



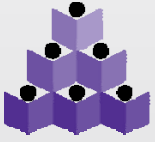
National Center  
on Response to  
Intervention

# INTERVENTIONS IN AN RTI MODEL

---

Dr. Erica Lembke  
University of Missouri  
[lembkee@missouri.edu](mailto:lembkee@missouri.edu)

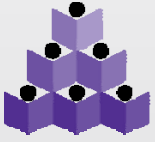




# Overview

---

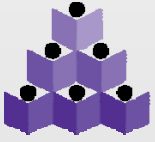
- ❖ Elements of research-based practices—brief summary
- ❖ Strategies in the Big 5 areas of reading
- ❖ Strategies in mathematics
- ❖ Discussion, conclusion



# What do we mean by evidence-based practices?

---

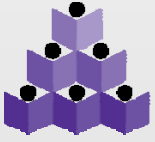
- ❖ Replicated in a variety of settings
- ❖ Sample reflects the population for which we're seeking answers
- ❖ Utilizes a control group—Implemented with one group while being compared to a control that is not getting the intervention
- ❖ Procedures are clearly described (so that the study could be replicated)
- ❖ Published in peer-reviewed journals



# Key to instructional success...

---

- ❖ The teaching!
- ❖ Need to consider incorporating important teaching characteristics...



# Explicit teaching procedures

---

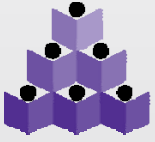
- ❖ Use explicit teaching demonstrations
  - ❖ Model, lead, test
- ❖ Control the language used in teaching skills and strategies
- ❖ Introduce one new skill at a time
- ❖ Provide guided practice in applying strategies
- ❖ Selecting examples
  - ❖ Present appropriate introductory examples
  - ❖ Provide discrimination practice



# Systematic teaching procedures

---

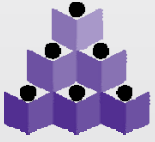
- ❖ Sequencing skills
  - ❖ Teach preskills of a strategy before the strategy is presented
  - ❖ Introduce high utility skills before less useful ones and easy skills before more difficult ones
  - ❖ Separate strategies and information likely to be confused
- ❖ Introduce new information at a realistic rate
- ❖ Provide adequate practice and review



# Selection of intervention

---

- ❖ Use screening data to identify who is at-risk
- ❖ Use progress monitoring data to determine whether the intervention is working
- ❖ Use diagnostic data to determine in what area or with what skill to intervene (see sample)



# Using data to guide intervention selection

1 to 3 times per year

Standardized national or state test

District test

CBM Screening

? answered—how is this student doing compared to peers or benchmarks?

Weekly or monthly

**Progress monitoring** using CBM for students deemed at-risk after district or state tests or CBM screening  
? answered—how proficient is the student in a particular subject?

Weekly or monthly

Diagnostic tests (teacher-made, unit, or chapter tests)  
? answered—what specific skills are mastered or do I need to reinforce?

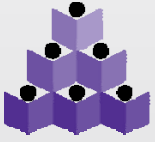




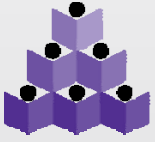
# Making decision-making about intervention less subjective

---

- ❖ **Decision-making rubric—to be implemented at least every 6 weeks**
- ❖ Three questions to guide discussion on data at problem solving team meetings:
  - ❖ What is the student's goal? Current level?
  - ❖ What decision-making rule are we using (4-point; Trend; rubric)? Can we apply that now?
  - ❖ If a change needs to be made, what do we do?
  - ❖ SEE EXAMPLE



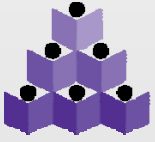
- **FIRST**, to make a decision on movement/non-movement between tiers or interventions, the rubric should be applied.
- **SECOND**, if a change needs to be made, the team questions:
  - Intensity
  - Fidelity
  - Evidence-based of intervention
  - Duration



# Treatment fidelity

---

- ❖ One of the key components of an Rti framework is lack of response to validated instruction that has been implemented with integrity
  - ❖ Need to check on fidelity of implementation. How can this be done?
  - ❖ Checklists, observation, discussion, video
- ❖ The purpose of fidelity checks is to create open dialogue regarding what is effective and what needs to be altered
  - ❖ Should be an OPEN process—no surprises here!



