NCSM/NCTM – SAN DIEGO – APRIL 2019

IT TAKES MORE THAN A VILLAGE: ENGAGED PROFESSIONAL LEARNING TO PROMOTE MATH OUTCOMES FOR ALL STUDENTS USING EVIDENCE-BASED PRACTICES

MAKING RESEARCH RELEVANT

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AIR®

Welcome!

Agenda

1. A perspective on results-driven accountability (RDA)
2. Understanding evidence-based practices (EBPs)
3. Conceptualizing an implementation design (ID) and creating professional development (PD)
4. Quiz on all of the acronyms used today (JK)

A Little Bit of Background…

13 schools in **8** districts are working with the RI Intensive Math Intervention Project to improve outcomes for students "at-risk" in Mathematics.

This project is a collaboration between RIDE and AIR. The project is implemented by AIR staff who were consulted by RIDE to fulfill their State Systemic Improvement Plan (SSIP) to improve outcomes for students in grades 3-5 with identified learning disabilities and we are specifically looking at students from African -American or Hispanic descent.

All Students Can Learn!

- *When provided effective mathematics instruction, teachers can reduce the performance gap between students who are at risk for mathematics difficulty and their average and high-performing peers.*

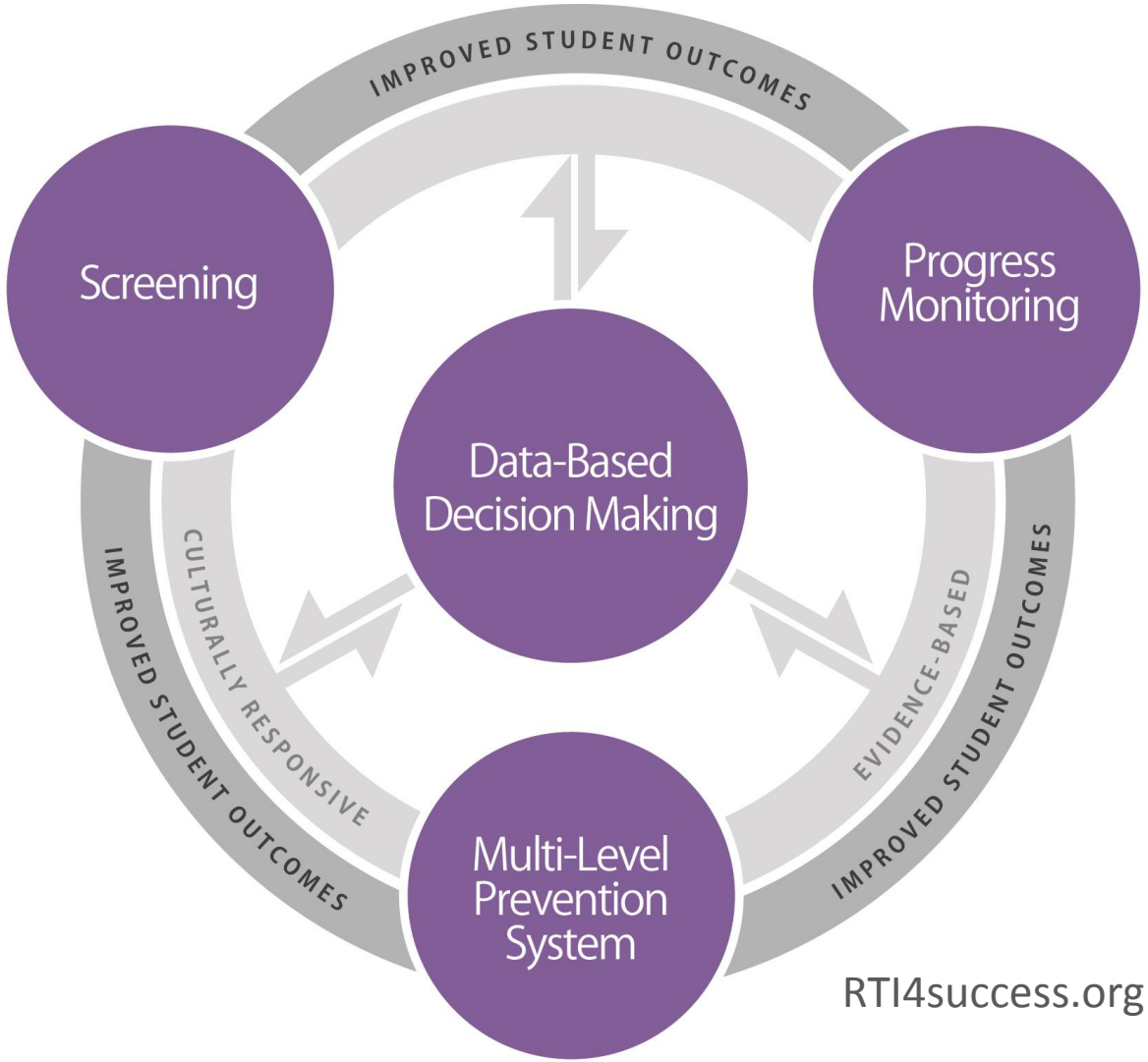
  (Clarke, Smollkowski, Baker, Fien, Doabler, & Chard, 2011)

- *Students who receive effective mathematics intervention can develop critical skills like problem-solving and abstract reasoning, which are necessary to achieve mathematics proficiency.*

  (Allsopp, Lovin, & van Ingen, 2017; Gersten, Chard, Jayanthi, Baker, Morphy, & Flojo, 2008)

Multi-Tiered System of Support (MTSS)

