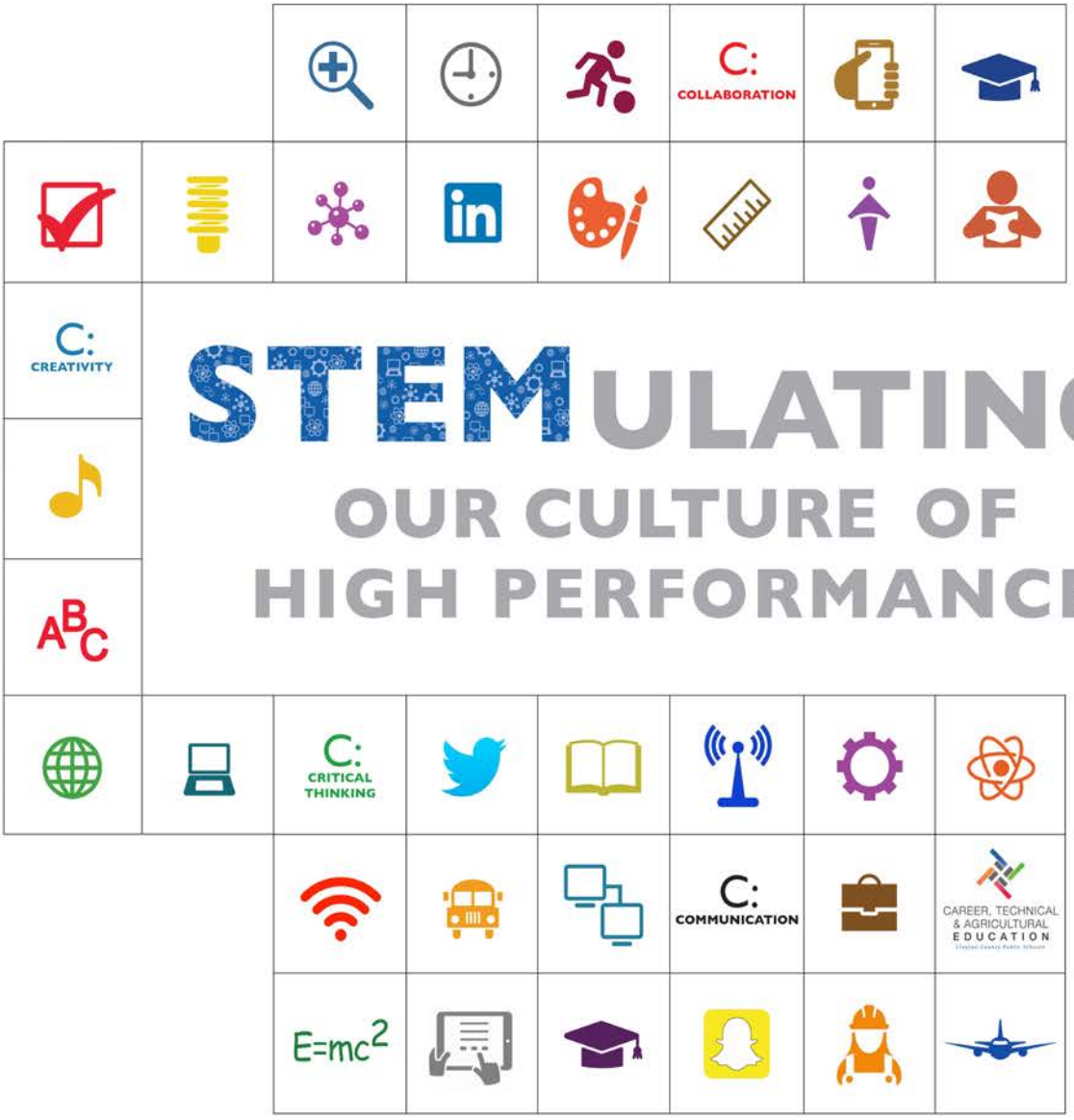

INNOVATE . INVESTIGATE . INSPIRE

IMPLEMENTATION PLAN

2018-2021

VERSION 4.0

SUBMITTAL BY:
DR. EBONI C. CHILLIS

Contributors

Dr. Morcease Beasley

Dr. Eboni C. Chillis

Dr. Tonya D. Clarke

Wayne Clayton

Janetta Greenwood

Kristie Heath

Dr. Ebony Lee

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STEM.STEAM.STREAM.STREAMM.

What is in the Acronym?

STEM – Science, Technology, Engineering and Mathematics. Whether you integrate the "A" for Arts, the "R" for Research, or an additional "M" for Manufacturing, the areas of STEM education may change, but the philosophy remains the same.

STEM is a philosophy, grounded primarily in the solution of problems from a multi-faceted and inter-disciplinary perspective. However, it should not just cater to the science, technology, engineering, or math aspects of a student's education. A well-thought out STEM-based approach to education includes the integration of all subject matter that may be brought to bear on problems, such as the environmental, social, regulatory, technical, legal, institutional, political, and economic aspects. This is how engineers solve problems large and small every day, and for this reason engineering and its study is an important part of any STEM culture (Roman, 2012). In the perfect STEM world, all the subjects would be blended.

What is STEM Education?

