S²TEM SC Innovation Configuration (IC) Map:
STEM-Mindedness

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White Paper: STEM-Mindedness

STEM-mindedness is a way of thinking inspired by vision and informed by data; it drives cutting edge innovation and underlies collaborative actions that build and sustain a thriving society where all citizens contribute and benefit. Within a STEM-minded school, stakeholders collaborate to create a culture that inspires and celebrates innovation; decisions are Informed by data, and learning opportunities are designed to ensure that all students are ethical, well informed citizens able to meet the demands of the 21st Century contributing to their success and that of their communities, and beyond.

Collaborative Culture Inspiring Innovation

Within this culture, school leaders, teachers, students and strategic alliances think, dream and do in an atmosphere that has been thoughtfully created to embody a spirit of American ingenuity and inquiry. The community is nurtured by visionary leaders who value the exchange of ideas and encourage out-of-the-box thinking. Teachers, thus, feel free to collaborate on innovative curriculum, assessment and instruction that engage students in building deep content knowledge while seeking creative solutions to complex, local and global challenges. Strategic alliances infuse the school culture with new talent, ideas and resources to expand innovation efforts. In this environment, self-directed individuals work interdependently to generate, test, and refine new ideas.

STEM for All Students

Effective STEM schools engage all students in active learning experiences in which they are encouraged to question the status quo, deliberate about complex problems, pose creative solutions, and learn from failure. These schools promote all students as being STEM-capable citizens, competent for success in college and careers. At one time, the "pinnacle" STEM careers, such as engineers, researchers or physicians, belonged to a select few. Today, STEM-minded schools practice multidimensional inclusion.

- One dimension of inclusion is that STEM schools encourage and support all students equally in their pursuit of STEM careers. This type of inclusion is most prominent at open-access schools—programs that service all students without restrictions. These types of STEM schools should be acutely aware of their underserved and at-risk students, providing them with equal opportunities to succeed.
- A second dimension of inclusion in STEM education is fairness in “gate-keeping.” Elite STEM schools accepting only highly motivated students with a record of high achievement should have an unbiased assessment process in place to select students using multiple measures of assessment. In the same way, other STEM schools offering gifted and advanced courses should have a similar system in place to ensure student selection into those courses is inclusive.
- A third dimension of inclusion in STEM education is comprehensive STEM course offerings. Georgetown University’s Center on Education and the Workforce STEM Report states, “The STEM supply problem goes beyond the need for more professional scientists, engineers and mathematicians. We also need more qualified technicians and skilled STEM workers in Advanced Manufacturing, Utilities and Transportation, Mining, and other technology-driven industries.” (Carnevale, et.al, 2011). Offering a wide range of STEM learning opportunities prepares students with varying interests, talents, and abilities for careers across multiple workforce clusters.

Theory in Action

Teachers in Anderson School District 2 engage in professional learning designed to prepare them to implement a STEM after school program to increase student achievement for at-risk students.

Multiple sources of data guide STEM schools in determining their focus. This includes workforce, community, and global needs projections, as well as perceptions and demographics of parents, students, and community members, and data related to student achievement within and beyond K-12 schooling.

Data Informed

Data-informed decision-making involves using a collaborative, continuous improvement process that yields actionable information used to guide and inform decisions. All stakeholder groups including students benefit from answers generated from data-based inquiries. This may include:

- Students receiving answers related to academic progress, effectiveness of designed solutions, and future career goals.
- School leaders, faculty and staff gaining information to guide course scheduling, student support services, instructional practices, and determine the effectiveness of professional learning.
- Strategic alliances clarifying whether the school's efforts align with their needs and vice-versa.

STEM-Minded schools ensure that a data-based continuous improvement process is taught, modeled and practiced throughout all areas of the school community to monitor progress and determine next steps.

Components of STEM-Mindedness (Innovation, STEM for All, and Data-informed decision making) is evident in every facet of an effective STEM school. The vision-driven force of STEM-mindedness inspires stakeholders to build, sustain, and engage in a learned, socially responsible, and thriving citizenry.

IC Maps Purpose

According to Shirley Hord (2006), “Innovation Configuration Maps, or IC Maps, provide a description of what a specific educational innovation “looks like” when well implemented. It provides a mental image of an innovation in operation and “vision” toward which the user is moving. Thus, the IC map provides a tool that shares information and helps individuals and organizations figure out where they are and what they need to do to move toward implementation.” S²TEM Centers SC has created an IC map for Characteristics of High Functioning STEM schools and schools wanting to become more STEM-Minded.

