DIBELS® Math

DIBELS® Math:

An Overview for

Kindergarten – Sixth Grade

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DIBELS MATH

Overview

- Overview and Purposes of DIBELS Math
- Use of DIBELS Math within an Outcomes Driven Model – School Based Example
- Research Process
- Questions and Contact Information

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What is DIBELS® 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

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Foundations of DIBELS® 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

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Measures by Grade

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

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Time to Test

Grade	# of Measures	Time to Test	Total
Kindergarten	BOY, MOY, EOY: BQD, NIF, NNF	3 one-minute tests given individually	3 minutes
First Grade	BOY: NIF, NNF, AQD, MNF, Computation	4 one-minute tests given individually 2 two-minute tests done whole class	8 minutes
	MOY, EOY: AQD, MNF, Computation	2 one-minute tests given individually 2 two-minute tests done whole class	6 minutes
Second Grade	BOY, MOY, EOY: Computation, Concepts and Applications	2 two-minute tests & 1 five-minute tests done whole class	9 minutes
Third – Sixth Grade	BOY, MOY, EOY: Computation, Concepts and Applications	2 four- to six-minute tests & 1 ten- to sixteen-minute test	18-28 minutes

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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

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Linkages to Math Research

- Early Numeracy based on foundational skills required to develop number sense
- Number sense involves basic “intuitions” and ideas about numbers (Lee et al., 2008).
  - includes the ability to compare the magnitude of numbers, to understand the relative effect of arithmetical operations on numbers, and to have meaningful referents for number and quantity (NCTM, 1989)
  - Number sense "refers child's fluidity and flexibility with numbers, the sense of what numbers mean, and an ability to preform mental mathematics and to look at the world and make comparisons“ (Gersten & Chard, 1999, p. 19 & 20).

Linkages to Math Research

- Although hard to define, number sense predicts academic achievement (Berch, 2005; Gersten et al., 2005).
- Number sense has been operationalized in various ways (see Lago & DiPerna, 2010)
- Common underlying factors include:
  - Magnitude Comparison
  - Subitization
  - Oral counting
  - Number identification
  - Identifying the missing number
  - Basic computation

Link to Common Core State Standards

Grade	Common Core State Standards in Mathematics (Domain)	DIBELS Math Measures
K	Counting and Cardinality	Next Number Fluency Beginning Quantity Discrimination
K	Measurement and Data	Beginning Quantity Discrimination
1	Operations and Algebraic Thinking	Computation
1	Numbers and Operations in Base Ten	Next Number Fluency Number Identification Fluency Advanced Quantity Discrimination Missing Number Fluency Computation

Link to Common Core State Standards

Grade	Common Core State Standards in Mathematics (Domain)	DIBELS Math Measures
1	Operations and Algebraic Thinking	Computation
2	Operations and Algebraic Thinking Numbers and Operations in Base Ten	Computation
3	Operations and Algebraic Thinking Numbers and Operations in Base Ten	Computation
4	Operations and Algebraic Thinking Numbers and Operations in Base Ten Numbers and Operations–Fractions	Computation
5	Operations and Algebraic Thinking Numbers and Operations in Base Ten Numbers and Operations–Fractions	Computation
6	The Number System	Computation

Link to Common Core State Standards

Grade	Common Core State Standards in Mathematics (Domain)	DIBELS Math Measures
2	Operations and Algebraic Thinking Numbers and Operations in Base Ten Measurement and Data Geometry	Concepts and Applications
3	Operations and Algebraic Thinking Numbers and Operations in Base Ten Measurement and Data Geometry Numbers and Operations–Fractions	Concepts and Applications
4	Operations and Algebraic Thinking Numbers and Operations in Base Ten Measurement and Data Geometry Numbers and Operations–Fractions	Concepts and Applications

Link to Common Core State Standards

Grade	Common Core State Standards in Mathematics (Domain)	DIBELS Math Measures
5	Operations and Algebraic Thinking Numbers and Operations in Base Ten Measurement and Data Geometry Numbers and Operations - Fractions	Concepts and Applications
6	Ratios and Proportional Relationships Statistics and Probability The Number System Expressions and Equations Geometry	Concepts and Applications

Beginning Quantity Discrimination

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

Beginning Quantity Discrimination (BQD)

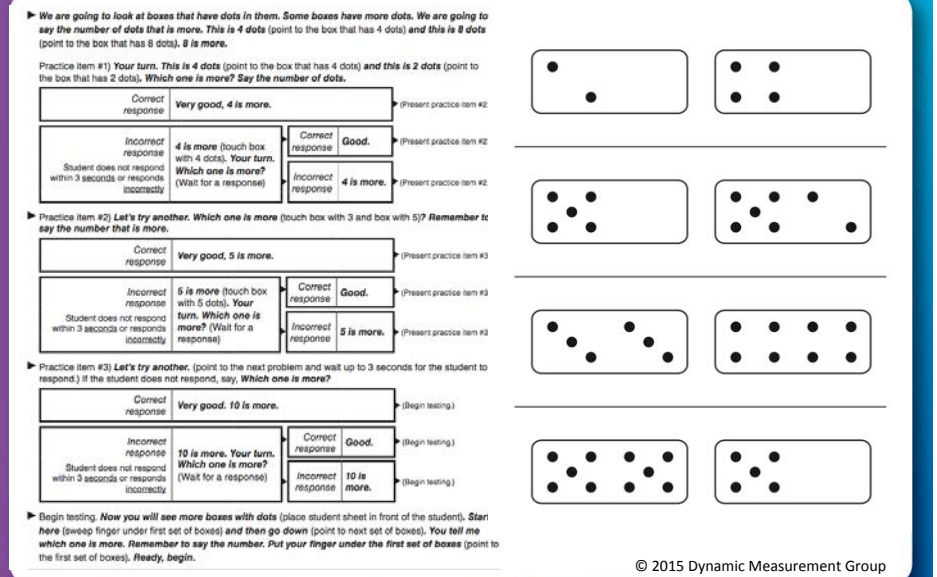
Format:

- 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.

