DATA BASED DECISION MAKING

Wayne Callender
University of Oregon
waynec@uoregon.edu

Copyright
Establish a Systematic Assessment System

- School-wide assessment system
- Commonly understood and used by all teachers
- Students evaluated and monitored frequently
- Purpose: Instructional decision making
Different kinds of assessment data are needed for different decisions within the system.

Four Purposes of Assessments
1. Screening Measure
2. Diagnostic Measure
3. Progress Monitoring Measure
4. Outcome Measure
Four Purposes of Assessment

**Screening**
- Identify Concern
- Identify Level of Concern

**Diagnostic**
- Pinpoint skill deficit?
- What Needs to be Taught?

**Progress Monitoring**
- Is it Working?
- Ensure Gap is Closing at Desired Rate

**Outcome**
- Predicted by Screening and Progress Monitoring
Using Data to Inform Instructional Decisions

• Use data to identify a problem (student/group performance in relation to expectation)
• Set goal for student/group to reach expectation
• Use data to monitor student progress and evaluate instructional decision
• In order to be more systematic and efficient in meeting our goals, we must use “good” data to inform our decisions
Assessment-Intervention Loop

1. Identify need for Support
2. Define & Validate Need for Support
3. Explore & Plan Instructional Intervention
4. Assess & Modify Support
5. Look at & Review results

Source: Adapted from Secretary’s Leadership Academy, Reading First Initiative
CBM/DIBELS is Useful in Making and Confirming These Decisions

- It is time efficient, accurate, and provides reliable and valid information.
- Provides information relevant to the four purposes of assessment.
- It links to intervention goals for students with direct service needs.
- It links to frequent progress monitoring for students with direct service needs.
Qualities of Good Assessment

- Facilitate improving instruction/intervention
- Easily administered, scored, interpreted
- Shouldn’t take us away from working with our students
- Should “fit” with our general education curriculum, content, what we feel are important outcomes, things for children to learn
Curriculum Based Measurement

- General Outcome Measure
  - Ability to reflect improvement in broad areas of academic skills (reading, writing, and math)

- Sensitive to small increments of change

- Curriculum validity (match between measure and instructional objectives)

- Meets appropriate psychometric standards
CBM as DIBS

**D** = Dynamic, indicates sensitivity of differences...

- Sensitive “between” students, e.g. detects differences between children with reading deficits vs. those without

- Sensitive “within”, e.g. detects change in performance over time, e.g. progress of students
DIBS

I = Indicator, thermometer, vital signs

- Indicators, probes, changes, getting better or getting worse, staying same?
- Progress/change/status over time
- Not the only indicator that could be used or measurement that could be used, doesn’t measure everything, not intended to or need to...
Basic Skills in areas of:

- Reading
- Spelling
- Mathematics
- Written expression
- Foundation skills
- Literacy skills
CBM Has Two Primary Functions

1. Screening

   It is summative CBM may be used as a summative assessment, e.g. norming the school, allows long-term comparisons, benchmarks, comparisons.

2. Progress Monitoring

   It is formative CBM can be used as frequent, ongoing measures over time, allowing for continuous data-based decision-making regarding outcomes of the strategies, interventions, programs we are implementing to improve learning.

And… Can also provide a level of diagnostic information
Some Ways CBM Data Can Be Used:

- Develop small groups for specialized strategies/interventions
- Set goals for learning based upon empirical data in your school
- Monitor a student’s progress and determine intervention effectiveness
- Assess new students to your school and provide appropriate instructional placement
- Task analyze student skills
- Provide parents with regular “report cards” on progress relative to goals/interventions, or to classmates.
Core Testing Strategies of CBM

- **Reading** - 3, one-minute probes, fluency.
- **Written expression** - complete “story starters” for 3 minutes, number of words written, words spelled correctly, or correct word sequences are counted.
- **Mathematics** - students write answers to addition, subtraction, mixed math, with 2/4 minute probe, # of digits written.
CBM and DIBELS Reading

Dynamic
Indicators
Basic
Early
Literacy
Skills

Grades K-1
- Phoneme segmentation fluency

Grade 1-8
- Nonsense word fluency
- Oral reading fluency
The outcome of each step depends on a) student’s beginning skills, b) effectiveness of core curriculum and instruction, and c) effectiveness of system of additional instructional support.
CBM Math

Kindergarten and first grade:
- Quantity Array
- Number Identification
- Quantity Discrimination
- Missing Number

Grades 1 - 6:
- Computation

Grades 2 - 6:
- Concepts and Applications
CBM Written Expression

- Total Words Written
- Correct Writing Sequences
- Percent of Correct Writing Sequence
- Correct Spelling Sequences
Why not continue to WISC, SB, WIAT & W-J them?

