Math Resources: Assessments to Inform Present Levels

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This document has been designed to provide various math assessments that will inform PLEPs (Present Levels of Educational Performance) for the IEP writing process. The PLEP should provide the foundation for the data-based decisions the IEP team is required to make with regard to a student’s goals, supports, accommodations, modifications, and services for the next year. The PLEP also provides information for selecting appropriate interventions and supports and services, including the least restrictive environment (LRE).

This document will assist the educator in choosing appropriate assessments to inform each PLEP (i.e., basic reading, reading fluency, and reading comprehension) and ultimately inform aligned, deficit-based interventions in the area of reading.

**Formatting Note:**
The notation “4:0-24:11” means 4 years 0 months through 24 years 11 months.
Math Areas of Deficit

Math areas of deficit include math calculation and math problem solving. **Math calculation** is the knowledge and retrieval of facts and the application of procedural knowledge in calculation. **Math problem solving** involves using mathematical computation skills, language, reasoning, reading, and visual-spatial skills in solving problems; and applying mathematical knowledge at the conceptual level.

Many of the assessments included in this document include components of both math calculation and math problem solving. In many cases, the distinction between math calculation and math problem solving is determined by how the skill is being used. For example, assessment of fraction operations would fall under math calculation; however, assessment of fractions used in the context of measurement would fall under math problem solving. Therefore, it is crucial that school teams use a variety of assessment information, including diagnostic assessments, to determine the student’s most foundational skill deficit and intervene appropriately.

Source: *RTI Implementation Guide*
# Math Areas of Deficit

The following chart is intended as a guide for helping determine a student’s deficit. Additional information can be found in the *RTI² Implementation Guide* (p.217-218) and the *Math Rubric*.

<table>
<thead>
<tr>
<th>Area of Deficit</th>
<th>Associated Deficits</th>
<th>Typically Assessed Skills*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Math Calculation</strong></td>
<td>Deficits in number sense and operations, one-to-one correspondence; learning and remembering basic facts</td>
<td>Counting and cardinality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Place value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basic facts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multi-digit operations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fraction and decimal operations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ratios and rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Integers and rational numbers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exponents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expressions and equations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Algebraic operations</td>
</tr>
<tr>
<td><strong>Math Problem Solving</strong></td>
<td>Difficulty identifying important information; filtering out unimportant information and determining necessary steps in problem solving; deficits in math vocabulary and mathematical metacognition (i.e., the inability to monitor one’s own learning)</td>
<td>Application of calculation skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comparing quantities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Using place value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Money</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measurement/Geometry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Word problems</td>
</tr>
</tbody>
</table>

*This is not an exhaustive list.

Source: *RTI² Implementation Guide*
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## Math Assessments

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- Aimsweb Plus
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- CIBS-II
- CMAT
- CTP
- DAB-4
- DAB-I
- EasyCBM
- HAMAT
- KeyMath-3
- KTEA-2
- PAL-II Math
- Star Math
- TOMA-3
- WIAT-III
- WJ-IV Achievement
- WRAT-4
Academic Improvement Measurement System (AIMSweb)

Ages
• Early Numeracy: Grades K-1
  • Math: Grades 2-8

Administration & Time
• ≈1-25 minutes per subtest
• 1:1 administration for Early Numeracy measures
• Group administration for Math measures
• May be computer or paper administration

Purpose
• To screen all students (universal screening tool)
  • To progress monitor broad progress
  • To identify skill-level needs (some subtests)

English Learner (EL) Options
Spanish Options:
• Early Numeracy
• Math

Additional Information
High school norms included (see TDOE guidance document for high school)

Subtests

Early Numeracy
• Test of Early Numeracy

Math
• Math Computation (M-COMP)
• Mathematics Concepts and Applications (M-CAP)
Academic Improvement Measurement System Plus (AIMSweb Plus)

Ages
Grades K-8

Administration & Time
• ≈ 1-25 minutes per subtest
• Computer or paper administration

Purpose
• Universal screening tool
• Broad outcome progress monitor
• Some subtests identify skill-level needs

EL Options
Spanish Options

Additional Information
High school norms included (see TDOE guidance document for high school)

Subtests

Early Numeracy
• Number Naming Fluency
• Quantity Total Fluency
• Quantity Difference Fluency
• Concepts and Applications
• Number Comparison Fluency
• Math Facts Fluency – 1 digit
• Math Facts Fluency – Tens

