

Karen Garraway

Chapter #8 Reading Quiz - Math

Prof.- Dr. Ruiz

03/06/2023

Question #1

What is the difference between a semantic equation vs. a computational form of the equation? Give your own examples for chart 8.2

In semantic equations, the numbers are written in the order that follows the meaning of the story problem. Its' part unknown is to the left of the equal sign For example, $? + 4 = 12$. When an equation does not isolate the unknown on one side of the equal sign, an equivalent equation can be written for the same problem, in this case for $? + 4 = 12$ will be written as $12 - 4 = ?$. This new equation is referred to as the computational form of the equation, which isolates the unknown quantity and would be used if you were to solve the problem with a calculator

Question #2

Explain the “=” sign to a first grader.

The equal sign is a major part of mathematics. Understanding the equal sign can help you solve word problems, equations and more. This symbol “=” means the same, with the same value. For example, if you have 3 apples and your friend also has 3 apples it means that you both have equal(=) amounts of apples. You don't have more than or less than your friend, you have the

same. When doing an equation, whatever is represented on the left side of the equal sign is equal in value to what is represented on the right side of the equal sign.(Van de Walle et al., 2019). For example, $4 + 3 = 3 + 4$ or $7 + 1 = 4 + 4$. The concept of the equal sign will support algebraic thinking in future grades.

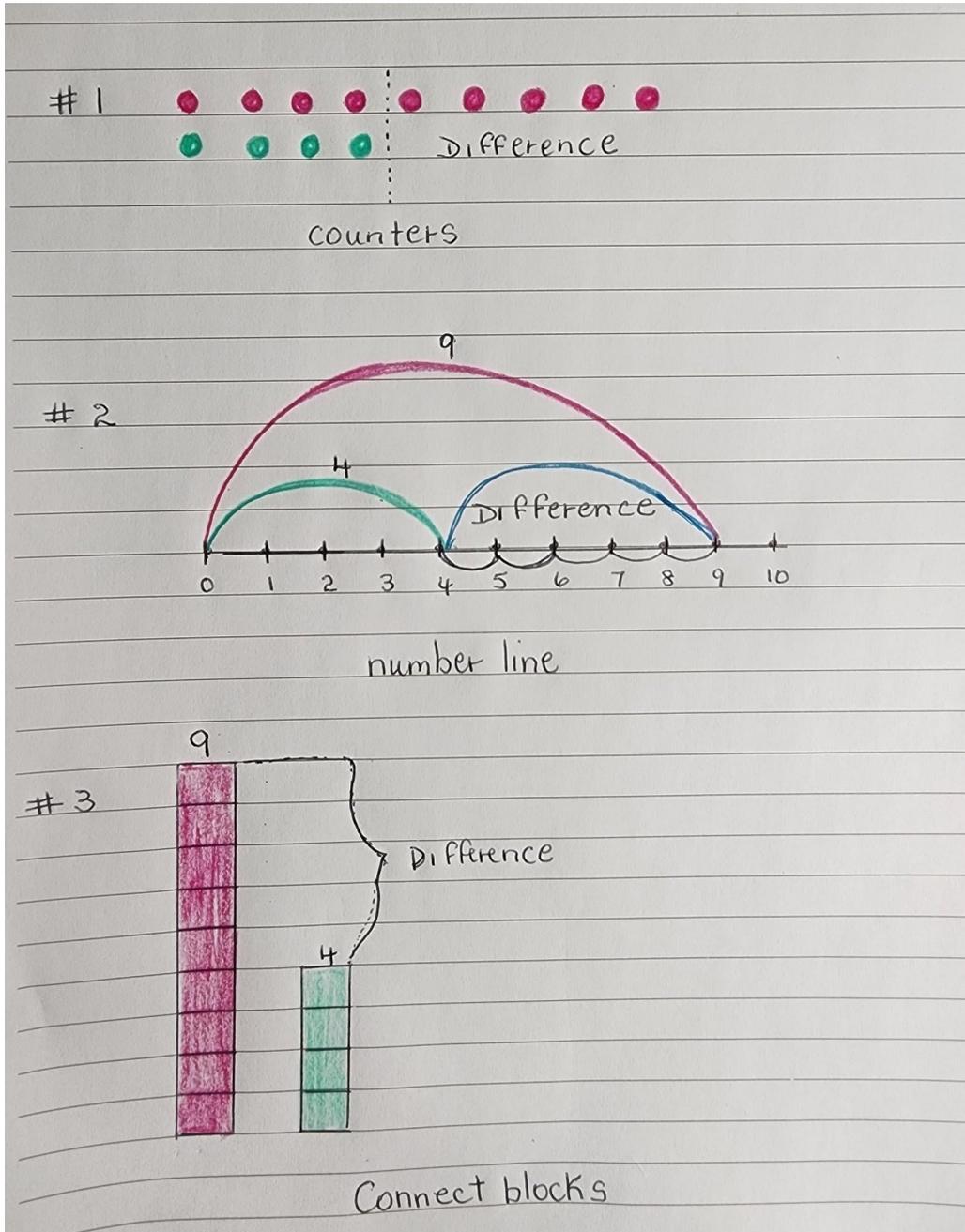
Question #3

Why are number lines confusing and how can you help children to better understand how to use this semi-concrete manipulative.

