



## DIBELS Math Data Interpretation Mentor Webinar

## What is DIBELS<sup>®</sup> Math?

- ▶ A set of measures used to assess mathematics skills for students from kindergarten through sixth grade that can be used to:
  - ▶ Identify students who may be at risk for mathematics difficulties
  - ▶ Help teachers identify areas to target instructional support
  - ▶ Monitor progress of students
  - ▶ Examine the effectiveness of instructional support

## Foundations of DIBELS<sup>®</sup> Math

- ▶ *Prevention* focus—We CAN change outcomes for students
- ▶ DIBELS Math is one part of a *system*
- ▶ DIBELS Math is an *indicator*
- ▶ Teach mathematics concepts explicitly and thoroughly
- ▶ Monitor progress *frequently and efficiently*
- ▶ Use DIBELS Math within an *Outcomes-Driven Model of decision making*
- ▶ *Outcomes* drive instructional change

## DIBELS Math Measures

### Early Numeracy

- Beginning Quantity Discrimination
- Number Identification Fluency
- Next Number Fluency
- Advanced Quantity Discrimination
- Missing Number Fluency

### Computation

### Concepts and Applications

## Measures by Grade

	Beginning Quantity Discrimination	Number Identification	Next Number Fluency	Advanced Quantity Discrimination	Missing Number Fluency	Computation	Concepts and Applications
K	■	■	■				
1 <sup>st</sup>		■	■	■	■	■	
2 <sup>nd</sup>						■	■
3 <sup>rd</sup>						■	■
4 <sup>th</sup>						■	■
5 <sup>th</sup>						■	■
6 <sup>th</sup>						■	■

## Features of DIBELS Math

- Linked to CCSS
- Standardized
- Timed
- Brief
- Problem types carefully constrained within and across probes
- Purposes – universal screening and progress monitoring
- Benchmark goals



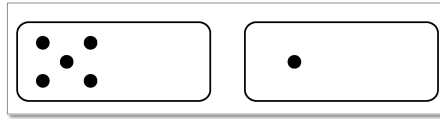
DIBELS<sup>®</sup> Math

## DIBELS Math Data Interpretation Webinar Review of the Measures

## Beginning Quantity Discrimination

<b>Skill</b>	Magnitude Comparison and Subitization (indirectly)
<b>Administration Time</b>	1 minute
<b>Administration Schedule</b>	Beginning of Kindergarten to end of Kindergarten
<b>Score</b>	1 point for each correctly identified number
<b>Wait Rule</b>	If the student does not respond within 3 seconds on an item, provide the correct answer and mark a slash (/) through the number
<b>Discontinue Rule</b>	Zero points in the first four items (the first page)

## Beginning Quantity Discrimination (BQD)



Format:

- ▶ Assessor shows page of dots to the student.
- ▶ The assessor then provides a set of standard directions that ask the student to say the number which represents the larger set of dots from two distinct sets of dots.

Score:

- ▶ Total of correctly identified numbers in 1 minute.

## Number Identification Fluency

<b>Skill</b>	Number Identification
<b>Administration Time</b>	1 minute
<b>Administration Schedule</b>	Beginning of kindergarten to beginning of first grade
<b>Score</b>	1 point for each correctly identified number
<b>Wait Rule</b>	If the student does not respond within 3 seconds on an item, provide the correct answer and mark a slash (/) through the number
<b>Discontinue Rule</b>	Zero points in the first five items (the first line)

## Number Identification Fluency



Format:

- ▶ Assessor shows page with numbers to the student.
- ▶ The assessor then provides a set of standard directions that ask the student identify the printed number before him/her (digits 1–99)

Score:

- ▶ Total of correctly identified numbers in 1 minute.

## Next Number Fluency

<b>Skill</b>	Counting (extending the counting sequence)
<b>Administration Time</b>	1 minute
<b>Administration Schedule</b>	Beginning of kindergarten to beginning of first grade
<b>Score</b>	1 point for each correct number
<b>Wait Rule</b>	If the student does not respond within 3 seconds on an item, and mark a slash (/) through the number
<b>Discontinue Rule</b>	Zero points in the first five items (the first line)

## Next Number Fluency

Next Number Fluency					
<b>3</b> (4)	<b>8</b> (9)	<b>33</b> (34)	<b>5</b> (6)	<b>15</b> (16)	_____
<b>37</b> (38)	<b>70</b> (71)	<b>10</b> (11)	<b>40</b> (41)	<b>11</b> (12)	_____
<b>19</b> (20)	<b>31</b> (32)	<b>6</b> (7)	<b>65</b> (66)	<b>13</b> (14)	_____
<b>36</b> (37)	<b>12</b> (13)	<b>58</b> (59)	<b>18</b> (19)	<b>41</b> (42)	_____
<b>7</b> (8)	<b>46</b> (47)	<b>20</b> (21)	<b>1</b> (2)	<b>16</b> (17)	_____
<b>27</b> (28)	<b>9</b> (10)	<b>43</b> (44)	<b>14</b> (15)	<b>4</b> (5)	_____
Total Score: _____					

Format:

- ▶ Assessor says a series of numbers, one at a time, to the student and asks the student to say the number that comes next.

Score:

- ▶ Total of correctly named numbers in 1 minute.

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## Advanced Quantity Discrimination

<b>Skill</b>	Magnitude Comparison
<b>Administration Time</b>	1 minute
<b>Administration Schedule</b>	Beginning of first to end of first
<b>Score</b>	1 point for each correct number
<b>Wait Rule</b>	If the student does not respond within 3 seconds on an item, provide the correct answer and mark a slash (/) through the number
<b>Discontinue Rule</b>	Zero points in the first six items (the first page)

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## Advanced Quantity Discrimination

<b>14</b>	<b>22</b>	<b>56</b>	<b>48</b>
<b>37</b>	<b>28</b>	<b>43</b>	<b>75</b>

Format:

- ▶ The assessor provides a set of standard directions that ask the student to provide the number that is more.

Score:

- ▶ Total of correctly named numbers in 1 minute.

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## Missing Number Fluency

<b>Skill</b>	Strategic Counting (extending the counting sequence—counting by 1s, 5s, 10s)
<b>Administration Time</b>	1 minute
<b>Administration Schedule</b>	Beginning of first to end of first grade
<b>Score</b>	1 point for each correct number
<b>Wait Rule</b>	If the student does not respond within 5 seconds on an item, provide the correct answer and mark a slash (/) through the number
<b>Discontinue Rule</b>	Zero points in the first six items

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## Missing Number Fluency

15            17    18

Format:

- ▶ The assessor provides a set of standard directions that ask the student to provide the missing number.

