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- **What we learn today doesn't make yesterday wrong, it makes tomorrow better!**
- **Math Misconceptions I've heard this month**
    - -One of my students is very confused with how to add…
    - -The word "altogether" told me to add.
    - -You can just add a "zero" when multiplying by ten.
    - -58 X 6 = "I times the 6 x 8 and 6 X 5."
    - -Multiplication always ends with a larger number.
    - -There is one way to solve a problem.

- **What are some ways to help with this problem:**
    - -Have students explain their thinking for solving the problem.
    - -Activities that require students to put (by bundling, connecting, etc.) objects together in groups of ten.
    - -Use 100 board to look for patterns.
    - -Do activities with two-digit numbers to represent them using tens and ones only.

- **Be observant**
    - -Value of each digit - Is the 3 in 34   3   or   30?
    - -Can the student compose and decompose?
    - -What about the inverse operations for addition and subtraction? Does the student recognize this?

- **After formatively assessing the student to determine their misconception, give them a task to help correct the misconception.**

- **Be observant**
    - Don't teach "look for words". (altogether, join, take away, etc)
    - It's difficult for students to solve + and – problems
        - -when they think addition always means "join"
        - -when they think subtraction always means "take away"
        - -actually, addition means plus and subtraction means minus
    - Give students the opportunity to develop their own story problems and BE OBSERVANT.
      ***********join, separate, part-part-whole, and compare

    - Students should use the most efficient and effective strategy <u>as long as it makes sense to them.</u>

    - **Let's look at story problems:**
    - **<u>Separate: result unknown</u>**
      Sue has 9 dolls. She gave 3 to Jill.   How many dolls does Sue have now?
    - **<u>Compare: difference unknown</u>**
      Bill has 3 baseballs.   Tom has 9 baseballs. How many more baseballs does Tom have than Fred?
    - **<u>Part-Part-Whole: Part unknown</u>**

Lillie has 3 black hair bows and some white hair bows. She has 9 hair bows altogether. How many white hair bows does she have?
- **Join: change unknown**
  Will has 3 cars. How many more does he need to have 9 altogether?

*If multiplying by 10 always means you just add a zero...
*Multiplication tricks will trip you up
*Does multiplication always mean you increase a number?
*What happens when you multiply ½ X 6

- **Teaching to the test + Teaching isolated facts + Teaching cute tricks = MINDLESS MISCONCEPTIONS. . . BUT**
- **Teaching to the why + how = DEEPER UNDERSTANDING**

Questions to make you think:

- **Do you really need to memorize lots of rules to be good at math?**

- **There are lots of ways to "do the math".**

- **Memorization/Procedural= learning in isolation which lead to math misconceptions.**

- **Conceptual learning = deep understanding of HOW and WHY the math works which should lead to "AHA moments" and not lead to misconceptions.**

SO:

1. **It's not what you say, it's how you say it. "of"**
2. **Ongoing formative assessment is a must.**
3. **Using the correct tool with the correct problem.**
4. **Discussion, discussion, discussion. Or "Defend your answer."**
5. **Don't use manipulatives to show how to do the math, let students use manipulatives to show YOU how THEY are doing the math.**
6. **How we use vocabulary is important.**
7. **There are lots of ways to do the math.**

Questions/Statements to ask to promote thinking:
1. How did you work that out?
2. What did you do to solve that problem?
3. Tell me how that works.
4. If you did know how to do that problem, how would you do it?
5. Tell me more about that.
6. Prove that.
7. What number did you start with?
8. What I hear you say is, "...."
9. Let me hear how that sounds.
10. Would you explain what he/she just said?
11. Would you explain how he/she solved this problem?