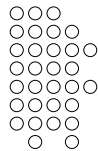


Joy of Data: Using Numbers to Promote Positive Outcomes

Catherine Christo, CSU, Sacramento
 Darren Husted, Woodland Joint Unified School District
 Meagan O'Malley, Winters Unified School District



Goals for This Presentation

- Increased understanding of the types of data available regarding student performance
- Increased ability to critically evaluate information on intervention effectiveness
- Understanding of Curriculum Based Measurement and its application within RtI
- Be familiar with techniques for monitoring progress of students in response to interventions and in consultation with teachers



Focus on Measurement

- NCLB
 - Accountability
 - Progress monitoring
- IDEA 2004
 - Outcomes and accountability
 - Data based decision making
 - Progress monitoring



Relevant Portions of IDEIA

- SLD criteria
- Need to assess rate of learning in response to scientific research based interventions
- Child has been provided high quality, research based instruction
- Data based documentation of repeated assessments



Types of Data

- Large group data
 - Provides big picture
 - Tied to outcomes outside school
 - Infrequent, summative
- Norm referenced data used with individuals
 - Typical assessment procedures
 - In evaluating interventions
- Progress monitoring data
 - Tracking individual students
 - Local use



Uses of Assessment Data

Type of Assessment	Large group comparison	Comparing individuals to criterion	Comparing individuals to others	Measuring progress	Informing Instruction
Large scale summative evaluations	X		X		
Nationally normed individual			X		
Mastery Measurement Tests		X		X on specific skills	X
General Outcome Measures	Sometimes	X	X	X	X



Using Data to Problem Solve For Individual Students



- How are students with similar characteristics doing?
 - Disaggregated group data
 - A system problem or individual problem
- How should we compare him to other students?
 - Which norm referenced standardized scores are most appropriate?
 - What information is useful?

Using Data to Problem Solve For Individual Students



- What intervention is most likely to be effective for him?
 - Determining intervention effectiveness
- How do we know if he is making progress?
 - How far is he from his peers?
 - Is the intervention working?
 - Can he return to the classroom?

Outline



- *How are students with similar characteristics doing?*
 - *Data at the whole school level*
- How should we compare him?
 - Data in standardized test scores
- What intervention is most likely to be effective?
 - Research based data
- How do we measure progress?
 - Measures
 - Tools

Big Picture Data



- **Academic Performance Index (State growth model)**
- **Definition of AYP (Federal criterion model)**
- **Identification of Program Improvement Schools**
- **Actions due to Program Improvement**
- **Using Data at the Global Level**

Definition of Academic Performance Index



- What your parents really care about!
- State Accountability Program

Academic Performance Index



- State assigns a single number from 200-1000
- Summarizes performance across grade levels and content areas
- Incorporates performance from norm-referenced tests and standards tests
- Standards tests have the most weight
- Used to rank schools, but primarily focused on growth
- Parents look up this number on the internet and compare schools

Academic Performance Index



API Base Data				API Growth Data			
	2001	2002	2003		From 2001 to 2002	From 2002 to 2003	From 2003 to 2004
Percent Tested	99	99	99	Percent Tested	99	99	99
API Base Score	712	688	736	API Growth Score	690	734	734
Growth Target	4	6	3	Actual Growth	-22	46	-2
Statewide Rank	8	7	8				
Similar Schools Rank	3	2	3				

Definition of Adequate Yearly Progress

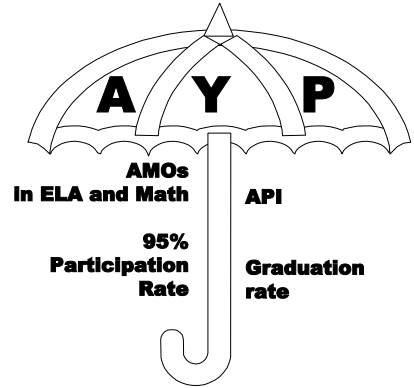


- What your site/district administration really cares about!
- Federal Accountability Program

Adequate Yearly Progress (AYP): The Basics



- Based on English language arts and mathematics separately
- All students held to same high academic standards
- Goal is 100% proficiency by 2013-14
- Inclusion of all students
 - 95% participation on assessments
 - Accountability for all students



Components of AYP



- 1) Achievement of the statewide Annual Measurable Objectives (AMO's) in both **English language arts (ELA) and math**
 - "Percent proficient"
- 2) Achievement of a **95% participation rate** on all applicable assessments
- 3) Achievement on the "additional" indicators
 - **API for all schools, and**
 - **Graduation rate for high schools**

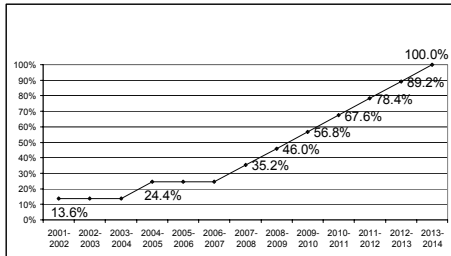
More On The AMO's...



- Statewide goals are applicable to ALL
 - Schools, including alternative and charters
 - Subgroups
 - Districts
 - State
- NCLB requires
 - Annual goals
 - Intermediate goals (no more than 3 years apart)

Sample AMO: English language arts

Elementary and Middle Schools and Elementary Districts



Participation Rates

- 95% required on any assessment used for AYP under NCLB
- The remaining 5% is the maximum allowable percentage of non-participants, including students who are exempted from testing at parental request.

