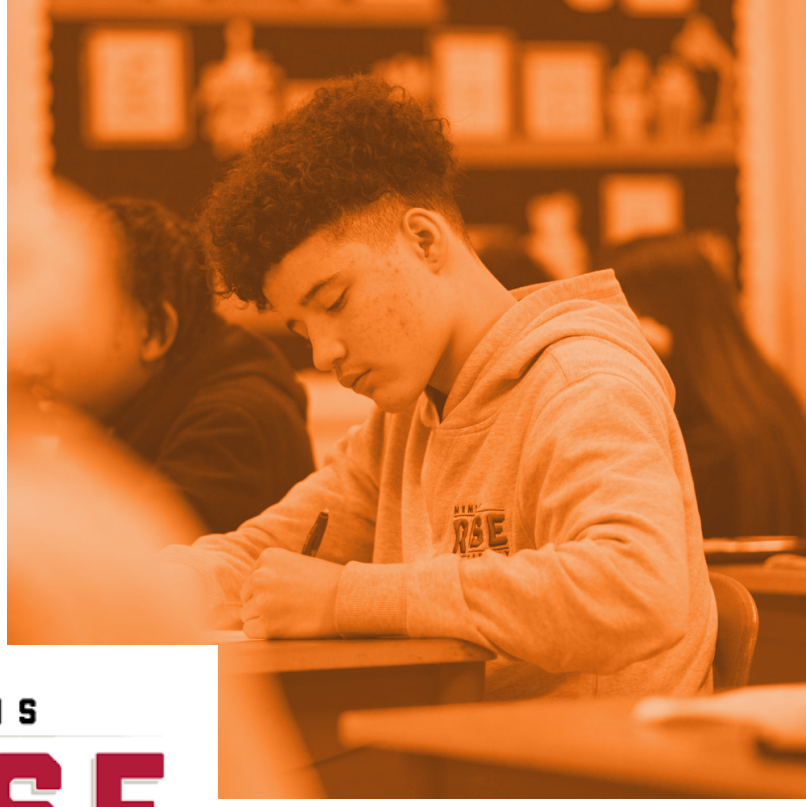

MEMPHIS RISE ACADEMY

Tennessee Charter School Center

MEMPHIS RISE ACADEMY CASE STUDY:
EXCELLENCE IN STEM EDUCATION

EXECUTIVE SUMMARY

In this installment of the Tennessee Charter School Center's "Success Stories" case study series, we examine how one school is excelling in STEM education, particularly among economically disadvantaged students. While achievement gaps in mathematics and science have narrowed nationally over recent decades, significant disparities persist, particularly for students from low-income families. Research consistently shows that strong performance in STEM subjects opens doors to advanced coursework, college success, and high-earning careers. Taken together, having access to quality STEM education courses can be key to economic mobility for many students.

This report, the sixth case study in the Tennessee Charter School Center's "Success Stories" series, examines how Memphis Rise Academy has achieved exceptional outcomes in STEM education, particularly for economically disadvantaged students. Through an intentional, integrated approach that combines cognitive science-based instructional practices, regular teacher observations, and a vertically aligned curriculum, Memphis Rise has created a model that facilitates student success in STEM courses: in 2025 their economically disadvantaged students scored in the top percentiles statewide in Algebra I (top 3%), Algebra II (top 2%), Geometry (top 7%), 3rd-8th grade math (top 4%), and science (top 10%).

Founded in 2014 in northeast Memphis to address the lack of quality middle and high school options, Memphis Rise serves a student population that often faces challenges to academic success: in 2024, 44% were economically disadvantaged and 32% were English Learners.[1] Yet, in 2025 their 6-8th grade math scores ranked in the top 25% of all schools statewide. This case study seeks to uncover the strategies that have driven these extraordinary outcomes, providing a roadmap for other schools seeking to close achievement gaps and ensure all students have access to an excellent STEM education.