Beginning Quantity Discrimination



► **We are going to look at boxes that have dots in them. Some boxes have more dots. We are going to say the number of dots that is more. This is 4 dots** (point to the box that has 4 dots) **and this is 8 dots** (point to the box that has 8 dots). **8 is more.**

Practice item #1) **Your turn. This is 4 dots** (point to the box that has 4 dots) **and this is 2 dots** (point to the box that has 2 dots). **Which one is more? Say the number of dots.**

Correct response	**Very good, 4 is more.**			(Present practice item #2)
Incorrect response Student does not respond within 3 seconds or responds incorrectly	**4 is more** (touch box with 4 dots). **Your turn. Which one is more?** (Wait for a response)	Correct response	**Good.**	(Present practice item #2)
		Incorrect response	**4 is more.**	(Present practice item #2)

► Practice item #2) **Let's try another. Which one is more** (touch box with 3 and box with 5)**? Remember to say the number that is more.**

Correct response	**Very good, 5 is more.**			(Present practice item #3)
Incorrect response Student does not respond within 3 seconds or responds incorrectly	**5 is more** (touch box with 5 dots). **Your turn. Which one is more?** (Wait for a response)	Correct response	**Good.**	(Present practice item #3)
		Incorrect response	**5 is more.**	(Present practice item #3)

► Practice item #3) **Let's try another.** (point to the next problem and wait up to 3 seconds for the student to respond.) If the student does not respond, say, **Which one is more?**

Correct response	**Very good. 10 is more.**			(Begin testing.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly	**10 is more. Your turn. Which one is more?** (Wait for a response)	Correct response	**Good.**	(Begin testing.)
		Incorrect response	**10 is more.**	(Begin testing.)

► Begin testing. **Now you will see more boxes with dots** (place student sheet in front of the student). **Start here** (sweep finger under first set of boxes) **and then go down** (point to next set of boxes). **You tell me which one is more. Remember to say the number. Put your finger under the first set of boxes** (point to the first set of boxes). **Ready, begin.**

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Beginning Quantity Discrimination Video

Dynamic Measurement Group

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Number Identification Fluency

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

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Number Identification Fluency

5 3 2

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.

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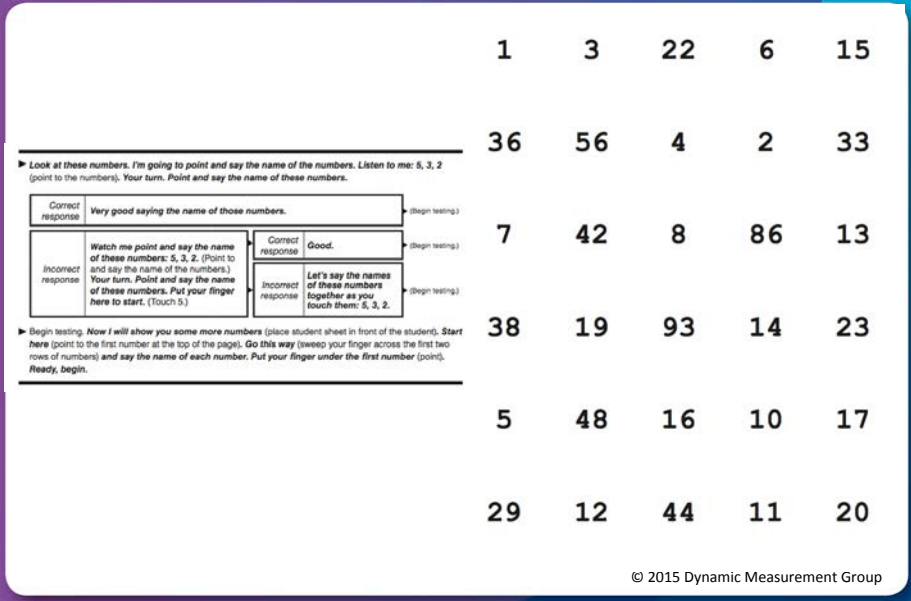
Number Identification Fluency



► *Look at these numbers. I'm going to point and say the name of the numbers. Listen to me: 5, 3, 2* (point to the numbers). *Your turn. Point and say the name of these numbers.*

- *Correct response:* *Very good saying the name of those numbers.* → (Begin testing.)
- *Incorrect response:* *Watch me point and say the name of these numbers: 5, 3, 2.* (Point to and say the name of the numbers.) *Your turn. Point and say the name of these numbers. Put your finger here to start.* (Touch 5.)
  - *Correct response:* *Good.* → (Begin testing.)
  - *Incorrect response:* *Let's say the names of these numbers together as you touch them: 5, 3, 2.* → (Begin testing.)

► Begin testing. *Now I will show you some more numbers* (place student sheet in front of the student). *Start here* (point to the first number at the top of the page). *Go this way* (sweep your finger across the first two rows of numbers) *and say the name of each number. Put your finger under the first number* (point). *Ready, begin.*

1	3	22	6	15
36	56	4	2	33
7	42	8	86	13
38	19	93	14	23
5	48	16	10	17
29	12	44	11	20