- Are summative, not formative measures
- Have low to no intervention validity or sensitivity
- Measure differences between rather than progress over time
- Do not yield information about how or what to teach
- Cannot be used frequently (practice effects)
- Cannot be used frequently (time)
- Do not assess success relative to your curriculum
CBM is used most effectively applied within an assessment – Intervention loop.

CBM has the advantage of their reliability, concurrent validity, and treatment validity.

CBM and measures are sensitive to change, can be repeatedly given, and therefore allow us to modify interventions and strategies without wasting valuable resources and learning for children.
Activity

Data Based Decision Making

ACTIVITY #1

In groups of 3, each person prepares, then teaches one of the three items below...

1. What does CBM/DIBELS measure?
2. What advantages does CBM/DIBELS offer over traditional testing?
3. For what instructional purpose can CBM/DIBELS be used?
DATA BASED DECISION MAKING

Using Assessment for Instructional Decisions

Screening (revisit from days 1 & 2)

Diagnostic

Progress Monitor
Purpose of Assessment

Screening
Diagnostic
Progress Monitoring

Method of Assessment

Benchmark Testing
Functional Assessment
CBM/In-program Testing
Screening Assessment

- Brief assessment
- Used to classify students as at risk or not at risk for academic failure
- Assessment instrument must demonstrate: reliability and validity and accuracy of classification (at risk vs. not at risk)
IDENTIFY and VALIDATE
Level of Support Needed to Meet Expected Performance Goals

Use Benchmark Assessment Results to Answer:

✓ How many students are in need of additional instructional support?

✓ Which students are in need of additional instructional support?
First Grade Example

**Oral Reading Fluency**

**Benchmark Goal:** The benchmark goal is for all children to have established reading skills of 40 words per minute on Oral Reading Fluency by the end of First Grade.

**May Status:** At the end of First Grade, students should have 40 correct words per minute on Oral Reading Fluency.

- **62% (n=251) Low Risk**
  Students reading unpracticed First Grade passages at a rate of 40 or more correct words per minute on Oral Reading Fluency at the end of First Grade are established readers. Established readers read First Grade material accurately and efficiently. Their reading is characterized by increasingly fluent decoding. Students reading in this range at the end of First Grade typically begin to read with expression and enjoy the content of their reading. Progress toward benchmark goals should be checked in the beginning, middle, and end of Second Grade to ensure adequate growth.

- **20% (n=82) Some Risk**
  Students reading unpracticed First Grade passages at a rate of 20 to 39 correct words per minute at the end of First Grade are emerging readers. Emerging readers can decode unfamiliar first grade material but are not fluent in doing so. Students scoring in this range at the end of First Grade may need additional instructional support in reading to achieve benchmark goals. Progress toward benchmark goals should be monitored monthly.

- **17% (n=69) At Risk**


First Grade DIBELS Benchmark Goals

So how are we doing in Fall?

<table>
<thead>
<tr>
<th>DIBELS Measure</th>
<th>Beginning of Year</th>
<th>Middle of Year</th>
<th>End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Performance</td>
<td>Status</td>
<td>Performance</td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>LNF &lt; 25</td>
<td>At Risk</td>
<td>PSF &lt; 10</td>
</tr>
<tr>
<td></td>
<td>25 ≤ LNF &lt; 37</td>
<td>Some Risk</td>
<td>10 ≤ PSF &lt; 35</td>
</tr>
<tr>
<td></td>
<td>LNF ≥ 37</td>
<td>Low Risk</td>
<td>PSF ≥ 35</td>
</tr>
<tr>
<td>Phonemic Segmentation Fluency</td>
<td>PSF &lt; 10</td>
<td>Deficit</td>
<td>PSF &lt; 10</td>
</tr>
<tr>
<td></td>
<td>10 ≤ PSF &lt; 35</td>
<td>Emerging</td>
<td>10 ≤ PSF &lt; 35</td>
</tr>
<tr>
<td></td>
<td>PSF ≥ 35</td>
<td>Established</td>
<td>PSF ≥ 35</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>NWF &lt; 13</td>
<td>At Risk</td>
<td>NWF &lt; 30</td>
</tr>
<tr>
<td></td>
<td>13 ≤ NWF &lt; 24</td>
<td>Some Risk</td>
<td>30 ≤ NWF &lt; 50</td>
</tr>
<tr>
<td></td>
<td>NWF ≥ 24</td>
<td>Low Risk</td>
<td>NWF ≥ 50</td>
</tr>
<tr>
<td>Oral Reading Fluency</td>
<td>ORF &lt; 8</td>
<td>At Risk</td>
<td>ORF &lt; 20</td>
</tr>
<tr>
<td></td>
<td>8 ≤ ORF &lt; 20</td>
<td>Some Risk</td>
<td>20 ≤ ORF &lt; 40</td>
</tr>
<tr>
<td></td>
<td>ORF ≥ 20</td>
<td>Low Risk</td>
<td>ORF ≥ 40</td>
</tr>
</tbody>
</table>

