineering, photonics, biomedical, etc.).

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 instructional 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 rich culture that incorporates a 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; and 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 innovative pathways with higher education partners for students to obtain college credit, such as online resources, virtual courses, distance learning, shared professor, etc.).

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- 6.3.C Develops 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 develops 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.



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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 and Vision					
1.1.A Mission-Driven Leadership	D	I	I	M	R
1.1.B Mission-Driven Leadership	D	I	I	M	R
1.2.A-C Leadership and Governance	I	I	M	M	R
1.2.D-G Leadership and Governance		D	I	M	R
1.3.A-B Program Review and Evaluation		D	I	M	R
Benchmark 2: STEM Academy Culture and Design					
2.1.A-C Personalization	D	I	M	R	R
2.1.D-F Personalization	D	I	M	M	R
2.2. Culture	D	I	M	R	R
2.3. Postsecondary Success (College and Career)		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	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	D	D	I	M	R
4.3 Teacher Retention	D	I	I	M	R
Benchmark 5: Curriculum, Instruction, and Assessment					
5.1 Rigor	D	D	I	I	M
5.2 STEM-focused Curriculum	D	D	I	I	M
5.3 Instructional Practices	D	I	I	M	R
5.4 STEM Education Integration	D	I	M	M	R
5.5 Literacy	D	I	M	M	R
5.6 Assessment	D	I	M	R	R
Benchmark 6: Strategic Alliances					
6.1 Parent and/or Family Participation	D	I	M	M	R
6.2-6.3 Business and School Community; Institutions of Higher Education	D	D	I	M	M
6.4 Communication with Alliance Members and Stakeholders					
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

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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	
<ul style="list-style-type: none"> Written mission and vision statement 		<ul style="list-style-type: none"> 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
<ol style="list-style-type: none"> Mission/vision is developed by end of planning period, and aligned with T-STEM Blueprint. Mission and vision is sometimes used in the decision making process. Mission and vision is known by all staff. Mission and vision is scheduled to be reviewed for improvement. 	<ol style="list-style-type: none"> Mission and vision is aligned to T-STEM and developed with input from some stakeholders. Some relevant data indicate that the mission and vision are being used in the decision-making process. Mission and vision is posted on website and is known by some key stakeholders. The Academy has started to evaluate its use of the mission and vision in the decision-making process. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> Mission and vision is aligned with T-STEM and is developed with input from many key stakeholders. Many relevant data indicate that the mission and vision are being used regularly in the decision-making process. Mission and vision is posted on website and marketing materials, and many leadership, staff, parents, and students can articulate mission and vision. The Academy regularly evaluates its use of the mission and vision in the decision-making process and may make some as a result. <p style="text-align: center;"><i>And meets criteria from Implementing</i></p>	<ol style="list-style-type: none"> Mission and vision is aligned with T-STEM and is developed and reviewed with all key stakeholders. An effective comparison data gathering process is in place to collect information best performing similar organizations support strategic mission-driven decision-making in all seven benchmarks. Nearly all leadership, staff, parents, and can articulate key tenets of the and vision that is posted throughout the Academy, website, and marketing materials. The Academy regularly evaluates its use of the mission and vision in the decision-process and makes ongoing improvements. <p style="text-align: center;"><i>And meets criteria from Implementing and Mature</i></p>

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Benchmark 1: Mission-Driven Leadership			
Program Requirement 1.1 Mission and Vision			
1.1.B Develops and incorporates <i>an Annual Action Plan</i> (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	
<ul style="list-style-type: none"> • AAP incorporated into Campus/School improvement plan 		<ul style="list-style-type: none"> • 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
<ol style="list-style-type: none"> 1. AAP is developed with minimal input from key stakeholders. 2. AAP addresses STEM-literacy or a few of the T-STEM benchmarks. 3. AAP is sometimes used in the -making process. 4. AAP is occasionally monitored or assessed. 5. Mission has some specific and measurable goals. 	<ol style="list-style-type: none"> 1. AAP is developed with input <i>some</i> key stakeholders. 2. AAP defines STEM literacy and addresses <i>many</i> of the T-STEM benchmarks. 3. <i>Some</i> relevant data indicates that the AAP is being used in the -making process and is shared with <i>some</i> key stakeholders. 4. The Academy has started to evaluate its use of the AAP in the decision-making process. 5. Mission has specific and measurable goals. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. AAP is developed with input from <i>many</i> key stakeholders. 2. AAP defines STEM literacy and <i>most</i> of the T-STEM benchmarks. 3. <i>Many</i> relevant data indicate that the AAP is being used <i>regularly</i> in the decision-making process and is shared with <i>many</i> key stakeholders. 4. The Academy <i>regularly</i> evaluates its use of the AAP in the decision-making and <i>may</i> make some changes as a result. 5. Mission goals are measured for results. <p style="text-align: center;"><i>And meets criteria from Implementing</i></p>	<ol style="list-style-type: none"> 1. AAP is developed and reviewed with input <i>all</i> key stakeholders. 2. An effective comparison data gathering is in place to collect information best performing similar organizations operationalize STEM literacy and <i>all seven T-STEM benchmarks</i> . 3. AAP evaluation column is updated <i>quarterly</i> to indicate progress and is shared with <i>all</i> key stakeholders. 4. The Academy regularly evaluates its use of the AAP in the decision-making process and makes <i>ongoing</i> improvements. 5. Conducts an Annual <i>SWOT</i> analysis of mission and goal attainment. <p style="text-align: center;"><i>And meets criteria from Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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