## Fidelity of implementation— critical to intervention success!

---

- ❖ How is this monitored in schools? Or is it monitored?
- ❖ How can this become a routine part of a school's practices?
- ❖ Even though it might appear to create adversarial relationships, how can this lead to more open dialogue and better instructional methods?
- ❖ See example of fidelity checklist in handouts



National Center  
on Response to  
Intervention

# INTERVENTIONS IN READING

---





# Sample sources (also see your handouts)

---

- ▶ What Works Clearinghouse (<http://ies.ed.gov/ncee/wwc/>)
  - ▶ Practice guides in many areas, including adolescent literacy
- ▶ Google Scholar--<http://scholar.google.com/>
  - Find relevant, research-based references for interventions being considered
- ▶ Doing what works ([dww.ed.gov](http://dww.ed.gov))
  - Website sponsored by the U.S. Department of Education. DWW is dedicated to helping educators identify and make use of effective teaching practices.



# National Reading Panel Findings on Critical Areas of Literacy Instruction

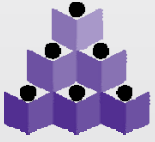
---

- ▶ **Phonemic Awareness**—ability to hear and manipulate individual sounds in oral language
- ▶ **Phonics**—understanding and connecting letters of written language with sounds of oral language
- ▶ **Fluency**—reading text accurately and quickly and with expression
- ▶ **Vocabulary**—oral or reading language needed for effective communication
- ▶ **Text Comprehension**—purposeful and active strategies for understanding written language

(National Reading Panel, 2000)

Summarized in *Put Reading First*:

[http://www.nifl.gov/partnershipforreading/publications/reading\\_first1.html](http://www.nifl.gov/partnershipforreading/publications/reading_first1.html)

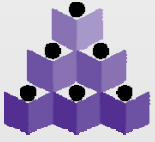


# Critical Dimensions of Phonemic Awareness

---

- ❖ **Blending**: I'll say the sounds of a word. You guess what the word is. What word is this?  
/ffuuunnn/
- ❖ **Segmenting**: I'm going to say a word, and then I'll say each sound in the word. Listen carefully. "man" - /m/ /a/ /n/
- ❖ Now I'll say a different word and you tell me each sound you hear.

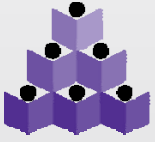




# Phoneme Deletion or Substitution

---

- ❖ Deletion: I'm going to ask you to say a word and then to say it again without one or more of its sounds. Say "sat." Now say it again, but don't say /s/. ("at")
  - Say "plate" but don't say /p/. ("late")
  - Say "plane" but don't say /n/. ("play")
- ❖ Substitution: Say "plane" but change /pl/ to /tr/ ("train")



# PHONICS

---

## ❖ Systematic and Explicit Phonics

instruction significantly improves young children's decoding, spelling, and reading comprehension and older students' word reading and oral text reading skills.

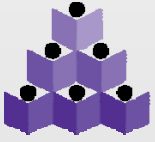
- ❖ Systematic: logical sequence and careful selection of letter-sounds for instruction
- ❖ Explicit: precise directions for teachers or careful wording to emphasize accurate models for students and to make letter-sound relationships conspicuous



# Systematic and Explicit Phonics Instruction

- Introduce most common sound for a new letter (/k/ for “c”)
- Separate instruction of potentially confusing letters due to visual or auditory similarity (h/n, e/i, b/d)
- May introduce lower case letters first (more functional)
- Start with high-utility letters (s, t, m, and vowels, not z, x)
- Select words that start with continuous sounds rather than stop sounds when beginning to sound out words--or for blending and segmenting practice (use “mat” before “bat”)

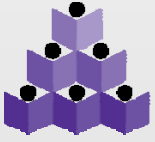
Potential sequence for introducing letters: a, m, t, s, S, i, f, d, r, o, O, g, l, h, u, U, c, C, b, n, k, K, v, V, e, w, W, j, p, P, y, Y, T, L, M, F, D, I, N, A, R, E, H, G, B, x, X, q, z, Z, J, Q



# FLUENCY

---

- ❖ Oral reading fluency is the ability to read with accuracy, and with an appropriate rate, expression, and phrasing
- ❖ Fluency is important because it provides a bridge between word recognition and comprehension