Source: Oregon Reading First
## Identify Goals for Expected Performance

<table>
<thead>
<tr>
<th>Measure</th>
<th>How Much?</th>
<th>By When?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Sounds Fluency</td>
<td>25 or more</td>
<td>Middle of K</td>
</tr>
<tr>
<td>Phonemic Segmentation Fluency</td>
<td>35 or more</td>
<td>End of K</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>25 or more 50 or more</td>
<td>End of K Middle of 1st</td>
</tr>
<tr>
<td>Oral Reading Fluency</td>
<td>G1: &gt;= 40 G2: &gt;= 90</td>
<td>G1: End of year G2: End of year</td>
</tr>
</tbody>
</table>

Source: Oregon Reading First
### CBM Writing Norms

#### 50<sup>th</sup> Percentile

<table>
<thead>
<tr>
<th>Grade</th>
<th>How Much</th>
<th>By When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>End of Year</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>End of Year</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>End of Year</td>
</tr>
<tr>
<td>4</td>
<td>38</td>
<td>End of Year</td>
</tr>
<tr>
<td>5</td>
<td>48</td>
<td>End of Year</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>End of Year</td>
</tr>
<tr>
<td>7</td>
<td>55</td>
<td>End of Year</td>
</tr>
<tr>
<td>8</td>
<td>62</td>
<td>End of Year</td>
</tr>
</tbody>
</table>
# CBM Math Norms

## 50th Percentile

<table>
<thead>
<tr>
<th>Grade</th>
<th>How Much</th>
<th>By When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>End of Year</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>End of Year</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>End of Year</td>
</tr>
<tr>
<td>4</td>
<td>53</td>
<td>End of Year</td>
</tr>
<tr>
<td>5</td>
<td>49</td>
<td>End of Year</td>
</tr>
<tr>
<td>6</td>
<td>33</td>
<td>End of Year</td>
</tr>
<tr>
<td>7</td>
<td>35</td>
<td>End of Year</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>End of Year</td>
</tr>
</tbody>
</table>
From Grade 6 Reading Passages
(Tilly & Shinn, unpublished data)

<table>
<thead>
<tr>
<th>Grade 6</th>
<th>Oral Reading</th>
<th>Cloze</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125.3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Oral Reading</th>
<th>Cloze</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>147.3</td>
<td>31.4</td>
</tr>
<tr>
<td>Special Education</td>
<td>87.7</td>
<td>23.0</td>
</tr>
</tbody>
</table>

Grade 10

<table>
<thead>
<tr>
<th>Oral Reading</th>
<th>Cloze</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>167.7</td>
</tr>
<tr>
<td>Special Education</td>
<td>115.2</td>
</tr>
</tbody>
</table>

Grade 11

<table>
<thead>
<tr>
<th>Oral Reading</th>
<th>Cloze</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>166.8</td>
</tr>
<tr>
<td>Special Education</td>
<td>110.9</td>
</tr>
</tbody>
</table>
DATA BASED DECISION MAKING

Using Assessment for Instructional Decisions

Screening (revisit)
Diagnostic
Progress Monitor
Purpose of Assessment | Method of Assessment
---|---
Screening (revisit) | Benchmark Testing
Diagnostic | Functional Assessment
Progress Monitoring | CBM/In-program Testing
Diagnostic Assessment

• Follows screening or at any time during the school year

• Provides more detailed information on target skills

• Reliable and Valid for multiple skills within a Big Idea or Different Big Ideas

• Helps plan instruction and may determine specific interventions needed
How Much Diagnostic Assessment and When

• Primary Purpose: Identifying what to teach
• Under what circumstances?
  – All Strategic/Low Benchmark students
  – Some Intensive students
  – Key function is to tell us what to teach - to know for explanation or curiosity purposes
Is there a difference in the instruction for children struggling or at-risk for different reasons?

“...thus far, no conclusive evidence exists that the particular cause (genetic or environment) of a child’s delay in either of these domains is relevant to the type of instruction he or she will require in learning to read”

National Reading Panel Report, based on 115,000 reading research studies
Use Functional Academic Assessments

Answer: What needs to be taught?