Grades 2-8
• Number Comparison Fluency
• Mental Computation Fluency
• Concepts and Applications

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Basic Achievement Skills Inventory (BASI)

Ages
- Comprehensive version: 8:0-80:0
- Survey version: Grades 3-12

Administration & Time
- ≈ 115 minutes for complete battery
- ≈ 20-35 minutes per subtest

Purpose
Comprehensive version:
- Determine academic strengths and weaknesses
  - Monitor student progress
Survey version:
- Gain quick overview of achievement
  - Screen for giftedness

Additional Information
- Can choose comprehensive or survey version based on purpose of assessment
- Publication date is 2004

Subtests

<table>
<thead>
<tr>
<th>Comprehensive Version</th>
<th>Survey Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math Computation</td>
<td>Math</td>
</tr>
<tr>
<td>Math Application</td>
<td></td>
</tr>
</tbody>
</table>

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Brigance Comprehensive Inventory of Basic Skills (CIBS-II)

Ages
Grades Pre-K-9

Administration & Time
• ≈15-30 minutes per subtest (highly flexible)
  • 1:1 or group administration

Purpose
• Assess students' strengths and needs in the classroom
  • Inform PLEPs and goals

EL Options
Brigance ABS-R (Assessment of Basic Skills-Revised, Spanish edition) for grades PK-9

Additional Information
Many subtests across multiple domains available

Math Skills Assessed
• Number and operations
• Algebra
• Geometry
• Measurement
• Data analysis and probability
Comprehensive Mathematical Abilities Test (CMAT)

Ages
7:0-18:11

Administration & Time
• ≈30-120 minutes
• 1:1 administration

Purpose
Assess individual math strengths and weaknesses, including for higher level math students

Additional Information
• National age- and grade-based norms available
• Can select 2-12 subtests according to need

Subtests

<table>
<thead>
<tr>
<th>Core Subtests</th>
<th>Supplemental Subtests</th>
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</thead>
<tbody>
<tr>
<td>Addition</td>
<td>Rational Numbers</td>
</tr>
<tr>
<td>Subtraction</td>
<td>Algebra</td>
</tr>
<tr>
<td>Multiplication</td>
<td>Geometry</td>
</tr>
<tr>
<td>Division</td>
<td>Time</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>Money</td>
</tr>
<tr>
<td>Charts, Tables, and Graphs</td>
<td>Measurement</td>
</tr>
</tbody>
</table>
Ages
Grades 1-11
(some subtests begin in grade 3)

Administration & Time
• ≈2 ½-4 hours
• Group administration (paper or online)
  • Standardized

Purpose
To assess high-achieving students on content and conceptual knowledge

Additional Information
• Gives percentile ranks based on national norms
• Primarily normed on private school students in the northeast

Subtests
• Mathematics (Grades 1-11)
• Quantitative Reasoning (Grades 3-11)
Diagnostic Achievement Battery, 4th Edition (DAB-4)

Ages:
6:0-14:11

Administration & Time
• ≈ 60-120 minutes
• 1:1 or small group administration, depending on the subtest
  • Standardized

Purpose
• Assess academic abilities
• Determine student strengths and weaknesses
• Document student progress

Additional Information
Provides standard scores, percentile ranks, and age/grade equivalents

Subtests
• Math Reasoning
• Math Calculation

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Diagnostic Achievement Battery – Intermediate (DAB-I)

Ages
13:0-17:11

Administration & Time
• ≈ 60-90 minutes
  • 1:1
  • Standardized

Purpose
• Assess academic abilities
• Inform remediation planning

Additional Information
Provides standard scores, percentile ranks, and age/grade equivalents

Subtests
• Math Reasoning
• Math Calculation
Easy CBM

Ages
Grades K-8

Administration & Time
• ≈8-45 minutes per subtest
• Paper/pencil or online
• Group administration

Purpose
• Universal screening tool
• Broad outcome progress monitor
• Some subtests identify skill-level needs

EL Options
Spanish

Additional Information
• Norms included for K-8 (see TDOE guidance document for high school)
• NCTM and CCSS Math universal screening available

Subtests

<table>
<thead>
<tr>
<th>Screening Measures</th>
<th>Progress Monitoring Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCTM</td>
<td>Numbers, Operations, and Algebra</td>
</tr>
<tr>
<td>CCSS Math</td>
<td>Algebra</td>
</tr>
</tbody>
</table>

