RTI Implementer Series
Module 2: Progress Monitoring

National Center on Response to Intervention
Session Agenda

- Welcome and Introductions
- Review
- Homework Discussion (optional)
- What Is Progress Monitoring?
- Using Progress Monitoring Data for Decision Making
- Closing and Next Steps
Upon completion of this training, participants will be able to:

1. Discuss importance of progress monitoring
2. Use progress monitoring to improve student outcomes
3. Use progress monitoring data for making decisions about instruction and interventions
4. Develop guidance for using progress monitoring data
REVIEW: WHAT IS RTI?
Defining RTI

- Response to intervention (RTI) integrates assessment and intervention within a school-wide, multi-level prevention system to maximize student achievement and reduce behavior problems.

(National Center on Response to Intervention)
Defining RTI

- With RTI, schools identify students at-risk for poor learning outcomes, monitor student progress, provide evidence-based interventions and adjust the intensity and nature of those interventions based on a student’s responsiveness, and

- RTI may be used as part of the determination process for identifying students with specific learning disabilities or other disabilities.

(National Center on Response to Intervention)
RTI as a Preventive Framework

- RTI is a multi-level instructional framework aimed at improving outcomes for ALL students.
- RTI is preventive and provides immediate support to students who are at risk for poor learning outcomes.
- RTI may be a component of a comprehensive evaluation for students with learning disabilities.
Essential Components of RTI

- Screening
- Progress Monitoring
- School-wide, Multi-Level Prevention System
  - Primary Level
  - Secondary Level
  - Tertiary Level
- Data-based decision making for:
  - Instruction
  - Evaluating Effectiveness
  - Movement within the multi-level system
  - Disability identification (in accordance with state law)
Essential Components of RTI

Diagram showing the relationship between screening, progress monitoring, data-based decision making, and multi-level prevention system.
Essential Component

SCREENING
Screening

- **PURPOSE:** Identify students who are at risk of poor learning outcomes
- **FOCUS:** ALL students
- **TOOLS:** Brief assessments that are valid, reliable, and demonstrate diagnostic accuracy for predicting learning or behavioral problems
- **TIMEFRAME:** Administered more than one time per year (e.g., fall, winter, spring)
Essential Components of RTI

- Screening
- Data-Based Decision Making
- Multi-Level Prevention System
- Progress Monitoring
Essential Component

PROGRESS MONITORING
Progress Monitoring

- **PURPOSE:** Monitor students’ response to primary, secondary, or tertiary instruction to estimate rates of improvement, identify students who are not demonstrating adequate progress, and compare the efficacy of different forms of instruction.
- **FOCUS:** Students identified through screening as at risk for poor learning outcomes.
- **TOOLS:** Brief assessments that are valid, reliable, and evidence based.
- **TIMEFRAME:** Students are assessed at regular intervals (e.g., weekly, biweekly, or monthly).
Essential Components of RTI

- Screening
- Data-Based Decision Making
- Multi-Level Prevention System
- Progress Monitoring

IMPROVED STUDENT OUTCOMES
CULTURALLY RESPONSIVE
EVIDENCE-BASED
IMPROVED STUDENT OUTCOMES
Essential Component

SCHOOL-WIDE, MULTI-LEVEL PREVENTION SYSTEM
Multi-Level Prevention System

Primary Level: School-/classroom-wide instruction for all students, including differentiated instruction

Secondary Level: Supplemental group systems for students with at-risk response to primary level

Tertiary Level: Specialized individualized systems for students with intensive needs

~80% of Students

~15%

~5%
Changing the Intensity and Nature of Instruction

- Intervention
- Duration
- Frequency
- Interventionist
- Group size
Essential Components of RTI

Screening

Data-Based Decision Making

Multi-Level Prevention System

Progress Monitoring
Essential Component

DATA-BASED DECISION MAKING
Data-Based Decision Making: The Basics

- Analyze data at all levels of RTI implementation (e.g., state, district, school, grade level) and all levels of prevention (i.e., primary, secondary, or tertiary).
- Establish routines and procedures for making decisions.
- Set explicit decision rules for assessing student progress (e.g., state and district benchmarks, level, and/or rate).
- Use data to compare and contrast the adequacy of the core curriculum and the effectiveness of different instructional and behavioral strategies.
Data-Based Decision Making: Types of Decisions

- Instruction
- Evaluate Effectiveness
- Movement within the multi-level prevention system
- Disability identification (in accordance with state law)
Essential Components of RTI
Screening Review Activity (Optional)

- List the four essential components of RTI.
- Do screening tools tend to over identify or under identify? Why?
- Provide three examples of questions you can answer based on screening data.
- What is criterion-referenced?
- What is the difference between a summative and formative assessment? Provide an example of each.
Screening Review Activity (Optional)

- Who should receive a screening assessment?
- What is a cut score?
- What is the difference between a Mastery Measure and a General Outcome Measure?
- How often are screening assessments administered?
- What is the definition of norm referenced?
- How can screening data be used in SLD identification?
- What is classification accuracy?
WHAT IS PROGRESS MONITORING?
Essential Components of RTI

- Screening
- Progress Monitoring
- Data-Based Decision Making
- Multi-Level Prevention System

IMPROVED STUDENT OUTCOMES
CULTURALLY RESPONSIVE
EVIDENCE-BASED
IMPROVED STUDENT OUTCOMES
Why Progress Monitoring?