1. FAAs Are...
   - Informal
   - Brief
   - Used to evaluate academic skills

2. Especially useful with strategic level students

3. Often do not require parental consent – examine purpose:
   - If used for the purpose of intervention vs.
   - Used for establishing eligibility
Functional Academic Assessments

Examples:

• Houghton Mifflin Phonics Screener
• Assessing Reading: Multiple Measures
• Ekwall/Shanker Reading inventory
• DIBELS/CBM Error Analysis
• Curriculum-Based Evaluation (CBE)
  • Reading
  • Writing
  • Math
• Designing Effective Mathematics Instruction, Third Ed. (Stein, Silbert, Carnine)
• Program Assessments (placement tests)
Example: Assessing Reading

1. Begin by evaluating the student's performance on screening measure – identify instruction recommendation (B, S, or I)

2. Evaluate performances on particular tasks (oral reading passage, nonsense word fluency, etc.) and conduct skills analysis – answer: What type of errors? What type of instructional objectives? Is there a pattern of performance (i.e., good accuracy but low fluency, high error rate, etc.)

3. Apply fluency formula

4. Administer phonic screener

5. On basis of information, group students according to like profiles/instructional needs, begin instruction and progress monitor
Progress Monitoring
Ruining the Prediction

- Progress Monitoring Screening can be used to predict the future of students.
- Our job: Ensure that prediction does not become reality.
- Our goal: Identify students who are heading towards failure and put them on the track to success by intervening. Progress monitoring allows us to evaluate whether we are on that track.
## Two Types of Progress Monitoring:

<table>
<thead>
<tr>
<th>Type of Assessment</th>
<th>Answers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Program Assessment</td>
<td>Are students learning the content?</td>
</tr>
<tr>
<td>CBM/DIBELS</td>
<td>Are they generalizing? Can they apply in a different context?</td>
</tr>
</tbody>
</table>
In-Program Assessment

- Accompany most programs
- Provide critical information about in-program learning
- Administered regularly
- Identifies which students require more instruction
- Predictors of later skill development generalization
If Fluency is Low - Ask Why?

• Too much attention devoted to figuring out words?
• Makes word-reading errors and loses the sense of the passage as they struggle and pause?
• Alters attention to accessing the meaning of individual words?
• Takes too long to get to the end of passage and can’t remember the beginning?
Fluency or Decoding Issue?

Does the student need instruction on fluency or decoding?

• Select a new passage at the highest level which the student failed to meet fluency criterion but was +90% accurate and ask the student to read the passage aloud – cold timing.

• Teacher marks where the student is at the end of 1 minute but allows the student to continue reading.

• Then ask the Student to reread the same passage as quickly and carefully as they can and the teacher stops the student at the end of 1 minute.

• Compute: \( \text{Rereading Rate} - \text{Initial Rate} \times \frac{100}{\text{Initial Rate}} = \% \)
Fluency or Decoding?

Example: 90 rereading rate – 83 initial rate ÷ 83 initial rate X 100 = 8%

Example: 118 rereading rate – 83 initial rate ÷ 83 initial rate X 100 = 42%

- If the increase is greater than or equal to 40%, instruct to build fluency;
- If the gain is less than 40%, then conduct further error analysis or diagnostic assessments to determine specific deficits

Curriculum Based Evaluation, Howell, Nolet, 2000
Houghton Mifflin Phonics Screener

e   i   a   o   u

sip   cat   let   but   hog

vop   fut   dit   keb   laz
Written Expression Screener for Problem Solving
Record Form

CBM Written Expression: Is Written Communication Acceptable?  □ Yes  □ No
Hypothesis: Problem is occurring because student does not write fluently

<table>
<thead>
<tr>
<th>Student Score</th>
<th>Peer Median</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWW</td>
<td>CWS</td>
<td>WSC</td>
</tr>
<tr>
<td>TWW</td>
<td>CWS</td>
<td>WSC</td>
</tr>
<tr>
<td>TWW</td>
<td>CWS</td>
<td>WSC</td>
</tr>
</tbody>
</table>

Does the problem appear to be spelling, handwriting, capitalization, grammar, or punctuation?  □ Yes  □ No

Single Skill Assessment: Is sentence syntax adequately complex?  □ Yes  □ No
Hypothesis: Problem is occurring because student does not write sentences that are adequately complex

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragments</td>
<td></td>
</tr>
<tr>
<td>Simple Sentences</td>
<td></td>
</tr>
<tr>
<td>Compound Sentences</td>
<td></td>
</tr>
<tr>
<td>Compound-Complex Sentences</td>
<td></td>
</tr>
</tbody>
</table>

Single Skills Assessment: Is semantic maturity adequate?  □ Yes  □ No
Hypothesis: The problem is occurring because the student does not use adequate vocabulary when writing

<table>
<thead>
<tr>
<th>Total Words</th>
<th>Percent of Unrepeated Words</th>
<th>Percent longer words (7 letters or more)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary:
What areas of need have been identified? ___________________________________________

What skills should be targeted first? _____________________________________________
## Mathematics Screener for Problem Solving

### Record Form

**CBM Early Math Literacy Skills:** Are Early Literacy Skills Adequate? □ Yes □ No

Hypothesis: Problem is occurring because student does not have the necessary early literacy skills.