# Fluency Interventions

- ❖ Students should read aloud repeatedly with guidance.
- ❖ Use text at independent level (approx. 95% accuracy).
- ❖ Discuss prosody, or reading with expression (Eats, Shoots and Leaves by Lynne Truss)
- ❖ Activities from *Put Reading First*:
  - ❖ Student-adult reading
  - ❖ Choral reading
  - ❖ Tape-assisted reading
  - ❖ Partner reading
  - ❖ Reader's theater



# Readers Theater

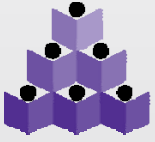
(taken from the CORE reading sourcebook, Honig, Diamond, and Gutlohn)

---

## Sample Schedule

- ❖ Monday—teacher reads the play aloud. Discuss the message of the story. Focus on some aspect of fluency (i.e., how you used your voice to convey the characters' feelings, where you read more slowly or quickly)
- ❖ Tuesday—students get into small groups and read the play aloud from beginning to end, with each student practicing his/her highlighted part. Then students exchange scripts and read through the play again, practicing a new part.
- ❖ Wednesday—group members practice reading aloud two new roles. Then students are assigned or choose the role that they will portray in the performance on Friday.
- ❖ Thursday—work together to read and re-read specific part. Students should discuss where they'll stand and they may want to make character labels.
- ❖ Friday—Perform the play

\*\*At-home practice continues all week

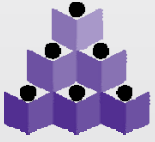


# VOCABULARY: Examples for Specific Word Instruction

---

- ❖ Model the concept “above.” Use hand or object and place above or not above other objects (demonstrate position).
- ❖ Teach meaning for “gigantic” by using the known synonym “large.” Connect to prior knowledge, check with examples and non-examples, and use in sentences.
- ❖ Teach meaning by providing definition: “*exit*--a door that leads out of the building. Is this (point to front door) an exit or not? How do you know?”

(see Carnine, Silbert, Kame’enui, & Tarver, 2002)



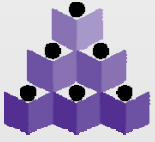
# Vocabulary

---

Teach students how to use context as a clue (Beers, K., 2003)

- ❖ Definition/explanation clues
- ❖ Restatement/synonym clues
- ❖ Contrast/antonym clues
- ❖ Gist clues

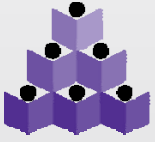




# Using context as a clue, examples

---

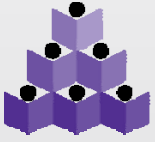
- ▶ Which clue can we use in each of these examples?
  - The gentleman was very enigmatic. In fact, everyone agreed that he was quite mysterious.
  - Lori is very punctual, while her sister is always running behind.
  - She was very surreptitious about the way that she sneaked the candy, meaning that she stealthily and quietly reached into the bowl.
  - As the avalanche increased in intensity, the rocks began to carom off the side of the cliff. Then they would shoot off into the air like rifle shots.



# Vocabulary, cont.

---

- ❖ Words across contexts (Beers, K.)
  - ❖ What would the word (insert word) mean to
    - a. Give one example
    - b. Give a second example
    - c. Give a third example (optional)
  - ❖ Example: What would the word *jersey* mean to:
    - a. A dairy farmer?
    - b. Someone from New England?
    - c. A football player?
    - d. A seamstress?
  - You try using the word *surf*



# COMPREHENSION

---

- ❖ ...is the reason for reading!
- ❖ Comprehension is both purposeful and active. Good readers have a purpose for reading, and they think actively about what they are reading as they are doing it (*metacognition*--monitoring understanding during reading and applying “fix up” strategies, such as adjusting reading speed and rereading; also checking understanding afterward).

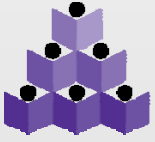


One of the most effective ways to help students improve their comprehension (National Reading Panel)...

---

## ❖ STRATEGIES

- ❖ Identifying important information
- ❖ Inferring/predicting
- ❖ Monitoring/clarifying
- ❖ Questioning
- ❖ Visualizing
- ❖ Summarizing
- ❖ Synthesizing
- ❖ Evaluating



# Teaching comprehension strategies

---

- ❖ Provide the rationale for and evidence of the effectiveness of the strategy
- ❖ Describe and model the strategy using “thinking aloud”
- ❖ Provide supported practice and feedback
- ❖ Provide independent practice
- ❖ Teach for generalization and maintenance



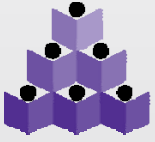
National Center  
on Response to  
Intervention

# PRE-READING STRATEGIES

---

Taken or modified from:  
Beers, K. (2003). *When kids can't read: What teachers can do*. Heinemann: Portsmouth, NH.