STEM Education is a mindset. STEM is a way of thinking, communicating, processing, acquiring, reflecting, and applying knowledge during a rigorous instructional lesson connected to the real world or in one's daily life. It takes the individual skills and concepts that students learn in Science, Technology, Engineering, and Mathematics and assimilates them within other disciplines that also include Social Studies, Literature, Fine Arts, World Languages, and Career, Technology and Agricultural Education. STEM Education is more than just presentation and dissemination of information and cultivation of techniques. A process for teaching and learning offers students opportunities to make sense of the world and take charge of their learning, rather than learning isolated bits and pieces of content (education.com). STEMulating education is a culture.

Characteristics of a STEMulating Culture			
STEM Teacher	**STEM Student**	**STEM Environment**	**STEM Community**
Relevancy	Collaborators	Engagement	Partnership
Rigor	Communicators	Energy	Perspectives
Relationships	Creators	Experiences	Preparedness
Real-world Problems	Critical Thinkers	Eagerness	Participation
Innovation Spaces			
Maker Space ◄►	Collaboration Cafe ◄►	Design Lab ◄►	Innovation Center

A STEM culture requires well-structured lessons which are challenging (complex but not impossible!) and rooted in the real world. It also calls for active engagement, reflective thinking, problem solving, strategic reasoning, academic and technical communication. Cultivating a STEM culture requires a community of stakeholders who are committed to behaving as critical thinkers by demonstrating a willingness to be introspective as well as perceptive. These critical thinkers must be willing to question ideas, challenge assumptions, explore concepts, examine points of view, and analyze implications. A STEM Educator purposefully assists in developing these behaviors that lead to deeper understanding and better application of information. STEMulating a culture of high performance sets an expectation that our students will be fully equipped to explore, understand, and apply the knowledge and skills learned in the classroom. In turn, students will be well prepared to compete, *live, work, play*, and advance in our global society.

Early STEM Learners

All children are born with the need and desire to connect with those around them. Neuroscience tells us that brain development unfolds rapidly in the first three years of life, and that social and emotional development begins in the earliest days of life. When children feel secure in their relationships and have their needs met in responsive and consistent ways, they begin forming strong social and emotional foundations (U.S. Department of Education, 2016). The importance of promoting active science, technology, engineering, and math (STEM) learning for our youngest children encourages the process of inquiry that is integral to the way young children naturally learn.

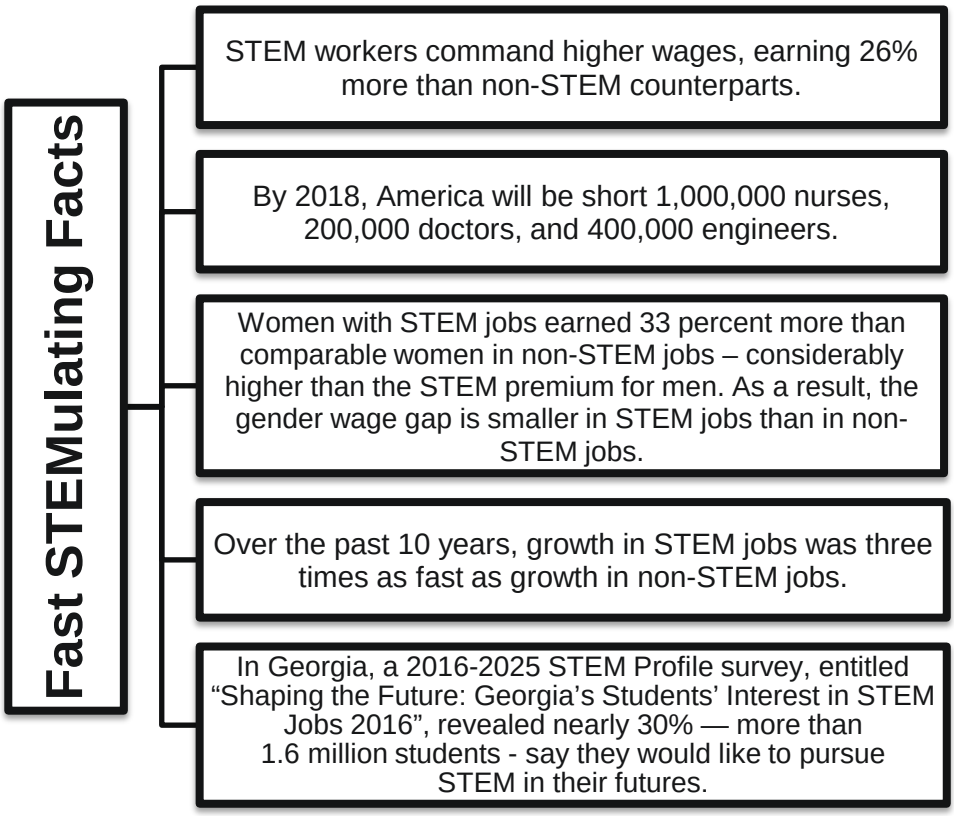
Young children explore, ask questions, and discuss their findings. When first grade learners gathered around a sand table, “students become engrossed with the sand, some marbles, and rulers, and soon, with the help of a few guiding questions, they are learning principles of physical science” (MacPherson, 2014). Our youngest students have the gift for exploration and experimentation already. When those natural impulses are matched with fundamental science concepts and instruction in inquiry methods such as controls, communication, and record keeping, students gain a solid foundation in science that can help them move ahead and excel in STEM fields. There are practical ways to integrate a STEMulating culture for our Early Learners - consider establishing a campaign that begins in K-2 called early STEM Innovators (Chillis, 2016). Utilize “Tips Sheets” to provide fun, concrete resources and recommendations for families, caregivers, and infant, toddler, and preschool educators on easy ways to incorporate STEM concepts and vocabulary into everyday routines, and suggestions for activities to engage young children in STEM (U.S. Department of Education, 2016).