- Progress monitoring research has been conducted over the past 30 years
- Research has demonstrated that when teachers use progress monitoring for instructional decision making:
  - Students learn more
  - Teacher decision making improves
  - Students are more aware of their performance
Progress Monitoring

- **PURPOSE**: monitor students’ response to primary, secondary, or tertiary instruction to estimate rates of improvement, identify students who are not demonstrating adequate progress, and compare the efficacy of different forms of instruction.
- **FOCUS**: students identified through screening as at risk for poor learning outcomes.
- **TOOLS**: brief assessments that are valid, reliable, and evidence based.
- **TIMEFRAME**: students are assessed at regular intervals (e.g., weekly, biweekly, or monthly).
Purpose of Progress Monitoring

Allows practitioners to...

- Estimate rates of improvement
- Identify students who are not demonstrating adequate progress
- Compare the efficacy of different forms of instruction in order to design more effective, individualized instruction
Estimate Rates of Improvement

Words Read Correctly vs. Weeks of Primary Prevention

6 WRC

.3 WRC
Identify Students Not Making Adequate Progress

**Increasing Scores:**

- Trend line
- Goal line

**Flat Scores:**

- Trend line
- Goal line

Weeks of Instruction

Digits Correct

0 10 20 30 40 50 60 70 80 90 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14

National Center on Response to Intervention
Compare Efficacy of Interventions

Growth by Intervention Type

Week 1  Week 2  Week 3  Week 4

Words Read Correctly

Intervention A
Intervention B
Intervention C
Progress Monitoring Answers the Questions

- Are students making progress at an acceptable rate?
- Are students meeting short- and long-term performance goals?
- Does the instruction or intervention need to be adjusted or changed?
Specific Learning Disability Eligibility Criteria Related to Progress Monitoring

To ensure that underachievement in a child suspected of having a specific learning disability is not due to lack of appropriate instruction in reading or math, the group must consider, as part of the evaluation described in 34 CFR 300.304 through 300.306:

• Data that demonstrate that prior to, or as a part of, the referral process, the child was provided appropriate instruction in regular education settings, delivered by qualified personnel; and

• Data-based documentation of repeated assessments of achievement at reasonable intervals, reflecting formal assessment of student progress during instruction, which was provided to the child’s parents.
THINK-PAIR-SHARE

- How is progress monitoring being used in your district?
Focus of Progress Monitoring

- Typically includes students identified as at risk for poor learning outcomes
Progress Monitoring Tools

- Progress monitoring tools are—
  - brief assessments
  - reliable, valid, and evidence based
  - repeated measures that capture student learning
  - measures of age-appropriate outcomes

- Different progress monitoring tools may be used to assess different outcome measures
### Review: Types of Assessments

<table>
<thead>
<tr>
<th>Type</th>
<th>When?</th>
<th>Why?</th>
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<tbody>
<tr>
<td>Summative</td>
<td>After</td>
<td>Assessment of Learning</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>Before</td>
<td>Identify skill strengths and weakness</td>
</tr>
<tr>
<td>Formative</td>
<td>During</td>
<td>Assessment for Learning</td>
</tr>
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</table>
Formative Assessments

- PURPOSE: Tells us how well students are responding to instruction
- Administered during instruction
- Typically administered to all students during benchmarking and some students for progress monitoring
Common Formative Assessments

Mastery Measurement vs. General Outcome Measures

Sample Progress Monitoring Chart

- Words Correct
- Aim Line
- Linear (Words Correct)

Number of problems correct in 5 minutes

WEEKS

- Multidigit Addition
- Multidigit Subtraction
- Multiplication Facts

Words Correct Per Minute
Mastery Measurement

- Describes mastery of a series of short-term instructional objectives

To implement Mastery Measurement, the teacher:

- Determines a sensible instructional sequence for the school year
- Designs criterion-referenced testing procedures to match each step in that instructional sequence
## Mastery Measure: Multidigit Addition Assessment

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General Outcome Measures (GOM)

- A GOM is a measure that reflects overall competence in the annual curriculum.
- Describes individual student’s growth and development over time (both “current status” and “rate of development”).
- Provides a decision making model for designing and evaluating interventions.
- Is used for individuals and groups of students.
GOM Example: CBM

- Curriculum-Based Measure (CBM)
  - A General Outcome Measure (GOM) of a student’s performance in either basic academic skills or content knowledge
  - CBM tools available in basic skills and core subject areas grades K-8 (e.g., DIBELS, AIMSweb)
**CBM Math Example**

- Random numerals within problems (considering specifications of problem types)
- Random placement of problem types on page
Raymond lived in Georgia. He was born there and had many friends. One day Dad had come home from work to say that they would have to move far away. Dad worked in a factory. The factory had closed and Dad needed a new job. Dad had found a new job and now they had to move.

Raymond was sad because he did not want to leave his school. He did not want to leave his friends.

"I am sorry, son," said Dad.
THINK-PAIR-SHARE

- What mastery measures and general outcome measures are being used in your district?
## NCRTI Progress Monitoring Tools

### Progress Monitoring General Outcome Measures Tools Chart

View the Progress Monitoring Mastery Measures Tools Chart

<table>
<thead>
<tr>
<th>Tools</th>
<th>Area</th>
<th>Reliability of the Performance Level Score</th>
<th>Reliability of the Slope</th>
<th>Validity of the Performance Level Score</th>
<th>Predictive Validity of the Slope of Improvement</th>
<th>Alternate Forms</th>
<th>Sensitive to Student Improvement</th>
<th>End-of-Year Benchmarks</th>
<th>Rates of Improvement Specified</th>
<th>Norms Disaggregnated for Diverse Populations</th>
<th>Disaggregnated Reliability and Validity Data</th>
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Process for Using the Tools Chart

1. Gather a team
2. Determine your needs
3. Determine your priorities
4. Familiarize yourself with the content and language of the chart
5. Review the ratings and implementation data
6. Ask for more information
1. Gather a Team

- Who should be involved in selecting a progress monitoring tool?
- What types of expertise and what perspectives should be involved in selecting a tool?
2. Determine Your Needs

