Project STAIR

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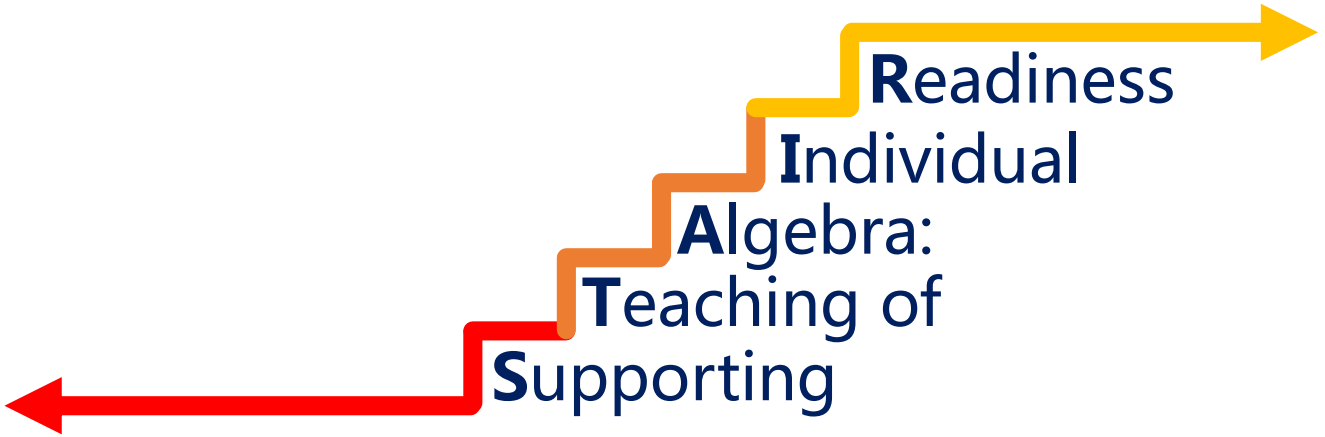

IDEAs that Work

Office of Special Education Programs
U.S. Department of Education

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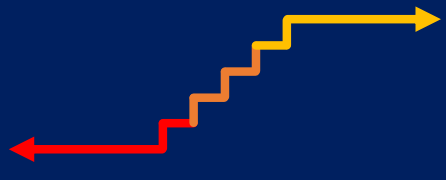
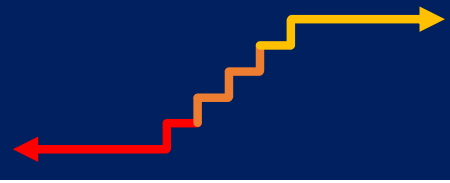