Score:

- ▶ Total of correctly identified numbers in 1 minute.

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## Computation

<b>Skill</b>	Basic Computation
<b>Administration Time</b>	2, 4, 5, 6 minutes per worksheet depending on grade
<b>Administration Schedule</b>	Beginning of first grade to end of sixth grade
<b>Score</b>	Correct digits in final answer
<b>Wait Rule</b>	No wait rule
<b>Discontinue Rule</b>	No discontinue rule

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## Practice Activity: Student Worksheet

DIBELS® Math Early Release / Computation Grade 4  
Benchmark 3 / Form B

					Total: _____
$\begin{array}{r} 882 \\ + 16 \\ \hline 898 \end{array}$	$\begin{array}{r} 1854 \\ + 1778 \\ \hline 3632 \end{array}$	$5\frac{1}{3} + 1\frac{1}{3} = 6\frac{2}{3}$	$\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$	$\begin{array}{r} 42 \\ 4 \overline{)738} \end{array}$	
$\begin{array}{r} 672 \\ - 332 \\ \hline 340 \end{array}$	$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$	$\begin{array}{r} 7126 \\ - 638 \\ \hline 7812 \end{array}$	$\begin{array}{r} 79 \\ \times 11 \\ \hline 790 \\ 869 \end{array}$	$6\frac{5}{8} + 5\frac{2}{8} = 11\frac{7}{8}$	
$\begin{array}{r} 80 \\ 2 \overline{)627} \end{array}$	$\begin{array}{r} 7 \\ 7 \overline{)21} \end{array}$	$\begin{array}{r} 98 \\ \times 48 \\ \hline 798 \\ 3920 \\ \hline 4688 \end{array}$	$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$	$\begin{array}{r} 253 \\ \times 6 \\ \hline \end{array}$	

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## Practice Activity: Teacher Key

DIBELS® Math Early Release / Computation Grade 4  
Benchmark 3 / Form B

					Total: _____
1. $\begin{array}{r} 882 \\ + 16 \\ \hline 898 \end{array}$	2. $\begin{array}{r} 1854 \\ + 1778 \\ \hline 3632 \end{array}$	3. $5\frac{1}{3} + 1\frac{1}{3} = 6\frac{2}{3}$	4. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$	5. $\begin{array}{r} 184r2 \\ 4 \overline{)738} \end{array}$	_____/26
6. $\begin{array}{r} 672 \\ - 332 \\ \hline 340 \end{array}$	7. $\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$ OR $\frac{1}{2}$ only (3)	8. $\begin{array}{r} 7126 \\ - 638 \\ \hline 6488 \end{array}$	9. $\begin{array}{r} 79 \\ \times 11 \\ \hline 869 \end{array}$	10. $6\frac{5}{8} + 5\frac{2}{8} = 11\frac{7}{8}$	_____/22
11. $\begin{array}{r} 80 \\ 2 \overline{)627} \end{array}$	12. $\begin{array}{r} 7 \\ 7 \overline{)21} \end{array}$	13. $\begin{array}{r} 98 \\ \times 48 \\ \hline 798 \\ 3920 \\ \hline 4704 \end{array}$	14. $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$ OR $\frac{1}{2}$ only (3)	15. $\begin{array}{r} 253 \\ \times 6 \\ \hline 1518 \end{array}$	_____/31

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## Concepts and Applications

<b>Skill</b>	Understanding math concepts and vocabulary, and applying that knowledge to solving problems.
<b>Administration Time</b>	8, 12 or 16 minutes per worksheet depending on grade
<b>Administration Schedule</b>	Beginning of second grade to end of sixth grade
<b>Score</b>	Correct digits in final answer or the exact answer
<b>Wait Rule</b>	No wait rule
<b>Discontinue Rule</b>	No discontinue rule

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1. Is the dotted line a line of symmetry for each shape? Write "yes" or "no" in the space provided below each shape.

2. Compare the number in Box 1 with the number in Box 2. Fill in the blank with > (greater than), = (equal to), or < (less than).

Box 1	>, =, <	Box 2
826		751
333		619
131		168

3. List three numbers that are multiples of 4.

4. Jake read 17 books over the summer that were non-fiction and 43 books that were fiction. His friend Rose read 38 books total. How many more books did Jake read than Rose? \_\_\_\_\_ books.

5. Compare the decimal in Box 1 with the decimal in Box 2. Fill in the blank with > (greater than), = (equal to), or < (less than).

Box 1	>, =, <	Box 2
0.39		0.68
0.47		0.35
0.89		0.91

6. We rented a movie that was 1 hour and 15 minutes long. How many minutes total was the movie? \_\_\_\_\_ minutes.

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## DIBELS Math Data Interpretation Webinar Outcomes Driven Model Step 1&2

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## DIBELS<sup>®</sup> Math Benchmark Goals

What is a Benchmark Goal?

A research-based target score

- ▶ Represents the lowest level of performance on a measure that predicts reaching the next goal
- ▶ Consists of three parts: a basic early numeracy skill, a level of performance, and a point in time
- ▶ If a student achieves a benchmark goal, the odds are in favor of that student achieving later mathematics outcomes

How are the Benchmark Goals derived?

Based on longitudinal research examining how a score on a measure at a point in time predicts later reading outcomes

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## Three Levels of Performance Compared to Benchmark Goals

If a student achieves a Benchmark Goal, the odds are in favor of that student achieving later mathematics outcomes.

- ▶ **Well Below Benchmark** Odds are generally 100% to 200% of high-achieving students. Benchmark goals and important mathematics outcomes. **Student is likely to likely to require support to make adequate progress.**

## Benchmark Goals

DIBELS Math Benchmark Goals and Cut Points for Risk for Kindergarten Children

DIBELS Math Measure	DIBELS Math Score Level	Likely Need for Support	Beginning of Year	Middle of Year	End of Year
DIBELS Math Early Numeracy Composite Score	At or Above Benchmark	Likely to Need Core Support	27+	48+	75+
	Below Benchmark	Likely to Need Strategic Support	11 - 26	31 - 47	51 - 74
	Well Below Benchmark	Likely to Need Intensive Support	0 - 10	0 - 30	0 - 50
Beginning Quantity Discrimination (BQD)	At or Above Benchmark	Likely to Need Core Support	5+	8+	11+
	Below Benchmark	Likely to Need Strategic Support	2 - 4	4 - 7	7 - 10
	Well Below Benchmark	Likely to Need Intensive Support	0 - 1	0 - 3	0 - 6
Number Identification Fluency (NIF)	At or Above Benchmark	Likely to Need Core Support	6+	13+	23+
	Below Benchmark	Likely to Need Strategic Support	3 - 5	7 - 12	13 - 22
	Well Below Benchmark	Likely to Need Intensive Support	0 - 2	0 - 6	0 - 12
Next Number Fluency (NNF)	At or Above Benchmark	Likely to Need Core Support	5+	10+	12+
	Below Benchmark	Likely to Need Strategic Support	1 - 4	6 - 9	9 - 11
	Well Below Benchmark	Likely to Need Intensive Support	0	0 - 5	0 - 8

The benchmark goal is the number provided in the At or Above Benchmark row. The cut point for risk is the first number provided in the Below Benchmark row. At the beginning and middle of year, the DIBELS Math Composite is  $2 * BQD + 1 * NIF + 2 * NNF$ . At the end of year, the DIBELS Math Composite is  $2 * BQD + 1 * NIF + 3 * NNF$ .