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| <ul style="list-style-type: none"> • Job descriptions and roles for DT, LT, and AB • Minutes/action items from meetings of the DT, LT, and AB • Signatures & roles/titles sign off on AAP • Annual turnover rates in DT & LT • Lists of subcommittees, such as student, parent, IHE, facilities, outreach/partnerships • Frequency of meetings | <ul style="list-style-type: none"> • 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 |
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Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Design Team (DT) established. 2. Leadership Team (LT) established. 3. Advisory Board (AB) established. 4. Some evidence of fidelity to implementation. 	<ol style="list-style-type: none"> 1. DT positions identified with all roles defined and aligned with 7 T-STEM Benchmarks. 2. LT positions identified with all defined. 3. AB positions and subcommittees are identified. 4. DT, LT, AT meeting dates are regularly scheduled with majority attendance. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. DT positions filled, and DT has developed 1 year AAP. 2. LT is a high performing team with effective communication measures and aligned to mission and vision. 3. AB develops innovative and creative approaches to support Academy mission vision. 4. DT and LT develop policies and to build and manage STEM knowledge assets. <p style="text-align: center;"><i>And meets criteria from Implementing</i></p>	<ol style="list-style-type: none"> 1. DT seeks input from key stakeholders. 2. Monitoring mechanism in place to evaluate of internal and external leadership roles. 3. AB addresses major shifts in STEM, educational standards, industry expectations, and analyzes SWOT of Academy, resulting in measurable action items. 4. DT and LT receive performance evaluations fidelity to T-STEM blueprint implementation. <p style="text-align: center;"><i>And meets criteria from Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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 a mission-driven decision-making structure and organizational 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).

Key Element for Success		Example Artifacts	
<ul style="list-style-type: none"> Organizational chart with responsibilities. 		<ul style="list-style-type: none"> 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
<ol style="list-style-type: none"> Annual Action Plan minimally participation of distributed leadership. Academy creates a decision-making organizational chart that, at a minimum, addresses the autonomy of the Academy leader. Decisions are researched and validated with some data. 	<ol style="list-style-type: none"> Students, teachers, and key stakeholders have voice in the organization. A clear organizational chart delineates authority for budget, facilities, personnel, etc. Data sources are clearly identified such as TAKS (passing/commended), PSAT, AYP, Accuplacer, RTI, TPM, surveys, benchmarks, leaver codes, and attendance. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> Process, protocols, and documentation support capturing customer voice. Clear processes are in place to apprise key stakeholders of Academy decision-making structures and organizational chart. Students, teachers, parents, and staff participate in setting and reflecting on individual student and overall AAP goals. <p style="text-align: center;"><i>And meets criteria from Implementing</i></p>	<ol style="list-style-type: none"> Customer voice processes are proactive and continuously innovative to capture unstated and anticipated requirements, expectations, and desires. Academy’s decision-making protocols demonstrate integrity, ethics, honoring of voice, diversity, engagement, and striving for daily performance excellence. Data sources include tracking of value-added education via vertical scale scores, etc. <p style="text-align: center;"><i>And meets criteria from Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

Benchmark 1: Mission-Driven Leadership			
Program Requirement: 1.3 Program Review and Evaluation			
<p>1.3.A Integrates and assesses the level of mission-driven and data-driven decision making evident in the daily work of the Academy.</p> <p>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.</p>			
Key Element for Success		Example Artifacts	
<ul style="list-style-type: none"> Mission is posted and can be articulated by teachers, staff, students, key stakeholders, etc. 		<ul style="list-style-type: none"> 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 indicating 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
<p>1. Little or no evidence of data-driven and mission-driven decision making.</p> <p>2. Little or no process for program review.</p>	<p>1. Data is used to design student interventions, Annual Action Plan (AAP), and to inform teaching and learning aligned to the mission.</p> <p>2. Student, teacher, and Academy goals are aligned to mission with checklists and protocols to review for alignment.</p> <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<p>1. Teachers work interdependently as teams to review data across content, develop targeted interventions, and develop common formative assessments.</p> <p>2. Academy adopts a reflective culture incorporating multiple metrics to regularly evaluate overall, team level, and individual success in achieving program goals.</p> <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<p>1. The Academy’s continual analysis of results for improvement is critical to the school’s system of interventions and culture of celebration.</p> <p>2. Academy implements a well-developed, systematic review process, involving formative and summative data, to ensure that results align with the Academy mission (resource allocation, curriculum pathways, instructional strategies, resources, marketing, outreach, professional development, goals, etc.).</p> <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

Benchmark 1: Mission-Driven Leadership

Program Requirement: 1.4 Leadership Development and Collaboration

- 1.4.A** 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.B** Participates in the T-STEM Network by collaborating with other T-STEM Academies, utilizing T-STEM Centers’ resources, and promoting broad dissemination and adoption of promising practices to improve student achievement.
- 1.4.C** Actively participates in leadership development opportunities available through the T-STEM Network.

Key Element for Success		Example Artifacts	
<ul style="list-style-type: none"> • MOUs with T-STEM Centers 		<ul style="list-style-type: none"> • Academy submissions to the T-STEM newsletter • Academy member attendance at T-STEM conferences • 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 (PDIS, technical assistance, student internships, etc.) 	
Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Some members of the Leadership team occasionally attend T-STEM leadership conferences and cluster meetings. 2. Academy leadership occasionally collaborates with T-STEM Centers and T -STEM Coaches. 	<ol style="list-style-type: none"> 1. Several members of the Leadership Team participate in a regular basis at the T-STEM leadership conferences and cluster meetings. 2. Academy leaders and staff collaborate with T-STEM Centers and Coaches to integrate STEM teacher preparation, teaching, and learning. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Academy members regularly share best practices at T-STEM conferences and cluster meetings, as well as through the T-STEM portal and newsletter. 2. Academy plans with regional T-STEM Center (at least quarterly) and meets with their T-STEM Coach monthly (at least). <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Academy members regularly network with other T-STEM Academies to share best practices and improve student achievement. 2. Academy dialogues on a regular, ongoing basis with T-STEM Centers and Coaches, and utilizes available T-STEM resources to improve student achievement and teacher preparation. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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 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	
<ul style="list-style-type: none"> • Student IGPs w/ CCRS • Master schedule for advisory • Student enrollment 		<ul style="list-style-type: none"> • 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
<p>1. District and Academy resources are allocated to ensure teaching staff and facilities remain small.</p> <p>2. Student advisory is regularly scheduled and focuses on relationships, building school capital, developing, and fostering global literacy.</p>	<p>1. Annual Action Plan and Academy handbook address plan for maintaining personalized, small, learning communities.</p> <p>2. Advisory class has written curriculum with goals, expectations, scope, sequence, and pacing guides.</p> <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<p>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.</p> <p>2. Teachers work in teams to develop systemic advisory programs with horizontally and vertically aligned student outcomes.</p> <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<p>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.)</p> <p>2. Annual resources are allocated to develop, revise, and sustain advisory program with input from students, teachers, parents, and external partners.</p> <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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 student with an individual STEM-focused graduation plan (IGP) (upon entering the T-STEM Academy) that addresses THECB College and Career Readiness Standards, and is regularly reviewed and revised with the student, counselor, and family.