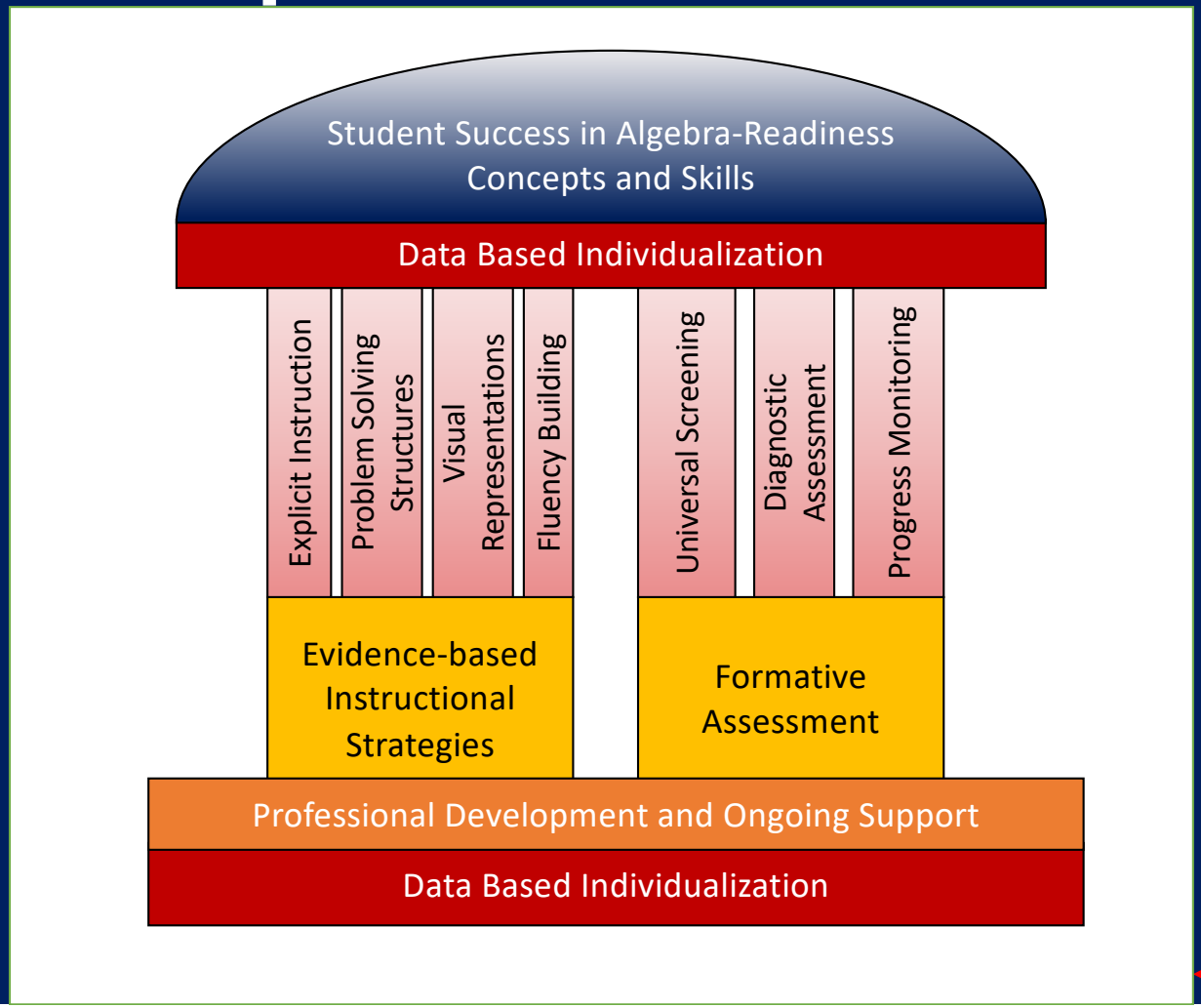
Project STAIR

- Project STAIR targets early intervention in middle schools
  - Systems-level perspective
  - Data-based individualization
- Goal → preparation for Algebra 1 in high school
- To reach this goal, we designed Project STAIR, a four-year model demonstration project

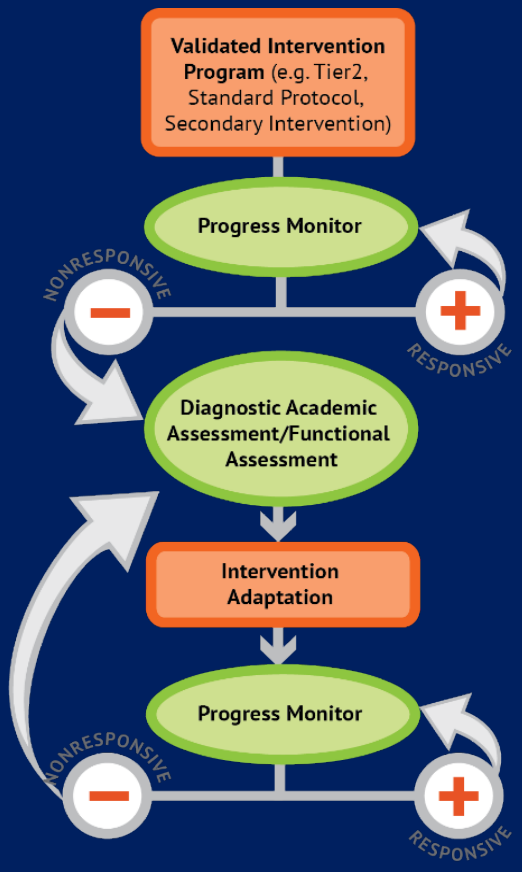


Many slides adapted from McMaster & Lembke (2018)

Description of the Model



2. Key Components of DBI



1. Establish that there is a Tier 2 validated intervention program in place

2. Progress monitor
   - Establish a present level
   - Set an ambitious long term g
   - Collect frequent assessment data
   - Use decision rules

