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## Cognitively Guided Instruction Works for Students with Cognitive Disabilities Too!

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NCTM  
Denver, CO  
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### How We Defined CGI

- Problem-based
- Developmental
- Allows students to solve problems in ways that make sense to them
- Non-linear approach to teaching mathematics

### Problem Types

Join Result Unknown	Join Change Unknown	Join Start Unknown
Separate Result Unknown	Separate Change Unknown	Separate Start Unknown
Part-Part-Whole Whole Unknown	Part-Part-Whole Part Unknown	
Compare Difference Unknown	Compare Quantity Unknown	Compare Referent Unknown
Multiplication	Measurement Division	Partitive Division

### Solution Strategies – Developmental Approach

- Direct modeling
- Counting on - Counting back
- Use of memorized facts and deriving

### Pat's Class – Where We Started

- Class for students labeled as CDMS
  - IQ's ranged 24-67
  - Only ever worked on counting and addition
  - "Functional" approach to teaching/learning
  - No access to general education curriculum
  - Lots of direct instruction to get right answers
- In year one...
  - Math scores actually went down
  - Worked through a lot of learned helplessness

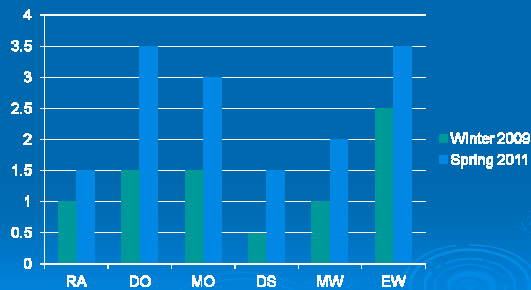
What did this look like the second year?



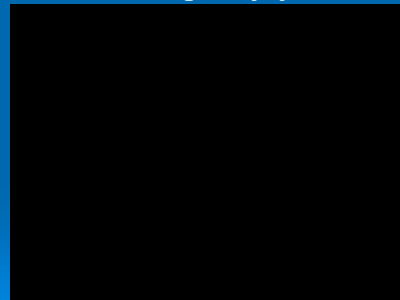
What Did Pat Ask of Her Students that Stood Out to You?

- How did her teaching change?
- How did student thinking change?

What were the results after two and a half years?



How did the math skills of these students change by year three?



After Another 1½ Years...



Why Does This Approach Work?

- Brain research says...
  - People with cognitive disabilities have great difficulty with working memory
- CGI provides...
  - Problems situated in a real context
  - Concrete and representational means of remembering where you are in a problem
  - Focuses on conceptual understanding rather than rote memorization

## What are the implications for inclusive mathematics classes?

## Additional Resources

- Website for the Closing the Math Achievement Gap of Native American Students with Learning Disabilities (CMAG) Grant
  - Mindsong Math website  
<http://www.uwosh.edu/coehs/mindsongmath/>

The CMAG Project is funded by a Wisconsin Improving Teacher Quality Grant that is directed by Dr. Judith Hanks, UW-O. Dr. Stacey Skoning is a co-director responsible for investigating and reporting outcomes for students with cognitive disabilities.

## Contact Information

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