Example Artifacts

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| <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • IGP, record folder/portfolio, 6th-14th course plan • Master schedule, tutoring schedule • Minutes/action items from site based committees, etc. • Website showcasing student work |
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Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Academy develops a flexible schedule that supports student success. 2. Academy regularly schedules for students to share their knowledge and work products. 3. Academy develops IGP for each student that addresses STEM pathways, THECB College and Career Readiness Standards. 	<ol style="list-style-type: none"> 1. Schedule is developed with input from teachers, counselors, content coaches, extracurricular and internship/capstone requirements. 2. Students participate in panel presentations, debates, academic fairs, webinars, online challenges, competitions, design challenges, etc. 3. Student, counselor, and family regularly review and revise the IGP to address student goals for courses, grades, college entrance exams, PSAT/ACT/SAT, career aspirations, etc. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Teachers work in teams to adjust daily schedule to facilitate interdisciplinary PBL. 2. Resources are allocated to provide students with opportunities to participate in state and national forums, conferences, and competitions. (financial, facilities, staffing, transportation, etc.). 3. Annually reviews and revises IGP according to previously established protocols and timelines. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Schedule is adjusted to meet student needs according to data, student, teacher, and parent voice; intervention and extension plans. 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. Mentors are assigned to students to develop intervention contracts to address deficiencies or acceleration opportunities in IGP. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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

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| <ul style="list-style-type: none"> • 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” | <ul style="list-style-type: none"> • 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 |
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Developing	Implementing	Mature	Role Model
<p>1. Handbook is developed to address, student, parent expectations and a culture of respect, responsibility and trust.</p> <p>2. Professional Learning Community (PLC) is developed which supports staff devoting effort, energy, time, and resources into incorporating valuable new strategies into their practice.</p>	<p>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.).</p> <p>2. An inquiry-based continuous improvement orientation to practice is pervasive, with data informing practice and learning widely shared.</p> <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<p>1. Handbook is developed with input from key stakeholders with clear policies, procedures, and consequences (attendance, discipline, student contracts, teacher extended days, etc.).</p> <p>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.</p> <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<p>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.</p> <p>2. A desire to do the best for <i>all</i> 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.</p> <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

Benchmark 2: T-STEM Academy Culture and Design

Program Requirement: 2.3 Postsecondary Success (College and Career)

- 2.3.A** Prepares students who graduate for postsecondary level coursework and careers in science, technology, engineering, and mathematics through the integration of the Governor’s economic workforce clusters and Achieve Texas STEM clusters: 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** Develops a plan for student success on postsecondary entrance exams.
- 2.3.C** Provides high-quality, college preparation for students and families.
- 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		
<ul style="list-style-type: none"> • Schedule that reflects dual credit/AP/IB courses • STEM focused course pathways 	<ul style="list-style-type: none"> • 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 • Number and 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 • Governor’s economic workforce clusters and/or Achieve Texas STEM clusters included in course pathways • Number and percentage of students on target to graduate under the distinguished graduation plan 		
Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Develops plan to ensure student success in high school to college transition. 2. Partners with higher education and other organizations to offer at least 12-30 college credits. 	<ol style="list-style-type: none"> 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, THEA, etc. 2. Develops school-wide tiered intervention support structures to ensure all students graduate with 12-30 college credit hours. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Systemic and ongoing efforts to develop the college navigation capital of Academy students, parents, and families. 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. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Partners with industry and higher education to continually evaluate and improve course offerings and curriculum to ensure students graduate ready for postsecondary success and careers in STEM related fields. 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. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

Benchmark 3: Student Outreach, Recruitment, and Retention

Program Requirements: 3.1 Recruitment and 3.2 Open Access

- 3.1.A** Develops structures and processes for marketing and recruitment to encourage participation from underrepresented 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** Includes grades 6-12 or actively works with feeder middle or elementary schools to develop student interest in STEM education.
- 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 Element for Success	Example Artifacts
<ul style="list-style-type: none"> • Written admission policy and application with lottery explained 	<ul style="list-style-type: none"> • Recruitment schedule and locations (schools, churches, community centers, etc.) • Brochures and marketing items • Brochures and marketing in Spanish, English 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

Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 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. 2. Academy has at least 50% economically disadvantaged and underrepresented students, via an open, lottery based admission policy, where the application <i>does not</i> include requirements that might deter students such as TAKS, grades, teacher recommendation, discipline, or attendance. 	<ol style="list-style-type: none"> 1. Marketing and recruitment plan developed with input from key stakeholders, and targets feeder pattern, community needs, and cultural relevance. 2. Clearly communicated admission policy that indicates target enrollment goals and implements support processes structures such as transportation, child care, etc. to meet goals. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Marketing plan highlights Academy’s STEM pathways, industry, and higher education partners. Recruitment efforts include Academy staff, students, and parents. 2. Academy tracks enrollment data and indicates some increases in recruitment/enrollment rates. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Students and staff from Academy collaborate with feeder schools to develop, deliver, and monitor recruitment results from STEM crosswalk engagement lessons that are conducted at the feeder middle schools. 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. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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 orientation session(s) and summer bridge program(s) to facilitate successful student transition into rigorous college-prep curriculum and a STEM focused classroom environment.
- 3.3.C** Provides all students with opportunities and the expectation to assume roles of leadership and responsibility within the classroom, Academy, and community.
- 3.3.D** Provides all students access and expectations to engage in purposeful school-sponsored activities.
- 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