SUMMARY OF FINDINGS

Through this study, several practices were identified that drive Memphis Rise's impressive STEM outcomes:

- A consistent lesson delivery model based on cognitive science principles structures every class period across all subjects, maximizing student learning time.
- An intensive teacher coaching model that includes regular, immediate feedback cycles, and targeted support, with all coaches also teaching to stay grounded in classroom practice.
- Tailor-made curricula with vertical alignment across grades that ensures skills build sequentially toward advanced coursework
- Extended instructional time, including 90-minute math blocks in middle school, provides space for both new content and remediation of foundational skills.
- Strategic focus on 6th grade as a foundation-building year, bringing students from 2-20% proficiency on entry to 64% proficiency by year's end.
- The charter model's flexibility enables curriculum autonomy, scheduling flexibility, mission-aligned hiring, and rapid decision-making—all essential to implementing this integrated approach

It's important to note that these results were accomplished by integrating multiple practices rather than any single intervention. What's more, many of the foundational principles—particularly the lesson delivery model based on Brock Rosenshine's Principles of Instruction—are freely available and could be adapted by schools in various contexts.

INTRODUCTION

In this installment of the Tennessee Charter School Center's "Success Stories" case study series, we examine how one school is excelling in STEM education, particularly among economically disadvantaged students. While achievement gaps in mathematics and science have narrowed nationally over recent decades, significant disparities persist, particularly for students from low-income families. Research consistently shows that strong performance in STEM subjects opens doors to advanced coursework, college success, and high-earning careers. Taken together, having access to quality STEM education courses can be key to economic mobility for many students.

Examining Tennessee's 2024-2025 TCAP data, Memphis Rise Academy stands out for their STEM performance, especially among economically disadvantaged students. With 44% of students qualifying as economically disadvantaged, 75% identifying as Hispanic, 21% as Black, and 32% as English Learners[2], Memphis Rise serves a population that has historically faced significant educational barriers. Yet their economically disadvantaged students achieve remarkable outcomes: ranking in the top 3% statewide in Algebra I, top 2% in Algebra II, top 7% in Geometry, top 4% in 3rd-8th grade math, and top 10% in science. Overall, their 6-8th grade math scores place them in the top 25% statewide. These outcomes are even more impressive given that roughly 80% of their 6th graders enter below grade level in mathematics.

THESE REMARKABLE RESULTS BEGGED THE QUESTION: WHAT IS MEMPHIS RISE DOING THAT IS DRIVING THIS SUCCESS?

Memphis Rise Academy opened in 2014-2015 as an independent, single-site charter school founded by Jack Vuylsteke, a Building Excellent Schools fellow. The school launched with 100 sixth graders and 10 staff members in northeast Memphis, an area that had limited access to quality 6-8 and 6-12 education options. Using a slow-growth model, Memphis Rise added one grade level each year, graduating its first senior class in 2021. Now in its 12th year, the school serves approximately 600 students in grades 6-12 with full enrollment and a waitlist of nearly 900 students which is larger than the school's entire capacity.

To answer our central question, we conducted interviews with five key staff members at Rise: their Director of Curriculum and Instruction for Math and Science, their Director of Operations; their Network Science Coach; their High School Math Coach and their Middle School Math Coach. Through their insights, we sought to answer the following questions:

1. What strategies has Memphis Rise Academy implemented to achieve such high STEM outcomes, particularly among economically disadvantaged students?
2. What challenges have they encountered and how have they overcome them?
3. How has the charter school model facilitated their success?

POLICIES AND PRACTICES

The exceptional STEM outcomes at Memphis Rise Academy are no accident. These results stem from a deliberate, integrated system of practices that work together to maximize student learning. Rather than any single strategy, Memphis Rise's success comes from the systematic alignment of lesson delivery, coaching, curriculum, time allocation, and school culture. Below, we explore the key strategies driving their success.

THE LESSON DELIVERY MODEL: COGNITIVE SCIENCE IN PRACTICE

At the foundation of Memphis Rise's approach is a consistent lesson delivery model used across every classroom in every subject. This model, based on Barak Rosenshine's Principles of Instruction[3]—a framework grounded in cognitive science research—structures each class period to maximize learning while minimizing cognitive load. According to multiple staff, this makes lessons both effective and predictable, freeing up cognitive resources to focus on mastering material.

> *"If I'm a student and I know how the lesson will go, I'm not spending working memory trying to figure out what's going on and what comes next. This offloads work for teachers too."*
>
> MEMPHIS RISE'S DIRECTOR OF CURRICULUM & INSTRUCTION

EVERY LESSON FOLLOWS THE SAME SEQUENCE:

DO NOW ❯ INSTRUCTION ❯ GUIDED PRACTICE ❯ INDEPENDENT PRACTICE

The "Do Now" activity begins immediately when students enter, either reviewing previous material or practicing fluency skills like math facts. Teachers then introduce new material through direct instruction, explicitly modeling how to think about and solve problems. This transitions to guided practice, where students work through problems with teacher support, before moving to independent practice. Each lesson concludes with a 5-6 minute exit ticket that provides formative assessment data to inform the next day's instruction.