Number Identification Fluency Video

Next Number Fluency

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

Next Number Fluency

Next Number Fluency

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

Total Score: _____

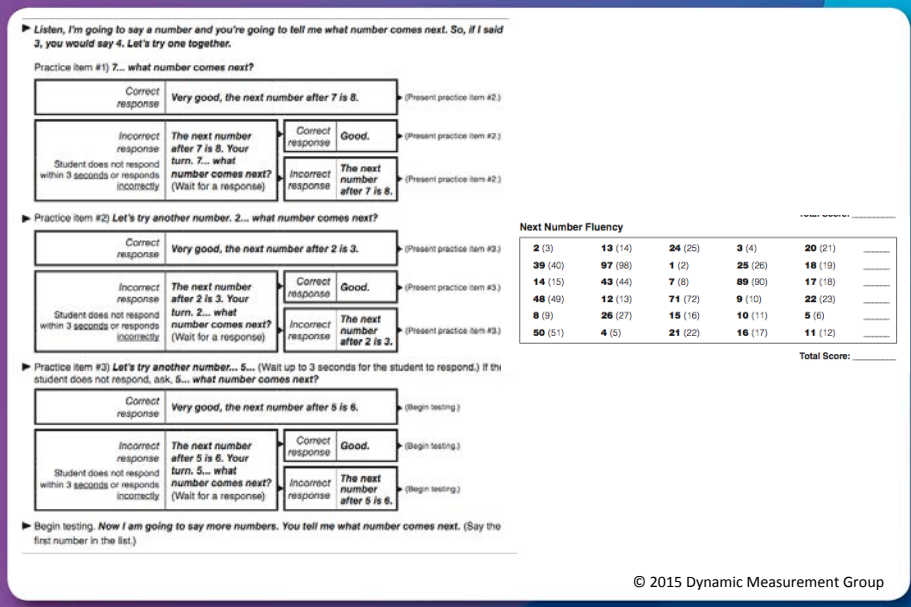
Format:

- 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.

Next Number Fluency



► **Listen, I'm going to say a number and you're going to tell me what number comes next. So, if I said 3, you would say 4. Let's try one together.**

Practice item #1) **7... what number comes next?**

Correct response	**Very good, the next number after 7 is 8.**			(Present practice item #2.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly	**The next number after 7 is 8. Your turn. 7... what number comes next?** (Wait for a response)	*Correct response*	**Good.**	(Present practice item #2.)
		Incorrect response	**The next number after 7 is 8.**	(Present practice item #2.)

► Practice item #2) **Let's try another number. 2... what number comes next?**

Correct response	**Very good, the next number after 2 is 3.**			(Present practice item #3.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly	**The next number after 2 is 3. Your turn. 2... what number comes next?** (Wait for a response)	*Correct response*	**Good.**	(Present practice item #3.)
		Incorrect response	**The next number after 2 is 3.**	(Present practice item #3.)

► Practice item #3) **Let's try another number... 5...** (Wait up to 3 seconds for the student to respond.) If the student does not respond, ask, **5... what number comes next?**

Correct response	**Very good, the next number after 5 is 6.**			(Begin testing.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly	**The next number after 5 is 6. Your turn. 5... what number comes next?** (Wait for a response)	*Correct response*	**Good.**	(Begin testing.)
		Incorrect response	**The next number after 5 is 6.**	(Begin testing.)

► Begin testing. **Now I am going to say more numbers. You tell me what number comes next.** (Say the first number in the list.)

Next Number Fluency

2 (3)	**13** (14)	**24** (25)	**3** (4)	**20** (21)	_____
39 (40)	**97** (98)	**1** (2)	**25** (26)	**18** (19)	_____
14 (15)	**43** (44)	**7** (8)	**89** (90)	**17** (18)	_____
48 (49)	**12** (13)	**71** (72)	**9** (10)	**22** (23)	_____
8 (9)	**26** (27)	**15** (16)	**10** (11)	**5** (6)	_____
50 (51)	**4** (5)	**21** (22)	**16** (17)	**11** (12)	_____

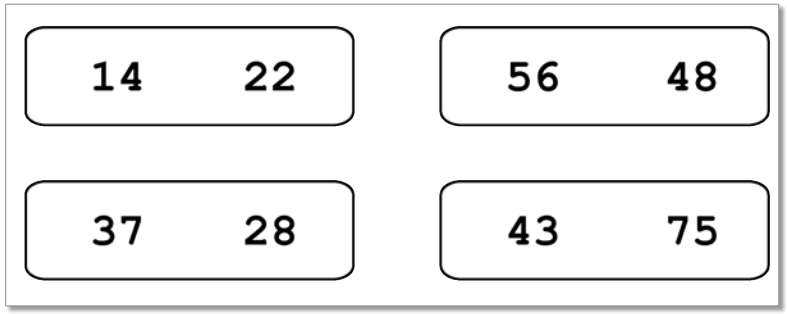
Total Score: _____

Next Number Fluency Video

Advanced Quantity Discrimination

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

Advanced Quantity Discrimination



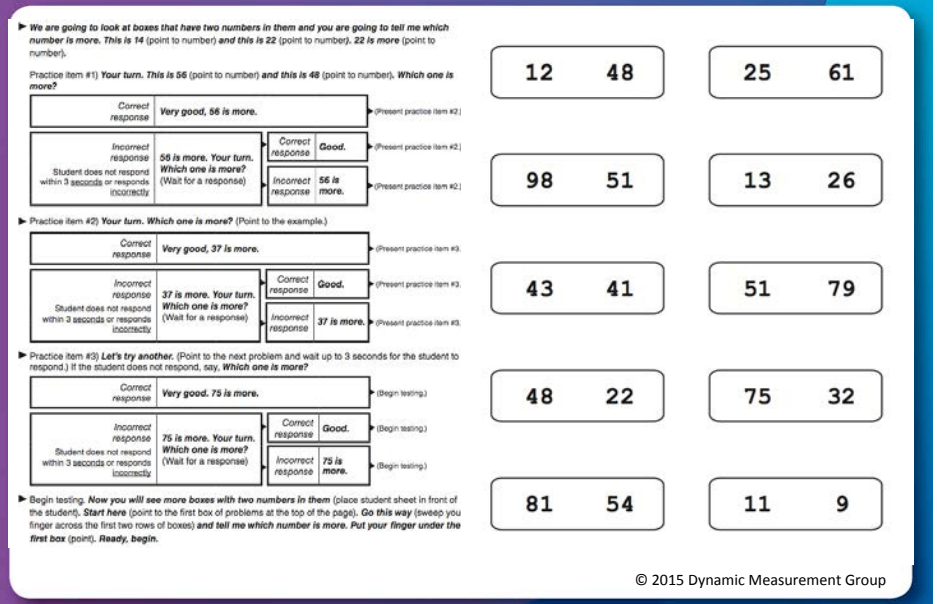
Format:

- 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.