Percent at Proficient or Above

Subject	Male	Female	English Learners	Economically Disadvantaged		Students With Disabilities	
				Yes	No	Yes	No
English-Language Arts	35	39	24	32	41	12	40
Mathematics	44	39	35	34	49	19	45
Science	36	32		25	43		38
History/							

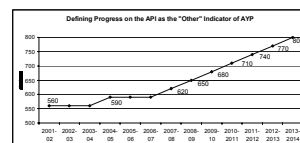
Percent Above 50th Percentile on NRT

Subject	Male	Female	English Learners	Economically Disadvantaged		Students With Disabilities	
				Yes	No	Yes	No
Reading	42	49	29	39	50	38	46
Mathematics	60	59	71	51	68	32	64

API and Graduation Rate

- The API will serve as the “other” indicator for all grades
 - How would a school meet the “other” indicator?
 - API above the “status bar”, **OR**
 - Show growth of at least one point
- Graduation rate will be an additional indicator for high schools
 - Demonstrate a one-tenth of a percent increase up to 100%

The API Criteria to Meet AYP Requirements



Graduation Rate



- National Center for Educational Statistics (NCES) four year completion rate
- Progress = increase of one tenth of one per cent per year until the school reaches 100%

Subgroups



- African American (not of Hispanic origin)
 - American Indian or Alaska Native
 - Asian
 - Filipino
 - Hispanic or Latino
 - Pacific Islander
 - White (not of Hispanic origin)
 - Socioeconomically disadvantaged
- NEW:**
- **Students with disabilities**
 - **English Learners**

District Accountability



- Held to same AYP criteria as schools; will be held accountable for **all** students enrolled in the district for a full year (not just those who aren't counted at the school level)
- Will be identified for Program Improvement (PI) in the same manner as schools
- The CDE will provide additional guidance

Identification of Program Improvement Schools and Districts



- What everyone really cares about!

Special Education and Program Improvement



- The most prevalent reason districts fall into program improvement is the performance of their special education subgroup
- Once identified as Program Improvement, need to make AYP goals for two years to exit

AYP for Title I Schools and Districts



- Applies to all schools and districts that receive Title I funds
- Title I schools and districts must meet all four components of AYP
 - Percent of students proficient or above on statewide assessments
 - Student participation rate in the statewide assessments
 - API
 - Graduation rate (high schools)

Title I Schools Identified for PI



- Did not meet the annual measurable objectives (AMOs) in the same content area (English-language arts or math) for two years in a row in the socio-economically disadvantaged subgroup for a targeted Title I school
- Did not meet the annual measurable objectives (AMOs) in the same content area (English-language arts or math) for two years in a row for the entire school in a school-wide Title I school
- School that do not receive Title I can not go into Program Improvement

Actions Required by NCLB PI Schools



- Year 1 Program Improvement
 - Revise school plan.
 - Use 10% funds for staff development.
 - Provide school choice with paid transportation.
 - District provides technical assistance (TA).

NCLB PI School Requirements



- Year 1 Program Improvement
 - Revise school plan, Use 10% funds for staff development; Provide school choice with paid transportation, District provides technical assistance (TA).
- Year 2 continue year 1 and add:
 - Supplemental services/tutoring
- Year 3 continue as above and:
 - District corrective action
- Year 4 continue year 2 and add:
 - Development of plan for alternative governance
- Year 5: Restructuring with alternative governance plan
 - Alternatives include charter school replace staff, external entity, state takeover

PI District Requirements



- Revise LEA Plan.
- Use 10% funds for staff development.
- Target students not making AYP.
- Provide extended learning opportunities.
- Involve parents.
- Receive TA from state.

Using Data at the Global Level



- STAR assessment results
- API accountability
- AYP accountability
- Other assessments used in district (i.e.CBM, writing sample, accelerated reader, etc.)
- Ask which assessment is most important
- Leverage you assessments to link with these

Academic Expectations



- Learn or establish goals
- May be based on external demands (AYP special education subgroup, lack of API growth, program improvement status)
- May be different from site to site
- Link district assessments to external assessments for the biggest leverage
- How does the school know the instructional range of the classroom compared to the achievement of special education students?

Outline



- How are students with similar characteristics doing?
 - Data at the whole school level
- *How should we compare him?*
 - *Data in standardized test scores*
- What intervention is most likely to be effective?
 - Research based data
- How do we measure progress?
 - Measures
 - Tools

Norm Referenced Data



- How do we compare students?
- How do we plot data?
- What can data tell us?
- What language do data speak?
- How to be critical of data when choosing an intervention

How Do We Compare Students?



- Normative Sample
 - Measure age or grade-related performance
 - Compared to sample population
 - E.g., grade, region, nation

Criterion



- Pre-established benchmark
- Measures mastery
- Describes rather than compares

Edumetric



- Changes within the individual

How Do We Quantify Performance?



- We plot obtained data using different scales

How Do We Plot Data?



- **Nominal Scale**
 - Categorical (e.g., dog breeds)
 - “FLK”
 - Not helpful for measuring skills/progress

How Do We Plot Data?



- **Ordinal Scale**
 - Order/rank (e.g, 1st, 2nd, 3rd place)
 - “...student is lowest in my class”
 - Not very helpful for measuring skills/progress
 - If student is “lowest” in a class full of gifted students it does not tell us much

How Do We Plot Data?