- For what skills or set of skills do you need a progress monitoring tool?
- What population will you progress monitor (grades, subgroups)?
- When and how frequently will progress monitoring occur?
- Who will conduct the progress monitoring and what is their knowledge and skill level?
- What kind of training do staff need and who will provide it?
- What materials will you need (computer, paper and pencil)?
- How much funding will you need?
3. Determine Your Priorities

- Is it a tool that can be purchased for a reasonable cost?
- Is it a tool that does not take long to administer and score?
- Is it a tool that offers ready access to training and technical support for staff?
- Is it a tool that meets the highest standards for technical rigor?
4. Familiarize Yourself with the Content and Language of the Chart

**Progress Monitoring General Outcome Measures Tools Chart**

**View the Progress Monitoring Mastery Measures Tools Chart**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Select Subject</th>
<th>Grade</th>
<th>Select Grade</th>
<th>Filter</th>
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</table>

**General Outcome Measures**

**Mastery Measures**
Select Reading or Math to limit the tools to the subject of interest

Select Elementary or Secondary School to select the grade level of interest
# Comparing Tools

Limit your search by selecting tools that appear to fit your needs.
## Comparing Tools

<table>
<thead>
<tr>
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## General Outcome Measures: Technical Rigor

<table>
<thead>
<tr>
<th>Technical Rigor Standards:</th>
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<tbody>
<tr>
<td>Reliability of the Performance Level Score</td>
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<td>Norms Disaggregated for Diverse Populations</td>
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<td>Disaggregated Reliability and Validity Data</td>
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### Technical Rigor Standards:
- Reliability of the Performance Level Score
- Reliability of the Slope
- Validity of the Performance Level Score
- Predictive Validity of the Slope of Improvement
- Alternate Forms
- Sensitive to Student Improvement
- End-of-Year Benchmarks
- Rates of Improvement Specified
- Norms Disaggregated for Diverse Populations
- Disaggregated Reliability and Validity Data
## NCRTI Progress Monitoring Tool Chart

### Mastery Measures

#### NCRTI Progress Monitoring Mastery Measures Tools Chart

**View the Progress Monitoring General Outcome Measures Tools Chart**

<table>
<thead>
<tr>
<th>Tools</th>
<th>Area</th>
<th>Skill Sequence</th>
<th>Sensitive to Student Improvement</th>
<th>Reliability</th>
<th>Validity</th>
<th>Pass/Fail Decision</th>
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**Legend:** ● Convincing evidence  ● Partially convincing evidence  ○ Unconvincing evidence  ● Data unavailable or inadequate

Technical Rigor
# Mastery Measures: Technical Rigor

## Technical Rigor Standards:
- Skill Sequence
- Sensitivity to Student Improvement
- Reliability
- Validity
- Pass/Fail Decision
- Disaggregated Reliability and Validity Data

<table>
<thead>
<tr>
<th>Skill Sequence</th>
<th>Sensitive to Student Improvement</th>
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</thead>
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**National Center on Response to Intervention**
### Reliability of the Performance Level Score

Reliability of the performance level score is the extent to which the score (or average/median of 2-3 scores) is accurate and consistent.

<table>
<thead>
<tr>
<th>Rating defined</th>
<th>Rating</th>
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<tr>
<td>Unconvincing evidence</td>
<td>○</td>
</tr>
<tr>
<td>No evidence</td>
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</tbody>
</table>

- **Convincing evidence**: The reliability estimates for the performance level score (e.g., Cronbach’s alpha, test-retest and/or inter-rater reliability) are adequate.
- **Unconvincing evidence**: The reliability estimates for the performance level score (e.g., Cronbach’s alpha, test-retest and/or inter-rater reliability) are not adequate.
- **No evidence**: Reliability of the performance level score data were not provided.

#### General Outcome Measures

<table>
<thead>
<tr>
<th>TOOLS</th>
<th>AREA</th>
<th>Reliability of the Performance Level Score</th>
<th>Reliability</th>
<th>End-of-Year Benchmarks</th>
<th>Rates of Improvement Specified</th>
<th>Disaggregated for Diverse Populations</th>
<th>Disaggregated Reliability and Validity Data</th>
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<td>Test of Early Literacy - Letter Naming Fluency</td>
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<td>Test of Early Literacy - Letter Sound Fluency</td>
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<td>Test of Early Numeracy - Missing Numbers</td>
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<td>●</td>
</tr>
</tbody>
</table>

---

**Chart Legend**:
- ● Convincing Direct Evidence
- ○ Partially Convincing Evidence or Convincing Indirect Evidence
- ○ Unconvincing Evidence
- — No Evidence Submitted
Implementation Requirements

- Cost of tool
- Training required to implement tool
- Level of expertise required to administer tool
- Training and technical support offered
- How are scores reported
5. Review the Ratings and Implementation Data

**Data:**

- Look for tools that conducted studies with outcome measures and samples similar to your population and outcome of interest.
- Determine if tools are appropriate for certain subgroups (e.g., ELLs).