Advanced Quantity Discrimination



- ***We are going to look at boxes that have two numbers in them and you are going to tell me which number is more. This is 14*** (point to number) ***and this is 22*** (point to number). ***22 is more*** (point to number).

Practice item #1) ***Your turn. This is 56*** (point to number) ***and this is 48*** (point to number). ***Which one is more?***

- Correct response: ***Very good, 56 is more.*** → (Present practice item #2.)
- Incorrect response (Student does not respond within 3 seconds or responds incorrectly): ***56 is more. Your turn. Which one is more?*** (Wait for a response)
  - Correct response: ***Good.*** → (Present practice item #2.)
  - Incorrect response: ***56 is more.*** → (Present practice item #2.)

- Practice item #2) ***Your turn. Which one is more?*** (Point to the example.)
  - Correct response: ***Very good, 37 is more.*** → (Present practice item #3.)
  - Incorrect response (Student does not respond within 3 seconds or responds incorrectly): ***37 is more. Your turn. Which one is more?*** (Wait for a response)
    - Correct response: ***Good.*** → (Present practice item #3.)
    - Incorrect response: ***37 is more.*** → (Present practice item #3.)

- Practice item #3) ***Let's try another.*** (Point to the next problem and wait up to 3 seconds for the student to respond.) If the student does not respond, say, ***Which one is more?***
  - Correct response: ***Very good. 75 is more.*** → (Begin testing.)
  - Incorrect response (Student does not respond within 3 seconds or responds incorrectly): ***75 is more. Your turn. Which one is more?*** (Wait for a response)
    - Correct response: ***Good.*** → (Begin testing.)
    - Incorrect response: ***75 is more.*** → (Begin testing.)

- Begin testing. ***Now you will see more boxes with two numbers in them*** (place student sheet in front of the student). ***Start here*** (point to the first box of problems at the top of the page). ***Go this way*** (sweep you finger across the first two rows of boxes) ***and tell me which number is more. Put your finger under the first box*** (point). ***Ready, begin.***

12 48	25 61
98 51	13 26
43 41	51 79
48 22	75 32
81 54	11 9

Advanced Quantity Discrimination Video

Dynamic Measurement Group

Missing Number Fluency

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

Missing Number Fluency

15 __ 17 18

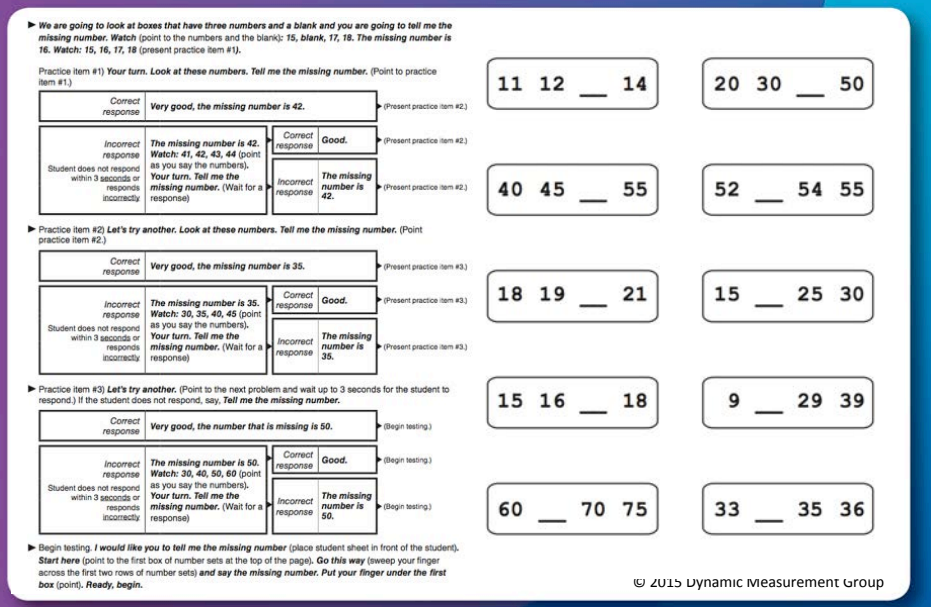
Format:

- 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.

Missing Number Fluency



► ***We are going to look at boxes that have three numbers and a blank and you are going to tell me the missing number. Watch*** (point to the numbers and the blank): ***15, blank, 17, 18. The missing number is 16. Watch: 15, 16, 17, 18*** (present practice item #1).

Practice item #1) ***Your turn. Look at these numbers. Tell me the missing number.*** (Point to practice item #1.)

Correct response	***Very good, the missing number is 42.***			(Present practice item #2.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly.	***The missing number is 42. Watch: 41, 42, 43, 44*** (point as you say the numbers). ***Your turn. Tell me the missing number.*** (Wait for a response)	Correct response	***Good.***	(Present practice item #2.)
		Incorrect response	***The missing number is 42.***	(Present practice item #2.)

► Practice item #2) ***Let's try another. Look at these numbers. Tell me the missing number.*** (Point practice item #2.)

Correct response	***Very good, the missing number is 35.***			(Present practice item #3.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly.	***The missing number is 35. Watch: 30, 35, 40, 45*** (point as you say the numbers). ***Your turn. Tell me the missing number.*** (Wait for a response)	Correct response	***Good.***	(Present practice item #3.)
		Incorrect response	***The missing number is 35.***	(Present practice item #3.)

► Practice item #3) ***Let's try another.*** (Point to the next problem and wait up to 3 seconds for the student to respond.) If the student does not respond, say, ***Tell me the missing number.***

Correct response	***Very good, the number that is missing is 50.***			(Begin testing.)
Incorrect response Student does not respond within 3 seconds or responds incorrectly.	***The missing number is 50. Watch: 30, 40, 50, 60*** (point as you say the numbers). ***Your turn. Tell me the missing number.*** (Wait for a response)	Correct response	***Good.***	(Begin testing.)
		Incorrect response	***The missing number is 50.***	(Begin testing.)

