



*DIBELS<sup>®</sup> Math*

# DIBELS<sup>®</sup> Math Essential Workshop

DIBELS MATH

# Workshop Objectives

- ▶ Understand the research behind *DIBELS Math*
- ▶ Learn how to give and score *DIBELS Math*
- ▶ Begin to link *DIBELS Math* to *Vmath Summer*



# Workshop Agenda

Part 1: *DIBELS Math* Foundations

Part 2: Beginning Quantity Discrimination (BQD)

Part 3: Number Identification Fluency (#IDF)

Part 4: Next Number Fluency (N#F)

Part 5: Advanced Quantity Discrimination (AQD)

Part 6: Missing Number Fluency (?#F)

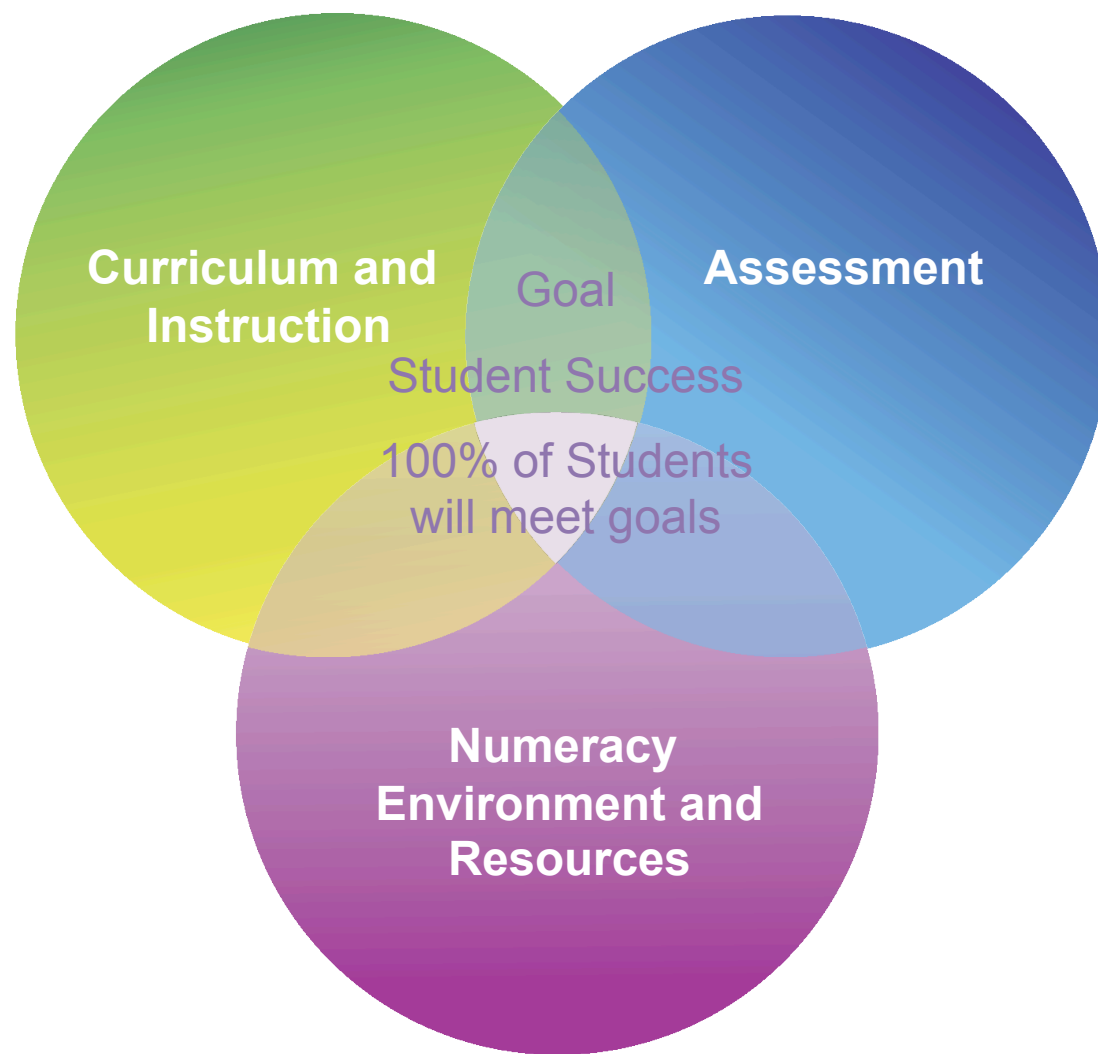
Part 7: Computation (C) *Test, Score, Response Pattern Analysis*

