National Center on
INTENSIVE INTERVENTION
at the American Institutes for Research®

February 2025

From Data to Action

Individualizing Math Supports to Meet Student Needs

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Today's Webinar

- Evidence and Research
- DBDM: Framework
- DBDM: Instructional Platform
- DBDM: Progress Monitoring
- DBDM: Diagnostics
- Next Steps
- Resources

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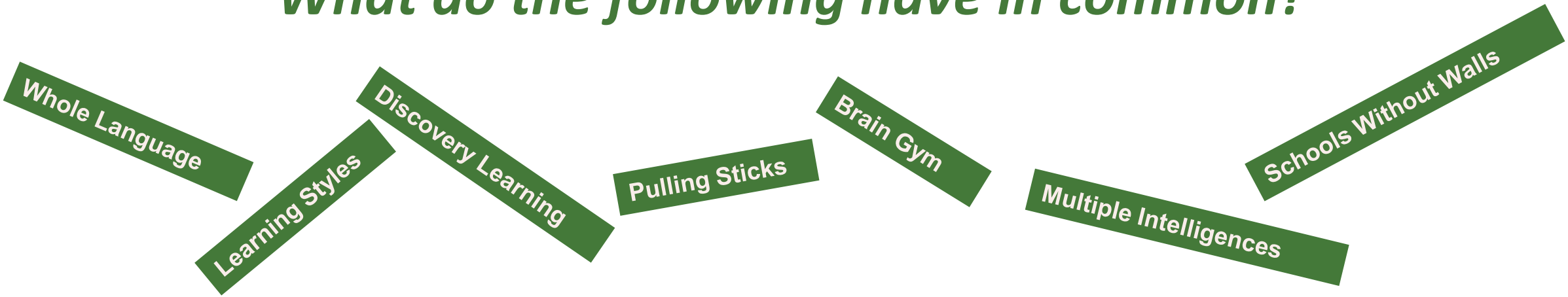
Evidence-Based Practices: Instruction and Intervention

What do the following have in common?



These approaches were attempts to solve a problem but, disappointingly led to little to no effects.

The best defense against bias and poor research is common sense and triangulation of outcomes-based research (Witzel et al., 2024).

Be cautious when reviewing research.

- Publication bias is a frequent problem in U.S. journals on education.
  - This means that competing viewpoints have competing published "research."
- Warning: Not all studies focus on academic performance, especially for math and science. Some even make conclusions on everything except academic performance.

"Lastly, we excluded studies focused on multiple disciplinary domains beyond mathematics (e.g., English language arts, social studies, science) or studies that used mathematics achievement data as the sole source of connection to mathematics education (e.g., Hornstra et al., 2010), meaning that mathematics education was not a central focus" (Tan et al., 2022, p. 10).

Be skeptical and ask questions.

"Whether we grouped students strategically (Dweck & Leggett, 1988; Hatano, 1988; Jansen, 2006) or we let students form their own groups (Urdan & Maehr, 1995), we found that 80% of students entered these groups with the mindset that, within this group, their job is not to think. However, when we frequently formed ***visibly random groups****, within six weeks, 100% of students entered their groups with the mindset that they were not only going to think, but that they were going to contribute" (Liljedahl, 2022).*

Be skeptical and ask questions.

"Psychologist Jason Moser studied the neural mechanisms that[illegible] brains when they make mistakes (Moser et al., 2011). Moser and his gr[illegible]found something fascinating. When we make a mistake, synapses fire. A synapse is an electrical signal that moves between parts of the brain when learning occurs" (Boaler, 2016, p. 11).

A synapse is a small pocket of space between two cells where messages are passed.

"The recent ne[illegible]ical research on the brain and mistakes is hugely important for math teachers and [illegible]lls us that making a mistake is a very good thing. When we make mistakes, our b[illegible]grow. Mistakes are not only opportunities for learning, as students consid[illegible]s, but also times when our brains grow, even if we don't know we have made a mi[illegible] (Boaler, 2016, p. 12).

Learning does occur during mistakes. They are called errors and errors can be memorized.

Note. As quoted in Witzel (2024).

Levels of Research

Systematic Reviews and Meta-Analyses
Randomized Controlled Trials (RCTs)
Quasi-Experimental Studies

High Level of Evidence

Survey Data
Single Case Design

Moderate Level of Evidence

Case Study
Position Papers

Low Level of Evidence

Institute of Education Sciences (IES) Practice Guides

https://ies.ed.gov/ncee/wwc/practiceguides

Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades

Released: March 2021

Summary document (638 KB)

Full Guide (1.9 MB)

Recommendations | Details | Panel | Related Resources

This practice guide provides evidence-based practices that can help teachers tailor their instructional approaches and/or their mathematics intervention programs to meet the needs of their students.

1 Systematic Instruction: Provide systematic instruction during intervention to develop student understanding of mathematical ideas. Show More	STRONG EVIDENCE	TIER 1 STRONG
2 Mathematical Language: Teach clear and concise mathematical language and support students' use of the language to help students effectively communicate their understanding of mathematical concepts. Show More	STRONG EVIDENCE	TIER 1 STRONG
3 Representations: Use a well-chosen set of concrete and semi-concrete representations to support students' learning of mathematical concepts and procedures. Show More	STRONG EVIDENCE	TIER 1 STRONG
4 Number Lines: Use the number line to facilitate the learning of mathematical concepts and procedures, build understanding of grade-level material, and prepare students for advanced mathematics. Show More	STRONG EVIDENCE	TIER 1 STRONG
5 Word Problems: Provide deliberate instruction on word problems to deepen students' mathematical understanding and support their capacity to apply mathematical ideas. Show More	STRONG EVIDENCE	TIER 1 STRONG
6 Timed Activities: Regularly include timed activities as one way to build fluency in mathematics. Show More	STRONG EVIDENCE	TIER 1 STRONG

Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools

Released: April 2009

Full Guide (4.0 MB)

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Taking early action may be key to helping students struggling with mathematics. The eight recommendations in this guide are designed to help teachers, principals, and administrators use Response to Intervention for the early detection, prevention, and support of students struggling with mathematics.

1 Screen all students to identify those at risk for potential mathematics difficulties and provide interventions to students identified as at risk. Show More	MODERATE EVIDENCE	TIER 3 PROMISING
2 Instructional materials for students receiving interventions should focus intensely on in-depth treatment of whole numbers in kindergarten through grade 5 and on rational numbers in grades 4 through 8. Show More	MINIMAL EVIDENCE	TIER 4 HAS RATIONALE
3 Instruction during the intervention should be explicit and systematic. Show More	STRONG EVIDENCE	TIER 3 PROMISING
4 Interventions should include instruction on solving word problems that is based on common underlying structures. Show More	STRONG EVIDENCE	TIER 3 PROMISING
5 Intervention materials should include opportunities for students to work with visual representations of mathematical ideas and interventionists should be proficient in the use of visual representations of mathematical ideas. Show More	MODERATE EVIDENCE	TIER 3 PROMISING
6 Interventions at all grade levels should devote about 10 minutes in each session to building fluent retrieval of basic arithmetic facts. Show More	MODERATE EVIDENCE	TIER 3 PROMISING
7 Monitor the progress of students receiving supplemental instruction and other students who are at risk. Show More	MINIMAL EVIDENCE	TIER 4 HAS RATIONALE
8 Include motivational strategies in tier 2 and tier 3 interventions. Show More	MINIMAL EVIDENCE	TIER 4 HAS RATIONALE

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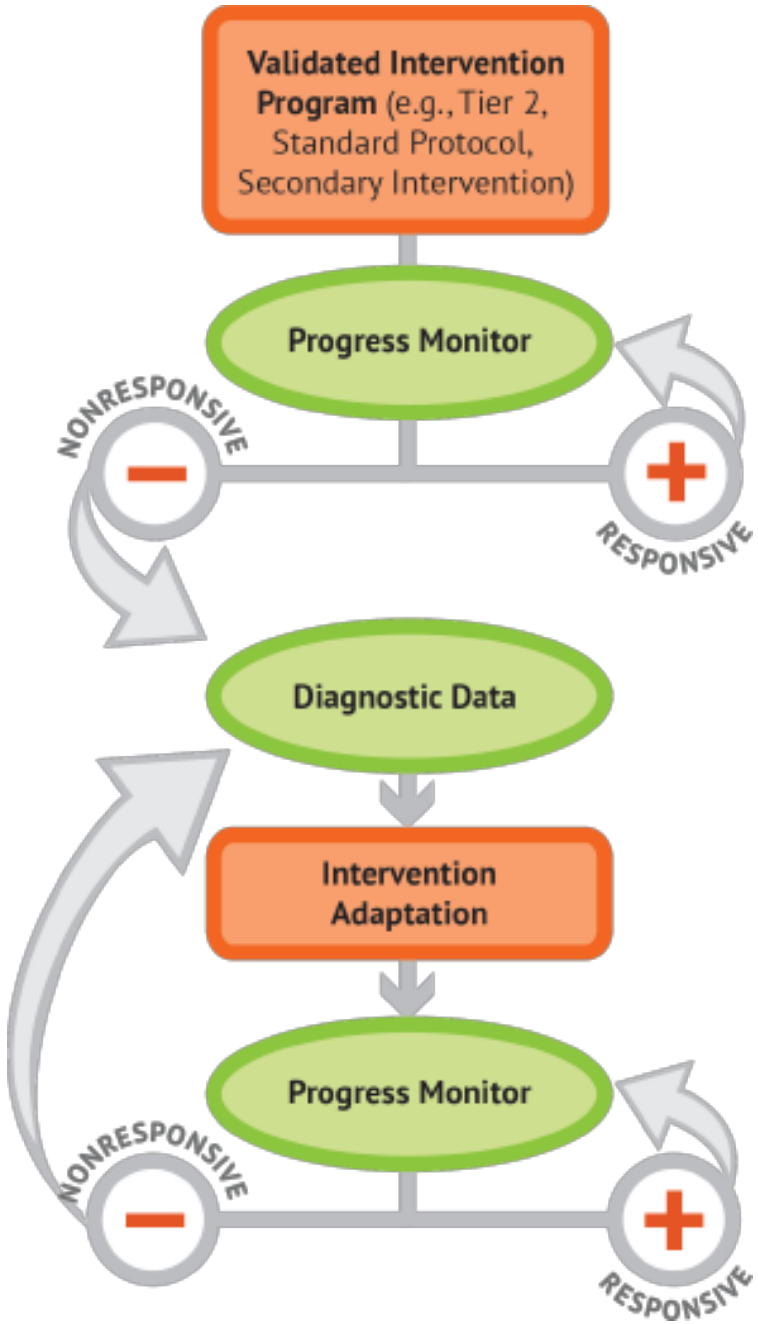
Data-Based Decision Making (DBDM)

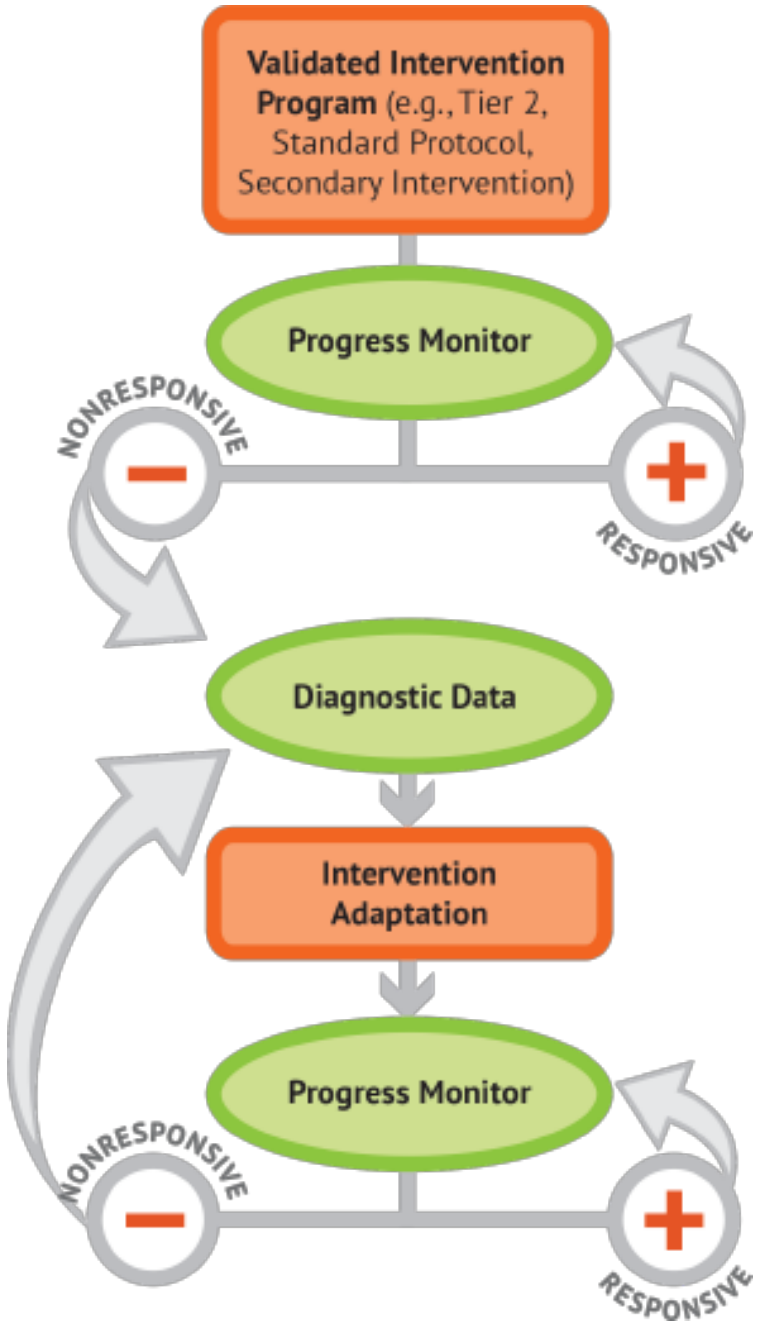
A framework of instruction, assessment, and decision making designed to make timely decisions about a student's instructional programming.



