**Derived fact strategies questions:**

1. Describe two ways to use derived fact strategies to solve 7+9



2. Tell a basic addition fact for which using doubles would be a more efficient strategy than counting on.



3. Tell a basic addition fact for which making 10/using 10 would be a more efficient strategy that counting on.



4. Tell a basic addition fact that you can't use the make 10 strategy to solve.



5. Describe how to solve 14 - 8 by **a.** building up through 10 and **b.** backing down through 10.



6. Tell a basic subtraction fact that you can't solve by backing down through 10.



7. Show how so use doubles to solve 7+9 using ten frames.



8. Show how you would write a use doubles strategy solution of 7+9 using equations.



9. Show how to use the make 10 strategy to solve 7+9 on ten frames



10. Show how to use the make 10 strategy to solve 7+9 on a number line (in the more efficient way)



11. Show how you would write a make 10 strategy solutions of 7+9 using equations



12. Show how you would show a build up through 10 strategy for solving 14-8 on a number line



13. Show how you would wite a build up through 10 strategy for solving 14-8 using equations.



14. Show how you would show a back down through 10 solution for 14-8 on a number line



15. Show how you would write a back down through 10 solution for 14-8 using equations.



**Equals signs and fixing running equations**

16. If we say we want children to understand the correct meaning of the equals sign, what is it that we want children to understand?

equals means that the value on both sides of the equals sign are the same

the amounts on both sides are balanced

17. What is the most common misunderstanding children have about the equals sign?

write the answer next (on the right)

18. Write a tricky equals sign problem (that children would get wrong if they don't understand the correct/balance meaning of the equals sign):

4+5=\_\_\_+1

the \_\_ to the right of = means that children have to be thinking about the totals on both sides, and not “the answer comes next”

19. Fix these equations so that they show the same steps, but there is no incorrect use of the equals sign:

a. 6 × 4 = 24 ÷ 2 = 12 × 4 = 48 + 36 = 84



b. (1/3) × 36 × 5 = (1/3) × 180 = 120 + 36 = 156



20. In a way that uses equals signs properly, write down this strategy for subtracting 73-29:

"First I took away 30 from 70, because 30 is close to 29, and that gave me 40, and then I had to add 1 back on because it was 29 and not 30, so I got 41, and then I added the 3 and got 44." (Note that you don't have to write down all of the reasons, just the calculations that were actually done.)



**Base 10 manipulatives**

21. Explain the difference between a proportional and a non-proportional manipulative and give an example of each.



Proportional material: base 10 blocks, popsicle sticks grouped with rubber bands,

Non-proportional manipulatives: Montessori stamp game, money: pennies and dimes or $1 and $10

22. Explain the difference between a decomposable/groupable manipulative and a non-decomposable manipulative, and give an example of each.

Decomposable manipulative: you can physically take a ten apart and make 10 ones. Example: popsicle sticks and rubber bands or beans in bowls.

Non decomposable manipulatives: you can’t take apart a 10 to make 10 ones—you have to trade a 10 for 10 ones (or vice versa). Base 10 blocks or money or stamp game.

23. If I use lima beans to show 1's, and glue 10 lima beans each to a bunch of popsicle sticks to show 10's, is that decomposable or not decomposable? Is it proportional or non-proportional?

not decomposable

Proportional (yes)

24. When choosing a base 10 manipulative for first grade students, what properties would you want that manipulative to have?

**decomposable and proportional**

**Childrens understanding of base 10 numbers**

25. Describe two different ways that base 10 understanding was assessed in the video interviews you watched (Marilyn Burns talking to Cena and Jonathan). Why might children seem to understand base 10 numbers in one assessment and not in the other?

group tiles in tens and asked for the total

In a number like 16, what does 1 mean and what does 6 mean?

They can remember what they were told but without having tried it themselves

They have learned something one way, but they don’t know how to try it in another setting.