

# Error Identification assessments (EIA)

## LEA Purpose and Method

Develop a district-wide assessment system that is **meaningful to teachers** in Math and Reading for grades 2-9 (three administrations per year)

- Similar to Cognitive Diagnostic Assessments, multiple-choice items were constructed by **designing foils/distractors that mimic typical student cognitive processing errors**
- Utilize the **error vocabulary** of each domain to report **error descriptions teachers understand**

The transition from report data to instruction, is more difficult in reading than math ...

# Error Identification assessments (EIA)

## The Cognitive Task and Error Description in Math

MC Cognitive Task: evaluation of the differences between foils

$$\frac{1}{2} + \frac{1}{4} = \frac{2}{6}$$

?

- A 1/6
- B 2/4
- C 2/6
- D 3/4
- E 1/8

Error Description: “adding both numerator and denominator”

(EIA Reports within 3 to 5 days)

(6% to 12% increase, all grades, but reading is different)



# Error Identification assessments (Ela)

## Reading is Different from Math

- You can “see” math errors  
... but not reading inferential thinking errors
- Math **teachers are trained in an error vocabulary** that is aligned with foil misconceptions  
... reading literature emphasize **strategies**, not errors
- Math **methods and materials** (text books) are very **similar** in both format and rigor to state and federal **high stakes tests ...**

# Error Identification assessments (Ela)

## Disconnect: Testing vs. Teacher Training/Experience

### High Stakes Reading Tests are Inferential

- Multiple Choice Items are difficult (p-values .3 to .7)

### Teacher Experience with Purchased Materials

- too few multiple-choice and too easy (p-values .7 to .9)
- too literal
- current teaching **methods emphasize constructed-response** items that are often too accepting, and without a rubric

### Teacher Training and Vocabulary

- Metacognition and fix-up strategies: look back to clarify, predict, author's purpose, main idea, activate background knowledge, etc. (Based upon Literature and NAEP contexts)

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## Cognitive Model of Task Performance for Reading Comprehension Multiple-choice Items

### High Scoring versus Low Scoring Students

Motivated and will spend time and effort to:

- Be metacognitively aware; (identified error: “X”)
- “look back” to clarify/re-read; and (identified error: “T”)
- **Evaluate differences between foils** (identified error: “R”)

Passage/items and **foils** are at the independent level (or not)

Familiar with test format (or not)

# Error Identification assessments (Ela)

## Reading Errors that are Meaningful to Teachers

Each Ela foil is coded:

CODE	ERROR
(X)	No-Support (“answer grabbing”)
(T)	Text Matching (“look back” for a literal answer)
(R)	Related (good but not the “BEST” = “tricky”)
(L)	Looks Like
(O)	Opposite
(A)	Anaphoric Pronoun Referent
(s)	Skipped Items

# Error Identification assessments (E1a)

## Text Matching and No-Support Foils

### Exhibit 1 (Teacher Copy)

#### JOHN ROCK

Item 65	Why did the author write <b>paragraph 4</b> ?	
<b>T</b>	A. To show how he became a dentist.	(he was a “dentist” in paragraph 3)
<b>T</b>	B. To show John was a teacher.	(he was a “teacher” in paragraph 2)
<b>C</b>	C. To show John was a hard worker who wanted to help black people.	(inference)
<b>T</b>	D. To show John was the first black lawyer to be recognized by the Supreme Court.	(this was described in paragraph 5)
<b>X</b>	E. To show John moved to the South during the Civil War.	(he did not move to the South)

↑  
**Error  
Codes**

↑  
**Foils**

↑  
**Comment**

# Error Identification assessments (EIA)

The Carefully Crafted ... Related Foil:  
requires students to evaluate subtle differences between foils

## Exhibit 2 (Teacher Copy)

### CLIMBING HIGH

- 67 Which statement **BEST** describes what the passage is **MOSTLY** about?
- R** A. Annie was a woman who took many risks. *(she did take risks)*
  - C** B. Annie was a person who wasn't afraid to follow her dreams. *(implied, best answer)*
  - R** C. Women can be mountain climbers. *(she did)*
  - T** D. Most mountains can be climbed. *(text matching)*
  - T** E. Most people never climb mountains. *(text matching)*

The related foil, as a constructed-response, would be an  
acceptable summative answer