Part 8: Concepts & Applications (C&A) *Test, Score, Response Pattern Analysis*

Part 9: Common Core State Standards & Vmath Modules

Part 10: *Next Steps...* Follow-up Workshop in PM for Early Numeracy Skills

# DIBELS<sup>®</sup> Math is *One Part* of an Effective School-wide *System*





# Key Features of DIBELS<sup>®</sup> Math

- ▶ Universal Screening and Progress Monitoring
- ▶ Standardized
- ▶ Timed
- ▶ Brief
- ▶ Simple Scoring
- ▶ Predictive–Benchmark Goals & Composite Scores

# 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> |                                   |                       |                     |                                  |                        |             |                           |

# 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 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 math outcomes

# 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.**
- ▶ **Below Benchmark:** Odds are generally 40% to 60% of achieving subsequent benchmark goals and important mathematics outcomes. **Student is likely to need strategic support to make adequate progress.**
- ▶ **Well Below Benchmark:** Odds are generally 10% to 20% of achieving subsequent benchmark goals and important mathematics outcomes. **Student is likely to need intensive support to make adequate progress.**



# Benchmark Goals and Local Norms

- ▶ Benchmark Goals are available for the Early Numeracy measures and Computation (1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade)
- ▶ Schools should use local normative information, available through DIBELSnet, for Computation and Concepts & Applications and in 3<sup>rd</sup> and 6<sup>th</sup> grade while the Benchmark Goals are developed during the 2014–2015 school year.



# Interpreting Results: Local Norms

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

- ▶  $\frac{1}{2}$  of the students will be at or below average and  $\frac{1}{2}$  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

# 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 the number of measures included may vary (e.g. 1<sup>st</sup> grade from fall to winter).

# 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)
- ▶ 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)



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# Part 2- BQD Beginning Quantity Discrimination

# DIBELS® Math

| <b>Underlying Concepts</b>  | <b>DIBELS Math Measures</b>  |
|-----------------------------|--|
| <b>Magnitude Comparison</b> | <b>Beginning Quantity Discrimination</b><br>Advanced Quantity Discrimination |
| <b>Subitization</b>         | <b>Beginning Quantity Discrimination</b><br>(indirectly measured)            |
| Strategic Counting          | Next Number Fluency<br>Missing Number Fluency                                |
| Number Identification       | Number Identification  |
| Basic Computation           | Computation  |

# Magnitude Comparison

What is it?

- ▶ Students' ability to discern quickly the greatest number in a set and ability to weigh relative differences in magnitude efficiently (Gersten et al., 2012)
- ▶ Requires understanding of place value and ability to perform mental calculations
- ▶ Complexity of items depends on the set of numbers given to the student

Why is it important?

- ▶ It is related to other critical areas of mathematical performance such as mental calculation and place value (Gersten et al., 2012).



# What Is Subitization?

- ▶ The ability to instantly judge the number associated with a group of items.
- ▶ Different from counting
- ▶ Children as young as 2 begin to subitize small amounts
- ▶ Conceptual subitizing plays an advanced organizing role (Clements, 1999)
  - ▶ For example, with the domino pattern students who are able to conceptually subitize recognize the number pattern as composite parts and as a whole

# Why Is Subitization Important?

- ▶ Thought to be an important precursor to mathematics development
- ▶ Recent studies have linked subitizing ability to counting, arithmetic, and number system knowledge.
- ▶ Research has found that there is a significant link between subitizing ability and mathematical skills in kindergarten aged children (Yun et. al., 2011).
- ▶ Predictive of later mathematics performance (Desoete & Gregorie, 2006)

# Beginning Quantity Discrimination

|                                |  |
|--------------------------------|--|
| <b>Skill</b>                   | Magnitude Comparison and Subitization (indirectly)   |
| <b>Administration Time</b>     | 1 minute   |
| <b>Administration Schedule</b> | BOY K to EOY K   |
| <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>        | 0 points in the first four items (the first page)  |

