

Effective Tiered Instruction for Math

Introduction

The following case study regards a fifth-grade student who is proficient in third-grade math standards. The School-Based Leadership Team (SBLT), in combination with the general and special education teachers, developed a multi-tiered plan to provide additional supports for the student.

Tier 1

The focus in core (Tier 1) is on successful implementation of standards to drive math instruction. Each standard provides clear expectations for the knowledge and skills students need to master in each grade level and ensure high-quality instruction and positive outcomes for *all* students. They provide the foundation for students to develop critical thinking and problem-solving skills that will be used throughout life. Two frameworks for supporting the implementation of standards are the Universal Design for Learning (UDL) and Differentiated Instruction, which provide students with options for accessing and engaging with instruction, as well as demonstrating their learning. The effectiveness of instruction is determined through student progress toward grade-level expectations.

Tier 1 Case Study

District Benchmark Assessments provided baseline data of a fifth-grade student who was struggling with adding and subtracting fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. Through further data collection, error analysis of a Curriculum-Based Measurement (CBM) probe, the teacher determined that the student's deficits were with conceptual understanding of fraction concepts and operations. Understanding the barrier, the teacher employed techniques of differentiation and UDL Principles, such as providing options of manipulatives (e.g., fraction strips) and technology (e.g., National Library of Virtual Manipulatives). Additionally, pictorial representations were presented along with the written fraction to reinforce the connection of concrete-to-representational-to-abstract. A peer-tutoring program was in place as primary prevention, with a higher-performing student paired with the lower-performing student.

The student's progress monitoring data was reviewed again and it was determined that there was not sufficient evidence of progress toward core expectations. Based upon data indicating a poor response to Tier 1 (core instruction), the SBLT determined that instruction was not matched to the student's learning needs and that more focused instruction (Tier 2 supports) was necessary.

Tier 2

The focus of supplemental (Tier 2) support is to address gaps that pose barriers to learning and to improve student performance with Tier 1 expectations. This requires systematic, explicit and interactive small group instruction targeted on foundational skills. Instruction is more intense (more time and narrow focus with explicit feedback) and may be provided by various professionals (e.g., general educator, special educator).

Data (e.g., benchmark, progress monitoring, diagnostic) are used to identify groups of students who are in need of supplemental supports and those that share the same academic needs. The frequency of progress monitoring within a tier varies depending on students' needs and assessment parameters. Effective Tier 2 instruction matches instruction to the need of the students in the group and provides multiple opportunities to practice the skill and receive feedback. The additional time allotted is *in addition* to core instruction. The intervention includes materials and strategies designed to supplement core instruction and are integrated and reciprocal within Tier 1.

Tier 2 Case Study

The teacher dug deeper into the student's foundational gap and discovered that the student's misconceptions regarded the belief that fractions' numerators and denominators could be treated as separate whole numbers. He was failing to understand the concept that the denominator defined the size of the fractional part and the numerator represented the number of this part. Upon further review, targeted assessments utilizing CBM error analysis were given to determine the nature of the discrepancy. The teacher determined that the student had mastery of the third grade standards surrounding extending understanding of fraction equivalence. Her hypothesis was that he was lacking fourth grade standards related to conceptual understanding of visual

fraction models to generate equivalent fractions, as well as the ability to compare fractions with varying denominators. The SBLT determined that the student would receive Tier 2 support three days a week for 30 minutes per day using an evidence-based supplemental program. He was provided with fourth grade supplemental materials on the skills that he was lacking, which were aligned to the fifth grade standards that core instruction was currently focused on.

Systematic, explicit, and modeled instruction was provided to the small group with highly sequenced, small learning steps, verbalization of thought processes, guided practice, cues, and feedback. The teacher supplemented her instruction with guidance found in the Math Formative Assessment System-Model Eliciting Activity resources. Pre-teaching of core concepts and explicit instruction were delivered in a small group setting led by teacher modeling, which supported the student's ability to reason about fractions through concrete (e.g., fraction tiles, fraction circles) and representational models (number line, graphic organizer) and kept the student focused on the learning task and engaged in his learning. UDL principles were employed, which provided the student with ways to access the content (e.g., textbook, manipulatives, websites), demonstrate his learning (e.g., worksheet, manipulatives, website report), and engage in his learning (e.g., station rotation through math centers with peer collaboration that aligned to core concepts).