► Begin testing. ***I would like you to tell me the missing number*** (place student sheet in front of the student). ***Start here*** (point to the first box of number sets at the top of the page). ***Go this way*** (sweep your finger across the first two rows of number sets) ***and say the missing number. Put your finger under the first box*** (point). ***Ready, begin.***

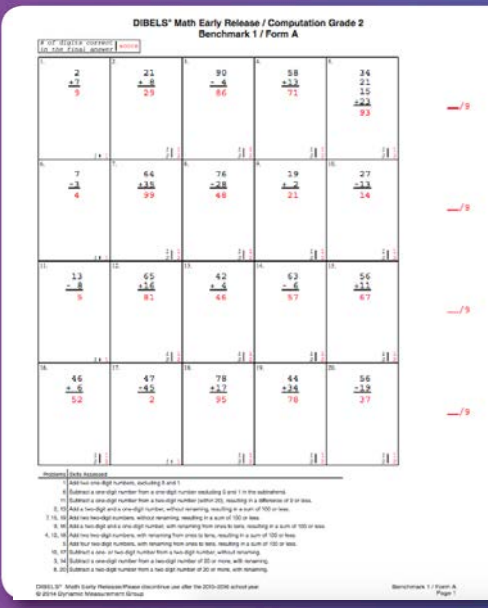
11 12 __ 14	20 30 __ 50	15 16 __ 18	9 __ 29 39
40 45 __ 55	52 __ 54 55	60 __ 70 75	33 __ 35 36

Missing Number Fluency

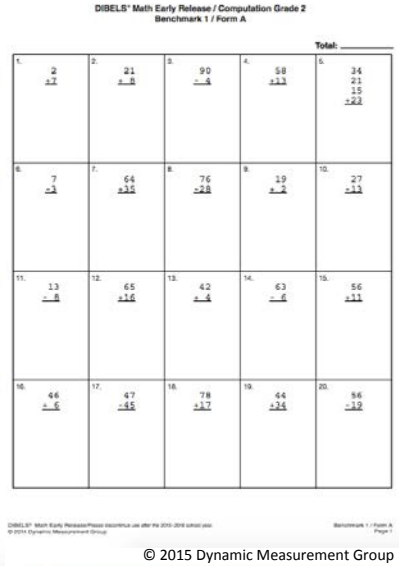
Computation

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

Computation - Examples



DIBELS® Math Early Release / Computation Grade 2
Benchmark 1 / Form A

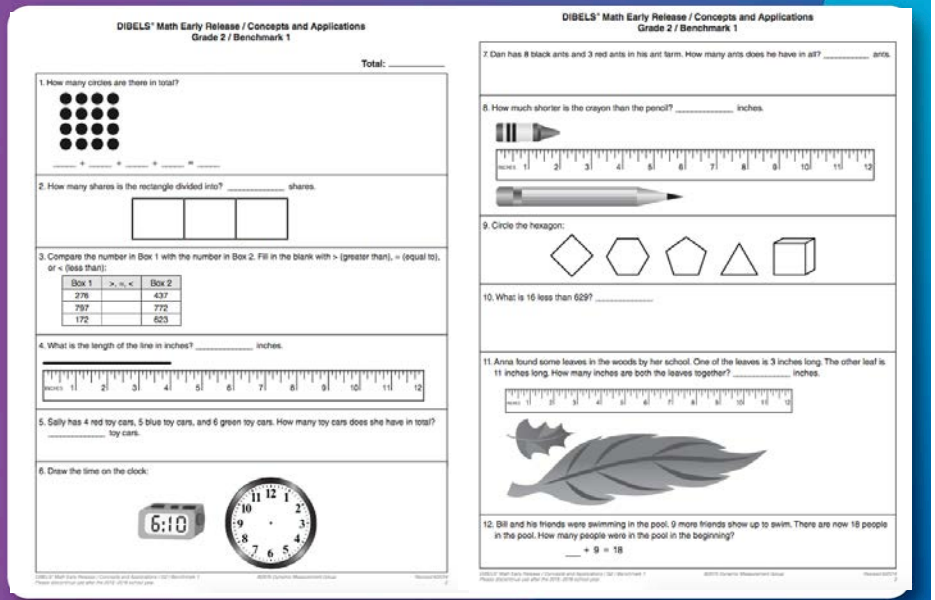


DIBELS® Math Early Release / Computation Grade 2
Benchmark 1 / Form A

Concepts and Applications

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

Concepts and Applications Example



DIBELS® Math Early Release / Concepts and Applications
Grade 2 / Benchmark 1

Total: _____

1. How many circles are there in total?

_____ + _____ + _____ + _____ = _____

2. How many shares is the rectangle divided into? _____ shares.

3. 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
276		437
797		772
172		623

4. What is the length of the line in inches? _____ inches.

5. Sally has 4 red toy cars, 5 blue toy cars, and 6 green toy cars. How many toy cars does she have in total?
_____ toy cars.

6. Draw the time on the clock:

6:10

DIBELS® Math Early Release / Concepts and Applications
Grade 2 / Benchmark 1

7. Dan has 8 black ants and 3 red ants in his ant farm. How many ants does he have in all? _____ ants.

8. How much shorter is the crayon than the pencil? _____ inches.

9. Circle the hexagon:

10. What is 16 less than 629? _____

11. Anna found some leaves in the woods by her school. One of the leaves is 3 inches long. The other leaf is 11 inches long. How many inches are both the leaves together? _____ inches.

