



Richard Woods, Georgia's School Superintendent

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Georgia STEAM Certification Continuum for Elementary School

April, 2016

Criteria	Continuum			
	Pre-Implementation	→		Full
1. STEAM Vision and Culture	No vision is in place and there is no STEAM culture evident in the school.	→		The vision for STEAM is clearly defined and a STEAM culture has been established within the program and/or school (students articulate through their actions a passion and perception that STEAM is the culture in the school).
<p align="center">Required:</p> <p><i>Note - * The terms "Fine Arts" and "Arts" throughout all STEAM certification documents is defined as Dance, Music, Theatre and Visual Arts</i></p> <ol style="list-style-type: none"> The STEAM vision for the school/program is written. The school provides evidence that a STEAM culture has been established (it is the school's decision how they will show this). 				
2. STEAM students (Not applicable for whole school certification)	No students are identified as STEAM.	STEAM students are identified.	STEAM students are identified and a selection process is described.	STEAM students are identified by a school designed selection process that has been vetted with successful longitudinal evidence.
<p align="center">Required:</p> <ol style="list-style-type: none"> Documentation of how students are selected based upon specific criteria such as academic achievement, interest, standardized test scores, lottery, random selection, etc. A copy of the STEAM application for the STEAM program/school. 				



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3. Non-traditional student participation in STEAM (minorities, females, and economically disadvantaged) (Not applicable for whole school certification)	The non-traditional student participation does not reflect the diversity and gender of the school district.	A plan is being developed for outreach, support, and focus on non-traditional student populations.	A plan is in place for outreach, support, and focus on non-traditional student populations.	The non-traditional student participation reflects the diversity of the school in terms of gender, minorities, and economically disadvantaged.
Required:				
1. Documentation of non-traditional student participation (The term Nontraditional Careers refers to jobs that have been traditionally filled by one gender. The US Department of Labor defines Nontraditional Occupations as occupations for which individuals from one gender comprise less than 25% of the individuals employed in each such occupation. For certification purposes, the definition has expanded to include minorities and economically disadvantaged).				
4. Characteristics of the STEAM curriculum	Students in the STEAM program follow a similar curriculum as students not in a STEAM program.	A plan is being developed for an explicit and unique curriculum for STEAM students or a specific curriculum for STEAM students is currently implemented only in some of the school's grade levels.	There is a plan in place to expand an explicit and unique curriculum from some grade levels to multiple grade levels and to maintain sustainability.	STEAM students are regularly exposed to a unique and explicit curriculum that is different from non-STEAM students and there is evidence of its sustainability (three plus years). The STEAM curriculum should support one of the GaDOE STEAM focus areas: advanced academics, agriculture, architecture, biotechnology, computer programming, cyber security, energy, engineering, food science and nutrition, forensic science, health care science, and/or information technology plus <i>arts integration</i> .
Required:				
1. Written description of the unique characteristics of the STEAM curriculum. 2. The school's STEAM focus area is described and how fine arts are incorporated into all areas.				
EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS				
<ul style="list-style-type: none"> • The curriculum offers opportunities for student presentations of investigations and findings <i>through the fine arts</i>. • There is evidence that students engage in regular "arguments from evidence" during classroom instruction • There are opportunities for students to interact with STEM and fine arts professionals to support curriculum • There are opportunities that involve older students working with elementary students in the STEAM program 				



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<ul style="list-style-type: none"> • There are opportunities for students to interact with museum/business/community/museum/arts partners to support curriculum • A school foundation composed of parents, community, arts and business partners has been established to maintain sustainability • An entrepreneur component of the STEAM program may be in place. 				
<p>5. Teacher Content Knowledge</p>	<p>None of the STEM teachers are working toward increasing content knowledge in science and math. Fine Arts teachers are uncertified in their subject area.</p>			<p>Fine Arts Teachers are all content matter experts holding certification in their subject area. STEM teachers <u>are working toward</u> increasing content knowledge in science and math through multiple means such as:</p> <ul style="list-style-type: none"> • science and/or math endorsements, • middle school science and/or math certification, • additional coursework in math and/or science at the post-secondary level • STEM Endorsement (available from the Ga PSC school year 2018-19) • content collaboration with business/industry, post-secondary partners, or informal education partners. • Externships
<p>Required:</p>				
<ol style="list-style-type: none"> 1. Documentation of method/procedures implemented for increasing math and science content knowledge for all STEM teachers. 2. Documentation of method/procedures implemented for increasing fine arts teachers content knowledge and arts integration content knowledge of STEM teachers. 3. Documentation of the plan for sustaining content knowledge and induction of new STEM and fine arts teachers. 				
<p>6. Teacher Professional Learning</p>	<p>There is no STEAM related professional</p>	<p>STEAM teachers attended at least one</p>	<p>STEAM teachers have on-going STEM-specific</p>	<p>STEAM teachers have on-going STEAM and arts integration professional learning</p>



