IMPACT:
THE FIRST FIVE YEARS

STEM
PREPARATORY ACADEMY
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FROM OUR EXECUTIVE DIRECTOR

Dear Friends,

Five years ago this fall, I recruited our very first STEM Prep student, Danna, in the parking lot of the Coleman Park Community Center. Her eyes were so bright. Her mind eager.

Since Danna’s first day of fifth grade, over 1,000 families have sought enrollment at STEM Prep. Danna’s class has raised the bar for excellence, year-over-year outperforming peers in Tennessee. The best teachers from around the country have made Nashville home to serve our very special, diverse population, and our students can tell you not only of their teachers’ love and dedication, but also of their steadfast commitment to graduating every child from college. In short, the journey of our children and families is nothing short of breathtaking.

Impact: The First Five Years is a story about the journey to progress and prosperity for our community in South Nashville. In every student, I see a vast collection of stories both in and out of the classroom, both in and out of the neighborhood, both in and out of the family. Indeed, this report is about the achievement of our children during STEM Prep’s earliest years; but also and more importantly, these years have been about building an exceptional community of mothers and fathers, sisters and brothers, neighbors and strangers – together aspiring to a greater future through the transformative moments of now. And I can think of no more appropriate way to introduce our school’s story than for Danna to share her welcome.

Together, may our ambitions remain broad and impactful. See you in the classroom!

All our best,

Kristin

Kristin L. McGraner, Ed.D.
Founder, Executive Director

"We cannot seek achievement for ourselves and forget about progress and prosperity for our community... Our ambitions must be broad enough to include the aspirations and needs of others, for their sakes and for our own."

- Cesar Chavez

DEAR STEM Prep community,

On behalf of my peers in the college graduating class of 2023, I welcome you to STEM Prep. We are a community of students, teachers, and administrators who are working toward a brighter future. STEM Prep wants to be the difference in our community; but I believe we have already made a huge difference, and it all started five years ago at our first very small school on Nolensville Road. That small school that started with 100 students has come a very long way, and throughout that journey, STEM Prep has impacted and changed many people’s lives. We invite you to join us in seeking achievement for our South Nashville community and the underserved children and families who are our neighbors in this world. Let’s aspire to greatness together.

Regards,

Danna

STEM Prep CORE BELIEFS

In steadfast support of our students and families, STEM Preparatory Academy is founded upon and firmly committed to THREE CORE BELIEFS. These core beliefs underpin STEM Prep's design and daily execution of our mission.

1. EVERY CHILD deserves a rigorous, college preparatory education delivered by highly effective teachers.
2. A culture of ACCOUNTABILITY and HIGH EXPECTATIONS develops learners and leaders.
3. Excellent schools are deeply and broadly tied to the COMMUNITIES they serve.
STEM Preparatory Academy is dedicated to delivering a rigorous, inquiry-based education with a strategic focus on science, technology, engineering, and mathematics. By cultivating a community of learning and academic excellence, STEM Prep will bolster the number of underrepresented students who graduate from the most competitive postsecondary programs and universities in the country and lead the discoveries and innovations of the future.
WHO WE SERVE

STEM Prep serves a unique, highly diverse population, achieving among the greatest academic results in the nation through use of a novel academic model, and is doing so with unmatched efficiency. Together, we can advance this impact.
“WE ARE LIKE THE UNITED NATIONS. WE HAVE BACKGROUNDS COMING FROM ALL OVER THE WORLD. AS MINORITIES, IT IS IMPORTANT FOR EACH OF US TO STAND TOGETHER TO ACHIEVE SUCCESS.”

– Mahiri, 9th Grader

In 2015, 570 students were served by STEM Prep Middle and STEM Prep High. By 2018, STEM Prep will serve over 1,100 students annually.

DEMOGRAPHICS

- Hispanic/Latino 65%
- Caucasian 17%
- African-American/Black 16%
- Asian/Pacific Islander 1%
- Other 1%

92% of STEM Prep students qualify for free or reduced-price meals.

STEM Prep serves the LARGEST percentage of Hispanic and Latino students in the state.