## Composite Scores

- Composite scores provide the best overall estimate of the student's skills.
- Composite scores take all of the measures into consideration
- Different weights are given to different measures depending on the time of year
- Composite scores may increase or decrease because of the number of measures that make up them (e.g. 1<sup>st</sup> grade from fall to winter)

## Benchmark Goals and Local Norms

- ▶ Benchmark Goals are available for the Early Numeracy and Computation grades 1-5.
- ▶ Schools should use local normative information, available through DIBELSnet, for Concepts and Applications and Computation grade 6 while the Benchmark Goals are developed.

## Interpreting Results: Local Norms

Local norms look at a student's performance relative to your school/district

- ▶ ½ of the students will be at or below average and ½ of the students will be at or above average
- ▶ The average only applies to your school/district
- ▶ Demographics of your school/district must be taken into account when examining performance
- ▶ Other districts may be higher or lower

The magnitude of the discrepancy can be used to determine whether intervention is necessary, and to set instructional goals.

Use the following rule of thumb:

- ▶ < 20 %ile = at risk
- ▶ 20 %ile–40%ile = some risk
- ▶ > 40 %ile = low risk

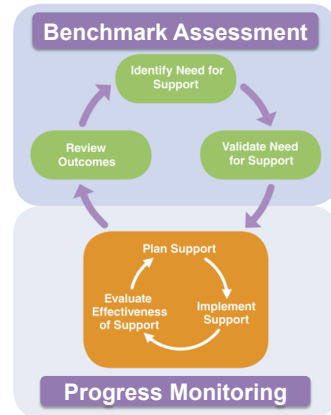
## Use of DIBELS® Math Measures within an Outcomes Driven Model

- ▶ Teachers have to use the data for instructional decision-making
- ▶ Can occur for both screening and progress monitoring
- ▶ A framework for using DIBELS Math data
  - System-level data—so all students reach outcomes
  - Student-level data—so each student reaches outcomes
- ▶ A series of steps, questions, and data sources to help answer the questions

## Outcomes-Driven Model

**Outcomes Driven Model** steps:

1. **Identify** need for support.
2. **Validate** need for support.
3. **Plan** and implement support.
4. **Evaluate** and modify support.
5. **Review** outcomes.



## ODM Step 1. Identify Need for Support

ODM Step	Questions: Systems	Questions: Student
1. Identify Need for Support	Are there students who may need support? How many students may need support?	Which students may need support?
2. Validate Need for Support	Are we reasonably confident in the accuracy of our data overall?	Are we reasonably confident that the identified students need support?
3. Plan and Implement Support	At what grade levels and/or in what areas may support be needed? What are our system-wide goals? What is our system-wide plan for support?	What are the student's skills and needs? What is the plan of support for the student, including goals and plan for progress monitoring?
4. Evaluate and Modify Support	Are we making progress toward our system-wide goals? Is our system of support effective?	Is each student making adequate progress? Is the support effective for individual students?
5. Review Outcomes	Have we met our system-wide goal? Is our system of support effective? Are there students who may need support? How many students may need support?	Has the support been effective for individual students? Has the student met his/her goal? Which students may need support?

# Are There Students Who Need Instructional Support?

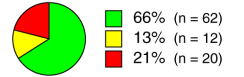
## School or District Overview Report

Summarizes percent of students whose scores fall at/above, below, or well below the benchmark goal

Includes all of the measures used in that grade at that time of the year

### Beginning of Year

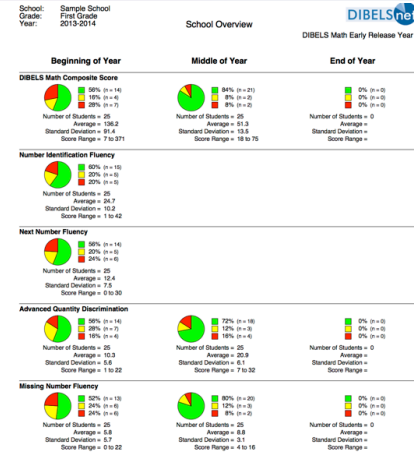
#### DIBELS Composite Score



Number of Students = 94  
Average = 330  
Standard Deviation = 107.8  
Score Range = 47 to 626

Status	Score Level	Likely Need For Support
At or Above Benchmark	At or Above Benchmark	Likely to Need Core Support
Below Benchmark	Below Benchmark	Likely to Need Strategic Support
Well Below Benchmark	Well Below Benchmark	Likely to Need Intensive Support

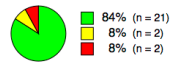
# Sample School Overview Report 1st Grade



# Sample School Overview Report 1st Grade MOY

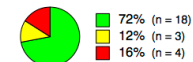
## DIBELS Math Composite Score

### Middle of Year



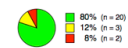
Number of Students = 25  
Average = 51.3  
Standard Deviation = 13.5  
Score Range = 18 to 75

### Advanced Quantity Discrimination



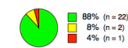
Number of Students = 25  
Average = 20.9  
Standard Deviation = 6.1  
Score Range = 7 to 32

### Missing Number Fluency



Number of Students = 25  
Average = 8.8  
Standard Deviation = 3.1  
Score Range = 4 to 16

### Math Computation



Number of Students = 25  
Average = 12.8  
Standard Deviation = 4.3  
Score Range = 3 to 25

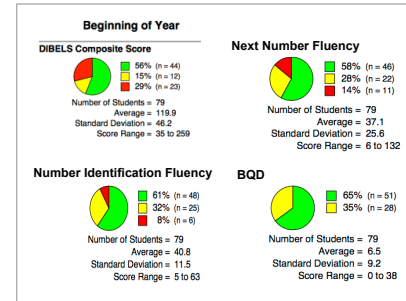
# Are There Students Who Need Instructional Support?