The desired outcome is stated on the left. Decreasingly desirable levels along the continuum are to the right. *Sustaining* signifies the ideal and highest quality of implementation and reflects the processing of all actions through a data-informed, evidence-based continuous improvement process.

STEM schools aligned with the criteria identified in the IC maps will progress toward developing students with world class knowledge, world class skills, and life and career characteristics as defined by the Profile of the SC Graduate.

IC Maps Format

Overarching Standard for the respective IC Map.

Standard: Professional learning for STEM educators: is a system of continuous improvement that increases educator effectiveness in preparing students for success in college, careers, and citizenship; it is data informed, research [illegible] vision, and goals for STEM education and sustained by skillful leaders

Desired Outcome(s) are listed in each IC Map as statements of STEM school characteristics as related to the Overarching Standard (shown above).

PL1 = Professional Learning Map, 1st Desired Outcome

Title of IC Map (i.e. Professional Learning)

Words defined in the glossary are highlighted in blue

Total Instructional Focus – Professional Learning

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome PL1: Professional learning is the collective responsibility of all STEM educators and is the result of active engagement in a STEM professional learning community (PLC). It is a system of continuous improvement aligned with the school's/district's mission, vision, and goals for STEM education.				
PL1.Leaders1: Support faculty and staff in setting and implementing professional learning goals				
Model and employ with fidelity ALL essential elements of a continuous improvement process school wide including: • identifying STEM goals • planning • implementing • gathering evidence • self-assessing • adapting Support and maintain commitment to personal and PLC learning of faculty and staff through observation, reflecting conversations, and feedback as aligned with the school/district goals for STEM education.	Model and employ the essential elements of a continuous improvement process school wide including: • identifying STEM goals • planning • implementing • gathering evidence • self-assessing • adapting Support commitment to personal and PLC learning of faculty and staff through observation, reflecting conversations, and feedback as aligned with the school/district goals for STEM education.	Provide ongoing support to faculty and staff as they work toward their individual and PLC STEM focused goals for professional growth through observation, reflecting [illegible]	Support faculty and staff as they work toward their individual and PLC STEM focused goals for professional growth through observation and feedback.	Collaborate with faculty and staff as individual STEM focused goals for professional growth are set.

5 Implementation Levels on the continuum from Getting Started to Sustaining. Read the map from right to left.

Indicator by Role for the Desired Outcome (i.e. PL1), then the Role described (i.e. Leaders), then a number to represent which indicator is being outlined (i.e. 1) NOTE: Roles include Leaders, Teachers, Students, and Strategic Alliances.

Strategic Alliance
An individual or group of stakeholders who may be outside of the day to day work of schools, but who engage in ongoing active partnership with schools in developing and implementing a shared mission, vision and goals for STEM education. Strategic alliances may include but are not limited to businesses, institutions of higher education, community and civic organizations.

Within the white cells are descriptors for

IC Map: STEM-Mindedness

Standard: Within a STEM-minded culture, all stakeholders collaborate to design, implement, and celebrate innovative thought and action; decisions are Informed by data, and learning opportunities ensure that all students are ethical, well informed citizens able to meet the demands of the 21st Century contributing to their success and that of their communities, and beyond.

STEM-Mindedness				
Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM1: A culture that inspires innovation is created and sustained through processes, policies, facilities, and resources that inspire stakeholders to explore, design, implement, and refine innovative solutions to challenges within and beyond the school community.				
SM1.Leaders1: School Leaders and STEM Leadership Team (SLT) Create a collaborative culture that inspires innovation				
Coordinate a collaborative network to continually assess the effectiveness of the plan for the acquisition, allocation, and maintenance of facilities and resources to support students in the design of innovative solutions to challenges within and beyond the school community. These resources include but are not limited to curriculum, creative work spaces, time, technology, and human talent	Acquire resources and monitor the implementation and effectiveness of the plan for equipping and staffing a learning environment to support students in the design of innovative solutions to challenges within and beyond the school community	Collaborate with the school community to develop a plan aligned with the shared vision for equipping and staffing a learning environment that supports students in the design of innovative solutions to challenges within and beyond the school community	Develop a shared vision for equipping and staffing a learning environment that supports students in the design of innovative solutions to challenges within and beyond the school community	Research innovative learning environments