Data-Based Decision Making (DBDM)

Sometimes it is called

data-based individualization (DBI)



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Data-Based Decision Making (DBDM)

Systematic

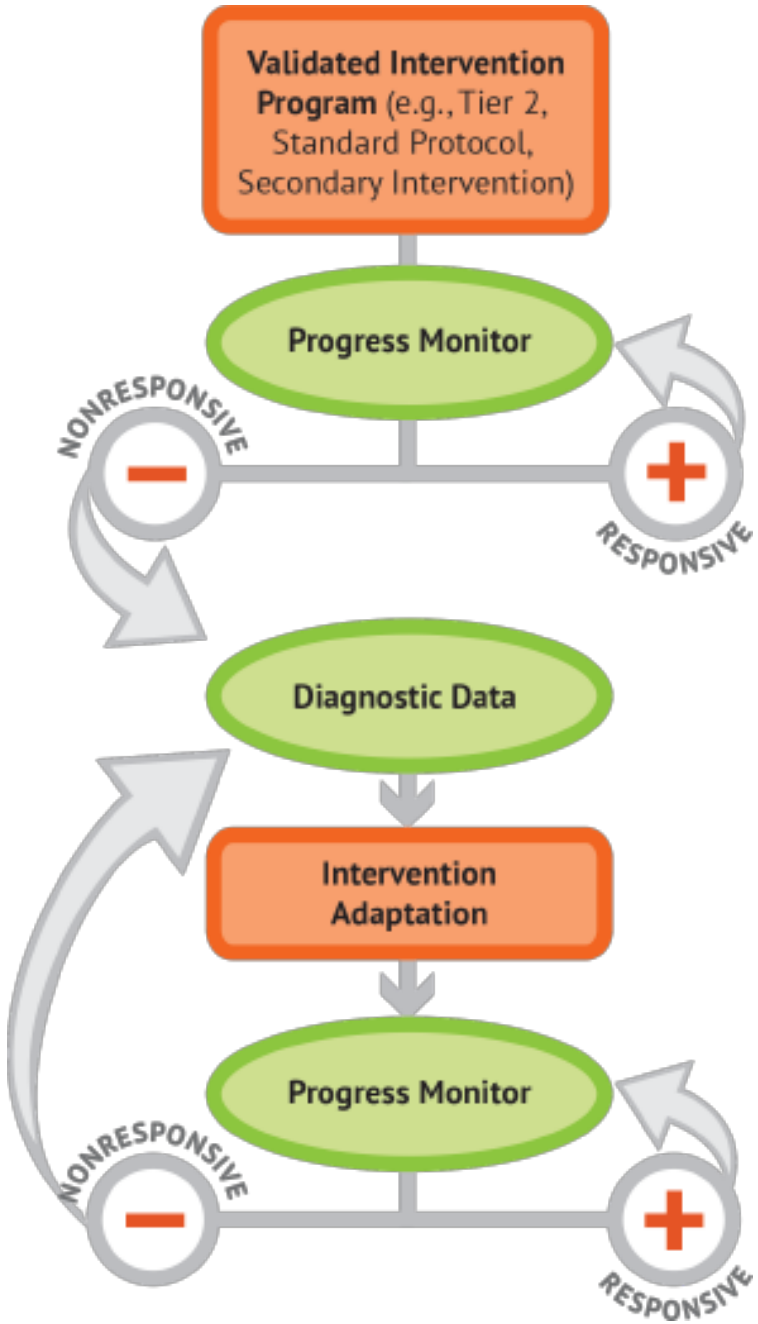
Relies on data

Helps individualize instruction

Data-Based Decision Making (DBDM)

Three primary components

- **Assessment**
- **Instruction**
- **Decision making**



DBDM

Is …

- A *framework* for making instructional decisions
- A dynamic *process* of ongoing assessment and intervention

Is not …

- A curriculum
- An assessment
- A single intervention

Data-Based Decision Making (DBDM)

Helps teachers be **mindful** about **evidence-based** practices

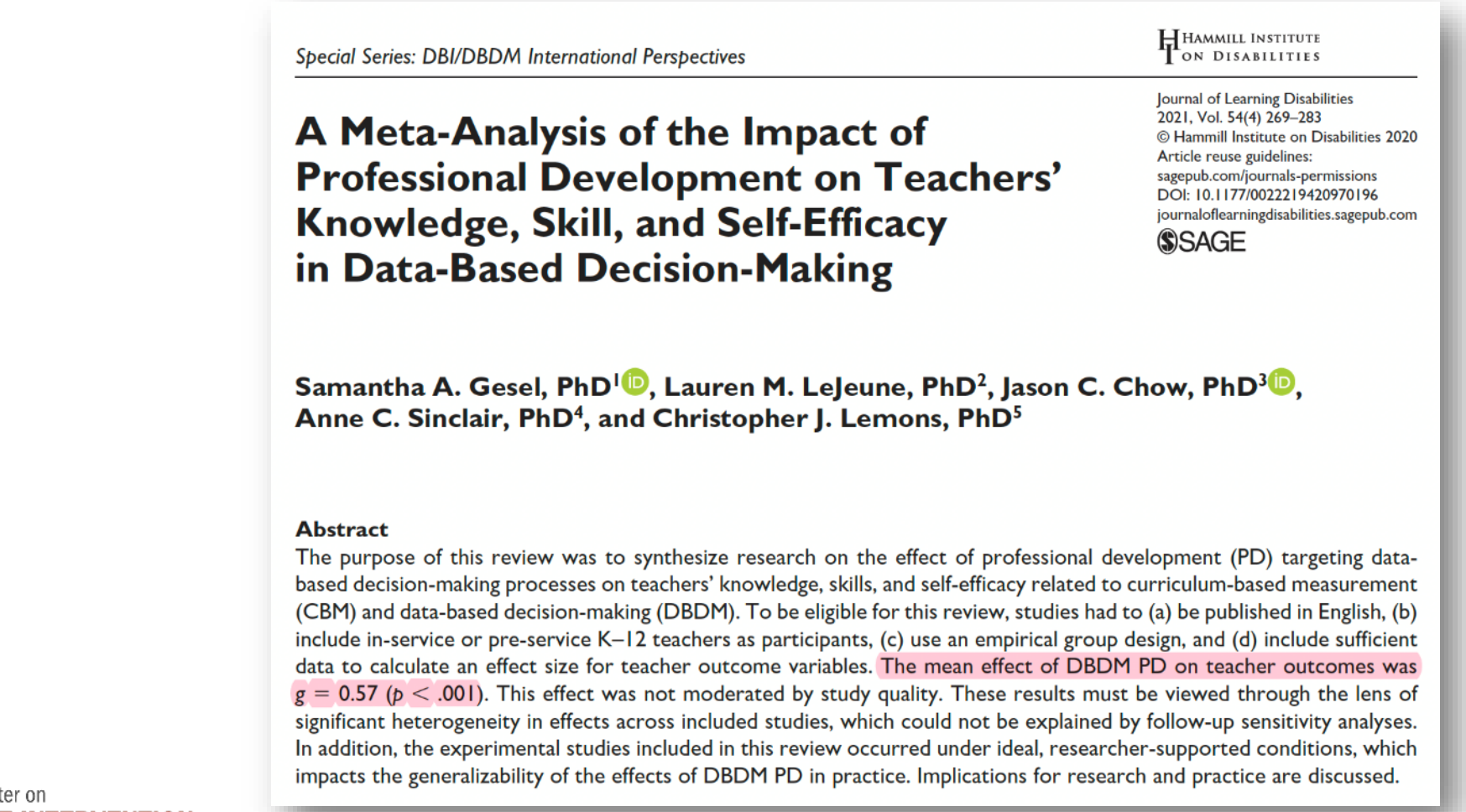
Helps teachers make **timely decisions** and responses about student progress

Can be used in **different settings** (Tier 1, Tier 2, Tier 3, or special education)

Can be used across **content areas** for both academics and behavior

Data-Based Decision Making (DBDM)

Research supports the use of DBI for improving **teacher outcomes**.



Special Series: DBI/DBDM International Perspectives

HAMMILL INSTITUTE ON DISABILITIES

Journal of Learning Disabilities
2021, Vol. 54(4) 269–283

DOI: 10.1177/0022219420970196
journaloflearningdisabilities.sagepub.com
SAGE

A Meta-Analysis of the Impact of Professional Development on Teachers' Knowledge, Skill, and Self-Efficacy in Data-Based Decision-Making

Samantha A. Gesel, PhD[1], Lauren M. LeJeune, PhD[2], Jason C. Chow, PhD[3], Anne C. Sinclair, PhD[4], and Christopher J. Lemons, PhD[5]

Abstract

The purpose of this review was to synthesize research on the effect of professional development (PD) targeting data-based decision-making processes on teachers' knowledge, skills, and self-efficacy related to curriculum-based measurement (CBM) and data-based decision-making (DBDM). To be eligible for this review, studies had to (a) be published in English, (b) include in-service or pre-service K–12 teachers as participants, (c) use an empirical group design, and (d) include sufficient data to calculate an effect size for teacher outcome variables. The mean effect of DBDM PD on teacher outcomes was $g = 0.57$ ($p < .001$). This effect was not moderated by study quality. These results must be viewed through the lens of significant heterogeneity in effects across included studies, which could not be explained by follow-up sensitivity analyses. In addition, the experimental studies included in this review occurred under ideal, researcher-supported conditions, which impacts the generalizability of the effects of DBDM PD in practice. Implications for research and practice are discussed.

Data-Based Decision Making (DBDM)

Research supports the use of DBI for improving **student outcomes**.

Learning Disabilities Research & Practice, *33*(3), 144–155

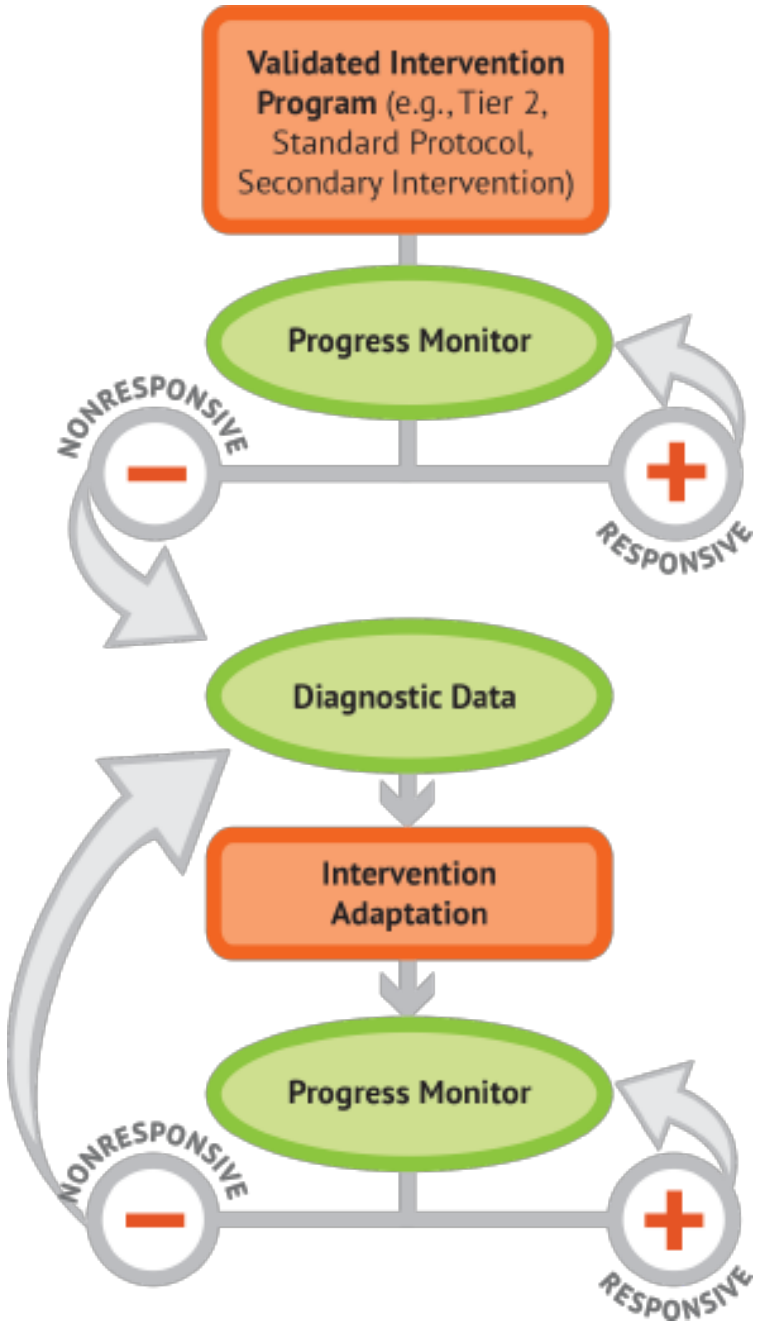
DOI: 10.1111/ldrp.12172

Effects of Data-Based Individualization for Students with Intensive Learning Needs: A Meta-Analysis

Pyung-Gang Jung
Ewha Womans University
Kristen L. McMaster and Amy K. Kunkel
University of Minnesota
Jaehyun Shin
Gyeongin National University of Education
Pamela M. Stecker
Clemson University

We examined the mean effect of teachers' use of data-based individualization (DBI) on the performance of students with intensive learning needs across academic areas and factors influencing the effects of DBI on student achievement. A total of 57 effect sizes from 14 studies were categorized into two comparisons: DBI Only (comparisons between DBI and a business-as-usual control) and DBI Plus (comparisons in which DBI implementers had access to additional information on student performance while they implemented DBI, compared to a control). The mean effect of DBI Only on student performance was $g = 0.37$; the mean effect of DBI Plus was $g = 0.38$. Differential effects of DBI were found depending on the nature of CBM tasks, frequency of CBM administration, and type and frequency of supports provided to teachers. Findings support the use of DBI to enhance student outcomes across academic areas.

Establish a validated instructional platform.