[DATA 2013-2014: Tennessee 7.8%, Nashville 19.6%, STEM Prep 65.5%]

QUICK FACT

- It is projected that, by 2040, Hispanics and Latinos will compose nearly 34% of Nashville’s projected population (275,000).

- This means that 3 out of 10 English Learners were born in other countries and now call Nashville home.

- 7 out of 10 English Learners at STEM Prep are native-born.

“[STEM Prep is] one of the most diverse schools you’re going to see in Davidson County with achievement at the very highest levels.”

– Former Nashville Mayor Karl Dean

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– Former Nashville Mayor Karl Dean
Language = Opportunity

The majority of STEM Prep students speak at least two languages.

85% of STEM Prep students speak, or have at least one parent who speaks, a variety of 19 LANGUAGES

Native Languages of the STEM Prep Family:
- Amharic
- Arabic
- Bengali
- Burmese
- English
- English (Ghanaian)
- French
- Haitian Creole
- Kinyarwanda
- Kurdish
- Lao
- Oromo
- Rundi
- Somali
- Spanish
- Swahili
- Tagalog
- Turkish
- Twi

In fact, STEM Prep serves a greater percentage of English Learners (ELs) than Metropolitan Nashville Public Schools and the state of Tennessee combined.

[Data: MNPS: 15%; TN: 4.3%; STEM Prep: 26%]

In our increasingly competitive and global workforce, multilingualism is a significant asset; bilingualism is, in many industries, a necessity. STEM Prep students are at a unique advantage as we leverage these assets in the classroom and strengthen, not only our students’ problem-solving skills, but also their abilities to engage with individuals of diverse backgrounds.

66% of North American job recruiters agree that being bilingual will be increasingly important in the next 10 years.

[Data Source: http://www.iseek.org/news/fw/fw6715FutureWork.html]

Equity and Access are Paramount

In the last five years, STEM Prep has provided over 5,000 hours of interpretation and translation services to our community.

60% of STEM Prep students have been classified as English Learners during their academic career.

Roughly 80% of STEM Prep students speak, or have at least one parent who speaks, a variety of 19 LANGUAGES.

In fact, STEM Prep serves a greater percentage of English Learners (ELs) than Metropolitan Nashville Public Schools and the state of Tennessee combined.
STEM Prep serves a unique, highly diverse population, achieving among the greatest academic results in the nation through use of a novel academic model, and is doing so with unmatched efficiency. Together, we can advance this impact.
ACROSS ALL GRADE LEVELS AND SUBJECT AREAS, STEM PREP OUTPERFORMS NASHVILLE AND TENNESSEE.

**MATH**

- **STEM PREP** 68.6%
  - Nashville 43.4%
  - Tennessee 51.2%

**SCIENCE**

- **STEM PREP** 78.7%
  - Nashville 47.1%
  - Tennessee 63.0%

**READING**

- **STEM PREP** 57.0%
  - Nashville 40.7%
  - Tennessee 49.9%

**SOCIAL STUDIES**

- **STEM PREP** 92.4%
  - Nashville 76.0%
  - Tennessee 84.6%

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[DATA: 5th through 8th grade students scoring proficient or above between 2011-2015]
STEM PREP IS LEADING IN MATH AND READING AMONG PUBLIC CHARTER SCHOOLS IN THE STATE OF TENNESSEE.

90% of students are reading at or above grade level by the end of their 8th-grade year.

For two consecutive years, 85% of STEM Prep's students have been proficient or advanced in science, with over one-third of all students scoring advanced.

STEM Prep has DOUBLED our Grade 5 students’ mathematics proficiency for four consecutive years.

85% of English Learners achieve language proficiency after being enrolled in STEM Prep for 1-2 YEARS. On average, most ELs in Nashville spend 5-7 YEARS in the EL programs before reaching full proficiency.

Since inception, STEM Prep has accounted for 100% of the “excelling” seats in the cluster, according to the district’s Academic Performance Framework.

89% P/A 2013-2014
86% P/A 2014-2015

AVERAGE ANNUAL GROWTH

(Data: Aggregate across all subject areas and grade levels between 2011-2015)
NATIONALLY, STEM PREP ENGLISH LEARNERS ACHIEVE BETTER RESULTS THAN THEIR PEERS.

