TED 323: Math Content and Teaching Techniques K-3

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Current classes <u>Math 246</u> : Math for Elementary Education I (regular elementary education majors/premajors) <u>TED 323</u> : Math Content and Teaching Techniques for Early Childhood Education I (early childhood transition to degree program) <u>Math 411</u> : Geometry Math 436: History of Mathematics	Other resources Math Games Elementary Ed for Grad students past courses and resources Archive
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Field Expe	erience Assignments (under construction) <u>he lessons</u> : A lot of the course information is availab	e on line. These are links to the online lessons for
TED 323 a Week of	Topics and meetings	Tasks
Sept 4-7	Thurs. Sept 5 at 5-30 ITV Introduction to the class, and overview of Cognitively Guided Instruction and the addition and subtraction problem types. Start reading the textbook chapters before Thursday class, but don'take the quizzes until after Thursday (class time should be useful for that)	 In the textbook Children's Mathematics: Cognitively Guided Instruction, read the introduction and chapter1. "Print and bring to Class Thursday: Course Sythabus Some COI problems Coll problems Coll problems Coll problems Thead COI Lesson 1 and take the associated D2L quiz "Read COI Lesson 2 and take the associated D2L quiz "Read COI Lesson 2 and take the associated D2L quiz



CGI Word Proble	ms and Strategi	ies			
Addition and Sub	raction Strateg	ties			
Base 10 work and	multidigit addi	tion and subtrac	tion		
Multiplication and	division				
Algebraic Thinkin	2				
Geometry					
Eractions					
		Go			

Cognitively Guided Instruction:

- Understanding how children think about addition, subtraction, multiplication and division, including...
- What contexts (word problems and visualization strategies) make it easier for children to visualize mathematical operations
 What stages children go through as they learn how to perform mathematical operations.
 How to write problems that support childrens mathematical learning
 What types of problems mathemating blocks for students at different levels

Addition and Subtraction:

In Children's Mathematics: Cognitively Guided Instruction, read the introduction, chapter 1, chapter 2, and the section Direct Modeling Strategies in chapter 3 (up to page 18).

Lesson 0: Introduction (no quiz)

- Lesson 1: Two ways of looking at addition (JRU and PPW-WU) (D2L quiz)
- Lesson 2: Addition and subtraction as actions (JRU and SRU, including direct modeling) (D2L quiz)

Lesson 3: Other problem types with distinct direct modeling strategies (JCU, SRU and CDU) (D2L quiz)

Lesson 4: More about part-part-whole (direct modeling by association; PPW-WU and PPW-PU)

Lesson 11 Note moon party memory memory and their problem type and answer questions about direct modeling. (D2L quiz) Go

Children's **Mathematics**

Cognitively Guided Instruction



Research results about how children learn, solve and think about addition, subtraction, multiplication and division using word problem contexts.

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Common Core

These two: the Join (Add To), Result Unknown

are the trickiest to keep straight

and the Part-Part Whole, Whole Unknown (Put Together)

CGI











CGI Practice Problems 1. Gina had 13 glow sticks. She used up some left. How many glow sticks disk use up? 1. Gine had 13 glow sticks. She used up some left. How many glow sticks disk use up? 2. There are 12 children sitting in the classroom. 50 the children are girls. How many of the children are boys? 3. Gus has 2 crystal rocks and 7 polished rocks. How many more polished rocks than how crayon. Ho has 7 nore loid crayons than new crayons. How many dot yoc cars. How many toy cars does he have of raryons does he have? 4. David has 1 new crayon. Ho has 7 nore rolored toy bugs. How many toy bugs does he have in al? 14. Connor has 2 small toy cars and 9 large old crayons the dark toy bugs and all? 5. Blake has 3 glow in the dark toy bugs and the have in al? 16. Jonna has 6 sweet crackers. She has la Prover made 4 paper airplanes. For his birthday, he got 4 more Bakugans. Kot has 11 Bakugans. How many bakugans did he have left? 8. Jil has 13 bouncy balls. She has 6 more batis does Nathan have? 17. Donna had 14 carrot sticks. She ate 4 of hear are and 9 video games. He way write yesterday? 9. Diana has 17 Barbies. Sandy has 9 fewer Barbies than Diana. How many Barbies does Bandy have? 19. Pater and 9 video games. He gave some video games. How many poense video games, How many poense video games and the exar ed ull. How many of the pencils are dull. How many of the pencils are dull?