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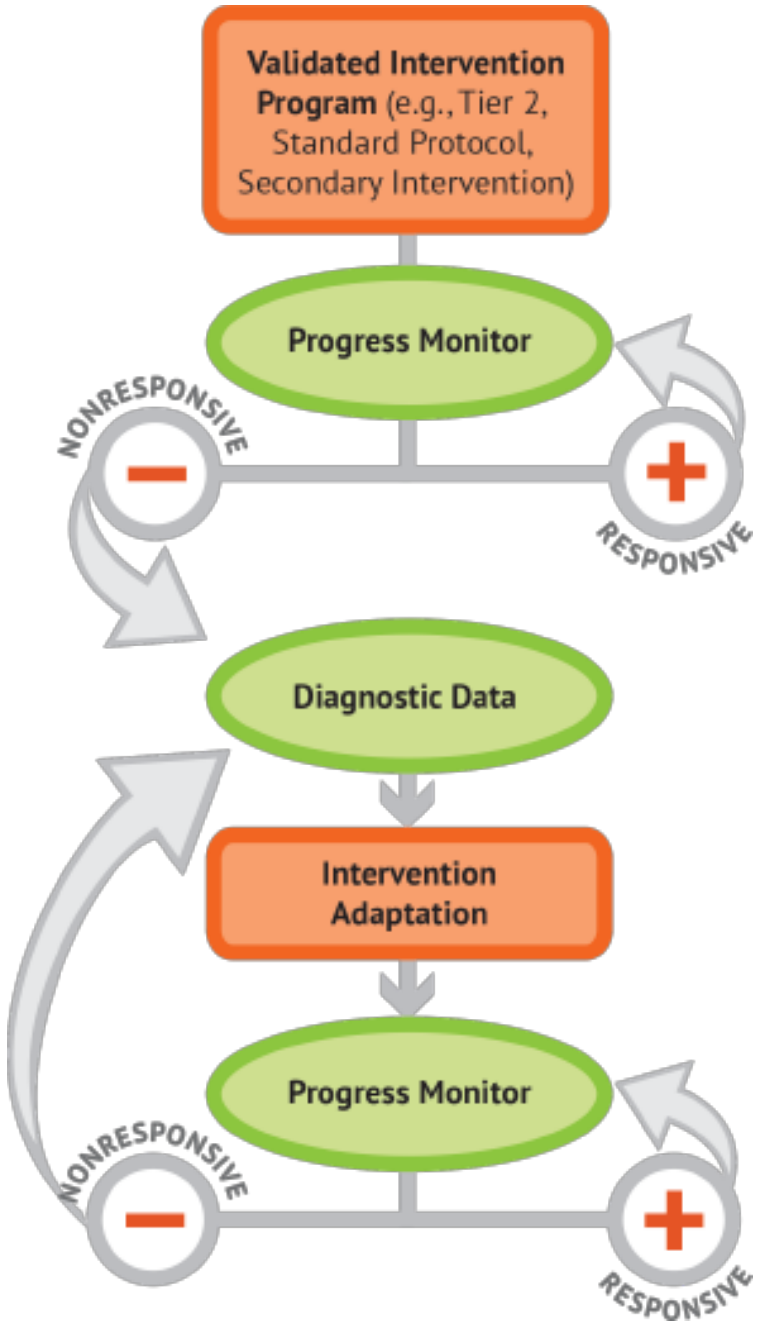
Establish a validated instructional platform.

Progress monitor:

- Establish a present level of performance.
- Set an ambitious long-term goal.
- Collect frequent assessment data.
- Use decision rules.



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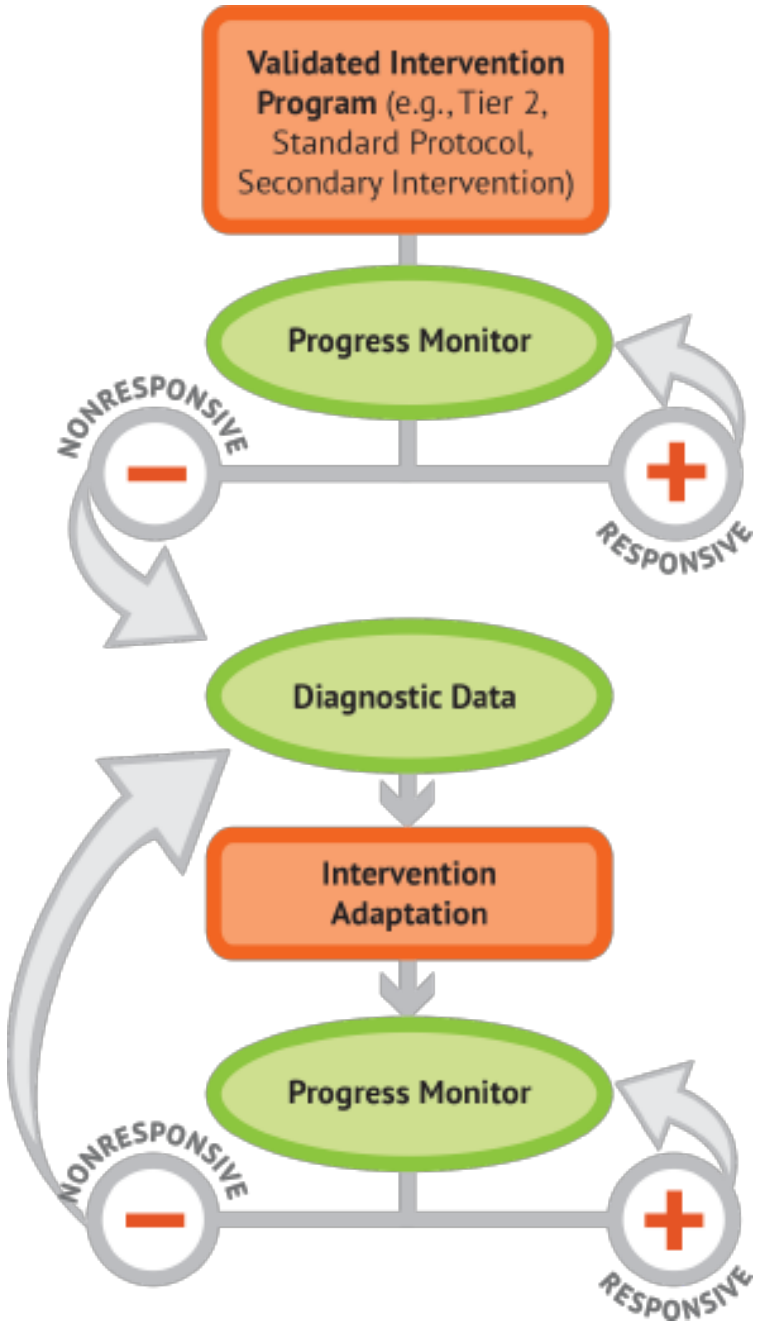
Based on student response:

- Continue the instructional platform with progress monitoring OR
- Collect diagnostic data.



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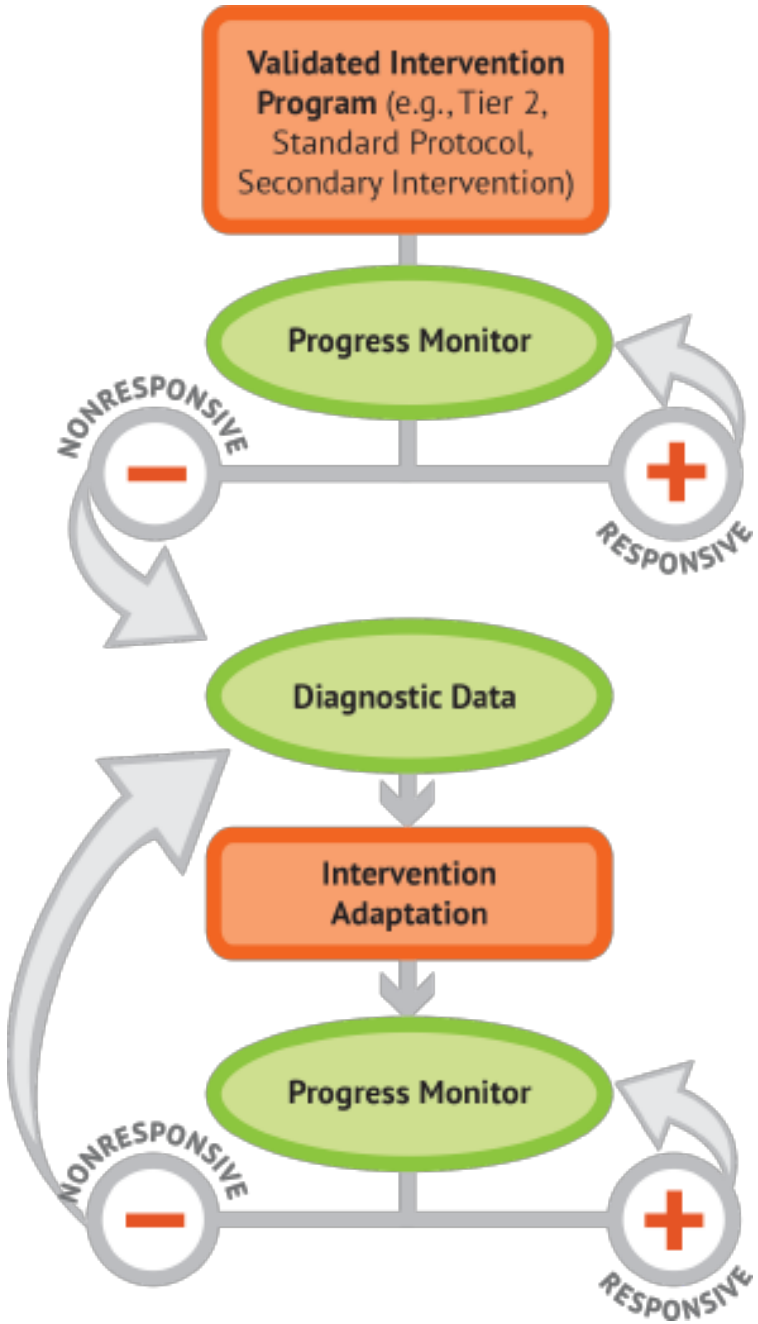

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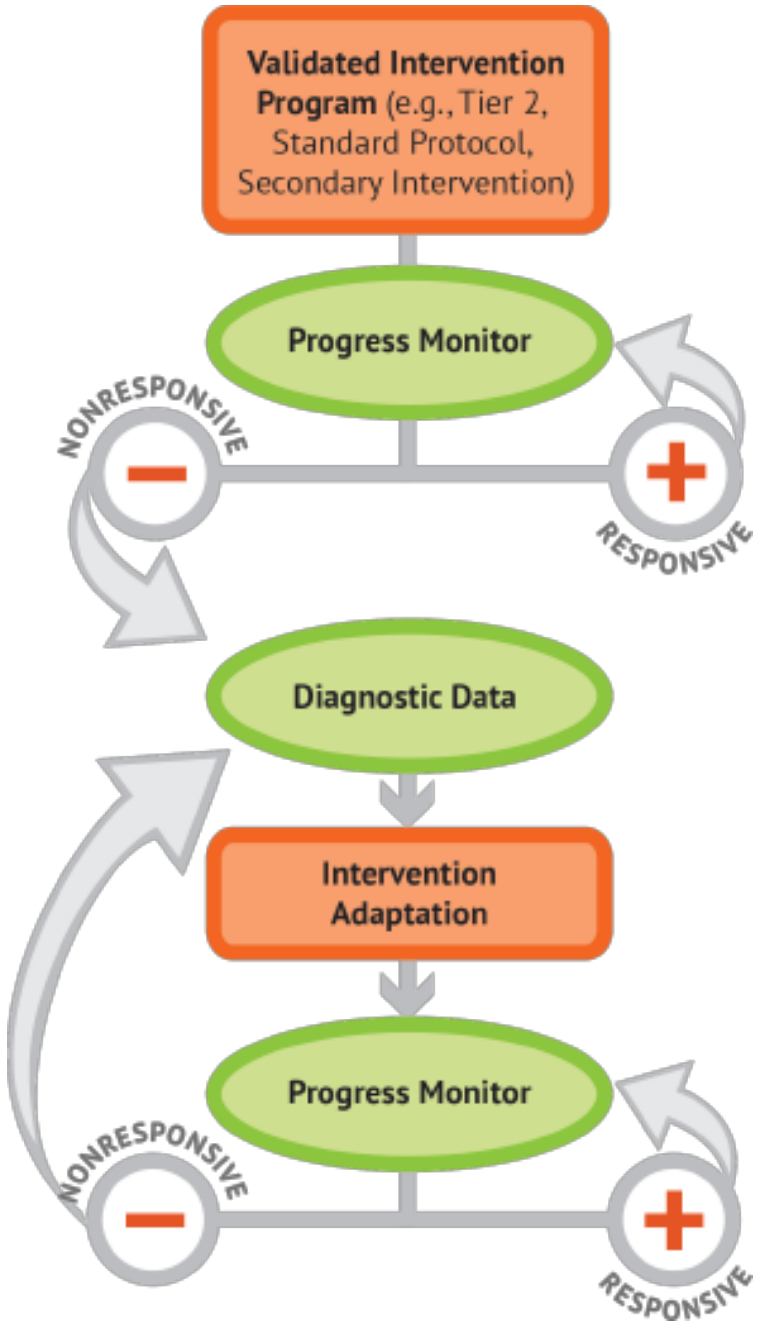
Make instructional adaptations based on data.

Continue to monitor progress to determine whether student is responding adequately.