MATH

READING

64.4%

26.61%

31.5%

25.56%

STEM PREP

STATES

STEM PREP

STATES

METHOD AND LIMITATION:

After determining that Tennessee ranks fourth among the states with the fastest-growing immigrant populations in the nation, according to the Migration Policy Institute, we examined the percentage of Limited English Proficient (LEP) students, in peer states, scoring proficient and above in reading and math on their state standardized test in grades 5-8. We then took these data, averaging across grades and states, and examined our data in comparison to these results. The states examined include Alabama, Arkansas, Georgia, Kentucky, Nebraska, Nevada, North Carolina, South Carolina, Tennessee, and Utah. Although we recognize state-level variance in content standards and assessments, we believe the data represented herein suggest EL STEM Prep students are outperforming their peers across the country.

In Nevada, 50.87% fewer LEP students scored proficient or above in math than students at STEM Prep.

In Alabama, only 4.25% of LEP students scored proficient or above in reading compared to 31.5% at STEM Prep, a 27.25% difference.

In Georgia, 55.17% more score proficient or above in math at STEM Prep than do LEP students in Utah.

In Alabama, only 4.25% of LEP students score proficient or above in reading compared to 31.5% at STEM Prep, a 27.25% difference.

21.9% more LEP students at STEM Prep score proficient or above in reading than do LEP students in Georgia.

DATA: 5th through 8th grade LEP students scoring proficient or above in the 2013-2014 school year.
STEM Prep serves a unique, highly diverse population, achieving among the greatest academic results in the nation through the use of a novel academic model, and is doing so with unmatched efficiency. Together, we can advance this impact.
We teach thinking

We believe our students must be able to think critically, formulate hypotheses and conjectures, analyze what they read and see, debate masterfully, present scientific research to diverse audiences, and remain adaptive across contexts and environments. We don’t believe in “drill and kill,” textbook-driven, teacher-centered instruction. We do, however, believe the most exemplary teachers can enact inquiry-based instruction while also ensuring students learn facts and basic skills. Our students are rewarded when they pose questions and use their imaginations. It’s what we value. And we know it works.
A CULTURE OF ACCOUNTABILITY AND HIGH EXPECTATIONS DEVELOPS LEARNERS AND LEADERS.

We couple our belief that teaching is a science with a holistic model to ensure every child has the full range of skills necessary to compete and excel in any environment.

INQUIRY-BASED LEARNING:
This student-centered method of instruction engages students and improves their ability to question, reason, and justify by giving them opportunities to address real-life problems with real-life solutions.

At STEM Prep, we know that, in order to best prepare students for their futures, we must go beyond explicit language instruction and engage students in self-directed, challenging, and authentic work.

CAPSTONE PROJECTS:
At the end of each course, students complete Capstone Projects that give them the opportunity to integrate knowledge they have mastered throughout the year in creative ways. Students complete these projects in phases and are consistently monitored to ensure that they are exhibiting the exemplary work that is expected of them.
In Grade 6 Science, students focus on the Engineering Design Process, using their knowledge regarding energy and the environment in order to design an effective and efficient wind turbine. At the outset of the project, students research and discuss the energy crisis in the United States, specifically focusing on both the pros and cons of the further development of wind energy.

For the second phase of the project, in groups, students are tasked with designing the most efficient turbine, by focusing on the shape and design of the turbine blades. Each group member creates a design, using their knowledge and understanding of force and surface area, to present to their group members. As a team, the students select the most effective elements from the pitches and design and build their first prototype. The team then attaches their blades to a turbine and, using a millimeter, collects data with regard to the strength of their design.

After the initial test, the group returns to the design process, and discusses the outcomes of their trial. Using this knowledge and data, the group designs a second prototype, and again tests their blades using the turbine hub and millimeter.

After evaluating the results of their second trial, the team works together to create a presentation in order to pitch their design to the STEM Prep community, highlighting the strengths of their design as well as the potential challenges associated with their product and wind power. Students also individually produce a detailed lab report that explains how their design works, their team’s work through the Engineering Design Process, and their final conclusions and understandings.
For the Grade 5 Math Capstone, students take on the role of architects, designing the blueprint for STEM Prep High.