# Error Identification assessments (EIA)

## Sample Summary Error Identification Report to a Teacher

**Exhibit 4**

**Current Grade: 4**

	story1: ChefSeattle_gp4			story2: ClimbingHigh_gp4			Report1: Error Summary		
	tot1	tot2	rd_level	d_Prof	Correct	Related	Text Match	AnsGrab	Skip
JAMIE	10	10	Advanced	10	20	0	0	0	0
ZACHARY	8	10	Advanced	8	18	1	1	0	0
ANNA	6	8	Good_Level	4	14	2	3	1	0
LUKE	4	9	Good_Level	3	13	6	1	0	0
MILLIE	3	9	Proficient	2	12	3	3	2	0
YADI	3	7	Proficient	0	10	3	3	3	1
ALLEN	2	8	Proficient	0	10	1	8	1	0
DESHAUN	4	5	z_BasicLevel	-1	9	3	6	2	0
GUAD	3	5	z_BasicLevel	-2	8	5	5	0	0
SHELLY	2	5	zzBelowBasic	-3	7	4	4	5	0
KARL	6	0	zzBelowBasic	-4	6	1	2	1	10
AMAN	4	2	zzBelowBasic	-4	6	3	4	0	7
JOSE	2	3	zzBelowBasic	-5	5	7	7	1	0
ELLIE	2	3	zzBelowBasic	-5	5	3	3	9	0

(Student's need to explain their reasoning)

# Error Identification assessments (Eia)

## The Assessment is Consumed for Instruction

Eia test items and foils are used as instructional aids

### Teachers conference with students:

- an “internal view” with “retroactive verbal reports” (Leighton & Gierl; Norris; Gorin; 2007); “think alouds” (Davey, 1983);
- Help students get involved in their own learning by making their thinking visible to themselves, peers and teachers; and
- For the teaching of critical thinking (inference) and understanding of ideas in the text [foils] (Wells, 2000; Block, Gambrell & Pressley, 2002).

### Additional instructional/assessment materials

- Reading Comprehension Support Exercises

# Error Identification assessments (EIA)

## Teacher Opinion of EIA:

- I use them to see **what they are thinking** ... which errors seem to be used consistently - **what they are “tricked on”**. I turn it into a **game-type activity: students vs. teacher** (reading teacher, grades 2-5).
- If students are aware of the errors they make, determined students will **change their behavior both in reading and testing** (classroom teacher, grade 5).
- They now **don't grab the first answer** that they connect to, they take more time to **evaluate and critique each choice** (reading teacher, unknown grade).
- **No support errors** identifies students who clearly can't read on grade level **or aren't taking it seriously** (classroom teacher, grade 4).

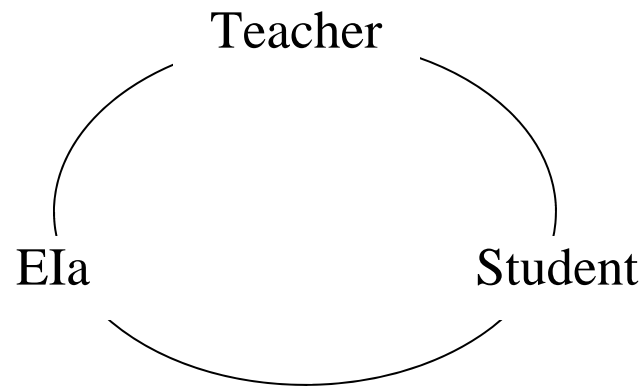
# Error Identification assessments (Ela)

## Teacher Opinion of Ela:

- I meet with students in small groups ... Keeping the test booklets and handing them back to students is helpful in discussing why they chose their answers and it makes them accountable for their choices (classroom teacher, grade 4).
- Understanding their misconceptions is one thing – getting them to change the misconception is the difficult part (classroom teacher, grade 7).
- As we are working on it, [Ela post-conferencing] often students will “get” it when it is a clear error. The related [versus the] correct answer does not come as easily during the explanation (classroom teacher, grade 4).  
(Related is an important foil for “ability estimates” or critical thinking, some student’s will need more reading experience and scaffolding)

# Error Identification assessments (Ela)

**Summary:** *EIa with Teachers for Instruction*



With a combination of:

EIa reports, items and teacher conferencing with students, teachers diagnose student misconceptions and provide scaffolding during repeated critical thinking activities.

# Error Identification assessments (Ela)

## Reliability, Validity and Prediction

<b>Alpha Reliability Grades 2 to 9</b>			
	2009 Beginning-Year	2009 Mid-Year	2008 End-Year
<b>Math</b>	.90 to .93	.90 to .92	.88 to .94
<b>Reading</b>	.84 to .88	.80 to .86	.84 to .89
All 60 reading comprehension passages are original			

<b>Concurrent Validity Grades 3 to 9</b>		
	2008 Beginning-Year	2008 Mid-Year
<b>Math</b>	.82 to .92	.82 to .91
<b>Reading</b>	.76 to .86	.79 to .82
<b>Prediction:</b> Multiple <i>R</i> .85 to .93 in Reading		