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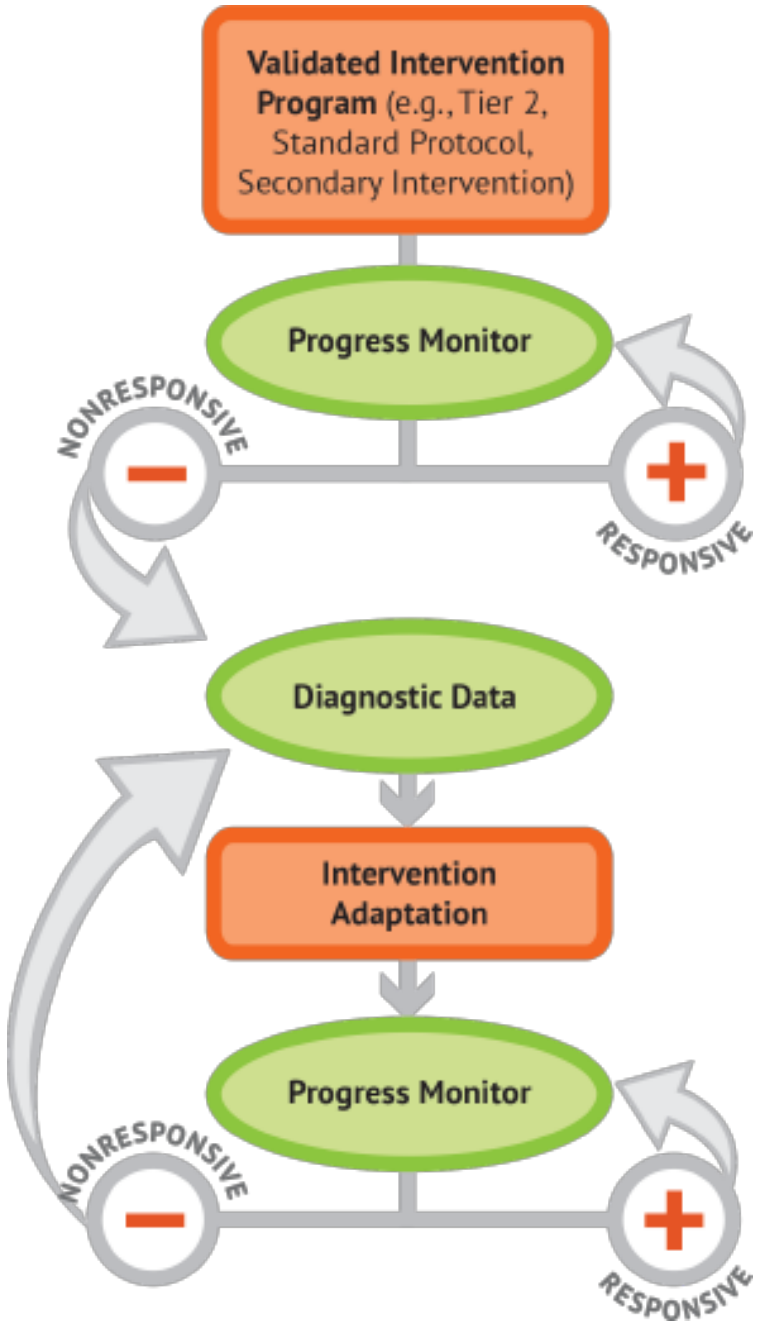
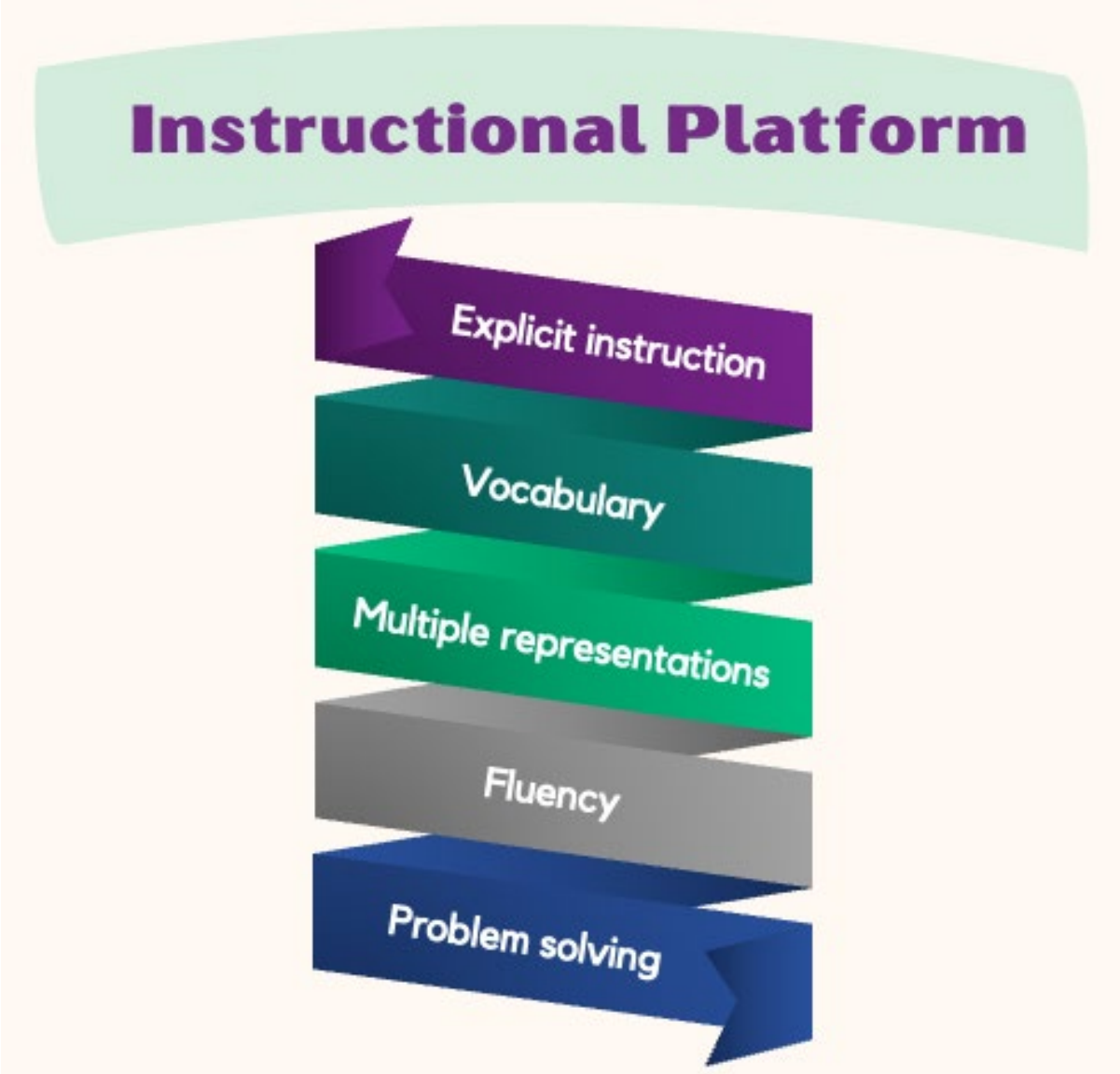
Data-Based Decision Making (DBDM)

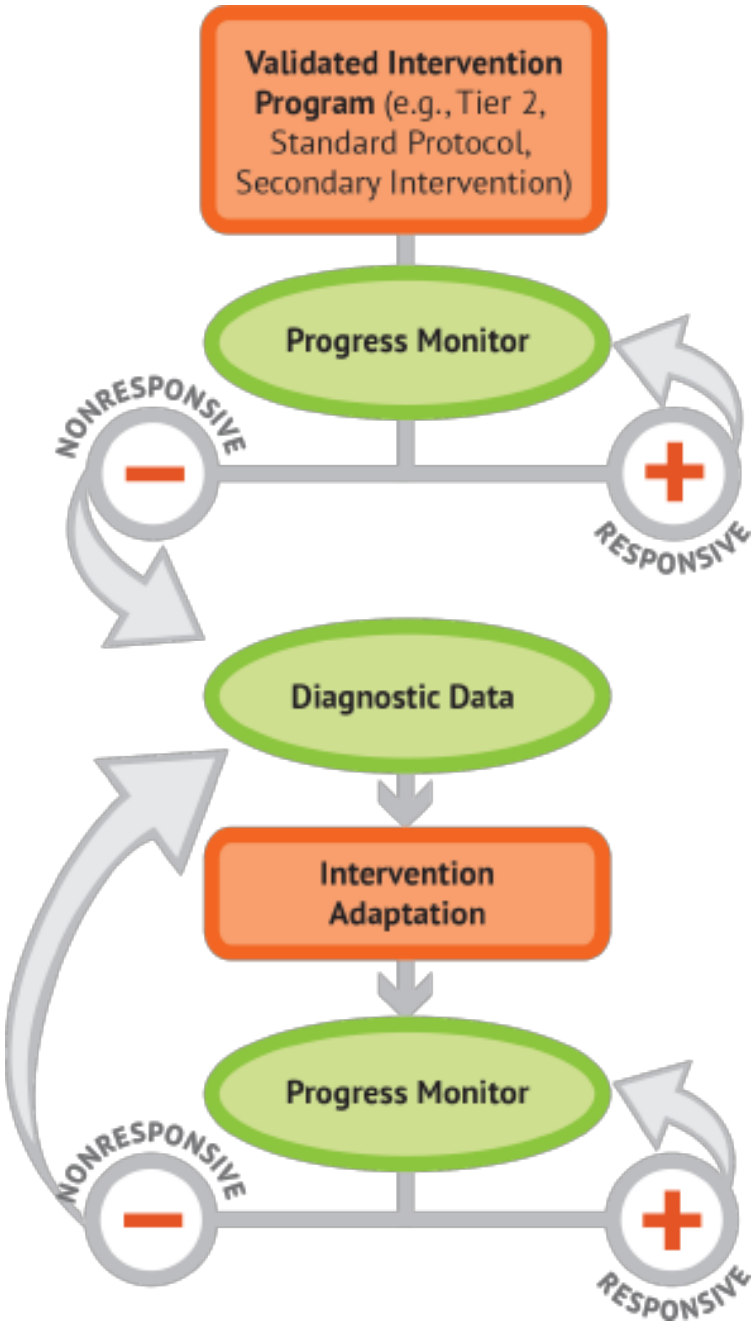
DBDM starts with an **instructional platform**.

This platform must comprise research-validated practices for instruction in mathematics.





Source: https://mathspiral.com/



Explicit Instruction

MODELING	PRACTICE
Step-by-step explanation	Guided practice
Planned examples	Independent practice

SUPPORTS

Ask high-level and low-level questions

Elicit frequent responses

Provide affirmative and corrective feedback

✓ **Modeling** starts with an introduction about the goals and importance of the lesson.

"Today, we are learning about division. This is important because sometimes you share things equally."

SPIRAL
Specialized Math Intervention to Reach All Learners

Source: https://mathspiral.com/

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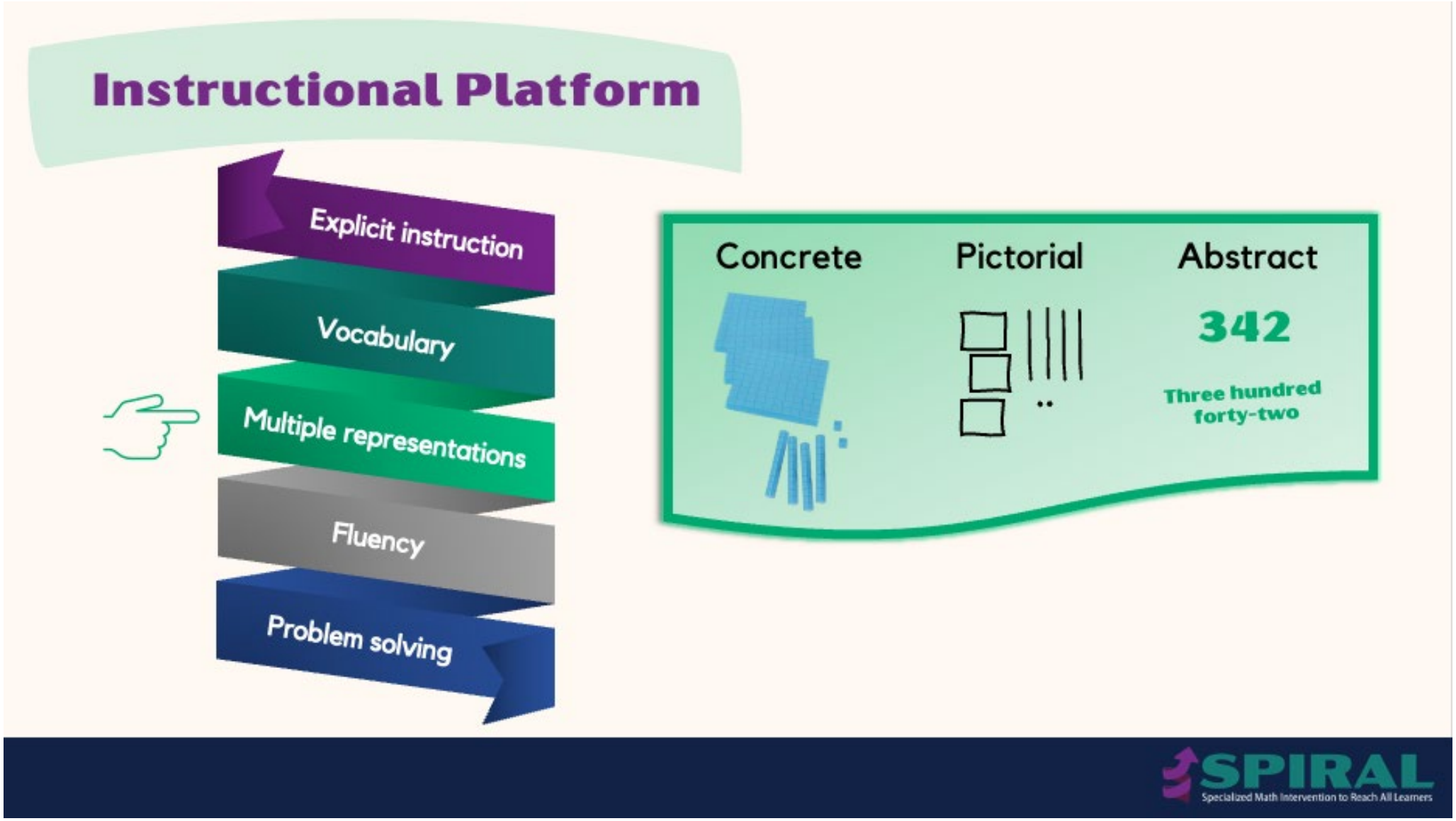