The students first take ownership over their roles as architects by completing a problem given to graduate students in architecture at Harvard. This problem requires students to apply the skills that they have developed throughout the year, leveraging both their content and problem-solving skills.

Then, students begin the design process by surveying the STEM Prep community in order to determine which aspects of the school’s design are most important to our parents, students, and teachers. Students must include the conclusions and data from their survey in their final blueprint and design, composing a short written argument, explaining how their proposed design meets the needs of the community.

Students’ final blueprint of the school incorporates many of the skills that they have developed throughout the year in Grade 5, including measurements to the fraction of an inch, an irregular shape for the area of the building, the area of each room of the building, and total area.

Students also produce a portfolio which includes the draft of the blueprint, a graphic representation of the data from their survey, the area and perimeter of each room, and a written narrative describing their design process and how they incorporated their mathematical skills and understandings in their design process. Students also create a poster with the final blueprint and a drawing of the design of the front of the building. Both the portfolio and poster are shared with the STEM Prep community through a Capstone showcase at the conclusion of the project.

In addition, in order for students to further connect this experience to future opportunities, a panel of Nashville architects are also invited to speak with the students about the project and share design ideas and feedback on students’ projects.
A CLOSER LOOK

CAPSTONE PROJECT

Seventh-Graders Investigate: Is the United States a Melting Pot?

Paul Develops Program to Preserve Cultural Identity

In the Grade 7 Language Arts Capstone, students focus on a fundamental aspect of the American experience, focused on topics associated with cultural integration and assimilation. Students begin the project by focusing on these questions:

- Is the United States a “melting pot” or a “mixing bowl”? What are the advantages and disadvantages of these models for cultural integration and assimilation?

Students begin the project by researching and learning more about this topic and composing an expository paper focusing on the effects of assimilation in the United States.

In the second phase of their project, students design and develop a plan for a community-based program that would allow community members to retain an important aspect of their cultural identity or share a component of their cultural identity with others. In order to develop their program, students compose three written components: a grant proposal outlining the services provided by their program; a narrative impact statement, which describes the effects of the program on their community; and a persuasive component, which encourages potential funders to support their program.

Students pitch their programs and projects at a culminating mock Community Fair, which is attended by representatives of Nashville’s entrepreneur and nonprofit communities. At the fair, students present their projects and pitches, and “funders” can choose the projects that they would like to support.

During the Capstone process, students also have the opportunity to attend a presentation by a grant-writer and researcher who shares insights with students about the process of acquiring funding for and supporting community-based initiatives.
STEM Prep serves a unique, highly diverse population, achieving among the greatest academic results in the nation through use of a novel academic model, and is doing so with unmatched efficiency. Together, we can advance this impact.
STEM Prep has outperformed district peer schools on both a nominal and real basis. During the last five years, STEM Prep has added educational value (as measured by the Tennessee Department of Education) at a rate of eight times that of MNPS middle schools.

When considering the resources invested to achieve those academic gains, the contrast in performance is even more stark. Since its inception, STEM Prep has added educational value per dollar spent at a rate 11 times that of the district. Our organization sets a high bar in the Nashville community for leveraging every dollar spent with maximum efficiency.
STEM Prep serves a unique, highly diverse population, achieving among the greatest academic results in the nation through use of a novel academic model, and is doing so with unmatched efficiency. Together, we can advance this impact.
SCHOOL #2 NOW OPEN!

In August 2015, STEM Prep High opened and will cultivate a talent pipeline capable of transforming the communities and industries in which we live and work, in part, by working with students on Personalized Learning Plans (PLPs).

PLPS WILL FOCUS ON FOUR PRIMARY AREAS:

GOALS AND OBJECTIVES
Will establish annual goals and objectives, four-, eight-, and 12-year milestones.

IMPACT STATEMENT
Students will develop an impact statement grounded in long-term goals, individual passions and interests, and in alignment with impact career pathways and outcomes.

PROGRAM OF STUDY
Every student will declare his or her program of academic study to include field experience, practica, and service learning.

FINANCIAL PLAN
Because STEM Prep recognizes the challenges students in low-income communities face in pursuit of postsecondary education, students will develop a financial plan that indicates methods of education funding and their requisite action steps.