This consistent structure provides multiple benefits. For students, predictability reduces anxiety and frees up cognitive resources for learning content rather than navigating unfamiliar routines. For teachers, the framework provides clear guidance while still allowing for creativity in content delivery. And for coaches, the shared language enables more precise feedback and support.

The model's emphasis on direct instruction, modeling, and graduated practice aligns particularly well with STEM subjects, where procedural fluency and conceptual understanding must develop together. By explicitly showing students how to think through problems and providing structured opportunities to practice, Memphis Rise ensures students build both skills and confidence.

INTENSIVE COACHING: INVESTING IN TEACHER DEVELOPMENT

Memphis Rise's commitment to teacher development is reflected in their intensive coaching model that provides ongoing support to all teachers, regardless of experience level. This is supported by a robust coaching team. The coaching team consists of seven people: five instructional coaches plus two Directors of Academics (one for ELA, one for STEM). This investment reflects the school's belief that excellent teaching must be actively cultivated.

> *"Our most effective teachers are those that have been cultivated in the building by an instructional coach."* - MEMPHIS RISE'S PRINCIPAL

Coaching at Rise follows a weekly or bi-weekly cycle: coaches observe in every classroom at least once every two weeks, provide feedback in weekly check-in meetings, and support teachers through weekly lesson preparation cycles. For first and second-year teachers, this support intensifies further, with coaches often co-teaching and gradually releasing responsibility as teachers build their skills.

What sets Memphis Rise's coaching model apart is that all coaches also teach. The middle school math coach teaches nearly a full course load, while other coaches teach at least one class. This design serves multiple purposes: it keeps coaches grounded in classroom practice, builds credibility with teachers, and allows coaches to pilot new strategies before asking teachers to implement them. What's more, coaches teach the most advanced courses in their respective sequences. This allows them to identify skills and knowledge that are not being taught in a way that effectively scaffolds students' success in advanced courses.

Importantly, Memphis Rise has protected these coaching positions even as ESSA funding has shifted away, recognizing coaching as essential infrastructure rather than an optional enhancement. These coaches have demonstrated success as teachers and approach coaching the same way they approach teaching students: identify a teacher's strengths as well as areas for improvement and structure activities tailored to grow teachers where they are.

CURRICULUM DEVELOPMENT: BUILDING WHAT STUDENTS NEED

Memphis Rise has never purchased a packaged curriculum for core subjects (except for niche high school electives). Instead, teachers and coaches collaboratively create and continuously improve their own curriculum, using publicly available resources as starting points and adapting materials to meet student needs.

The curriculum development process operates on an annual cycle of design, delivery, assessment, and revision. During the school year, formative assessments like daily exit tickets provide data about lesson effectiveness. If students struggle with a concept, teachers and coaches adjust the lesson for the next iteration. Over the summer, instructional coaches archive successful lessons and revise those that didn't work as well.

> *"It's data-driven teaching at a systems level. Take what went well and keep it and figure out what didn't go well and change it."* - MEMPHIS RISE'S PRINCIPAL

A critical feature of Memphis Rise's curriculum is vertical alignment—deliberately coordinating what students learn across grade levels to build toward advanced coursework. Rather than teaching each year's standards in isolation, teachers design curriculum with the end goal in mind. For example, students begin learning factoring in the earliest grades and continue building this skill throughout their mathematical progression. Further, foundational skills are taught consistently across all courses. With coaches teaching the most advanced courses, they use student results to inform what skills need to be taught at earlier courses and adjust the school's curriculum accordingly.

EXTENDED TIME: CREATING SPACE FOR LEARNING

Memphis Rise allocates significantly more time to core academic subjects than is typical, particularly in mathematics. Middle school students receive 90 minutes of math instruction daily which is substantially more than the 45-60 minutes common in most schools. This extended block is taught by two different teachers who coordinate their instruction based on their respective strengths.