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| <ul style="list-style-type: none"> • Student, parent, staff contracts • Student retention and persistence plan • Orientation and bridge agendas • Lists of clubs, service learning projects, and planned competitions • Exit interviews | <ul style="list-style-type: none"> • IGP's 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. |
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Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Academy develops a strategic plan for student retention and persistence, and maintains persistence rates above 70%. 2. Academy develops student orientation/summer bridge program(s), student clubs, and plans for external activities and competitions. 3. Students can select from a small number of leadership opportunities available. 4. Academy creates STEM Academy orientation for parents and stakeholders. 	<ol style="list-style-type: none"> 1. Student persistence rates range between 70-80% and the strategic plan addresses research-based supports such as annual IGP review parental involvement, tiered interventions, and cultural relevance. 2. The orientation/summer bridge program sets priorities and includes a timeline with skills, tools, and resources students need to successfully transition to a STEM environment. 3. The staff encourages students to select leadership opportunities. 4. Opportunities exist for parents and stakeholders to participate in service learning, and/or attend student presentations. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 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. 2. The orientation/summer bridge program is implemented as planned and continually refined annually, with a complete scope and sequence and supporting materials. 3. The staff tracks student involvement in leadership activities and develops interventions for students who have minimally participated. 4. Bi-annual (at least) opportunities exist for parents and stakeholders to participate in STEM activities. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Campus engages in ongoing dialogue to address persistence data (lack of course credit, leaving the Academy) and uses data to adjust recruitment and support efforts to ensure persistence rates above 90%. 2. The orientation/summer bridge program monitors initial student success, identifies struggling students early on, and ensures those students have additional support. 3. Student leadership is evidenced in nearly every non-classroom related initiative or event and leadership is evenly distributed throughout the student body. 4. Annual parent and stakeholder participation goals are developed and monitored for continued improvement. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

Benchmark 4: Teacher Selection, Development, and Retention

Program Requirement: 4.1 Highly Qualified Teachers

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

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| <ul style="list-style-type: none"> Written recruiting plan Interview questions and rubrics Academy has hiring authority (is not required to hire from pool unless best candidate) Advertisement for positions (STEM listservs, social networking sites etc) Interview panel consists of staff, key stakeholders, etc. Teacher turnover rates | <ul style="list-style-type: none"> Needs assessment Evaluation results of recruiting measures Feedback from candidates regarding interview process Teacher effectiveness surveys from students, peer staff, administrators, and parents Student achievement and school participation numbers (clubs, competitions, etc.) per teacher |
|--|---|

Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Academy has authority to hire “best” qualified for goals of the Academy and STEM blueprint requirements. 2. Academy develops a collaborative interview process. 3. Job descriptions are developed for all positions serving the Academy. 	<ol style="list-style-type: none"> 1. Develops a written plan for creative recruiting to ensure highly qualified, effective teachers. 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. 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. <p style="text-align: center; font-style: italic;">And meets criteria from Developing</p>	<ol style="list-style-type: none"> 1. Develops annual needs assessment and actively implements a teacher recruitment and placement program. 2. Collaborative interview includes outside stakeholders such as the T-STEM Coach. 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. <p style="text-align: center; font-style: italic;">And meets criteria from Developing and Implementing</p>	<ol style="list-style-type: none"> 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. Evaluates effectiveness of recruitment practices to ensure highly qualified, effective teachers. 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. <p style="text-align: center; font-style: italic;">And meets criteria from Developing, Implementing and Mature</p>

Texas Science, Technology Engineering and Mathematics

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** Builds teacher and administrator expertise in developing, teaching, learning, and assessing STEM cross-content curriculum.

Example Artifacts

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| <ul style="list-style-type: none"> • PD plan • Coach job descriptions, calendar of trainings • Professional Learning Community • Vertical planning dates/outcomes | <ul style="list-style-type: none"> • 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
<ol style="list-style-type: none"> 1. Develops PD plan with clear pedagogy expectations, aligned with mission goals, teacher needs, and student needs. 2. Develops a PLC plan that identifies ways in which teachers will work in collaborative teams to build shared knowledge and formative/summative data. 3. Teacher/Student Support: Coaches motivate and support instruction and curriculum development aligned to Academy mission and vision. 	<ol style="list-style-type: none"> 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. 2. Teachers collaboratively develop common essential student outcomes which reflect their efforts to build shared knowledge regarding best practice, (STEM integration, college and career readiness, 21st century skills,). 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. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Needs assessment and PD plan address teacher and student retention to include teacher, student, and parent voice in decision-making process. 2. Teachers collaboratively clarify the criteria they use to judge quality of student work and criteria is consistently applied horizontally and vertically. 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.). <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Meaningful partnerships with external organizations ensure progressive expectations for educators' application of content knowledge, curriculum design, and delivery. 2. Teachers participate in externships and mentorships with higher education and industry. PLC plan is annually monitored, evaluated, and revised for effective practice. 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. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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 cluster meetings, contribute to T-STEM newsletter, and populate Academy press releases).

Key Element for Success		Example Artifacts	
<ul style="list-style-type: none"> • Master schedule with common planning time 		<ul style="list-style-type: none"> • 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 PDI trainings and convenings • Needs assessment and individual PD plans • Evidence of variety of instructional strategies adapted to student needs • Teacher mentoring 	
Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Incentive plan with teacher input regarding flexible schedule, innovative instruction, and release time. 2. Common planning time within the school day focuses on PLC collaboration. 3. Develops an orientation plan aligned to Academy mission and vision, and teacher enculturation. 	<ol style="list-style-type: none"> 1. Retention plan addresses teacher voice in ongoing, job-embedded development to improve teacher content knowledge, technology integrated instruction, integrative STEM pedagogy, college and career readiness standards, instructional strategies, and leadership capacity. 2. Teams develop team-time norms, set goals, and evaluate effective use of team-time for curriculum development, student artifact reflection, parental involvement, etc. 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. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Partnerships with industry and higher education facilitate staff leadership capacity and align instructional strategies to ensuring a successful P-20 pipeline. 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. 3. Induction process is clearly enunciated, consistently practiced, and evaluated and revised for effectiveness. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Incentive plan supports T-STEM education efforts (journal articles, conference presentations, attend T-STEM PDI trainings and cluster meetings, contribute to T-STEM newsletter, and populate Academy press releases). 2. Collaborative school-level planning is judged effective as evidenced by student learning outcomes. 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. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

