

MESPA 2014 Institute

Improving teaching and learning is vital to improving mathematics achievement. So, how do we do it?

Key Ideas of Session/Coaching Questions	Notes
<p>There are 4 levels of questions based on Norm Webb's Depth of Knowledge</p> <ul style="list-style-type: none"> ▪ Level 1 Recall ▪ Level 2 Skill/Concept ▪ Level 3 Strategic Thinking ▪ Level 4 Extended Thinking <p>If we want students to pass the MCAs/OLPA with proficiency we must teach consistently at level 2, 3, and 4.</p> <p>Common Core State Standards Resource Includes examples and videos of classroom lessons. http://www.insidemathematics.org/index.php/commmon-core-math-intro</p>	
<p>KEY SHIFT #1 TO PRODUCTIVE STRUGGLE</p> <ul style="list-style-type: none"> • Struggle and perseverance are components of strong learning and retention • High achieving countries let students struggle more than is typical in the United States • Mathematicians, scientists and engineers actually struggle with the problems they solve <p>Video Clip of Gr. 4 Bilingual Classroom Equations Given to Students</p> $8 + 4 = ? + 5 \qquad 5 = 5$ $7 = 3 + 4 \qquad 5 = 4 + 1$ $6 = 6 + 0 \qquad 6 = 3 + 3$ $6 = 6 \qquad 15 + 4 = ? + 11$ <ul style="list-style-type: none"> • How does this teacher scaffold understanding among her students? • What do you see this teacher doing and NOT doing during the lesson? <p>Coaching Questions to Help with this Shift¹</p> <ul style="list-style-type: none"> • What might be some benefits of allowing students to engage in productive struggle? What might it look like in a specific lesson? • What are some ways that you challenge students to persevere on mathematical tasks? • In your classroom, how do you deal with multiple approaches to solving tasks? 	

KEY SHIFT #2 TO MAKING CONNECTIONS WITHIN MATHEMATICS & TO PRIOR KNOWLEDGE

- Effective Lesson Design - use the research-based LESA Learning Cycle (Launch-Explore-Summarize-Apply)
- bookmark of LESA Learning Cycle and corresponding questions available online²
- PRIMACY - what is remembered best is what happens in the beginning
- RECENCY - next best remembered is what happens last, or most recently

Coaching Questions to Help with this Shift¹

- What might be some benefits of allowing students to engage in productive struggle? What might it look like in a specific lesson?
- What are some ways that you challenge students to persevere on mathematical tasks?
- In your classroom, how do you deal with multiple approaches to solving tasks?¹

KEY SHIFT #3 Changing the culture of the classroom in two fundamental ways

- Toward a focus on explanation and understanding of mathematical relationships
- Toward mathematical authority coming from sound student reasoning

Math Talk “Moves” to encourage classroom talk

- Revoicing
- Asking students to revoice
- Asking students to agree or disagree
- Prompting students to add on
- Using wait time
- Playing dumb
- Emphasizing reasoning vs an answer

Coaching Questions to Help with this Shift¹

- What strategies have you used to encourage students to think and reason for themselves?
- What might get in the way of students thinking and reasoning for themselves?
- What might be some benefits of students explaining why and how they found their answers?
- What supports might students need in order to learn how to explain their thinking to others?

Key Shift #4 to Differentiation within the Classroom

- Structure each lesson with whole class instruction as well as time for independent or small group work.
- The independent or small group work should be developed to meet the individual needs of students.
- This could include previously learned material or additional practice on the skills of the day.

Coaching Questions to Help with this Shift¹

- How do you currently differentiate instruction?
- What are some things that you notice that your students need (around teaching and learning mathematics)?
- How might you adapt this lesson to meet those learning needs?
- How could you incorporate higher order thinking and scaffold that learning for all students?

¹ Adapted from McGatha & Bay-Williams, "Making Shifts Toward Proficiency," *Teaching Children Mathematics*, October 2013, www.nctm.org

² Visit the following website for resources connected to today's presentation:
www.scimathmn.org/stemtc go to resources tab, go several pages to find MESPA 2014
www.mctm.org go to MESPA 2014 presentation link on home page

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