12. Bill and his friends were swimming in the pool. 9 more friends show up to swim. There are now 18 people in the pool. How many people were in the pool in the beginning?
_____ + 9 = 18

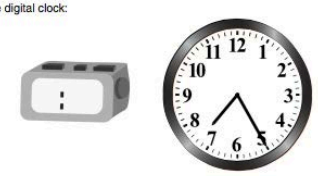
Concepts and Applications Example

DIBELS® Math Early Release / Concepts and Applications
Grade 2 / Benchmark 1

13. Write the number...

Number	...in the 1s place	...in the 10s place
248		
782		
126		

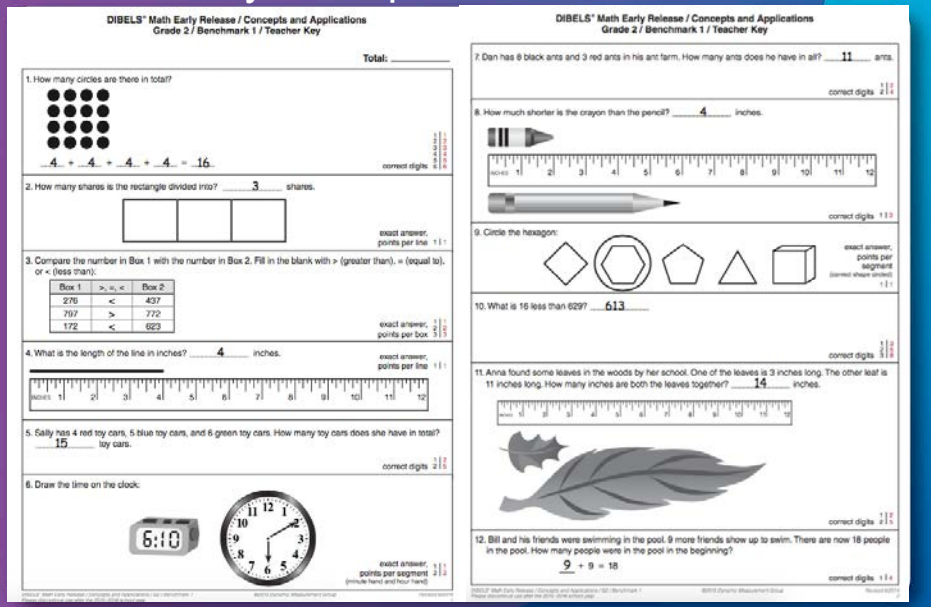
14. Fill in the time on the digital clock:



15. José has 14 gumballs, but gives 5 of them away. He then gives 3 more away. How many gumballs does José have now? _____ gumballs.

16. You have 2 quarters, 2 dimes, and 1 penny. How many cents do you have to spend? _____ ¢.

Concepts and Applications Teacher Key Example



DIBELS® Math Early Release / Concepts and Applications
Grade 2 / Benchmark 1 / Teacher Key

Total: _____

1. How many circles are there in total?

4 + 4 + 4 + 4 = 16

correct digits

2. How many shares is the rectangle divided into? 3 shares.

exact answer, points per line

3. 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
276	<	437
797	>	772
172	<	623

exact answer, points per box

4. What is the length of the line in inches? 4 inches.

exact answer, points per line

5. Sally has 4 red toy cars, 5 blue toy cars, and 6 green toy cars. How many toy cars does she have in total?
15 toy cars.

correct digits

6. Draw the time on the clock:

6:10

exact answer, points per segment (minute hand and hour hand)

DIBELS® Math Early Release / Concepts and Applications
Grade 2 / Benchmark 1 / Teacher Key

7. Dan has 8 black ants and 3 red ants in his ant farm. How many ants does he have in all? 11 ants.

correct digits

8. How much shorter is the crayon than the pencil? 4 inches.

correct digits

9. Circle the hexagon:

exact answer, points per segment (correct shape circled)

10. What is 16 less than 629? 613

correct digits

11. Anna found some leaves in the woods by her school. One of the leaves is 3 inches long. The other leaf is 11 inches long. How many inches are both the leaves together? 14 inches.

correct digits

12. Bill and his friends were swimming in the pool. 9 more friends show up to swim. There are now 18 people in the pool. How many people were in the pool in the beginning?
9 + 9 = 18

correct digits

Concepts and Applications Teacher Key Example

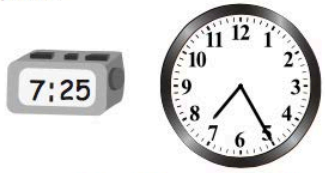
DIBELS® Math Early Release / Concepts and Applications
Grade 2 / Benchmark 1 / Teacher Key

13. Write the number...

Number	...in the 1s place	...in the 10s place
248	8	4
782	2	8
126	6	2

exact answer, points per box 1 | 1, 2 | 2, 3 | 3, 4 | 4, 5 | 5, 6 | 6

14. Fill in the time on the digital clock:



correct digits 1 | 1, 2 | 2, 3 | 3

15. José has 14 gumballs, but gives 5 of them away. He then gives 3 more away. How many gumballs does José have now? 6 gumballs.

correct digits 1 | 7

16. You have 2 quarters, 2 dimes, and 1 penny. How many cents do you have to spend? 71 ¢.

correct digits 1 | 5, 2 | 11

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DIBELS® Math

Preliminary Benchmark Goals for DIBELS Math

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DIBELS® 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 mathematics 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 mathematics 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.

- **At or Above Benchmark**: Odds are generally 80% to 90% of achieving subsequent benchmark goals and important mathematics outcomes. **Student is likely to make adequate progress with effective core instruction**.

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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. 1st grade from fall to winter)

Benchmark Goals - Kindergarten

DIBELS Math Preliminary 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 Composite Score	At or Above Benchmark	Likely to Need Core Support	26+	72+	88+
	Below Benchmark	Likely to Need Strategic Support	15 - 25	51 - 71	67 - 87
	Well Below Benchmark	Likely to Need Intensive Support	0 - 14	0 - 50	0 - 66
Beginning Quantity Discrimination (BQD)	At or Above Benchmark	Likely to Need Core Support	5+	8+	12+
	Below Benchmark	Likely to Need Strategic Support	2 - 4	5 - 7	9 - 11
	Well Below Benchmark	Likely to Need Intensive Support	0 - 1	0 - 4	0 - 8
Number Identification Fluency (NIF)	At or Above Benchmark	Likely to Need Core Support	6+	15+	25+
	Below Benchmark	Likely to Need Strategic Support	4 - 5	8 - 14	14 - 24
	Well Below Benchmark	Likely to Need Intensive Support	0 - 3	0 - 7	0 - 13
Next Number Fluency (NNF)	At or Above Benchmark	Likely to Need Core Support	5+	11+	13+
	Below Benchmark	Likely to Need Strategic Support	2 - 4	8 - 10	10 - 12
	Well Below Benchmark	Likely to Need Intensive Support	0 - 1	0 - 7	0 - 9

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, the DIBELS Math Composite is 2 * BQD + 1 * NIF + 2 * NNF. At the middle, the DIBELS Math Composite is 3 * BQD + 1 * NIF + 3 * NNF. At the end of year, the DIBELS Math Composite is 2 * BQD + 1 * NIF + 3 * NNF.

