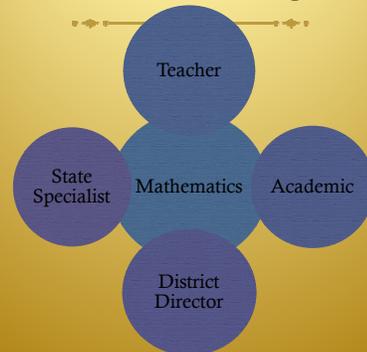


# Linking Policy and Practice through Learning Trajectories

Mary Pittman, Ph. D.

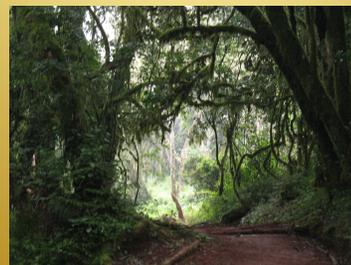
## Professional Background



## Landscape



## Policy Landscape



## A Few Current Initiatives



## Policy Implications for the Classroom



## Catalina Video

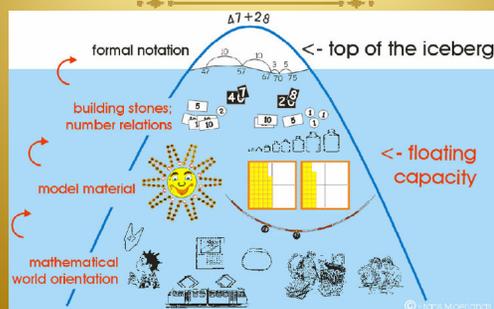
## Catalina Discussion Questions

- ✦ What prior experiences may have led to Catalina's current mathematical understandings?
- ✦ What else do you want to know about Catalina?
- ✦ What instructional next steps do you recommend for Catalina?

You need to know where you have been to determine where to go next. . .



## Iceberg Model



## Profile of Jennifer

Mrs. Collins sits at a table across from her student, Jennifer. Between them sits a pile of plastic chips and two pieces of paper. Beneath one sheet, Mrs. Collins places 16 chips, drawing Jennifer's attention to her actions and asking Jennifer to confirm there are 16 chips under the paper. Then Mrs. Collins removes four chips and asks Jennifer, "How many remain?" Jennifer labors through the task, placing both hands on the table, tapping her index finger on the table top, repeatedly counting forward and back under her breath, her face showing deep concentration. Finally, Jennifer answers, "Fourteen."



## Profile of Jennifer

Jennifer's individualized education plan (IEP) states her goals as "increase fluency with single digit addition and subtraction" and "increase speed and accuracy with double digit subtraction"

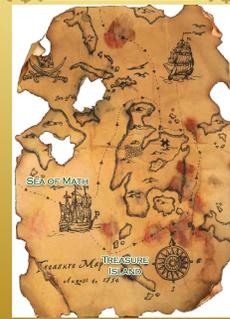
Jennifer's mathematics experience has included pullout and special education mathematics classes. In these separate classes she has experienced a mathematics curriculum dramatically different from her grade level peers. For years, Jennifer's mathematics instruction has focused extensively on remediation in basic facts and two-digit addition and subtraction but she still lacks fluency with these basic operations.

## Jennifer Discussion Questions

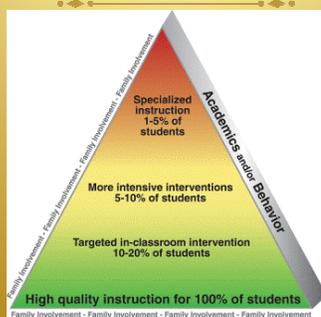
- ✦ What else do you want to know about Jennifer?
- ✦ What can be done for a student like Jennifer?
- ✦ How can educators support students such as Jennifer who appear to have reached a "dead end" in their mathematical learning?