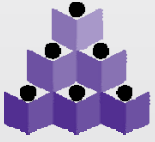




# Anticipation guide

---

- ❖ A set of generalizations related to the theme of a selection, where students decide whether they agree or disagree with each statement in the guide. Major purpose is to activate prior knowledge.
1. Write the guide
    - ❖ Write down generalizations about the topic, keeping those that are controversial.
    - ❖ Students write whether they agree or disagree (not true or false).
  2. Introduce the strategy to students
    - ❖ Do one with them
    - ❖ Not guessing the correct answer, but exploring your thoughts
  3. Use it before, during, and after reading



# Probable passage

---

Helps stop passive reading habits by encouraging students to make predictions, active prior knowledge, see causal relationships, make inferences, and form images about a text.

1. Choose 8-14 key words
  - Some that have an obvious connection, some unknown, and some that create disagreement
  - Students must be able to grasp the meaning of the word by reading the selection
2. Model the strategy a few times
  - Think aloud your reasoning
3. After reading, return to the WS to see which of your To Discover questions you can answer
  - Know the meaning of any words in the unknown words box?
4. Have students try on their own





National Center  
on Response to  
Intervention

# DURING READING STRATEGIES

---

“It is more critical for dependent readers to talk about texts during the reading experience than after it.”

Taken or modified from: Beers, K. (2003). *When kids can't read: What teachers can do*. Heinemann: Portsmouth, NH.





# Say Something—for students who don't think about the text or what they understand as they read

- Model
  - Explain the procedures
    - Students get into groups of 2 or 3 and take turns reading a portion of text aloud
    - As each student reads, he/she stops occasionally to say something about what was read
  - Partner offers a response to what was said
  - Dependent readers may need help making comments
  - First, practice on short texts
  - Continue modeling often
  - Use Say Something reflections once in awhile
- Rules
- With your partner, decide who will say something first
  - When you say something, do one or more of the following:
    - Make a prediction
    - Ask a question
    - Clarify something you had misunderstood
    - Make a comment
    - Make a connection
  - If you can't do one of those five things, then you need to reread.



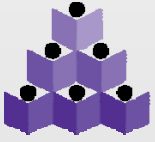
National Center  
on Response to  
Intervention

# AFTER READING STRATEGIES

---

Taken or modified from:  
Beers, K. (2003). *When kids can't read: What teachers can do*. Heinemann: Portsmouth, NH.

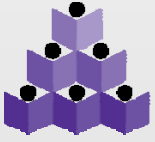




# Scales

---

- ▶ For both types of scales, choose word pairings or statements that require reflection and have no obvious choice
- ▶ 4 to 6 items
- ▶ Have students justify their responses in some way following completion of the scale
- ▶ Assess their reasons for marking as they did (can use a rubric)
- ▶ Likert
  - To indicate level of agreement with a statement
- ▶ Semantic Differential
  - Opposite character traits are placed at opposite ends of the scale and students decide how much of a trait the character possesses
  - Can rate a character both at the beginning and end of a story



# Somebody, Wanted, But, So

---

- ❖ Offers students a framework to create summaries
  - ❖ Which somebody to consider
  - ❖ What that somebody wanted
  - ❖ What occurred that caused a problem
  - ❖ So what eventually happened
- ❖ Need to have one sentence that offers a summary of the text when students are finished

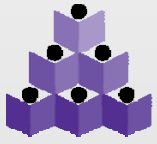


National Center  
on Response to  
Intervention

# Questions?

---

❖ And answers!



National Center  
on Response to  
Intervention

# INTERVENTIONS IN MATHEMATICS

---



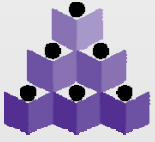


## Resources (others in your handouts)

---

- ❖ Because I don't have much time... (sorry)
  - ❖ Dr. Gersten's webinar on RTI and mathematics:  
[http://www.rti4success.org/index.php?option=com\\_content&task=blogcategory&id=18&Itemid=75](http://www.rti4success.org/index.php?option=com_content&task=blogcategory&id=18&Itemid=75)
  - ❖ Center on instruction resources in mathematics:  
[http://www.centeroninstruction.org/resources.cfm?category=math&subcategory=&grade\\_start=&grade\\_end=](http://www.centeroninstruction.org/resources.cfm?category=math&subcategory=&grade_start=&grade_end=)

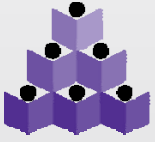




# Making decisions about intervention implementation

---

- ❖ Assessment
  - ❖ Task analysis
  - ❖ Error analysis
  - ❖ Checklists of skills
  - ❖ Interviews
  - ❖ Can use the CBM mathematics probes diagnostically, but remember that they do not include all essential skills. They are indicators.



