What Is Next for Benchmark Goals?

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Special Thank You

- A special thank you to all of the site coordinators who made our benchmark goal study possible. They ensured fidelity to the research design, made sure all research activities were timely, and did a wonderful job of submitting data in time for analyses.

  Mary Giboney — Lisa Habedank Stewart
  Kristen MacConnell — Amy Murdoch
  Alecia Rahn-Blakeslee — Kristin Orton

- Thank you also to all of the school, teachers, students who worked to contribute to our knowledge of DIBELS Next.

Significant Advances in Reading Assessment to Inform Instruction

1. **Research Validated Benchmark Goals** and Cut Points for Risk. Benchmark goals and cut points for risk are empirically validated based on the odds of achieving future reading goals.
2. **Research Based DIBELS Composite Score**. The DIBELS Composite Score combines multiple DIBELS Next scores into a single composite that best predicts and measures outcomes.
3. **Extraordinary Control of Text Readability**. Passages at each grade level are developed, researched, and arranged to provide maximum control of text difficulty.
4. **DIBELS Instructional Grouping Worksheets, DIBELS Survey.**
5. And, First Sound Fluency replaces Initial Sound Fluency; NWF-Whole Words Read and Daze are added. And more!

Benchmark Goal Study Research Questions

- The Benchmark Goal Study was designed to address three research questions:

1. What levels of performance on *DIBELS Next* assessments predict a student is likely to score at or above the 40%ile on selected outcome measures?
2. What levels of performance on *DIBELS Next* assessments predict a student is unlikely to score at or above the 40%ile on selected outcome measures?
3. What are the correlations between *DIBELS Next* assessments and the Group Reading Assessment and Diagnostic Evaluation (GRADE), a criterion measure of reading proficiency that includes comprehension?

Participants

- Students recruited for the study were from 13 schools in five school districts representing five US regions.
- Participating school districts had a median of 10 years experience using DIBELS.
- Kindergarten through 6th grade students participated in *DIBELS Next* assessments (*n* = 3,816 total; 433 to 569 per grade). The percentage at benchmark ranged from 65% - 79% across grades and times of year.
- Subsamples of students participated in testing with an external criterion measure (Group Reading Assessment and Diagnostic Evaluation; GRADE) (*n* = 1257 total; 103 to 219 per grade). The GRADE subsample was 50% female on average across grades.

Participant Demographics

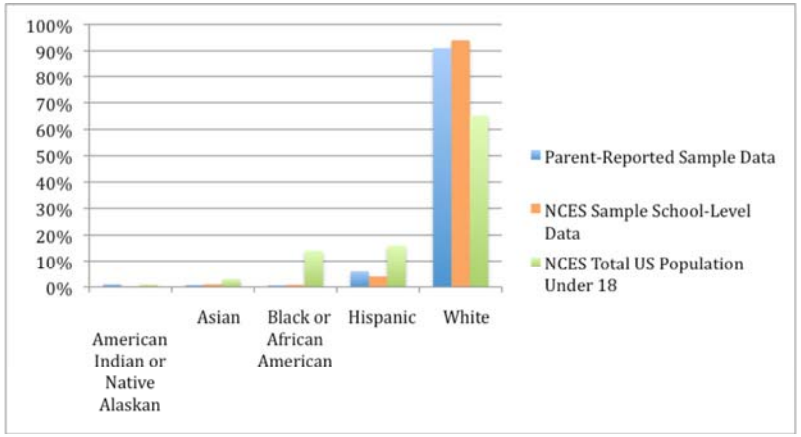
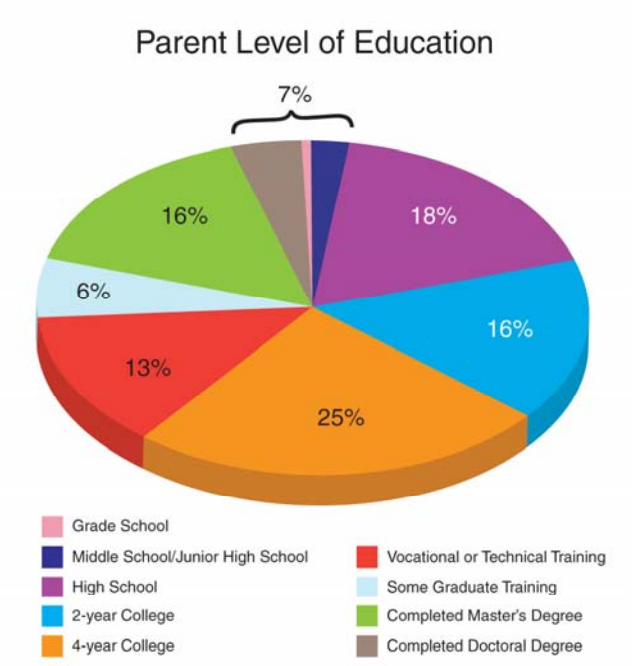
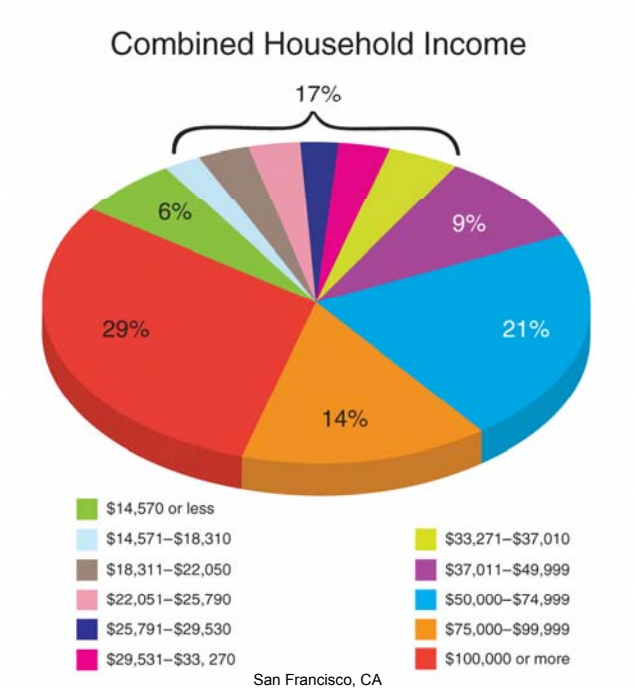