- **Interval Scale**
 - Data are quantified on a continuum
 - Equidistant intervals with arbitrary “0” point
 - E.g, standard scores (0 does not indicate an absence of quantity)

How Do We Plot Data?



- **Ratio scale**
 - Similar to interval scale
 - Ratio scale has true “0” point
 - E.g, weight (0 = absence of weight)

What Can Data Tell Us?

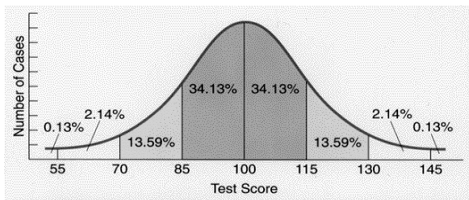


- **Data distribution**
 - Normal curve
- **Central tendency**
 - Typifies groups of numbers
- **Dispersion**
 - Typifies variability within groups of numbers

Data Distribution



- **Normal Curve**
 - A depiction of a score distribution that approximates a bell shape when plotted graphically
 - Many psychological traits follow this distribution
 - Some argue that there exists statistical bias and/or manipulation is involved in this theoretical distribution



Data Distribution

• Central Tendency

- Mean (ungrouped data)
 - Arithmetic “average”
 - Useful in determining “typical” value
 - $(1\text{kg.} + 2\text{kg.} + 3\text{kg.} + 4\text{kg.} + 6\text{kg.})/5 = 3.2\text{kg.}$
 - Not useful if there are extreme values
 - $(1\text{kg.} + 2\text{kg.} + 3\text{kg.} + 6\text{kg.} + 55\text{kg.})/5 = 13.4\text{kg.}$

Data Distribution

- Median
 - Middle point of range when data are ordered from smallest to largest
 - Provides better indication of “typical” value when data distribution is skewed (extreme scores) for ordinal data
 - $(1\text{kg.} + 2\text{kg.} + 3\text{kg.} + 6\text{kg.} + 55\text{kg.}) = 3\text{kg.}$

Data Distribution

- Mode
 - Most frequently occurring value
 - Useful in typifying nominal data
 - E.g., what size shoes do most 3rd graders wear?

Data Distribution

- Dispersion
 - Standard Deviation
 - Most common measure of how spread out the values are with reference to the mean in a data set
 - Useful in typifying variability among interval and ratio scale data
 - Wechsler scale has fixed SD

Data Distribution

- Semi-Interquartile Range
 - Measure of variability that can be used when extreme values are in your data set
 - $(\text{Quartile 3} - \text{Quartile 1})/2$
 - Less useful with normally distributed data

What Language Do Data Speak?



- **Relative Standing**
 - Standard scores
 - Percentile rank
- **Miscellaneous metrics**
 - Grade/age-equivalents
 - NPR's, etc.

Relative Standing



- **Standard scores** (equidistant intervals)
 - A transformed raw score that can be compared to other standard scores using a common metric (e.g. z, t, Wechsler)
 - Has designated mean and standard deviation
 - If you put grapes and oranges side-by-side it's not an easy comparison, but if you turn them both into juice you can then compare them using a common unit of measurement

Relative Standing



- **Percentile rank** (intervals not equidistant)
 - Percentage of scores at or below a particular score in the reference group
 - E.g. PR of 75 "means that your child's performance was the same or higher than 75% of students in comparison group"
 - Cannot average PR's

Miscellaneous Metrics



- **Stanines** (Standard nine-point scale)
 - Mean of 5 and SD of 2
 - Above average = (9,8,7)
 - Average = (6,5,4)
 - Below average = (3,2,1)
 - Useful for making broad comparisons but not for making fine distinctions in performance

Miscellaneous Metrics



- **Scaled scores**
 - Scaled scores are standard scores
 - Various scales exist
 - GRE-type = 200-800; mean = 500; SD = 100
 - Wechsler scaled scores = 1-19; mean = 10; SD = 3

Miscellaneous Metrics



- **Normal curve equivalent** ("NCE")
 - A standard score
 - 1-99; Mean = 50; SD = 21.06
 - Permits averaging of Percentile Ranks between groups since PR's cannot be averaged
 - Intervals are equidistant, unlike PR's

Miscellaneous Metrics



- National Percentile Rank (“NPR”)
 - Can compare an individual’s PR to the average PR of for instance, a national sample of students
 - PR’s cannot be averaged
 - NPR is derived from average NCE
 - RPR (SABE/2) is like NPR

Miscellaneous Metrics



- Age and grade equivalents
 - Mean raw score on a test for a group at a specific age or grade
 - AE (8 yrs.-0 mos.): e.g., if avg. score of a group of 8-0’s is 7/10 then someone who earns 7/10 has AE of 8-0
 - GE (3.2^{10th/grade}): e.g., if avg. score of a group of 3.2 graders is 15/20 then someone who earns 15/20 has GE = 3.2

Miscellaneous Metrics



--continued

- AE and GE intervals not equal
- AE and GE does not represent mastery level of curriculum
- AE/GE indicates that the student shares number of items correct with average student and not the level of functioning or mastery
- Many suggest **not using AE/GE at all**

Outline



- How are students with similar characteristics doing?
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 - Tools

How To Be Critical of Data When Choosing An Intervention



- IDEA 2004: IEP’s must include “a statement of the special education and related services and supplementary aids and services based on peer-reviewed research...”