CGI Practice Problems	
 Gina had 13 glow sticks. She used up some of her glow sticks. Now she has 5 glow sticks left. How many glow sticks did she use up? 	 Kyle had some dinosaurs. He gave 5 dinosaurs to David. Now he has 4 left. How many dinosaurs did Kyle have to begin with?
 There are 12 children sitting in the classroom. 5 of the children are girls. How many of the children are boys? 	12. Gus had some grapes. He ate 3 grapes. Now he has 9 grapes left. How many grapes did he have before he ate any of them?
 Gus has 2 crystal rocks and 7 polished rocks. How many more polished rocks than crystal rocks does Gus have? 	13. Gus drew 3 pictures. How many more does he have to draw to have 6 pictures?
4. David has 1 new crayon. He has 7 more old crayons than new crayons. How many old crayons does he have?	14. Connor has 2 small toy cars and 9 large toy cars. How many toy cars does he have in all?
5. Blake has 3 glow in the dark toy bugs and 7 colored toy bugs. How many toy bugs does he have in all?	15. Donna has 6 sweet crackers. She has 1 fewer sweet crackers than salty crackers. How many salty crackers does she have?
6. Peter made 4 paper airplanes. Later he made 3 more paper airplanes. How many paper airplanes did he make in all?	16. Jane made 7 origami animals. Later she made 4 more origami animals. How many origami animals did she make in all?
7. Connor had some Bakugans. For his birthday, he got 4 more Bakugans. Now he has 11 Bakugans. How many Bakugans did he have before his birthday?	17. Donna had 14 carrot sticks. She ate 4 of her carrot sticks. How many carrot sticks did she have left?
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10. Blake had 8 bouncy balls. When he cleaned his room, he found some more bouncy balls, and then he had 11 bouncy balls. How many bouncy balls did he find?	20. There are 7 pencils in the drawer. 3 of the pencils are sharp and the rest are dull. How many of the pencils are dull?





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 If the unknown is the Bigger set, then the problem can be solved by adding the difference to the smaller set. Bigger Unknown (Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has 3 fewer apples does Julie have? 		Common core breaks up the whether the unknown is the k being compared. This corres operation to use to solve the	remaining compare problems by pigger or the smaller of the sets sponds to whether the natural problem is addition or subtraction
Control Control <t< th=""><th>Take b Put https: Take Ay</th><th>If the unknown is the Bigger set, then the problem can be solved by adding the difference to the smaller set.</th><th>Bigger Unknown (Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?</th></t<>	Take b Put https: Take Ay	If the unknown is the Bigger set, then the problem can be solved by adding the difference to the smaller set.	Bigger Unknown (Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?
	Cangar	$\label{eq:constraint} \begin{array}{ c c c } \hline \\ \hline $	(Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2+3=? 3+2 =?



CGI breaks up the remaining compare the problem is easier or harder for child figure out how to solve. This corresponds to how the sentences corresponds to whether the action impl words matches the natural operation for Compared Quantity Unknown (Version with "more"):	problems by whether the dren to understand and s are worded, which ied by the comparison or solving the problem The Compared Quantity is the first set in the comparison
Julio has three more apples than Lucy. Lucy has two apples. How many apples does Julio have? 2+3=? 3+2 =?	Statement (cassier)
(Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 53=??+3=5	more the one users from the just

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(version with more apples than Lucy. Julie has five apples. How many apples does Lucy have? 588=? ?+3=5	Comparison statement: the set being compared to. (harder)		t transition	
Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2#8=? 3+2 =?	New that pairs?	Habbles does Connee Josef	hteef	