Benchmark Goals – Second Grade

DIBELS Math Preliminary Benchmark Goals and Cut Points for Risk for Second Grade Children

DIBELS Math Measure	DIBELS Math Score Level	Likely Need for Support	Beginning of Year	Middle of Year	End of Year
DIBELS Math Composite Score	At or Above Benchmark	Likely to Need Core Support	30+	48+	66+
	Below Benchmark	Likely to Need Strategic Support	20 - 29	34 - 47	48 - 65
	Well Below Benchmark	Likely to Need Intensive Support	0 - 19	0 - 33	0 - 47
Computation (Comp)	At or Above Benchmark	Likely to Need Core Support	7+	11+	16+
	Below Benchmark	Likely to Need Strategic Support	4 - 6	8 - 10	12 - 15
	Well Below Benchmark	Likely to Need Intensive Support	0 - 3	0 - 7	0 - 11
Concepts and Applications (C&A)	At or Above Benchmark	Likely to Need Core Support	15+	23+	33+
	Below Benchmark	Likely to Need Strategic Support	8 - 14	15 - 22	22 - 32
	Well Below Benchmark	Likely to Need Intensive Support	0 - 7	0 - 14	0 - 21

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, middle and end of year, the DIBELS Math Composite Score is 1* C&A + 2 * Comp.

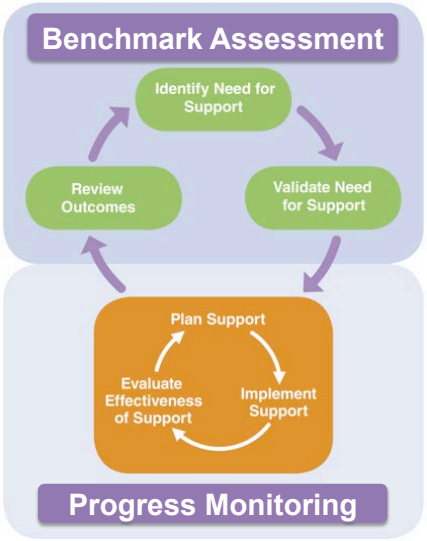
DIBELS® Math

How Schools are Using DIBELS Math

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.



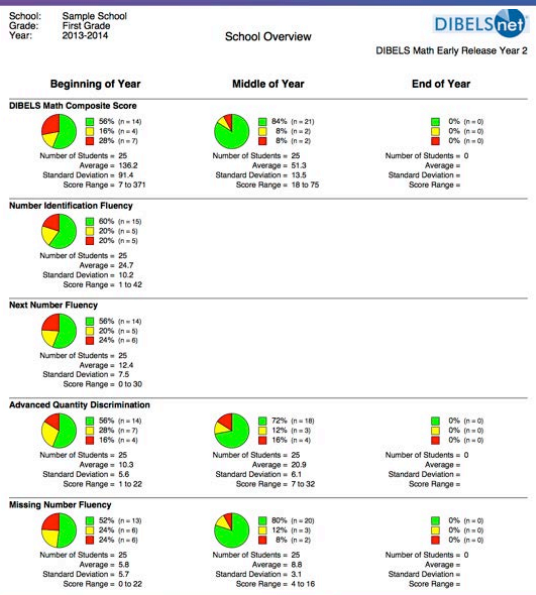
Outcomes-Driven Model Steps and Questions

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?*

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

Sample School Overview Report 1st Grade - DIBELSnet



Sample Classroom Report: Middle of Kindergarten

School: Sample School
Grade: Kindergarten, Middle of Year
Year: 2013-2014
Class: Sample Kindergarten

Classroom Report

DIBELS Math Early Release Year 2

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	BQD		NID		NNF		COMPOSITE	
	Score	Local %ile	Score	Local %ile	Score	Local %ile	Score	Local %ile
Apple, Abby	9	42	11	25	6	14	41	31
Banana, Barry	10	47	20	53	10	42	60	42
Currant, Christie	13	72	24	64	13	72	76	69
Durian, Derek	14	81	35	92	14	81	91	86
Elderberry, Emmy	13	72	28	86	15	86	84	81
Fig, Frankie	17	92	23	58	12	64	81	75
Guava, Guillermo	15	86	17	42	11	53	69	50
Honeydew, Hayley	4	6	10	14	6	14	30	8
Icefruit, Ichibod	12	61	27	81	11	53	73	64
Jicama, Jorge	6	25	10	14	5	3	32	17
Kangkong, Katie	7	31	15	36	7	28	43	36
Lychee, Laura	22	97	25	72	13	72	95	92
Mango, Muffie	12	61	37	97	19	97	99	97
Nectarine, Ned	4	6	10	14	7	28	32	17
Orientalpersimmon, Olga	5	17	3	3	6	14	25	3
Papaya, Pippy	8	36	18	47	18	92	70	58
Raspberry, Ruben	5	17	13	31	8	36	39	25
Strawberry, Sally	11	53	25	72	11	53	69	50
GOAL	8		13		10		48	
AVERAGE	10.4		19.5		10.7		61.6	