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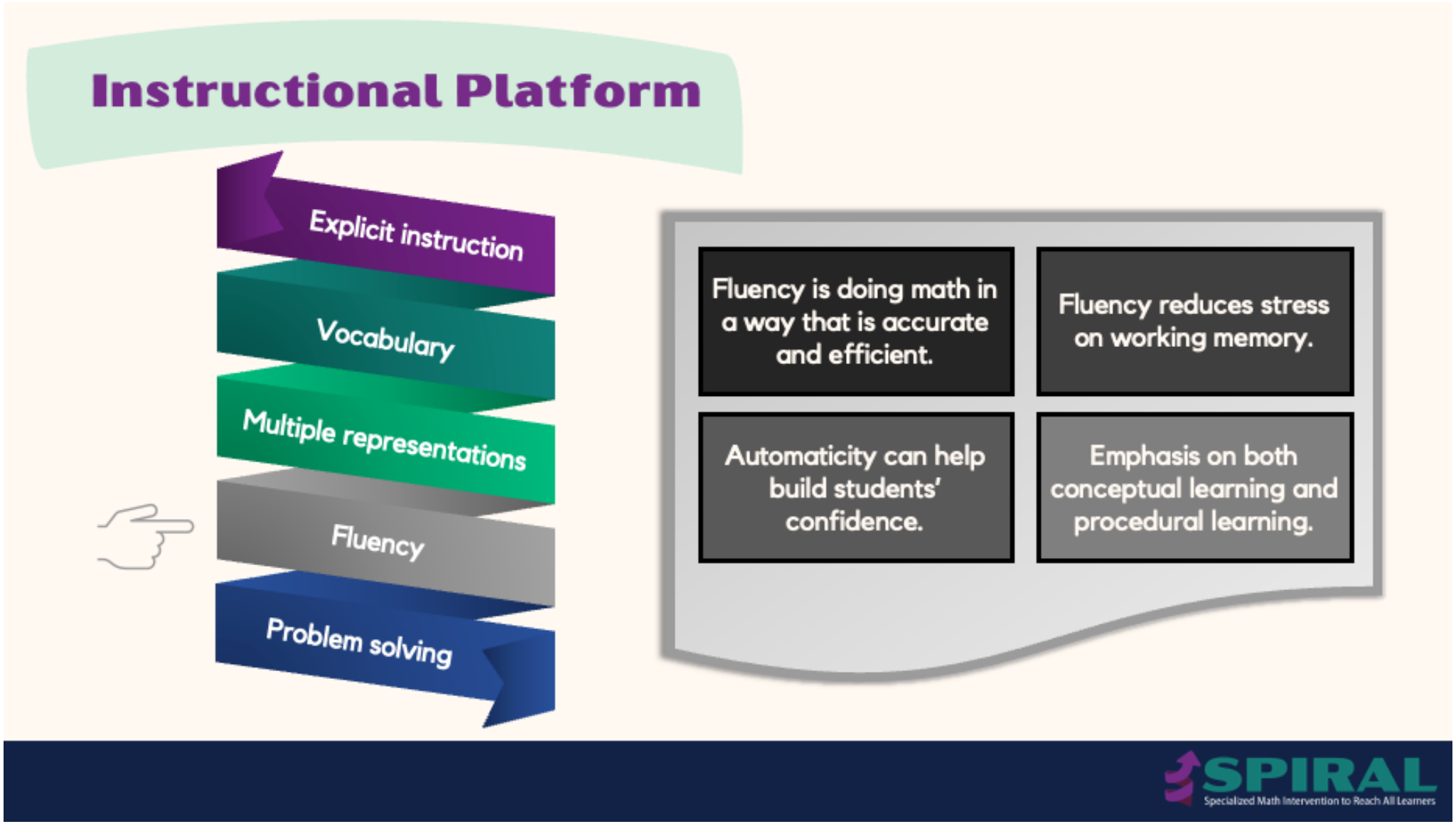

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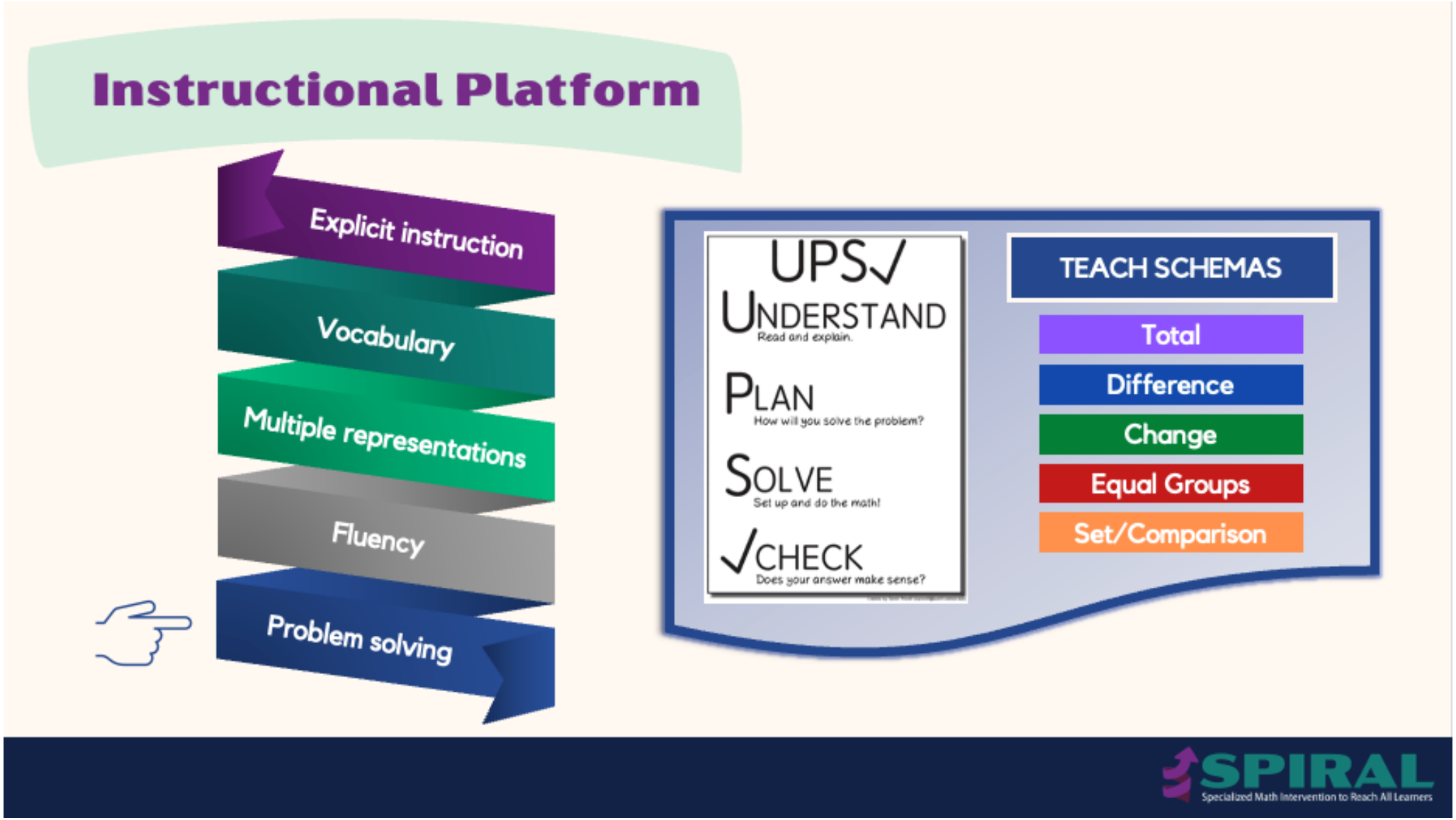

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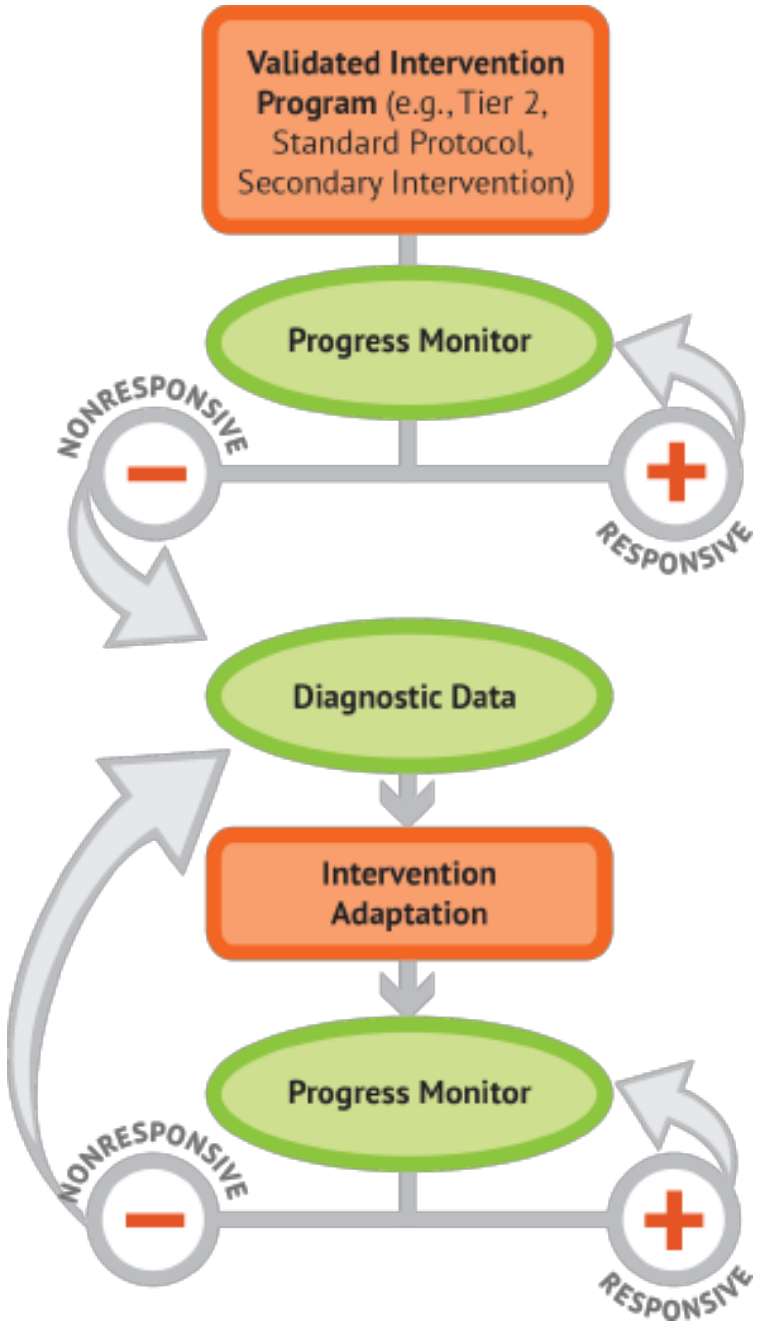

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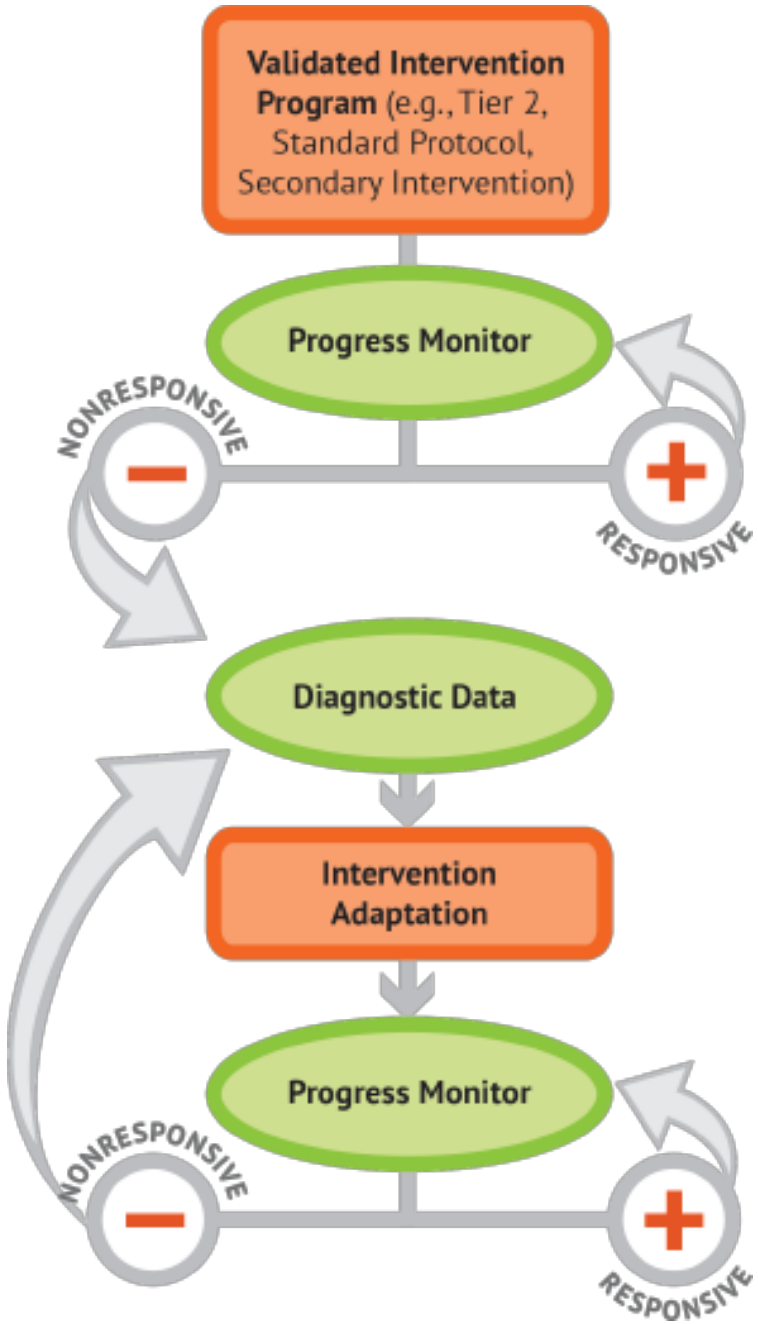
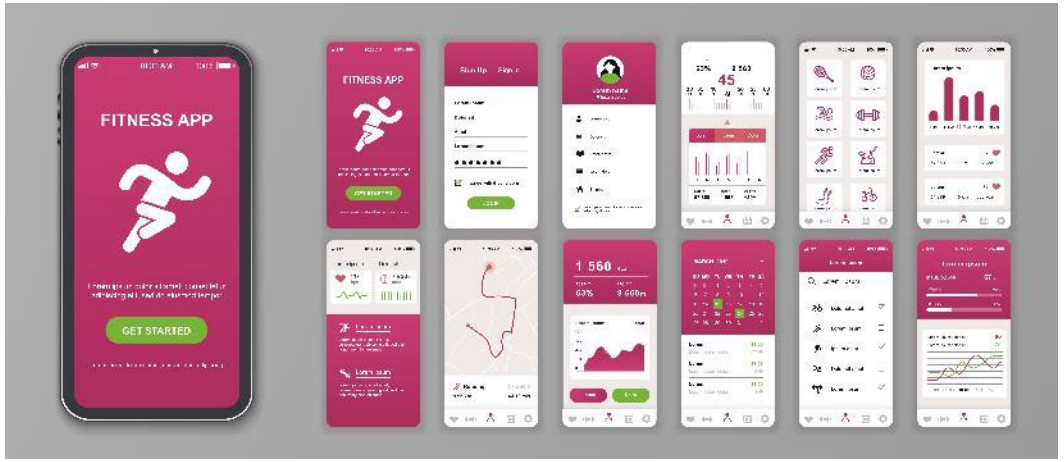
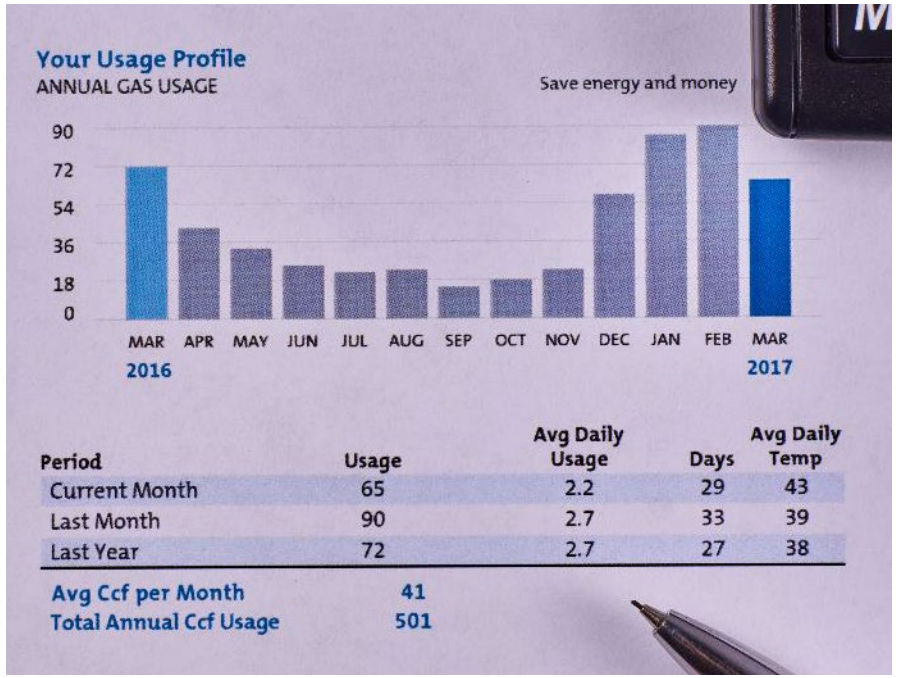
Data-Based Decision Making (DBDM)