Figure 1. Racial/Ethnic Background





Measures: DIBELS Next

- The measures included all *DIBELS Next* assessments. *DIBELS Next* assessments include:
  - Letter Naming Fluency
  - First Sound Fluency
  - Phoneme Segmentation Fluency
  - Nonsense Word Fluency Correct Letter Sounds and Whole Words Read
  - Oral Reading Fluency Words Correct, Accuracy, and Retell.
  - Daze Adjusted Score (DIBELS-maze)
  - DIBELS Composite Score

Measures: Group Reading Assessment and Diagnostic Evaluation (GRADE)

- Un-timed and group administered. Appropriate for students in preschool through grade 12
- Five components and 16 subtests. Subtests combine to form the following composites:
  - Phonemic Awareness, Early Literacy Skills, Comprehension, Vocabulary, and Total Test.
  - We used the Total Test Raw Score for analyses.
- The GRADE has excellent reliability and validity for its intended purposes.
  - Reliability ranges from .77 to .98.
  - Correlation coefficients range from .69 to .86 with other group- and individually-administered achievement tests.

Procedures: Data Collection

- All Data were collected during the 2009-2010 school year
- *DIBELS Next* assessments were administered at regular benchmark intervals by trained school personnel using standardized procedures.
- GRADE testing occurred in the spring at the end of the year and was conducted across two to three sessions. Total testing time ranged from 60 to 90 minutes. The GRADE was administered by trained school personnel and onsite coordinators.

What is the Purpose of Benchmark Goals and Screening for Risk in Education?

Different standards, procedures, and requirements are necessary if our purpose is:

1. To quickly *identify* students that are likely to need additional support to *prevent* later academic difficulty.
2. To accurately identify students who are the *true* Tier 3 students or who have a *true* learning disability early.

- To specify important and meaningful future goals—a level of skills at a point in time where we can change the odds to being in favor of an individual's meeting subsequent goals.

We are troubled by the purpose of identifying *true* Tier 3 students. We think the future is not set. Tier 3 is not a characteristic of the student. There are no *true* Tier 3 students. Tier 3 is a level of support necessary for the student to make adequate progress.
No fate but what we make.

Our purpose is to prevent reading difficulty and enhance reading outcomes by providing targeted, differentiated instruction early.

Fourth Grade Reading Outcomes on the 2007 National Assessment of Educational Progress

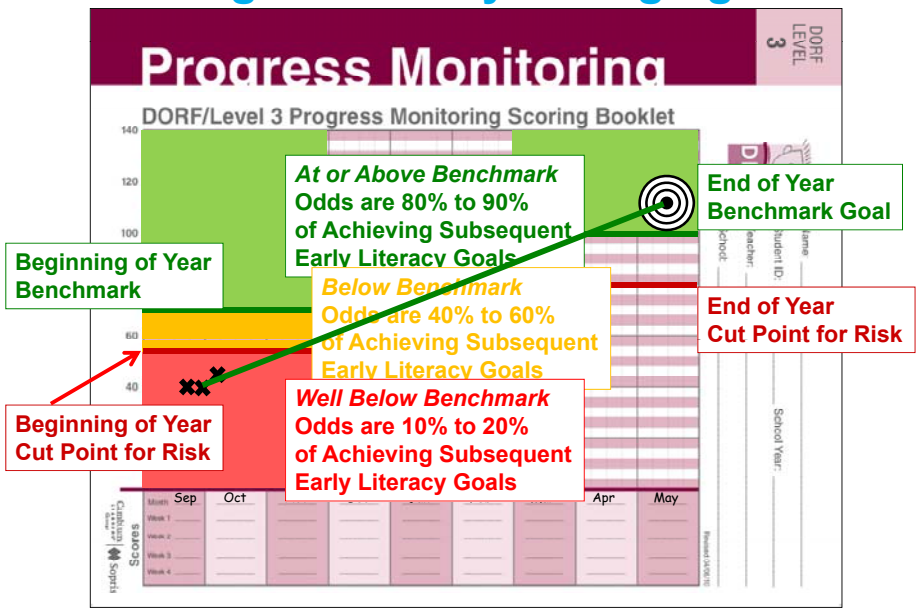
Skill Level	Skill level definition	National (public school) percent of fourth grade students *scoring below* (pp. 16, 52-53)	Nation (public) percent of fourth grade students from diverse backgrounds *scoring below* (pp. 54 & 57)
Basic	Basic denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at a given grade.	34%	54%, 51%, 49%, 50%
Proficient	Proficient represents solid academic performance. Students reaching this level have demonstrated competency over challenging subject matter.	68%	86%, 83%, 80%, 83%

Note: Students from diverse backgrounds includes students identified as Black, Hispanic, American Indian/Alaska Native, and eligible for free/reduced-price school lunch. From data reported in Lee, Grigg, & Donahue (2007).

