

MTSS/RTI: Mathematics

Use this outline to follow along with the module's main features. The blank "Notes" panels below each section are interactive and can be filled in using Adobe Acrobat. Otherwise, print this document and record your notes by hand.

Module Home

- **Module Description:** This module describes the MTSS, or RTI, framework as applied to mathematics. It includes discussions of how MTSS and RTI are related, as well as a description of instruction, assessment, and data-based decision making at each level of intensity: Tier 1, Tier 2, and Tier 3 (est. completion time: 2.5 hours).
- *STAR Legacy Cycle*
- **Related to This Module**
 - Link: Module Outline
 - Video: Navigating an IRIS *STAR Legacy* Module
 - Link: IRIS and Adult Learning Theory
 - Wrap-Around Content Map

Challenge

- **Video:** Two years ago, the principals and teachers in the Lincoln School district decided to focus on their students' mathematics performance. They began by improving their high-quality mathematics instruction, making sure to implement standards-based curricula and evidence-based strategies at each grade level.

Notes

Initial Thoughts

- What is RTI for mathematics?
- How can teachers effectively implement RTI for mathematics?

Notes

MTSS/RTI: Mathematics

Perspectives & Resources

❖ Module Objectives

- After completing the entire Perspectives & Resources section and reviewing the accompanying activities, you should:
 - Have an understanding of the MTSS/RTI framework as it applies to mathematics
 - Be familiar with the main features or components of MTSS/RTI
 - Be able to identify the differences in instruction at each tier
 - Understand the importance of making data-based instructional decisions
- This IRIS Module aligns with the following licensure and program standards and topic areas...

Notes

❖ Page 1: Overview of RTI

- Teachers know that if students are to create a foundation for understanding abstract mathematics concepts...
- Research Shows
 - NAEP Mathematics Achievement Test Results [graph]
- Explanation of response to intervention (RTI)
 - Link: multi-tiered system of support (MTSS) [definition]
 - FYI
- RTI serves two primary purposes [numbered lists and bullet points]
 - Link: IQ-achievement discrepancy model [definition]
 - Link: pre-referral [definition]
- Did You Know?
 - Link: Common characteristics of students with mathematics learning disabilities
- Video: Tessie Rose Bailey, a technical assistance provider for the National Center on Response to Intervention, discusses the differences between pre-referral and RTI
- Tiers of Support [graphic]
- Video: Learn more about RTI's tiers
- Characteristics of a typical MTSS framework
 - Link: Every Student Succeeds Act (ESSA) [definition]
 - Link: Individuals with Disabilities Education Act (IDEA) [definition]
- In this module, we will... [bullet points]

MTSS/RTI: Mathematics

Notes

❖ Page 2: The Features of RTI

- RTI Features [table]
 - Link: evidence-based practices [definition]
 - Link: formative assessment [definition]
- Video: The relationship between the features of RTI is more fully explained
- Elementary versus Middle and High School
 - Audios: David Allsopp and Brad Witzel discuss how RTI differs at the elementary level compared to the middle and high school levels, highlighting a few implementation challenges at the upper levels
 - Some of the common myths regarding RTI at the middle and high school levels [drop-down menus]
- Importance of Collaboration
 - The success of the RTI approach depends upon...
 - Audio: Brad Witzel discusses the importance of collaboration to determine effective intervention practices that should be implemented across teachers. He also elaborates on four steps that teachers can implement to help improve their instruction
 - Throughout the RTI process, communication with parents or guardians is important

Notes

❖ Page 3: Universal Screening

- When they administer universal screening measures, schools or districts need to consider a number of important factors
- Frequency of the Screening
 - Time administered/Purpose [table]

MTSS/RTI: Mathematics

- FYI
- Selecting a Measure
 - Link: curriculum-based measurement (CBM) [definition]
 - Link: general outcome measurement (GOM) [definition]
 - Link: Computation Probe Elementary
 - Link: Computation Probe Secondary
 - Link: Concepts and Applications Probe Elementary
- Regardless of the universal screening measure a school chooses, that measure must [bullet points]
- FYI
 - Link: Academic Progress Monitoring Tools Chart [NCII]
 - Audio: Brad Witzel highlights the need for better universal screening assessments at the high school level and offers suggestions to confirm universal screening data
- Administering a Measure
 - Teachers should schedule the administration of the universal screening assessment to...
 - Link: alternate forms [definition]
 - Audio: David Allsopp discusses how time, staffing, and scheduling affect universal screening at the high school level
- Criteria for Identifying Struggling Students
 - The criteria for determining which students are experiencing mathematics difficulties will depend on...
 - Link: benchmarks [definition]
 - Audio: Lynn Fuchs explains the importance of setting cut points high enough that students who are likely to struggle with mathematics will be identified