Sample Classroom Report: Middle of 1st

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

Classroom Report

DIBELS Math Early Release Year 2

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	NID		NNF		AQD		MNF		COMPUTATION		COMPOSITE	
	Score	Local %ile	Score	Local %ile	Score	Local %ile	Score	Local %ile	Score	Local %ile	Score	Local %ile
Anderson, Caleb	28	46	13	50	11	52	5	56	6	54	138	58
Brown, Aidan	29	56	14	56	12	60	6	62	7	60	153	62
Clark, Emmett	30	64	15	66	13	68	7	68	8	66	168	66
Davis, Sophia	14	22	7	28	5	22	2	28	2	32	63	22
Harris, Ethan	15	26	8	34	6	30	3	40	4	44	82	34
Jackson, Benjamin	16	30	9	38	7	34	4	50	5	50	97	42
Johnson, Charlotte	17	34	10	42	8	40	5	56	7	60	116	46
Jones, Amelia	13	16	6	20	4	14	1	18	1	20	48	14
King, Emily	12	10	5	14	3	10	0	6	0	8	33	10
Lee, Hannah	11	6	4	10	2	6	0	6	0	8	27	6
Martin, Norah	30	64	15	66	13	68	7	68	9	70	172	70
Miller, Oliver	31	72	16	74	14	74	8	74	10	78	187	74
Moore, Grayson	32	78	17	78	15	78	9	78	11	86	202	78
Nelson, Carter	33	82	18	82	16	82	10	82	10	78	209	82
Robinson, Grace	34	86	19	86	17	86	11	86	10	78	220	86
Smith, Liam	35	90	20	90	18	90	12	90	12	90	239	90
Taylor, Scarlett	40	94	30	98	20	94	20	94	20	94	350	94
Thomas, Emma	42	98	29	94	22	98	22	98	22	98	371	98
Thompson, Levi	1	2	0	4	1	2	0	6	1	20	7	2
Turner, Andrew	28	46	14	56	12	60	3	40	2	32	117	50
Walker, Finn	26	38	12	46	5	22	1	18	4	44	93	38
White, Lily	28	46	6	20	8	40	2	28	2	32	80	30
Williams, Noah	29	56	0	4	11	52	3	40	0	8	66	26
Wilson, Ava	31	72	15	66	10	46	3	40	2	32	119	54
Young, Natalie	13	16	7	28	5	22	1	18	0	8	49	18
GOAL	27		12		10		4		5		116	
AVERAGE	24.7		12.4		10.3		5.8		6.2		136.2	

DIBELS® Math

Research Process for the DIBELS Math Measures

Research Process

- Pilot (2006-2007)
  - Spring benchmark testing, over 1200 students per grade K-5
  - Alternate-form reliability of Computation
  - Informal examination of Computation item-level information, resulting in minor changes to scope and sequence
  - Examination of different scoring methods for Computation and Oral Counting
  - Customer feedback on usability and scope and sequence
- Beta 1 (2007-2008)
  - Winter and Spring benchmark testing, approx. 500-1000 students per grade K-5
  - Examination of growth over time
  - Wider-scale customer feedback on usability and scope and sequence, including preferences on using Computation vs. Early Numeracy for Fall of First Grade
  - Validity comparisons as available
- Beta 2 (2008-2009)
  - Fall, Winter, and Spring benchmark testing
  - Examination of growth over time
  - Wide-scale customer feedback
  - Validity comparisons as available
  - Alternate-form reliability of current Computation forms and scoring method

Research Process

- Prior to Beta 3 (2011-2012)
  - Principal components analysis helped to group the categories of problems into common skills sets based on difficulty
  - Examined the common skill sets and then rank the problems according to difficulty with Analysis of Means
  - Using multiple comparison procedures individual problems arranged into packets of problems of similar difficulty
  - Based on the number of items answered on the worksheets, we evaluated the time limits of the measures.
  - Evaluated different methods of scoring computation problems.
- Beta 3 (2011 – 2012)
  - Examined problems at item-level on untimed Computation worksheets with principal components analysis and item response difficulty and discrimination estimates
  - Time limit analysis was conducted
  - Confirmatory factor analysis was conducted
  - Altered problem types based on results

Research Process

- Benchmark Goals Study – Early Numeracy and Computation (2012-2013)
  - Examined what levels of performance on DIBELS Math Early Numeracy and Computation measures predict a student is likely or unlikely to score at or above the 40%ile on selected outcome measures (GMADE in grades K – 5)
  - Examined the correlations between DIBELS Math Early Numeracy and Computation measures and the selected outcome measures (GMADE in grades K - 5).
  - Examined the inter-rater reliability, alternate form reliability, and test-retest reliability for the DIBELS Math Early Numeracy and Computation measures

Research Process

- Concepts and Applications Pilot Study (2012-2013)
  - Examined problems at item-level on untimed Concepts and Applications worksheets with principal components analysis and item response difficulty and discrimination estimates
  - Time limit analysis was conducted
  - Altered problem types and eliminated problems based on results
- Concepts and Applications Beta 1 Study (2013-2014)
  - Examine problems at item-level on untimed Concepts and Applications worksheets with principal components analysis and item response difficulty and discrimination estimates
  - Time limit analysis will be conducted
  - Confirmatory factor analysis will be conducted
  - Problem types will be altered based on results

Research Process

- Concepts and Applications and Computation 3rd and 6th Grade Reliability and Validity Study (2014-2016)
  - Examining what levels of performance on DIBELS Math measures predict a student is likely or unlikely to score at or above the 40%ile on school provided outcome measures
  - Examining the correlations between DIBELS Math measures Concepts and Applications and 3rd and 6th Computation measures and the school provided outcome measures.
  - Examining the inter-rater reliability, alternate form reliability, and test-retest reliability for the DIBELS Math Concepts and Applications and 3rd and 6th grade Computation measures

Themes
We Can Build Futures If We:

- SUPPORT students, teachers, schools.
- CARE about mathematics.
- START EARLY: Trajectories are difficult to change
- SET ambitious goals.
- TEACH the basic early numeracy/mathematics skills.
- MONITOR progress toward goals.
- DO SOMETHING if/when students are not on track.
- CELEBRATE successes!

DIBELS MATH

Contact Information

- Early Release of measures to interested schools
- Interested in learning more information?
  - Contact: info@dibels.org, (541) 431-6931
  - Visit: dibels.org

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