<table>
<thead>
<tr>
<th>Number Identification</th>
<th>Student Score</th>
<th>Peer Median</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing Number</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity Discrimination</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CBM Computation Results:** Are Computation Skills Adequate? □ Yes □ No

Hypothesis: Problem is occurring because student does not have the necessary math computation skills.

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Student Score</th>
<th>School/District Median</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed Math Probe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CBM Application Results:** Are Application Skills Adequate? □ Yes □ No

Hypothesis: Problem is occurring because student does not have the necessary math skills.

<table>
<thead>
<tr>
<th>Student Score</th>
<th>District/Peer Median</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems Correct</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Single Skill Assessments

**Assess Operations:** Can student correctly perform operations at expected levels? □ Yes □ No

Hypothesis: The problem is occurring because the student does not carry out basic operations accurately.

<table>
<thead>
<tr>
<th>Operation</th>
<th>#Correct</th>
<th>Percentage</th>
<th>Error Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtraction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiplication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fractions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decimals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Assess Applications:** Are there problem-solving, content, or computation errors? □ Yes □ No

Hypothesis: The problem is occurring because the student does not have adequate problem-solving content, or computation skills.

<table>
<thead>
<tr>
<th>Content</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving</td>
<td></td>
</tr>
<tr>
<td>Money</td>
<td></td>
</tr>
<tr>
<td>Time/Temp</td>
<td></td>
</tr>
<tr>
<td>Metric Measurement</td>
<td></td>
</tr>
<tr>
<td>Customary Measure</td>
<td></td>
</tr>
<tr>
<td>Geometry</td>
<td></td>
</tr>
<tr>
<td>Place Value</td>
<td></td>
</tr>
<tr>
<td>Algebra</td>
<td></td>
</tr>
</tbody>
</table>

**Summary:**

What areas of need have been identified?

________________________

What skills should be targeted first?

________________________
DATA BASED DECISION MAKING

Using Assessment for Instructional Decisions

Screening (revisit)

Diagnostic

Progress Monitor
Purpose of Assessment

- Screening (revisit)
- Diagnostic
- Progress Monitoring

Method of Assessment

- Benchmark Testing
- Functional Assessment
- CBM & In-program Testing
## Schedule for Progress Monitoring

<table>
<thead>
<tr>
<th>Out of Program</th>
<th>Benchmark</th>
<th>Strategic</th>
<th>Intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progress Monitoring:</td>
<td>3 times year</td>
<td>Every 3-4 weeks</td>
<td>Twice per month</td>
</tr>
<tr>
<td>Program: Progress Monitoring</td>
<td>As indicated by Core Program</td>
<td>On-going: to ensure skills taught are firm</td>
<td>As indicated by intervention program</td>
</tr>
</tbody>
</table>
Benefits of Progress Monitoring

- **Improved communication** regarding student achievement with all stakeholders
- **Accelerated learning** due to appropriate educational decisions being made as soon as a problem is identified
- **Instructional decisions** formed through the evaluation of data
- **Fewer inappropriate special education referrals**
# CBM/ DIBELS Academic Progress Monitoring Examples:

<table>
<thead>
<tr>
<th>Area</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>DIBELS (ISF, PSF, NWF, ORF)</td>
</tr>
<tr>
<td></td>
<td>CBM Reading</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>CBM: Maze, Cloze</td>
</tr>
<tr>
<td>Math</td>
<td>CBM (computation, concepts, application, number sense)</td>
</tr>
<tr>
<td>Written Expression</td>
<td>CBM (TWW, CWS, WSC)</td>
</tr>
<tr>
<td>Content Area Learning</td>
<td>CBM: Vocabulary matching</td>
</tr>
</tbody>
</table>
STRONGLY Consider including a CBM Measure

- Reliable
- Valid
- Efficient
- Predicts Success
- Measure of generalization
- Promotes decision making
- Can be graphed
- Easy to administer/score
What are the Strengths and Weaknesses of each type of progress monitoring?

How often should each type of progress monitoring be used?
Applying Progress Monitoring to inform instructional decisions requires:

1. Accurate Goal Setting
2. Applying Decision Rules
GOAL SETTING
“What Is the Goal?”

The GOAL is the intended outcome of the intervention

- Includes student’s present level of performance (PLOP)
- Identifies the expected level of performance to ensure acceptable levels of skill development
Benefits of Goal Writing

- Determines whether the individual is making improvement
- Guides decision-making
- Demonstrates the effectiveness of an intervention or instructional program
Identify Goal and Timeline

1. What is the outcome goal?
   - What proficiency level is required for success?
   - What level is required to effectively be supported by the system?