The teacher collected formative data weekly to determine the student's progress. She continued to chart his progress through the use of CBMs, focusing on specific skills for the two fourth grade math standards that the student lacked mastery of. The SBLT had determined that the student would receive the Tier 2 supports three days a week for 20 minutes per day using an evidence-based supplemental program. Upon review of the data, the SBLT determined that the student was not responding to instruction and that more intensive Tier 3 supports were necessary.

Tier 3

The focus of intensive (Tier 3) support is for students who demonstrate both intense (large gap in expected versus current performance) and severe (unresponsive to intervention) learning problems. Effective implementation requires the support to be matched to student need and is provided by the most experienced, and/or specialized expert. Instruction is individualized and targeted to the skills that pose the greatest barrier to learning and is characterized by the greatest number of minutes of instruction with the narrowest focus for an individual or a very small group of students.

Individualized diagnostic data, as well as instructional time, are **in addition** to those provided in Tiers 1 and 2. Assessments occur more frequently and focus on the learning barriers to success at Tiers 1 and 2 and are based on intensity of needs. The larger the gap, the more frequent assessments occur to monitor student progress. The expected outcome, along with Tiers 1 and 2, is for the student to achieve Tier 1 proficiency levels.

Tier 3 Case Study

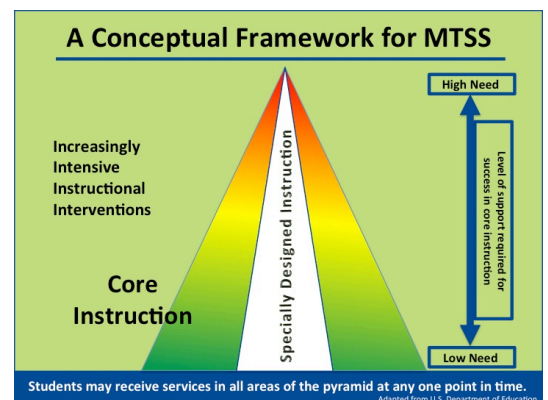
Using a task-specific CBM, the teacher found that the student continued to make computational errors due to his lack of conceptual understanding of finding a common denominator. The math coach suggested utilizing a representation that held units constant (i.e., measuring tape with marked units), assisting the student to see the need for common unit fractions. The SBLT determined that the student would receive Tier 3 support five days a week for 45 minutes per day using other evidence-based strategies. One-on-one instruction was provided to the student along with the opportunity to practice. Immediate feedback was provided. Engagement was enhanced by designing real-world application tasks for him to complete. The teacher ensured alignment to the core instruction by creating lessons involving using pieces of ribbon to make a belt. Curriculum-based assessments were provided weekly to determine if the skill gap was closing.

Specially Designed Instruction (SDI)

If it is determined that the student is eligible and in need of Exceptional Student Education Services and Supports, they will benefit from SDI. SDI refers to instruction that is provided to eligible students with disabilities (e.g., students that receive procedural safeguards by law and have an Individualized Education Program). SDI is provided collaboratively by the general and special education teachers and is applicable across all tiers of instruction. It enables students with disabilities to access the core curriculum in the least restrictive environment through a UDL approach. SDI provides unique instruction/intervention supports determined, designed, and delivered through a team approach, ensuring access to core instruction through the adaptation of content, methodology, or delivery of instruction.

Conclusion

A Multi-Tiered System of Supports exists to ensure **all** students have access to high-quality, engaging math instruction. It integrates instruction and intervention to meet the needs of students, identified through data-based decisions, to accelerate performance and ensure mastery of standards.



References

- MTSS Implementation Components: Ensuring Common Language and Understanding — http://floridarti.usf.edu/resources/format/pdf/mtss_q_and_a.pdf
- RtI and Mathematics: IES Practice Guide-Response to Intervention in Mathematics (Webinar) — http://www.rti4success.org/sites/default/files/rti_and_mathematics_webinar_presentation.pdf
- What is “Special” About Special Education? — http://floridarti.usf.edu/resources/format/pdf/specially_designed_instruction.pdf
- Accompanying Technical Assistance Paper — <http://info.fldoe.org/docushare/dsweb/Get/Document-7122/dps-2014-94.pdf>