Is the next step to analyze and improve core mathematics instruction at Tier 1 or to plan Tier 2?

Overall, the vast majority of students are on track

On which skills will students need additional support in Tier 1?

12–28% of students are not on track, which is a reasonable number for which to plan Tier 2 supports



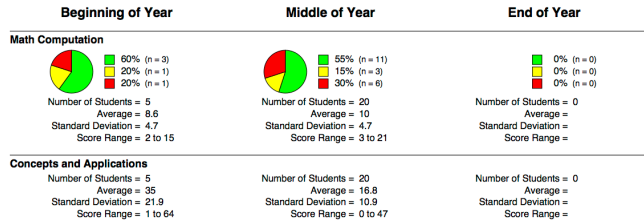
## Sample Overview Report – Local Norms

School: Sample School  
Grade: Second Grade  
Year: 2013-2014

### School Overview



DIBELS Math Early Release Year 2



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## ODM Step 2. Validate Need for Support

ODM Step	Questions: Systems	Questions: Student
1. Identify Need for Support	Are there students who may need support? How many students may need support?	Which students may need support?
2. Validate Need for Support	Are we reasonably confident in the accuracy of our data overall?	Are we reasonably confident that the identified students need support?
3. Plan and Implement Support	At what grade levels and/or in what areas may support be needed? What are our system-wide goals? What is our system-wide plan for support?	What are the student's skills and needs? What is the plan of support for the student, including goals and plan for progress monitoring?
4. Evaluate and Modify Support	Are we making progress toward our system-wide goals? Is our system of support effective?	Is each student making adequate progress? Is the support effective for individual students?
5. Review Outcomes	Have we met our system-wide goal? Is our system of support effective? <i>Are there students who may need support? How many students may need support?</i>	Has the support been effective for individual students? Has the student met his/her goal? <i>Which students may need support?</i>

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## ODM Step 2: Validate Need for Support System Level

Before moving forward to plan instruction, scan the system level data:

- ▶ Are we *reasonably confident* that the data were collected accurately?
- ▶ Did all assessors receive adequate training and practice?
- ▶ Did we conduct accuracy checks and/or shadow scoring?
- ▶ Are there inconsistencies in the pattern of data?

What data can you use?

- ▶ Assessment Accuracy Checklists
- ▶ Shadow Scoring Documentation

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## ODM Step 2. Validate Need for Support

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1. Identify Need for Support	Are there students who may need support? How many students may need support?	Which students may need support?
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5. Review Outcomes	Have we met our system-wide goal? Is our system of support effective? <i>Are there students who may need support? How many students may need support?</i>	Has the support been effective for individual students? Has the student met his/her goal? <i>Which students may need support?</i>

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## Step 1: Identify Need for Support Student Level

### Which Students May Need Support?

The *Classroom or Instructional Group Report* provides information on individual students at a given assessment period. The Classroom Report includes all the students from one class.

The Classroom Report shows:

- ▶ The student's score on each measure and on the DIBELS Math composite.
- ▶ The likely need for support category (i.e., Needs Core, Strategic, or Intensive Support) for the student's score on each measure and on the composite.
- ▶ Percentile ranks for the student's score on each measure to show the student's performance in relation to all participating students in the district.

## Sample Classroom Report: Middle of 1st

School: Sample School  
Grade: First Grade, Middle of Year  
Year: 2013-2014  
Class: Sample 1st

DIBELS Math Early Release Year

Classroom Report

■ At or Above Benchmark / Likely to Need Core Support    
 ■ Below Benchmark / Likely to Need Strategic Support    
 ■ Well Below Benchmark / Likely to Need Intensive Support

NAME	STUDENT ID	AQD		MNF		COMPUTATION		COMPOSITE	
		Score	Local %ile	Score	Local %ile	Score	Local %ile	Score	Local %ile
Anderson, Caleb	011	22	46	9	42	12	44	50	52
Brown, Aidan	005	25	72	10	72	14	58	59	70
Clark, Emmett	019	25	72	12	78	25	98	74	94
Davis, Sophia	006	20	38	10	72	8	10	48	46
Harris, Ethan	015	7	2	4	4	3	2	18	2
Jackson, Benjamin	013	25	72	13	88	19	54	70	90
Johnson, Charlotte	002	10	8	9	60	15	70	43	18
Jones, Amelia	004	17	24	5	14	14	58	41	14
King, Emily	004	28	66	7	26	16	62	56	62
Lee, Hannah	000	24	58	13	88	7	6	27	66
Martin, Norah	016	27	90	16	88	16	62	75	98
Miller, Oliver	007	29	52	9	60	10	28	51	58
Moore, Grayson	009	15	18	9	60	12	44	45	28
Nelson, Carter	003	29	58	6	42	9	18	45	28
Robinson, Grace	018	10	8	4	4	9	18	27	6
Smith, Liam	001	29	52	7	26	10	28	47	38
Taylor, Scarlett	010	29	72	7	26	11	34	50	52
Thomas, Emma	012	17	24	6	42	14	58	47	38
Thompson, Levi	017	30	38	9	60	9	18	47	38
Turner, Andrew	025	28	84	8	42	16	62	60	74
Walker, Finn	021	25	72	13	88	17	62	68	86
White, Lily	014	29	72	13	88	12	44	63	80
Williams, Noah	003	19	30	5	14	15	70	44	22
Wilson, Ava	008	32	98	8	42	15	70	63	80
Young, Natalie	022	12	14	5	14	12	44	34	10
GOAL		18		7		9		43	
AVERAGE		20.9		8.8		12.8		51.3	

## Sample Classroom Report: Middle of 2nd

School: Sample School  
Grade: Second Grade, Middle of Year  
Year: 2013-2014  
Class: Sample 2nd

Classroom Report

■ At or Above Benchmark / Likely to Need Core Support    
 ■ Below Benchmark / Likely to Need Strategic Support

NAME	STUDENT ID	COMPUTATION		CSA	
		Score	Local %ile	Score	Local %ile
Alleva, Regan	30002	7	33	7	20
Bading, Maria	MB2	9	40	11	30
Bevin, Bernardo	BB2	3	5	0	3
Bolstad, Leo	LB2	3	5	2	13
Eizenstat, Cooper	30004	12	65	1	8
Elrod, Asher	AE2	13	78	26	85
Featherson, Tommy	TF2	15	85	47	98
Hearst, Hadley	30005	16	93	26	85
Houck, Bert	BH2	12	65	18	58
Manese, Peyton	30003	5	20	20	68
McKay, Marian	MM2	12	65	13	38
Moffat, Anita	AM2	10	50	17	50
Nicolini, Dan	DN2	12	65	17	50
Pacholoni, Elsa	EP2	5	20	23	73
Paige, Lincoln	30001	5	20	11	30
Raymer, Will	WR2	15	85	24	78
Rodriguez, Annie	AR2	21	98	30	93
Ru, Carmen	CR2	5	20	16	43
Snyder, Emily	ES2	10	50	7	20
Tretter, Michael	MT2	9	40	19	63
GOAL		10			
AVERAGE		10.0		16.8	

## Validate Need for Support at the Student Level


What do you need to know?