# Preliminary BQD Benchmark Goals

| Grade        | Score Level | Need for Support | BOY | MOY | EOY  |
|--------------|-------------|------------------|-----|-----|------|
| Kindergarten | At or Above | Core             | 5   | 8   | 11   |
|              | Below       | Strategic        | 2–4 | 4–7 | 7–10 |
|              | Well Below  | Intensive        | 0–1 | 0–3 | 0–6  |

# Beginning Quantity Discrimination Video





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# Part 3- #IDF

## Number Identification Fluency



# DIBELS® Math

| <b>Underlying Concepts</b>   | <b>DIBELS Math Measures</b>   |
|------------------------------|---|
| Magnitude Comparison         | Beginning Quantity Discrimination<br>Advanced Quantity Discrimination |
| Subitization                 | Beginning Quantity Discrimination<br>(indirectly measured)            |
| Strategic Counting           | Next Number Fluency<br>Missing Number Fluency                         |
| <b>Number Identification</b> | <b>Number Identification Fluency</b>                                  |
| Basic Computation            | Computation   |

# Number Identification Fluency

What is it?

- ▶ Linking written numbers to names
- ▶ Equivalent to letter naming fluency in reading

Why is it important?

- ▶ Not necessarily a mathematical skill on its own, it serves as an important predictor of later skills.
- ▶ Number recognition is essential for later mathematical skills.

# Number Identification Fluency (#IDF)

|                                |  |
|--------------------------------|--|
| <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>        | 0 points in the first five items (the first line)  |

# Preliminary #IDF Benchmark Goals

| Grade        | Score Level | Need for Support | BOY   | MOY  | EOY   |
|--------------|-------------|------------------|-------|------|-------|
| Kindergarten | At or Above | Core             | 6     | 13   | 23    |
|              | Below       | Strategic        | 3–5   | 7–12 | 13–22 |
|              | Well Below  | Intensive        | 0–2   | 0–6  | 0–12  |
| First Grade  | At or Above | Core             | 27    |      |       |
|              | Below       | Strategic        | 15–26 |      |       |
|              | Well Below  | Intensive        | 0–14  |      |       |

# Number Identification Fluency Video





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# Part 4- NNF

## Next Number Fluency



# DIBELS® Math

| <b>Underlying Concepts</b> | <b>DIBELS Math Measures</b>   |
|----------------------------|---|
| Magnitude Comparison       | Beginning Quantity Discrimination<br>Advanced Quantity Discrimination |
| Subitization               | Beginning Quantity Discrimination<br>(indirectly measured)            |
| <b>Strategic Counting</b>  | <b>Next Number Fluency</b><br>Missing Number Fluency                  |
| Number Identification      | Number Identification Fluency   |
| Basic Computation          | Computation   |

# Strategic Counting

## What is it?

- ▶ Knowledge of counting principles and skill in counting (Gersten et al., 2012)
- ▶ Examples include counting with reference to objects, counting on, being able to say counting words without reference to objects

## Why is it important?

- ▶ It is a fundamental skill that leads to mathematical proficiency and understanding (Siegler & Robinson, 1982)
- ▶ Strategic counting is a critical problem solving skill (Gersten et al., 2012)

# 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, mark a slash (/) through the number. |
| <b>Discontinue Rule</b>        | 0 points in the first five items (the first line)   |

# Preliminary NNF Benchmark Goals

| Grade        | Score Level | Need for Support | BOY  | MOY | EOY  |
|--------------|-------------|------------------|------|-----|------|
| Kindergarten | At or Above | Core             | 5    | 10  | 12   |
|              | Below       | Strategic        | 2–4  | 6–9 | 9–11 |
|              | Well Below  | Intensive        | 0–1  | 0–5 | 0–8  |
| First Grade  | At or Above | Core             | 12   |     |      |
|              | Below       | Strategic        | 8–11 |     |      |
|              | Well Below  | Intensive        | 0–7  |     |      |

# Next Number Fluency Video



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# Part 5- AQD

## Advanced Quantity Discrimination



# DIBELS® Math

| Underlying Concepts         | DIBELS Math Measures   |
|-----------------------------|--|
| <b>Magnitude Comparison</b> | Beginning Quantity Discrimination<br><b>Advanced Quantity Discrimination</b> |
| Subitization                | Beginning Quantity Discrimination<br>(indirectly measured)                   |
| Strategic Counting          | Next Number Fluency<br>Missing Number Fluency                                |
| Number Identification       | Number Identification  |
| Basic Computation           | Computation  |

# Magnitude Comparison

What is it?