STEM Prep High is Nashville's first public charter high school specializing in science, technology, engineering, and mathematics, and provides a rigorous, college preparatory curriculum. Students at STEM Prep High will be prepared to not only keep pace with but lead the industries and innovations of the 21st century.

Through inquiry-based instruction and a first-of-its-kind college credit program in health sciences and information technologies, students deepen their critical thinking, reasoning, and problem-solving skills through project-based learning and workplace simulations in real labs and design studios. STEM Prep High graduates will be the most competitive applicants to the university or career pathway of their choice.

THE WORLD IS RAPIDLY CHANGING. ARE YOU READY?

Our holistic development model ensures all students have the “soft skills” to develop meaningful relationships, thrive in their communities, and lead positive change in the world.

MORE THAN JUST CURRICULUM
Giovanni, Leya, Mahir, Manar, Matin; 9th Graders
In a first-of-its-kind partnership, STEM Prep is launching the Nashville Newcomer Academy with MNPS to serve the youngest New Americans with the most urgent needs.

It is not only needed but also necessary to address the needs of newcomer students so that they can advance their academic achievement and thereby bolster the future workforce.

"[Nashville Newcomer Academy] is a great idea from STEM Preparatory Academy, a charter school in South Nashville with one of the largest English Learners populations in the state ... [it] will be a demonstration school designed to meet the unique needs of English Learners and provide professional development for other schools serving high concentrations of New American students."

– Former Nashville Mayor Karl Dean
IN THE NEWS

NEWS PUBLICATIONS:

USA Today: Human Kind
“Prep School Runs on Hugs from this Grandma”

The Tennessean
“Barry helps steer Nashville schools director search”
“Nashville schools build $38M program to teach immigrants English”
“Grandmother Guides STEM Prep Students Full Time, is Paid in Hugs”
“School Bus Tour Teaches Lessons on English Proficiency”
“Charters more than Third of Top Nashville Schools’ List”
“Five New Charter Schools Recommended for Approval”

Tennessee Charter School Association
“Charter School Prom a Big Success!”

Robertson County Times
“Springfield City Leaders Tour Charter Schools”

Nashville Business Journal
“LiveSchool Raises $1.65M to Grow Classroom Management App”

Southern Alpha: A Nashville Post Publication
“Nashville’s STEM Prep: ‘Make it Even Better’”

The City Paper
“Two More Charter Schools Coming to Metro”

ON TELEVISION:

News Channel 5
“Third MNPS Director Candidate Answers Questions at Public Forum”

News Channel 4
“Channel 4 News Reports on Black’s Visit to STEM Preparatory Academy”

HumanKind
“Hugs from Ms. Whitney”

BLOG FEATURES:

Discover, Create, Advance Blog
“STEM Preparatory Academy Students Complete the Scribot Project”

MP&F Blog
“STEM Preparatory Academy Announces New High School to Open in 2015”

Nashville Area Chamber of Commerce Blog
“Chamber Charter School Leaders Visit STEM Prep Academy”

My Just+Us Blog
“Charter a Success: STEM Preparatory”
AWARDS AND HONORS

2012 RECOGNITION
Alumni Award: Teach for America
Excelling School: Metropolitan Nashville Public Schools
Innovative School of the Year Finalist: Tennessee Charter School Association
Middle School Teacher of the Year: Tennessee Charter School Association
Technology Educator of the Year: Nashville Technology Council

2013 RECOGNITION
Advocate of the Year: Tennessee Charter School Association
Alumni Award: Teach for America
Excelling School: Metropolitan Nashville Public Schools
Innovative School of the Year: Tennessee Charter School Association
Reward School: Tennessee Department of Education

2014 RECOGNITION
Alumni Award: Teach for America
Excelling School: Metropolitan Nashville Public Schools
Innovative School of the Year Finalist: Tennessee Charter School Association
Middle School Teacher of the Year: Tennessee Charter School Association
Reward School: Tennessee Department of Education
Technology Educator of the Year: Nashville Technology Council

2015 RECOGNITION
Advocate of the Year: Tennessee Charter School Association
Excelling School: Metropolitan Nashville Public Schools
National Council of La Raza Fellow

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