DBDM relies on **progress monitoring**.



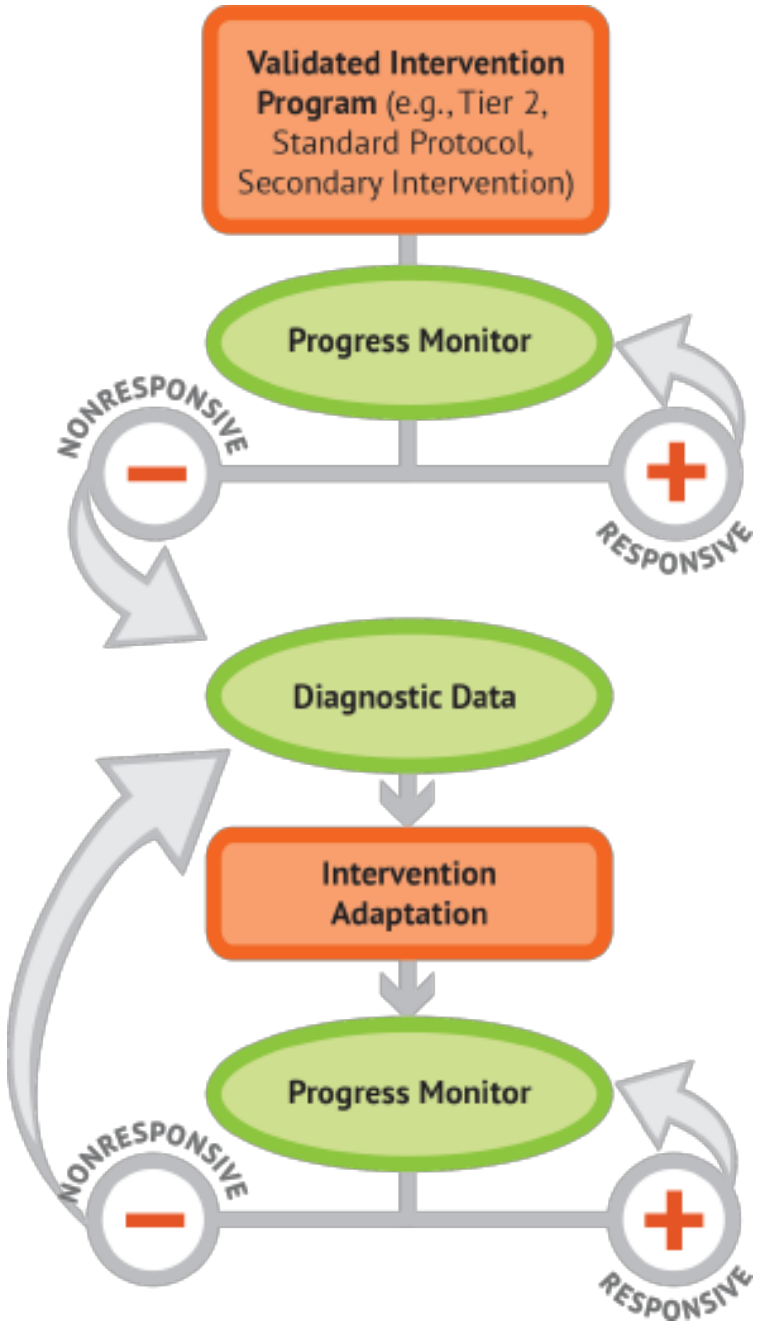
What Is Progress Monitoring?



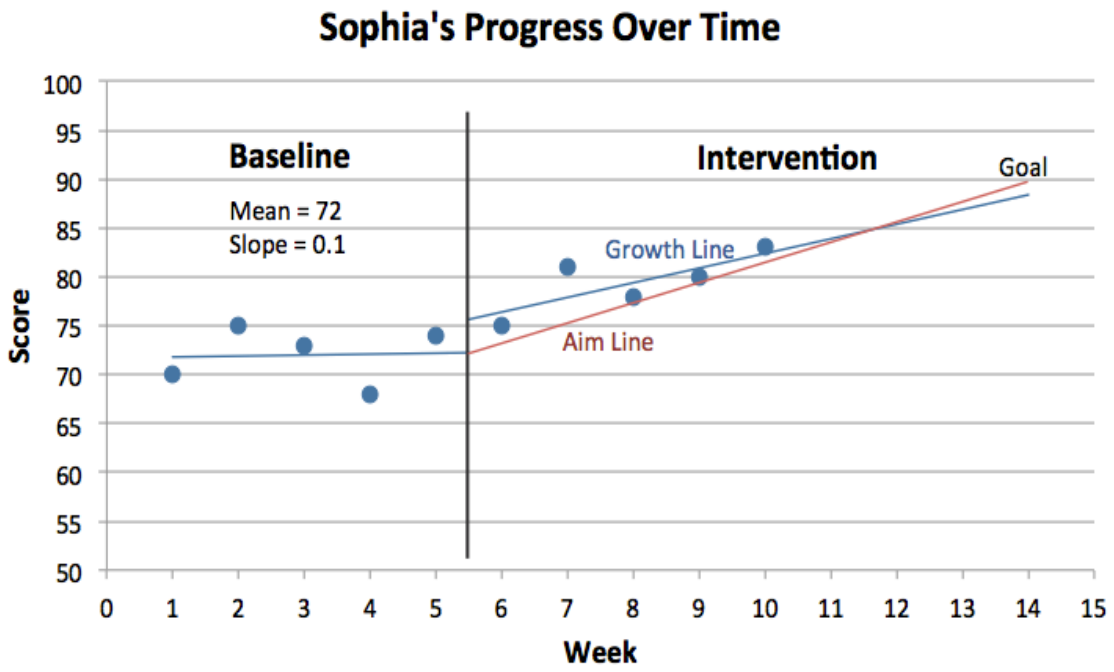


Data-Based Decision Making (DBDM)

DBDM also relies on **decision making** about the progress monitoring data.

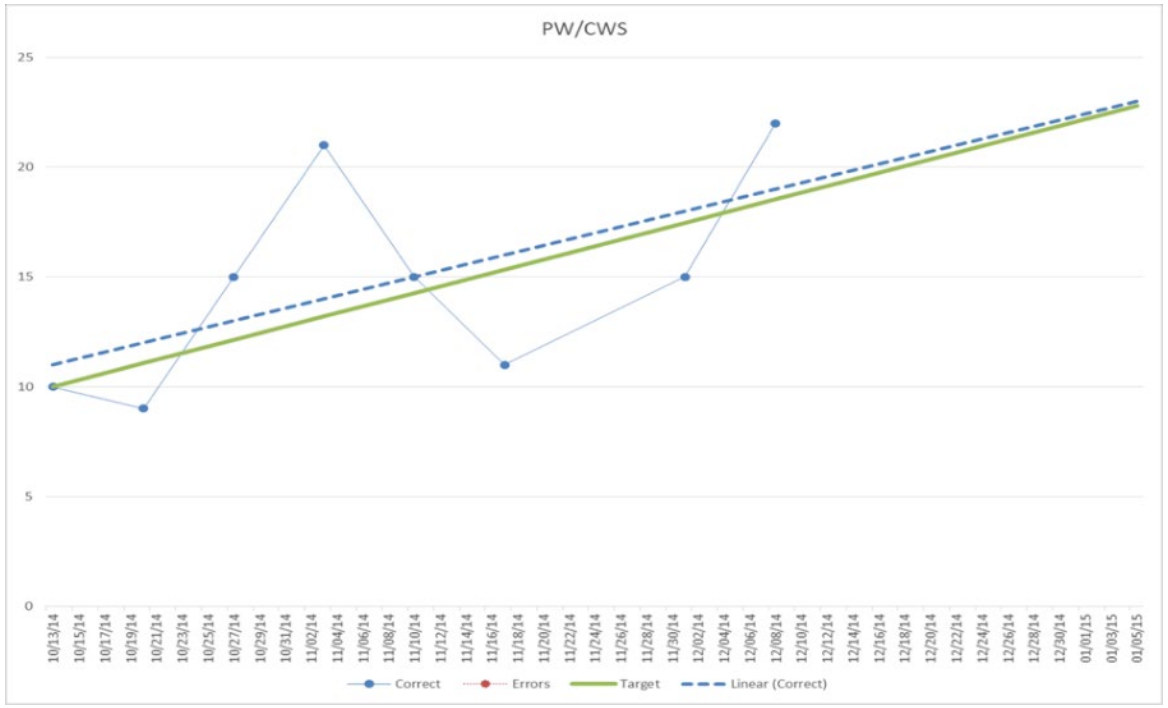


Interpreting Results From Progress Monitoring Measures



1. Gather baseline data.
2. Set performance goals.
3. Implement the intervention.
4. Administer progress monitoring measures at regular intervals.
5. Evaluate the student's progress.

Making Decisions From Progress Monitoring Results



- Is the student making adequate progress toward their goals?
  - How do you know?
  - How could you confirm?
- Is the intervention effectively meeting the student's needs?
  - How do you know?
  - How could you confirm?

Graphing

- Graphed data will provide you with a clear picture of a student's progress.
- The graph will allow you to
  - set reasonable and ambitious goals,
  - monitor the appropriateness of the student's goal,
  - judge the adequacy of the student's progress,
  - determine the effectiveness of the student's math instructional platform, and
  - use decision rules to make changes to the student's instructional platform when needed.