## Review by Gersten, Baker, Chard (2006)—[centeroninstruction.org](http://centeroninstruction.org)

---

- ❖ Practices with moderate to large effect sizes for students at-risk or students with special needs:
  - ❖ Visual and graphic depictions
  - ❖ Systematic and explicit instruction
  - ❖ Student think-alouds
  - ❖ Structured peer-assisted learning activities
  - ❖ Formative assessment data provided to teachers and/or students

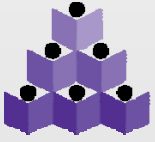


National Center  
on Response to  
Intervention

# VISUAL AND GRAPHIC DEPICTIONS

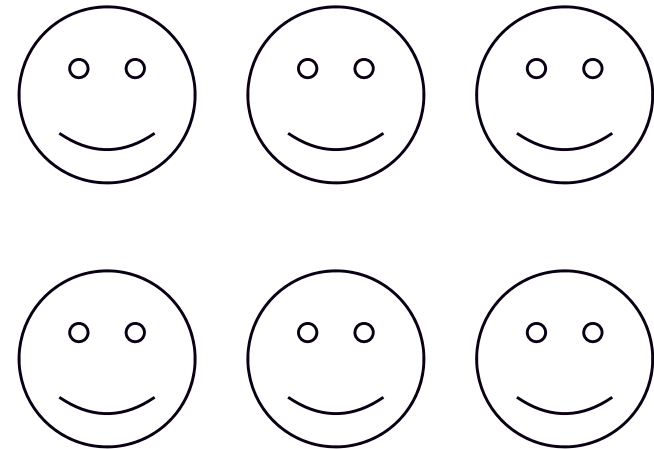
---





# Sequencing of Skills

- Concrete- to -Semiconcrete - to - Abstract (CSA)
  - Concrete: manipulatives
  - Semiconcrete: pictures
  - Abstract: number symbols
- Use *parallel modeling*
  - Relate manipulation of concrete objects or pictures immediately to number symbols
- Remember:
  - Conceptual understanding and automaticity are different skills



1. “How many rows?”
2. “How many faces in each row?”
3. “How many in all?”



# Schema-based strategy instruction

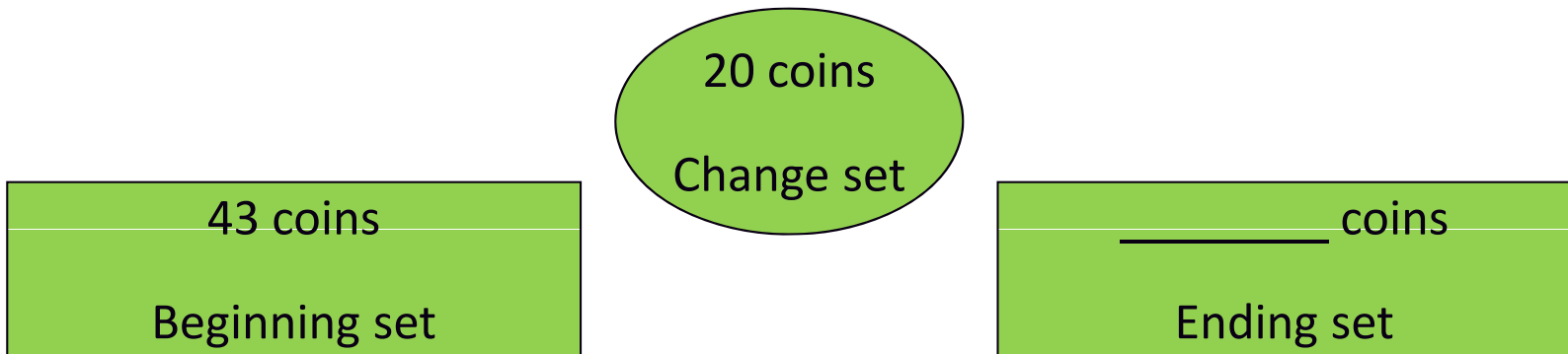
---

- ❖ Researched with grades 2-8 (see Xin & Jitendra, 2006, for example)
- ❖ Goal for students is to identify the schema, or type of problem, and use that information to solve the problem
  - ❖ Four interrelated steps
    - ❖ Identify the problem schema (i.e., a “compare” problem)
    - ❖ Generate a representation for the schema identified
    - ❖ Plan how to solve the problem, including setting a final goal, subgoals, selecting the appropriate operation, and writing the math sentence or equation
    - ❖ Carry out the plan