How is Effectiveness Typically Measured?



- Experimental
 - Hypothesis testing
- Correlational
 - Strength and direction of relationship
- Meta-analytic
 - Studying the studies

How is Effectiveness Typically Measured?



- Experiments (in psychology/education)
- Tests effectiveness of a treatment on student(s)
 - Independent variable
 - Tx. variable (e.g, phonics training)

How is Effectiveness Typically Measured?



--continued

- Dependent variable
 - The outcome/effect of the independent variable (e.g, decoding scores)
- Helps us decide if effect of Tx. is significant

How is Effectiveness Typically Measured?



- Correlations
- r is most common method
 - Correlation coefficient ranges from -1.0 to +1.0
 - Represents degree and direction of relationship between to variables
 - .01 to .20 = little to none
 - .20 to .40 = weak
 - .40 to .60 = moderate
 - .60 to .80 = moderately strong
 - .80+ = very strong

How is Effectiveness Typically Measured?



- r^2 is coefficient of determination
 - Tells us proportion of variance in one variable that is predicted by another variable
 - E.g, for $r = .80$, $r^2 = .64$ (64%)
 - E.g., knowing parent choice of automobile predicts 64% of variation in child choice of automobile

How is Effectiveness Typically Measured?



- Meta-analysis
- MA is “statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings.”

How is Effectiveness Typically Measured?



- Cohen's d is often used metric when integrating results form several studies
 - E.g., 50 studies of a phonics intervention reported a wide variety of results, which often report data using different metrics
 - MA utilizes standardization of results (e.g, Cohen's d) for a global evaluation of results

How are results regarding effectiveness typically reported?



- Is the effect significant?
 - Likelihood of “true” effect
- Is the “true” effect large or small?
 - Magnitude of effect

How are results regarding effectiveness typically reported?



- Is the effect significant?
 - p -value is probability that result could have occurred by chance if H_0 were true (e.g, there is no real effect)
 - An obtained $p = .10$ will be compared to a preset criterion
 - $p < .05$ is common standard of acceptance

How are results regarding effectiveness typically reported?



- One might see “...results reveal [$t(26) = 4.1; p < .05$]”
 - Obtained test statistic
 - Degrees of freedom
 - p -value (alpha level/criterion level)
 - Example suggests that one can be reasonably confident that effect is not spurious

How are results regarding effectiveness typically reported?



- One might also see “...results reveal [$F(2,30) = 7.9; p < .05$]”
- Obtained test statistic (e.g, ANOVA)
Degrees of freedom
 p -value (alpha level/criterion level)

How are results regarding effectiveness typically reported?



- Is the “true” effect large or small?
 - “Effect size” is magnitude of effect
 - Results can be statically significant yet differ in magnitude
 - Typically use cohen's d
 - 0.2 to 0.5 = small effect
 - 0.5 to 0.8 = medium effect
 - 0.8+ = large effect

How are results regarding effectiveness typically reported?



- continued
 - Example: Both scenarios below are statistically significant at $p < .05$ level
 - Mean fluency for Group A (before Tx.) = 160 WPM; SD = 30
 - Mean fluency for Group B (after Tx.) = 190 WPM; SD = 40
 - Effect size of Tx. $d = .5$ (small/medium effect)
 - However, if SD's were 50 and 60 $d = .8$ (large effect)

Summary



- How do we compare students?
- How do we plot data?
- What can data tell us?
- What language do data speak?
- How to be critical of data when choosing an intervention

Outline



- How are students with similar characteristics doing?
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 - *Tools*

Progress Monitoring Measures

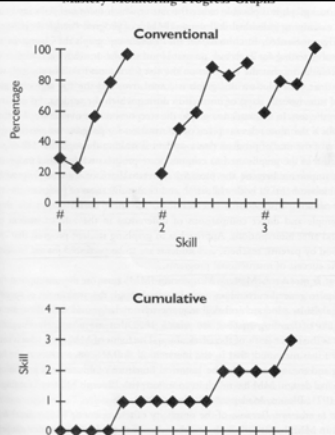


1. Description of Mastery Monitoring
2. Case example
3. Description of Curriculum Based Measurement
4. CBM Probes
5. CBM Uses
6. CBM Implementation

Mastery Monitoring



- Task analysis
- Subskills
- Objectives are steps along the way
- Use of data – move to next subskill?



Strengths of Mastery Monitoring



- Linked explicitly to skill being taught
- Provide information on skills learned & specific areas of weakness
- Short-term instructional objectives

Defensible Data



- Reduced bias
- High reliability and validity
- Answers need for instructional utility
- Are a standardized measure

VALIDITY AND RELIABILITY



- Reliability
 - Test/retest- .8 and above
 - Inter-rater

VALIDITY AND RELIABILITY



- Predictive/concurrent validity
 - CBM can provide information about students' current and future performance (Crawford, L., Tindal, G., & Stieber, S., 2001)
 - KDG predictors of 1st grade reading (Good, Simmons and Kame'enui, 2001; Marston, 1989; Shinn, M.R., Good, R.H., Knutson, N., Tilly, W.D., & Collins, V.L., 1992)
 - 1st grade letter naming and 5th grade STAR (Christo and Soutwell, 2001)
 - Significant correlations between CBM data and statewide end of year evaluations (Good, R.H., Simmons, D.C., & Kameenui, E.J., 2001)