Notes

❖ Page 4: Instruction

- Effective instruction is a cornerstone of the RTI framework
- High-Quality Instruction
 - Definition of a “standards-based curriculum”
 - Link: Common Core State Standards for Mathematics (CCSSM) [definition]
 - Additionally, the CCSSM [bullet points]
 - Definition of “evidence-based practices (EBPs)”
 - Link: scientifically based research [definition]

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- Some of the benefits of using EBPs [bullet points]
- FYI
- Increasingly Intensive Levels of Support
 - All students receive core instruction in the general education classroom
 - Tier 1: Core Instruction
 - A few of the evidence-based strategies that can be used to teach mathematics at this level of support [table]
 - Link: High-Quality Mathematics Instruction: What Teachers Should Know [IRIS Module]
 - Tier 2: Supplemental Intervention
 - Link: standard protocol [definition]
 - Link: problem-solving approach [definition]
 - Details of the delivery of Tier 2 intervention in elementary and middle/high school settings [table]
 - Audio: Brad Witzel discusses the importance of not ending an intervention too soon
- FYI
 - Audio: For students who require additional instructional support, David Allsopp suggests considering the students' needs and being playful.
- To make certain that the intervention can be correctly tailored to meet specific learning needs...
- Web-based resources for determining whether a practice or program is evidence-based [drop-down menu]
- Tier 3: Intensive, Individualized Intervention
 - Explanation of "quantitative changes"
 - Explanation of "qualitative changes"
 - Examples of quantitative and qualitative changes [table]
- FYI
 - Link: Learn more detailed information about RTI and the learning disability identification process
- Link: Intensive Intervention (Part 1): Using Data-Based Individualization to Intensify Instruction [IRIS Module]
- Comparison of Instruction at Each Tier
 - A side-by-side comparison of the features of instruction at each level of support [table]

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❖ Page 5: Progress Monitoring

- Explanation of “progress monitoring”
- Progress monitoring is used in the following ways at the different levels of instruction [bullet points]
- Benefits of curriculum-based measurements (CBM) [bullet points]
 - Audio: Brad Witzel discusses why it is important to use a curriculum-based measure that assesses skills a student encounters across the year as opposed to a mastery measurement probe that assesses a single skill
 - Link: mastery measurement [definition]
- FYI
- Definition of “computation probes”
 - Link: Sample elementary school computation probe
 - Link: Sample secondary school computation probe
- Definition of “concepts and applications probes”
 - Link: Sample elementary concepts and applications probe
- FYI
 - Link: Academic Progress Monitoring Tools Chart [NCII]
 - Audio: There is a lack of available validated measures to assess the mathematics skills of high school students. This is especially true of measures that assess students’ conceptual understanding. David Allsopp discusses an option for assessing this type of understanding
- Keep in Mind
 - Audio: Lynn Fuchs talks more about the benefits of using progress monitoring probes that sample the entire year’s curriculum
- Administering, Scoring, and Graphing Progress Monitoring Probes
 - Administering guidelines [drop-down menu]
 - The frequency of progress monitoring across tiers of intervention [bullet points]
 - Tips for Administering Probes [bullet points]
 - FYI
 - Scoring guidelines [drop-down menu]
 - Overview of how to score a computation or a concepts and applications probe
 - Link: Examples of a elementary probe scored using both methods
 - Audio: Lynn Fuchs points out several issues that school personnel should consider as they decide whether to score probes by the number of correct digits or correct problems
 - Audio: For students in middle and high school, problems should be scored by the number of problems correct. In the case of multi-step problems, partial credit can be given for correctly performed steps. Brad Witzel discusses the reasoning behind this latter approach
 - Graphing guidelines [drop-down menu]
 - Sample CBM graph [graphic]
 - FYI

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- Link: Classroom Assessment (Part 1): An Introduction to Monitoring Academic Achievement in the Classroom [IRIS Module]
- Link: RTI: Progress Monitoring [IRIS Case Study]
- Activity: Choose one of the students below, score his or her probe, and graph the data
 - Link: Student A: Elementary Student
 - Link: Student B: Secondary Student

Notes

❖ Page 6: Evaluating Student Performance

- Rate of Growth
 - Overview of “rate of growth”
 - Information needed to calculate a student’s rate of growth
 - Step-by-step explanation of how to calculate a student’s rate of growth [example]
 - Link: IRIS Slope Calculator
 - Teachers should compare each student’s rate of growth to determine whether the student is [bullet points]
 - FYI
 - Activity: Examine the graph for one of the students below. Calculate the student’s slope and evaluate his or her rate of growth
 - Link: Student A: Elementary
 - Link: Student B: Secondary
- Performance Level
 - Explanation of “performance level”
 - Teachers should compare a student’s performance level to a benchmark to determine whether the student is [bullet points]
 - Example: Ian’s progress monitoring chart [graphic]
 - Activity: Examine the graph for one of the students below. Calculate his or her performance level and determine whether he has met the benchmark
 - Link: Student A: Elementary