Early to Advanced Coding Learners

Coding or computer programming is the act of using languages to instruct a computer to perform functions. Coding, in the simplest of terms, is telling a computer what you want it to do, which involves typing in systematic commands for the computer to follow. Computers are not clever things; however, they are very obedient. They will do exactly what you want them to do, so long as you tell them how to do it correctly. Learning to code has been likened to learning a foreign language, or perhaps more specifically a family of foreign languages (Spaces., 2016). If students are exposed to coding and it is treated as a form of communication (a language) - Literacy+, then students develop structured and creative

thinking skills. Students gradually program their brain to break every problem down to bits and understand better. You start thinking logically and this gives rise to more creative solutions (Entrepreneur, 2017). Coding allows programmers to think logically about a problem. Once students start learning how to code, they stop giving up on other difficult situations. Repetition is embraced and students start trying over and over again to solve problems and to make predictions. Learning a programming language will also teach students how to learn in a methodical, self-structured way (Academy Cube, 2017). Students become persistent because they know there is always a solution. This is a learning-skill, career-skill and life-skill.

Importance of STEM - *Today, Tomorrow and Beyond…*



Sources: U.S Bureau of Labor Statistics, U.S. Department of Commerce – Economics and Statistics Administration

STEM Jobs Vs. Non-STEM Jobs

Table 1: Average Hourly Earnings of Full-Time Privates Wage & Salary Workers in STEM Occupations by Educational Attainment, 2015: OCE calculations using Current Population Survey public-use microdata.

	Average Hourly Earnings		Difference	
	STEM	Non-STEM	Dollars	Percent
High School Diploma/Less	$27.53	$16.21	$11.32	69.8%
Some College/Associate Degrees	$30.79	$19.09	$11.70	61.3%
Bachelor's Degree Only	$39.28	$28.34	$10.94	38.6%
Graduate Degree	$45.37	$35.16	$10.21	29.0%

Implementing a STEMulating Culture of High Performance

The implementation of a STEM Culture requires individuals that value the sciences, technology, engineering, and mathematics and the relationship of these areas to all content or subject areas. The Clayton County Public Schools has chosen to ensure our STEM Approach is not considered as an "add on" or "another initiative." Our STEM Approach is that of infusing STEM into all content/subject areas and across all grade levels. As shared on page 4, a STEM Education is a mindset. The mindset is a way of thinking, communicating, processing, acquiring, reflecting, and applying knowledge and making real world connections or in one's daily life.

A Culture of High Performance is one in which the adults and students work collaboratively to ensure every student is successful as he/she meets and exceed grade-level content standards. Additionally, the students are prepared for college and careers with skills that will contribute to high levels of critical thought, productivity, and that will result in increased opportunities for a higher quality of life.
The adults and students work from a set of standards or expectations of what students should know (content) and be able to do (skills). However, while the standards are the starting point, they are not an end in themselves. The adults and students should then work to apply the content and skills well beyond the classroom whether in a local, state, national or international context. STEM becomes the vehicle wherein the knowledge morphs into relevant experiences and applications with implications for daily living that are explored within varying contexts.

The expectations and experiences are enhanced with appropriately aligned instructional resources that afford students various ways to develop and apply STEM Thinking. To this end, a STEM Culture of High Performance is one that is sufficiently and appropriately infused with instructional resources that are used by both adults and students to develop and apply 21st Century skills that results in increased student achievement with more students ready for college and career.

~ Dr. Morcease Beasley CEO/Superintendent of Schools

Protocols to STEMulate the Culture

School system administrators supporting schools interested in pursuing Science, Technology, Engineering, and Mathematics (STEM) or Science, Technology, Engineering, Arts and Mathematics (STEAM) Certification (school or program) should consider the following protocols to assess their readiness to submit an application to AdvancED and/or the Georgia Department of Education (GADOE).

Step 1: Initial Contact
A district level administrator (eboni.chillis@clayton.k12.ga.us) should contact AdvancEd STEM Office or Georgia STEM at the Georgia Department of Education (GADOE) to discuss the interested schools, the process protocols, and convening a meeting to discuss the STEM School/Program Certification process with district administrators.

Step 2: Convene District Administrators
The interested school district convenes the administrators of all schools for a presentation from the AdvancEd/GADOE regarding the STEM/STEAM School Certification process. This meeting should be held with the STEM Director/Coordinator (eboni.chillis@clayton.k12.ga.us - Interim).

Step 3: Assemble a STEM Team
The school district assembles a district level **STEM/STEAM Team** who will work with the interested schools and be the review team that informs the state of the progress of each school working on certification. This team should be comprised of district level math, science, instructional technology, and CTAE individuals. It is strongly recommended that the STEM Team visit at least one of the schools that have already received certification.

Step 4: Certified Schools Visit
It is strongly recommended that the schools that are working on certification send a team to visit at least one of the schools that have already received certification.

Step 5: Pre-Application Visit
When the district level STEM Team feels a school is ready for certification, they will contact the STEM Director/Coordinator to inform the state AdvancEd Certifiers or GADOE Representatives to schedule a pre-visit.

Step 6: Application Submission Readiness (see Resources). There are no costs for STEM/STEAM Certification.