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM1: A culture that inspires innovation is created and sustained through processes, policies, facilities, and resources that inspire stakeholders to explore, design, implement, and refine innovative solutions to challenges within and beyond the school community.				
SM1.Teachers1: Create a collaborative classroom culture that inspires innovation				
Plan, create and sustain a classroom culture that inspires and supports innovative thinking through well-chosen curriculum, instruction/ assessment strategies, classroom management practices, physical layout of the classroom and available resources Use a continuous improvement process to assess the effectiveness of the plan using data collected from sources such as student achievement, satisfaction surveys, observations, etc.	Design, plan and implement ongoing learning experiences that engage students in using a continuous improvement process in the design of innovative solutions to challenges within and beyond the school community. Encourage students to take informed risks, apply research, demonstrate learning from failure, persevere to stick with ideas from conception to reality as they collaborate with team of peers, teachers, and/or strategic alliances to pose and design innovative solutions to challenging problems within and beyond school context.	Facilitate learning experiences that inspire innovative thinking and encourage informed risk taking, learning from failure, questioning of the status quo, etc.	Arrange physical components of the classroom to inspire innovative thinking. May include, but not limited to, furnishings, tinkering spaces, lighting, and colors.	Research innovative classroom environments.
SM1.Students1: Collaboratively design innovative solutions to challenging real-world problems				
Take informed risks, apply research, demonstrate learning from failure, persevere to stick with ideas from conception to reality as they collaborate with team of peers, teachers, and/or strategic alliances to pose and design innovative solutions to challenging problems within and beyond school context.	Collaborate with team of peers and/or teachers to use a continuous improvement process, such as an engineering design process, to create innovative solutions to challenging local and global problems.	Collaborate with team of peers to brainstorm, conduct investigations, and design innovative products, processes and solutions to complex, real-world challenges.	Collaborate with team of peers to explore multiple solutions to problems before determining the best for given situation.	Create an explanation, product or process to solve a problem based on one idea.

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM1: A culture that inspires innovation is created and sustained through processes, policies, facilities, and resources that inspire stakeholders to explore, design, implement, and refine innovative solutions to challenges within and beyond the school community.				
SM1.Strategic Alliances1: Provide expertise, financial ,and human resources to sustain an innovative learning environment				
Engage actively with the SLT to continually assess the effectiveness of the plan for the acquisition, allocation, and maintenance of facilities and resources to support flourishing innovation. These resources include, but are not limited to, curriculum, creative work spaces, tinkering spaces, time, technology, human talent, etc.	Provide resources to implement the plan. This may include: • funding creative work spaces, tinkering spaces, cutting edge technology on the school's site; and • providing the use of cutting edge technology, creative work spaces on the site of businesses, colleges, and community organizations for student and/or teacher learning. Providing professional practitioners to coach teachers and/or students as they learn to design innovative solutions to real world challenges within and beyond the classroom.	Collaborate with the SLT to develop a plan aligned with the shared vision for equipping and staffing a learning environment that supports students in the design of innovative solutions to challenges within and beyond the school community.	Collaborate with the SLT to develop a shared vision and goals for equipping and staffing a learning environment that supports students in the design of innovative solutions to challenges within and beyond the school community including creative work spaces, tinkering spaces, technology, and human talent.	Share research and expertise on innovative learning and work environments with the SLT.
SM1.Strategic Alliances2: Design, implement, and support learning experiences that promote innovation				
Design, plan, and implement ongoing learning experiences for students, teachers, parents and other stakeholders focused on solving real world problems through principles of innovative design.	Host learning experiences for students, teachers, parents and other stakeholders focused on solving real world problems through principles of innovative design.	Collaborate with students on the design of innovative solutions to real world problems.	Coach and mentor students as they design innovative solutions to real world problems.	Sponsor/host events and competitions that promote and celebrate students in designing innovative solutions to real world problems.