3. Based on student responsiv
   - Continue the Tier 2 progr
   - Collect Diagnostic data

4. Make an instructional change based on hypothesis

5. Continue to monitor progress … e to instruction

Universal Screener

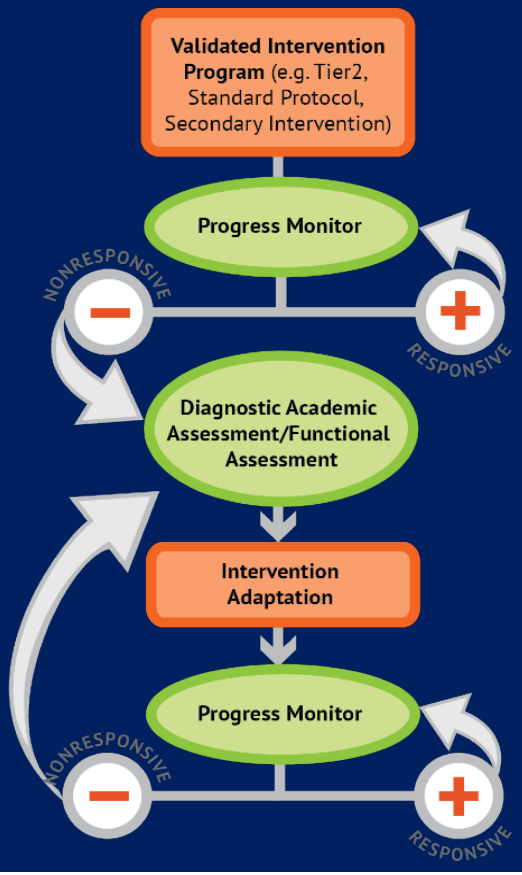
Progress Monitoring

Diagnostic Assessment

Progress Monitoring

2. Key Components of DBI

Renaissance STAR



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   - Establish a present level
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Istation's ARPM

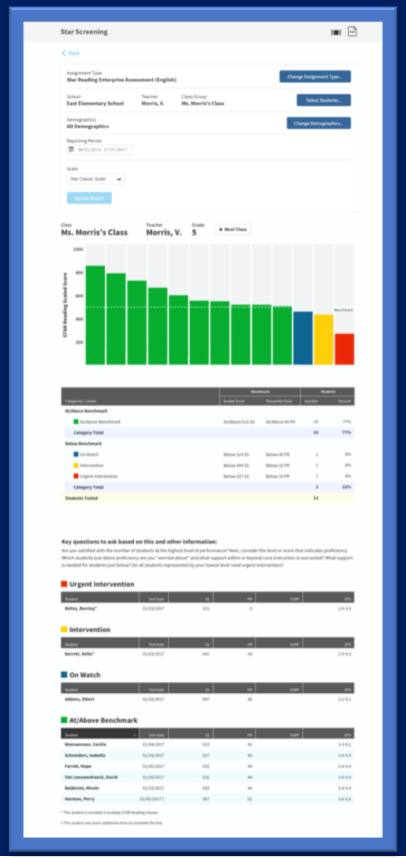
3. Based on student responsiveness:
   - Continue the Tier 2 program with progress monitoring
   - Collect Diagnostic data