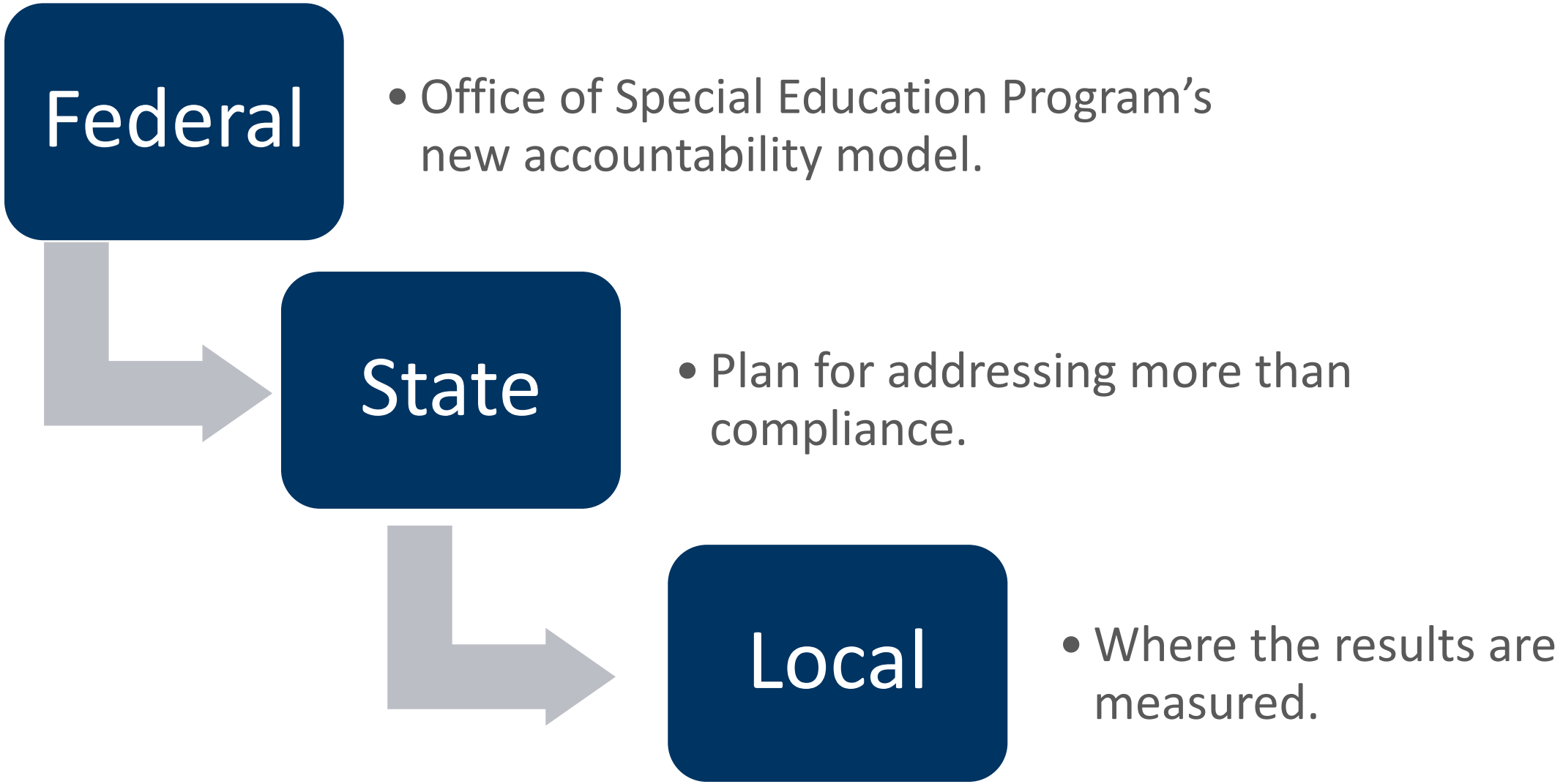
MTSS integrates assessment and intervention within a schoolwide, multilevel *prevention system* to maximize student achievement and reduce behavior concerns.



RTI4success.org

Understanding Results-Driven Accountability (RDA)

Federal Context: Results-Driven Accountability (RDA)



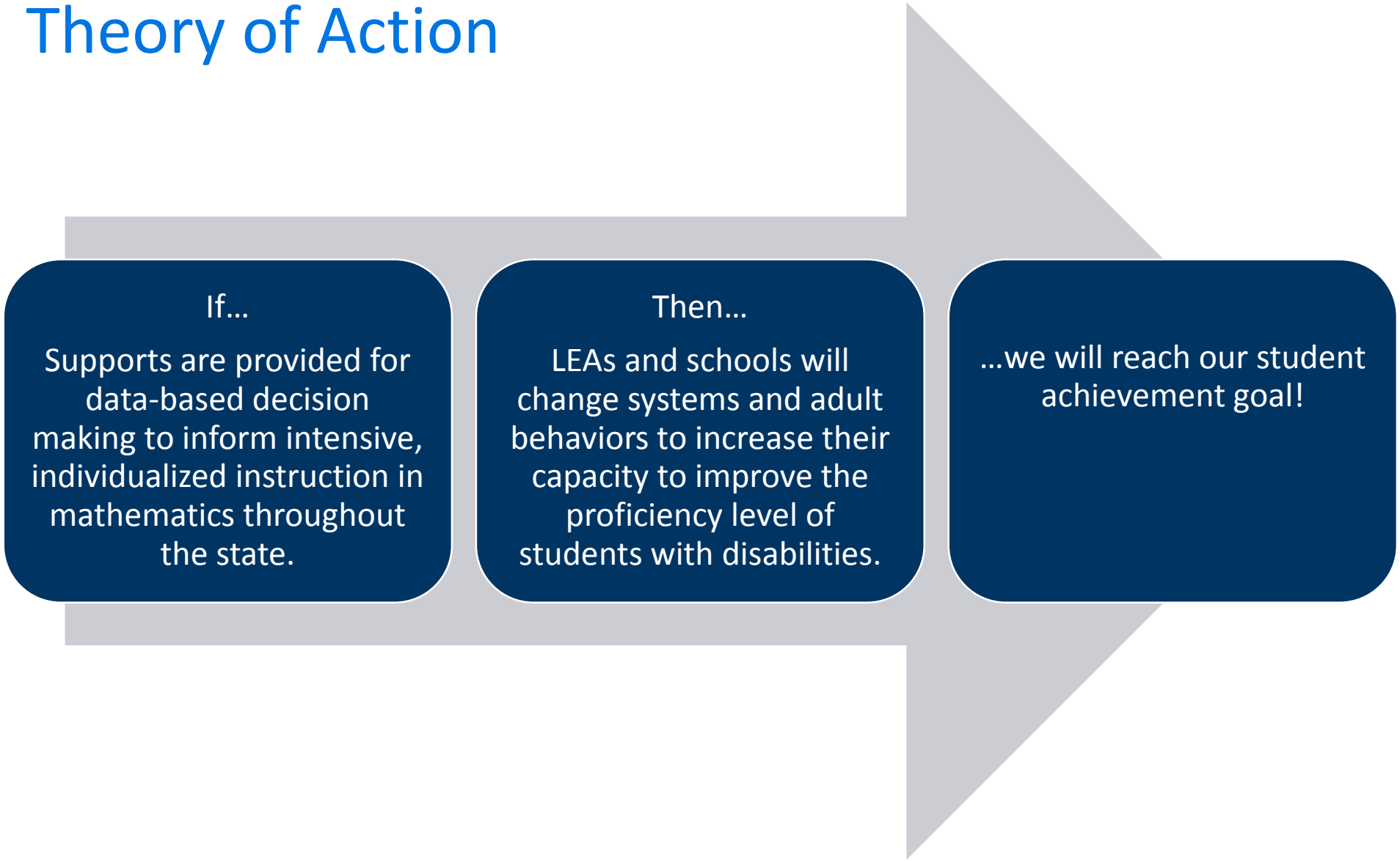
Implementation Planning within RDA

- Development of State Systemic Improvement Plans (SSIPs)
  - **Phase 1**: Analysis and creation of a state-identified measurable result (SiMR)
  - **Phase 2**: Action and evaluation plan
  - **Phase 3**: Evaluation of implementation and outcomes as well as changes based on continuous improvement

