

Research Base for Math Corps

Overview. Minnesota Math Corps is a strategic initiative of ServeMinnesota that combines the people power of AmeriCorps members with the science of how children learn. Through this program, trained Math Corps tutors use research-based tutoring interventions to ensure that students in 4th-8th grade develop proficiency in math by the end of 8th grade. Math Corps does not replace a comprehensive math curriculum, but instead is a data-driven tool that schools can use to supplement their own efforts to ensure that struggling students receive intentional practice time and individualized support from highly trained tutors. Our Theory of Change is that by providing evidence-based math interventions to build students' conceptual understanding, computational proficiency, and word problem-solving skills, students will achieve math proficiency.

Algebra Readiness. Math Corps builds math skills that are necessary for algebra readiness (NMAP, 2008). It ensures students have complete understanding and proficiency in working with numbers and operations, as recommended by the federal Institute for Education Science (IES) practice guide for math intervention (Gersten et al., 2009).

Mastery Approach. The Math Corps model aligns with longstanding findings in education intervention research (Baker, Gersten, & Lee, 2002; Burns et al, 2008; Gersten et al., 2009; Kroesbergen & Van Luit, 2003). Students receive explicit targeted instruction, immediate feedback, and visual supports throughout each lesson. Further, unlike traditional math instruction models that limit instructional time and permit student achievement levels to vary, Math Corps takes a mastery approach in which students advance after demonstrating mastery of the material. In this way, Math Corps ensures that students have the strong foundation needed for solving progressively more challenging lessons.

To support student mastery of foundational skills, Math Corps builds on research that recommends that interventions focus on 1) conceptual understanding, or the ability to understand what math numbers and symbols mean and how to work with them; 2) computational proficiency, or adding, subtracting, multiplying, and dividing; and 3) word problem-solving, which integrates math, reading, comprehension, and critical thinking skills and is widely used in tests for college entry, among other applications (Gersten et al., 2009; NMAP, 2008). These skills are the basis for the Math Corps interventions.

Coaching. Math Corps also builds on research that speaks to the importance of coaching. A groundbreaking study by Joyce & Showers (2002) found that only 5% of professionals implement new practices they learn in a training session, but 95% adopt the practice when they work with a coach who continues to provide instruction and feedback after training. Few education tutoring programs offer the comprehensive coaching structure used by Math Corps.

Evidence Base. The Math Corps approach is grounded in evidence-based research. It is built on three elements identified by educational researchers as essential for any model that addresses prevention and early identification of students struggling to acquire academic skills (Vaughn et al. 2007):

1. Valid and reliable measures for assessing student growth,
2. Evidence-based instructional interventions and
3. A framework for educators to utilize the data for improved instructional decision-making.

Response to Intervention. Math Corps is aligned with a Response to Intervention (RTI) approach, which is defined as the practice of providing high-quality instruction and interventions matched to student need, monitoring progress frequently to make changes in instruction, and utilizing data to inform instructional decisions.

Progress Monitoring. Math Corps tutors collect student data from benchmark assessments to identify and address the learning needs of each student. Tutors complete a profile for each student that contains demographic and assessment data, and tracks progress in interventions. Tutors track the number of minutes tutored, the specific lesson used, and assessment scores. Math Corps measures progress using the STAR Math assessment (Renaissance Learning, 2014), which is a broad computer-adaptive assessment of math skills. STAR Math has the highest level of technical adequacy for assessing math progress (National Center on Intensive Intervention, 2014), and Math Corps uses it five times throughout the year to gauge student progress toward year-end benchmarks.