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	development currently being planned and none has any been offered in the last year. Arts integration training has not been provided for STEAM teachers.	STEAM professional learning event. Arts integration training for STEAM teachers has occurred at least once	professional learning (specific to their STEM or Arts focus) and there is evidence of its implementation in classroom instruction. Fine arts teachers have been provided with specific content training for their subject area.	and STEAM specific strategies as it relating to the school's identified STEAM focus area and there is evidence of implementation in classroom instruction. Arts integration training is ongoing throughout the school year.
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Required:

1. Documentation of STEAM and arts integrated specific professional learning for all STEAM teachers that incorporates the following:
 - Project/problem/place-based learning
 - Arts Integrated instruction
 - Investigative research-based practices
 - Collaborative planning practices
 - 21st Century thinking skills
 - Increase of the STEM-focused content knowledge (advanced academics, agriculture, architecture, biotechnology, computer programming, cybersecurity, energy, engineering, food science and nutrition, forensic science, health care science, and/or information technology).
 - Increase of the fine arts focused content knowledge (dance, music, theatre and visual arts)
2. Documentation of visits to other STEM Certified Schools and STEAM focused schools (what school staff visited and where did they go).

EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS

- STEAM teachers have tailored professional learning to their specific needs and/or to their STEM or fine arts focus area.
- STEAM teachers participate in a job-embedded or practice-based approach to professional learning
- STEAM teachers attend STEM, STEAM, and/or fine arts content area state, regional, and national conferences
- STEAM teachers present at STEM, STEAM, and/or fine arts content area state, regional, and national conferences
- STEAM teachers/administrators have visited other STEM Certified or STEAM focused Schools
- STEAM teachers observe other STEM, STEAM, and fine arts teachers (peer observations, instructional rounds, etc.)
- STEAM teachers participate in project/problem-based learning professional learning
- STEAM teachers participate in professional learning related to STEAM integration



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<ul style="list-style-type: none"> • STEAM teachers participate in professional learning to strengthen STEAM and fine arts content knowledge and skills • STEAM teachers participate in arts integration training 				
7. Teacher Collaboration	There is no collaboration or collaboration is not structured or planned.	Teachers collaborate quarterly to plan integrated lessons, share/co-create STEAM activities, and plan learning outcomes.	Teachers have a scheduled collaboration at least monthly to plan integrated lessons, share/co-create STEAM activities, and plan learning outcomes.	Teachers collaborate at least weekly to plan integrated lessons, share/co-create STEAM activities, and plan learning outcomes. The school administration must provide planning time for teachers.
Required:				
1. Documented evidence of weekly STEAM collaborative planning time (minutes, generated artifacts, agendas, etc.).				
8. Math, Science, and Fine Arts Instruction	STEAM students do not participate in math, science, or fine arts enrichment opportunities. Students do not receive daily math, science, and fine arts instruction. STEAM instruction has replaced fine arts specific courses	STEAM students receive math, science, or fine arts instruction 1-4 times/week but it may be in isolation.	STEAM students participate in math, science, and fine arts enrichment opportunities. Students receive integrated math, science, and fine arts instruction 2-4 times/week.	STEAM students participate in math, science, and fine arts enrichment opportunities and are accelerated through differentiation. Students receive daily-integrated math, science and fine arts instruction.
Required:				
1. Documentation of the number of students enrolled and passing accelerated math and science.				
2. Documentation of the number of students enrolled and passing fine arts classes.				
3. Description of how the school differentiates to provide rigorous math instruction to all STEAM students.				
9. Business, Community, and Post-Secondary Partnerships STEM Georgia Business/Community/Post-	There are no business, community, arts, and post-secondary partnerships.	Plans are being developed to provide student opportunities to meet STEAM partners	Business, community, arts, and post-secondary partnerships are involved in the STEAM	Multiple business, community, arts, and post-secondary partnerships are on-going and are involved by directly connecting to in-class instruction, project/problem-