- ▶ Are we *reasonably confident* the student needs instructional support?
  - \* Rule out easy reasons for unexpected performance: bad day, confused on directions or task, ill, shy, or error in assessment administration

What data can you use?

- ▶ Any additional available assessment data
- ▶ Repeat DIBELS Math assessments using progress monitoring booklets.
  - \* General guideline: At least 2 more times, not on the same day but within 1 week





**DIBELS<sup>®</sup> Math**

# DIBELS Math Data Interpretation Webinar Outcomes Driven Model Step 3

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## ODM Step 3. Plan Support

ODM Step	Questions: Systems	Questions: Student
1. Identify Need for Support	Are there students who may need support? How many students may need support?	Which students may need support?
2. Validate Need for Support	Are we reasonably confident in the accuracy of our data overall?	Are we reasonably confident that the identified students need support?
3. Plan and Implement Support	At what grade levels and/or in what areas may support be needed? What are our system-wide goals? What is our system-wide plan for support?	What are the student's skills and needs? What is the plan of support for the student, including goals and plan for progress monitoring?
4. Evaluate and Modify Support	Are we making progress toward our system-wide goals? Is our system of support effective?	Is each student making adequate progress? Is the support effective for individual students?
5. Review Outcomes	Have we met our system-wide goal? Is our system of support effective? <i>Are there students who may need support? How many students may need support?</i>	Has the support been effective for individual students? Has the student met his/her goal? <i>Which students may need support?</i>

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## What is our Plan to Achieve System Goal?

Consider these variables when analyzing and improving core mathematics instruction:

- ▶ Protected block of time for instruction
- ▶ Research-based scope and sequence and instructional strategies are well trained and implemented with fidelity
- ▶ Majority of time spent in small, flexible, skill-based groups
- ▶ Resources come to classroom to support small groups
- ▶ All students receive core instruction—not removed from classroom for special education, speech, etc.
- ▶ Tier 2 supports are in addition to, not instead of Tier 1
- ▶ Screening data are used to inform instruction and groups; progress monitoring data informs changing groups
- ▶ Sufficient common planning time is available weekly

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## ODM Step 3. Plan Support

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## Step 3: Planning Support at the Student Level

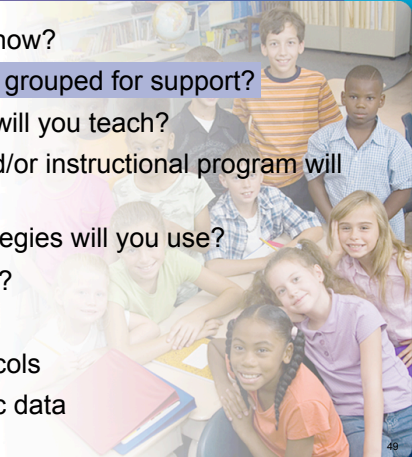
What do you need to know?

- ▶ How will children be grouped for support?
- ▶ What specific skills will you teach?
- ▶ What curriculum and/or instructional program will you use?
- ▶ What materials/strategies will you use?

What data can you use?

- ▶ Classroom Report
- ▶ Individual test protocols
- ▶ Additional diagnostic data

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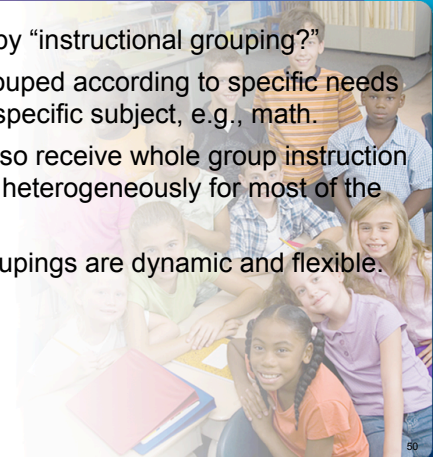


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## What is Instructional Grouping and Why Do It?

- ▶ What do we mean by “instructional grouping?”
  - \* Students are grouped according to specific needs for support in a specific subject, e.g., math.
  - \* Students may also receive whole group instruction and be grouped heterogeneously for most of the school day.
  - \* Instructional groupings are dynamic and flexible.

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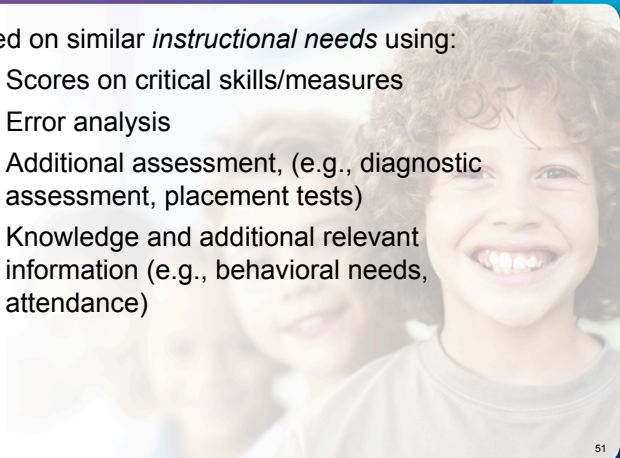
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## How Will Students Be Grouped?