- ▶ Students' ability to discern quickly the greatest number in a set and ability to weigh relative differences in magnitude efficiently (Gersten et al., 2012)
- ▶ Requires understanding of place value and ability to perform mental calculations
- ▶ Complexity of items depends on the set of numbers given to the student

Why is it important?

- ▶ It is related to other critical areas of mathematical performance such as mental calculation and place value (Gersten et al., 2012).

# Advanced Quantity Discrimination

|                                |   |
|--------------------------------|---|
| <b>Skill</b>                   | Magnitude Comparison  |
| <b>Administration Time</b>     | 1 minute  |
| <b>Administration Schedule</b> | Beginning of first grade 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 3 seconds on an item, provide the correct answer and mark a slash (/) through the number |
| <b>Discontinue Rule</b>        | 0 points in the first six items (the first page)  |

# Preliminary AQD Benchmark Goals

| Grade       | Score Level | Need for Support | BOY | MOY   | EOY   |
|-------------|-------------|------------------|-----|-------|-------|
| First Grade | At or Above | Core             | 10  | 18    | 20    |
|             | Below       | Strategic        | 5–9 | 13–17 | 15–19 |
|             | Well Below  | Intensive        | 0–4 | 0–12  | 0–14  |

# Advanced Quantity Discrimination Video



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# Part 6- ?NF

## Missing Number Fluency

# DIBELS<sup>®</sup> Math

| Underlying Concepts       | DIBELS Math Measures  |
|---------------------------|---|
| Magnitude Comparison      | Beginning Quantity Discrimination<br>Advanced Quantity Discrimination |
| Subitization              | Beginning Quantity Discrimination<br>(indirectly measured)            |
| <b>Strategic Counting</b> | Next Number Fluency<br><b>Missing Number Fluency</b>                  |
| Number Identification     | Number Identification   |
| Basic Computation         | Computation   |



# Strategic Counting

## What is it?

- ▶ Knowledge of counting principles and skill in counting (Gersten et al., 2012)
- ▶ Examples include counting with reference to objects, counting on, being able to say counting words without reference to objects

## Why is it important?

- ▶ It is a fundamental skill that leads to mathematical proficiency and understanding (Siegler & Robinson, 1982).
- ▶ Strategic counting is a critical problem solving skill (Gersten et al., 2012).
- ▶ Allows for flexibility in mental computing

# Missing Number Fluency (MNF)

|                                |   |
|--------------------------------|---|
| <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 grade 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 <b>5</b> seconds on an item, provide the correct answer and mark a slash (/) through the number. |
| <b>Discontinue Rule</b>        | 0 points in the first six items   |

# Preliminary MNF Benchmark Goals

| Grade       | Score Level | Need for Support | BOY | MOY | EOY |
|-------------|-------------|------------------|-----|-----|-----|
| First Grade | At or Above | Core             | 4   | 7   | 9   |
|             | Below       | Strategic        | 2-3 | 5-6 | 7-8 |
|             | Well Below  | Intensive        | 0-1 | 0-4 | 0-6 |

# Missing Number Fluency



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# Part 7

# Computation

# DIBELS® Math

| Underlying Concepts      | DIBELS Math Measures  |
|--------------------------|---|
| Magnitude Comparison     | Beginning Quantity Discrimination<br>Advanced Quantity Discrimination |
| Subitization             | Beginning Quantity Discrimination<br>(indirectly measured)            |
| Strategic Counting       | Next Number Fluency<br>Missing Number Fluency                         |
| Number Identification    | Number Identification   |
| <b>Basic Computation</b> | <b>Computation</b>  |

# Basic Computation

What is it?

