

Test practice problems for TED 323

Information given on the test/on the board:

CGI problem types are:

Join, Result Unknown (JRU)	Join, Change Unknown (JCU)	Join, Start Unknown (JSU)
Separate, Result Unknown (SRU)	Separate, Change Unknown (SCU)	Separate, Start Unknown (SSU)
Part Part Whole, Whole Unknown (PPW-WU)	Part-Part-Whole, Part Unknown (PPW-PU)	
Compare, Difference Unknown (CDU)	Compare, Compared Quantity Unknown (CQU)	Compare, Referent Unknown (CRU)

Sample test questions:

1. For each pair of problems on this page, **circle** the more **difficult** problem and **write a sentence explaining why** it is more difficult (for a child at the direct modeling stage of solving addition and subtraction problems).

<p>Jeff has 3 puzzles. Todd has 4 puzzles. How many puzzles do they have all together? PPW-WU harder because PPW-WU is harder than JRU. Some children have a hard time seeing the two sets as put together in a bigger set.</p>	<p>Jeremy made 5 paper airplanes. Later he made 2 more paper airplanes. How many paper airplanes did he make in all? JRU easier</p>
<p>John had 6 glow in the dark bugs. When he cleaned his room, he found some more glow in the dark bugs, and then he had 10 glow in the dark bugs. How many glow in the dark bugs did he find? JCU JCU in the past are harder.</p>	<p>Ben built 7 block towers. How many more does he have to build to have 11 block towers? JCU How many more JCUs are easier</p>
<p>Ben has 3 small toy cars. He has 9 more large toy cars than small toy cars. How many large toy cars does he have? CQU</p>	<p>Clara has 11 Barbies. She has 5 more Barbies than Anne. How many Barbies does Anne have? CRU is harder than CQU. With CCQU "9 more" tells us to do 3+9. In CRU "5 more" but we have to work back and do 11-5.</p>
<p>There are 7 children running in the race. 3 of the children are boys. How many of the children are girls? PPW-PU</p>	<p>Yesterday Gus made some origami animals. Today, he made 2 more origami animals. In all, he made 6 origami animals. How many origami animals did he make yesterday? JSU JSU is harder because start unknown problems are hard to direct model.</p>
<p>Kyle has 7 stuffed toy animals and 8 hard plastic toy animals. How many more hard plastic toy animals than stuffed toy animals does Kyle have? CDU</p>	<p>Michelle had some toy animals. She gave 10 toy animals to Jane. Now she has 6 left. How many toy animals did Michelle have to begin with? SSU SSU is harder than CDU (start unknown problems are hard to direct model)</p>

Briana had 9 Silly Bandz. She gave 3 Silly Bandz to Laura. How many Silly Bandz does Briana have left? SRU	2 of Leah's crayons got lost. She started with 9 crayons. How many crayons does she have now? SRU Harder because information is out of order.
There are 12 balloons in the room. 7 of the balloons are mylar and the rest are latex. How many of the balloons are latex? PPW-PU	There are 14 ounces of mixed juice in the pitcher. 8 ounces are apple juice, and the rest are grape juice. How many ounces of grape juice are in the pitcher? PPW-PU This one is harder because the numbers are representing a measured amount (liquid) and not something discrete that you can easily count one by one.

2. Explain the difference between each of these problem types:

a. JRU and PPW-WU JRU has a change over time: one group, and some is added to that group.

PPW-WU, there are two groups that are thought of as one group

b. CQU and CRU In CRU the referent (set following "than") is unknown, and in the CQU, the referent is known.

In CQU problem the comparison (more than/less than) tells you how to get the answer. In CRU, what you need to do is backwards from the comparison (more/less)

c. PPW-WU and CDU

In PPW the two sets are combined (question about sum)

In CDU the two sets are compared. (question about difference)

d. JSU and SSU

Join—the result is bigger than the start

Separate, the result is less than the start

3. Do children first figure out problems where there is a change over time, or problems where there is no change over time?

First figure out change over time.

4. Which problem types have a change over time?

Join and separate

5. Draw out or explain how a child would direct model (an example of) each of these problem types:

JRU (using the joining strategy). JCU (using joining to). SRU (using separating from). CDU (using comparing)

JRU: S has 5 apples, she gets 3 more. How many now?

first
o o o o o
^

, next
o o o o o o o o
Count ^

first add to file
o o o o o o o o
Count for ans.
all

Put out 5 counters. Add 3 counters to the pile. Count all for answer.

6. Write a problem for a given problem type (eg. JRU)

7. Is it a good idea to tell children to add when they see the word "more" and subtract when they see the word "fewer" or "less"? Why or why not?

No. Because in CRU more→subtract. less→add

8. Explain how students might solve a word problem (eg. Sarah caught 5 fish. How many more does she have to catch to have 8 fish?)

a. By direct modeling

b. Using a counting strategy.

count 5...6, 7, 8 The answer is 3 (number of counts or fingers)

9. Give at least 3 examples of basic facts for which...

a. counting on is an efficient strategy—addition

8+2, 9+3, 6+1, 2+6 6...7,8

b. counting back (by subtrahend) is an efficient strategy

9-2, 7-1, 8-2 (8-3)

c. counting up to (for subtraction) is an efficient strategy

9-7, 8-6, 6-5 (9-6)

10. Which of these are considered basic facts?

8+7 Y	9-3 Y	13+5 N	13-5 Y	17-4 N
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11. A child solves $5+3$ by making 5 tally marks and 3 tally marks and counting all of them. Is this considered a counting strategy or a direct modeling strategy?

Direct modeling

12. How is counting on from first different from counting on from higher?

JRU, 3+8 3...4, 5, 6, 7, 8, 9, 10, 11 count on from first. 8...9, 10, 11 counting on from higher

13. What CGI type is most strongly associated with each of these counting strategies?

a. counting on JRU

b. counting back SRU

c. counting up to (for subtraction) JCU

14. What are the two different variations on counting back that a child might use to solve $11-2$?

$11 \dots 10, 9$ --- $11, 10 \dots 9$

15. Why do we want children to learn to use "counting up to" to solve subtraction problems?

$11-8$ how much bigger is 11 than 8? How many more than 8 is 11?

Relates to addition

counting up is easier than counting back.

17. Write a good word problem for introducing

a. counting on (+) JRU $\underline{\quad}+1$, $\underline{\quad}+2$

b. counting back (-) SRU $\underline{\quad}-1$

c. counting up to (-) JCU, PPW-PU, CDU $7-6$, $8-7$ (only count up 1)