2. What is the present level of performance?
   - What is the student’s current level of skill?

3. How much growth is needed?

4. How much growth does this require per week?
### How Much?

**Performance Standards**

- Instructional placement standards
- School policy/standards
- Developmental norms
- Medical standards
- Adult expectations (parent, teacher, employer)
- Local norms/peer performance
- CBM Average Growth norms
- Criteria for next environment
“What is the present level of performance (PLOP)?”

Present level of performance describes an individual’s baseline level of performance in a target behavior at a specific point in time.

Note: If the student specifically below grade level, the PLOP should reflect instructional level rather than grade level.
Set Ambitious Goals

• Identify starting words correct per minute (e.g., 30 wcpm).
• Identify end of year grade level target (e.g., 90 wcpm).
• Subtract current wcpm from target & determine whether this is a realistic target (i.e., 60 wcpm is highly ambitious).
• Set goal and define weekly learning targets (i.e., amount of growth/number of instructional week).
• Monitor progress over time.

© 2000 by Deborah C. Simmons
# 2005 Hasbrouck & Tindal Oral Reading Fluency Data

Jan Hasbrouck and Gerald Tindal completed an extensive study of oral reading fluency in 2004. The results of their study are published in a technical report entitled, "Oral Reading Fluency: 90 Years of Measurement," which is available on the University of Oregon's website, [brt.uoregon.edu/tech_reports.htm](http://brt.uoregon.edu/tech_reports.htm).

This table shows the oral reading fluency rates of students in grades 1 through 8 as determined by Hasbrouck and Tindal's data. You can use the information in this table to draw conclusions and make decisions about the oral reading fluency of your students. Students scoring below the 50th percentile using the average score of two unpracticed readings from grade-level materials need a fluency-building program. In addition, teachers can use the table to set the long-term fluency goals for their struggling readers.

**Average weekly improvement** is the average words per week growth you can expect from a student. It was calculated by subtracting the fall score from the spring score and dividing the difference by 32, the typical number of weeks between the fall and spring assessments. For grade 1, since there is no fall assessment, the average weekly improvement was calculated by subtracting the winter score from the spring score and dividing the difference by 16, the typical number of weeks between the winter and spring assessments.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentile</th>
<th>Fall WCPM*</th>
<th>Winter WCPM*</th>
<th>Spring WCPM*</th>
<th>Avg. Weekly Improvement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>90</td>
<td>128</td>
<td>146</td>
<td>162</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>99</td>
<td>120</td>
<td>137</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>71</td>
<td>92</td>
<td>107</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>44</td>
<td>62</td>
<td>78</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>21</td>
<td>36</td>
<td>48</td>
<td>0.8</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
<td>145</td>
<td>166</td>
<td>180</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>119</td>
<td>139</td>
<td>152</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>94</td>
<td>112</td>
<td>123</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>68</td>
<td>87</td>
<td>98</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>45</td>
<td>61</td>
<td>72</td>
<td>0.8</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>166</td>
<td>182</td>
<td>194</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>139</td>
<td>156</td>
<td>168</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>110</td>
<td>127</td>
<td>139</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>85</td>
<td>99</td>
<td>109</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>61</td>
<td>74</td>
<td>83</td>
<td>0.7</td>
</tr>
<tr>
<td>6</td>
<td>90</td>
<td>177</td>
<td>195</td>
<td>204</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>153</td>
<td>167</td>
<td>177</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>127</td>
<td>140</td>
<td>150</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>98</td>
<td>111</td>
<td>122</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>68</td>
<td>82</td>
<td>93</td>
<td>0.8</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>180</td>
<td>192</td>
<td>202</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>156</td>
<td>165</td>
<td>177</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>102</td>
<td>109</td>
<td>123</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>79</td>
<td>88</td>
<td>98</td>
<td>0.6</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>185</td>
<td>199</td>
<td>199</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>161</td>
<td>173</td>
<td>177</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>133</td>
<td>146</td>
<td>151</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>106</td>
<td>115</td>
<td>124</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>77</td>
<td>84</td>
<td>97</td>
<td>0.6</td>
</tr>
</tbody>
</table>