- ▶ Addition
- ▶ Subtraction
- ▶ Multiplication
- ▶ Division

Why is it important?

- ▶ NAEP results in 2011 indicate that 40% of fourth grade students are at or above proficient (National Center for Education Statistics, 2011).
- ▶ 40% of the NAEP assessment in 4th grade focuses on number properties and operations, which are computation problems.
- ▶ Math computation plays a role in overall math achievement.



# Computation

|                                |   |
|--------------------------------|---|
| <b>Skill</b>                   | Basic Computation                                   |
| <b>Administration Time</b>     | 2, 3, 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                                 |

# Preliminary Computation Benchmark Goals

| Grade        | Score Level     | Need for Support | BOY | MOY | EOY   |
|--------------|-----------------|------------------|-----|-----|-------|
| First Grade  | At or Above     | Core             | 5   | 9   | 13    |
|              | Below           | Strategic        | 2–4 | 5–8 | 9–12  |
|              | Well Below      | Intensive        | 0–1 | 0–4 | 0–8   |
| Second Grade | At or Above     | Core             | 7   | 10  | 13    |
|              | Below           | Strategic        | 4–6 | 7–9 | 10–12 |
|              | Well Below      | Intensive        | 0–3 | 0–6 | 0–9   |
| Third Grade  | Use Local Norms |                  |     |     |       |

# Preliminary Computation Benchmark Goals

| Grade        | Score Level     | Need for Support | BOY   | MOY   | EOY   |
|--------------|-----------------|------------------|-------|-------|-------|
| Fourth Grade | At or Above     | Core             | 18    | 29    | 42    |
|              | Below           | Strategic        | 13–17 | 21–28 | 31–41 |
|              | Well Below      | Intensive        | 0–12  | 0–20  | 0–30  |
| Fifth Grade  | At or Above     | Core             | 29    | 48    | 53    |
|              | Below           | Strategic        | 16–28 | 31–47 | 37–52 |
|              | Well Below      | Intensive        | 0–15  | 0–30  | 0–36  |
| Sixth Grade  | Use Local Norms |                  |       |       |       |

# Grade Level Time Limits for Computation Worksheets

| Grade   | Time Limit Per Worksheet | Total Time for Benchmark Assessment (2 Worksheets) |
|---------|--------------------------|--|
| 1 and 2 | 2 minutes                | 4 minutes  |
| 3       | 3 minutes                | 6 minutes  |
| 4       | 5 minutes                | 10 minutes   |
| 5       | 6 minutes                | 12 minutes   |
| 6       | 6 minutes                | 12 minutes   |

# Practice Activity: Take the Test!

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

Total: \_\_\_\_\_

|   |  |   |  |   |
|---|--|---|--|---|
| 1.<br>$\begin{array}{r} 882 \\ + 16 \\ \hline 898 \end{array}$  | 2.<br>$\begin{array}{r} 1854 \\ + 1778 \\ \hline 3632 \end{array}$ | 3.<br>$5\frac{1}{3} + 1\frac{1}{3} = 6\frac{2}{3}$  | 4.<br>$\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$          | 5.<br>$\begin{array}{r} 42 \\ 4 \overline{)738} \end{array}$    |
| 6.<br>$\begin{array}{r} 672 \\ - 332 \\ \hline 340 \end{array}$ | 7.<br>$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$                    | 8.<br>$\begin{array}{r} 7126 \\ - 638 \\ \hline 7512 \end{array}$                           | 9.<br>$\begin{array}{r} 79 \\ \times 11 \\ \hline 79 \\ 869 \end{array}$ | 10.<br>$6\frac{5}{8} + 5\frac{2}{8} = 11\frac{7}{8}$            |
| 11.<br>$\begin{array}{r} 80 \\ 2 \overline{)627} \end{array}$   | 12.<br>$\begin{array}{r} 3 \\ 7 \overline{)21} \end{array}$        | 13.<br>$\begin{array}{r} 98 \\ \times 48 \\ \hline 1768 \\ 3920 \\ \hline 4688 \end{array}$ | 14.<br>$\frac{1}{4} + \frac{1}{4} =$                                     | 15.<br>$\begin{array}{r} 253 \\ \times 6 \\ \hline \end{array}$ |