Goal: Adequate Reading Skills

- Adequate reading skills should generalize across different state, national, and published reading tests.
- Adequate reading skills are not a normative decision, but are a socio-political judgment.
- The 40th percentile or above on a high quality, nationally norm-referenced test can serve as an approximation for adequate reading performance.
- Students at or above the 40th percentile on a high quality, nationally norm-referenced test are on track to be rated Basic or above on NAEP.
- We used the Group Reading Assessment and Diagnostic Evaluation (GRADE) in our initial research to provide an initial approximation of adequate reading skills.

Building Futures by Changing Odds



Evidence Base, Score Level, Likely Need for Support

	Outcome: Looking back	Screening: Looking forward
Odds of achieving subsequent early literacy goals	**Score level**	**Likely need for support to achieve subsequent early literacy goals**
80% to 90%	At or Above Benchmark *scores at or above the benchmark goal*	Likely to Need Core Support
40% to 60%	Below Benchmark *scores below the benchmark goal and at or above the cut point for risk*	Likely to Need Strategic Support
10% to 20%	Well Below Benchmark *scores below the cut point for risk*	Likely to Need Intensive Support

The fundamental rationale for benchmark goals and screening decisions is based on the odds of achieving subsequent early literacy goals.

DIBELS Composite Scores Provided the Framework

- DIBELS Composite Scores formed the backbone of the system of benchmark goals and cut points for risk.
- First, linked end of year DIBELS Composite Score to the end of year GRADE.
- Second, linked middle of year DIBELS Composite Score to the end of year DIBELS Composite Score.
- Third, linked beginning of year DIBELS Composite Score to the middle of year DIBELS Composite Score.
- Fourth, linked individual measures to the next DIBELS Composite Score.
  - For example, individual beginning of year measures were linked to the middle of year DIBELS Composite Score.

DIBELS Composite Score For Example Third Grade. Benchmark Goal: 220

Beginning, Middle and End of Year	
DORF Accuracy Percent	Accuracy Value
0% – 85%	0
86%	8
87%	16
88%	24
89%	32
90%	40
91%	48
92%	56
93%	64
94%	72
95%	80
96%	88
97%	96
98%	104
99%	112
100%	120

Beginning of Year Benchmark

DORF Words Correct = 99 [1]

Retell Score 39 x 2 = 78 [2]

Daze Adjusted Score 16 x 4 = 64 [3]

DORF Accuracy Percent: 98 %
100 x (Words Correct / (Words Correct + Errors))

Accuracy Value from Table = 104 [4]

DIBELS Composite Score (add values 1–4) = 345

Do not calculate the composite score if any of the values are missing (if DORF is below 40 and Retell is not administered, use 0 for Retell only on these worksheets).

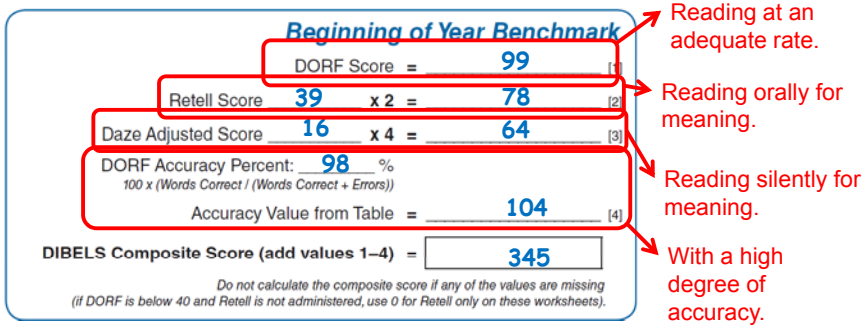
Measure	Score Level	Odds of being on track on the Middle of Year DIBELS Composite Score based on the Beginning of Year DIBELS Composite Score
DIBELS Composite Score	At or Above Benchmark	93%
	Below Benchmark	47%
	Well Below Benchmark	4%

DIBELS Composite Score Research Rationale

- DIBELS Composite Score explains more variance in reading outcomes than DORF Words Correct alone.
- Median 9% more, range 3% to 17%.
- DORF Words Correct alone is good, DIBELS Composite Score is better.

Grade and Time of Year	DORF Words Correct Predicting GRADE Total	DIBELS Composite Score Predicting GRADE Total	Additional Variance Explained by DIBELS Composite Score
Grade 1 Middle of Year	0.64	0.70	8%
Grade 1 End of Year	0.75	0.77	4%
Grade 2 Beginning of Year	0.69	0.75	8%
Grade 2 Middle of Year	0.76	0.80	5%
Grade 2 End of Year	0.73	0.75	3%
Grade 3 Beginning of Year	0.66	0.73	10%
Grade 3 Middle of Year	0.67	0.78	15%
Grade 3 End of Year	0.66	0.75	13%
Grade 4 Beginning of Year	0.76	0.80	5%
Grade 4 Middle of Year	0.76	0.80	6%
Grade 4 End of Year	0.75	0.80	8%
Grade 5 Beginning of Year	0.69	0.76	11%
Grade 5 Middle of Year	0.64	0.76	17%
Grade 5 End of Year	0.66	0.77	17%
Grade 6 Beginning of Year	0.64	0.71	9%
Grade 6 Middle of Year	0.59	0.68	12%
Grade 6 End of Year	0.61	0.73	16%

DIBELS Composite Score Educational Rationale



Students who are at or above benchmark on the DIBELS Composite Score are *reading for meaning* at an *adequate rate* and with a *high degree of accuracy*.