  
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## Learning Landmarks



## Response to Intervention



## RtI Assessments

- ✦ Screening
- ✦ Progress Monitoring
- ✦ Diagnostic
- ✦ Outcome

<http://www.rti4success.org/resourceslanding>

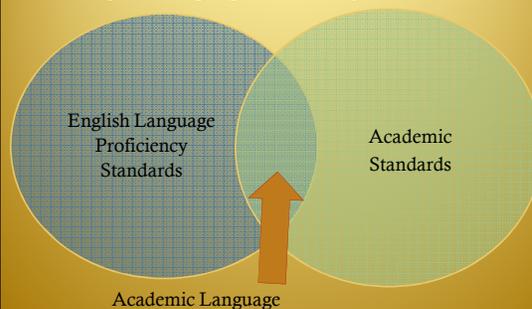
## A look back at Jennifer . . .

### + Diagnostic Assessment

We asked Jennifer to count backwards from different starting numbers. When asked to count backwards from 36, Jennifer responded with increasing hesitation, pausing frequently, finally tapering off as she said, "36, 37, 38, no, 36...35, 34, 33...32...31...20...40...21...22...29. . .28."

Jennifer was also presented with a model of five connected cubes. We had her confirm there were five cubes, some were removed, and she was shown what remained. When Jennifer was shown three cubes and asked how many were removed, Jennifer raised five fingers folding down one at a time until three fingers remained and then she counted her folded fingers.

## WIDA: English Language Proficiency Standards

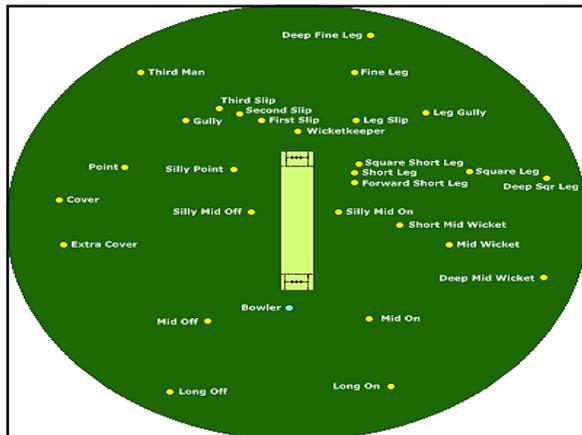


## What language?

“ Let’s kick back, learn the language, and in no time you’ll be sending down the old chinaman to be knicked by the batsman, before popping into the hands of the silly mid off fieldsman.”

## The Key to Understanding?

- + **Chinaman:** A delivery by a left arm spinner which to a right hand batsman appears as if it will spin from off to leg, however, spins in the opposite direction. Devised by a West Indian player of Chinese descent.
- + **Knock:** A term used to describe the batting innings of an individual player.
- + **Silly:** Refers to any fielding position that is located very close to the batsman
- + **Mid off fieldsman:** A player strategically placed within the field of play, with the object of stopping the batting team from scoring runs.



### Explaining the Game: Cricket

“Let’s kick back, learn the language, and in no time you’ll be sending down (*pitching*) the old chinaman (*type of pitch*) to be knicked (*slightly hit*) by the batsman (*batter*), before popping (*caught*) into the hands of the silly mid off fieldsman (*infielder*).”

## Educator Effectiveness

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- ✦ Content knowledge for teaching mathematics:
  - ✦ Deep understanding of mathematics
  - ✦ Further specialized mathematics knowledge for teaching.
- ✦ Pedagogical knowledge for teaching mathematics
  - ✦ Learners and learning
  - ✦ Teaching
  - ✦ Curriculum and assessment

## Learning Trajectories

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- ✦ “descriptions of children’s thinking and learning in a specific mathematical domain and a related, conjectured route through a set of instructional tasks designed to engender those mental processes or actions hypothesized to move children through a developmental progression of levels of thinking, created with the intent of supporting children’s achievement of specific goals in that mathematical domain” (Clements & Sarama, 2004, p. 83)

## Implications of Learning Trajectories

- ✦ Research
- ✦ Teacher Education
- ✦ Assessment
- ✦ Curricular Resources
- ✦ Instruction/Intervention
- ✦ Other . . .

## Concluding Thoughts . . .



Cindy video . . .