Click on any rating bubble to view data.
Example of Data

**CBM Maze Fluency**

**Predictive Validity of the Slope of Improvement**

<table>
<thead>
<tr>
<th>Type of Validity</th>
<th>Age or Grade</th>
<th>Test or Criterion</th>
<th>n (range)</th>
<th>Coefficient range</th>
<th>Information (including normative data/Subjects)</th>
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<td>1-7</td>
<td>Woodcock Reading Mastery Test: Passage Comprehension, concurrent with end of progress monitoring</td>
<td>279</td>
<td>.44-.63</td>
<td>62% African American; 66% subsidized lunch; 5% learning disabilities Weekly assessments over 6 months (15 &lt; 20; mean=17)</td>
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<tr>
<td>Criterion validity</td>
<td>1-7</td>
<td>Tennessee Comprehensive Assessment Profile, concurrent with end of progress monitoring</td>
<td>209</td>
<td>.58-.64</td>
<td>55% African American; 51% subsidized lunch; 7% learning disabilities Weekly assessments over 6 months (15 &lt; 20; mean=17)</td>
</tr>
</tbody>
</table>
6. Ask for More Information
The NCRTI Progress Monitoring Tools Chart Users Guide
Timeframe for Progress Monitoring

- Throughout instruction at regular intervals (e.g., weekly, bi-weekly, monthly)
- Teachers use student data to quantify short- and long-term goals toward end-of-year goals
Team Time: Progress Monitoring

  - Are your tools there?
  - What evidence exists for their reliability and validity?
THINK-PAIR-SHARE

- How has what you heard challenged your thinking about progress monitoring?
- How has it confirmed your thinking?
PROGRESS MONITORING DATA-BASED DECISION MAKING
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. Determine Frequency of Data Collection
5. Collect and Graph Data
6. Analyze and Make Instructional Decisions
7. Continue Progress Monitoring
Steps in the Decision Making Process

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6. Analyze and Make Instructional Decisions
7. Continue Progress Monitoring
Data Review Teams

1. Include at least three members
2. Regularly review progress monitoring data (e.g., every four to six weeks)
3. Follow established systematic data review procedures
Roles and Responsibilities of Team Members

- Ensure progress monitoring data are accurate
- Review progress monitoring data regularly
- Identify students in need of supplemental interventions
- Evaluate efficacy of supplemental interventions
Regularly Review Progress Monitoring Data

- Conduct at logical, predetermined intervals
- Schedule prior to the beginning of instruction
- Involve relevant team members
- Use established meeting structures
Establishing Systematic Data Review Procedures

- Articulate routines and procedures in writing
- Implement established routines and procedures with integrity
- Ensure routines and procedures are culturally and linguistically responsive
Establishing Systematic Data Review Procedures

Consider clarifying the following in writing:

- What you are looking for?
- How will you look for it?
- How will you know if you found it?
THINK-PAIR-SHARE

- In your school sites...
  - Who should be involved in the review of progress monitoring data?
  - What data review schedule is available?
  - How should meetings be facilitated?
Commonly Confused Terms

- **Cut Score** – score on a screening test that divides students who are considered potentially at risk from those who are considered not at risk.

- **Target or Benchmark** – pre-determined level of performance on a screening test that is considered representative of proficiency or mastery of a certain set of skills.

- **Criterion Scores** – scores on a screening test that separate students into performance levels (e.g., established, emerging, deficient)
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
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7. Continue Progress Monitoring
Establishing the Baseline Score

- To begin progress monitoring you need to know the student’s initial knowledge level or baseline knowledge.
- Having a stable baseline is important for goal setting.
- To establish the baseline:
  - Use the median scores of the most recent three probes (if collected at the same point in time).
  - Use the mean of the most recent three data points (if collected over three different points in time).
Median is preferred to a measure of the mean score because means are susceptible to outliers when dealing with small number sets. Stable baselines are important in goal setting.
THINK-PAIR-SHARE

What is Billy’s baseline score?

- 97/3 wrc, 88/2 wrc, 96/6wrc
Example: Finding the Baseline Score Using Means

- Monitor student over time (e.g., three data points over three weeks) to establish stable baseline. Take the mean of the most recent three scores.

Baseline Mean
\[ 8 + 9 + 10 / 3 = 9 \]
Progress Monitoring Grade Level

- Should be based on logical practices
- The goal should be set where you expect the student to perform at the end of the intervention period
- Survey level assessment may be used with students performing below grade level
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. Determine Frequency of Data Collection
5. Collect and Graph Data
6. Analyze and Make Instructional Decisions
7. Continue Progress Monitoring
Setting Goals Based on Logical Practices

Stakeholders should know...

- **Why** and **how** the goal was set
- **How long** the student has to achieve the goal
- What the student is **expected to do** when the goal is met
Goal Setting Approaches

Three options for setting goals:

1. End-of-year benchmarking
2. National norms for weekly rate of improvement (slope)
3. Intra-individual framework (Tertiary)
Option 1: Using Benchmarks

End-of-year benchmarking

- Identify appropriate grade-level benchmark
- Mark benchmark on student graph with an X
- Draw goal line from first three CBM scores to X
# Option 1: Setting Goals With End-of-Year Benchmarking

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reading Task</th>
<th>Computation</th>
<th>Concepts and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>40 sounds/min (Letter Sound Fluency)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade 1</td>
<td>60 words/min (Word Id Fluency)</td>
<td>20 digits</td>
<td>20 points</td>
</tr>
<tr>
<td>Grade 2</td>
<td>75 words/min (Passage Reading Fluency)</td>
<td>20 digits</td>
<td>20 points</td>
</tr>
<tr>
<td>Grade 3</td>
<td>100 words/min (PRF)</td>
<td>30 digits</td>
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<td>Grade 4</td>
<td>20 replacements/2.5 min (Maze)</td>
<td>40 digits</td>
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</tr>
<tr>
<td>Grade 5</td>
<td>25 replacements/2.5 min (Maze)</td>
<td>30 digits</td>
<td>15 points</td>
</tr>
<tr>
<td>Grade 6</td>
<td>30 replacements/2.5 min (Maze)</td>
<td>35 digits</td>
<td>15 points</td>
</tr>
</tbody>
</table>

Note: These figures may change pending additional RTI research and are specific to a certain tool.
Option 1: Setting Goals With End-of-Year Benchmarking

Weeks of Instruction vs. Digits Correct

- **Goal Line**: Represents the target learning progress.
- **End-of-Year Benchmark**: The milestone achievement by the end of the school year.