Primary Design Specifications for DIBELS Goals and Cut Points for Risk

- **Primary Specification**: At or Above Benchmark Decision on initial (screening) DIBELS assessment should provide favorable odds (80% -- 90%) of achieving subsequent reading outcomes. Benchmark Goal should provide a level where we are reasonably confident the student is making adequate progress.
- Below Benchmark Decision on initial DIBELS assessment should provide 50 – 50 odds (40% -- 60%) of achieving subsequent reading outcomes. Below the Benchmark Goal but above the Cut Point should provide a zone of uncertainty where we don't know if the student is making adequate progress or not.
- Well Below Benchmark Decision on initial DIBELS assessment should provide low odds (10% -- 20%) of achieving subsequent reading outcomes – ***unless*** intensive intervention is implemented. Below the Cut Point should provide a zone where we are reasonably confident the student will not make adequate progress -- unless we provide additional support.

Secondary Specifications for Benchmark Goals and Cut Points

- Marginal percents for the predictor close to marginal percents for the outcome.
  - The sample for the Benchmark Goal Study was a relatively high performing sample.
  - We tried have them appear equally high performing on DIBELS Next and the GRADE.
- Logistic Regression Analysis
  - Logistic regression predicted odds of about 60% or better at the exact goal score.
  - Logistic regression predicted odds of about 40% or below at the exact cut point for risk score.

Other Considerations DIBELS Goals and Cut Points

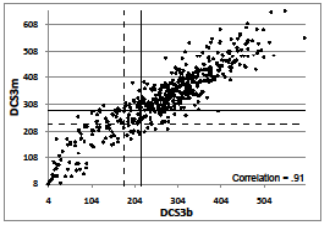
- Other considerations
  - Receiver Operator Characteristic Curve (ROC) analysis with large area under curve
  - Other metrics for decision utility
    - sensitivity,
    - specificity,
    - percent correct classification,
    - kappa
  - Coherent pattern of goals across measures and grades.

Setting Benchmark Goals and Cut Points for Risk

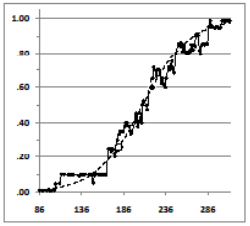
1. Examine scatterplot illustrating the relation between the screening assessment (earlier assessment or predictor) and the outcome assessment (later assessment).
   - DIBELS is a step-by-step model, so the outcome of one step is the predictor of the next step.
2. Examine the table of counts for each zone of the scatterplot.
3. Primary: Consider odds of students with each screening decision achieving goal.
4. Secondary: Consider marginal percents
5. Secondary: Consider logistic regression analysis
6. Other: Consider ROC curve and decision utility metrics
7. Other: Consider the overall pattern of goals and cut points.

Example Analysis Detail

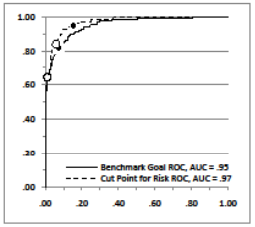
	Role	Variable	Goal	Cut Point	Description
Screening Decision	Predictor	DCS3b	220	180	DIBELS Composite Score, Grade 3, Beginning of Year
Outcome	Criterion	DCS3m	285	235	DIBELS Composite Score, Grade 3, Middle of Year



Scatterplot with benchmark goals (solid lines) and cut points for risk (dashed lines).



Logistic regression with goal (solid dot) and cut point (open dot).

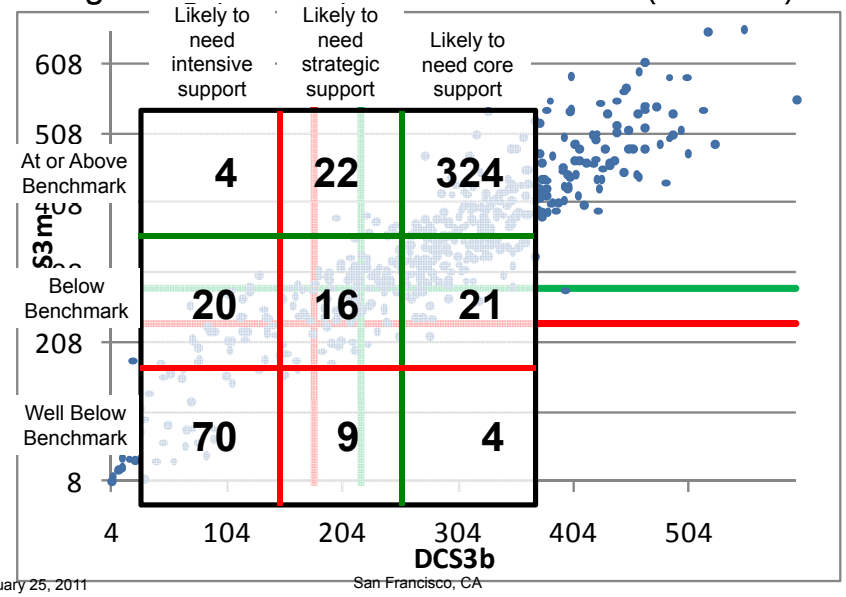


Receiver Operator Characteristic (ROC) curves.