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM2: STEM for All – The school ensures that gatekeeping processes are fair course offerings, are comprehensive, and all students, including those in underrepresented populations, receive opportunities and support to achieve success in STEM.				
SM2.Leaders1: School Leaders and STEM Leadership Team (SLT) Ensure fair and consistent admissions policies				
Facilitate the implementation of admissions policies for STEM placement that are • systematically reviewed, • revised as needed, • fair, • consistent, and • based on multiple measures.	Implement with fairness and consistency admissions policies that have been reviewed and revised to ensure that multiple measures guide STEM placement decisions.	Revise admissions policies as needed after review to ensure that multiple measures guide STEM placement decisions.	Review admissions policies to determine if multiple measures guide STEM placement decisions. Measures may include, but not limited to: grades, performance assessments, standardized test scores, student interests and attitude surveys, teacher recommendations.	Develop a process for the review of policies for admissions to STEM courses of study.
SM2.Leaders2: School Leaders and STEM Leadership Team (SLT) Provide comprehensive course offerings				
Ensure that course offerings are comprehensive in: • preparing students to take advantage of STEM related careers locally and globally, and • addressing students' unique STEM interests Ensure that the school is responsive to the changing needs of the workforce, the community, student needs and interests.	Schedule courses to prepare students for STEM related careers locally and globally. Schedule courses to address students' unique interests. Partner with other organizations to expand the school's course offerings (e.g., higher level math, science, and technical courses at a local college).	Plan for STEM learning opportunities to prepare students for STEM related careers locally and globally. Plan for STEM learning opportunities to address students' unique interests.	Consider job trends in STEM fields locally and globally to determine courses students will need. Identify trends in student interests (e.g., coding, gaming, robotics, etc.).	Analyze STEM career related data within surrounding school community to determine courses students will need. Conduct surveys to determine students' interest in STEM courses.
SM2.Leaders3: School Leaders and STEM Leadership Team (SLT) Reach out to students underrepresented in STEM fields				
Modify outreach approaches to students underrepresented in STEM fields based on knowledge gained from data.	Collect data to assess the effectiveness of the plan for outreach to students underrepresented in STEM fields.	Implement the plan for outreach to students underrepresented in STEM fields.	Create a plan to achieve goals for outreach to students underrepresented in STEM fields.	Identify students underrepresented in STEM fields (i.e., ethnic minorities, females) and set goals for outreach.

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM2: STEM for All – The school ensures that gatekeeping processes are fair course offerings, are comprehensive, and all students, including those in underrepresented populations, receive opportunities and support to achieve success in STEM.				
SM2.Leaders4: School Leaders and STEM Leadership Team (SLT) Develop and maintain a system of student support				
Monitor and assess the effectiveness of a student support system that engages all stakeholders and is designed to support all students equitably in being successful in STEM learning opportunities within and beyond K-12 schooling.	Engage the school community in the implementation of a student support system that nurtures students' success within and beyond K-12 schooling. The system: • aligns students' needs and interests with available resources; and • continuously seeks resources to address students' learning needs, unique abilities, and interests	Establish a student support system that identifies students learning needs, unique abilities, and interests and matches students with appropriate support to ensure student success in STEM learning. System may include tutoring, mentoring, internships, out of school learning time, etc.	Create a plan for addressing students' learning needs and interests in STEM.	Identify students' learning needs and interests in STEM.
SM2.Teachers1: Participate in administering a system of student support				
Ensure that students and parents are able to access and navigate a student support system. Assess the effectiveness of the system in addressing barriers to student learning and furthering student interests and abilities in STEM.	Makes information about a student support system available to students and parents. Promotes student use of resources within the student support system.	Collaborate with students and their parents in setting STEM learning goals incorporating student abilities and interests and identifying resources to support students in achieving their goals.	Implement STEM learning experiences that nurture students' unique abilities and interests while addressing barriers to student success in learning and applying STEM concepts.	Identify student learning needs, unique interest and abilities and address barriers to student success in learning and applying STEM concepts.
SM2.Students1: Utilize a system of student support as needed				
Demonstrate self-directedness in seeking support to address own barriers to success and further personal interests and abilities in STEM.	Monitor progress towards meeting goals through methods such as reflection, self-assessment, and coaching from parents, teachers, and peers. Seek mentors, tutors, internships and other support from student support system.	Implement action plan and continue to take advantage of opportunities provided to support them in reaching goals including tutoring, mentoring, internships, etc.	Identify personal strengths and limitations and take advantage of opportunities provided to support them in reaching goals including tutoring, mentoring, internships, out of school learning opportunities, etc.	Set goals for success within and beyond the classroom and develop a plan of action.