Based on similar *instructional needs* using:

- ▶ Scores on critical skills/measures
- ▶ Error analysis
- ▶ Additional assessment, (e.g., diagnostic assessment, placement tests)
- ▶ Knowledge and additional relevant information (e.g., behavioral needs, attendance)

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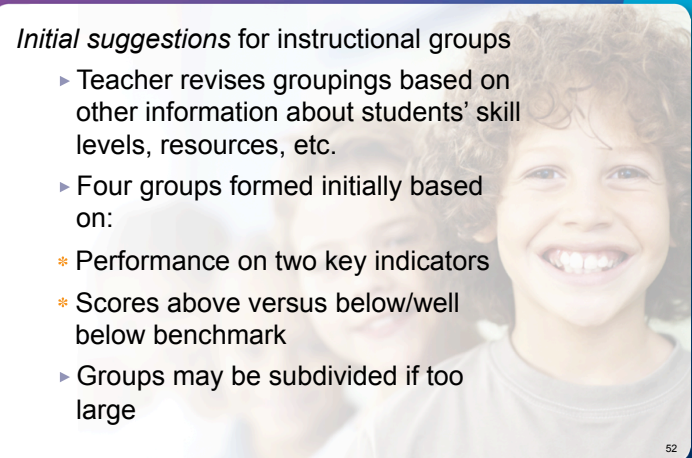
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## Grouping Worksheets

*Initial suggestions* for instructional groups

- ▶ Teacher revises groupings based on other information about students' skill levels, resources, etc.
- ▶ Four groups formed initially based on:
  - \* Performance on two key indicators
  - \* Scores above versus below/well below benchmark
- ▶ Groups may be subdivided if too large

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## Grouping Worksheets

Initial grouping based on performance on two key indicators.

	BOY	MOY	EOY
<b>Kindergarten</b>	BQD NIF (remember to look at NNF)	NIF NNF (remember to look at BQD)	NIF NNF (remember to look at BQD)
<b>First Grade</b>	NNF AQD (look at other measures)	AQD Computation (look at other measures)	MNF Computation (look at other measures)
<b>Second Grade</b>	Computation, Concepts and Applications	Computation, Concepts and Applications	Computation, Concepts and Applications
<b>Third Grade</b>	Computation, Concepts and Applications	Computation, Concepts and Applications	Computation, Concepts and Applications

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## Four Initial Groups

<p><b>Group 1.</b> Above benchmark goal on both key indicators</p>	<p><b>Group 2.</b> Above benchmark goal on one key indicator; below/well below on the other</p>
<p><b>Group 3.</b> Below/well below benchmark goal on one key indicator; above on the other (opposite of Group 2)</p>	<p><b>Group 4.</b> Below/well below benchmark goal on both key indicators</p>

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## Example: Grouping Students for Instruction Middle of First Grade

Possible patterns at the middle of first grade:

1. At/Above Benchmark on AQD and At/Above Benchmark on Computation
2. At/Above Benchmark on AQD and Below or Well Below Benchmark on Computation
3. Below or Well Below Benchmark on AQD and At/Above Benchmark on Computation
4. Below or Well Below Benchmark on AQD and Computation

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## Instructional Grouping: Summary

- ▶ One purpose of collecting DIBELS® Math data is to inform instructional groups.
- ▶ DIBELS® Math benchmark scores can be used to form initial groups based on the mathematical skills that students have mastered and the ones they need to work on next.
- ▶ Once initial groups are formed, subgroups may be formed based on patterns of scores and performance.

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## Instructional Grouping: Summary

- ▶ A goal of small group instruction is to differentiate instruction *within* Tiers (Tier 1, Tier 2, Tier 3).
- ▶ Matching instruction to student need is a critical practice in a Response to Intervention model of increasing student achievement.

## What Specific Skills?

For specific skill level use:

- ▶ Error analysis of DIBELS® Math performance
- ▶ Knowledge of child performance in class
- ▶ Curriculum-linked assessment, e.g., mastery measures, end of unit tests
- ▶ Diagnostic assessment as needed

The primary questions are:

- ▶ *What can the student do?*
- ▶ *What has the student been taught?*
- ▶ *On what specific skills does the student need support?*

## Error Analysis Example

### Benchmark 1

Problems	Skill Assessed
① 18, 21, 25	Add a three-digit and a two- or three-digit number, without renaming.
② 12, 17, 23	Add three one- or two-digit numbers, without renaming.
④ 10, 16	Add two two-digit numbers, with renaming from ones to tens.
③ 11, 19, 22	Add a three-digit and a two- or three-digit number, with renaming from ones to tens.
✗ 18	Subtract a one- or two-digit number from a two-digit number, with renaming.
✗ 15	Subtract a one-, two-, or three-digit number from a three-digit number, with renaming from tens to ones.
5, 14, 20, 24	Multiply a one-digit number by a one-digit number, resulting in a product of 20 or less.

## Potential Types of Errors - Computation

- Fact Error – student consistently gets certain type of fact incorrect
- Sign Error – student does not use appropriate sign when calculating answer (e.g. adds instead of subtracts)
- Placement Error – student does not align work properly and causes error in final answer

(Howell, Zucker, Morehead, 1982)



## Potential Types of Errors - Computation

- Wrong Steps – student uses steps that are not correct
- Missing Steps – student does not use the necessary steps to complete problem (e.g. does not renam3)
- Wrong Algorithm for Given Operation – student uses steps which may work for a different operation

(Howell, Zucker, Morehead, 1982)

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## Potential Types of Errors – Concepts and Applications

- Computation Error - student sets up the problem correctly, but makes mistakes when computing the answer
- Decoding Error – student incorrectly reads critical words in the problem
- Vocabulary Error – student does not know the meaning of a key word in the problem
- Translation Error – student does not set up the problem correctly (e.g. if the problem asks to the student to add and they subtract)

(Carnine & Stein, 1990)

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# DIBELS Math Data Interpretation Webinar Outcomes Driven Model Step 4

## ODM Step 4. Evaluate Support

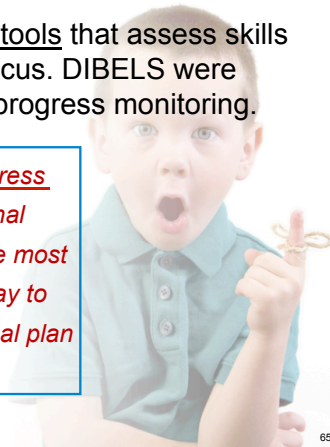
ODM Step	Questions: Systems	Questions: Student
1. Identify Need for Support	Are there students who may need support? How many students may need support?	Which students may need support?
2. Validate Need for Support	Are we reasonably confident in the accuracy of our data overall?	Are we reasonably confident that the identified students need support?
3. Plan and Implement Support	At what grade levels and/or in what areas may support be needed? What are our system-wide goals? What is our system-wide plan for support?	What are the student's skills and needs? What is the plan of support for the student, including goals and plan for progress monitoring?
4. Evaluate and Modify Support	Are we making progress toward our system-wide goals? Is our system of support effective?	Is each student making adequate progress? Is the support effective for individual students?
5. Review Outcomes	Have we met our system-wide goal? Is our system of support effective? <i>Are there students who may need support? How many students may need support?</i>	Has the support been effective for individual students? Has the student met his/her goal? <i>Which students may need support?</i>

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## How Do You Evaluate Effectiveness of Instruction for Individual Students?