	DCS3b Screening Decision:				
DCS3m Outcome:	Likely to need intensive support	Likely to need strategic support	Likely to need core support	Marginal total	Marginal percent
At or Above Benchmark	4	22	324	350	71%
Below Benchmark	20	16	21	57	12%
Well Below Benchmark	70	9	4	83	17%
Marginal Total	94	47	349	490	
Marginal Percent	19%	10%	71%		
Odds (conditional percent) of students with screening decision achieving goal (At or Above Benchmark)	4%	47%	93%		

	At or Above Benchmark outcome		Well Below Benchmark outcome	
	Core support decision	Intensive support decision	Core support decision	Intensive support decision
True Negative	324	346	345	383
False Negative	25	50	4	13
True Positive	115	90	79	70
False Positive	26	4	62	24
Sensitivity	.82	.64	.95	.84
Specificity	.93	.99	.85	.94
Negative Predictive Power	.93	.87	.99	.97
Positive Predictive Power	.82	.96	.56	.74
Accurate Classification	.90	.89	.87	.92
Kappa	.75	.70	.63	.75

Third Grade DIBELS Composite Score for Beginning (DCS3b) to Middle of Year (DCS3m)



Third Grade DIBELS Composite Score for Beginning (DCS3b) to Middle of Year (DCS3m)

	DCS3b Screening Decision:			
DCS3m Outcome:	Likely to need intensive support	Likely to need strategic support	Likely to need core support	Marginal total
At or Above Benchmark	4	22	324	350
Below Benchmark	20	16	21	57
Well Below Benchmark	70	9	4	83
Marginal Total	94	47	349	490

- Primary consideration: Odds of achieving outcome goal.
- Secondary consideration: Marginal Percents

Primary consideration: Odds of achieving goal

DCS3b Screening Decision:

DCS3m Outcome:	Likely to need intensive support	Likely to need strategic support	Likely to need core support	Marginal total
At or Above Benchmark	4	22	324	350
Below Benchmark	20	16	21	57
Well Below Benchmark	70	9	4	83
Marginal Total	94	47	349	490

- Core support beginning of year screening decision: 324 of 349 students achieve the middle of year goal, or 93% odds.
- Strategic support: 22 of 47 students achieve the goal, or 47% odds.
- Intensive support: 4 of 94 students achieve the goal, or 4% odds.

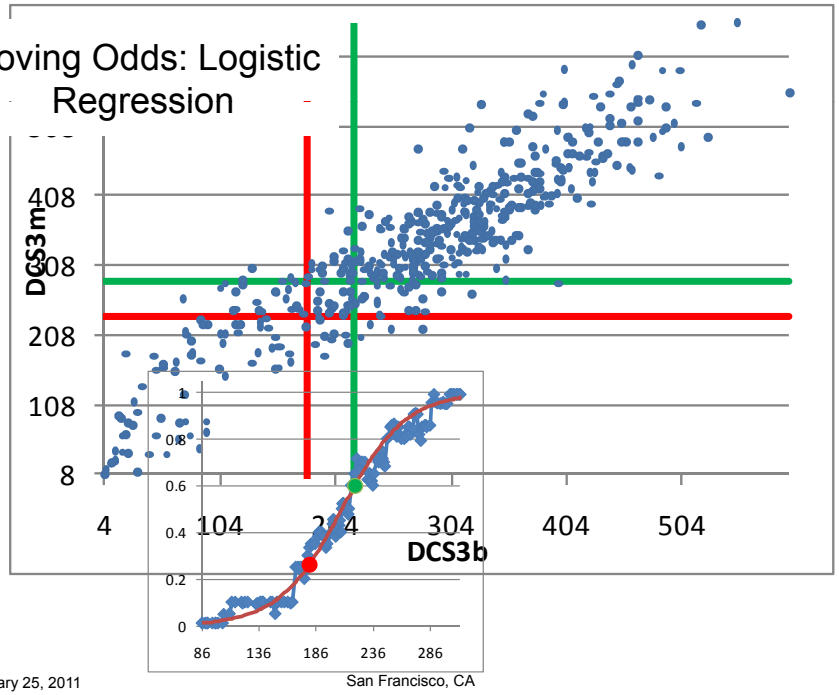
Also Considered Marginal Percents

DCS3b Screening Decision:

DCS3m Outcome:	Intensive support decision	Strategic support decision	Core support decision	Marginal total	Marginal percent
At or Above Benchmark	4	22	324	350	71%
Below Benchmark	20	16	21	57	12%
Well Below Benchmark	70	9	4	83	17%
Marginal Total	94	47	349	490	
Marginal Percent	19%	10%	71%		

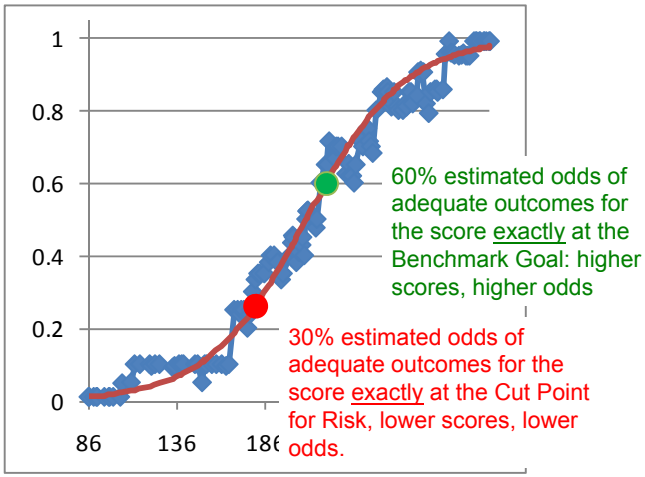
- Percent At or Above Benchmark at beginning of year is very close to the percent At or Above Benchmark in the middle of the year.
- Desirable for the screening decision to identify about the same percent of students that are expected on the outcome.

