PROBLEM SOLVED!

DIFFERENTIATING MATH INSTRUCTION MADE EASY

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WHO AM I?

- **Jennifer Long**

- **4th Grade teacher in the Fort Mill School District**

- **B.S. Elementary Education & M.Ed. Math Curriculum and Instruction – Winthrop University**

- **National Board Certified – Early and Middle Childhood Literacy**

WHY AM I HERE?

- My "math story" - teaching and beyond
- Success
- Support
- Practicality
- Passion

GOALS FOR TODAY

▶ **- Introduce a daily problem solving approach to mathematics instruction.**

▶ **- Demonstrate ways this problem solving approach can be used to differentiate math instruction.**

▶ **- Model a math lesson and allow you to participate.**

▶ **- Provide opportunities for sharing and questions.**

WHAT IS THIS PROBLEM SOLVING APPROACH TO TEACHING MATH ABOUT?

- **Problem solving! (Duh.)**
- **Differentiation**
- **Real world connections**
- **Hands-on experiences**
- **Student discovery**
- **Construction of mathematical explanations**
- **Learning from one another**
- **Mathematical conversations**
- **Honoring multiple strategies and/or algorithms**

BUT…WHY?

- Builds conceptual understanding
- Creates lifelong problem solvers
- Builds confidence
- Provides more opportunity for differentiation
- Raises test scores

EXPERTS SAY…

"**Teaching through problem solving requires a paradigm shift, which means that a teacher is changing more than just a few things about her teaching; she's changing her philosophy of how she thinks children learn and how she can best help them learn. At first it may seem that the teacher's role is less demanding because the students are doing the thinking, but the reverse is actually the case. Teachers must select quality tasks that allow students to learn the content by figuring out their own strategies and solutions. Teachers must then develop and ask the high-quality questions that allow students to verity and relate their strategies. This process allows students to understand mathematics on a deeper level.**"

(Van de Walle, Karp, & Bay-Williams, 2010)

WHAT DOES IT LOOK LIKE?

1. Students are broken into leveled groups.

2. Teacher poses a problematic task and checks for understanding. (My-POD)

3. Students work in groups (or individually, if desired) to solve the problem using math "toolboxes".

> Think through problem, choose appropriate tool to solve the problem, questioning, discussing,   trial and error, strategizing, recording thinking and attempts, explaining solutions

WHAT DOES IT LOOK LIKE?

4. Teacher facilitates, poses questions, guides thinking, and works with struggling individuals or groups.

5. Sharing - groups are allowed to share their solution and the strategy they used to come up with the solution.

6. Discussion and Direct Instruction

DIFFERENTIATING THE MY-POD

Task 1 - Liam and his sister Kelsie have a lot of homework to get done this afternoon. They each have 6 pages of homework to complete. If Liam completes 2/6 of his homework and Kelsie completes 5/6 of her homework before Mom gets home, who gets more work done?

Task 2 – Liam's mom told him he could take a break after doing 2/6 of his homework. She told his sister Kelsie she could take a break after doing 2/3 of her homework. If Kelsie and Liam have the same amount of homework, who gets to take a break first?

Task 3 - Liam's mom told him he could eat 2/6 of the banana crème pie she made. She told his sister Kelsie she could eat 2/3 of the pie. Who gets more pie? How much of the pie will be eaten if Liam and Kelsie each eat the part their mom told them they could have?

YOUR TURN TO PRACTICE

▶ **Group work to solve problem.**

▶ **Record/be prepared to share:**

  ▶ **What strategy(ies) did you use to solve the problem?**

  ▶ **How do you know your answer is reasonable?**

  ▶ **What is another way you could have solved the problem?**

▶ **Group share**

QUESTIONS

- Do I do this everyday?
- Umm…my kids can't work in groups to save their lives! What?!
- How are students assessed?
- How does this align with Common Core expectations?

- Livebinders Info
- Your questions??