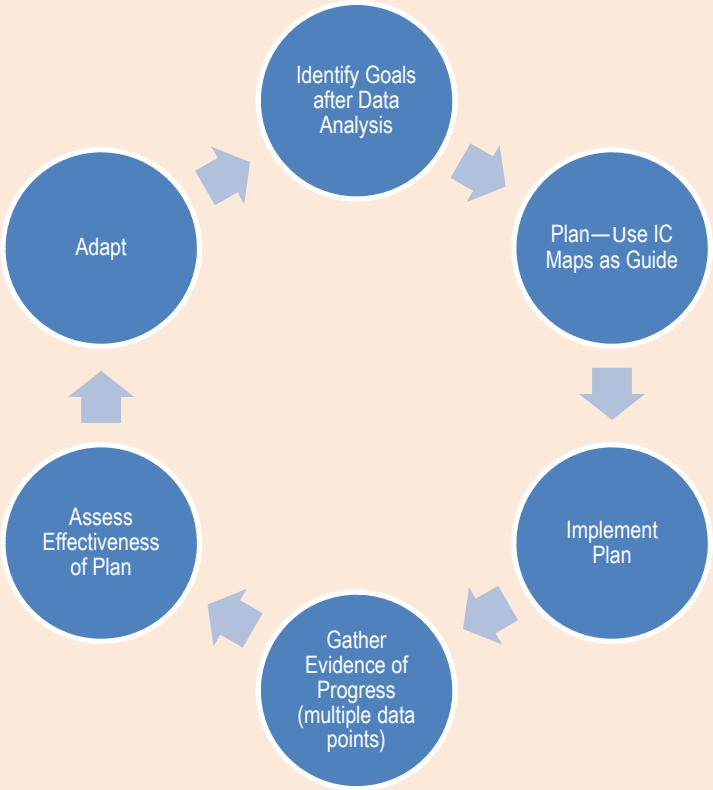
Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM2: STEM for All – The school ensures that gatekeeping processes are fair course offerings, are comprehensive, and all students, including those in underrepresented populations, receive opportunities and support to achieve success in STEM.				
SM2.Students2: Engage in STEM Courses and in STEM Course Development				
Collaborate with teachers and school leaders to develop course offerings to enhance students' opportunities for success in the workforce, higher education, and as citizens.	Explore STEM careers and strategically enroll in STEM courses to prepare for STEM careers and future courses of study.	Apply skills and knowledge gained in STEM courses to the design of solutions to real world challenges.	Seek support to achieve success in STEM courses.	Enroll in STEM courses.
SM2.Strategic Alliances1: Provide input, financial and human resources to sustain a system of student support				
Collaborate in active partnership with STEM school to employ a continuous improvement process to monitor the effectiveness of the plan for the acquisition and allocation of resources to support student STEM success (e.g., mentoring, tutoring, counseling, co-teaching, financial support for scholarships, facilities, technology, resource acquisition, grants, or teacher incentives).	Collaborate in active partnership with STEM school to implement plan for the strategic acquisition and allocation of resources to support student STEM success (e.g. mentoring, tutoring, counseling, co-teaching, financial support for scholarships, facilities, technology, resource acquisition, grants, or teacher incentives).	Partner with STEM school to develop a plan for the strategic acquisition and allocation of resources to support student STEM success (e.g. mentoring, tutoring, counseling, co-teaching, financial support for scholarships, facilities, technology, resource acquisition, grants, or teacher incentives).	Provide requested resources to support student STEM success (e.g. mentoring, tutoring, counseling, co-teaching, financial support for scholarships, facilities, technology, resource acquisition, grants, or teacher incentives).	Engage actively with the SLT by posing questions, concerns, and ideas to support students' STEM success.