This dual-teacher, 90-minute structure serves a crucial purpose: it allows Memphis Rise to address both grade-level content and foundational skill gaps. At the beginning of 6th grade, teachers use approximately six weeks to explicitly teach 3rd-5th grade computational fluency standards which include addition, subtraction, multiplication, and division algorithms. This ensures that all students have fundamental skills mastered before moving onto more advanced topics and subjects.

After state testing, Memphis Rise uses the remaining five weeks for intensive preparation for the next year's course, ensuring students enter their next mathematics class with prerequisite skills already developing.

> *"Every day in school is a purposeful day."*
>
> MEMPHIS RISE'S DIRECTOR OF CURRICULUM AND INSTRUCTION

THE SIXTH GRADE FOUNDATION: GETTING MIDDLE SCHOOL MATH RIGHT

Memphis Rise identifies 6th grade as a critical inflection point as it is the year that determines whether students will be positioned for success in advanced mathematics. This focus is born from necessity: only about 20% of entering 6th graders test at grade level in mathematics at the beginning of the year.

> *"We have to get middle school math right to get them on track for success on things like ACT, college math, etc."*
>
> MEMPHIS RISE'S DIRECTOR OF CURRICULUM AND INSTRUCTION

The school's intensive 6th grade approach which includes extended time, co-teaching, computational fluency remediation, consistent lesson structure, and daily formative assessment, produces remarkable results: in 2025, 57%[4] of students achieved proficiency by year's end. This growth creates momentum that carries through subsequent grades. By 8th grade, 50% of students take Algebra I, positioning them for advanced mathematics throughout high school.

The school's commitment to 6th grade excellence is evidenced by leadership's willingness to step into the classroom when needed. When a mid-year vacancy occurred in 6th grade math, the Director of Curriculum and Instruction shut down her normal schedule to teach the class herself and personally onboard the new teacher over three weeks.

> *"It's the grade level that's a health marker of the school. She covered it and shut her schedule down to cover it and make sure it was EXCELLENT for students."*
>
> MEMPHIS RISE'S PRINCIPAL

CHALLENGES AND SOLUTIONS

As with all success stories, Memphis Rise's results did not happen overnight. The school has faced challenges along the way that, in many cases, the charter model helped them overcome. The school's response to these challenges provides valuable lessons for other schools facing similar obstacles.

STAFF TURNOVER: MAINTAINING EXCELLENCE THROUGH TRANSITION

Despite a strong 90% retention rate, Memphis Rise faces ongoing challenges staffing classes, particularly given that many teachers arrive from outside of Memphis and will sometimes leave the school when they relocate.

To address this, Memphis Rise has invested heavily in onboarding systems. The high school math coach notes that despite having to onboard three new math teachers in one year, "their scores are still really, really high." This resilience comes from intensive coaching targeted at teachers in their first three years, combined with clear curricular materials and strong professional development. This system is strengthened by Memphis Rise's hands-on approach. New teachers often go through a period of co-teaching with a coach so that the school's structured approach to instruction can be modeled and learned alongside an expert in it.

ADDRESSING SKILL GAPS

Memphis Rise faces two distinct challenges related to student entry-level skills: the 6th grade achievement gap and high school students transferring in from other schools.

THE 6TH GRADE GAP: As noted earlier, only 20% of entering 6th graders score at grade level in mathematics. Memphis Rise addresses this through their comprehensive 6th grade approach to mathematics instruction: 90-minute dual-teacher blocks, intensive computational fluency remediation, and consistent lesson delivery. The fact that these students move to a proficiency rate of nearly 60% by year's end demonstrates that significant gaps can be closed with the right systems in place.

HIGH SCHOOL TRANSFER STUDENTS: Students entering Memphis Rise's high school from other middle schools present a different challenge—their skill gaps are more scattered and varied. The school is still refining its approach here, focusing on teaching remedial skills earlier (9th and 10th grade) and using targeted study hall blocks where teachers identify students' specific skill gaps and provide additional instruction in those areas.

In middle school, students are assigned to study hall groups based on specific skill gaps, with a teacher who writes curriculum specifically for this instruction. In high school, the approach is more flexible: students are assigned to teachers' study halls by teacher request, allowing teachers to address the specific gaps they've identified in their students.