Moving Odds: Logistic Regression



Logistic Regression Estimates Odds of Adequate Outcomes for each Score

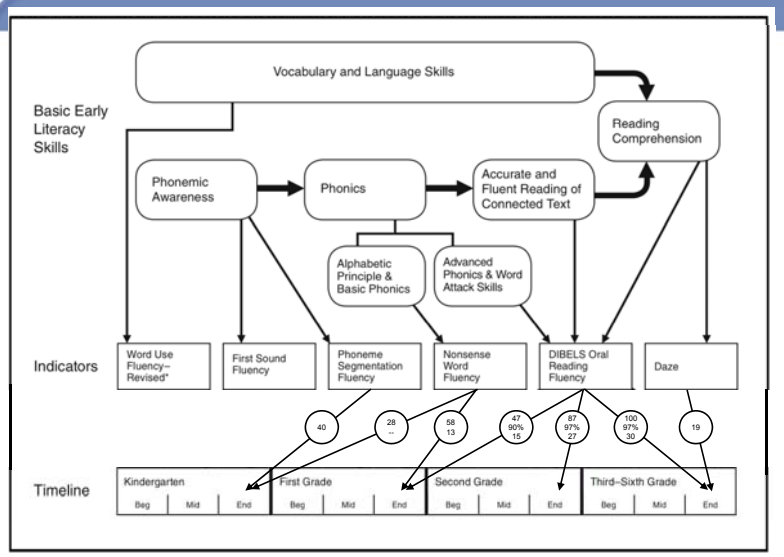
- Blue diamonds are moving proportion with adequate outcome.
- Red line is logistic regression estimated odds of adequate outcomes.



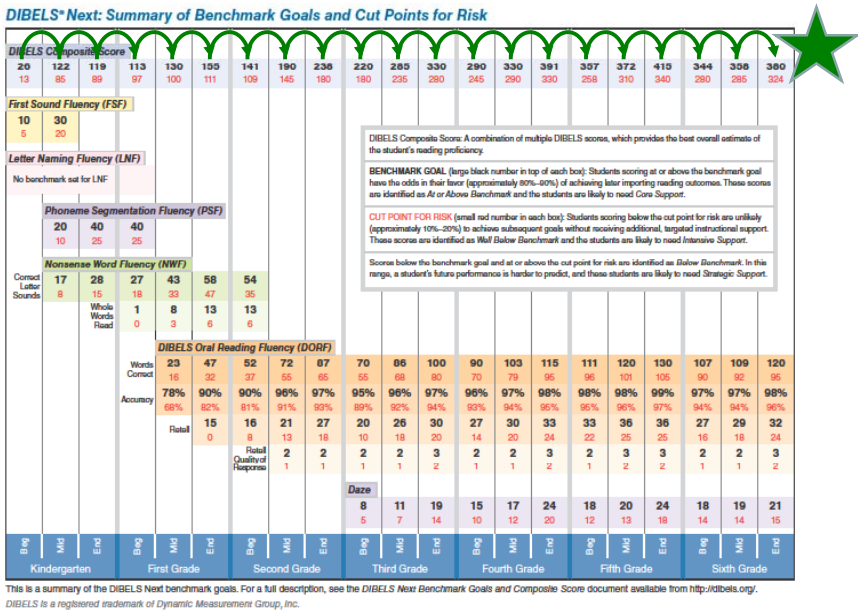
DIBELS is a Step-by-Step Model: Beginning to Middle; Middle to End;

- Mastering each step puts the odds in favor of mastering the next step.
  - **At or Above Benchmark**: Odds are generally 80% to 90% of achieving subsequent benchmark goals and important reading outcomes. **Student is likely to make adequate progress with effective core instruction**.
  - **Below Benchmark**: Odds are generally 40% to 60% of achieving subsequent benchmark goals and important reading outcomes. **Student is likely to need strategic support to make adequate progress**.
  - **Well Below Benchmark**: Odds are generally 10% to 20% of achieving subsequent benchmark goals and important reading outcomes. **Student is likely to need intensive support to make adequate progress**.
- Contiguous Continuity. Each step is a continuous process with a strong linkage. Each step is contiguous with the next step.

End of Year Benchmark Goals



*Word Use Fluency—Revised (WUF-R) is available as an experimental measure from http://dibels.org/. For Nonsense Word Fluency, the first number is the Correct Letter Sounds goal, and the second number is the Whole Words Read Goal. For DIBELS Oral Reading Fluency, the first number is the Words Correct goal, the second number is the Accuracy goal, and the third number is the Retell goal. For example, at the end of second grade a student should be able to read 87 words with 97% accuracy and retell of 27 words relevant to the passage. Third grade benchmark goals are illustrated, benchmark goals for grades 4 through 6 are available.