Example: Third-Grade CBM Computation

<table>
<thead>
<tr>
<th>Weeks of Instruction</th>
<th>Digits Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
</tr>
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</table>
Option 1: Setting Goals With End-of-Year Benchmarking Handout (Gunnar)

Weeks of Instruction

Fourth-Grade CBM Computation
Option 1: Setting Goals with End-of-Year Benchmarking Handout (Gunnar)—Answer

Fourth-Grade CBM Computation

- End-of-year benchmark
- Goal line
Option 2: Setting Goals With National Norms for Weekly Improvement (slope)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reading—Slope</th>
<th>Computation CBM—Slope for Digits Correct</th>
<th>Concepts and Applications CBM—Slope for Points</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1.8 (WIF)</td>
<td>.35</td>
<td>No data available</td>
</tr>
<tr>
<td>2</td>
<td>1.5 (PRF)</td>
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<td>.40</td>
</tr>
<tr>
<td>3</td>
<td>1.0 (PRF)</td>
<td>.30</td>
<td>.60</td>
</tr>
<tr>
<td>4</td>
<td>.40 (Maze)</td>
<td>.70</td>
<td>.70</td>
</tr>
<tr>
<td>5</td>
<td>.40 (Maze)</td>
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<td>.70</td>
</tr>
<tr>
<td>6</td>
<td>.40 (Maze)</td>
<td>.40</td>
<td>.70</td>
</tr>
</tbody>
</table>

Note: These figures may change pending additional RTI research and are specific to a certain tool.
Option 2: Setting Goals With National Norms for Weekly Improvement (slope)

Standard Formula for Calculating Goal Using Rate of Improvement (ROI):

\[
\text{ROI} \times \# \text{ Weeks} + \text{Baseline Score} = \text{GOAL}
\]
Option 2: Setting Goals With National Norms for Weekly Improvement (slope)

Using national norms for weekly rate of improvement (slope)

- Find baseline (e.g., average of most recent three data points) = 14
- Identify norm for fourth-grade computation = 0.70
- Multiply norm by number of weeks left in instructional period $16 \times 0.70 = 11.2$
- Add to baseline $11.2 + 14 = 25.2$
- Set goal = end-of-year goal is 25.2 (or 25)
Option 2: Setting Goals with National Norms Handout (Jane)

Weeks of Instruction

Digits Correct

Second-Grade CBM Computation
### Option 2: Setting Goals With National Norms

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reading—Slope</th>
<th>Computation CBM—Slope for Digits Correct</th>
<th>Concepts and Applications CBM—Slope for Points</th>
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<tr>
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<td>1.8 (WIF)</td>
<td>0.35</td>
<td>No data available</td>
</tr>
<tr>
<td>2</td>
<td>1.5 (PRF)</td>
<td><strong>0.30</strong></td>
<td>0.40</td>
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<tr>
<td>3</td>
<td>1.0 (PRF)</td>
<td>0.30</td>
<td>0.60</td>
</tr>
<tr>
<td>4</td>
<td>0.40 (Maze)</td>
<td>0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>5</td>
<td>0.40 (Maze)</td>
<td>0.70</td>
<td>0.70</td>
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<tr>
<td>6</td>
<td>0.40 (Maze)</td>
<td>0.40</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Note: These figures may change pending additional RTI research and are specific to a certain tool.
Option 2: Setting Goals With National Norms Handout (Jane) – Answer

1. Establish (baseline): Baseline = (12 + 10 + 12) ÷ 3 = 11.33

2. Find the appropriate norm from the table: 0.30

3. Multiply norm by number of weeks left in year:
   0.30 × 17 = 5.1

4. Add to baseline:
   5.1 + 11.33 = 16.43

5. Mark goal (16.43, or 16) on student graph with an X

6. Draw goal line from baseline
Option 2: Setting Goals With National Norms Handout (Jane) – Answer

Second-Grade CBM Computation
Rates of Weekly Improvement

Three things to keep in mind when using ROI for goal setting:

1. What research says are “realistic” and “ambitious” growth rates (implications for reducing the achievement gap)

2. What norms indicate about “good” growth rates

3. Local versus national norms
Student Comparison Lower than Norm

Score

Fall

Winter

Spring

Target

Student

90th %ile

75th %ile

50th %ile

25th %ile

10th %ile

Student Score: 103
Option 3: Setting Goals With Intra-Individual Framework (Tertiary)

Intra-individual framework

- Identify weekly rate of improvement (slope) using at least eight data points
- Multiply slope by 1.5
- Multiply by number of weeks until end of year (14 in this example)
- Add to student’s baseline score
- This is the end-of-year goal
Option 3: Setting Goals With Intra-Individual Framework

- Identify weekly rate of improvement using at least eight data points (2, 3, 5, 5, 5, 6, 7, 4)  
  \[ \frac{6-3}{7} = 0.43 \]
- Multiply slope by 1.5  
  \[ 0.43 \times 1.5 = 0.645 \]
- Multiply by number of weeks until end of year (14 weeks)  
  \[ 0.645 \times 14 = 9.03 \]
- Add to student’s baseline score (5.67)  
  \[ 9.03 + 5.67 = 14.69 \]
- 14.69 (or 15) is student’s end-of-year goal
Option 3: Setting Goals With Intra-Individual Framework Handout (Cecelia)

Slope = \( \frac{18 - 11}{7} = 1.0 \)
Option 3: Setting Goals With Intra-Individual Framework Handout (Cecelia) – Answer

- Identify weekly rate of improvement (slope) using at least eight data points:
  
  \[
  \text{slope} = \frac{18 - 11}{7} = 1.0
  \]

- Multiply slope by 1.5:
  
  \[
  1.0 \times 1.5 = 1.5
  \]

- Multiply (slope \times 1.5) by number of weeks until end of year (12 weeks):
  
  \[
  1.5 \times 12 = 18
  \]

- Add to student’s baseline score (the baseline is the average of Cecelia’s most recent three scores, 5+18+20/3):
  
  \[
  18 + 17.67 = 35.67
  \]

- Mark goal (35.67, or 36) on student graph with an X

- Draw goal-line from baseline to X
Option 3: Setting Goals With Intra-Individual Framework Handout (Cecelia) – Answer
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. **Determine Frequency of Data Collection**
5. Collect and Graph Data
6. Analyze and Make Instructional Decisions
7. Continue Progress Monitoring
Frequency of Progress Monitoring

IDEAL

VS.