Phase 2

- Creation of logic models and theories of action
- Development of implementation plans
  - Identify key evidence-based practices
  - Identify PD needs

Phase 2: Theory of Action

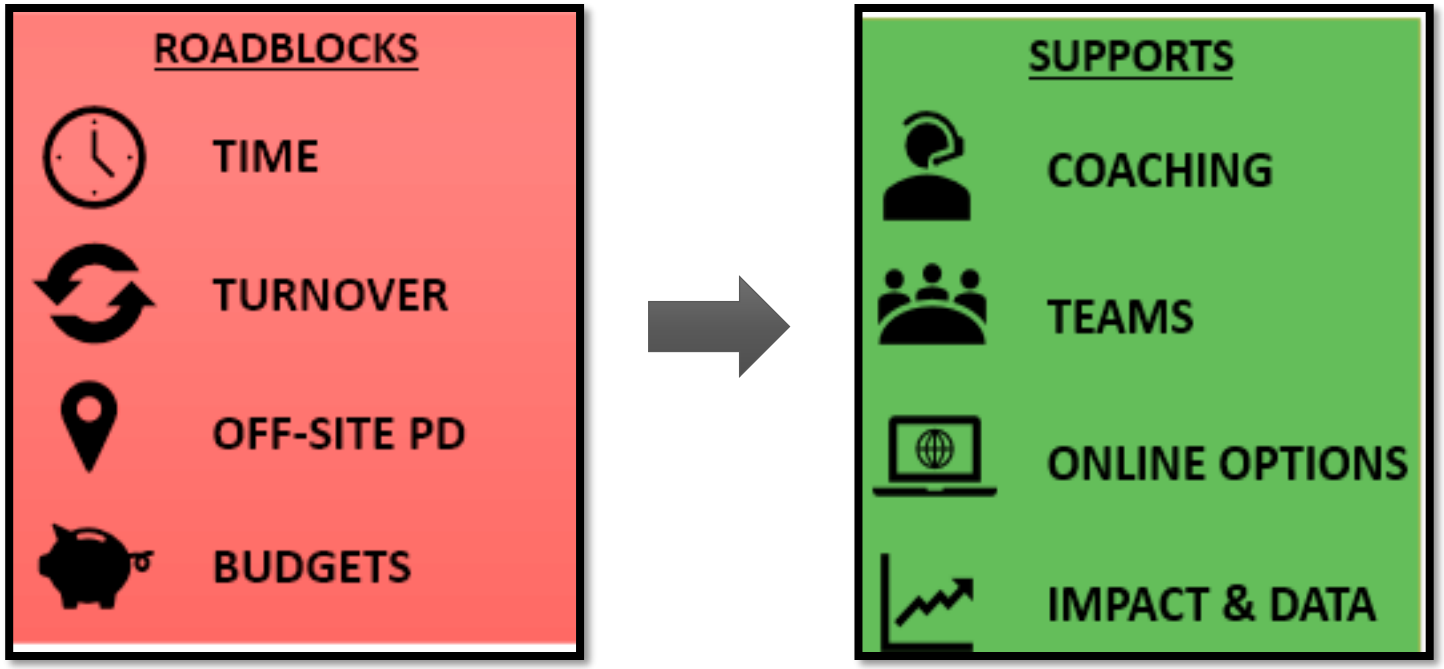


Phase 3: An Iterative Cycle of Implementation and Evaluation

Building Local Capacity

- Aligning to district priorities
  - What is the district worried about?
  - Who is the district worried about?
  - Why?
- Engaging leaders

Evolving Over Time to Scale/Sustain



Scaling

- From initial team to school-wide implementation

Sustaining

- Ability to easily train new staff and/or provide refreshers

Understanding Evidence-Based Practices

What are Evidence-Based Practices (EBPs)?

- EBPs are “instructional techniques with meaningful research support that represent critical tools in bridging the research-to-practice gap and improving student outcomes”
- As defined in ESSA: An activity, strategy, or intervention that shows a statistically significant effect on improving student outcomes or other relevant outcomes.

(Cook & Cook, 2011, p. 2).

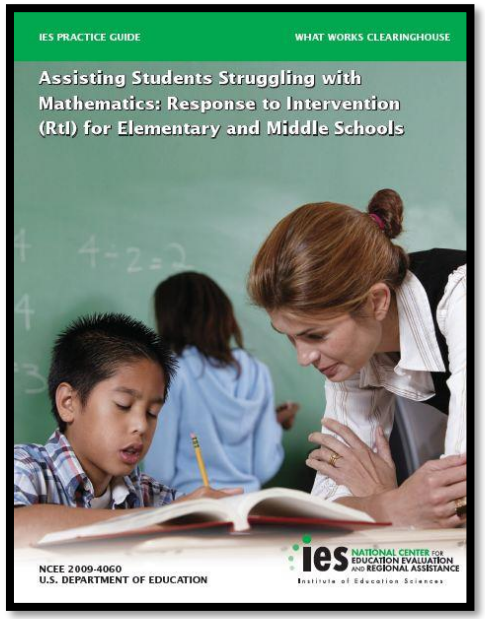
Why use EBPs?

- Increased likelihood of positive student mathematics outcomes
- Increased accountability because there are data to back up the selection of a practice or program, which in turn facilitates support from administrators, parents, and others
- Less wasted time and fewer wasted resources because educators start off with an effective practice or program rather than attempting to select one through trial-and-error
- Increased likelihood of being responsive to learners' needs
- Higher probability of convincing students to try a practice or program because there is evidence that it works

The IRIS Center (2017). *High-quality mathematics instruction: what teachers should know. Retrieved from* https://iris.peabody.vanderbilt.edu/module/math/

EBPs in Mathematics

- Materials for intervention should focus on
  - Whole numbers (Kindergarten – Grade 5)
  - Rational numbers (Grade 4 – 8)
- Instruction should be explicit and systematic
- Instruction on solving word problems
- Opportunities for students to work with concrete materials and visual representations
- Intervention should include ~10 minutes of fact instruction and practice in each session
- Monitor the progress of students
- Include motivational strategies



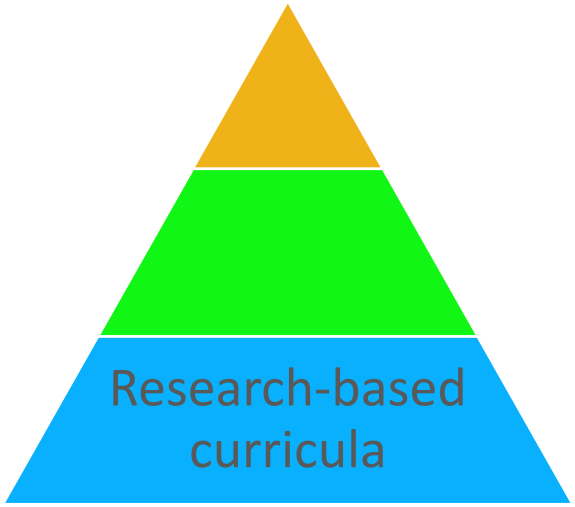
Gersten, R., Beckmann, S., Clarke, B., Foegen, A., Marsh, L., Star, J. R., & Witzel, B. (2009). Assisting students struggling with mathematics: Response to Intervention (RtI) for elementary and middle schools (NCEE 2009-4060). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides/.