ADVICE TO OTHER LEADERS

Memphis Rise's principal offers wisdom that guides Memphis Rise's approach to challenges:

> *"There's no problem that doesn't have a solution. If you keep your vision for your school and what you want to be true for your students and your community as your north star when you're making decisions for them, it will lead you to your solution—it will be hard, but it will always be the right one."*

He acknowledges making mistakes when decisions weren't sufficiently aligned with the school's vision and mission, reinforcing the importance of mission-driven decision-making. However, he believes placing the interests of your students and community as your top priority will always lead you to the right decision.

THE ROLE OF THE CHARTER SCHOOL MODEL

While the specific practices Memphis Rise has implemented could exist in various school contexts, the charter model provides crucial flexibility that enables their approach. The autonomy charter schools possess in curriculum, scheduling, hiring, and decision-making allows Memphis Rise to align all elements of their model around a coherent instructional vision.

CURRICULUM AUTONOMY: BUILDING WHAT STUDENTS NEED

Perhaps the most significant advantage of the charter model is the freedom to create curriculum that is responsive to student performance. As a charter school, Memphis Rise is not required to adopt district-mandated programs, allowing them to build curricula that align with their lesson delivery model and that is aligned across grade levels. This extends to their professional development for teachers as well.

> *"As a charter we can be more nimble and dexterous with our decisions about what strong instruction looks like. We can design teacher supports that are tailored to specific staff needs."*
>
> MEMPHIS RISE'S PRINCIPAL

This stands in contrast to district settings where, as he notes, "there are coaching and evaluation models designed by people who've never met most or all teachers who they are designing these systems for." At Memphis Rise, curriculum and instructional systems are designed by people who know the students and teachers, teach the classes, and understand the school's specific context.

SCHEDULING FLEXIBILITY: MAXIMIZING INSTRUCTIONAL TIME

The charter model allows Memphis Rise to craft schedules entirely around instructional goals rather than working within district-imposed constraints. This enables 90-minute math blocks, daily science and social studies, and targeted study halls. Every scheduling decision is evaluated through the lens of instructional time protection, ensuring the schedule serves learning rather than administrative convenience.

NIMBLE DECISION-MAKING AND DIRECT ACCESS

The small size and flat organizational structure of Memphis Rise enables rapid decision-making and direct communication between staff and decision-makers.

> *"The size of the school allows staff to come directly to decision makers. In a district school, there are many levers a principal can't pull but at a charter that's not the case."*
>
> MEMPHIS RISE'S PRINCIPAL

However, he is quick to point out the adage "that with great power comes great responsibility." In other words, charter leaders must be prepared to make strategic decisions as well as making sure their decisions are aligned with their communities' best interest in mind.

CONCLUSION

Memphis Rise Academy's STEM outcomes are the outgrowth of an integrated system of mutually reinforcing practices rather than any single innovation. The school's success rests on several interconnected practices:

- A consistent lesson delivery model based on cognitive science that structures every class period, reduces cognitive load, and maximizes learning time
- An intensive coaching system that provides regular observation and feedback cycles to all teachers while keeping coaches grounded in classroom practice
- Internally created curriculum with vertical alignment that allows responsiveness to student needs while building systematically toward advanced coursework
- Extended instructional time, particularly 90-minute math blocks that create space for both grade-level content and foundational skill development
- Strategic focus on 6th grade as a foundation-building year, producing 30+ percentage point gains that enable subsequent success
- Charter school flexibility that enables curriculum autonomy, scheduling control, mission-aligned hiring, and coherent system integration

What makes Memphis Rise's approach particularly noteworthy is not just the individual practices but their systematic integration. The lesson delivery model works because teachers receive intensive coaching to implement it well. The coaching works because coaches also teach and can pilot strategies themselves. The curriculum works because it aligns with the lesson delivery model and receives continuous data-driven refinement. The extended time works because every minute follows the structured lesson model. And all of this works because the charter model provides the flexibility to align these elements around a coherent vision.

For other schools seeking to replicate Memphis Rise's success, all these practices are achievable. Their story offers both inspiration and practical guidance for schools across Tennessee seeking to ensure all students, regardless of economic background, have access to an excellent education.

1. Tennessee Department of Education, (2024). School Enrollment File. Accessed August 2025.
2. Tennessee Department of Education, (2024). School Enrollment File. Accessed August 2025.
3. Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. American Educator, 36(1), 12–39.
4. Tennessee Department of Education (2026). School Assessment File 2025. Accessed August 2025.

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