Early Math Fluency CBM Probe: Number Identification

This introduction to the Number Identification probe provides information about the preparation, administration, and scoring of this Early Math CBM measure. Additionally, it offers brief guidelines for integrating this assessment into a school-wide 'Response-to-Intervention' model.

Number Identification: Description (Clarke & Shinn, 2004; Gersten, Jordan & Flojo, 2005)

The student is given a sheet containing rows of randomly generated numbers (e.g., ranging from 0 to 20). During a one-minute timed assessment, the student reads aloud as many numbers as possible while the examiner records any Number Identification errors.

Number Identification: Preparation

The following materials are needed to administer Number Identification (NID) Early Math CBM probes:

- Student and examiner copies of a NID assessment probe. (Note: Customized NID probes can be created conveniently and at no cost using Numberfly, a web-based application. Visit Numberfly at *http://www.interventioncentral.org/php/numberfly/numberfly.php*).

- A pencil, pen, or marker

- A stopwatch

Number Identification: Directions for Administration

1. The examiner sits with the student in a quiet area without distractions. The examiner sits at a table across from the student.

2. The examiner says to the student:

   "The sheet on your desk has rows of numbers."

   "When I say, 'start,' begin reading the numbers aloud. Start at the top of this page and read across the page [demonstrate by pointing]*. Try to read each number. When you come to the end of a row, go to the next row. Are there any questions?* [Pause] *Start. "*

3. The examiner begins the stopwatch when the student reads the first number aloud. If the student hesitates on a number for 3 seconds or longer, the examiner says, *"Go to the next one."* (If necessary, the examiner points to the next number as a student prompt.)

4. The examiner marks each Number Identification error by marking a slash (/) through the incorrectly read number on the examiner form.

5. At the end of one minute, the examiner says, *"Stop"* and writes in a right-bracket symbol ( ]) on the examiner form from the point in the number series that the student had reached when the time expired. The examiner then collects the student Number Identification sheet.

Number Identification: Scoring Guidelines

Correct NID responses include:

- Numbers read correctly
- Numbers read incorrectly but corrected by the student within 3 seconds

Incorrect NID responses include:

- Numbers read incorrectly
- Numbers read correctly after hesitations of 3 seconds or longer
- Numbers skipped by the student

To calculate a Number Identification fluency score, the examiner:

1. counts up all numbers that the student attempted to read aloud and
2. subtracts the number of errors from the total of numbers attempted.
3. The resulting figure is the number of correct numbers identified.(NID fluency score).

Number Identification Probes as Part of a Response to Intervention Model

- Universal Screening: To proactively identify children who may have deficiencies in development of foundation math concepts, or 'number sense' (Berch, 2005), schools may choose to screen all kindergarten and first grade students using Number Identification probes. Those screenings would take place in fall, winter, and spring. Students who fall below the 'cutpoint' of the 35th percentile (e.g., Gersten, Jordan & Flojo, 2005).of the grade norms on the NID task would be identified as having moderate deficiencies and given additional interventions to build their 'number sense' skills.

- Tier I (Classroom-Based) Interventions: Teachers can create Number Identification probes and use them independently to track the progress of students who show modest delays in their math foundation skills.

- Tier II (Individualized) Interventions. Students with more extreme academic delays may be referred to a school-based problem-solving team, which will develop more intensive, specialized interventions to target the student's academic deficits (Wright, 2007). Number Identification probes can be used as one formative measure to track student progress with Tier II interventions to build foundation math skills.

Number identification: Measurement Statistics

Test-Retest Reliability Correlations for Number Identification Probes		
Time Span	*Correlation*	*Reference*
13-week interval	0.85	Clarke & Shinn (2004)
26-week interval	0.76	Clarke & Shinn (2004)

Predictive Validity Correlations for Number Identification Probes		
Predictive Validity Measure	*Correlation*	*Reference*
Curriculum-Based Measurement Math Computation Fluency Probes: Grade 1 Addition & Subtraction (Fall Administration of MN Probe and Spring Administration of Math Computation Probe)	0.60	Clarke & Shinn (2004)
Woodcock-Johnson Tests of Achievement: Applied Problems subtest (Fall Administration of NID Probe and Spring Administration of WJ-ACH subtest)	0.72	Clarke & Shinn (2004)
Number Knowledge Test	0.58	Chard, Clarke, Baker, Otterstedt, Braun & Katz.(2005) cited in Gersten, Jordan & Flojo (2005)

References

Chard, D. J., Clarke, B., Baker, S., Otterstedt, J., Braun, D., & Katz, R. (2005). Using measures of number sense to screen for difficulties in mathematics: Preliminary findings. *Assessment For Effective Intervention, 30*(2), 3-14.

Clarke, B., & Shinn, M. (2004). A preliminary investigation into the identification and development of early mathematics curriculum-based measurement. *School Psychology Review, 33*, 234–248.

Gersten, R., Jordan, N.C., & Flojo, J.R. (2005). Early identification and interventions for students with mathematics difficulties. *Journal of Learning Disabilities, 38,* 293-304.

Berch, D. B. (2005). Making sense of number sense: Implications for children with mathematical disabilities. *Journal of Learning Disabilities, 38,* 333-339..

Wright, J. (2007). *The RTI toolkit: A practical guide for schools*. Port Chester, NY: National Professional Resources, Inc.