EBPs in Mathematics

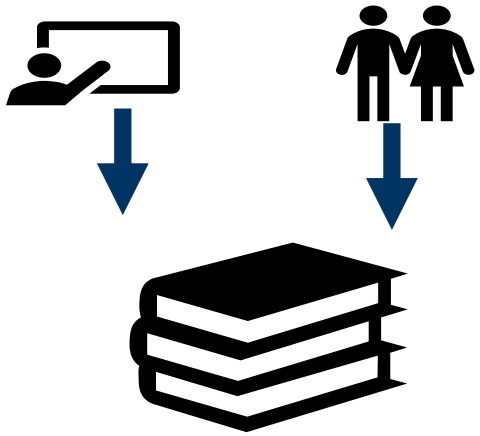
- Explicit and systematic instruction
- Visual representations
- Schema instruction
- Metacognitive strategies

The IRIS Center (2017). *High-quality mathematics instruction: what teachers should know. Retrieved from* https://iris.peabody.vanderbilt.edu/module/math/

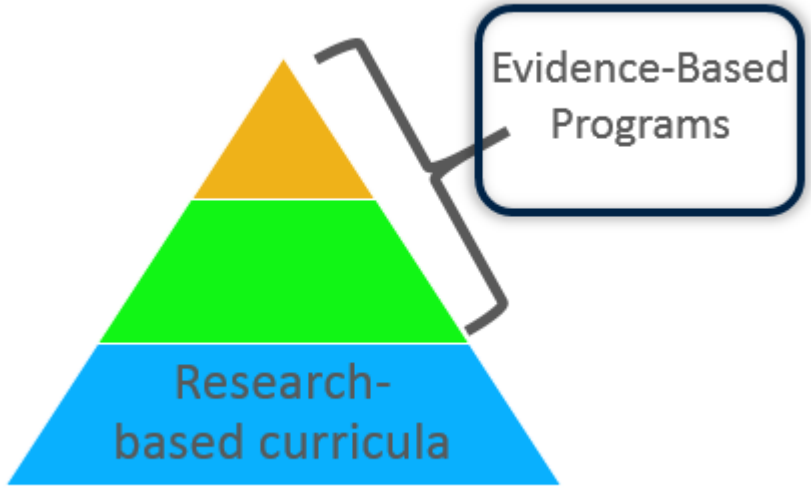
EBPs in Tier 1 Instruction



Evidence-Based Practices



EBPs in Tier 2 and 3 Instruction

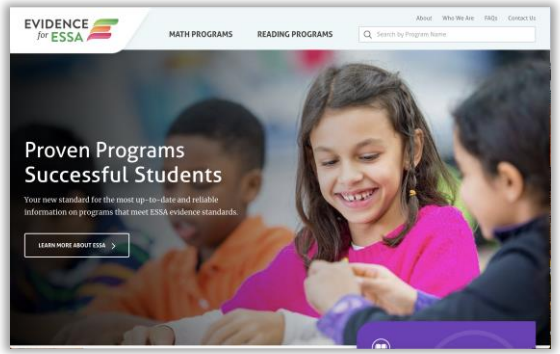


Identify and select a practice or program

Implement a practice or program with fidelity

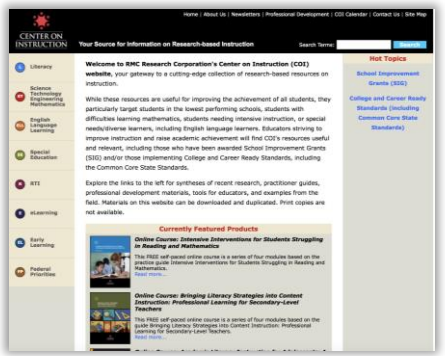
Evaluate learner outcomes and fidelity

Finding Evidence-Based Programs and Instructional Practices

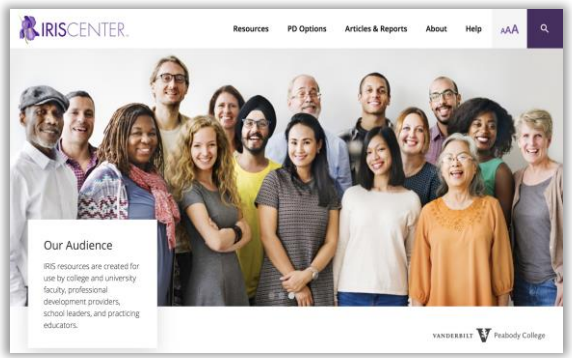


Evidence for ESSA

What Works Clearinghouse

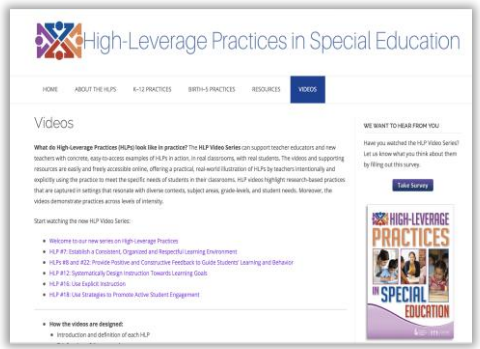


Center on Instruction



IRIS Center

National Center on Intensive Intervention



High Leverage Practices

Systematically Selecting and Intensifying an EBP

Strength	How well the program works for students with intensive intervention needs (effect size)
Dosage	The number of opportunities a student has to respond and receive corrective feedback
Alignment	How well the intervention matches the targeted academic skills or behaviors of concern, as well as incorporates grade-appropriate standards or behaviors we would expect for a particular context
Attention to transfer	The extent to which an intervention helps students transfer skills to other formats and contexts and realize connections between mastered and related skills
Comprehensiveness	How well the intervention incorporates a comprehensive array of explicit instruction principles
Behavioral support	Incorporation of self-regulation and executive function components with behavior principles to minimize non-productive behavior
Individualization	A validated, data-based process for individualizing intervention allowing for systematic adjustment of the intervention plan over time to address learning needs

Based on *Taxonomy of Intervention Intensity* (Fuchs, Fuchs, & Malone, 2017) and NCII

Five Elements of Fidelity

Student Engagement: How engaged and involved are the students in this intervention or activity?

Program specificity: How well is the intervention defined and different from other interventions?

Adherence: How well do we stick to the plan, curriculum, or assessment?

Exposure/Duration: How often does a student receive an intervention? How long does an intervention last?

Quality of Delivery: How well is the intervention, assessment, or instruction delivered? Do you use good teaching practices?