RESEARCH BASE



- Informing instructional decisions
 - Stecker, P.M. and Fuchs, L.S., 2000
 - Deno, S.L., Fuchs, L.S., Marston, D., & Shin, J. 2001)
- Identifying students at risk of academic difficulties (VanDerHeyden, A.M., Witt, J.C., Naquin, G., & Noell, G. 2001)
- Re-integration decisions
- Language minority students
- See Progress Monitoring, AimsWeb sites for other links

ADDITIONAL RESEARCH



- Use as a pre-referral intervention (Weishaar, M.K., Weishaar, P.M., & Budt, C., 2002)
- Use with ethnic groups
 - Predictive bias (Hintze, J.M., Callahan III, J.E., Matthews, W.J., S. Williams, S.A., & Tobin, K.G., 2002)
 - Situational bias (Evans-Hampton, T.N., Skinner, C.H., Henington, C., Sims, S., & McDaniel, C.E., 2002)
- Word Callers (Hamilton, C. and Shinn, M.R., 2003)

ACCOUNTABILITY



- Provides a baseline of performance
- CBM can document effectiveness by showing change over time
- Achievement and accountability decisions are made on basis of classroom performance

CBM DOES NOT



- Give national normative data, except through Aimsweb.com and DIBELS
- Provide broad band information
- Is not diagnostic
 - Although error analysis (or qualitative evaluation of reading) can be used to provide further information

CBM PROBES



- Standardized delivery
- Available for reading, math, spelling, and written language
- Quick to administer and score
- Items are generated from the student's entire, annual curriculum or from published sources
- Easy to develop or many available through various resources

MATH PROBE



- Not only samples from the entire, annual curriculum but also representative of the problem types the student will encounter
- Group administration
- Three to five minute test
- Correct digits (CD) = the number of digits in the correct place on each problem

$\begin{array}{r} 7014 \\ 6481 \\ + 8659 \\ \hline 22,154 \end{array} (5)$	$\begin{array}{r} 650 \\ \times 6 \\ \hline 3900 \end{array} (4)$	$\begin{array}{r} 51 \\ \times 20 \\ \hline 1020 \\ 1020 \\ \hline 1020 \end{array} (10)$	$\begin{array}{r} 744 \\ - 456 \\ \hline 288 \end{array} (3)$
$\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array} (2)$	$\begin{array}{r} 27 \\ + 61 \\ \hline 88 \end{array} (2)$	$\begin{array}{r} 66 \\ \times 20 \\ \hline 00 \\ 1320 \\ \hline 1320 \end{array} (10)$	$\begin{array}{r} 7 \\ 12 \overline{)84} \\ \hline \end{array} (1)$
$\begin{array}{r} 5527 \\ 3866 \\ + 9824 \\ \hline 19,217 \end{array} (5)$	$\begin{array}{r} 6 \\ 5 \overline{)33} \\ \hline 6 \\ 30 \\ \hline 3 \end{array} (6)$	$\begin{array}{r} 70 \\ - 8 \\ \hline 62 \end{array} (2)$	$\begin{array}{r} 5963 \\ - 2042 \\ \hline 3921 \end{array} (4)$
$\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array} (2)$	$\begin{array}{r} 55 \\ 10 \overline{)550} \\ \hline 50 \\ 50 \\ \hline 0 \end{array} (9)$	$\begin{array}{r} 26 \\ \times 70 \\ \hline 00 \\ 1820 \\ \hline 1820 \end{array} (9)$	$\begin{array}{r} 12 \\ 5 \overline{)108} \\ \hline \end{array} (2)$
$\begin{array}{r} 1566 \\ 591 \\ + 8346 \\ \hline 10,503 \end{array} (5)$	$\begin{array}{r} 355 \\ \times 7 \\ \hline 2485 \end{array} (4)$	$\begin{array}{r} 125 \\ - 53 \\ \hline 72 \end{array} (2)$	$\begin{array}{r} 4210 \\ - 180 \\ \hline 4030 \end{array} (4)$



SPELLING



- Correct Letter Sequence (CLS) = a letter that is correctly placed next to another letter, character, or "nothing"
- $t^r^a^i^n^ = 6$ possible CLS
- $d^o^n^t^ = 6$ possible CLS

Writing



- Correct Word Sequence (CWS) = two adjacent writing units that are correct within the context of what's written
- Total Words Written = any letter or group of letters separated by a space
- Writing Prompts:
 - lead sentence
 - Think time (~1min)
 - Writing time (~2 mins)

READING PROBE

- One-on-one administration
- Three one-minute tests
- Median score recorded
- Correct Words Per Minute (CWPM) = number of correct words read

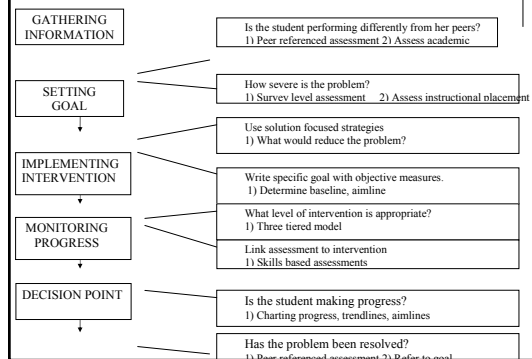
Practical use of CBM data: Individual, School, District