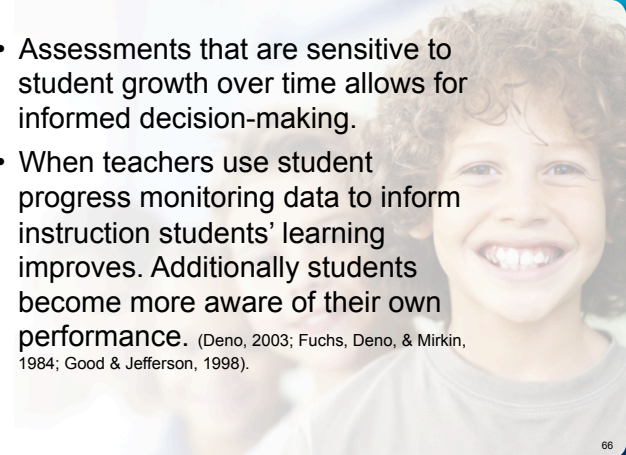
Use progress monitoring tools that assess skills of primary instructional focus. DIBELS were designed specifically for progress monitoring.

*Monitoring student progress towards the instructional objectives and goals is the most effective and efficient way to determine if the instructional plan is working.*



## Why Is Progress Monitoring Important?

- Assessments that are sensitive to student growth over time allows for informed decision-making.
- When teachers use student progress monitoring data to inform instruction students' learning improves. Additionally students become more aware of their own performance. (Deno, 2003; Fuchs, Deno, & Mirkin, 1984; Good & Jefferson, 1998).



## Sample Progress Monitoring DIBELSnet Report

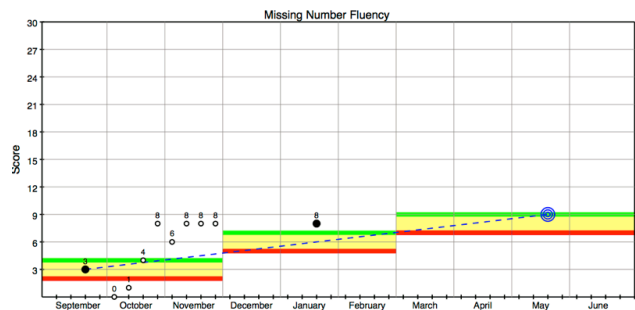
Name: Andrew Turner  
 Student ID: 025  
 School: Sample School  
 Class: Sample 1st  
 Grade: First Grade  
 Year: 2013-2014

Student Progress Monitoring Report

DIBELSnet

DIBELS Math Early Release Year 2

- Benchmark Score
- Progress Monitoring Score
- ▲ Score Above Graph Boundary
- Aimline
- Target Score
- Benchmark Goal
- Cut Point for Risk
- Instructional Support Change Line



## Basic Steps for Individual Student Progress Monitoring

1. Select students for progress monitoring
2. Determine which DIBELS materials should be used.
3. Set an appropriate goal for evaluating progress.
4. Determine the frequency of progress monitoring.
5. Evaluate progress toward the instructional goal. Modify the instructional plan as needed.

## Selecting Students for Progress Monitoring

- ▶ Candidates for progress monitoring are those who scored below or well below the benchmark goal, and probably need a change to instruction.
- ▶ Progress monitoring will help evaluate the effectiveness of the change.
- ▶ However, progress monitoring can be a complex decision making process that can be difficult to do with lots and lots of students.
- ▶ When there are many students below the benchmark goal, work on improving core instruction and carefully select the students who will be monitored.
- ▶ If you collect progress monitoring data, then you need to review it for the feedback to be effective.

## Selecting Students for Progress Monitoring

School: Sample School  
Grade: First Grade, Middle of Year  
Year: 2013-2014  
Class: Sample 1st

DIBELS Math Early Release Year

Classroom Report

■ At or Above Benchmark / Likely to Need Core Support    
 ■ Below Benchmark / Likely to Need Strategic Support    
 ■ Well Below Benchmark / Likely to Need Intensive Support

NAME	STUDENT ID	FACT		MNF		COMPUTATION		COMPOSITE	
		Score	Local %ile	Score	Local %ile	Score	Local %ile	Score	Local %ile
Anderson, Caleb	011	22	46	8	42	12	44	50	52
Brown, Adam	005	28	72	10	72	14	58	59	70
Clark, Emmett	019	25	72	12	78	25	98	74	94
Davis, Sophia	006	20	38	10	72	8	10	48	48
Harris, Daniel	015	7	2	4	4	3	25	18	2
Jackson, Benjamin	013	25	72	13	88	19	94	79	90
Johnson, Charlotte	002	10	8	9	60	15	70	43	18
Jones, Amelia	004	17	24	5	14	14	58	41	14
King, Emily	024	26	66	7	26	16	82	56	62
Lee, Vanessa	000	28	78	13	88	7	8	27	68
Martin, Norah	016	27	90	16	98	16	82	75	98
Miller, Oliver	007	23	52	9	60	10	28	51	58
Moore, Graydon	009	15	18	9	60	15	44	48	58
Nelson, Carter	023	20	38	8	42	9	18	45	28
Robinson, Grace	018	10	8	4	4	9	18	27	8
Smith, Liam	001	23	52	7	26	10	28	47	38
Taylor, Scarlett	010	25	72	7	26	11	34	50	52
Thomas, Sam	012	11	8	8	60	14	38	47	38
Thompson, Levi	017	20	38	9	60	9	18	47	38
Turner, Andrew	025	28	94	8	42	16	82	60	74
Walker, Finn	021	25	72	13	88	17	90	68	88
White, Lily	014	25	72	13	88	12	44	60	60
Williams, Noah	003	18	50	5	14	15	70	44	22
Wilson, Ava	008	32	98	8	42	15	70	63	80
Young, Natalie	022	18	14	8	18	9	44	38	18
GOAL		18		7		9		43	
AVERAGE		20.9		8.8		12.8		51.3	

## Basic Steps for Individual Student Progress Monitoring

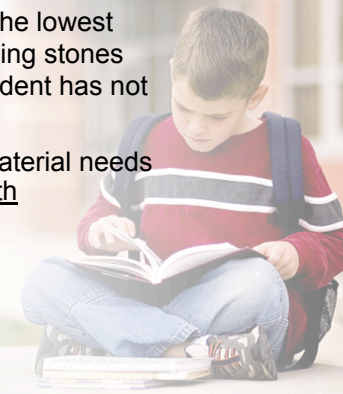
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3. Set an appropriate goal for evaluating progress.
4. Determine the frequency of progress monitoring.
5. Evaluate progress toward the instructional goal. Modify the instructional plan as needed.