Step 7: STEM Visitation Team
Once the application has been submitted and accepted, AdvancEd/GADOE will assemble a STEM Visitation Team who will schedule the date for a site visit to confirm that the school has met the criteria for certification. The STEM Director/Coordinator will work directly with school sites for a successfully STEM/STEAM certification process.

Step 8: Visitation Discussion
After the visit, the state visitation team meets to discuss the school application and compare it with the observations made during the visit and will make a decision as to whether the certification criteria have been met – STEM School/Program Certification!

Step 9: STEM Certification
AdvancEd/GADOE will contact the school principal to let them know if certification will be awarded. AdvancEd/GADOE and the school will work together to determine the press release and designation banner/certificate.

Step 10: Revisit
The school will be revisited every five years to determine if they will continue to hold the STEM/STEAM Certification status.

STEMulating Stages

Stage #1 – STEMulating ~ Think-Tanks & Planning	Stage #2 – Early STEMulating Implementation Plans	Stage #3 – Implementation of a STEMulating Culture of High Performance
• Creates a Coding and Programming Club or curriculum experience. • Continue building teacher capacity in core content areas (i.e. mathematics, science, ELA). • Teach the Units of Study (Project-Based Learning-PBL). • Finalize STEM vision and culture core values. • Develop and execute annual STEM Implementation Plan with input from school community and partners. • Principal meets at least monthly with STEM Team to guide and monitor progress. • STEM team meets bi-weekly to plan ensure execution of Implementation Plan. • Principal and Team visit at least two exemplary STEM schools. • Full staff is engaged in STEM planning and discussions at least monthly. • Begin teacher professional learning in STEM practices (i.e. project-based learning, problem-based learning, inquiry-based instruction). • Team and STEM teachers attend STEM related conferences and workshops. • Identify key business and post-secondary partners for STEM advisory board and assistance with planning projects. • Identify STEM curriculum options and projects.	• Continues to expand Coding and Programming Clubs, and there is participation in local, state, and national competitions as part of the Literacy+ curriculum experience. • Continue building teacher capacity in core content areas (i.e. mathematics, science, ELA). • Teach the Units of Study (Interdisciplinary lessons or thematic PBL Units) and create performance based assessments. • Develop and execute annual STEM Implementation Plan with input from school community and partners. • Principal meets bi-weekly with STEM Team to guide and monitor progress. • STEM team meets bi-weekly to plan ensure execution of Implementation Plan. • Principal and Team visit at least two exemplary STEM/STEAM schools. • Full staff is engaged in STEM discussions and activities at least monthly. • Continue teacher professional learning in STEM practices (i.e. project-based learning, problem-based learning, inquiry-based instruction). • STEM teachers plan together weekly. • STEM Team and teachers attend STEM related conferences and workshops. • Engage key business and post-secondary partners for STEM advisory board and assistance with planning projects. • Implement off-the-shelf curriculum as a supplement to units of study and through Specials/Connections/CTAE.	• Implements a Coding or Programming Pathway: Computer Science, Programming, Information Support and Services, Internet of Things, Game Design, Web and Digital Design, and Web Development. • Continue building teacher capacity in core content areas (i.e. mathematics, science, ELA). • Teach the Units of Study (Interdisciplinary lessons or thematic PBL Units) and utilize performance based assessments. • Modifying the units of study to integrate STEM PBL units (Interdisciplinary lessons or thematic lessons). • Develop and execute annual STEM Implementation Plan with input from school community and partners. • Principal meets bi-weekly with STEM Lead and STEM Team to guide and monitor progress. • STEM team meets bi-weekly to plan ensure execution of Implementation Plan. • Principal and Team visit at least two exemplary STEM schools. • Full staff is engaged in STEM discussions and activities at least monthly. • Continue teacher professional learning in STEM practices (i.e. project-based learning, problem-based learning, inquiry-based instruction). • STEM teachers plan together at least weekly. • STEM Team and teachers attend STEM related conferences and workshops • Engage key business and post-secondary partners for STEM.

Stage #1 – STEMulating ~ Think-Tanks & Planning	Stage #2 – Early STEMulating Implementation Plans	Stage #3 – Implementation of a STEMulating Culture of High Performance
• Execute STEM activities at least twice per semester (e.g. STEM day, STEM Challenges, STEM Competitions). • Develop space and equipment plan for an innovative STEM Lab(s). • Identify success indicators and establish progress targets.	• Establish at least one STEM lab for use by all STEM teachers as an innovative maker-space. • Develop and execute the school's annual STEM Implementation Plan, with a focus on: o Recruiting and retaining STEM Educators. o Recruiting and enrolling students in the STEM program (MS/HS). o Execute STEM activities at least twice per semester (e.g. STEM day, STEM Challenges, STEM Competitions). o Tracking progress indicators for accountability purposes. o Continuing to provide professional learning on STEM instructional strategies. o Students participating in STEM-related visioning experiences and competitions. o Reviewing and improving STEM systems, processes and procedures as needed.	• advisory board and assistance with planning projects • Implement off-the-shelf curriculum as a supplement to units of study and through Specials/Connections/CTAE. • Enhance and maximize STEM lab as an innovation center, incubator, maker-space for use by all STEM teachers and students. • Execute the school's annual STEM Implementation Plan, with a focus on: o Recruiting and retaining, and building capacity of STEM Educators. o Recruiting and enrolling students in the STEM program (MS/HS) o Providing professional learning on STEM instructional strategies for new teachers. o Presenting at STEM conferences. o Students participating in STEM-related fieldtrip experiences and competitions. o Students participating in internships and/or capstone projects (HS only). o Tracking progress indicators for accountability. o Reviewing and improving STEM systems, processes and procedures as needed. o Requesting official STEM evaluation from District STEM Support Team. o Completing and submitting application to AdvancED/GADOE for STEM certification visit. o Receive certification! o Completing and submitting application to AdvancED/GADOE for recertification every five (5) years.
Sources: Clayton County Public Schools, Atlanta Public Schools and DeKalb County Public Schools		