DOMA

4. Make an instructional change based on hypothesis
5. Continue to monitor progres… instruction …ve to

Istation's ARPM

Universal Screener: Identify Eligible Students

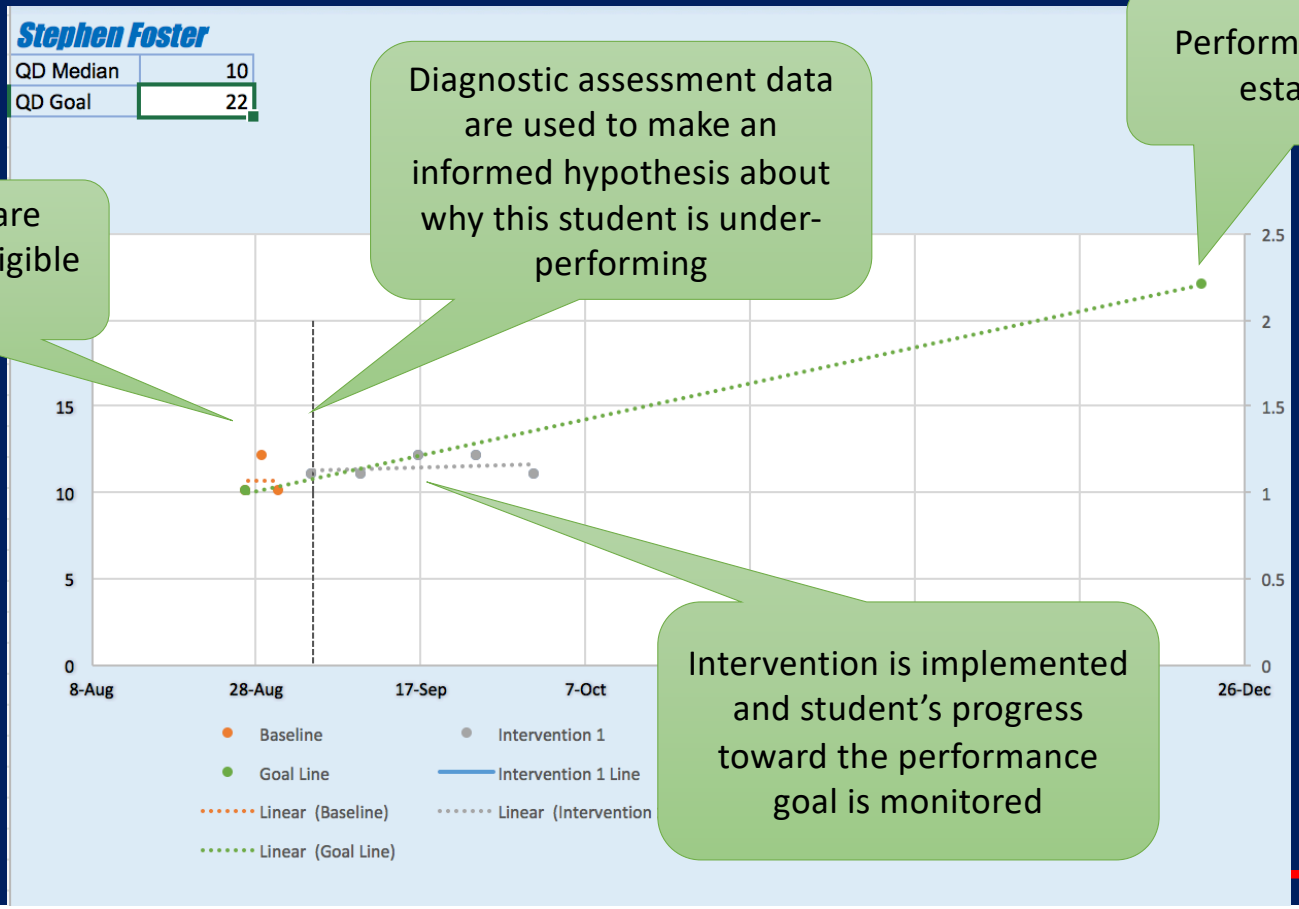


- Which (if any) students are at-risk or underperforming?
- Which students need interventions?
- What degree of intensity of intervention is needed?
  - Who needs intensive intervention?