Graphing

STUDENT DATA ENTRY

Student #	101

Last Name	testerson

First Name	testy

	Dates	QD	NP	PR
Baseline 1	27-Aug	6	3	4
Baseline 2	3-Sep	8	4	5
Baseline 3	10-Sep	6	3	4

Student		Date	QD	NP	PR
testy testerson	Intervention 1	17-Sep	7	2	5
		24-Sep	7	3	4
		1-Oct	8	4	7
		8-Oct	8	6	6
		15-Oct	9	7	9
		22-Oct	8	5	7
		29-Oct	10	9	9
		5-Nov	12	8	9
		12-Nov	13	10	10

Image from Project STAIR https://blog.smu.edu/projectstair/about-project-stair/

Decision Making

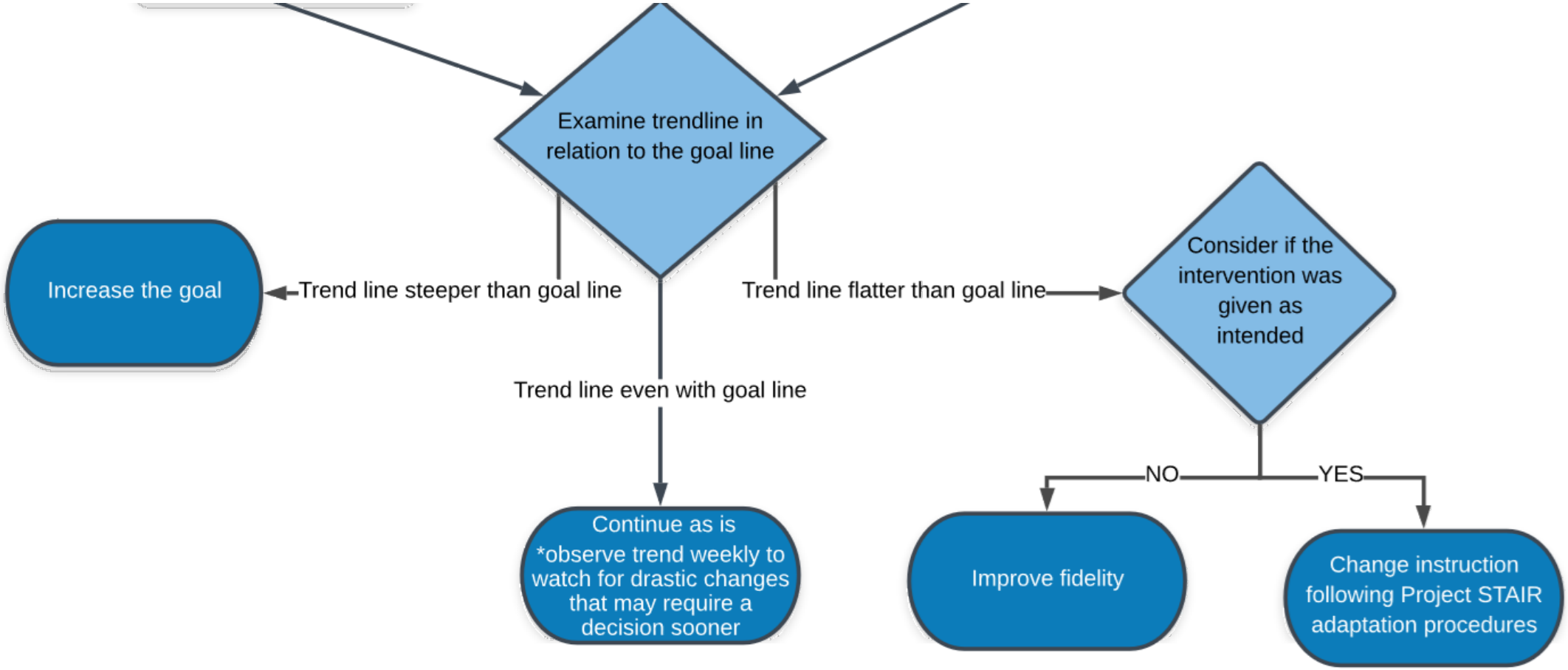
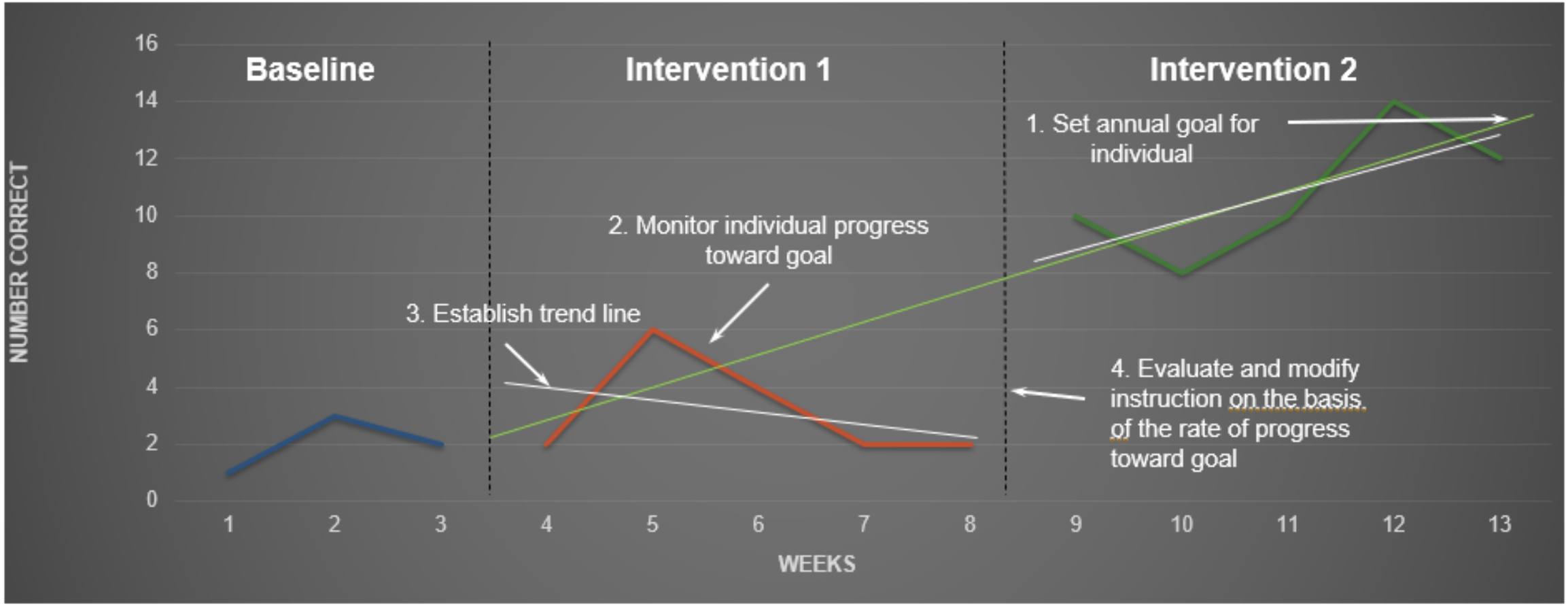


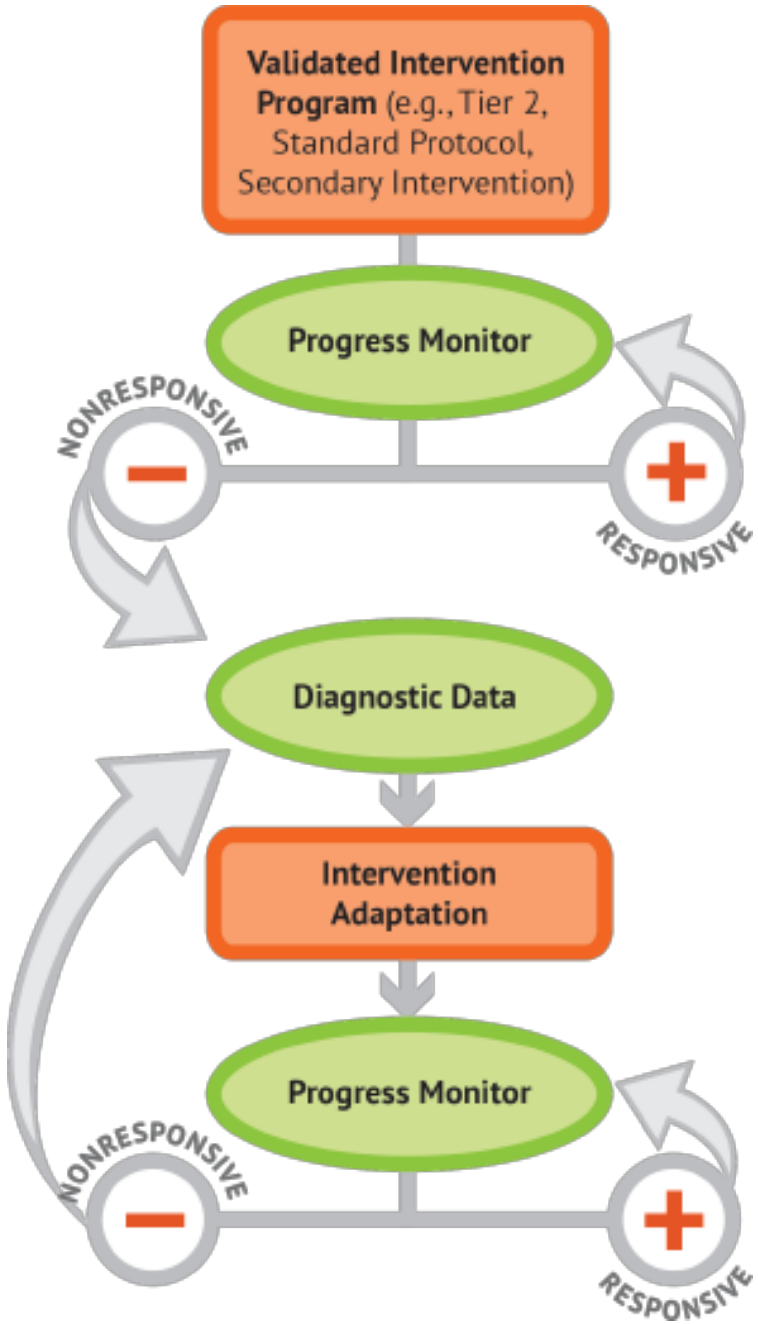
Image from STAIR 2.0: Supporting Teaching of Algebra with Individual Readiness https://www.smu.edu/simmons/research/research-in-mathematics-education/explore/stairr

Decision Making



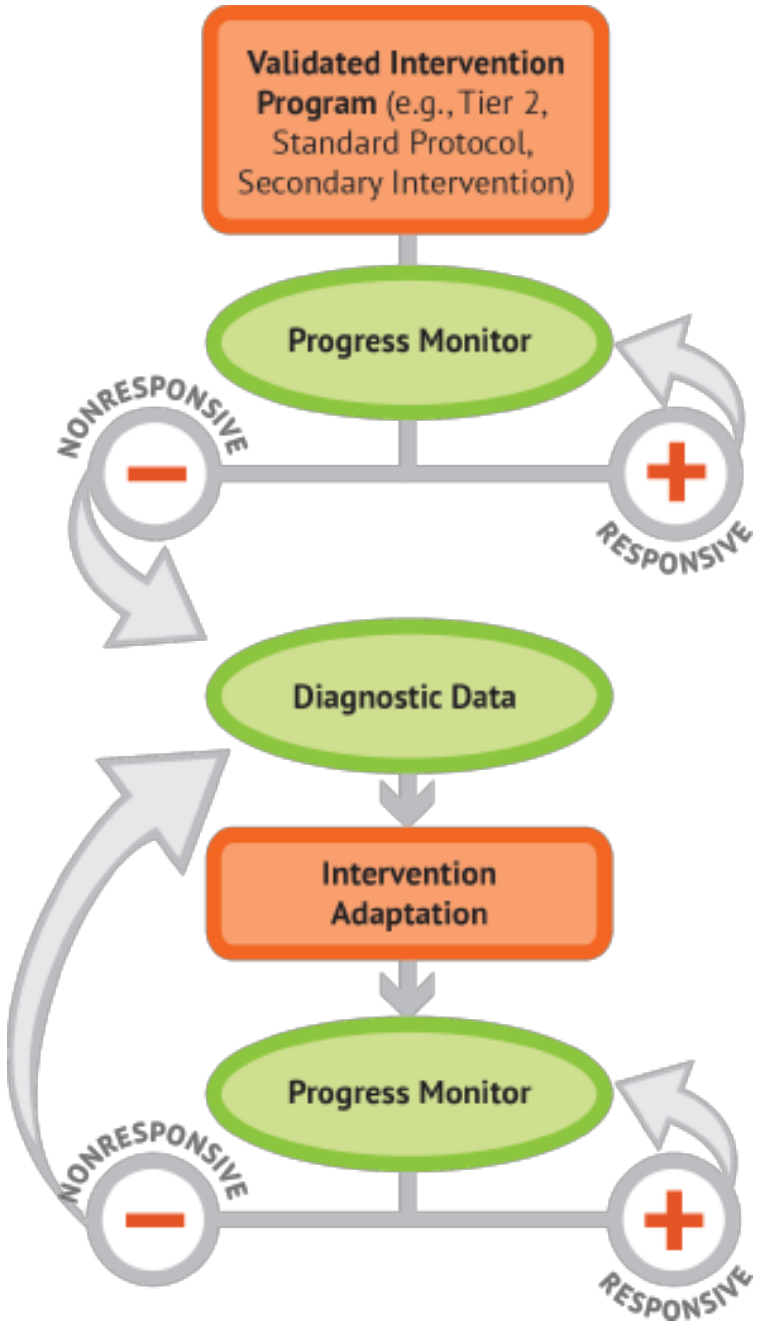
Data-Based Decision Making (DBDM)

DBDM relies on **progress monitoring**.



Data-Based Decision Making (DBDM)

DBDM also relies on **decision making** about the progress monitoring data.



Today's Webinar

Evidence and Research

DBDM: Framework

DBDM: Instructional Platform

DBDM: Progress Monitoring

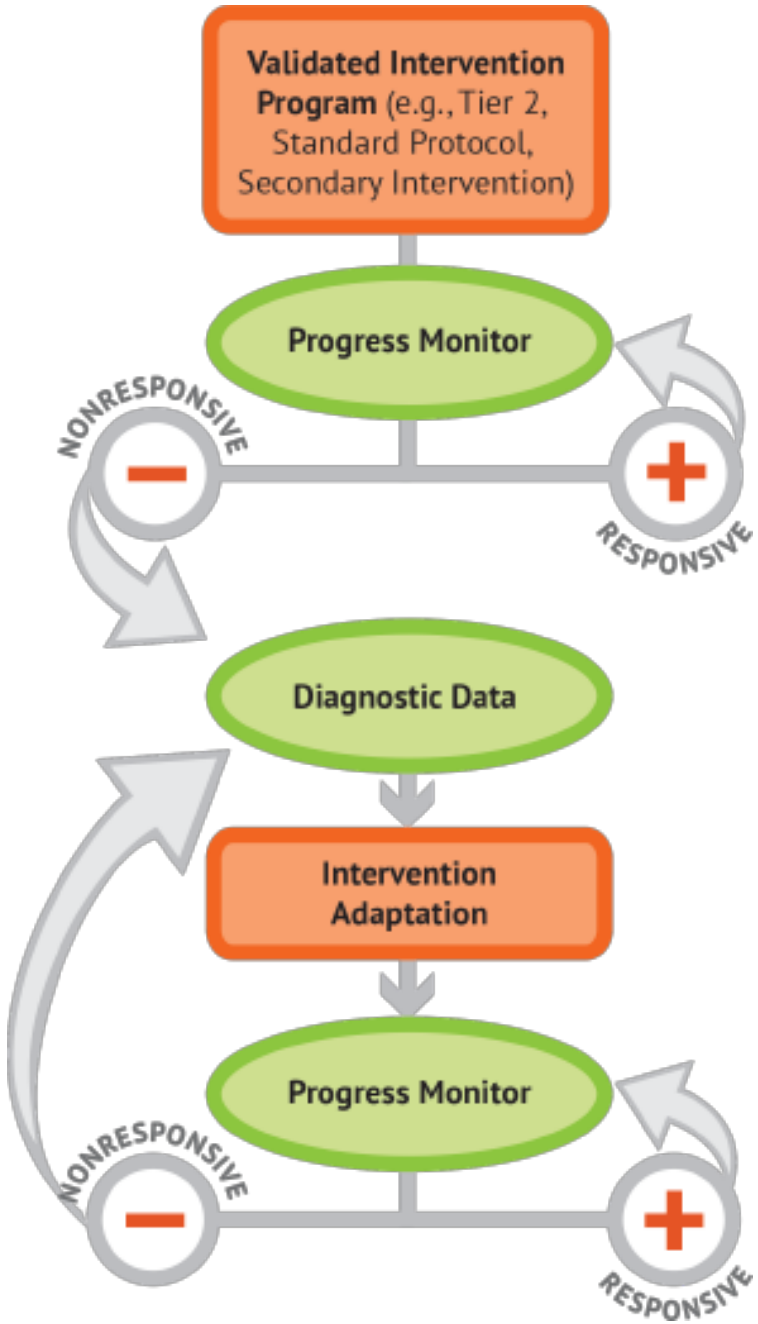
DBDM: Diagnostics

Next Steps

Resources

Data-Based Decision Making (DBDM)

DBDM relies on **diagnostic data** to inform adaptations to the instructional platform.