National Center on INTENSIVE INTERVENTION at American Institutes for Research

(Dane & Schneider, 1998; Gresham et al., 1993; O'Donnell, 2008)

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Selecting and Evaluating the Validated Intervention Programs

Evidence	Implementation	Impact
• Validated for a specific population • Incorporates executive functioning and behavioral supports • Targeted to need	• Specified group size or instructional delivery • Specified time and duration • Fidelity monitoring	Strong effects

National Center on INTENSIVE INTERVENTION at American Institutes for Research

Identification and Creation of Professional Development

"A hammer is effective, but not with a screw."

"A hammer is a tool. *Hammering* is what makes the hammer effective."

Our Journey so Far…

Original Intent

Focus on improving Tier 2 and Tier 3 interventions for students who struggle in mathematics

Needs Analysis

Many schools lacked high quality Tier 1 mathematics instruction for students

Ineffective or non-existent MTSS

Current situation

Continuing the focus on improving Tier 1 instruction and using data-based decision making

Improving implementation at Tier 2 in order for further intensification at Tier 3

Phase 2: Development of an Implementation Plan

- Provide training in math
- Provide training in data-based instruction (DBI)
- Provide coaching, targeted assistance and support for implementation
- Engage parents and families
- Align with RIDE initiatives as appropriate

Using a Team-Approach

- Builds upon each person's expertise
- Provides support for the teacher too
- Team members could be the classroom teacher, an interventionist, a math coach, SPED teacher, administrator, para-professional
- Ensures sound mathematical content background
- Helps to build capacity

Alignment of PD Across Initiatives

- Completed initiative reviews
  - Identify similarities across initiatives
  - Identify resources that could be shared
- Consider different ways of offering PD
  - Short, in-person, combined with coaching
  - Virtual
  - Mini-module structures

Engage Parents and Families/Support RIDE Initiatives

Partner with the Rhode Island Parent Information Network

Collaborate with the Office of Curriculum and Instruction at RIDE

Work with the Math Advisory Board at the state level

Convene an administrative PLC to foster cross-district collaboration

Common Challenges

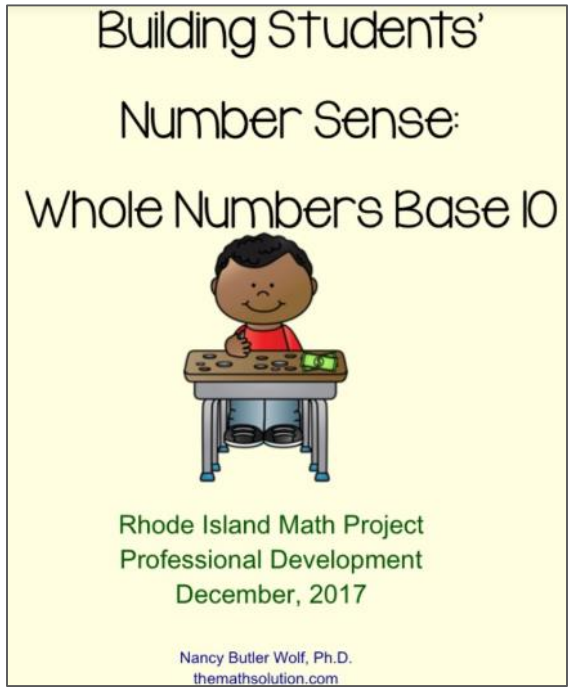
1. Disproportionate identification for Tier 2 and Tier 3 services
2. Children who seem to be stuck in intervention forever…
3. Focusing on the symptoms rather than the cause of poor math performance
4. Fixed mindset (students, teachers/administrators, parents)
5. Lack of planned intervention services, particularly at the middle school level

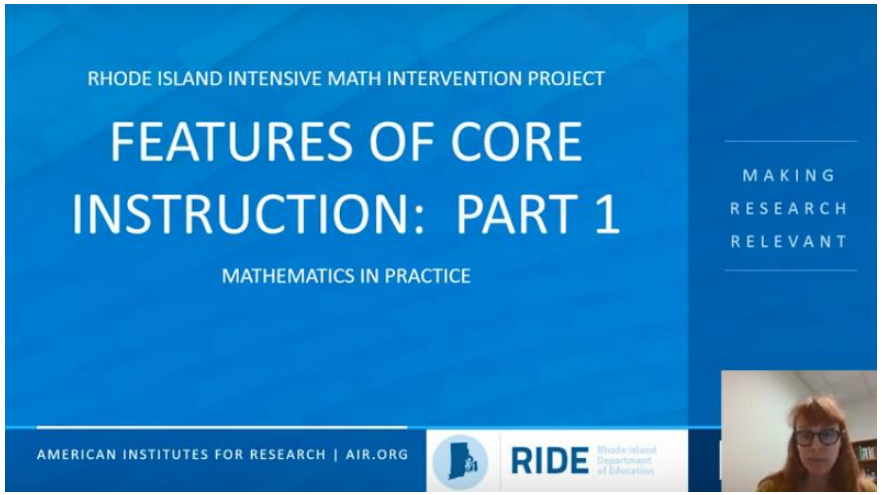
Why Shift in Focus to Tier 1?

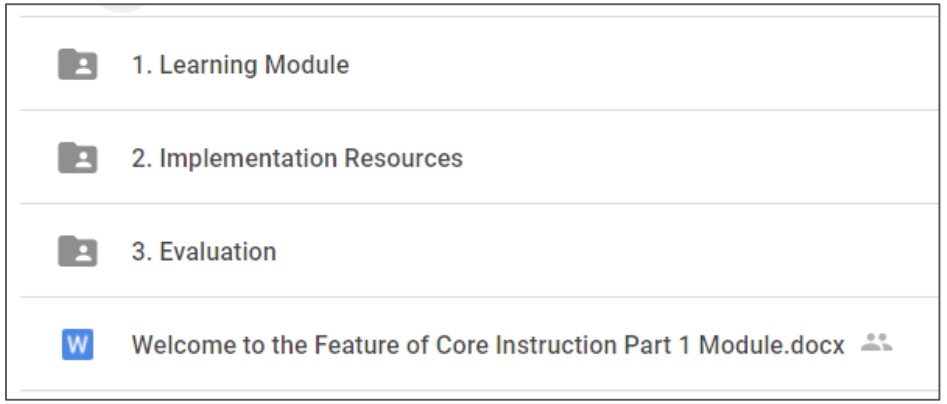
- Over-identification of students for Tier 2 and Tier 3 interventions
- LRE placement – Students with disabilities spend the majority of their time in a general education setting
- Middle school – Increases in the number of SWD who are pulled out of the classroom, resulting in the lack of opportunity for high quality mathematics instruction
- Content knowledge often rests with the general education teacher
- Implementation at Tier 1 was often not being done with fidelity (engagement in meaningful mathematics tasks)

Provide Training in Math

- Mini-modules
- Content-focused PD
- Training with PALS math







Focusing on the Symptoms Rather than the Cause

"Our students struggle with problem solving, so we are going to focus only on problem solving for the rest of the year."

