**DIBELS® Math: An Overview for Kindergarten – Sixth Grade**

Dr. Courtney Wheeler, Dynamic Measurement Group

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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

Measures by Grade

<table>
<thead>
<tr>
<th>Grade</th>
<th># of Measures</th>
<th>Time to Test</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>BOY, MOY, EOY: BQD, NIF, NNF</td>
<td>3 one-minute tests given individually</td>
<td>3 minutes</td>
</tr>
<tr>
<td>1st</td>
<td>BOY: NIF, NNF, AQD, MNF, Computation</td>
<td>4 one-minute tests given individually</td>
<td>8 minutes</td>
</tr>
<tr>
<td></td>
<td>MOY, EOY: AQD, MNF, Computation</td>
<td>2 two-minute tests done whole class</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 one-minute tests given individually</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 two-minute tests done whole class</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>BOY: MOY, EOY: Computation, Concepts and Applications</td>
<td>2 two-minute tests &amp; 1 five-minute tests done whole class</td>
<td>9 minutes</td>
</tr>
<tr>
<td>3rd</td>
<td>BOY: MOY, EOY: Computation, Concepts and Applications</td>
<td>2 four- to six-minute tests &amp; 1 ten- to sixteen-minute test</td>
<td>18-28 minutes</td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Time to Test

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
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 perform mental mathematics and to look at the world and make comparisons" (Gersten & Chard, 1999, p. 19 & 20).

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 & DiPerena, 2010)

Common underlying factors include:
- Magnitude Comparison
- Subitization
- Oral counting
- Number identification
- Identifying the missing number
- Basic computation

Linkages to Math Research

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

Link to Common Core State Standards

<table>
<thead>
<tr>
<th>Grade</th>
<th>Common Core State Standards in Mathematics (Domain)</th>
<th>DIBELS Math Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operations and Algebraic Thinking</td>
<td>Computation</td>
</tr>
<tr>
<td>2</td>
<td>Operations and Algebraic Thinking</td>
<td>Numbers and Operations in Base Ten</td>
</tr>
<tr>
<td>3</td>
<td>Operations and Algebraic Thinking</td>
<td>Numbers and Operations in Base Ten</td>
</tr>
<tr>
<td>4</td>
<td>Operations and Algebraic Thinking</td>
<td>Numbers and Operations in Base Ten Numbers and Operations–Fractions</td>
</tr>
<tr>
<td>5</td>
<td>Operations and Algebraic Thinking</td>
<td>Numbers and Operations in Base Ten Numbers and Operations–Fractions</td>
</tr>
<tr>
<td>6</td>
<td>The Number System</td>
<td>Computation</td>
</tr>
</tbody>
</table>
**Grade 2**
- Operations and Algebraic Thinking
- Numbers and Operations in Base Ten
- Measurement and Data
- Geometry

**Grade 3**
- Operations and Algebraic Thinking
- Numbers and Operations in Base Ten
- Measurement and Data
- Numbers and Operations-Fractions

**Grade 4**
- Operations and Algebraic Thinking
- Numbers and Operations in Base Ten
- Measurement and Data
- Numbers and Operations-Fractions

**Grade 5**
- Operations and Algebraic Thinking
- Numbers and Operations in Base Ten
- Measurement and Data
- Geometry
- Numbers and Operations-Fractions

**Grade 6**
- Ratios and Proportional Relationships
- Statistics and Probability
- The Number System
- Expressions and Equations
- Geometry

**Beginning Quantity Discrimination (BQD)**

- **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)

**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 see if the numbers of dots match their names. If the dots are to the left of the box and the dot is bigger, it is more.

Practice item (4): 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: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Point to the box that has 4 dots with a buddy, then ask, Which one is more? Help if no response.

Practice item (4): If the student cannot answer, then say, Which one is more? Help if no response.

Correct response: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Practice item (4): If the student cannot answer, then say, Which one is more? Help if no response.

Correct response: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Practice item (4): If the student cannot answer, then say, Which one is more? Help if no response.

Correct response: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Practice item (4): If the student cannot answer, then say, Which one is more? Help if no response.

Correct response: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Practice item (4): If the student cannot answer, then say, Which one is more? Help if no response.