## Selecting Progress Monitoring Materials Guidelines

In general, progress monitor with materials that match the lowest math skill in the stepping stones sequence that the student has not yet mastered

Progress monitoring material needs to be sensitive to growth

- ▶ Not too difficult
- ▶ Not too easy



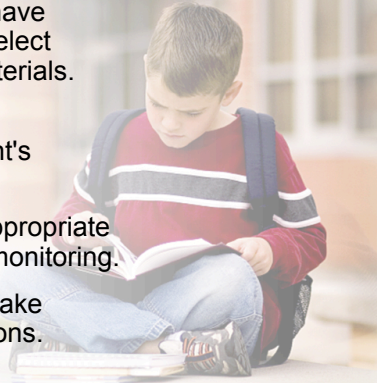


## DIBELS® Math Survey

Consider conducting DIBELS Math survey when you don't have enough information to select progress monitoring materials.

### Purpose(s)

- ▶ To identify a student's instructional level.
- ▶ To determine an appropriate level for progress monitoring.
- ▶ To set goals and make instructional decisions.



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## Survey Procedures

1. Start with benchmark scores
2. If the Composite Score is well below benchmark (or in 2<sup>nd</sup> and 3<sup>rd</sup> if students Computation score is well below benchmark or Concepts and Applications score is below the 20<sup>th</sup> percentile), then test backwards
3. Test back sequentially until you find the measure on which the student scores at/above benchmark

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## Definitions

### Mastery Level

- ▶ the highest level at which the student has demonstrated adequate skills for that grade level

### Instructional Level

- ▶ the lowest level at which the student has not mastered the skills necessary for adequate grade level performance.

### Progress Monitoring Level

- ▶ the optimum level for monitoring student progress. It should simultaneously illustrate: (a) the student's current level of skills, (b) an instructional goal that the student needs to attain, and (c) student progress toward the goal.

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## Basic Steps for Individual Student Progress Monitoring

1. Select students for progress monitoring
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5. Evaluate progress toward the instructional goal. Modify the instructional plan as needed.

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## Well-Written Goals When Monitoring with Grade Level Material

When monitoring with grade-level material, use the next benchmark goal for that measure.

Grade-level material includes any measure used for benchmark assessment in that grade

K – BQD, NIF, NNF

1<sup>st</sup> – NIF, NNF, ADQ, MNF, Computation

2<sup>nd</sup> – 6<sup>th</sup> – Computation, Concepts & Applications

## Components of Well-Written Goals

Learner:

- ▶ Name of student

Behavior:

- ▶ What is it that you want the student to do (i.e., correct digits, etc.)?

Criterion:

- ▶ How much of the behavior does the student have to do?

Conditions:

- ▶ Time frame typically determined by number of weeks until benchmark assessment or end-of-school year
- ▶ Measurement material (i.e., guided data collected via DIBELS Math Missing Number Fluency)

## Well Written Goal Example

First Grade:

By the end of the year, Jason will score 13 correct digits on a 1<sup>st</sup> grade level Computation probe.

Kindergarten:

By the end of the year, Heather will score 23 correctly identified numbers on a Number Identification Fluency probe.

## Well-Written Goals When Monitoring with Out-of-Grade Level Material

- There are multiple statistical approaches to out-of-grade level goal setting. Determining goals through a variety of methods typically results in the same goal. Some methods are more time consuming and require complex mathematical calculations.
- The least time consuming way to end up with a reasonable goal is to use the end of the year goal and students need to reach it in half the amount of time.

## Steps for Setting Out-of-Grade Progress Monitoring Goals

1. Determine students current level of performance (e.g., testing backwards using DIBELS Math materials).
2. Determine the goal based on the progress monitoring level and the end-of-year benchmark goal for that level (e.g., 13 correct digits in second-grade Computation).
3. Set the goal date so that the goal is achieved in half the time in which it would typically be achieved (e.g., move the end-of-year benchmark goal to be achieved by the middle-of-year benchmark time).
4. Draw an aimline connecting the current performance to the goal.

## Basic Steps for Individual Student Progress Monitoring

1. Select students for progress monitoring
2. Determine which DIBELS materials should be used.
3. Set an appropriate goal for evaluating progress.
4. Determine the frequency of progress monitoring.
5. Evaluate progress toward the instructional goal. Modify the instructional plan as needed.

## Progress Monitoring Step 3: Determine Frequency

### PM frequency guidelines:

- ▶ If monitoring in grade-level materials
  - If the student's scores fall into the Below Benchmark level, monitoring once per month is likely sufficient.
  - If scores fall into the Well Below Benchmark level, monitoring twice per month is ideal.
- ▶ If monitoring a student in out-of-grade materials, monitoring once per week is ideal, though every other week may be sufficient.

Note: Progress monitoring is the assessment that evaluates instruction. Instruction and intervention should be provided that matches student need.



DIBELS<sup>®</sup> Math

## DIBELS Math Data Interpretation Webinar Outcomes Driven Model Step 5

## ODM Step 5. Review Outcomes

ODM Step	Questions: Systems	Questions: Student
1. Identify Need for Support	Are there students who may need support? How many students may need support?	Which students may need support?
2. Validate Need for Support	Are we reasonably confident in the accuracy of our data overall?	Are we reasonably confident that the identified students need support?
3. Plan and Implement Support	At what grade levels and/or in what areas may support be needed? What are our system-wide goals? What is our system-wide plan for support?	What are the student's skills and needs? What is the plan of support for the student, including goals and plan for progress monitoring?
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## Basic Steps for Individual Student Progress Monitoring

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4. Determine the frequency of progress monitoring.
5. Evaluate progress toward the instructional goal. Modify the instructional plan as needed.

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## Considerations in Evaluating Progress Monitoring Data

### Considerations for Decision Making:

- ▶ Give the instruction/intervention enough time to work.
- ▶ Is the student's progress generally up?
- ▶ Is the student receiving research-based instruction?
- ▶ Is the instruction focused on the right skill?
- ▶ Is the instruction/intervention being implemented with fidelity?
- ▶ **When 3 consecutive data points are below the aimline consider making a change to instruction.**

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## Considerations in Evaluating Progress Monitoring Data

- ▶ Review progress relative to the goal, the aimline and the Pathways (when Pathways are available for DIBELS Math)
- ▶ If insufficient progress consider:
  - \* increasing opportunities to respond (increase amount of time and/or frequency, decrease group size)
  - \* changing focus of instruction
  - \* getting more explicit
- ▶ When student reaches the goal, make a change
  - \* fade support, move to next skill, move to next level of monitoring material

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