*WCPM = Words Correct Per Minute

**Average words per week growth
How Much Growth is Required?  
Goal Setting Example: Mary

Mary: 1st Grade (January)
What is the outcome goal?
   The spring benchmark for 1st grade ORF is a minimum of 40 correct words per minute
What is the present level of performance?
   10wpm, 1st Grade DIBELS ORF
How much growth is needed?
   30wpm by the Spring benchmark!
How much growth does this require per week?
   30 divided by 16 weeks = 2 words per week
Progress monitor using grade level materials
Approach for Students Severely Behind -

Identify amount of growth required to close the gap and realistic timeline

Bunky: 2\textsuperscript{nd} Grade
Reading Level = 10 wpm, 1\textsuperscript{st} Grade
Benchmark for 2\textsuperscript{nd} Grade = 90 wpm
Necessary Gain (wpm) = \textbf{80}

\begin{align*}
9 \text{ wks} &= 8.8 \\
18 \text{ wks} &= 4.4 \\
27 \text{ wks} &= 2.96
\end{align*}

Minimum of an 18 Week Goal: 4.4 wpm per week

In 18 weeks, on 2\textsuperscript{nd} grade DIBELS Probes, Bunky will read 90 words per minute.
Example: Jill

Jill: Fourth Grade (January)

Area: Math

• What is the outcome goal?
  *The spring benchmark for 4th grade CBM Math is a minimum of 53 correct digits*

• What is the present level of performance?
  *38 cds, 4th Grade*

• How much growth is needed?
  *___ cds by the Spring Benchmark!*

• How much growth does this require per week?
  *___ divided by ___ weeks = ___ cds per week*

See next slide for average growth
# Weekly Growth

**EXPECTED GAINS IN BASIC SKILLS**

**WEEKLY GROWTH**

Realistic (R) & Ambitious (A) Standards / Average Growth (Av)

<table>
<thead>
<tr>
<th>Area</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
<th>Grade 5</th>
<th>Grade 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>words per</td>
<td>2.0 wpm (R)</td>
<td>1.5 wpm (R)</td>
<td>1.0 wpm (R)</td>
<td>.85 wpm (R)</td>
<td>0.5 wpm (R)</td>
<td>.3 wpm (R)</td>
</tr>
<tr>
<td>minute</td>
<td>3 wpm (A)</td>
<td>2.0 wpm (A)</td>
<td>1.5 wpm (A)</td>
<td>.85 to 1.5 (Av)</td>
<td>0.8 wpm (A)</td>
<td>.66 wpm (A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.85 to 1.5 (Av)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maze</td>
<td>.39 wpm (R)</td>
<td>.39 wpm (R)</td>
<td>.39 wpm (R)</td>
<td>.39 wpm (R)</td>
<td>.39 wpm (R)</td>
<td>.39 wpm (R)</td>
</tr>
<tr>
<td></td>
<td>.64 wpm (A)</td>
<td>.64 wpm (A)</td>
<td>.64 wpm (A)</td>
<td>.64 wpm (A)</td>
<td>.64 wpm (A)</td>
<td>.64 wpm (A)</td>
</tr>
<tr>
<td>Spelling –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cls</td>
<td>1.0 cls (R)</td>
<td>1.5 cls (A)</td>
<td>.65 cls (R)</td>
<td>.45 cls (R)</td>
<td>.3 cls (R)</td>
<td>.3 cls (R)</td>
</tr>
<tr>
<td></td>
<td>1.0 cls (A)</td>
<td>.92 to 1.08 cls (Av)</td>
<td>.45 cls (A)</td>
<td>.65 cls (A)</td>
<td>.65 cls (A)</td>
<td>.65 cls (A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.57 to .70 cls (Av)</td>
<td>.43 to .48 cls (Av)</td>
<td>.23 to .46 cls (Av)</td>
<td>.23 to .46 cls (Av)</td>
<td>.23 to .46 cls (Av)</td>
</tr>
<tr>
<td>Math –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cd</td>
<td>.30 cd (R)</td>
<td>.30 cd (R)</td>
<td>.30 cd cd (R)</td>
<td>.75 cd (R)</td>
<td>.75 cd (R)</td>
<td>.75 cd (R)</td>
</tr>
<tr>
<td></td>
<td>.50 cd (A)</td>
<td>.50 cd (A)</td>
<td>.50 cd cd (A)</td>
<td>.75 (R)</td>
<td>.75 (R)</td>
<td>.75 (R)</td>
</tr>
<tr>
<td></td>
<td>.34 to .53 cd (Av)</td>
<td>.20 to .28 cd (Av)</td>
<td>.30 to .42 cd (Av)</td>
<td>.70 to .74 cd (Av)</td>
<td>.70 to .74 cd (Av)</td>
<td>.70 to .74 cd (Av)</td>
</tr>
</tbody>
</table>

But What about Bunky?

It’s going to require sustained, significant effort to move Sue to the grade level benchmark.