Benchmark 5: Curriculum, Instruction, and Assessment

Program Requirement: 5.1 Rigor

Example Artifacts

<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Student portfolios, IGPs, counseling, advising, college crosswalk, and feedback loop • Plans for PSAT, Accuplacer, CTE, interventions, etc. • Horizontal and vertical alignment of curriculum 			
<p><i>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.</i></p>	<p style="text-align: center;"><u>Developing</u> Investigate, Research, and Create</p>	<p style="text-align: center;"><u>Implementing</u> Formalize, Revise, and Publish</p>	<p style="text-align: center;"><u>Mature</u> Data-driven evaluation of effectiveness of program requirements</p>	<p style="text-align: center;"><u>Role Model</u> Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance</p>
<p>5.1.A Aligns curriculum, instruction, and assessment (such as, but not limited, THECB CCRS, national and state standards, content, context, culture, cognitive level, competencies, skills, processes, 21st century skills, and STEM synthesis).</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>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.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.1.C Develops an assessment and intervention plan to address gaps in student achievement and areas for extension.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.1.D Supports and encourages all students to successfully complete four years of mathematics, four years of science, and four years of STEM electives in order to graduate college ready on the recommended or distinguished high school graduation plan.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.1.E Offers dual credit, articulated concurrent enrollment, AP or IB courses that all students will graduate with 12-30 college credit hours.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>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).</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texas Science, Technology Engineering and Mathematics

Benchmark 5: Curriculum, Instruction, and Assessment

Program Requirement: 5.2 STEM-focused Curriculum

Example Artifacts

<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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)
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<p><i>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.</i></p>	<p><u>Developing</u> Investigate, Research, and Create</p>	<p><u>Implementing</u> Formalize, Revise, and Publish</p>	<p><u>Mature</u> Data-driven evaluation of effectiveness of program requirements</p>	<p><u>Role Model</u> Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance</p>
<p>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.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.2.B Develops performance-based and project-based assessments aligned to these innovative programs and state/national/industry standards.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.2.C 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.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.2.D Incorporates into the curriculum work-based, contextual learning with a global perspective.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.2.E Participates in extracurricular academic activities centered on science, technology, engineering, and mathematics.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.2.F Requires all students to complete an internship, and/or a STEM-related senior capstone project, presentation, and defense focused in the state's STEM-related economic development clusters (biotechnology, engineering, photonics, biomedical, etc.).</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texas Science, Technology Engineering and Mathematics

Benchmark 5: Curriculum, Instruction, and Assessment				
Program Requirement: 5.3 Instructional Practices				
Example Artifacts				
<ul style="list-style-type: none"> Peer observations, mentors, cross-curricular teams Walkthroughs, observations, model lessons Data informs scaffolding, reteaching, 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. 	<ul style="list-style-type: none"> 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 			
<i>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.</i>	<u>Developing</u> Investigate, Research, and Create	<u>Implementing</u> Formalize, Revise, and Publish	<u>Mature</u> Data-driven evaluation of effectiveness of program requirements	<u>Role Model</u> Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance
5.3.A Incorporates data-driven instruction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3.B Creates an environment for shared teacher responsibility and accountability for student learning across programs, content areas, and classrooms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3.C Organizes instructional 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3.D Ensures teachers' use of the aligned scope and sequence and integration across the disciplines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3.F Provides opportunities for students to exercise choice and voice within a relevant and rigorous context.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texas Science, Technology Engineering and Mathematics

Benchmark 5: Curriculum, Instruction, and Assessment

Program Requirement: 5.4 STEM-Education Integration

Example Artifacts

<ul style="list-style-type: none"> • PBL - Project Based Learning • Systemic expectations for number of presentations per class, documentation of students presenting to internal and external panels 	<ul style="list-style-type: none"> • Design teams, group projects, multiage projects, simulations, robotics teams, green teams, • Project scenarios based on real-world issues, (Future City, FIRST, Odyssey of the Mind, etc.) 			
<p><i>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.</i></p>	<p style="text-align: center;"><u>Developing</u> Investigate, Research, and Create</p>	<p style="text-align: center;"><u>Implementing</u> Formalize, Revise, and Publish</p>	<p style="text-align: center;"><u>Mature</u> Data-driven evaluation of effectiveness of program requirements</p>	<p style="text-align: center;"><u>Role Model</u> Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance.</p>
<p>5.4.A Promotes instructional strategies that challenge students to think critically, innovate and invent to solve real-world, contextual problems.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>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.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.4.C Offers standards-based STEM programs that incorporate integrative STEM literacy and innovative instructional tools.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>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.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.4.E Promotes a rich culture that incorporates a natural use of current technologies to enhance instruction, curriculum, teaching, and learning, and STEM literacy.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texas Science, Technology Engineering and Mathematics

Benchmark 5: Curriculum, Instruction, and Assessment				
Program Requirement: 5.5 Literacy				
Example Artifacts				
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> STEM focused strategies and activities such as word walls, student journals, literature circles, mock trials, student forums, 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 			
<i>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.</i>	<u>Developing</u> Investigate, Research, and Create	<u>Implementing</u> Formalize, Revise, and Publish	<u>Mature</u> Data-driven evaluation of effectiveness of program requirements	<u>Role Model</u> 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.B Graduates 21 st 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; and financial, economic, business, and entrepreneurship.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.C Selects appropriate STEM curriculum and culturally relevant instructional materials that foster widespread use of literacy strategies within the STEM curriculum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.D Provides opportunities for students to demonstrate the relevancy of the content through reading, writing, speaking, and presenting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texas Science, Technology Engineering and Mathematics