STEMulating Look Fors

Look For #1 STEM Embeddedness		
Assess & Address:		
Is STEM evident in every classroom and every hallway?	Is STEM built into our strategic plans?	Do we turn the "STEM switch" on and off?
Look For #2 Learner-centric Environments		
Assess & Address:		
Is STEM learning reserved for special activities and spaces, or is it the norm for most classrooms?	Do students and teachers report similar perspectives and experiences regarding learning activities?	Do classrooms look, sound, and feel active and engaged?
Look For #3 Stakeholder Engagement		
Assess & Address:		
Which voices influence STEM decision-making?	Do students and teachers have ongoing opportunities to engage with STEM practitioners?	Does a representative group of stakeholders meet to support and sustain the STEM program?
Look For #4 Program Sustainability		
Assess & Address:		
What is the trajectory of our STEM program?	What would be the impact if _____ was not here?	What are our measures of success?

Best STEMulating Practices

STEM education may be implemented at all grade levels (i.e. elementary, middle and high school) STEM education is based on rigorous curriculum that integrates subjects (e.g. math and science) as opposed to teaching them separately in isolation. STEM teachers plan and work collaborative as a team to deliver instruction that is driven by innovation, real-world problem solving, exploratory, and student-centered development of creative ideas and solutions. STEM education is not a prescribed curriculum, but a combination of several researched-based best practices proven to improve student achievement through:

- ✓ STEM certification - the **whole school** (all students participate in the STEM program), or for a **program** within the school (cohorts of students are taught by STEM teachers)
- ✓ Curriculum and professional development that is customized to meet the needs of the STEM Culture
- ✓ Purposeful preparation for STEM/STEAM certification usually takes 2 – 3 years
- ✓ Interdisciplinary instruction
- ✓ Problem and project-based learning
- ✓ Inquiry-based learning
- ✓ Collaborative learning
- ✓ Identification of STEM students who are collaboratively grouped
- ✓ **100% of STEM teachers** certified in a STEM content area (i.e. mathematics, science, technology or a career cluster)
- ✓ School community (e.g. staff, parents, business partners) meeting to determine commitment to STEM
- ✓ Teacher professional learning that is on-going and in content areas (i.e. mathematics, science, technology, or a career cluster)
- ✓ High schools that have STEM education incorporated with a state-approved career cluster (i.e. agricultural science, biotechnology, computer science, engineering & technology, healthcare science, or food & nutrition science)
- ✓ Laboratory investigations
- ✓ Designated a STEM lab(s)
- ✓ STEM teachers who collaborate and integrate lessons in science and mathematics, utilizing instructional technology and real world projects
- ✓ Research projects
- ✓ Real-world experiences via work-based or community-service based learning opportunities
- ✓ Advance Placement (AP), International Baccalaureate (IB), college Dual Enrollment programs, and Career, Technical and Agricultural Education (CTAE)

AdvancEd STEM Standards and Indicators

Overview

AdvancED STEM Certification provides a proven, research-based framework and criteria from which to assess and validate the quality, rigor and substance of STEM educational programs. Through this certification protocol, institutions and programs build awareness, increase expectations and demonstrate a commitment and ability to deliver high-quality STEM education. AdvancED STEM Certification is a mark of STEM distinction and excellence for those institutions that are granted the certification.

AdvancED STEM Certification:

- ✓ Combines a data-driven internal review process and an external diagnostic review process to provide educators with detailed findings and a clear roadmap to stimulate and sustain dramatic improvement.
- ✓ Demonstrates a school's ongoing commitment and capacity to prepare students for STEM fields of study and work.
- ✓ Communicates to postsecondary business and industry leaders that the school is committed to driving higher levels of student achievement.
- ✓ Requires STEM school leadership to engage stakeholders in an honest and continual evaluation of policies, strategies and learning conditions in order to achieve desired outcomes.

AdvancED STEM Standard and Indicators

STANDARD: STEM students have the skills, knowledge, and thinking strategies that prepare them to be innovative, creative, and systematic problem-solvers in STEM fields of study and work.

STEM LEARNERS

ST1.1 The STEM school/program supports non-traditional student participation through outreach to groups often underrepresented in STEM program areas.

ST1.2 Students work independently and collaboratively in an inquiry-based learning environment that encourages finding creative solutions to authentic and complex problems.

ST1.3 Students are empowered to personalize and self-direct their STEM learning experiences supported by STEM educators who facilitate their learning.

ST1.4 Students use technology resources to conduct research, demonstrate creative and critical thinking, and communicate and work collaboratively.

ST1.5 Students demonstrate their learning through performance-based assessments and express their conclusions through elaborated explanations of their thinking.

STEM EDUCATORS

ST1.6 The interdisciplinary problem-based curriculum includes a focus on real world applications.