DIBELS® Next: Summary of Benchmark Goals and Cut Points for Risk

	Kindergarten			First Grade			Second Grade			Third Grade			Fourth Grade			Fifth Grade			Sixth Grade		
	Beg	Mid	End	Beg	Mid	End	Beg	Mid	End	Beg	Mid	End	Beg	Mid	End	Beg	Mid	End	Beg	Mid	End
DIBELS Composite Score	20 13	122 85	119 89	113 97	130 100	135 111	141 109	190 145	236 180	220 180	285 235	330 280	290 245	330 290	391 330	357 258	372 310	415 340	344 280	356 285	380 324
First Sound Fluency (FSF)	10 5	30 20																			
Letter Naming Fluency (LNF)	No benchmark set for LNF																				
Phoneme Segmentation Fluency (PSF)	20 10	40 25		40 25																	
Nonsense Word Fluency (NWF) Correct Letter Sounds	17 8	28 15		27 18	43 33	58 47	54 35														
Nonsense Word Fluency (NWF) Whole Words Read				1 0	8 3	13 6	13 6														
DIBELS Oral Reading Fluency (DORF) Words Correct				23 16	47 32	52 37	72 55	87 65		70 55	86 68	100 80	90 70	103 79	115 95	111 96	120 101	130 105	107 90	109 92	120 95
DIBELS Oral Reading Fluency (DORF) Accuracy				78% 68%	90% 82%	90% 81%	96% 91%	97% 93%		95% 89%	96% 92%	97% 94%	96% 93%	97% 94%	98% 95%	98% 95%	98% 96%	99% 97%	97% 94%	97% 94%	98% 96%
DIBELS Oral Reading Fluency (DORF) Retell				15 0	16 8	21 13	27 18			20 10	26 18	30 20	27 14	30 20	33 24	33 22	36 25	36 25	27 16	29 18	32 24
DIBELS Oral Reading Fluency (DORF) Retell Quality of Response					2 1	2 1				2 1	2 1	3 2	2 1	2 1	3 2	2 1	3 2	3 2	2 1	2 1	3 2
Daze										8 5	11 7	19 14	15 10	17 12	24 20	18 12	20 13	24 18	18 14	19 14	21 15

DIBELS Composite Score: A combination of multiple DIBELS scores, which provides the best overall estimate of the student's reading proficiency.

BENCHMARK GOAL (large black number in top of each box): Students scoring at or above the benchmark goal have the odds in their favor (approximately 80%–90%) of achieving later importing reading outcomes. These scores are identified as *At or Above Benchmark* and the students are likely to need *Core Support*.

CUT POINT FOR RISK (small red number in each box): Students scoring below the cut point for risk are unlikely (approximately 10%–20%) to achieve subsequent goals without receiving additional, targeted instructional support. These scores are identified as *Well Below Benchmark* and the students are likely to need *Intensive Support*.

Scores below the benchmark goal and at or above the cut point for risk are identified as *Below Benchmark*. In this range, a student's future performance is harder to predict, and these students are likely to need *Strategic Support*.

This is a summary of the DIBELS Next benchmark goals. For a full description, see the *DIBELS Next Benchmark Goals and Composite Score* document available from http://dibels.org/.

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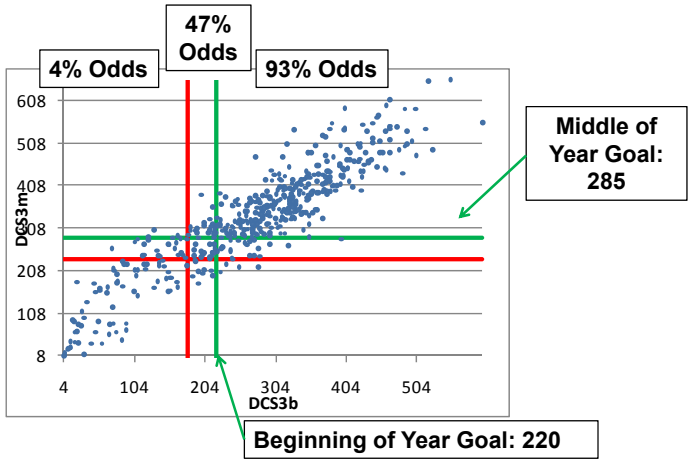
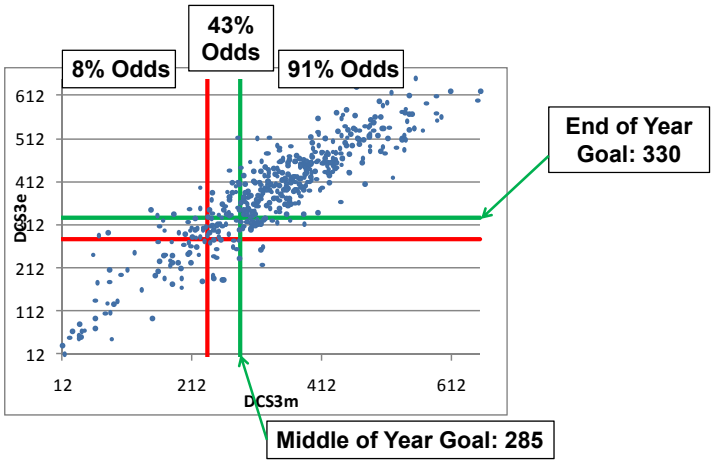
Third Grade DIBELS Composite Score for Beginning of Year (DCS3b) and Middle of Year (DCS3m)