Correct response: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Practice item (4): If the student cannot answer, then say, Which one is more? Help if no response.

Correct response: 4 dots are more.

Incorrect response: Present practice item until correct response is given.

Beginning of kindergarten to beginning of first grade

1 point for each correctly identified number

If the student does not respond within 3 seconds on an item, provide the correct answer and mark a slash (/) through the number.

Score: Zero points in the first five items (the first line).

Number Identification Fluency

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

Format:

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

Score:

- Total of correctly identified numbers in 1 minute.
Number Identification 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, mark a slash (/) through the number.

Discontinue Rule: Zero points in the first five items (the first line)

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: 5, what number comes next?

Correct response: 6
Incorrect response: Student does not respond.

Practice Item 2: 2, what number comes next?

Correct response: 3
Incorrect response: Student does not respond.

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)

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

**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

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.
**Computation**

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

Teacher Key Example
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

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.
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

<table>
<thead>
<tr>
<th>DIBELS Math Measure</th>
<th>DIBELS Math Score Level</th>
<th>Likely Need for Support</th>
<th>Beginning of Year</th>
<th>Middle of Year</th>
<th>End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>At or Above Benchmark</td>
<td>Likely to Need Core Support</td>
<td>26+</td>
<td>72+</td>
<td>88+</td>
<td></td>
</tr>
<tr>
<td>Below Benchmark</td>
<td>Likely to Need Strategic Support</td>
<td>15 - 25</td>
<td>51 - 71</td>
<td>67 - 87</td>
<td></td>
</tr>
<tr>
<td>Well Below Benchmark</td>
<td>Likely to Need Intensive Support</td>
<td>0 - 14</td>
<td>0 - 50</td>
<td>0 - 66</td>
<td></td>
</tr>
<tr>
<td>Beginning Quantity Discrimination (BQD)</td>
<td>Likely to Need Core Support</td>
<td>5+</td>
<td>8+</td>
<td>12+</td>
<td></td>
</tr>
<tr>
<td>Below Benchmark</td>
<td>Likely to Need Strategic Support</td>
<td>2 - 4</td>
<td>5 - 7</td>
<td>9 - 11</td>
<td></td>
</tr>
<tr>
<td>Well Below Benchmark</td>
<td>Likely to Need Intensive Support</td>
<td>0 - 1</td>
<td>0 - 4</td>
<td>0 - 8</td>
<td></td>
</tr>
<tr>
<td>Number Identification Fluency (NIF)</td>
<td>Likely to Need Core Support</td>
<td>6+</td>
<td>15+</td>
<td>25+</td>
<td></td>
</tr>
<tr>
<td>Below Benchmark</td>
<td>Likely to Need Strategic Support</td>
<td>4 - 6</td>
<td>8 - 14</td>
<td>14 - 24</td>
<td></td>
</tr>
<tr>
<td>Well Below Benchmark</td>
<td>Likely to Need Intensive Support</td>
<td>0 - 3</td>
<td>0 - 7</td>
<td>0 - 13</td>
<td></td>
</tr>
<tr>
<td>Next Number Fluency (NNF)</td>
<td>Likely to Need Core Support</td>
<td>5+</td>
<td>11+</td>
<td>13+</td>
<td></td>
</tr>
<tr>
<td>Below Benchmark</td>
<td>Likely to Need Strategic Support</td>
<td>2 - 4</td>
<td>8 - 10</td>
<td>10 - 12</td>
<td></td>
</tr>
<tr>
<td>Well Below Benchmark</td>
<td>Likely to Need Intensive Support</td>
<td>0 - 1</td>
<td>0 - 7</td>
<td>0 - 9</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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 Score is 1 * C&A + 2 * Comp.
**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.