A number line is an essential model but it can initially present conceptual difficulties for children below second grade and students with disabilities. This confusion is due to the fact that the students have difficulty in seeing the unit, which is a challenge when it appears in a continuous line. The number line is a shift from counting a number of individual objects in a collection to counting continuous lengths of units. When using the number line, these students are often off by one because they count the tick lines instead of the spaces between lines. To help students understand how to use the number line, have them play board games with number paths to help them develop a better concept of number magnitude, and help them estimate more accurately on a number line. Also have students use Cuisenaire rods of the same color to build a number path of a given length. This path will show that each length unit is “one unit” and that the same unit is repeated over and over to form a number line.(Van de Walle et al., 2019).

Question #4

Using Figure 8.8, draw the difference between 9 and 4 in three ways.



Question # 5

What are the multi/division structures? Give a division and a multiplication story for each.

Multiplication and division structures are problem structures that will help in formulating and discussing multiplication and division tasks. These structures will benefit students in generalizing as a way to identify familiar situations. There are four different classes of multiplicative structures. Equal-group problems, comparison problems, array and area problems and combination problems.

- **Equal Groups** problems involve three quantities, the number of groups, the size of the groups and the total of all the groups. When the number of groups and the size of the groups are known, the problem is a multiplication situation with an unknown product. When the group size (how many in each group or the number of groups (how many groups) is unknown, then the problem is a division situation. Divisions can vary, fair-sharing or partition division is when the size of the group is unknown and measurement division is when the number of groups is unknown but the size of the equal group is known.

Example -Multiplication - There are 6 swimmers on each team, 7 teams are at the swimming competition. How many swimmers are there altogether? $6 \times 7 = ?$

Division- Susie has \$60.00 that she wants her 4 nieces to share equally. How much money does each niece receive? $60 \div 4 = ?$

- **Comparison problems** - With multiplication comparison there are three possibilities for the unknown, the product, the group size and the number of groups. In multiplicative situations the comparison is based on one group being a particular multiple of the other.

Example- multiplication - Mary has 7 grapes. Joe has 5 times the amount of grapes that Mary has. How many grapes does Joe have? $7 \times 5 = ?$

Division - Mark picked 24 apples. He picked 4 times as many as Jill. How many apples did Jill pick? $24 \div 4 = ?$

- **Array and Area problems** - The array is a model for an equal-group situation. It is shown as a rectangular grouping with the first factor(the number of groups) representing the number of rows and the second factor(the number of items in each equal group) representing the equal number found in each row. What distinguishes area from the others is that the product is literally a different type of unit from the two factors. In a rectangular shape the product of two lengths($l \times w$) is an area, which is usually measured in square units (Van de Walle et al., 2019)

Example - Multiplication Array. There are 5 rows of seats in the theater.. Each row has 6 seats. How many seats are there? $5 \times 6 = ?$

Division - There are 30 seats in the theater, in 5 equal rows. How many seats are in each row? $30 \div 5 = ?$

Multiplication(Area problem) - A room is 10' by 8'. What is the area of the room?
 $10' \times 8' = ?$ sq. ft.

- **Combination problems** - Combination problems involves counting the number of possible pairings that can be made between two or more sets (things or events). This structure is more complex and therefore is not a good introductory point for

multiplications, but it is important to recognize it as another category of multiplicative problem structures. The combination structure is rarely used to divide.

Example- Combination - Sam bought 4 pairs of pants and 3 jackets. How many different outfits consisting of a pair of pants and a jacket does sam have? $4 \times 3 = ?$

Question # 6

9 divided by two. What are the 5 remainder possibilities?

- 4 and 1 left over (left over)
- $4\frac{1}{2}$ partitioned as a fraction
- 4 (discarded)
- 4 (rounded approximate result)
- 5 (forced to next whole number)

Question #7

Pick one argument against using a key word approach for math problems.

In the past, students have been taught to look for key words in story problems to help them determine if they should add, subtract, multiply or divide. Some students are still encouraged to use lists of key words with the corresponding operation linked to the word. For example, the strategy suggests that words like *altogether* and *in all*, in a story problem, means you should

add and *left* and *fewer* means you should subtract. In contrast to this approach, researchers and mathematics educators have long cautioned against this key word strategy (Clement & Bernard, 2005; Heng & Sudarshan, 2013, as cited in Van de Walle et al., 2019). The key word strategy sends the wrong message about doing Math. The most important approach to solving any contextual problem is to analyze it and make sense of it using all the words. The key word approach encourages children to ignore the meaning and structure of the problem. Math is about reasoning and making sense of situations (Van de Walle et al., 2019)

Question # 8

Pick and describe one common misconception found in figure 8.1

Students overgeneralize the communicative property of addition to subtraction. For example, in solving $24 - 7$, the student subtracts $4 - 7$ as $7 - 4$ for an answer of 23. To help, have students first model problems with single digit numbers and show how you cannot subtract 7 cubes from 4 cubes (Van de Walle et al., 2019).

Van de Walle, J. A., Karp, K., Bay-Williams, J. M., Wray, J. A., & Elizabeth Todd Brown. (2019). *Elementary and middle school mathematics : teaching developmentally* (10th ed.). Pearson.