MTSS/RTI: Mathematics

- FYI
 - Link: Student B: Secondary
 - Link: IRIS Short-Term Goal Calculator
 - Learn more about the process for determining a short-term goal [drop-down menu]
- Dual Discrepancy
 - Overview of the dual-discrepancy approach [bullet points]
 - Is the student is responding adequately to instruction? [table]
 - Audio: Lynn Fuchs outlines how to determine whether a student is making adequate progress in terms of performance level and rate of growth and how that determination applies to changing a student's tier of instruction
- When To Use Each Indicator
 - When To Evaluate [table]
 - Activity: Apply the dual discrepancy approach to determine whether your students are making adequate progress in the intervention

Notes

❖ Page 7: Data-Based Decisions

- Explanation of data-based decision making
- Initiating Instructional Supports
 - Initiation Process [flowchart]
- Discontinuing Instructional Supports
 - Link: round of intervention [definition]
 - Discontinuation Process [flowchart]
 - When teachers implement the discontinuation process, it is important that they...
- FYI
 - Link: individualized education program (IEP) [definition]
 - Link: Intensive Intervention (Part 2): Collecting and Analyzing Data for Data-Based Individualization [IRIS Module]
- Data/Instructional Decision [examples]

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- Audio: Diane Bryant describes how teams make decisions in cases similar to that of Student 2's by carefully considering a student's data
- Activity: Practice making instructional decisions
 - Link: Student 3
 - Link: Student 4

Notes

❖ Page 8: Fidelity of Implementation

- Link: fidelity of implementation [definition]
- Link: Lyle Elementary RTI Manual
- Link: East High School RTI Guidelines
- Fidelity variables
 - Definition of "fidelity checks"
 - Fidelity check variables [bullet points]
 - Fidelity Variables [table]
 - Link: standard checklist [definition]
 - Link: Evidence-Based Practices (Part 2): Implementing a Practice or Program with Fidelity [IRIS Module]
 - Audio: David Chard talks about two components of RTI, which in his experience are often not implemented with fidelity
 - Types of feedback
 - Examples of fidelity issues

Notes

MTSS/RTI: Mathematics

❖ Page 9: Implementation at Lyle Elementary

- Review of the module's Challenge
- Did You Know?
- Link: Lyle Elementary RTI Manual
- Universal Screening
- High-Quality Instruction
 - Link: Ms. Shockley's lesson plans
- Progress Monitoring
 - Link: TaShonda's data
 - Link: Luis' data
 - Link: Olivia's data
 - Link: Jacob's data
- Data-Based Decisions (Tier 1)
 - Data-based decisions for Ms. Shockley's students [table]
- Fidelity of Implementation
 - Link: Fidelity of Implementation: Selecting and Implementing Evidence-Based Practices and Programs [IRIS Module]
- Data-Based Decisions (Tier 2)
 - Link: Luis' data
 - Link: Olivia's data
 - Link: Jacob's data
 - Audio: Diane Bryant discusses a number of the issues that schools should consider

Notes

❖ Page 10: Implementation at East High School

- Review of the module's Challenge
- Did You Know?
- Link: East High School RTI Guidelines
- Universal Screening
- High-Quality Instruction
 - Grayson [example]
 - Imani [example]

MTSS/RTI: Mathematics

- Audio: Brad Witzel discusses the benefits of creating a flex-time during the school day
- Audio: David Allsopp discusses the advantages of taking into account the needs of students who need additional support
- Progress Monitoring
- Data-Based Decisions
 - Data-based decisions for Grayson and Imani [table]
- Fidelity of Implementation
 - Link: Fidelity of Implementation: Selecting and Implementing Evidence-Based Practices and Programs [IRIS Module]

Notes

❖ Page 11: References & Additional Resources

- Suggested module citation
- References
- Additional Resources

❖ Page 12: Credits

- Suggested module citation
- Content Experts
- Module Developers
- Module Production Team
- Media Production Team
- Media
- Expert Interviews

Wrap Up

- Video: Summary of the module
- Revisit your Initial Thoughts responses

Notes

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Assessment

- Complete the numbered questions. Please note that the IRIS Center does not collect your Assessment responses. If this is a course assignment, you should turn them in to your professor using whatever method he or she requires.

Notes

You Have Completed This Module

- Give Us Your Feedback
 - Link: [Module feedback survey form](#)
- Professional Development Hours
 - Link: [IRIS PD Options](#)
- Related Resources [[links](#)]