Benchmark 5: Curriculum, Instruction, and Assessment				
Program Requirement: 5.6 Assessment				
Example Artifacts				
<ul style="list-style-type: none"> 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 Pre-assessments/ post-assessments, course offerings for interventions, grades, end of course exams, student presentations, narrative assessments, oral assessments, product based assessment 	<ul style="list-style-type: none"> IGPs, progress reports, student information sheets, home visits, parent conferences, 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 			
<p style="text-align: center;"><i>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.</i></p>	<p><u>Developing</u> Investigate, Research, and Create</p>	<p><u>Implementing</u> Formalize, Revise, and Publish</p>	<p><u>Mature</u> Data-driven evaluation of effectiveness of program requirements</p>	<p><u>Role Model</u> Continually assesses to document successes and challenges with action plans implemented to correct deficiencies in performance.</p>
<p>5.6.A Uses diagnostic, ongoing, and vertically and horizontally aligned formative and summative assessments for all students to drive instructional decisions.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.6.B Uses state and national standards, college and career readiness standards, industry standards, and STEM program requirements to develop common benchmark assessments.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.6.C Employs student readiness assessments or diagnostics to identify and address gaps in learning.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.6.D Tracks and reports student progress using student information systems.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5.6.E Uses performance-based assessments that allow students to demonstrate their understandings of STEM concepts.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texas Science, Technology Engineering and Mathematics

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			
<ul style="list-style-type: none"> Documents in Spanish and English Service learning and field projects for students and families, culturally responsive pedagogy Schedule of parental involvement events 	<ul style="list-style-type: none"> Parent Sessions and # attending (college readiness, financial aid, rigor, careers etc.) Parent conferences, website hits, satisfaction surveys 		
Developing	Implementing	Mature	Role Model
<ol style="list-style-type: none"> 1. Develops family engagement plans. 2. Minimal strategic communications with parents and families. 3. Minimal parent participation on school committees and leadership positions. 	<ol style="list-style-type: none"> 1. Family engagement plans developed to include monitoring schedules, checklists, and evaluation criteria. 2. Regularly scheduled distribution of communications is planned and presented to key stakeholder groups. 3. Parent participation is encouraged and actively visible via parent volunteer activities within the school (teacher aids, booster club leadership, etc.) <p style="text-align: center; margin-top: 20px;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Engagement planning is conducted and reviewed annually. Revisions are included in AAP. 2. Strategic communications are timely 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. 3. Parents participate as key stakeholders and leaders in Academy in diverse areas, such as school support functions, academics, and extracurricular activities. <p style="text-align: center; margin-top: 20px;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Engagement plans are continuously assessed and metrics data is used to validate performance. Corresponding actions are implemented to correct deficiencies in performance. 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. 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. <p style="text-align: center; margin-top: 20px;"><i>And meets criteria from Developing, Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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 innovative pathways with higher education partners for students to obtain college credit (online resources, virtual courses, distance learning, shared professor, etc.).
- 6.3.C** Develops 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 advisory members and stakeholders of Academy success in promoting the STEM college and career pipeline by tracking Academy graduates' college and career experiences.

Example Artifacts

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| <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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
<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Initial contact made and some support is 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 THSP. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 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 are 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. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 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 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. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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. Provides annual analysis, review, and revision of strategic plan and develops 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.

Example Artifacts

<ul style="list-style-type: none"> • 3-5 year strategic plan • Annual Action Plan • Documents networking participation/leadership and number of staff participating • Log of participation in T-STEM network 		<ul style="list-style-type: none"> • 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
<ol style="list-style-type: none"> 1. Mission, vision, goals, objectives, and strategic plans correspond with the operation of the Academy. 2. Develops continuous improvement processes/protocols with indicators and checklists. 	<ol style="list-style-type: none"> 1. Strategic planning initiated and outline defined. Vision, goals, and metrics developed. Participates in networking opportunities. 2. Scheduled reviews of all processes and data for process improvement initiatives. Data collected to assess key areas requiring process improvement implementation. <p style="text-align: center; margin-top: 20px;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 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. 2. Systematic approach to campus improvement and data collection which provides real time assessment of effectiveness. <p style="text-align: center; margin-top: 20px;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Routine and regular reviews and modifications of strategic plans based on changing variables. Responsive to environmental, political, and budgetary policy changes. 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. <p style="text-align: center; margin-top: 20px;"><i>And meets criteria from Developing, Implementing and Mature</i></p>

Texas Science, Technology Engineering and Mathematics

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

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| <ul style="list-style-type: none"> • 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 (time, funds, peer observations, etc.) | <ul style="list-style-type: none"> • 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
<ol style="list-style-type: none"> 1. Maintains a balanced budget. 2. Develops contacts for alternative funding sources such as grants and other monetary awards. 3. Grant applications and grant writing professionals are included in the staff of STEM academy. 	<ol style="list-style-type: none"> 1. Guidance relating to the alignment of program budget requirements, strategic goals, actual costs, and performance outcomes. 2. Grants and other sources of funding are acquired for near term-requirements. 3. Grants are an integral funding source for STEM operations. Ad hoc applications submitted to meet funding needs. <p style="text-align: center;"><i>And meets criteria from Developing</i></p>	<ol style="list-style-type: none"> 1. Integration of planning and performance in all phases of the budget formulation and execution process. 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. 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. <p style="text-align: center;"><i>And meets criteria from Developing and Implementing</i></p>	<ol style="list-style-type: none"> 1. Use of standardized processes and data continually adjust and align budgets and planning with mission and goals. 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. 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. <p style="text-align: center;"><i>And meets criteria from Developing, Implementing, and Mature</i></p>

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Texas Academies Design Blueprint Glossary

21st CENTURY SKILLS:

The framework presents a holistic view of teaching and learning that combines a discrete focus on 21st century student outcomes (a blending of specific skills, content knowledge, expertise, and literacies) with innovative support systems to help students master the multi-dimensional abilities required of them in the 21st century. <http://www.21stcenturyskills.org/>

ACCELERATED (5.1.C): Curriculum, instruction, learning, and assessment designed to identify and close gaps in student knowledge base and process application.