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM3: Data-informed decision-making in a STEM school is a collaborative, continuous improvement process guided by school-based data along with workforce and global needs projections.				
SM3.Leaders1: School Leaders and STEM Leadership Team (SLT) Make data informed decisions				
Engage school community in developing and employing a continuous improvement process to ensure the collection, analysis and use of various data to collaboratively plan, implement, and evaluate the effectiveness of school based decisions on the school, workforce, and community at large. Data sources may include but are not limited to: • student achievement; • demographics of students, community and staff; • classroom observations; • perception data of students, parents, and staff; • student learning data K-16 (e.g., HS graduation rate, college graduation rate…). • work force needs; and • community needs.	Collect and analyze, various data and use the findings to plan, implement, and evaluate the effectiveness of school decisions. Data sources may include but are not limited to: • student achievement; • demographics of students, community and staff; • classroom observations; • perception data of students, parents, and staff; • student learning data K-16 (e.g., HS graduation rate, college graduation rate…). • work force needs; and • community needs.	Use multiple sources of data to plan, and implement, school based decisions and evaluate the effectiveness of decisions.	Evaluate the effectiveness of decisions based on a single source of data.	Makes decisions based on a single source of data. Decisions may include, but are not limited to, hiring, scheduling, class offerings, facilities, curriculum, etc.

Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM3: Data-informed decision-making in a STEM school is a collaborative, continuous improvement process guided by school-based data along with workforce and global needs projections.				
SM3.Teachers1: Make data informed instructional decisions				
Partner with school community in developing and employing a continuous improvement process to ensure the collection, analysis and use of various data to collaboratively plan, implement, and evaluate the effectiveness of classroom based decisions. Data sources may include but are not limited to: • student achievement; • demographics of students, community and staff; • classroom observations; • perception data of students, parents, and staff; • student learning data K-16 (e.g., HS graduation rate, college graduation rate…). • work force needs; and • community needs.	Collaborate with colleagues and school leadership to collect and analyze, various data and use the findings to plan, implement, and evaluate the effectiveness of classroom based decisions. Data sources may include but are not limited to: • student achievement; • demographics of students, community and staff; • classroom observations; • perception data of students, parents, and staff; • student learning data K-16 (e.g., HS graduation rate, college graduation rate…). • work force needs; and • community needs.	Use multiple sources of data to plan, and implement, classroom based decisions and evaluate the effectiveness of decisions.	Evaluate the effectiveness of classroom based decisions based on a single source of data and plan next instructional steps.	Make instructional decisions based on a single source of data (e.g., summative test score). .
SM3.Teachers2: Engage students in using data to make informed decisions				
Collaborate with students on the development of a data plan to be included as part of personal goal setting and with project proposals; the data plan will provide for data collection and analysis with the results being used to monitor progress, modify actions, and clarify goals.	Support students in using academic, workforce, and community needs data in: • goal setting and monitoring, and • determining the effectiveness of final solutions to complex challenges;	Support students in using academic and workforce data in: • goal setting and monitoring, and • determining the effectiveness of final solutions to complex challenges.	Provide students with ongoing feedback and support them in using feedback data and summative assessment data to guide next steps throughout the design and implementation of solutions to complex challenges.	Provide learning opportunities for students to collect, analyze, and display data.

