The Critical Numeracy Checklist Validation Study

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Why Critical Numeracy Checklist?

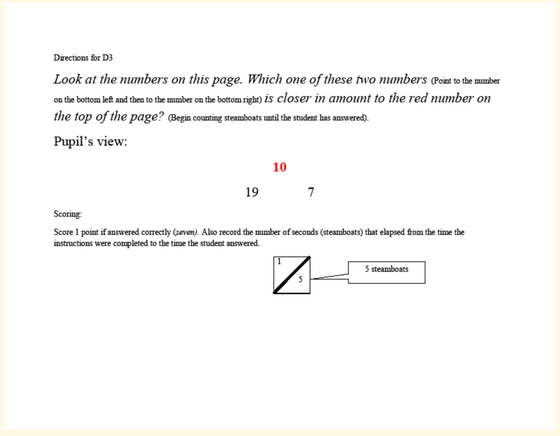
- Longitudinal studies indicate that students who 'top out' early in mathematics development have historical deficiencies in numeracy, especially number sense (Geary & Hoard, 2005; Halberda, Mazzocco, Feingenson, 2008).
- Teachers need to have a Curriculum Based Measurement tool to help assess numeracy deficiencies.

Abstract

- Study of children's performance on the Critical Numeracy Checklist (CNC) across K-3. Study sought cross validation with the KeyMath (Connolly, 2000).

Methods

- Development of Instrument
- Early Field Testing for Social Validity
- Data Gathering Phase
- Data Analysis


Directions for D3

Look at the numbers on this page. Which one of these two numbers (Point to the number on the bottom left and then to the number on the bottom right) *is closer in amount to the red number on the top of the page?* (Begin counting steamboats until the student has answered).

Pupil's view:

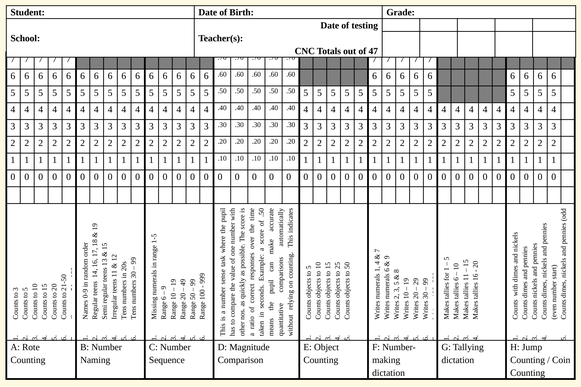
10

19 7

Scoring:

Score 1 point if answered correctly (*seven*). Also record the number of seconds (steamboats) that elapsed from the time the instructions were completed to the time the student answered.

1 5 — 5 steamboats



Sample Characteristics

- Small Mid-Western Elementary School
- N=116
  - Kindergarten = 34
  - Grade 1 = 42
  - Grade 2 = 18
  - Grade 3 = 22
- Mean Age = 7 years, 1 month

Results

- Study revealed evidence supporting the validation of the Critical Numeracy Checklist
  - Cronbach's Alpha (SPSS) = .784
  - Concurrent Validity with KeyMath-Numeration Subscale = .85

Table 1: Correlation Coefficients of Critical Numeracy Checklist
Grades K - 3
Entire Sample N = 116

	Key Math	Rote Count	Number Naming	Sequencing Number	Magnitude Compare	Object Count	Number Making	Tallying	Jump Count	CNC Total
Key Math	1.0	0.65	0.71	0.76	0.59	0.48	0.77	0.53	0.75	0.85
Rote Count		1.0	0.83	0.78	0.48	0.60	0.79	0.74	0.40	0.84
Number Naming			1.0	0.82	0.48	0.59	0.87	0.62	0.46	0.87
Sequencing Number				1.0	0.65	0.57	0.84	0.62	0.56	0.91
Magnitude Compare					1.0	0.42	0.59	0.37	0.52	0.75
Object Count						1.0	0.54	0.49	0.30	0.66
Number Making							1.0	0.61	0.54	0.91
Tallying								1.0	0.34	0.69
Jump Count									1.0	0.70
CNC Total										1.0

Implications

- CNC can help teachers be more informed of their student's capacity of numeracy
- CNC will guide teachers in altering their instruction
- CNC will enable teachers to rescue student's from need for Special Education (RTI, Tier 2)

Future Directions

- Develop materials for teachers to use in order to strengthen their student's numeracy skills
- Create an intervention curriculum that incorporates these materials in which teachers can use to assist in instruction
- Instruct teachers on how to implement and use the materials and curriculum