FEASIBLE
Frequency of Progress Monitoring

- Should occur at least monthly.
- As the number of data points increases, the effects of measurement error on the trend line decreases.
- Christ & Silberglitt (2007) recommended six to nine data points.
Frequency of Progress Monitoring

<table>
<thead>
<tr>
<th>Number of assessments/15 weeks</th>
<th>Effect Size (SD)</th>
<th>Percentile Gain</th>
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</thead>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>.34</td>
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<td>28.5</td>
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<tr>
<td>30</td>
<td>.82</td>
<td>29</td>
</tr>
</tbody>
</table>


Similar results found by Fuchs & Fuchs (1986)
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. Determine Frequency of Data Collection
5. **Collect and Graph Data**
6. Analyze and Make Instructional Decisions
7. Continue Progress Monitoring
Graphing Progress Monitoring Data

- Graphed data allows teachers to quantify rate of student improvement:
  - Increasing scores indicate that the student is making progress and responding to the curriculum.
  - Flat or decreasing scores indicates that the student is not benefiting from instruction and you need to alter the instructional program or deliver method.
Graphing CBM Scores

The vertical axis is labeled with the range of student scores.

The horizontal axis is labeled with the number of instructional weeks.
Graphing CBM Scores

![Graph showing the relationship between weeks of instruction and problems correct in 3 minutes. The graph displays a line of best fit through data points.](image-url)
Graphing CBM Scores

Weeks of Instruction

Problems Correct in 3 Minutes
Trend Line, Slope, and ROI

- **Trend Line** – a line through the scores that visually represents the performance trend
- **Slope** – quantification of the trend line, or the rate of improvement (ROI)
- **Rate of Improvement (ROI)** – specifies the improvement, or average weekly increases, based on a line of best fit through the student’s scores.
Estimating the Slope:
Step 1 – Draw a Trend Line

Step 1: Divide the data points into three equal sections by drawing two vertical lines. (If the points divide unevenly, group them approximately.)

Step 2: In the first and third sections, find the median data point and median instructional week. Locate the place on the graph where the two values intersect and mark with an “X.”

Step 3: Draw a line through the two Xs, extending to the margins of the graph. This represents the trend line or line of improvement.
Step 1 – Draw a Trend Line

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Step 3: Draw a line through the two Xs, extending to the margins of the graph. This represents the trend line or line of improvement.
Practicing Drawing a Trend Line Handout

Step 1: Divide the data points into three equal sections by drawing two vertical lines. (If the points divide unevenly, group them approximately.)

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Step 3: Draw a line through the two Xs, extending to the margins of the graph. This represents the trend line or line of improvement.
Practicing Drawing a Trend Line – Answer

Weeks of Primary Prevention

Words Read Correctly

National Center on Response to Intervention
Calculating Slope: Step 2 – Quantify Weekly Rate of Improvement (ROI)

Third median point – First median point

number of weeks of instruction

\[(50 - 34) \div 7 = 2.3\]
Practicing Drawing a Trend Line and Estimating the Slope Handout

Weeks of Primary Prevention

Words Read Correctly

Weeks of Primary Prevention
Third median point – First median point

number of weeks of instruction

(40 – 20) ÷ 8 = 2.5 slope
Sarah’s Graph: Primary Prevention

Sarah’s slope: 

\[
\frac{(16 - 3)}{7} = 1.9 \text{ slope}
\]  

First-Grade CBM Word Identification Fluency
Jessica’s Graph: Primary Prevention

First-Grade CBM Word Identification Fluency

Jessica’s slope:

\[(6 - 6) \div 7 = 0.0\] slope
Jessica’s Graph: Secondary Prevention

Jessica’s slope:

\[
\frac{(28 - 6)}{11} = 2.0 \text{ slope}
\]

Words Read Correctly

Weeks of Instruction

First-Grade CBM Word Identification Fluency
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. Determine Frequency of Data Collection
5. Collect and Graph Data
6. **Analyze and Make Instructional Decisions**
7. Continue Progress Monitoring
Collecting Data Is Great...

- But using data to make instructional decisions is **most** important.
- Select a decision making rule and stick with it.
Decisions Using Progress Monitoring Data

- Identify students who are not making progress and need additional assessment and instruction
- Confirm or disconfirm screening data
- Evaluate effectiveness of interventions and instruction
- Allocate resources
- Evaluate effectiveness of instruction programs for target groups (e.g., ELL, Title 1)
PM Instructional Decision Making

- Decision rules for PM graphs
  - Based on four most recent consecutive scores
  - Based on student’s trend line
Decision Rules Based on Four-Point Method

- If **three weeks** of instruction have occurred AND at least **six data points** have been collected, examine the four most recent data points.
  - If all four are above goal line, increase goal.
  - If all four are below goal line, make an instructional change.
  - If the four data points are both above and below the goal line, keep collecting data until trend line rule or four-point rule can be applied.
Four-Point Method

- **Weeks of Instruction**
- **Problems Correct in 7 Minutes**
  - Most recent four points
  - Goal line