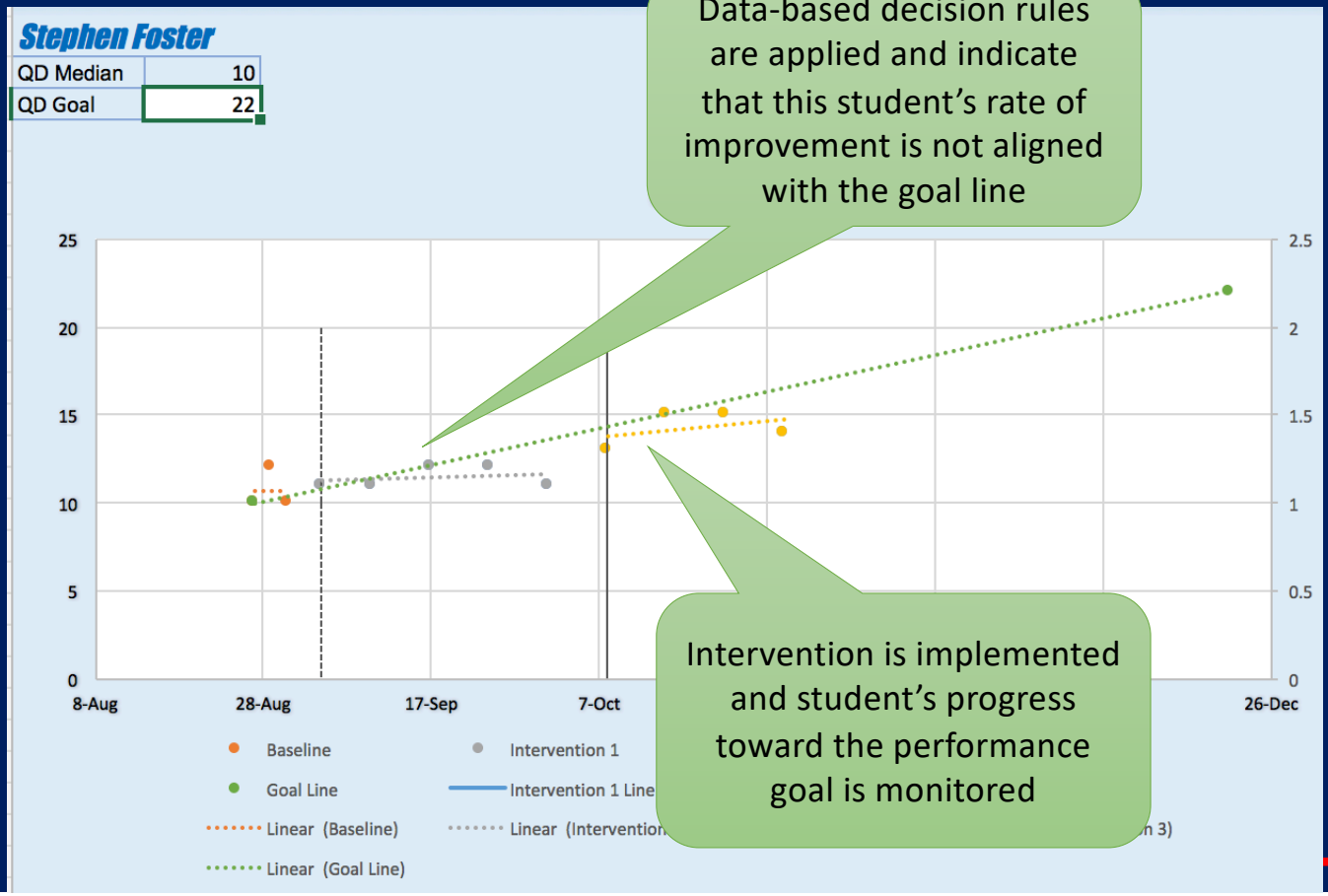
Progress Monitoring: Istation's Algebra Readiness PM

Subtest	Quantity Discrimination	Number Properties	Proportional Reasoning
Example Exemplar Item	$3.35 \square 3\frac{1}{4}$	$3\frac{5}{9} + 1\frac{3}{4} \square 1\frac{3}{4} + 8\frac{5}{9}$	40% of 40 ☐ 40% of 60
Possible Numerical Reasoning Strategy	The common fraction $\frac{1}{4}$ is routinely converted to 0.25, making this comparison of magnitude about recognizing and evaluating values between number systems. Since the whole numbers are the same and 0.35 > 0.25, then 3.35 > 3.25.	Because of the commutative property of addition, the order of the addends does not affect the sum. Therefore, the comparison a + b ☐ b + c can be determined by comparing a and c. Since $3\frac{5}{9} < 8\frac{5}{9}$, then $3\frac{5}{9} + 1\frac{3}{4} < 1\frac{3}{4} + 8\frac{5}{9}$.	The same percent, 40%, is specified for both quantities represented in the comparison. Since 40 is less than 60, then 40% of 40 < 40% of 60.