ST1.7 STEM educators collaborate as an interdisciplinary team to plan, implement, and improve integrated STEM learning experiences.

ST1.8 STEM learning outcomes demonstrate students' STEM literacy necessary for the next level of STEM learning and for post- secondary and workforce readiness.

ST1.9 STEM teachers and leaders participate in a continuous program of STEM-specific professional learning.

STEM EXPERIENCES

ST1.10 Community, post-secondary, business/industry partners and/or families actively support and are engaged with teachers and students in the STEM program.

ST1.11 Students are supported in their STEM learning through adult-world connections and extended day opportunities.

District Timeline

Goals	Objectives	Responsible
Establish a unifying district STEM approach	1. Create a STEMulating Culture of High Performance print materials, website, social media, and evidence of STEM practices/experiences PBL, interdisciplinary units, STEM Clubs, Robotics, STEM Competition, etc. 2. Expose School Leadership to STEM Experiences, i.e. Hands-On STEM activity, Leadership STEM Expeditions, Professional Development opportunities. 3. Establish cohorts of school teams pursuing STEM program or STEM School Certification.	All stakeholders, STEM Coordinator and Business Partners
Communicate to all stakeholders the importance of STEM	1. STEMulating informational sessions 2. STEMulating website, videos, print materials, etc. 3. STEM Fest, Science Fair, Math Olympiad and/or Fine Arts Showcases 4. STEM Competitions (domestic/international). 5. STEM Visioning Experiences 6. STEM Partnerships 7. Summer Enrichment Camps 8. Develop a STEMulating International Exchange Program	All stakeholders, STEM Coordinator and Business Partners
Identify STEM Team to support schools	1. Identify STEM needs and recruit team members to serve on the STEM Team by March 2018. Project members include representation from various departments who are responsible for coordinating efforts for successful implementation. 2. Establish regular STEM Team meetings and objectives to support schools.	All stakeholders, STEM Coordinator, CIA and Administrators
Create a STEM Budget	1. Supports STEM curriculum, staffing, training, professional development, visioning. experiences, supplies and equipment for school pursing STEM Certifications and those that have attained STEM certification.	Superintendent of Schools/CEO and CFO
Evaluate and Assess Effectiveness	1. Collaborate with power-users to identify milestones and benchmark, and other collected artifacts and evidence of growth. 2. Liaise with AdvancED and GADOE STEM Certifiers.	STEM Team, STEM Coordinator and Administrators
Build STEM Capacity	1. Train and certify: (1) Assistant Superintendent, STEM/CTAE, Science and Math Coordinators and (3) Principals (ES, MS and HS) to become certified: AdvancED STEM Certifiers.	In-progress
STEM Goal	100% of CCPS Schools STEM is part of the culture or STEM Certified (Program/School) – 2023.	All stakeholders
Communicate progress of actions and monitor frequently.	1. Initiate frequent communication checkpoints and communicate finding; take corrective actions as needed. *Cycle of continuous improvement. 2. Schools will provide quarterly written updates to Assistant Superintendents; take or recommend corrective actions as needed.	Assistant Superintendents, Principals, STEM Coordinator

STEM Occupations & Majors

COMPUTER AND MATH OCCUPATIONS	
COMPUTER SCIENTISTS AND SYSTEMS ANALYSTS	MISCELLANEOUS MATHEMATICAL SCIENCE OCCUPATIONS
COMPUTER PROGRAMMERS	MATHEMATICIANS
COMPUTER SOFTWARE ENGINEERS	OPERATIONS RESEARCH ANALYSTS
COMPUTER SUPPORT SPECIALISTS	STATISTICIANS
DATABASE ADMINISTRATORS	NETWORK AND COMPUTER SYSTEMS ADMINISTRATORS
ACTUARIES	NETWORK SYSTEMS AND DATA COMMUNICATIONS ANALYSTS
ENGINEERING AND SURVEYING OCCUPATIONS	
SURVEYORS, CARTOGRAPHERS, AND PHOTOGRAMMETRISTS	MATERIALS ENGINEERS
AEROSPACE ENGINEERS	MECHANICAL ENGINEERS
AGRICULTURAL ENGINEERS	MINING AND GEOLOGICAL ENGINEERS, INCLUDING MINING SAFETY ENGINEERS
BIOMEDICAL ENGINEERS	NUCLEAR ENGINEERS
CHEMICAL ENGINEERS	PETROLEUM ENGINEERS
CIVIL ENGINEERS	ENGINEERS, ALL OTHER
COMPUTER HARDWARE ENGINEERS	DRAFTERS
ELECTRICAL AND ELECTRONIC ENGINEERS	ENGINEERING TECHNICIANS, EXCEPT DRAFTERS
ENVIRONMENTAL ENGINEERS	SURVEYING AND MAPPING TECHNICIANS
INDUSTRIAL ENGINEERS, INCLUDING HEALTH AND SAFETY	SALES ENGINEERS
MARINE ENGINEERS AND NAVAL ARCHITECTS	
PHYSICAL AND LIFE SCIENCES OCCUPATIONS	
AGRICULTURAL AND FOOD SCIENTISTS	PHYSICAL SCIENTISTS, ALL OTHER
BIOLOGICAL SCIENTISTS	AGRICULTURAL AND FOOD SCIENCE TECHNICIANS
CONSERVATION SCIENTISTS AND FORESTERS	BIOLOGICAL TECHNICIANS
MEDICAL SCIENTISTS	CHEMICAL TECHNICIANS
ASTRONOMERS AND PHYSICISTS	GEOLOGICAL AND PETROLEUM TECHNICIANS
ATMOSPHERIC AND SPACE SCIENTISTS	NUCLEAR TECHNICIANS
CHEMISTS AND MATERIALS SCIENTISTS	OTHER LIFE, PHYSICAL, AND SOCIAL SCIENCE TECHNICIANS
ENVIRONMENTAL SCIENTISTS AND GEOSCIENTISTS	
STEM MANAGERIAL OCCUPATIONS	
COMPUTER AND INFORMATION SYSTEMS MANAGERS	ENGINEERING MANAGERS
NATURAL SCIENCES MANAGERS	
STEM UNDERGRADUATE MAJORS	
COMPUTER MAJORS	
COMPUTER AND INFORMATION SYSTEMS	COMPUTER SCIENCE
COMPUTER PROGRAMMING AND DATA PROCESSING	INFORMATION SCIENCES
COMPUTER ADMINISTRATION MANAGEMENT AND SECURITY	COMPUTER NETWORKING AND TELECOMMUNICATIONS