Why are our students struggling with problem solving?

- Lack of computational fluency
- Lack of experience with reading/interpreting problems
- Lack of language supports
- Unable to see the connection between math and real-life applications
- Lacking scaffolds to initially access a problem
- Lacking strategies for solving

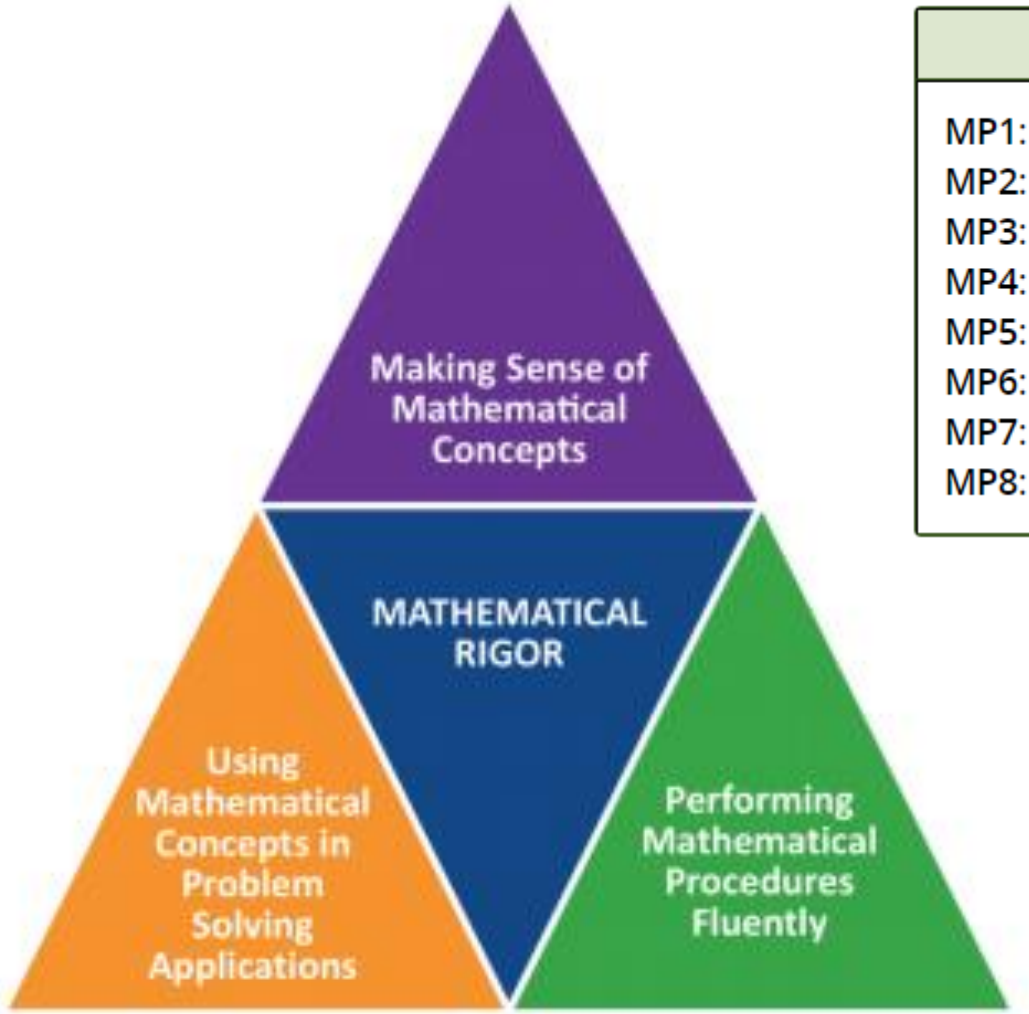
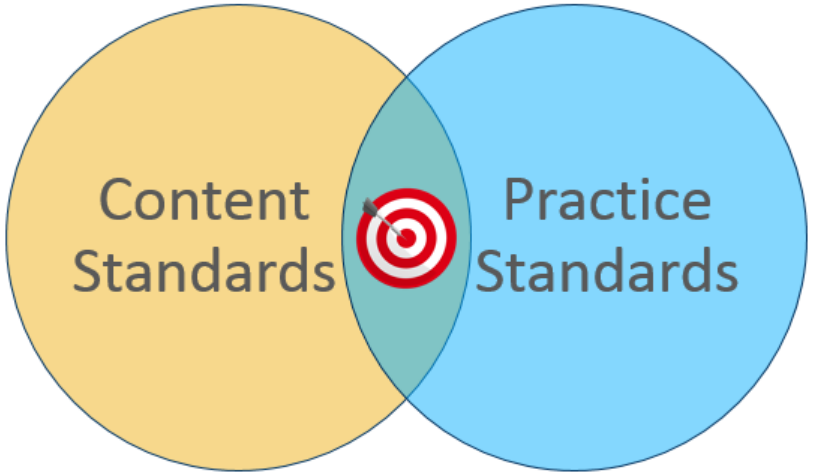


Image: MA DESE, *Mathematics Curriculum Framework for Mathematics, 2017*

CCSSM Standards for Mathematical Practice

MP1: Make sense of problems and persevere in solving them.
MP2: Reason abstractly and quantitatively.
MP3: Construct viable arguments and critique the reasoning of others.
MP4: Model with mathematics.
MP5: Use appropriate tools strategically.
MP6: Attend to precision.
MP7: Look for and make use of structure.
MP8: Look for and express regularity in repeated reasoning.

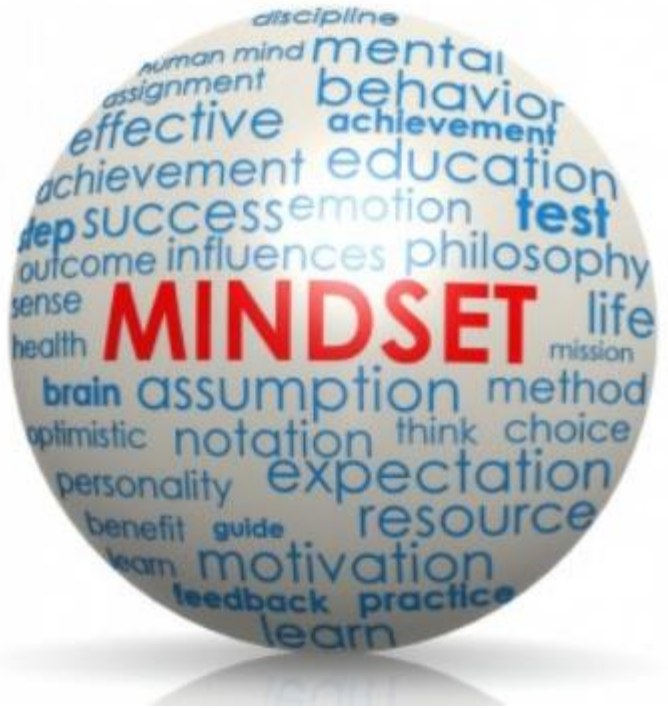


Children Who Seem to be Stuck in Intervention Forever…

- Failing to start with a student's strengths rather than deficits
- Decisions are not data-based (instruction and monitoring)
  - Not collecting the needed data
  - Not analyzing the data to make decisions (progress monitoring)
- Not using evidence-based practices or programs
- Not implementing EDPs with fidelity