ACHIEVE TEXAS: AchieveTexas is designed to help students (and their parents) make wise education choices. It is based on the belief that the curricula of the 21st century should combine rigorous academics with relevant career education. When schools integrate academic and technical education, students can see the “usefulness” of what they are learning. The system also facilitates a seamless transition from secondary to postsecondary opportunities. This initiative uses the sixteen federally defined Career Clusters of the States’ Career Clusters initiative (www.careerclusters.org) as the foundation for restructuring how schools arrange their instructional programs. A Career Cluster is a grouping of occupations and broad industries based on commonalities. The sixteen Career Clusters provide an organizing tool for schools, small learning communities, academies, and magnet schools. Career programs of study (POS) have been developed for each of the Career Clusters. The POS represent a recommended sequence of coursework based on a student’s interest or career goal. <http://ritter.tea.state.tx.us/curriculum/achievetexas/index.html> <http://www.achievetexas.org/Sciences.htm>

ACHIEVE TEXAS STEM CLUSTER: Planning, managing, and providing scientific research and professional and technical services (physical science, social science, and engineering) including laboratory and testing services, and research and development services.

ADVISORY BOARD: A recommended Advisory Board consists of representatives from the Academy, school board, district, community, higher education, and STEM businesses. The vision of the Academy Board is to ensure a successful 6th-20th STEM academic and career pipeline. The mission of the Advisory Board is to support and offer input regarding Academy operations such as facility requirements, resource acquisition, curriculum development, internship, externships, and student/community outreach.

ANNUAL ACTION PLAN (AAP): Upon completing the T-STEM Blueprint Rubric self-assessment, the Academy annually creates an Annual Action plan that is aligned with the Academy mission and addresses areas for growth as identified in the T-STEM Blueprint self-assessment. The AAP should be regularly monitored and revised with evidence of results recorded. The AAP should include data, PD, literacy, and technology plan elements.

CAPSTONE PROJECT: A culminating research project and oral and written presentation wherein students apply the skills they have developed in problem definition, issue framing, collection of data and information, interviewing, selection and analyses of alternatives, presentation of findings and recommendations, design of implementation tools, and an analysis of practical and ethical issues. A key component is a review of existing literature related to the project topic. Students find and synthesize research, reports, program materials, and other documents, and present to panels of industry and higher education experts the relevance of key findings for the project and recommendations for future research.

CURRICULUM ALIGNMENT: Curriculum that is backloaded from the THECB-CCRS and external state and national assessments to ensure vertical and horizontal alignment of content, context, and cognitive levels in the written, taught, and tested curriculum. Aligned curriculum promotes the successful transfer of knowledge, skills, processes, creativity, and innovation to the classroom, state and national assessments, simulated real world (PBL), and the real world.

COLLEGE-GOING CULTURE: 1) understand what it takes to succeed in entry-level college courses; 2) unpack the complexity of the U.S. postsecondary system; 3) preparation a student needs in order to enroll and succeed – without remediation – in credit-bearing general education courses that meet requirements for a baccalaureate degree. “Succeed” is defined as completing entry-level courses at a level of understanding and proficiency sufficient to: 1) pass a subsequent course in the subject area, and 2) apply course knowledge to another subject area. www.epiconline.org

CULTURALLY RESPONSIVE: Culturally responsive teaching is a research-based teaching method that helps close achievement gaps. Teachers who use culturally responsive instruction recognize students' cultural strengths and experiences and use them as tools to achieve mastery of new knowledge and skills. Inherent in culturally responsive instruction are: 1) curriculum that is both rigorous and relevant to students' lives; and 2) trusting relationships among teachers, students, and families that extend beyond the classroom. A culturally responsive teacher: 1) develops cultural awareness and competency to prevent the norming of whiteness and disconnect for children of color and, 2) helps all children see the relevance and value to their lives in their experiences at school in order to be academically successful. Culturally responsive teachers honor and understand the underlying cultural differences and personal abilities amongst us, and use that knowledge to better engage students in the learning process. Culturally Responsive Teaching. (2006). *Multicultural Resource Center*, 2(1), 1.

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CUSTOMER VOICE: A process for capturing student and stakeholder related information

CUSTOMER: The students, teachers, community, and T-STEM Network.

DESIGN-BASED LEARNING: Design-based learning (DBL) is a form of project-based learning in which students learn what they need to learn in a just-in-time fashion while trying to design something.

DESIGN TEAM SAMPLE ROLES (DT): An Academy in the *Planning Phase* the design team might include individuals from the T-STEM Academy leadership, district office personnel such as technology, curriculum, advanced academics (GT/AP/IB/Dual Credit), T-STEM Center, T-STEM Coach, school board member, and local industry STEM experts. In an Academy in year two and beyond, the design team and advisory board may merge into one team.

EXTENSION (5.1.C): Pre-AP and/or gifted student product, process, content expectations.

EXTERNSHIP: Externships are experiential learning opportunities, similar to internships, offered by educational institutions and industry to give teachers and or students short practical experiences in their field of study.

GOVERNOR'S ECONOMIC WORKFORCE CLUSTERS: Advanced Technologies and Manufacturing, Aerospace and Defense, Biotechnology and Life Sciences, Information and Computer Technology, Petroleum Refining and Chemical Products, and Energy. <http://www.twc.state.tx.us/news/tcluster.html>

HIGH PERFORMING TEAM: Teams that use work processes to systematically pursue ever higher levels of overall organizational and individual performance, including quality, productivity, innovation, and accountability. High-performing teams demonstrate results in improved programs and services for students and stakeholders. (2009-2010 Baldrige Education Criteria for Performance Excellence, p. 62)

HIGHLY QUALIFIED: The federal definition of a "Highly Qualified" teacher is one who is: fully certified and/or licensed by the state; holds at least a bachelor's degree from a four-year institution; and demonstrates competence in each core academic subject area in which the teacher teaches.