- Intervene ASAP.
- Select the most intensive intervention program.
- Consider use of skip schedules to accelerate student performance.
- Double or triple dose reading instruction.
- Set goals for lesson progress and track carefully.
Identify amount of growth required to close the gap and realistic timeline

Dan: 3rd Grade
Reading Level = 12 wpm, 1st Grade
Benchmark for 3rd Grade = 110wpm
Necessary Gain (wpm) = 100 wpm
  9 wks =
  18 wks =
  27 wks =

Use the average growth chart to help establish an ambitious but realistic time frame and expected weekly growth.
Use Decision Rules to Evaluate the Effectiveness of the Instructional Program
Decision Rules and Graphing Conventions

Why not use a Graph??!
Benefits of Using a Graph

• Creates a learning picture.
• Allows for decision making.
• Helps predict learning.
• Provides documentation.
• Makes data easier to interpret.
Sample Basic Monitoring Graph
Graphing the Baseline: Before Intervention
Baseline Data Should Be:

• Stable
  – Three measures or more
  – Collected in the appropriate setting/s
  – Collected in a relatively short period of time

• Representative
  – Teacher says it is “typical”
  – Accurately describes behavior as it naturally occurs
The “Aimline”

Shows you the expected/predicted rate of learning from your baseline to your goal.

Goal for Sam:

- In 18 weeks, when presented with random 2nd grade reading passages, Sam will read aloud at a rate of 73 wpm for 3 of 5 trials.

Criterion: 3/5 data points >73wpm
Aimline: Ensure Bunky is on Track to Reach the Goal!

The **aimline** connects where you are to where you want to get to, and shows the course to follow to get there.
“What Is a Data Decision Rule?”

- A decision rule is the systematic procedure by which patterns of data are analyzed. This data analysis assists in making a decision about the effectiveness of an intervention.
Why Decision Rules?

• How do you know when to continue or modify an intervention?
• Do you have unlimited time to continue with interventions that are not working?
• Allows data to guide instructional decisions
• Would you like to know which things work and which things don’t work for your students?
What Rules Can I Use for Making Decisions?

• **Option I: Moving Median**
  - Decision is made when 3 consecutive data points fall above or below the aimline.

• **Option II: Three-Day**
  - Decision is made after 3 data points (medians)
How Do I Graph the Moving Median?

- The moving median is a quick and easy method which reduces variability and eliminates the need for a trendline.
- The moving median is a method for graphing the median of your 3 newest scores.
  1. Draw the aimline
  2. Administer 1 probe each week for 3 weeks and record the raw data below the graph.
  3. After 3 weeks, plot your first data point.
  4. Each week thereafter, plot the median of your 3 newest scores (most recent plus 2 previous)

** Each data point will always be a median score
Option I: Moving Median

Data Decision Rules

1. If three (3) consecutive data points are above the aimline, raise the criteria
3. If three (3) consecutive data points are below the aimline, change the intervention.
2. If the date points align with the aimline, student is making adequate progress towards the benchmark goal.
Evaluate Support: Modify Instruction for Bunky?

Whoops! Time to make a change!

Whoops!

[Diagram of a scatter plot with months and words correct on the axes. The aimline is shown with a focus on scores.]
Evaluating Support
Modify Instruction for Bunky Now?

DMG (c) 2005
### What Changes?
#### Alterable Variables Chart

<table>
<thead>
<tr>
<th>Alterable Components</th>
<th>Specific Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opportunities to Learn (Time/Concentration of Instruction)</strong></td>
<td>Increase attendance; Provide instruction daily; Increase opportunities to respond; Vary schedule of easy/hard tasks/skills; Add another instructional period (double dose)</td>
</tr>
<tr>
<td><strong>Program Efficacy</strong></td>
<td>Pre教 components of core program; Use extensions of the core program; Supplement core with appropriate materials; Replace current core program; Implement specially designed program</td>
</tr>
<tr>
<td><strong>Program Implementation</strong></td>
<td>Model lesson delivery; Monitor implementation frequently; Provide coaching and ongoing support; Provide additional staff development; Vary program/lesson schedule</td>
</tr>
<tr>
<td><strong>Grouping for Instruction</strong></td>
<td>Check group placement; Reduce group size; Increase teacher-led instruction; Provide individual instruction; Change instructor</td>
</tr>
<tr>
<td><strong>Coordination of Instruction</strong></td>
<td>Clarify instructional priorities; Establish concurrent reading periods; Provide complementary reading instruction across periods; Establish communication across instructors; Meet frequently to examine progress</td>
</tr>
</tbody>
</table>
Definition of Insanity

Einstein: “Engaging in the same behavior, expecting different results”

RTI: Progress monitoring and then not using the data to inform instruction!