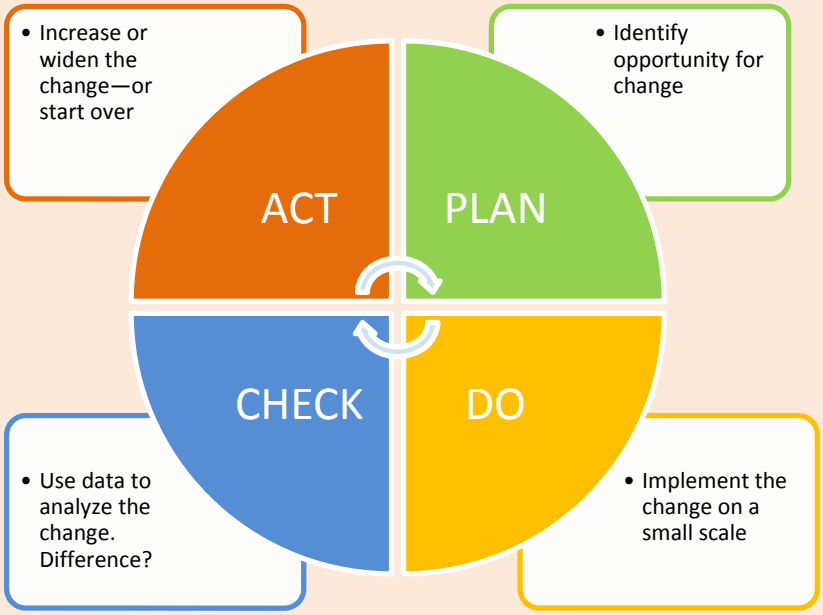
Sustaining	Fully Implementing	Refining and Expanding	Progressing	Getting Started
Desired Outcome SM3: Data-informed decision-making in a STEM school is a collaborative, continuous improvement process guided by school-based data along with workforce and global needs projections.				
SM3.Students1: Make data informed decisions				
Analyze data to monitor own progress, reassess, and clarify goals; refine plans of action, and make adjustments in learning approaches. Include data related to community needs, higher education, and the workforce in setting goals for success.	Analyze trends in personal achievement data, and reflect on personal progress over time; amend actions based on data. Include data related to community and workforce needs in setting goals for success.	Modify actions (e.g., studying, seeking tutoring, etc.) based on data from assessments and assignments.	Implement plan of action and monitor progress towards goals using data from peer and teacher feedback on ongoing assignments as well as data from summative assessments.	Use their personal student achievement data to set goals and develop a plan of action for academic success.
SM3.Students2: Collect, analyze and use data in problem solving				
Design solutions to complex challenges that include a plan for data collection, analysis, and use in decision making and determining next steps throughout the process.	Incorporate data into a design process when solving complex challenges to determine the effectiveness of designs and to justify revisions in solution designs.	Use data before, throughout, and after the design of solutions to complex problems to support design decisions and determine their effectiveness.	Use data throughout the design of solutions to complex problems to support design decisions.	Use data to determine the effectiveness of prototypes after designing solutions.
SM3.Strategic Alliances1: Provide current data to schools and use data to make decisions regarding resource allocation				
Use data to monitor the effectiveness of resources designed to overcome student deficits and justify changes in resources based on data. Continue to provide current data on student post high school performance and industry needs and trends for the purpose of monitoring the progress of actions designed to overcome student deficits.	Provide resources to implement the data-informed plan; resources may include tutoring, mentoring, internships, technology, facilities, human talent, college courses for teachers, etc.	Partner with the SLT to develop a data-informed plan to meet the goals designed to overcome student deficits revealed in the data provided by strategic alliances.	Collaborate with the SLT to use multiple sources of data to identify causal factors for deficits in student performance and set goals to overcome the deficits. Data sources may include: • student achievement; • demographics of students, community and staff; • classroom observations; • perception data of students, parents, and staff; and • student learning data K-16 (e.g., HS graduation rate, college graduation rate…)	Provide the SLT with data on: • how students perform within the strategic alliance's organization, after graduating from the K-12 system including college and workforce performance; and • present industry needs and future trends in relation to the knowledge and skills that students need currently and in the future.

Glossary

Collaborative Norms	The capacities and skills that guide productive dialogue and discussion in collaborative groups. Each group member agrees to the norms and governs himself or herself accordingly. http://www.thinkingcollaborative.com/norms-collaboration-toolkit/
Collective Responsibility	The attitudes and beliefs that all stakeholders in the school community share the responsibility of ensuring high levels of learning for every child and that they use their communal strengths to prepare students for success within and beyond K-12 schooling.
Continuous Improvement Process	A data-informed, active and ongoing process in which self-directed learners at all levels of the school identify, plan, implement, monitor, and refine goals. This approach applies to the continuous learning and growth of students, faculty, staff, leaders, organization, and community. **Examples of Continuous Improvement Processes** (NOTE: These are a few examples; not an exhaustive list): **Example 1** **Continuous Improvement Process** 

Example 2

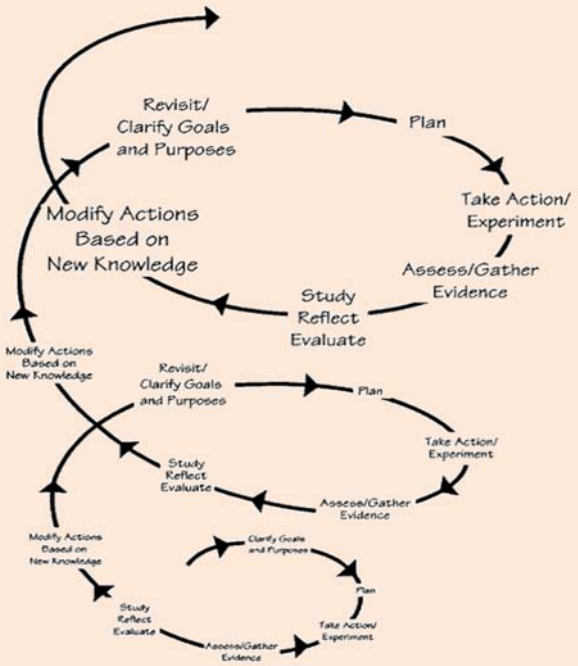
Continuous Improvement Process



(Deming, n.d.)