- Student progress in relation to others
- Student referral
- Promotion and retention
- Instructional program decisions
- Screening tool/Student Study Teams
- Summer School
- Progress monitoring
- Problem solving model

CBM USE (Con't)

- Special Education Goals
- Identify High Need Students
- Class Profile
- Parent Reports
- Student Study Team
- Program/Support Program Evaluation
- STAR Alternate Assessment

CBM Implementation: Creating Solutions



Gathering Information: Screening and Referral

- Is the student performing differently from her peers?
 - 1) Peer referenced assessment
 - 2) Assess academic environment
- How severe is the problem?
 - 1) Survey level assessment
 - 2) Assess instructional placement

SCREENING & REFERRAL: Determining Benchmarks

- Available norms
 - Online
 - Research studies
- Local data tied to important future outcome

DIBELS

Second Grade DIBELS Benchmark Goals

DIBELS Measure	Beginning of Year		Middle of Year		End of Year	
	Performance	Status	Performance	Status	Performance	Status
Oral Reading Fluency	ORF < 26	At Risk	ORF < 52	At Risk	ORF < 70	At Risk
	26 ≤ ORF < 44	Some Risk	52 ≤ ORF < 68	Some Risk	70 ≤ ORF < 90	Some Risk
	ORF ≥ 44	Low Risk	ORF ≥ 68	Low Risk	ORF ≥ 90	Low Risk

www.readnaturally.com

Grade	Percentile	Fall	Winter	Spring	Avg. Weekly
		WCPM*	WCPM*	WCPM*	Improvement**
1	90	81	111	1.9	
	75	47	82	2.2	
	50	23	53	1.9	
	25	12	28	1.0	
	10	6	15	0.6	
2	90	106	125	142	1.1
	75	79	100	117	1.2
	50	51	72	89	1.2
	25	25	42	61	1.1
	10	11	18	31	0.6

www.interventioncentral.org

InterventionCentral

Intervention Central offers free tools and resources to help school staff and parents to promote positive classroom

On-Line Tools

- *Behavior Reporter: Behavior Report Card Generator
- *Curriculum-Based Measurement List Builder
- *Jackpot! On-Line Reinforcer Survey Generator
- *Math Worksheet Generator
- *OK!?!? Reading Probe Generator
- *Char!Dog: Create CBM Charts
- *Test Score Analyzer 2.0

Favorite Downloads

- *DIBEL Evaluation Manual
- *Bully Prevention Booklet
- *Curriculum-Based Measurement Warehouse
- *Classroom Behavior Report Card Manual
- *Peer Tutor Training Manual
- *Reading Interventions Manual
- *School-Based Intervention Team (SBIT) Forms

behaviors and foster effective learning for all children and youth. The site was created by Jim Wright, a school psychologist from Central New York.

Visit to check out newly posted academic and behavioral intervention strategies, download publications on effective teaching practices, and use tools that streamline classroom

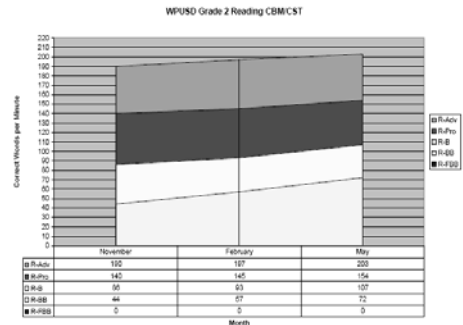
- ### Movies
- *Academic Intervention Ideas That Any Teacher Can Use [AVI Format/7.3MB]
 - *Difiant Kids: Communication Tools for Teachers [AVI Format/9.3MB]
- ### Contribute
- Your donation will help to keep Intervention Central free, free, free...

The screenshot shows the AIMSweb website interface. On the left, there are navigation buttons for 'Home', 'New', 'Help', 'Contact Us', 'Log Out', 'My Account', 'My Progress', 'My Reports', 'My Settings', and 'My Tools'. The main content area features a large graphic titled 'HOW THE AIMSWEB SYSTEM WORKS' with three main components: 1. PROGRESS MONITOR (Track all goals and monitor progress frequently for three months), 2. STRATEGIC MONITOR (Alerts of risk, identify students needing extra support), and 3. BENCHMARK (Establish benchmarks three times per year for early identification and accountability). Below this, there is a section for 'AIMSWEB BENCHMARK SYSTEM' and 'TIER 1: Benchmarks are established three times per year using DIBELS assessments. Regularly identify students at risk, help individualize instruction, evaluate student progress, demonstrate adequate yearly progress, and serve as an accountability and communication tool for system improvement.' A list of features includes: 'Establish benchmarks in the fall, winter, and spring of each school year', 'Generate and print professional classroom and student reports', 'Accurate and quickly identify students at risk', 'Enable evidence-based, individualized and data-driven decision making', and 'Monitor progress, demonstrate improvement, and Accurate Achievement Data Accountability'.