Five Steps of a Task Analysis

1. Identify the standard/construct.
2. Choose a math problem at the expected level of complexity within this construct.
3. Solve the problem in a stepwise manner.
4. State the reason why each step is made.
    - Avoid tricks or unexplainable steps.
5. Challenge your approach with alternatives to see when your steps work and when they don't.
    - Minimize steps that aren't generalizable to more complex work.

Task Analysis: Multidigit Subtraction

325 – 148 = ?

a. Decompose.

$$300 + 20 + 5$$
$$-100 - 40 - 8$$

b. Regroup the minuend.

$$200 + 110 + 15$$
$$-100 - 40 - 8$$

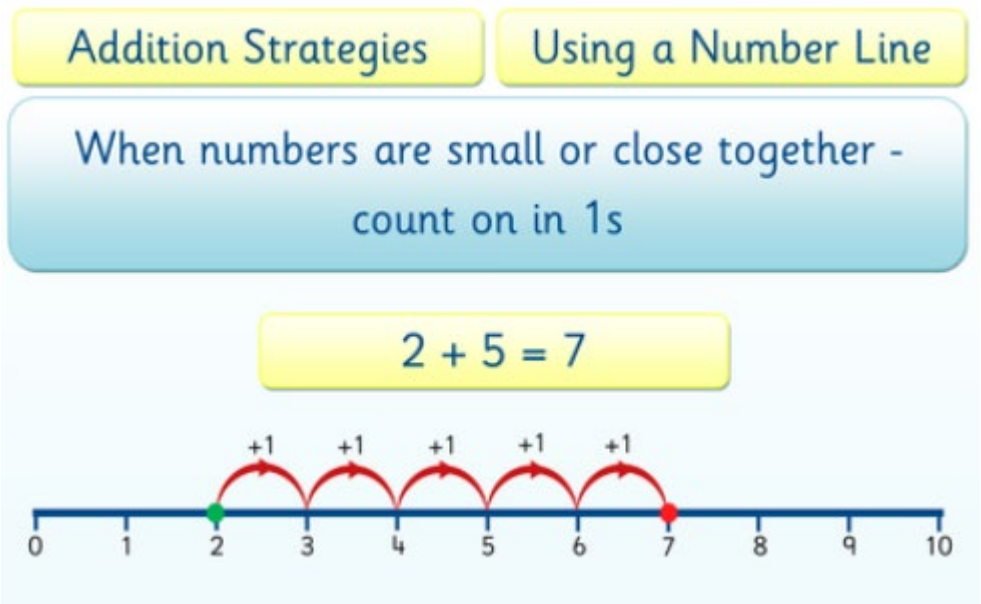
c. Subtract by place value.

$$+100 + 70 + 7$$

d. Compute final answer.

177

Building Your Mnemonic to an Acrostic



Example from TES.com

a. Determine whether the problem is addition.

b. Identify the first addend.

c. Go to that number on the number line.

d. Identify the second addend.

e. Take that many steps forward.

f. Say the number where you arrive.

Sample Acrostic Mnemonics

Solving Equations

Identify the variables.

Set up equations.

Organize to balance.

Let equations begin.

Add variable side of equal sign.

Total other side.

Evaluate and check answer.

Slope Intercept

Recognize and reorder the formula.

Identify the slope and intercept.

Set up the intercept.

Evaluate the slope.

Rise over run.

Use the dots to make a line.

Need to check your answer.

Quadratic

Find out whether the formula is quadratic.

Accurately compute to equal the whole number.

Compute the same numbers to equal the coefficient.

The parentheses come next.

Order what's in the parentheses.

Recheck the answer.

Task Analysis Addition Example

Student	Decompose	Regroup	Place-value subtraction	Add	Answer	Total
Jack	✓	✓	✗	✓	✗	3 out of 5
Bill	✓	✗	✓	✓	✗	3 out of 5
Kelly	✓	✗	✓	✓	✗	3 out of 5
George	✓	✓	✓	✓	✓	3 out of 5
Jivan	✓	✗	✓	✓	✗	3 out of 5
Grace	✓	✓	✓	✓	✓	3 out of 5

Today's Webinar

- Evidence and Research
- DBDM: Framework
- DBDM: Instructional Platform
- DBDM: Progress Monitoring
- DBDM: Diagnostics
- Next Steps
- Resources

Getting Started Implementing DBDM

1. Identify a student or small group of students with whom you might implement.
2. Conduct initial progress monitoring measure.
   a. Try NCII's tools charts.
3. Choose the type of measure you will use based on each student's skill needs:
   a. Early numeracy
   b. Computation
   c. Concepts and applications

Getting Started Implementing DBDM

4. Administer screening measures to each student as specified by the company.
5. Score and graph the baseline data.
6. Set a goal for each student, using the established levels of expectation for the instructional level and skill you are measuring.
7. Begin weekly progress monitoring, administering one measure each week, scoring, and graphing the data.
8. After 6 data points, use the decision-making flow chart to determine next steps:
    a. Continue instruction.
    b. Make an instructional adaptation utilizing diagnostic data.
    c. Raise the goal.

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The Five Steps of DBI

Resource Type: **Self-Paced Modules**
Developed By: **National Center on Intensive Intervention**
Publication Date: **April, 2021**

The course is expected to take 30 minutes to complete. You may complete the course in one sitting or return at a later time to complete it.

View Module

This interactive self-paced module is intended to help educators and administrators learn about the data-based individualization (DBI) process. By completing the Five Steps of the DBI Process course, you will be able to:

Related Resources

SELF-PACED MODULES
Introduction to Intensive Intervention

TOOLS/TIPS
Breaking Down the DBI Process Questions & Considerations

TRAINING MODULES
Updated: Introduction to Data-Based Individualization (DBI): Considerations for Implementation in Academics and Behavior (DBI Professional Learning Series Module 1)

View All Resources

View All Online Learning Modules >

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Academic Progress Monitoring Tools Chart

This tools chart presents information about academic progress monitoring tools. The following three tabs include ratings on the technical rigor of the tools: (a) Performance Level Standards, (b) Growth Standards, and (c) Usability.

The presence of a particular tool on the chart does not constitute endorsement and should not be viewed as a recommendation. All tools that meet the criteria for review are posted on the chart, regardless of results. The chart represents all tools that were reviewed, not those that were "approved."

Last updated: November 2024. Click here for a brief summary of the new and improved tools we've released.

View Chart Resources

Print Current Chart View

Legend Convincing evidence | Partially convincing evidence | Unconvincing evidence | Data unavailable | d Disaggregated data available

FILTER RESULTS

Subject
- [ ] Reading
- [x] Mathematics
- [ ] Spelling & Written Expression

Grade
- [ ] Pre-K
- [ ] Elementary (K-5)
- [ ] Middle School (6-8)
- [ ] High School (9-12)

Apply Filters | Show Advanced Filters | Clear Filters

Compare Tools | Reset Chart | Performance Level Standards | Growth Standards | Usability

All ■	Title	Area	Grade	Measure Type	Reliability	Validity	Bias Analysis Conducted
☐	Acadience Math	Computation	Grade 2	End Year Goal	●	○	No
☐	Acadience Math	Computation	Grade 3	End Year Goal	●	○	No
☐	Acadience Math	Computation	Grade 4	End Year Goal	●	○	No

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Intensive Intervention in Mathematics Course Content

Intensive instruction was recently identified as a high-leverage practice in special education, and DBI is a research based approach to delivering intensive instruction across content areas (NCII, 2013). This course provides learners with an opportunity to extend their understanding of intensive instruction through in-depth exposure to DBI in mathematics, complete with exemplars from actual classroom teachers.

NCII, through a collaboration with the University of Connecticut and the National Center on Leadership in Intensive Intervention and with support from the CEEDAR Center, developed course content focused on enhancing educators' skills in intensive mathematics intervention. The course includes eight modules that can support faculty and professional development providers with instructing pre-service and in-service educators who are learning to implement intensive mathematics intervention through data-based individualization (DBI). The content in this course complements concepts covered in the Features of Explicit Instruction Course and so we suggest that users complete both courses.

Intensive Intervention in Mathematics Course Overview

Modules 1-8: Intensive Intervention in Mathematics

There are 8 modules within this course. Each course has an introduction, three parts, and a conclusion.

Related Course Content

RESOURCE
Intensive Intervention in Mathematics Course Overview

RESOURCE
CEC Standards Addressed

RESOURCE
Suggested Reading List

WEBINAR
Count me In! Supporting Students in Your Class with Math Difficulty

WEBINAR
Make Your Course Count: Preparing Educators to Support Students with Math Difficulty

WEBINAR SERIES
Implementing DBI with a Focus on Mathematics During COVID-19 Restrictions

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Principles for Designing Intervention in Mathematics

Resource Type: **Documents**
Developed By: **National Center on Intensive Intervention**

The purpose of this guide is to provide brief explanations of practices that can be implemented when working with students in need of intensive intervention in mathematics. Special education instructors, math interventionists, and others working with students who struggle with mathematics may find this guide helpful. Specific topics covered include the following:

- Explicit, Systematic Instruction
- Effective Questioning
- Concrete, Representational/Visual/Pictorial, Abstract/Symbolic Models
- Teaching Mathematical Vocabulary and Symbols
- Fluency Building
- Error Analysis

Principles for Designing Intervention in Mathematics

Latest Resources

TRAINING MODULES
Using Informal Diagnostic Data to Individualize Academic Intervention

TOOLS/TIPS
Decision Rules for Analyzing Academic Progress Monitoring Data

WEBINARS
From Data to Action: Supporting Students With Behavioral and Mental Health Challenges

See more

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Mathematics Sample Lessons to Support Intensifying Intervention

NCII developed a series of mathematics lessons and guidance documents to support special education instructors, mathematics specialists, and others working with students who struggle with mathematics. These lessons and activities are organized around six mathematics skill areas that are aligned to college– and career-ready standards, and incorporate several instructional principles that may help intensify and individualize mathematics instruction to assist teachers and interventionists working with students who have difficulty with mathematics. The lessons may be used to supplement mathematics interventions, programs, or curricula that are currently in place. However, these lessons by themselves would not constitute an effective mathematics intervention.

In this video, Dr. Sarah Powell shares considerations for teaching students with math difficulty.

The purpose of this guide is to provide brief explanations of practices that can be implemented when working with students in need of intensive intervention in mathematics.

View Guide

Click on the skill areas below to explore resources and lessons related to each area.

Select a Skill to Explore

- NUMBER SYSTEM COUNTING
- BASIC FACTS
- PLACE VALUE CONCEPTS
- PLACE VALUE COMPUTATION
- FRACTIONS AS NUMBERS
- COMPUTATION OF FRACTIONS

Need Help Determining What to Target?

Diagnostic Assessment >

Related Resources

VIDEO & TIPS
Using Sample Lessons to Support Continuity of Learning During: Tips for Educators and Parents

COURSE CONTENT
Intensive Intervention in Mathematics Course Content

TOOLS/TIPS
Mathematics Curriculum Crosswalk Grades 1-5

WEBINAR
Making Fractions Make Sense: Considerations for Secondary and Intensive Intervention

TRAINING MODULES
Supporting Mathematics Intervention in Middle School

TRAINING MODULES
Supporting Mathematics Intervention in Elementary School

See more

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IDEAs that Work
Office of Special Education Programs

References

Gesel, S. A., LeJeune, L. M., Chow, J. C., Sinclair, A. C., & Lemons, C. J. (2021). A meta-analysis of the impact of professional development on teachers' knowledge, skill, and self-efficacy in data-based decision-making. *Journal of Learning Disabilities*, *54*(4), 269–283.

Jung, P. G., McMaster, K. L., Kunkel, A. K., Shin, J., & Stecker, P. M. (2018). Effects of data-based individualization for students with intensive learning needs: A meta-analysis. *Learning Disabilities Research & Practice*, *33*(3), 144–155.

Liljedahl, P. (2022). *The 14 building thinking classrooms practices: 2. How we form collaborative groups.* https://www.buildingthinkingclassrooms.com/about-btc

Tan, P., Padilla, A., & Lambert, R. (2022). A critical review of educator and disability research in mathematics education: A decade of dehumanizing waves and humanizing wakes. *Review of Educational Research*, *92*(6), 871–910. https://doi.org/10.3102/00346543221081874

George Mason University, College of Education and Human Development. (n.d.). *Perform a task analysis: What's the purpose of task analysis?* https://cehdclass.gmu.edu/ndabbagh/Resources/IDKB/taskanalysis2.htm

Witzel, B. S., Myers, J., Root, J., Freeman-Green, S., Riccomini, P., & Mims, P. (2024). Research should focus on mathematics proficiency for students with disabilities. *Journal of Special Education*, *57*(4), 240–247. https://doi.org/10.1177/00224669231168373