- **Words Read Correctly**
Four-Point Method

Weeks of Instruction

Problems Correct in 7 Minutes

Words Read Correctly

most recent four points

goal line

National Center on Response to Intervention

137
Decision Rules Based on the Trend Line

- If **four weeks** of instruction have occurred AND at least **eight data points** have been collected, figure trend of current performance and compare to goal line.
- Calculate by hand or by computer.
Calculating the Trend Line

Third median point – First median point
number of weeks of instruction

\[(50 - 34) \div 7 = 2.3 \text{ slope}\]
Decision Rules Based on the Trend Line

- If the student’s trend line is steeper than the goal line, the student’s end-of-year performance goal needs to be increased.
- If the student’s trend line is flatter than the goal line, the teacher needs to revise the instructional program.
- If the student’s trend line and goal line are the same, no changes need to be made.
Trend Line Analysis

Words Read Correctly

Weeks of Instruction

trend line

goal line
Trend Line Analysis

- Trend line
- Original goal line
- Revised goal line
- Indicates change

Weeks of Instruction vs. Words Read Correctly
Trend Line Analysis

End-of-year performance goal and goal line are never decreased
Decision Rules Summary

- Four-point rule—easy to implement, but not as sensitive
- The trend line rule—more sensitive to changes, but requires calculation to obtain
EXAMPLE – Primary Prevention: Confirming At-risk Status With PM

- All students screened using CBM
- Students scoring below a cut score are suspected to be at risk for poor learning outcomes
- Students suspected to be at risk are monitored for six to ten weeks during primary prevention using CBM
Primary Prevention: Screening for Possible Math Risk

<table>
<thead>
<tr>
<th>Grade</th>
<th>Computation cutoff</th>
<th>Concepts and Applications cutoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>&lt; 5 digits</td>
<td>&lt; 5 points</td>
</tr>
<tr>
<td>Grade 2</td>
<td>&lt; 10 digits</td>
<td>&lt; 10 points</td>
</tr>
<tr>
<td>Grade 3</td>
<td>&lt; 10 digits</td>
<td>&lt; 10 points</td>
</tr>
<tr>
<td>Grade 4</td>
<td>&lt; 10 digits</td>
<td>&lt; 5 points</td>
</tr>
<tr>
<td>Grade 5</td>
<td>&lt; 15 digits</td>
<td>&lt; 5 points</td>
</tr>
<tr>
<td>Grade 6</td>
<td>&lt; 15 digits</td>
<td>&lt; 5 points</td>
</tr>
</tbody>
</table>

Note: These figures may change pending additional RTI research and are specific to a certain tool.
Primary Prevention: Confirming At-risk Status With PM

- At the end of six – ten weeks, student risk status is confirmed or disconfirmed.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reading—Slope</th>
<th>Computation CBM—Slope for Digits Correct</th>
<th>Concepts and Applications CBM—Slope for Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>1.0 (LSF)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1</td>
<td>1.8 (WIF)</td>
<td>0.35</td>
<td>No data available</td>
</tr>
<tr>
<td>2</td>
<td>1.5 (PRF)</td>
<td>0.30</td>
<td>0.40</td>
</tr>
<tr>
<td>3</td>
<td>1.0 (PRF)</td>
<td>0.30</td>
<td>0.60</td>
</tr>
<tr>
<td>4</td>
<td>0.40 (Maze)</td>
<td>0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>5</td>
<td>0.40 (Maze)</td>
<td>0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>6</td>
<td>0.40 (Maze)</td>
<td>0.40</td>
<td>0.70</td>
</tr>
</tbody>
</table>

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Primary Prevention: Confirming At-risk Status With PM

Weeks of Instruction
Problems correct in 3 minutes

Fourth-Grade CBM Computation
Primary Prevention: Confirming At-risk Status With PM

Weeks of Instruction
Problems Correct in 3 Minutes

Fourth-Grade CBM Computation
Calculating Slope and Determining Responsiveness in Primary Prevention Handout (Arthur)

Weeks of Instruction
Problems correct in 3 minutes

Second-Grade Computation
Calculating Slope and Determining Responsiveness in Primary Prevention Handout (Arthur)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reading—Slope</th>
<th>Computation CBM—Slope for Digits Correct</th>
<th>Concepts and Applications CBM—Slope for Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>1.0 (LSF)</td>
<td>—</td>
<td>—</td>
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</tbody>
</table>

Note: These figures may change pending additional RTI research and are specific to a certain tool.
Calculating Slope and Determining Responsiveness in Primary Prevention

Handout (Arthur) – Answer

Arthur’s slope:

\[(7 - 7) \div 8 = 0.0\]
Primary Prevention: Review

- All classroom students are screened to identify students suspected to be at risk.
- Students suspected to be at risk remain in primary prevention and are monitored using CBM for six to ten weeks:
  - Students with adequate slopes remain in primary prevention.
  - Students with inadequate slopes move to secondary prevention.
# Secondary Prevention: Determining Response in Reading

<table>
<thead>
<tr>
<th>Grade</th>
<th>CBM Probe</th>
<th>Slope</th>
<th>&lt; End Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Letter Sound Fluency</td>
<td>1.0</td>
<td>&lt; 30</td>
</tr>
<tr>
<td>Grade 1</td>
<td>Word Identification Fluency</td>
<td>1.8</td>
<td>&lt; 30</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Passage Reading Fluency</td>
<td>1.5</td>
<td>&lt; 60</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Passage Reading Fluency</td>
<td>1.00</td>
<td>&lt; 70</td>
</tr>
<tr>
<td>Grade 4</td>
<td>Maze Fluency</td>
<td>0.40</td>
<td>&lt; 25</td>
</tr>
<tr>
<td>Grade 5</td>
<td>Maze Fluency</td>
<td>0.40</td>
<td>&lt; 25</td>
</tr>
<tr>
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<td>Maze Fluency</td>
<td>0.40</td>
<td>&lt; 25</td>
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</tbody>
</table>