Math Fluency (Deno & Mirkin (1977))

Grade Level	Digits Correct per Minute	Significantly At Risk
1 to 3	10 to 19	<9
4 and above	25-39	<19

CBM/CST Reading



Gathering Information

- How severe is the problem?
- What general education services can be used?
- Survey level assessment



Gathering Information: Determining Discrepancy

- Discrepancy ratio is greater than 2
 - Average vs median for peer group
 - Peer median/Student median
 - $100/40 = 2.5$
- Criterion scores
 - Well below instructional range
 - Will vary with grade
- Percentile rank



Teacher Rank Order/ Percentile Rank

Western Placer Unified School District

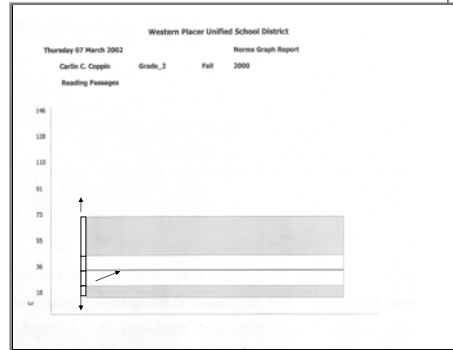
Thursday 07 March 2002
 Carlin C. Coppin Grade_2 Fall 2000

Task Title: Reading Passages High Score: 146 Low Score: 3
 Mean: 36.58 Std Deviation: 29.59

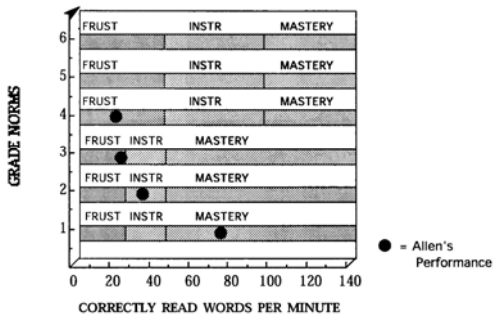
Student Name	Student Score	Percentile Rank
1	146	100
2	145	99
3	144	98
4	143	97
5	142	96
6	141	95
7	140	94
8	139	93
9	138	92
10	137	91
11	136	90
12	135	89
13	134	88
14	133	87
15	132	86
16	131	85
17	130	84
18	129	83
19	128	82
20	127	81
21	126	80
22	125	79
23	124	78
24	123	77
25	122	76
26	121	75
27	120	74
28	119	73
29	118	72
30	117	71
31	116	70
32	115	69
33	114	68
34	113	67
35	112	66
36	111	65
37	110	64
38	109	63
39	108	62
40	107	61
41	106	60
42	105	59
43	104	58
44	103	57
45	102	56
46	101	55
47	100	54
48	99	53
49	98	52
50	97	51
51	96	50
52	95	49
53	94	48
54	93	47
55	92	46
56	91	45
57	90	44
58	89	43
59	88	42
60	87	41
61	86	40
62	85	39
63	84	38
64	83	37
65	82	36
66	81	35
67	80	34
68	79	33
69	78	32
70	77	31
71	76	30
72	75	29
73	74	28
74	73	27
75	72	26
76	71	25
77	70	24
78	69	23
79	68	22
80	67	21
81	66	20
82	65	19
83	64	18
84	63	17
85	62	16
86	61	15
87	60	14
88	59	13
89	58	12
90	57	11
91	56	10
92	55	9
93	54	8
94	53	7
95	52	6
96	51	5
97	50	4
98	49	3
99	48	2
100	47	1



Pocket CBM: Quartile Distribution



Instructional Range



Setting and Writing Goals

- What would reduce the problem?
 - What level of intervention?
- Measurable goals with clear expectations
 - Level of progress needed should be clear
 - Long-term vs. short-term measurement

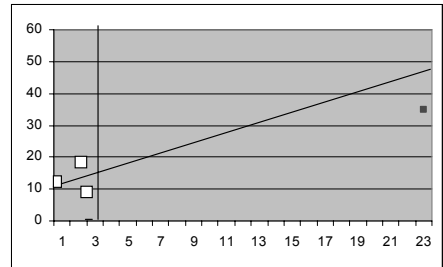


Setting and Writing Goals : Determining Goal



- Peer referenced
- Minimum competence
- Expert judgment
- Reasonable growth

Baseline and Aimline



Implementing Interventions



- Level of intervention necessary
 - How far is child from peers?
- Intervention focuses on meaningful skills that lead to increases in behavior measured.

Progress Monitoring In IDEA, 2004



- Essential to response to intervention
- Effectiveness of instruction and interventions
- Growth of at risk students

Progress Monitoring of All Students



- Helps to determine where resources need to be placed
- Where is need for support?
 - At student level
 - At classroom
 - At school
 - At district

Progress Monitoring in Rtl



- For some students
 - Measure general effectiveness of a given intervention for your specific population
 - Must show that instruction or intervention is effective for most students
- For individual students
 - Progress monitoring
 - Identification
 - Measuring performance in comparison
 - To peers
 - To a set standard
 - Measuring the response to intervention

Measures to Use

- Curriculum embedded measures
 - Link to measure for ongoing progress monitoring.
 - Many curriculums (particularly early reading) have basic mastery levels
 - Running records
- Goal Attainment Scale
- General Outcome Measures
 - CBM
 - Most useful in progress monitoring

ACES: Goal Attainment Scale

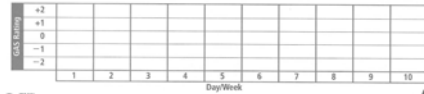
GAS with Descriptive Criteria for Monitoring Behavior Change



STEP 4. Implement Interventions: Consult the Academic Intervention Monitoring System (AIMS) guidebook or other resources that provide guidance in selecting and implementing interventions for academic difficulties.