MATH MAJORS	
MATHEMATICS	STATISTICS AND DECISION SCIENCE
MATHEMATICS AND COMPUTER SCIENCE	APPLIED MATHEMATICS
ENGINEERING MAJORS	
GENERAL ENGINEERING	ENVIRONMENTAL ENGINEERING
AEROSPACE ENGINEERING	GEOLOGICAL AND GEOPHYSICAL ENGINEERING
BIOLOGICAL ENGINEERING	NDUSTRIAL AND MANUFACTURING ENGINEERING
ARCHITECTURAL ENGINEERING	MATERIALS ENGINEERING AND MATERIALS SCIENCE
BIOMEDICAL ENGINEERING	MECHANICAL ENGINEERING
CHEMICAL ENGINEERING	METALLURGICAL ENGINEERING
CIVIL ENGINEERING	MINING AND MINERAL ENGINEERING
COMPUTER ENGINEERING	NAVAL ARCHITECTURE AND MARINE ENGINEERING
ELECTRICAL ENGINEERING	NUCLEAR ENGINEERING
ENGINEERING MECHANICS PHYSICS AND SCIENCE	ELECTRICAL ENGINEERING TECHNOLOGY
PETROLEUM ENGINEERING	INDUSTRIAL PRODUCTION TECHNOLOGIES
MISCELLANEOUS ENGINEERING	MECHANICAL ENGINEERING RELATED TECHNOLOGIES
ENGINEERING TECHNOLOGIES	MISCELLANEOUS ENGINEERING TECHNOLOGIES
ENGINEERING AND INDUSTRIAL MANAGEMENT	
PHYSICAL SCIENCE AND LIFE SCIENCE MAJORS	
ANIMAL SCIENCES	GENETICS
FOOD SCIENCE	MICROBIOLOGY
PLANT SCIENCE AND AGRONOMY	PHARMACOLOGY
SOIL SCIENCE	PHYSIOLOGY
ENVIRONMENTAL SCIENCE	ZOOLOGY
BIOLOGY	MISCELLANEOUS BIOLOGY
BIOCHEMICAL SCIENCES	NUTRITION SCIENCES
BOTANY	NEUROSCIENCE
MOLECULAR BIOLOGY	COGNITIVE SCIENCE AND BIOPSYCHOLOGY
PHYSICAL SCIENCES	GEOLOGY AND EARTH SCIENCE
ASTRONOMY AND ASTROPHYSICS	GEOSCIENCES
ATMOSPHERIC SCIENCES AND METEOROLOGY	OCEANOGRAPHY
CHEMISTRY	PHYSICS
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Appendix A-C

Elementary School Feeders to Middle School	
Anderson Elementary	Adamson Middle, Forest Park Middle, Morrow MS
Brown Elementary	Mundy's Mill Middle, Pointe South Middle
Callaway Elementary	Kendrick Middle
Church Street Elementary	North Clayton Middle, Riverdale Middle
East Clayton Elementary	Adamson Middle
Edmonds Elementary	Forest Park Middle
Fountain Elementary	Babb Middle, Sequoyah Middle
Harper Elementary	Sequoyah Middle
Hawthorne Elementary	Lovejoy Middle, Mundy's Mill Middle
Haynie Elementary	Babb Middle, Sequoyah Middle
Huie Elementary	Forest Park Middle
Jackson Elementary	Jonesboro Middle,Roberts Middle
Kemp Primary/ Elementary	Lovejoy Middle, Mundy's Mill Middle, Pointe South Middle, White Academy 6-8
Kilpatrick Elementary	Jonesboro Middle, Sequoyah Middle
King Elementary	North Clayton Middle, Riverdale Middle, Sequoyah Middle
Lake City Elementary	Babb Middle
Lake Ridge Elementary	Kendrick Middle, Riverdale Middle
Lee Street Elementary	Jonesboro Middle, Mundy's Mill Middle
Marshall Elementary	Adamson Middle,Morrow Middle
McGarrah Elementary	Morrow Middle, Rex Mill Middle
Morrow Elementary	Babb Middle, Morrow Middle
Mt. Zion Primary/Elementary	Jonesboro Middle,Rex Mill Middle, Roberts Middle
Northcutt Elementary	North Clayton Middle
Oliver Elementary	North Clayton Middle, Riverdale Middle
Pointe South Elementary	Kendrick Middle, Pointe South Middle
Riverdale Elementary	Riverdale Middle, Sequoyah Middle
River's Edge Elementary	White Academy Middle
Smith Elementary	Adamson Middle Rex Mill Middle
Suder Elementary	Jonesboro Middle, Roberts Middle Mundy's Mill Middle, Point South Middle
Swint Elementary	Jonesboro Middle, Kendrick Middle, Pointe South Middle
Tara Elementary	Jonesboro Middle
West Clayton Elementary	North Clayton Middle
White Academy Elementary	Lovejoy Middle, White Academy Middle