Example 3

Feedback Spiral



(Costa & Kallick, Assessment in the learning organization, 1994)

Gatekeeping Processes Processes (multiple measures) that are the entry requirements for STEM courses of study.

Intra-disciplinary	Processes, methods, and language within a single discipline.
Interdisciplinary	Processes, methods and language from more than one discipline.
Professional Learning Community (PLC)	A group of educators who engage in job-embedded, collaborative learning; together, participants develop professional and student learning goals, and monitor progress towards meeting those goals through a continuous improvement process.
School Community	The collective group of stakeholders reflecting the environment in which the STEM school operates including the cultural norms, political influences, economic resources, and education levels.
Self-Directedness	Being guided by oneself to set challenging goals, develop a plan of action, persevere in the face of challenges, and accurately assess progress and performance based on evidence.
SMART Goals	**Framework for goal setting. SMART goals should be:** **S** = Specific **M** = Measurable **A** = Attainable **R** = Results-based **T** = Time-bound
Stakeholder	An individual or group with an interest in the success of a school in fulfilling its mission, includes but not limited to parents, students, faculty and staff, businesses, institutions of higher education and community organizations.
STEM Leadership Team (SLT)	A team representing the diversity of the community, consisting of school/district leaders and representatives from all stakeholder groups. The SLT will lead in the development and implementation of the STEM mission, vision, and goals ensuring that all stakeholder ideas and concerns are represented. SLT members should be influential within the groups they represent and able to articulate with clarity communication from their constituent groups to the SLT and vice-versa.
STEM Learning Ecosystem	A network of in-and-out of school STEM learning opportunities that work together to deepen students' STEM understandings; the system may be comprised of STEM learning experiences made available by schools, afterschool providers, universities, museums, science centers, community organizations, and families. "This phrase," according to the National Academy Press publication, Identifying and Supporting Productive STEM Programs in Out-of-School Settings, "refers to the dynamic interaction among individual learners, diverse settings where learning occurs, and the community and culture in which they are embedded. STEM learning ecosystem includes all of a community's STEM-rich assets, which include: • *designed settings,* such as schools, clubs, museums, and youth programs; • *naturalistic settings*, such as city parks, waterways, and forests and deserts; • *people and networks of people,* such as practicing STEM professionals, educators, enthusiasts, hobbyists, and business leaders who can serve as inspiration and role models; and • *everyday encounters* with STEM, such as on the internet, on television, on the playground, or during conversations with family members and other young people." http://www.nap.edu/catalog/21740/identifying-and-supporting-productive-stem-programs-in-out-of-school-settings

STEM Literacy	The knowledge, skills, attitudes, and capacities to: • integrate **transdisciplinary** concepts purposefully and strategically in the design and implementation of innovative solutions (explanations, products, processes) to complex, real-world, personal, local, and global challenges • think critically and flexibly • refine designs through an iterative process (e.g. engineering design process/continuous improvement process)
Strategic Alliance(s)	An individual or group of stakeholders who may be outside of the day to day work of schools, but who engage in ongoing active partnership with schools in developing and implementing a shared mission, vision and goals for STEM education. Strategic alliances may include but are not limited to businesses, institutions of higher education, community and civic organizations.
Transdisciplinary	Student driven approach to teaching and learning in which students, guided by their own questions, design solutions to solve complex, real world problems by calling upon the knowledge, skills, and processes of multiple disciplines as they need them.
World Class Knowledge	**(Source: Profile of the South Carolina Graduate)** • Rigorous standards in language arts and math for career and college readiness • Multiple languages, science, technology, engineering, mathematics (STEM), arts and social sciences
World class skills	**(Source: Profile of the South Carolina Graduate)** • Creativity and innovation • Critical thinking and problem solving • Collaboration and teamwork • Communication, information, media and technology • Knowing how to learn

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