Note: These figures may change pending additional RTI research.
# Secondary Prevention: Determining Response in Math

<table>
<thead>
<tr>
<th>Grade</th>
<th>Computation</th>
<th>Concepts and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slope</td>
<td>&lt; End level</td>
</tr>
<tr>
<td>Grade 1</td>
<td>0.35</td>
<td>&lt; 20 digits</td>
</tr>
<tr>
<td>Grade 2</td>
<td>0.30</td>
<td>&lt; 20 digits</td>
</tr>
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</tr>
<tr>
<td>Grade 6</td>
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<td>&lt; 20 digits</td>
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</tbody>
</table>

Note: These figures may change pending additional RTI research.
Secondary Prevention: Inadequate Response

If student response to secondary prevention is inadequate:

- **First:**
  - Student participates in more small-group tutoring while weekly PM continues.

- **Second:**
  - Student moves to tertiary prevention.
  - Multidisciplinary assessment to determine disability (in accordance with state policy).
Calculating Slope and Determining Responsiveness in Secondary Prevention Handout (David)

Weeks of Instruction

Words Read Correctly

Third-Grade CBM Passage Reading Fluency
## Secondary Prevention: Confirming Risk Status With PM

<table>
<thead>
<tr>
<th>Grade</th>
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<td>&lt; 60</td>
</tr>
<tr>
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<td><strong>1.00</strong></td>
<td></td>
<td></td>
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<td>Maze Fluency</td>
<td>0.40</td>
<td>&lt; 25</td>
</tr>
</tbody>
</table>

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Calculating Slope and Determining Responsiveness in Secondary Prevention (David) – Answer

David’s slope:

\[
(54 - 24) \div 8 = 3.75
\]
Calculating Slope and Determining Responsiveness to Secondary Prevention
Handout (Martha)

Third-Grade CBM Concepts and Applications
## Secondary Prevention: Confirming Risk Status With PM

<table>
<thead>
<tr>
<th>Grade</th>
<th>Slope</th>
<th>&lt; End level</th>
<th>Concepts &amp; Applications</th>
<th>&lt; Slope</th>
<th>&lt; End level</th>
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<tbody>
<tr>
<td>Grade 1</td>
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<td>&lt; 20 digits</td>
<td>No data available</td>
<td>0.40</td>
<td>&lt; 20 points</td>
</tr>
<tr>
<td>Grade 2</td>
<td>0.30</td>
<td>&lt; 20 digits</td>
<td>0.60</td>
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</table>

Note: These figures may change pending additional RTI research.
Calculating Slope and Determining Responsiveness to Secondary Prevention
Handout (Martha) – Answer

Martha’s slope:

\[(10 - 6) ÷ 8 = 0.5\]
Calculating by Computer

- EXCEL: Right click on graphed data, add trend line, click on options, and add equation. $y=mx+b$ (m=rate or slope)

- DATA SYSTEMS: Most progress monitoring data systems automatically establish trend lines and calculate rate of improvement
Problems with Excel – Does Not Recalculate after Intervention Change
Published Data Systems often Recalculate Trend Line and ROI after Changes
Steps in the Decision Making Process

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. Determine Frequency of Data Collection
5. Collect and Graph Data
6. Analyze and Make Instructional Decisions
7. Continue Progress Monitoring
Establish Procedures for Sharing Data

- Communicating **purpose** of data collection AND **results** regularly
  - Share with parents, teachers, and students
- Dissemination with discussion is preferred
  - Encourage all school teams to talk about results, patterns, possible interpretations, and likely next steps.
Things to Remember

- Good data IN... good data OUT
  - Know where your data came from and the validity of the data
- Focus on the big picture for ALL Students
  - Are most students making progress?
- ALL instructional and curriculum decisions should be based on DATA.
- Keep it Simple and Efficient!
Implementing the RTI Framework

- Select and implement valid and reliable procedures for progress monitoring.
- Implement progress monitoring with integrity.
- Ensure cultural, linguistic and socioeconomic factors that students bring to the classroom are reflected in tool selection and implementation.
CLOSING
Review Activity

- What is the difference between a mastery measure and general outcome measure?
- T or F: All progress monitoring tools are created equal.
- Where can I find evidence of the reliability and validity of progress monitoring tools?
- Name three uses for progress monitoring data.
- What is a trend line?
- What are three ways to establish PM goals?
- Describe two ways to analyze PM data.
Review Objectives

1. Identify the importance of progress monitoring
2. Use progress monitoring to improve student outcomes
3. Use progress monitoring data for making decisions about instruction and interventions
4. Develop guidance for using progress monitoring data
Team Activity: Next Steps

- Gather additional information
- Participate or deliver additional training
- Clarify the purpose of progress monitoring
- Review existing practices
- Identify needs, priorities, logistics
- Develop additional guidance
Homework (Optional)

- Identify what progress monitoring tools are being used in the district.
  - What evidence exists for their reliability and validity as progress monitoring tools?
Homework (Optional)

- Develop a plan for how the district will provide guidance on the following:
  - Selecting progress monitoring tools
  - Setting progress monitoring goals
  - Establishing the frequency of progress monitoring by tiers
  - Ensuring accuracy of the progress monitoring results
  - Making decisions with progress monitoring data
Need More Information?

National Center on Response to Intervention
www.rti4success.org

RTI Action Network
www.rtinetwork.org

IDEA Partnership
www.ideapartnership.org
Questions?

National Center on Response to Intervention

www.rti4success.org
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