Middle School Feeders to High Schools	
Adamson Middle	Morrow High
Babb Middle	Forest Park High
Forest Park Middle	Forest Park High
Jonesboro Middle	Jonesboro High, Mt. Zion High
Kendrick Middle	Riverdale High, Jonesboro High
Lovejoy Middle	Lovejoy High, Mundy's Mill High
Morrow Middle	Morrow High, Mount Zion High
Mundy's Mill Middle	Jonesboro High, Lovejoy High, Mundy's Mill High
North Clayton Middle	North Clayton High
Pointe South Middle	Mundy's Mill High, Riverdale High
Rex Mill Middle	Morrow High, Mt. Zion High
Riverdale Middle	Drew High School, Riverdale High
Roberts Middle	Jonesboro High, Mt. Zion High
Sequoyah Middle	Drew High School, Forest Park High
White Academy 6-8	Lovejoy High

School	Coding Experiences	STEM Integration (GADOE STEM Rubric, Robotics Clubs, The Flying Classroom, Project Lead the Way, etc.)?	STEM Information Meeting (GADOE)
Callaway Elementary Church Street Elementary Harper Elementary Kemp Elementary King Elementary Lake Ridge Elementary Lee Street Elementary Northcutt Elementary Oliver Elementary Haynie Elementary Marshall Elementary Mt. Zion Elementary Pointe South Elementary Riverdale Elementary River's Edge Elementary Tara Elementary Swint Elementary Smith Elementary West Clayton Elementary Jonesboro Middle Kendrick Middle North Clayton Middle Pointe South Middle Sequoyah Middle Riverdale Middle Lovejoy Middle Forest Park Middle Rex Mill Middle Adamson Middle		The Flying Classroom STEM+ Curriculum	All (GADOE G. Lyons or Felicia Cullars 2015-2016)
Pointe South Middle School - Engineering North Clayton Middle School - Engineering Jonesboro Middle School - Engineering Adamson Middle School - Engineering Haynie Elementary Church Street Elementary Rex Mill Middle School - STEM		Project Lead the Way Grant 2016-2017	
Smith Elementary		Reviewed rubric	
Fountain Elementary		Reviewed rubric	
Forest Park High School		Offers a Biotech course	
Brown ES		Application Completed STEM Certification Process – AdvancEd 2018	

<table>
<tr><th>School</th><th>Coding Experiences</th><th>STEM Integration (GADOE STEM Rubric, Robotics Clubs, The Flying Classroom, Project Lead the Way, etc.)?</th><th>STEM Information Meeting (GADOE)</th></tr>
<tr><td>Charles Drew High
(competed in robotics – GaTech)
Rex Mill
(made it to State)
MD Roberts
Lovejoy Middle
Babb Middle
Mundy's Mill Middle
Kendrick Middle
(made it to Super-Regionals)
N. Clayton Middle (made it to Super-Regionals)
Mundy's Mill Middle
Jonesboro Middle
Brown Elementary
Smith Elementary
Tara Elementary (haven't competed yet)</td><td></td><td> 
Robotics Club
  </td><td rowspan="2"> 
All
(GADOE G. Lyons 2015-2016
  </td></tr>
<tr><td>Schools TBD:
Eddie White
Anderson
East Clayton
Arnold
Huie
McGarrah
Edmonds
Unidos
West Clayton
Hawthorne
Jackson
Kemp
Kemp Primary
Kilpatrick
Suder
Elite
Mount Zion High
Morrow High
Mundy's Mill High
North Clayton High
Jonesboro High
Riverdale High
Perry Center
Stilwell</td><td></td><td></td></tr>
<tr><td>Brown ES
Smith ES
Fountain ES
Jackson ES
Elite Scholars MS
Adamson MS
Mundy's Mill MS
Rex Mill MS
Forest Park MS
MD Roberts MS
Eddie White MS
North Clayton MS
Charles Drew HS
Forest Park HS
Lovejoy HS</td><td colspan="3">  Coding Experiences (Clubs/Curriculum)
• Stage 1/2</td></tr>
</table>

Mundy's Mill HS	
*Several school attended the Crayola Training…sponsored by Fine Arts (Arts integration but not directly aligned to STEM/STEAM) *Brown ES, Rex Mill MS and NCHS –Principals are AdvancED STEM Certified Evaluators	
Information compiled from: - Dr. Tonya Clarke, Coordinator of Mathematics - Janetta Greenwood, Coordinator of Science - Dr. Monika Wiley, Director of Fine Arts - Dr. Eboni Chillis, Coordinator of CTAE - Mrs. Charmine Johnson, Assistant Superintendent – Cluster D - Trina Reaves, Principal Brown ES - Dr. Caryn Turner, Principal Rex Mill MS - Mrs. Shakira Rice, Principal North Clayton MS *AdvancED STEM Certified Evaluators	