Fixed Mindset (Students AND Teachers/Administrators)

- Low expectations
- Students not exposed to on-grade-level materials
- Failure to provide needed modifications and/or scaffolds
- Failure to remove modifications and/or scaffolds as students progress

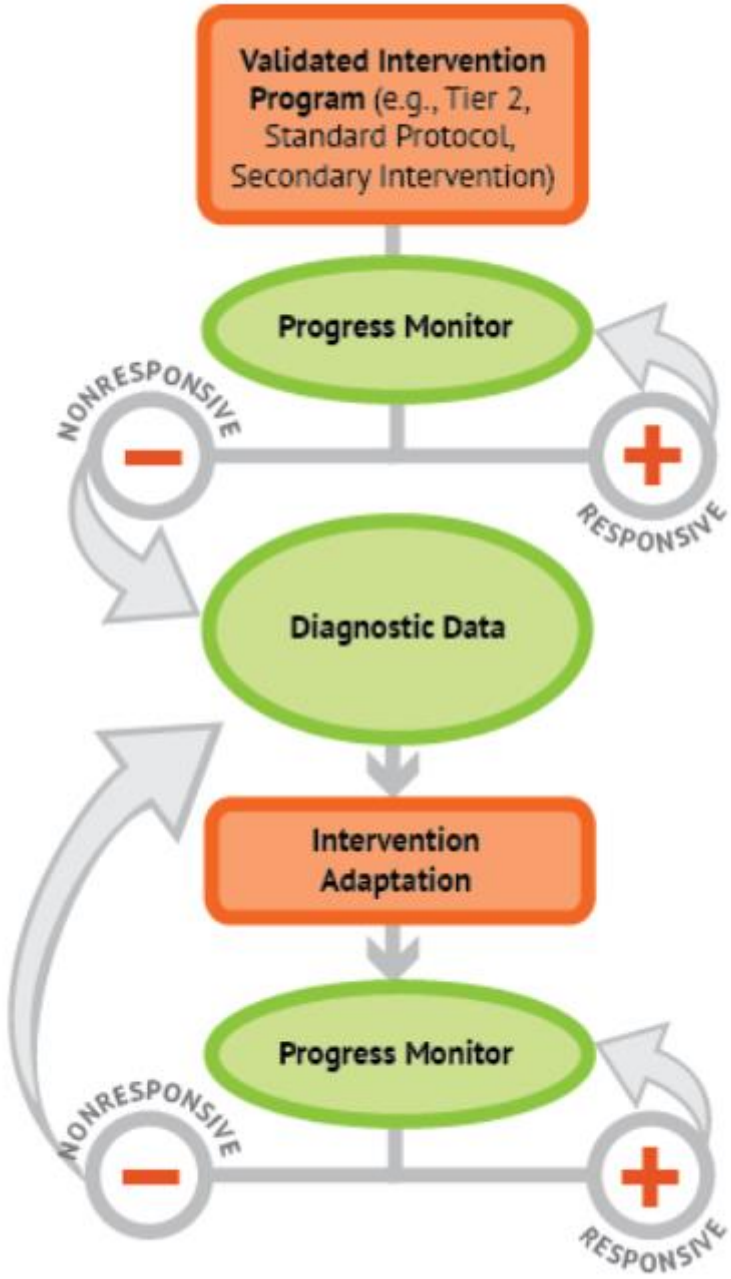


Data-Based Individualization (DBI): A Case Study Approach

DBI is a research-based process for individualizing and intensifying interventions

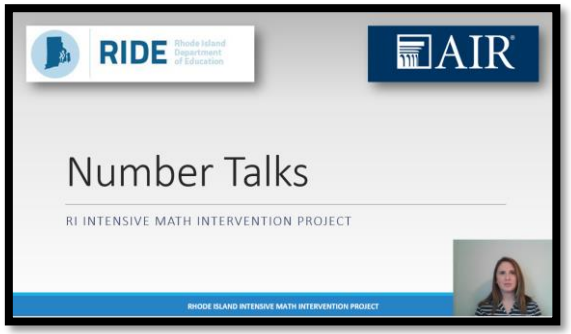
- Systematic use of assessment data
- Validated interventions
- Research-based adaptation strategies

National Center on Intensive Intervention (NCII)



Provide Coaching, Targeted Assistance, and Implementation Support

- Implementation of Number Talks
- Improved data analysis systems



Mathematics Tier 1 Instruction Support:

What does the student do?
Number Sense & Base 10
❑ Students reasonably estimate/predict solutions to problems ❑ Students check and justify reasonableness of solutions ❑ Students use a variety of representations for ordering, grouping, regrouping in Base 10 ❑ Students use multiple representations (e.g. tables, pictures, graphs, words, number lines) ❑ Students use manipulatives appropriately and productively ❑ Students make connections between concrete and representational models ❑ Students make generalizations and abstractions from concrete and representational models ❑ Students subitize using a variety of models and representations. ❑ Students name numbers in different ways (e.g. traditional, base ten names, by groups) ❑ Students use manipulatives to group and regroup numbers with a focus on expressing numbers efficiently ❑ Students use a variety of manipulatives and representations to explore different/more efficient ways to count ❑ Students actively participate in number talks, discussing their thinking about numbers and strategies
Number Sense and Place Value
❑ Explore place value using a variety of materials, manipulatives, tools, and models (e.g. place value cards/chips, pocket chart, games) ❑ Order and compare values of numbers with attention to place value ❑ Name large numbers with attention to place value ❑ Round numbers using a number line (closer to which?)
Addition and Subtraction
❑ Look for and discuss patterns ❑ Apply multiple strategies for adding and subtracting ❑ Use multiple representations of thinking and work (e.g. pictures, number lines, words, manipulatives) ❑ Use manipulatives and tools to practice a variety of addition and subtraction strategies (e.g. Base 10 Blocks, two color counters, virtual manipulatives, hundreds charts) ❑ Explore content through the CRA model (concrete, representational, abstract), including use of manipulatives ❑ Participate in number talks, discussing their thinking and strategies for adding and subtracting ❑ Solve authentic problems/rich tasks ❑ Solve story problems accurately ❑ Categorize story problems based on problem type

Number Talk Implementation Observation Checklist/Self-Assessment

Teacher:	Grade:	Setting:

Number Talk Problem	Student Engagement		Student Responses		Student Strategies Shared
What problem is posed?	❑ Very few engaged ❑ Some engaged ❑ Most engaged ❑ All engaged		❑ Very few students identify one strategy ❑ Some students identify one strategy ❑ Most students identify one strategy ❑ All students identify one strategy *How many students had multiple strategies?* *❑Very Few ❑Some ❑Most ❑All*		
Have students been exposed to this skill/ concept previously? ❑ *Yes* ❑ *No*	Who struggled?	Who exceeded?	Who struggled?	Who exceeded?	