## Change problem

Stacy had 43 coins in her coin collection. She lost 20 of them when she moved from one house to another. Now Stacy has \_\_\_\_\_ coins.



## Group problem

Jim has \_\_\_ baseball cards in his collection. 20 are from the St. Louis Cardinals and the remaining 15 are Kansas City Royals players.





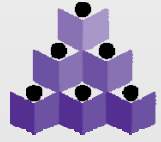
National Center  
on Response to  
Intervention

# SYSTEMATIC AND EXPLICIT INSTRUCTION

---



AMERICAN  
INSTITUTES  
FOR RESEARCH



## Basic Instructional Plan—Tier 2 or 3

---

- ❖ Key features
  - ❖ Evidence-based techniques combined into one, 20-minute lesson
  - ❖ Can be used with a variety of levels of students
  - ❖ Individually or small group
  - ❖ Can use any type of material
  - ❖ Can use with any skill
  - ❖ Highly engaging and motivation is built in





National Center  
on Response to  
Intervention

# STUDENT THINK-ALOUNDS

---





# Sample Problem-Solving Strategies

## *Montague (1992)*

1. Read for understanding
2. Paraphrase in your own words
3. Visualize a picture or diagram
4. Hypothesize a plan to solve the problem
5. Estimate or predict the answer
6. Compute the answer
7. Check to be sure everything is correct

## *Miller, Strawser, & Mercer (1996)*

1. Read the problem
2. What is the question the problem asks?
3. To answer the question, do I have to:  
\_\_\_ Add      \_\_\_ Subtract  
\_\_\_ Multiply    \_\_\_ Divide
4. What information is not needed?
5. Write out the problem using numbers
6. Solve the problem
7. Check the answer



National Center  
on Response to  
Intervention

# STRUCTURED PEER-ASSISTED LEARNING ACTIVITIES

---





# Critical features of peer assisted learning activities—Tiers 1 or 2

---

- ❖ Supplemental practice several times per week (30-45 min. each session, depending on grade level and activities)
- ❖ Structured activities
- ❖ Reciprocal roles (Coaches and Readers)
- ❖ Individualized support--corrective feedback
- ❖ More time on task with active engagement
- ❖ Inclusion of all students with built-in opportunities for success
- ❖ Facilitation of positive peer interactions
- ❖ Opportunities to monitor student progress
- ❖ Practical AND effective strategies



National Center  
on Response to  
Intervention

# FORMATIVE ASSESSMENT DATA PROVIDED TO TEACHERS AND/OR STUDENTS

---





# Error Analysis

- ❖ Discovering patterns of errors by analyzing student's work samples
- ❖ Goal is identification of error patterns
  - ❖ Work sample is scored
  - ❖ All errors are noted
  - ❖ An attempt is made to sort the errors into meaningful categories
    - ❖ Random responding
    - ❖ Basic fact error
    - ❖ Wrong operation
    - ❖ Defective algorithm
    - ❖ Place value problems



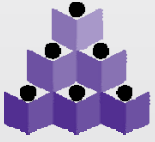
# Assessment & Error Analysis

- Construct probes with representative problem types
- Have student complete probe and either
  - Talk while doing problems
  - Tell you after each problem how it was solved

- Sample problems:  
Find the error

1. 45	2. 15	3. 743
$\begin{array}{r} + 64 \\ \hline 19 \end{array}$	$\begin{array}{r} \times 5 \\ \hline 525 \end{array}$	$\begin{array}{r} + 581 \\ \hline 235 \end{array}$

1. Added all numbers together (defective algorithms, no regard for place value)
2. Student does not regroup (carry)
3. Student adds numbers from left to right (and carries to column on right)



# Questions and wrap up...

---

- ❖ Goal setting and RTI fidelity sheet in your handouts