

K – 12 Catalyst Grant for STEM Education Proposal

Title of the Proposal: Engineering Minds Through STEM Education

Date: May 22, 2025

1. Introduction

ABC Elementary School, located in Augusta, Georgia, is a Title I school dedicated to delivering high-quality education to all students. As of the 2024–2025 academic year, the school serves an enrollment of approximately 500 students, with nearly 100% qualifying for free lunch. ABC Elementary fosters a supportive and inclusive learning environment where academic excellence is encouraged, and all stakeholders—students, families, educators, and community members—are united in their commitment to shared success.

The purpose of the Engineering Minds Through STEM Education project is to enhance the quality and accessibility of STEM education at ABC Elementary School by fostering a hands-on, inquiry-based learning environment for all students in kindergarten through fifth grade. The goal is to increase student engagement, cultivate critical thinking, and strengthen real-world problem-solving skills through equitable and innovative STEM learning experiences.

2. STEM Integration

To enhance student engagement and achievement in science, technology, engineering, and mathematics (STEM), ABC Elementary will implement weekly STEM enrichment opportunities for all students in kindergarten through fifth grade. These lessons will align with the Georgia Standards of Excellence, ensuring that instruction is both rigorous and standards based. Each grade level will participate in developmentally appropriate, hands-on activities designed to cultivate critical thinking, collaboration, and problem-solving skills.

Students will explore foundational STEM concepts such as force and motion, simple machines, data collection, coding, and environmental challenges. These topics will be introduced through real-world design challenges and the engineering design process. Lessons will emphasize building, testing, and presenting solutions, providing students with a comprehensive and progressive STEM experience from kindergarten through fifth grade.

3. Implementation

A STEM Lab has been established in a designated classroom space equipped with workstations, storage, and technology. All SPIKE Essential Sets and supplies will be organized by station and labeled for efficient student use. An assigned STEM teacher and support staff will be trained on the LEGO SPIKE Essential kits, the LEGO SPIKE platform, classroom management for labs, and lesson pacing.

Each kindergarten through fifth grade class will visit the STEM Lab once a week for a 45-minute session, following a rotating schedule. Lessons will be scaffolded by grade level and aligned to the

Georgia Standards of Excellence. Activities will follow the engineering design process: Plan, Create, Test, Improve, Share.

Students in kindergarten through second grade will engage in foundational STEM challenges focusing on exploration, basic machines, and storytelling through builds. Students in third through fifth grade will work on increasingly complex tasks involving sensors, basic coding, data collection, and multi-step problem-solving. The lab teacher will lead instruction, model building techniques, and facilitate student collaboration and reflection.

4. Project Timeline

- **July 2025 - August 2025**
 - Purchase materials and set up the STEM lab
 - Train teachers and support staff on LEGO Education tools and lesson integration
 - Launch communication to families and stakeholders
- **September 2025**
 - Begin classroom implementation
 - Administer pre-project student surveys and baseline observations
- **October 2025 – February 2026**
 - Continue weekly LEGO STEM activities
 - Monitor student engagement and performance using monthly check-ins, collaborative planning, and vertical planning
 - Conduct monthly check-ins and gather student work samples
- **March 2026**
 - Mid-year evaluation of project implementation
 - Administer mid-year student survey and teacher reflection forms
 - Adjust instructional strategies and delivery based on feedback
- **April 2026 – May 2026**
 - Prepare and host student STEM Showcase Night
 - Administer post-project surveys and collect final data
 - Evaluate project outcomes

5. Sharing Lessons

To maximize the impact of STEM Education, students and teachers will engage in intentional sharing of lessons through the following strategies:

- **Teacher Collaborative Planning Sessions:** Weekly grade-level and monthly vertical team meetings will be used for teachers to reflect on student outcomes, share successful strategies, and troubleshoot implementation challenges.
- **School-Wide Presentations/Community Engagement:** Project updates and student highlights will be shared during quarterly STEM nights. Student-led STEM showcase events will provide a platform for families and community stakeholders to witness the impact of project-based learning and offer feedback.
- **Digital Documentation:** The school's website and social media platforms will feature project snapshots, reflections, and videos to celebrate success and inspire broader interest.

6. Projected Outcomes

- Increase student engagement and enthusiasm for STEM learning across grades kindergarten through fifth.

- Improve students' critical thinking, collaboration, and problem-solving skills through hands-on experiences.
- Strengthen foundational understanding of STEM concepts aligned to the Georgia Standards of Excellence.
- Encourage creativity, innovation, and perseverance in the face of real-world challenges.
- Promote equitable access to high-quality STEM experiences.

7. Measurement of Results

- Performance-Based Assessments: Standards-aligned tasks that measure mastery of targeted STEM objectives.
- Student Work Portfolios: Collection of student projects, journals, and reflections that showcase application of STEM concepts
- Teacher Observations and Feedback: Rubric-based monitoring of student participation, collaboration, and skill application
- Pre- and Post-Student Surveys: To assess changes in interest, confidence, and attitudes toward STEM

8. Budget

Item	Quantity	Unit Cost	Total Cost	Links
LEGO Education SPIKE Essential Set (Full Set)	12 sets	\$329.95	\$3,959.40	https://education.lego.com/en-us/shop/elementary/
LEGO Education SPIKE Essential Replacement Pack	20 packs	\$6.95	\$139.00	https://education.lego.com/en-us/products/lego-education-spike-prime-replacement-pack-/2000719/
Shipping & Handling	N/A	\$150	\$150	N/A
Professional Development Teacher Training and Materials (Manuals, Supplies, Printables)	N/A	\$500	\$500	N/A
Total				\$4,748.40