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**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

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**Outcomes-Driven Model Steps and Questions**

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

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**Sample School Overview Report**

1st Grade - DIBELSnet
Sample Classroom Report: Middle of Kindergarten

School: Sample School
Gender: Kindergarten, Middle of Year
Year: 2013/2014
Class: Sample Kindergarten

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** | **Score** | **Local Total** | **Score** | **Local Total** | **Score** | **Local Total** | **CORRECTIVE**
--- | --- | --- | --- | --- | --- | --- | ---
Apple, Abby | 90 | 42 | 11 | 3 | 59 | 10 | 41 | 31
Banana, Barry | 50 | 47 | 20 | 35 | 10 | 42 | 68 | 42
Clement, Charles | 13 | 73 | 25 | 34 | 10 | 72 | 76 | 49
Dorthea, Dennis | 14 | 81 | 35 | 92 | 14 | 89 | 91 | 86
Eternal, Emily | 13 | 73 | 25 | 88 | 13 | 85 | 84 | 86
Fig, Frankie | 17 | 98 | 32 | 58 | 12 | 65 | 81 | 75
Gloove, Gulliver | 15 | 50 | 17 | 57 | 11 | 55 | 69 | 59
Hockey, Haley | 4 | 6 | 10 | 15 | 6 | 14 | 10 | 8
Icecold, Ickid | 12 | 61 | 27 | 81 | 13 | 55 | 73 | 64
James, Jane | 6 | 79 | 18 | 77 | 11 | 73 | 96 | 99
Kangaroo, Katie | 7 | 31 | 15 | 38 | 7 | 25 | 43 | 36
Lorrie, Laura | 22 | 97 | 34 | 83 | 13 | 72 | 95 | 92
Mango, Muffin | 12 | 61 | 37 | 97 | 10 | 97 | 99 | 97
Nextel, New | 4 | 6 | 15 | 94 | 7 | 56 | 62 | 17
Orangeperson, Opla | 5 | 27 | 13 | 24 | 5 | 14 | 29 | 3
Paper, Poppy | 8 | 36 | 11 | 51 | 10 | 82 | 90 | 89
Raspberry, Robin | 5 | 37 | 13 | 31 | 6 | 35 | 39 | 29
Strawberry, Sally | 11 | 53 | 25 | 72 | 11 | 55 | 70 | 50
**TOTAL** | **8** | **11** | **10** | **40**
**AVERAGE** | **10.4** | **19.3** | **11.7** | **61.0**

Sample Classroom Report: Middle of 1st Grade

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

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** | **Score** | **Local Total** | **Score** | **Local Total** | **Score** | **Local Total** | **CORRECTIVE**
--- | --- | --- | --- | --- | --- | --- | ---
Arnold, Carol | 29 | 88 | 14 | 50 | 10 | 60 | 84 | 55
Brown, Alice | 20 | 50 | 14 | 56 | 10 | 60 | 74 | 50
Clark, Bernadette | 39 | 88 | 14 | 50 | 10 | 60 | 89 | 55
Dora, Stefanie | 14 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Eddy, Ethel | 15 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Jackson, Benjamin | 17 | 50 | 14 | 50 | 10 | 60 | 50 | 35
Johnson, Charlotte | 30 | 50 | 14 | 50 | 10 | 60 | 100 | 65
Jones, Amelia | 12 | 50 | 14 | 50 | 10 | 60 | 35 | 25
King, Cindy | 12 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Lee, Hannah | 11 | 50 | 14 | 50 | 10 | 60 | 25 | 15
Maurice, Noel | 10 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Miller, Gloria | 11 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Nelson, Carter | 30 | 50 | 14 | 50 | 10 | 60 | 100 | 65
North, Grace | 30 | 50 | 14 | 50 | 10 | 60 | 100 | 65
Peters, Lila | 30 | 50 | 14 | 50 | 10 | 60 | 100 | 65
Raynor, Sarah | 30 | 50 | 14 | 50 | 10 | 60 | 100 | 65
Thomson, Emma | 30 | 50 | 14 | 50 | 10 | 60 | 100 | 65
Thompson, Lisa | 12 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Taylor, Abigail | 20 | 50 | 14 | 50 | 10 | 60 | 50 | 35
Waller, Sue | 20 | 50 | 14 | 50 | 10 | 60 | 50 | 35
Williams, Troy | 12 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Wilson, Ana | 12 | 50 | 14 | 50 | 10 | 60 | 35 | 25
Young, Jodie | 12 | 50 | 14 | 50 | 10 | 60 | 35 | 25
**TOTAL** | **27** | **110** | **100** | **27**
**AVERAGE** | **14.3** | **55.0** | **55.0** | **13.6**

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!

Contact Information

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