IGP: Individualized graduation plan.

IHE: Institution of Higher Education, including Texas-sanctioned academic and specialty trade schools for high school graduates.

INDIVIDUAL EDUCATION PLAN: Students failing to meet expectations on state/district assessments will receive an individualized acceleration plan designed to address their specific areas of growth.

INTEGRATED CONTENT: Content of one type incorporated into another type. Ex: Curriculum using the concepts and skills from at least two different academic content areas for the authentic study of a multidisciplinary topic, problem, or design challenge.

INTEGRATIVE STEM PEDAGOGY: An approach to teaching and learning that recognizes that individual content areas should not be taught in isolation. Integrative STEM pedagogy incorporates the teaching and learning of science, technology, engineering, and mathematics into multiple content areas, and focuses on the integration of the content as evidenced in the real world.

INTERNSHIP: Internships are student work experiences in STEM related fields that are linked to a student's academic coursework, college/career, or capstone interest. They afford opportunities for students to confirm choice of major and/or career while gaining practical work experience. Internships may be done concurrently while a student is carrying a full time academic course load or may be done during the summer.

JOB SHADOWING: Job shadowing is a work experience option where students learn about a job by walking through the work day as a shadow to a competent worker. The job shadowing work experience is a temporary, unpaid exposure to the workplace in an occupational area of interest to the student. Students witness firsthand the work environment, employability, occupational skills in practice, the value of professional training, and potential career options. Job shadowing is designed to increase career awareness, help model student behavior through examples, and reinforce in the student the link between classroom learning and work requirements. Job shadowing is limited in that allows students to observe only; direct work experience, responsibility and skills are not acquired. Integration of school and work is implied in job shadowing (Paris & Mason, 1995, p. 47).

KNOWLEDGE ASSETS: The Academy's unique intellectual capital or expertise stored in a digital/electronic format. *Knowledge assets* promote understanding, provide guidance for decision-making, record facts about critical decisions, and create meta-knowledge about how work changes. Ex: team norms, protocols for meetings, conflict resolution protocols, student interventions, Academy brochures, recruitment procedures, culture building activities, student contracts, PBLs, rubrics, etc.

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LEADERSHIP TEAM (LT) 1.2.B: The Academy leadership team is comprised of individuals that play key roles in the internal and external governance of the Academy such as: administrators, counselors, academic deans, team leaders, and campus instructional facilitators/coaches. The leadership team works as collaborative entity to continually improving the design, governance, operations, accountability, curriculum development, professional development, and outreach of the Academy.

LITERACY: The ability to read, write, ask questions, determine answers, and understand, for personal decision making, participation in civic and cultural affairs, and economic productivity in areas such as: numeracy, reading, writing, global awareness, financial, economic, business and entrepreneurial, technology, civic, health, environmental, information, media, ICT (information, communications and technology). <http://www.nap.edu/readingroom/books/nses>

MISSION STATEMENT: A mission statement defines what an organization is, why it exists, and its reason for being - the organization's fundamental purpose. A mission statement focuses on a school's present state while a vision statement focuses on the future of what the organization hopes to become.

PROFESSIONAL LEARNING COMMUNITY: A professional learning community is composed of collaborative teams whose members work interdependently to achieve common goals linked to the purpose of learning. The very essence of a learning community is a focus on and a commitment to the learning of each student (*Dufour, Dufour, Eaker, and Many, 2006, p.3*). To create a professional learning community, 1) focus on learning rather than teaching, 2) work collaboratively, and 3) hold yourself accountable for results. http://pdonline.ascd.org/pd_online/secondary_reading/el200405_dufour.html

PROJECT-BASED LEARNING (PBL): T-STEM Project Based Learning (PBL) is an inquiry-based instructional approach, in a real-world context, where students generate the pathways and products that meet defined, standards-based outcomes. PBL allows students to utilize 21st century skills to access and master content. These skills include communication and presentation, organization and time management, research and inquiry, self-assessment and reflections, and group participation and leadership skills.

RELATIONAL KNOWLEDGE: Relational knowing (Gallego et al., 2001; Hollingsworth et al., 1993) is another important feature of urban teaching practice that leads to the concept of "we". That is, the ability to "know-in-relationship" (Hollingsworth et al., 1993), to understand the meaning of the interactions between self and others, supported some teachers in feeling more efficacious in their teaching. Relational knowing helps teachers to learn from the many interactions and collaborations that are part of daily teaching.

RESULTS: Data showing performance levels, trends, and relevant comparisons for key measures and indicators of organizational performance.

SERVICE LEARNING: Service learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities. <http://www.servicelearning.org/what-service-learning>

STAKEHOLDERS: Leadership team, design team, advisory board, and representatives from: school board, community, students, parents, higher education, STEM businesses, T-STEM Centers, T-STEM Coaches.

STEM-LITERATE: One understands how STEM can impact the quality of life for an individual, the education community, workforce of the future, the research environment, and public policy actions (Leigh R. Abts, Pd.D., 2008, A. James Clark School of Engineering, University of Maryland).

STUDENT VOICE: The individual and collective perspective and actions of young people within the context of learning.

STEM: Science – Using inquiry, materials testing, data collection; Technology – intake, processing, output (communications); Engineering – engineering design process in projects, problem solving, innovation; Mathematics – symbolic language, analysis, trends.

SWOT: Strengths, weaknesses, opportunities, and threats.

THECB CCRS: The Higher Education Coordinating Board College and Career Readiness Standards <http://www.thecb.state.tx.us/index.cfm?objectid=EADF962E-0E3E-DA80-BAAD2496062F3CD8>

UNDERREPRESENTED STUDENTS: Students of a particular race, socioeconomic status, or otherwise important social group that has a smaller representation in a sub-portion than it does in the entire sample. Ex: students who have not been fully represented in postsecondary education, such as minority students, first-generation college students, and students of a low socioeconomic background.

VISION STATEMENT: A desired future state of the organization. The vision describes where the organization is headed, what it intends to be, or how it wishes to be perceived in the future.