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<p><u>Secondary Partnership Involvement Levels</u></p> <p><i>Link to the GA Teaching Artists Roster:</i> <u>http://gaarts.org/georgia-artists/artists-rosters</u></p>		<p>and to participate in STEAM learning environments directly connected to in-class learning.</p>	<p>instructional program 1-4 times/school year and are directly connected to in-class learning.</p>	<p>based learning, arts integration, and exposing students to STEAM careers.</p>
<p>Required:</p> <p>1. Documentation on the quality of the partnership engagement based upon the <u>STEM Georgia Partnership Involvement Levels</u>. <i>There must be involvement at all three levels.</i></p>				
<p>10. STEM, STEAM, Fine Arts Competitions and Exhibits AND/OR STEM, STEAM, Fine Arts Clubs</p>	<p>No STEAM students are involved in STEM and/or arts competitions, on-site/online STEM or arts exhibits, and/or in state and national STEAM, STEM and/or arts forums or clubs.</p>	<p>Some of the STEAM students participate in STEM and/or arts competitions on-site/online STEM and/or arts exhibits and performances, and/or in state and national STEAM forums.</p>	<p>A majority of the STEAM students participate in STEM and arts competitions on-site/online STEM and arts exhibits and performances, and/or in state and national STEAM forums.</p>	<p>All STEAM students participate in STEM and fine arts competitions, exhibits, forums and performances at the school, district, state and/or national.</p>
<p>Required:</p> <p>1. Documentation that shows how many students have participated in each STEM, STEAM, Arts competition, exhibit, or club (this number should equal the number of students enrolled in the STEAM school/program.</p>				
<p>EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS</p> <ul style="list-style-type: none"> Included but not limited to those listed below: Examples: STEM Talk, Science Olympiad, Science and Engineering Fair, art club, band, orchestra, chorus, drama club, dance program, eCybermission, TAG IT Challenges, Dupont Essay Contest, Reflections PTA Art contest, BioGENEius Challenges, School wide or district wide art exhibit or performance, Clean Tech Challenges, Vex and Lego Robotics, Math Competitions, Technology Fairs, CTAE CTSO Competitions, etc. Clubs could be science club, Maker Spaces, math club, engineering club, STEAM club, gardening club, etc. 				
<p>11. Project/Problem-Based Learning and the use of the arts as a presentation tool</p>	<p>Students are only assessed using state and unit assessments.</p>	<p>In addition to state and unit assessments, teachers use multiple</p>	<p>In addition to state, unit, knowledge, and performance-based</p>	<p>Short and long-term projects/problems are implemented <i>throughout the school year</i> incorporating student-generated</p>



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		indicators of success in a STEAM content area, including knowledge and performance-based assessments.	assessments, short and long-term projects/problems are implemented and are moving toward student-generated ideas. . Students are able to present content learned through an arts form several times each semester.	ideas that are standards-based, multidisciplinary and real world. Students are able to articulate the relationship among the concepts they are learning in math, science, and the arts to their created projects. Students are able to present content learned through an art form as regular practice.
Required:				
1. Summary of grade level specific, interdisciplinary, STEAM-focused, problem/project-based learning opportunities that have occurred throughout the school year (curriculum map, timeline, calendar, etc).				
EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS				
<ul style="list-style-type: none"> • Collaborative projects that require planning, research, discussion/debate, and presentations through an arts form • Products that require students to analyze and interpret data, construct explanations and design solutions, and engage in argument from evidence • Experimentation that requires students illustrate their understanding of STEAM concepts • Peer/Self-assessment on products using rubrics • Solving problems using real-world applications • Creation of video, artwork, or performance that demonstrates content mastery • Student demonstrations that reflect mastery of STEAM content and procedures • Student work may be designed around the Grand Challenges • Portfolios that allow students to portray their learning via collections of personal work and performances • A culminating project that integrates all the STEAM content areas and presents information learned through an art form • Student work created in collaboration with a business/community/post-secondary partner 				
12. STEAM Integration	STEAM is not integrated into the curriculum. Students receive daily math and science instruction in	STEAM students receive integrated math, science, and fine arts instruction 1-3 times/week.	STEAM students participate in integrated math, science, and fine arts instruction. Arts Integration is	Students receive daily math, science, and fine arts instruction that supports a STEAM project correlated to current math, science, and fine arts standards. Instruction is multidisciplinary including



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	isolation. Fine Arts classes are sporadic and not integrated into STEM courses.		occasionally integrated into other content areas. Standards may be revisited from previous years.	<p>mathematics, technology, arts and the science and engineering practices:</p> <ol style="list-style-type: none"> 1. Asking questions (for science) and defining problems (for engineering) 2. Developing and using models 3. Planning and carrying out investigations 4. Analyzing and interpreting data 5. Using mathematics and computational thinking 6. Constructing explanations (for science) and designing solutions (for engineering) 7. Engaging in argument from evidence 8. Obtaining, evaluating, and communicating through an art form} <p>Students are able to clearly articulate an understanding of the math, science, and fine arts concepts being studied.</p>
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Required:
1. Documentation of the school or classroom schedule indicating time spent on interdisciplinary learning.