STEP 5. Evaluate Interventions: Use the GAS graph below to monitor the student's progress during the intervention. Then re-administer an ACES at the conclusion of the intervention to document intervention outcomes.

Graph of Intervention Results



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<http://www.studentprogress.org/chart/chart.asp>

Standards

Tools Area

Standard	Reading	Writing	Math	Science	History	Art	Music	Physical Education	Health	Foreign Language	Career/Technical Education
Reading	*	*	*	*	*	*	*	*	*	*	*
Writing	*	*	*	*	*	*	*	*	*	*	*
Math	*	*	*	*	*	*	*	*	*	*	*
Science	*	*	*	*	*	*	*	*	*	*	*
History	*	*	*	*	*	*	*	*	*	*	*
Art	*	*	*	*	*	*	*	*	*	*	*
Music	*	*	*	*	*	*	*	*	*	*	*
Physical Education	*	*	*	*	*	*	*	*	*	*	*
Health	*	*	*	*	*	*	*	*	*	*	*
Foreign Language	*	*	*	*	*	*	*	*	*	*	*
Career/Technical Education	*	*	*	*	*	*	*	*	*	*	*

Monitoring Progress with CBM

- Is the student making adequate progress toward the academic standards?
- General direction
 - Three dot rule
- Plot trend or slope
 - Using Excel or other spreadsheet
 - By hand Self monitoring
- Using software in excel
- Using online services

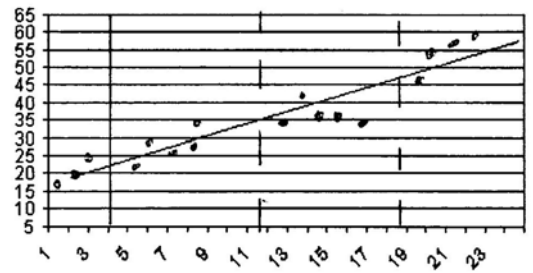
CBM PM - Hand

Appendix C: Progress Monitoring Charts



Jim Wright www.interventioncentral.org

MONITORING PROGRESS: Three Dot Rule

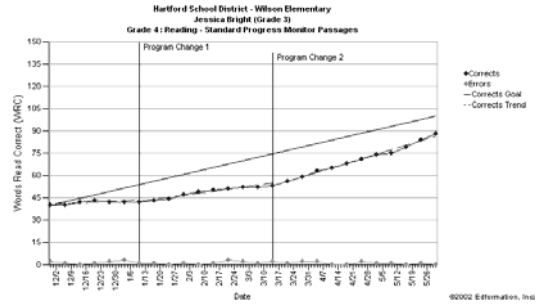


Using Software Programs

- ..\..\..\Desktop\cbmExcelChart Sample data.xls
- Available at www.interventioncentral.org
 - Also *chartdog* for online charts
 - Preformatted charts



Online programs: Aimsweb and DIBELS

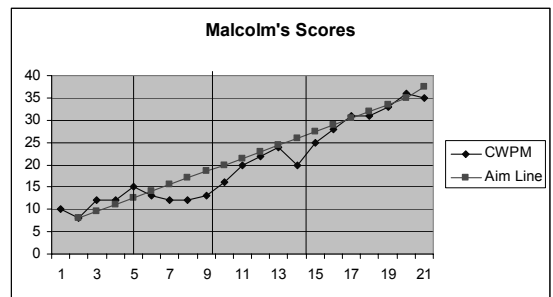


Guidelines for Monitoring Progress

- Use intervention guidelines for program
- “10 week” rule
- How much progress is enough?
 - Expected amount of growth
 - Expected trajectory



Evaluating Response to Varying Interventions



Making Decisions

- Has the problem been resolved?
 - Look at original goals
 - Peer referenced assessment
 - Is student within instructional range of classroom? (LRE)
- If no, what's next?
 - Re-consider level of service being provided
 - Does the intervention need changing?
 - Does he need a more intensive level of service?



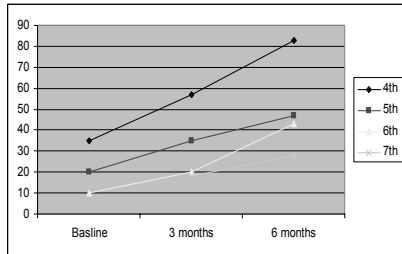
Monitoring Progress: Using Norm Referenced Measures

Bob's Scores



Monitoring Progress: Using General Outcome Measures

Bob's Scores



Summary

- There is no one perfect type of data
- Different types of data are useful for different purposes
- What are my needs?
 - To know where the whole school is compared to the district, state, nation?
 - To know where individual students are compared to peers, district, state, nation, self?
- As psychologists we must be astute users of data
 - Choose appropriate measures
 - Explain clearly

Resources: Websites for Progress Monitoring

- CBM and NCLB - <http://www.ed.gov/offices/OESE/SASA/aypstr/index.html>
- Training materials/probes www.interventioncentral.org
- Read Naturally www.readnaturally.com
- CBM Website List - <http://www.luc.edu/schools/education/c487/lap/velde.htm>
- Progress monitoring www.studentprogress.org
- www.aimsweb.com
- University of Oregon – Dibels <http://dibels.uoregon.edu> and www.idea.uoregon.edu
- Florida Project - <http://sss.usf.edu/cbm/cbm.htm>
- Excellent general site. www.studentprogress.org