# Practice Activity: Score

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

Total: 37

|   |   |  |  |   |
|---|---|--|--|---|
| <p>1.</p> $\begin{array}{r} 882 \\ + 16 \\ \hline 898 \\ \uparrow\uparrow\uparrow \end{array}$ <p style="text-align: center;">③</p> | <p>2.</p> $\begin{array}{r} 1854 \\ + 1778 \\ \hline 3632 \\ \uparrow\uparrow\uparrow\uparrow \end{array}$ <p style="text-align: center;">④</p> | <p>3.</p> $5\frac{1}{3} + 1\frac{1}{3} = 6\frac{2}{3}$ <p style="text-align: center;">②</p>  | <p>4.</p> $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ <p style="text-align: center;">②</p>   | <p>5.</p> $\begin{array}{r} 42 \\ 4 \overline{)738} \end{array}$ <p style="text-align: center;">①</p> |
| <p>6.</p> $\begin{array}{r} 672 \\ - 332 \\ \hline 340 \end{array}$ <p style="text-align: center;">③</p>                            | <p>7.</p> $\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$ <p style="text-align: center;">②</p>  | <p>8.</p> $\begin{array}{r} 7126 \\ - 638 \\ \hline 7512 \end{array}$ <p style="text-align: center;">①</p>                           | <p>9.</p> $\begin{array}{r} 79 \\ \times 11 \\ \hline 79 \\ \phantom{79} \\ \times 790 \\ \hline 869 \end{array}$ <p style="text-align: center;">⑧</p> | <p>10.</p> $6\frac{5}{8} + 5\frac{2}{8} = 11\frac{7}{8}$ <p style="text-align: center;">④</p>         |
| <p>11.</p> $\begin{array}{r} 80 \\ 2 \overline{)627} \end{array}$ <p style="text-align: center;">①</p>                              | <p>12.</p> $\begin{array}{r} 3 \\ 7 \overline{)21} \end{array}$ <p style="text-align: center;">①</p>  | <p>13.</p> $\begin{array}{r} 98 \\ \times 48 \\ \hline 1768 \\ 3920 \\ \hline 4688 \end{array}$ <p style="text-align: center;">②</p> | <p>14.</p> $\frac{1}{4} + \frac{1}{4} =$   | <p>15.</p> $\begin{array}{r} 253 \\ \times 6 \\ \hline \end{array}$                                   |

# Response Pattern Analysis

- ▶ *Student Computation Worksheet(s)*
- ▶ *Benchmark Scoring Booklet*
  - \* Note the last item attempted
  - \* Circle Correct Items
  - \* Put X on Incorrect Items
  - \* Leave Blank Skipped or Not Attempted Items





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# Part 8- C&A

## Concepts and Applications

# Concepts and Applications

What is it?

- ▶ A standardized measure designed to assess students' progress in the basic skills of understanding mathematical concepts and vocabulary and applying that knowledge to solve mathematical problems. It can be administered individually or to groups.

# Concepts and Applications

|                                |   |
|--------------------------------|---|
| <b>Skill</b>                   | Understanding math concepts and vocabulary, and applying that knowledge to solving problems                                   |
| <b>Administration Time</b>     | 5, 10, 12, 14 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, exact answer points per box, exact answer points per line, or exact answer points per segment |
| <b>Wait Rule</b>               | No wait rule  |
| <b>Discontinue Rule</b>        | No discontinue rule   |

# Grade Level Time Limits for Worksheets

| Grade | Time Limit |
|-------|------------|
| 2     | 5 minutes  |
| 3     | 12 minutes |
| 4     | 10 minutes |
| 5     | 14 minutes |
| 6     | 16 minutes |

# Concepts and Applications

- ▶ Practice Activity: Take the Test!
- ▶ Practice Activity: Score
- ▶ Response Pattern Analysis

*-Student Concepts & Applications Worksheet*  
*-Benchmark Scoring Booklet*

- \* Note the last item attempted
- \* Circle Correct Items
- \* Put X on Incorrect Items
- \* Leave Blank Skipped or Not Attempted Items



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## Part 9

# Common Core State Standards & *Vmath Summer Modules*



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# Part 10

## Conclusion & Next Steps