13. STEAM Labs/Resources	There are no STEAM lab/resources in the school. STEAM lab has replaced fine arts spaces.	The STEAM lab has only technology access and a few resources.	The STEAM lab(s) has technology access and resources but are only used by a few teachers. STEAM lab is separate from fine arts spaces.	The STEAM lab(s) has technology access and resources are used by multiple teachers for collaboration, project work, virtual collaboration, and can be used as exhibition and performance space.
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Required:



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1. Documentation describing the STEAM lab(s), including who uses the lab, how often, and for what purposes.				
14. Student Rigor & Relevance and Instructional Quality	Most of the learning occurs at the acquisition level. Content knowledge is taught in a silo by discipline and instruction focuses on knowledge awareness and comprehension of information. Classroom instruction is predominantly teacher centered.	Most of the learning occurs at the acquisition and application levels. Classroom instruction is predominantly teacher centered. Work shows students designing solutions to problems centered on a single discipline at a time by applying knowledge to new situations.	Most of the learning occurs at the assimilation levels. Classroom instruction is predominantly student centered and students extend and refine their acquired knowledge to routinely analyze and solve problems, as well as create unique solutions.	Learning occurs at the adaptation level on a regular basis. <i>Classroom instruction is predominantly student centered</i> and students have the competence to think in complex ways and also apply the knowledge and skills they have acquired. When confronted with perplexing unknowns, students are able to create solutions and take action that further develops their skills & knowledge.
Required:				
1. Submission of at least two examples of student work that has occurred at the adaptation level of the Rigor and Relevance Framework				
EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS				
<ul style="list-style-type: none"> • Students are asked to use extensive knowledge and skills to take action on perplexing problems with unknown solutions • Student work is designed around a STEAM community or business/arts/industry problem • Project products are exhibited that indicate quadrant D critical thinking skills are being used • Involvement with a specialized science, math, fine arts, and/or engineering program(s) • A culture of inquiry, creativity, and innovation exists among students, teachers, and administrators. 				
15. Technology Integration	There is little or no technology integration supporting STEAM teaching and learning.	A technology plan is in place to integrate a variety of technology tools supporting STEAM teaching and learning.	A technology plan is implemented in STEAM classrooms. Classrooms include a variety of technology tools that are integrated at least weekly into STEAM teaching and learning.	Technology use is ubiquitous throughout STEAM classrooms and students are producers and not just consumers of digital content.
Required:				



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1. Submission of at least two student-produced products through the use of technology.
2. Evidence of ubiquitous use of technology throughout classrooms.

EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS

- Computer use is commonplace
- Students are regular producers of websites, blogs, computer programs, videos, classroom digital products, music recordings, etc
- Computer-based, online, mobile, virtual, and other technology tools are integrated into STEAM classwork
- Probes are used to collect and analyze data
- Tablets are in use with apps specific to the topic
- Graphing calculators may be used to solve problems at the upper elementary level
- STEAM industry related technology is available for student use
- 21st century technology tool use by students is visible throughout the school
- Instructional technology equipment is rarely inoperable
- Teachers and students receive on-going access and opportunity to expand their proficiency in technology use

16. Investigative Research	There is no investigative research occurring in classes.	Students are conducting investigative research that is grade-level appropriate but the purpose is ill-defined and variables have not been identified.	STEAM students are conducting investigative research that is grade level appropriate, variables have been identified, and the scientific process is understood.	STEAM students conduct investigative research to make claims, collect evidence, analyze data, and argue from evidence. Students are able to communicate results via written, oral, drawn, and digital presentations and performances.
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Required:

1. Submission of at least two student investigative research topics and their findings.

EXAMPLE ARTIFACTS THAT SUPPORT STEAM EFFORTS

- Students enter a science and engineering fair
- Students present findings to a public audience through an art form
- Students publish research through an art form in a public venue
- Student research is posted in hallways and classroom walls
- Student performances and exhibitions are ongoing throughout the school year and integrated into project/ problem based learning

17. Accountability	There is no evidence		Schools determine the evidence that
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	the STEAM program is increasing student academic and creative growth.		STEAM students are increasing in academic and creative growth.
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Required:

1. Schools indicate evidence the STEAM program is increasing student academic growth over a three year period through a standardized measure selected by the school.