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Hammill Multiability Achievement Test (HAMAT)

Ages
7:0-17:11

Administration & Time
• ≈ 30-60 minutes
• 1:1 administration

Purpose
• Assess academic abilities
• Determine student strengths and weaknesses

Additional Information
Normed in 1998

Subtests
• Mathematics (computation)
KeyMath-3 Diagnostic

Ages
• 4:6-21:11
• Grades K-12

Administration & Time
• ≈ 30-90 minutes
• 1:1 administration
• Paper/pencil

Purpose
• To diagnose mathematical weaknesses
• To monitor growth and progress

Additional Information
• Nationally normed
• Composite provides standard scores, age/grade equivalents, percentile ranks, and growth scale values

Subtests
• Numeration
• Algebra
• Geometry
• Measurement
• Data Analysis & Probability
• Mental Computation and Estimation
• Written Computation: Addition and Subtraction
• Written Computation: Multiplication and Division
• Foundations of Problem Solving
• Applied Problem Solving

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Kaufman Test of Educational Achievement, Second Edition (KTEA-II)

Ages
4:0-25:11

Administration & Time
• ≈15-85 minutes
• Paper/pencil or online

Purpose
• In-depth assessment of key academic skills
• Identifying and remediating learning gaps
  • Measuring student progress

Additional Information
Web-based or manual scoring

Subtests
• Math Concepts and Applications
• Math Computation

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Ages
Grades K-6

Administration & Time
• Time varies depending on subtests used
  • Paper/pencil

Purpose
• Investigate cognitive processes related to math
• Provide diagnostics of math weaknesses
  • Inform PLEPs and goals

Additional Information
Can be used briefly or comprehensively

Subtests
• Oral Counting
• Place Value
• Part-Whole Relationships (Time)
• Fact Retrieval
• Computation Operations
• Multi-Step Problem Solving
• Quantitative Working Memory
• Part-Whole Fractions and Mixed Numbers
Star Math (Renaissance)

Ages:
Grades 1-12

Administration & Time
• ≈ 20 minutes
• Computer-administered
• Computer-adaptive

Purpose
To screen/monitor students for math achievement levels

EL Options
Spanish Option: Grades 1-8

Additional Info
Provides percentile rank, normal curve equivalent, and student growth percentile

Math Skills Assessed
• Numeration Concepts
• Computation Processes
• Estimation
• Geometry
• Measurement
• Data Analysis and Statistics
• Word Problems
• Algebra

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Test of Mathematical Abilities – 3rd Edition (TOMA-3)

Ages
8:0-18:11

Administration Time
• 60-90 minutes
• Group or individual administration

Purpose
Identify, describe, and quantify math deficits

Subtests
• Mathematical Symbols and Concepts
• Computation
• Mathematics in Everyday Life
• Word Problems
• Attitude Toward Math (supplemental)

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Weschler Individual Achievement Test (WIAT-III)

Age
4:0-Adult

Administration & Time
• Varies by grade level and number of subtests
  • 1:1
• Paper/pencil or online

Purpose
• To identify academic strengths and weaknesses
  • To inform instructional decisions

Additional Information
Provides standard scores, percentile ranks, stanines, NCEs, and age/grade equivalents

Subtests
• Math Problem Solving
• Numerical Operations
• Math Fluency – Addition
• Math Fluency – Subtraction
• Math Fluency – Multiplication

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Woodcock-Johnson IV Tests of Achievement (WJ Ach IV)

**Age**
Grades Pre-K-12

**Administration & Time**
- Time varies by grade level and number of subtests
  - 1:1
  - Standardized

**Purpose**
- To identify and describe patterns of performance across achievement
- To determine academic strengths and weaknesses

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**Subtests**

**Standard Battery**
- Calculation
- Math Facts Fluency
- Applied Problems

**Extended Battery**
- Number Matrices

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Age
Grades Pre-K-12 (5:0-Adult)

Administration & Time
• ≈ 15-45 minutes
• 1:1 or small group
• Paper/pencil

Purpose
• To assess academic skills
• To screen for further evaluation

Additional Information
Addresses math calculation

Subtests
• Math Computation
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This is only a sampling of available products and services. If you would like your product or service to be considered for addition to the list, please contact Erin Lavery.