Key Implementation Features (*Place a check mark in each box if implemented/observed*)				
Quick (10-15 min)	Teacher as Facilitator	Teacher recorded the student thinking to visually interpret the strategy	Mental Math plays an integral part in the Number Talk	Purposeful set of computation problems to build fluency
Expectations set and classroom Number Talks procedures were clear	Hand Signals to promote Wait Time	Overall respect amongst group while students are sharing their thinking/answers	Students, rather than teacher, determines if the answer is correct/incorrect	Use of scaffolds (e.g., whiteboards, manipulatives, or visual cues) for struggling learners

Case Study Running Record for RI Intensive Math Intervention Project

Please redact any information identifying the student.

School			Grade		Teacher	
IEP status		EL status	Gender		Ethnicity	
Math goal?						

Screening Results: *Label benchmark comparison*	Spring 2018 (previous year)		FALL		WINTER		SPRING

General Math skill deficit from screening	
Other considerations	
Tier 1 accommodations, scaffolds, and differentiation *Are they consistently implemented?*	
Clarifying Questions	
Initial Hypothesis: Behavior Concerns are impacting performance in mathematics and other subjects	**Decision:**

Tier 2 prevention plan

Which intervention did you select/evaluate? Why?

When a change or adaptation is made identify which taxonomy dimension was addressed through that adaptation.

Intervention Name:

Elements	Rating (0=fails to address; 1=minimally addresses; 2=moderately addresses; 3=strongly addresses)	Descriptions
Strength		
Dosage		
Alignment		
Attention to Transfer		
Comprehensiveness		
Behavioral Supports		

Family Engagement	**Plan for engaging families/guardians:**

Case Study Running Record for RI Intensive Math Intervention Project

Please redact any information identifying the student.

	PM tool	Intervals of Administration	Goal set
Progress Monitoring			

- ❑ Please upload students' graphed Progress Monitoring data to the google folder
- ❑ On the graph indicate when instructional changes are made (*draw a phase line*)

Fidelity of Implementation Plan *Progress Monitoring & Intervention*

Progress Monitoring Fidelity

❑ Fidelity Checks to include: ○ Time ○ Place ○ Person ○ Environment ○ Administration of assessment ○ Scoring ○ Engagement during administration	Dates of the Monthly checks/result: (*be sure to enter any changes as an event on the data collection sheet below*) Click or tap to enter a date. Click or tap to enter a date. Click or tap to enter a date.

Implementation Fidelity

- ❑ Fidelity Tool Name: Click or tap here to enter text.
- ❑ Elements in Place: ☐Duration ☐Adherence ☐Quality of Delivery ☐Engagement ☐Specificity
- ❑ Plan for monitoring other elements: Click or tap here to enter text.
- ❑ Enter any notes/changes/adjustments as events below

External Checks of Intervention (*observations/walkthroughs*)

- ❑ Data/Results

DATA Collection ***(Insert rows needed)***

Date	Score (SS/ PR/ digits correct)		Event (Document what occurred: Progress Monitoring, Implementation Fidelity Information, adaptations/changes to the intervention based on diagnostic assessment,, goal, or tool, initial DBI meeting, etc.; if a change or adaptation was made, identify which taxonomy dimension was addressed)
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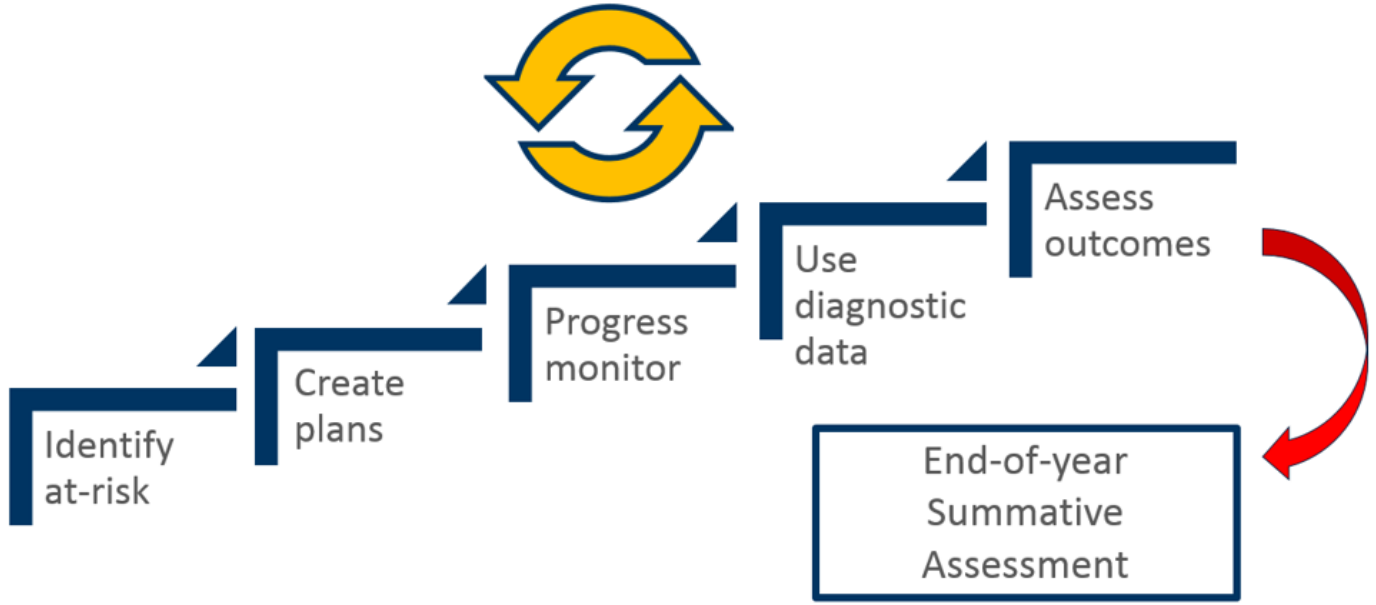
Lack of Interventions, Particularly at the Middle School Level

- Consider “test prep” an intervention…
- Intervention “on the fly”
- Lack of available programs



In Summary….

- Evidence-based practices are the core of Tier 1 instruction as well as implementing an effective Tier 2 and Tier 3 intervention program
- Plan flexibly, focusing on strengths and acknowledging challenges
- Work to build school and district level capacity to adopt and implement changes

Meet the Presenters: Rhode Island Intensive Math Intervention Project

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Thank You!