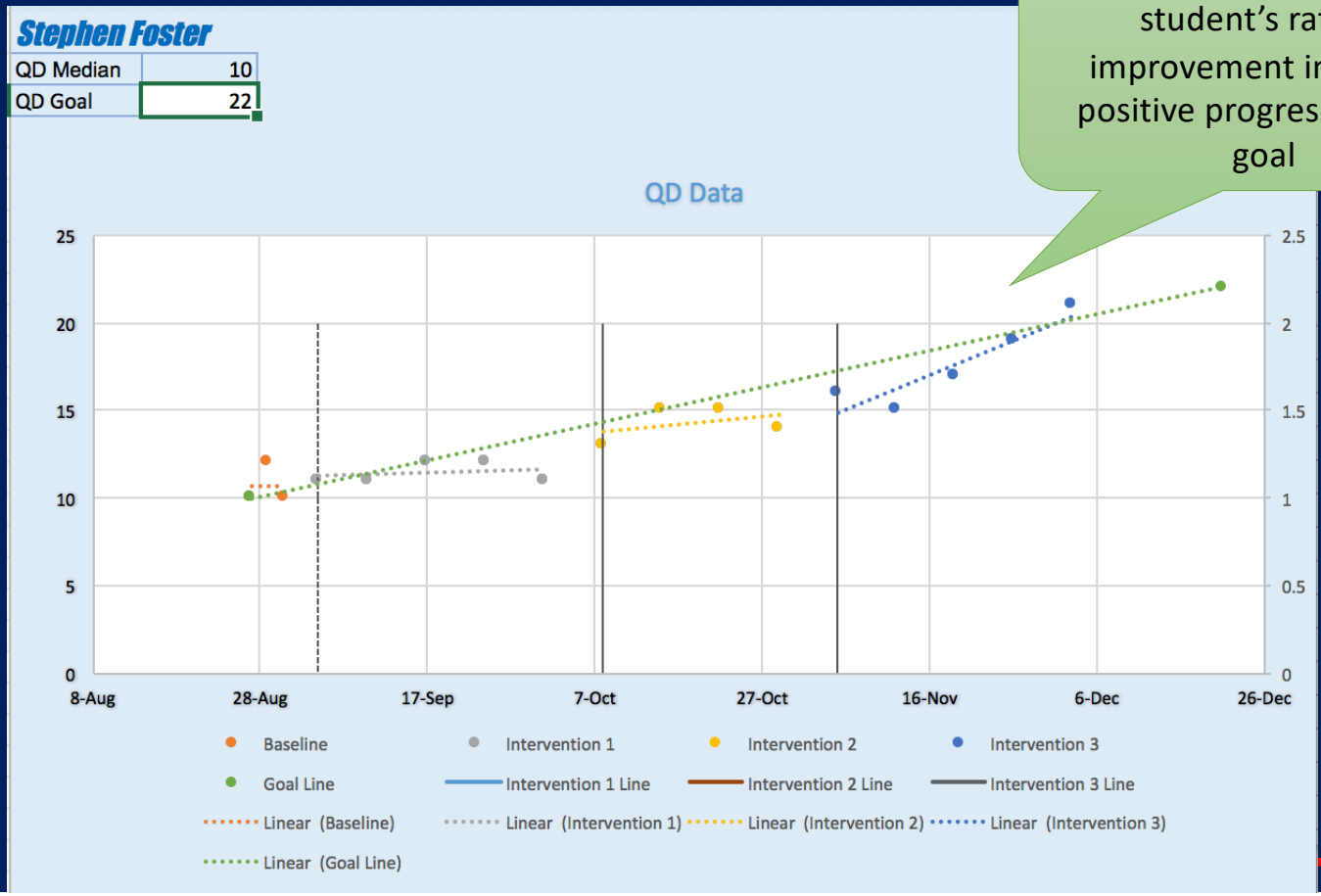
DBI Process Illustrated



DBI Process Illustrated



DBI Process Illustrated

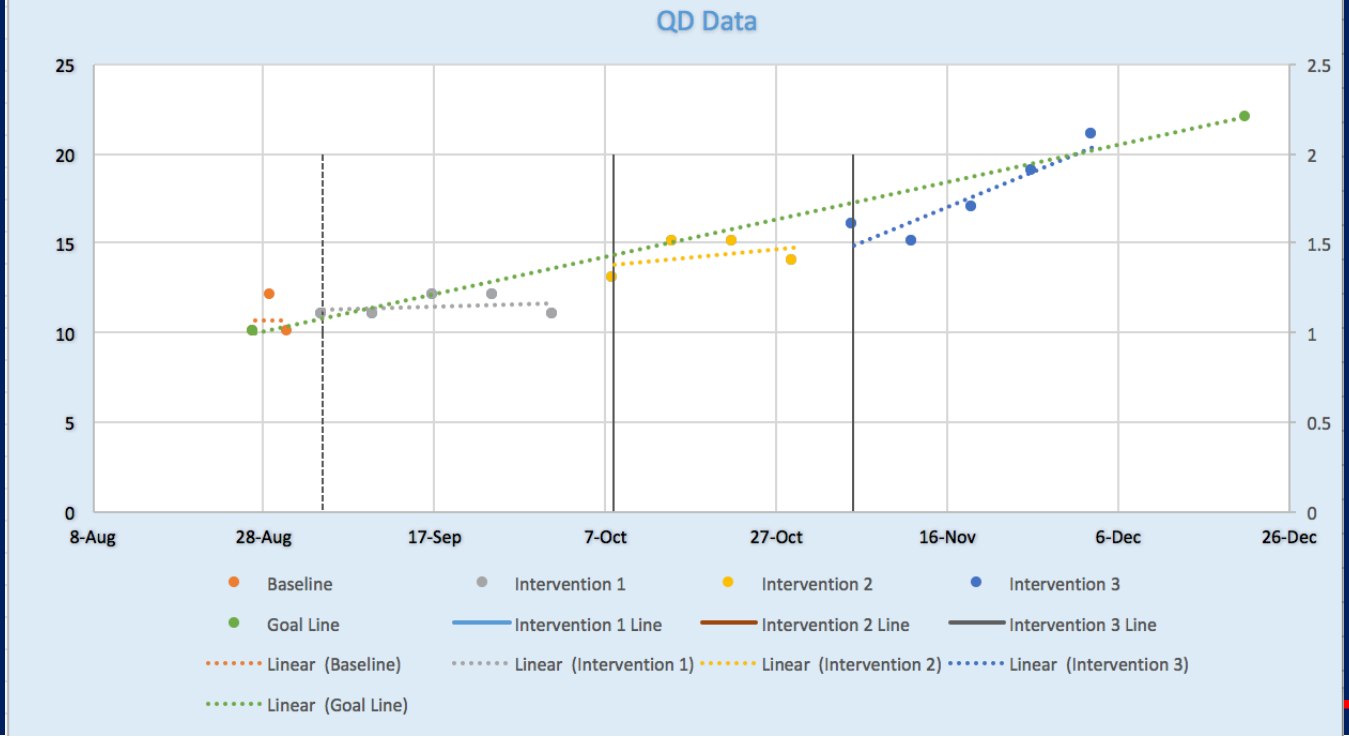


Process continues until student's rate of improvement indicates positive progress toward goal

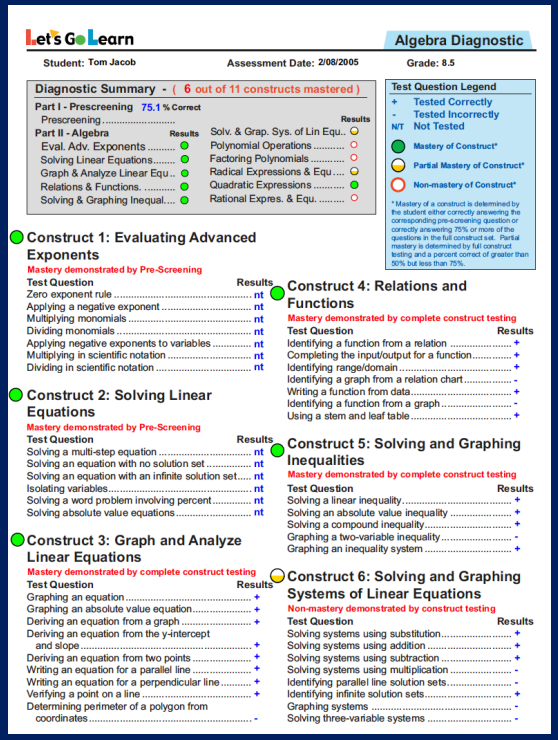
Progress Monitoring: Process Illustrated

Stephen Foster

QD Median	10
QD Goal	22



Diagnostic Assessments: Hypothesis Generating



Let's Go Learn — Algebra Diagnostic

Student: Tom Jacob Assessment Date: 2/08/2005 Grade: 8.5

Diagnostic Summary - (6 out of 11 constructs mastered)

Part I - Prescreening 75.1 % Correct

Part II - Algebra

	Results		Results
Eval. Adv. Exponents	●	Polynomial Operations	○
Solving Linear Equations	●	Factoring Polynomials	○
Graph & Analyze Linear Equ	●	Radical Expressions & Equ	◒
Relations & Functions.	●	Quadratic Expressions	●
Solving & Graphing Inequal	●	Rational Expres. & Equ.	○

Test Question Legend

+ Tested Correctly
- Tested Incorrectly
N/T Not Tested

● Mastery of Construct*
◒ Partial Mastery of Construct*
○ Non-mastery of Construct*

* Mastery of a construct is determined by the student either correctly answering the corresponding pre-screening question or correctly answering 75% or more of the questions in the full construct set. Partial mastery is determined by full construct testing and a percent correct of greater than 50% but less than 75%.