- .91 correlation to DIBELS Composite Score at Middle of Year



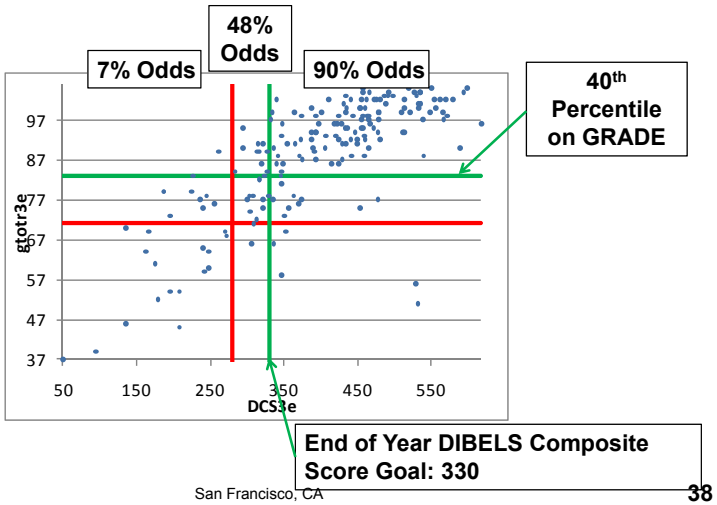
Third Grade DIBELS Composite Score for Middle of Year (DCS3m) and End of Year (DCS3e)

- .90 correlation to DIBELS Composite Score at End of Year



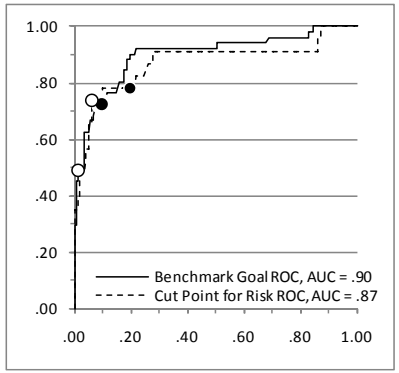
Third Grade DIBELS Composite Score for End of Year (DCS3e) and GRADE Total Raw Score (gtotr3e)

- .75 correlation to GRADE Total Raw Score at End of Year



Receiver Operator Characteristic Curve

- Larger area under the curve indicates favorable trade off of sensitivity and specificity.
- Decision points in the upper left bend of the curve indicate a favorable balance of sensitivity and specificity.



Receiver Operator Characteristic (ROC) curves.

Other Decision Utility Metrics End of Third Grade

We are troubled by the terminology. We think a "True Positive" is actually a student for whom we were not effective in ruining the prediction. A "False Positive" is a student for whom we have changed the future.

	At or Above Benchmark outcome		Well Below Benchmark outcome	
	Core support decision	Intensive support decision	Core support decision	Intensive support decision
True Negative	123	134	132	154
False Negative	14	26	5	6
True Positive	37	25	18	17
False Positive	13	2	32	10
Sensitivity	.73	.49	.78	.74
Specificity	.90	.99	.80	.94
Negative Predictive Power	.90	.84	.96	.96
Positive Predictive Power	.74	.93	.36	.63
Accurate Classification	.86	.85	.80	.91
Kappa	.63	.56	.39	.63

	Role	Variable	Goal	Cut Point	Description
Screening Decision	Predictor	DCS3e	330	280	DIBELS Composite Score, Grade 3, End of Year
Outcome	Criterion	gtotr3e	83	71	GRADE Total Test, Grade 3, End of Year

Caveats for Use

- DIBELS Next Benchmark Goals and Cut Points for Risk are specific to the DIBELS Next assessments, passage difficulty, and readability.
  - Alternative passages of a lower level of difficulty will require higher benchmark goals.
  - Alternative passages of a higher level of difficulty will require a lower benchmark goal.
- You cannot use DIBELS Next Benchmark Goals with other progress monitoring passages. Each set of passages must conduct their own research on benchmark goals.

Caveats for Use: Early Intervention and Prevention are Active Ingredients

- The effectiveness of the school-wide system of instruction can change the odds.
  - Differences in the effectiveness of Tier 1 instruction and Tier 2 & 3 intervention change the underlying relation between screener and outcome.
  - Less effective school-wide system Tier 1 instruction can decrease the odds of achieving subsequent early literacy goals for students who are at or above benchmark.
  - Increasing the effectiveness of Tier 2 & 3 intervention can increase the odds of achieving subsequent early literacy goals for students who are at risk.

Building Futures

- Key Point: The student's outcome is unknown and not fixed at the time of the screening. Instead, the outcome is the result of the targeted, differentiated instruction and intervention we provide as a direct result of the screening information.
- **Our instructional goal is to ruin screening predictions**
- For Example: If a child screens as at high risk on a measure of early literacy skills in Kindergarten, we know they are likely to need additional instructional support to be successful. Their later outcome, their reading skills in first grade for example, are a direct result of the targeted, differentiated instruction and early intervention that we provide.

Implications and Discussion

1. Using a composite is new way of using DIBELS Next data to improve our decision making
   - Understand where the cut points and goals come from and what they mean
   - Composites represent a more complete sample of behavior, better at almost every grade and time of year
     - "The beauty of the *DIBELS* Composite score is that it allows for easy and meaningful integration of information"
     - Represents accuracy, rate and meaning

Implications and Discussion, Cont'd

2. Some caveats
   - Still a screening measure
     - use yep, yep, huh? test and validate as needed
   - For instructional planning, look at individual test scores (e.g., K, DORF)

Implications and Discussion, Cont'd

3. How should we evaluate and think about screening measures? our job in the schools is to "ruin" the predictions for at risk students.
   – How would we know the "true" sensitivity and specificity of a measure?
   – At a practical level, this highlights the importance of a Tier Effectiveness Report or similar reports that track students over time

Implications and Discussion, Cont'd

4. Study bonus: Additional evidence of the strong correlation between CBM/DIBELS type measures and lengthier paper pencil measures of reading skills and comprehension, in this case the GRADE
   – More Info: Technical Manual, NASP poster
   – Personal Note: giving the GRADE in K was quite an experience!

What Questions Are There?