● Construct 1: Evaluating Advanced Exponents

Mastery demonstrated by Pre-Screening

Test Question	Results
Zero exponent rule	nt
Applying a negative exponent	nt
Multiplying monomials	nt
Dividing monomials	nt
Applying negative exponents to variables	nt
Multiplying in scientific notation	nt
Dividing in scientific notation	nt

● Construct 2: Solving Linear Equations

Mastery demonstrated by Pre-Screening

Test Question	Results
Solving a multi-step equation	nt
Solving an equation with no solution set	nt
Solving an equation with an infinite solution set	nt
Isolating variables	nt
Solving a word problem involving percent	nt
Solving absolute value equations	nt

● Construct 3: Graph and Analyze Linear Equations

Mastery demonstrated by complete construct testing

Test Question	Results
Graphing an equation	+
Graphing an absolute value equation	+
Deriving an equation from a graph	+
Deriving an equation from the y-intercept and slope	+
Deriving an equation from two points	+
Writing an equation for a parallel line	+
Writing an equation for a perpendicular line	+
Verifying a point on a line	+
Determining perimeter of a polygon from coordinates	-

● Construct 4: Relations and Functions

Mastery demonstrated by complete construct testing

Test Question	Results
Identifying a function from a relation	+
Completing the input/output for a function	+
Identifying range/domain	+
Identifying a graph from a relation chart	-
Writing a function from data	+
Identifying a function from a graph	-
Using a stem and leaf table	+

● Construct 5: Solving and Graphing Inequalities

Mastery demonstrated by complete construct testing

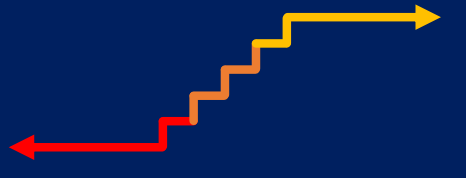
Test Question	Results
Solving a linear inequality	+
Solving an absolute value inequality	+
Solving a compound inequality	+
Graphing a two-variable inequality	-
Graphing an inequality system	+

◒ Construct 6: Solving and Graphing Systems of Linear Equations

Non-mastery demonstrated by construct testing

Test Question	Results
Solving systems using substitution	+
Solving systems using addition	+
Solving systems using subtraction	+
Solving systems using multiplication	-
Identifying parallel line solution sets	-
Identifying infinite solution sets	+
Graphing systems	-
Solving three-variable systems	-

- Why is a student underperforming?
  - What are the student's correct conceptualizations or understandings of the content?
  - What are the student's persistent misconceptions and errors?
- What content and/or instructional design features should be included in the intervention for this student?



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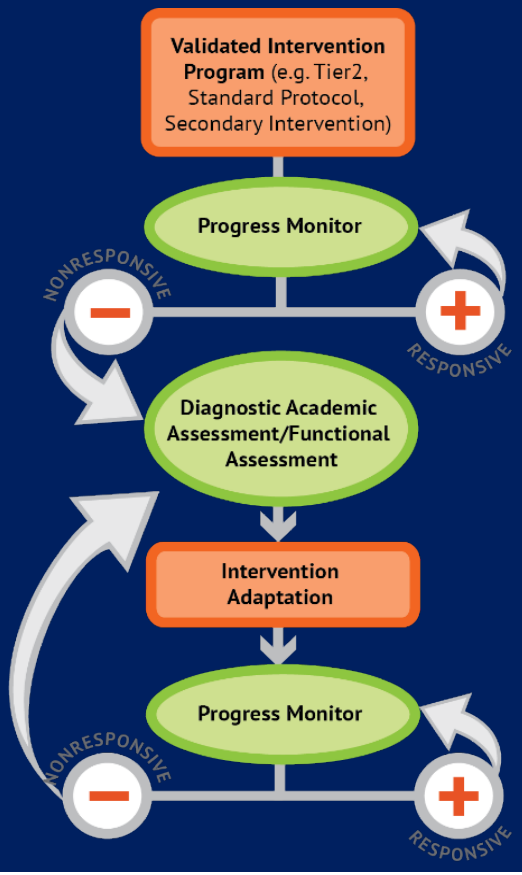

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5. Continue to monitor progress to determine if student is/is not responsive to instruction

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