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Let's Talk About Problem Solving

Jonathan Bostic

Bowling Green State University, bosticj@bgsu.edu

Tim Jacobbe

University of Florida, jacobbe@coe.ufl.edu

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Jonathan Bostic

Bowling Green State University

bosticj@bgsu.edu

Tim Jacobbe

University of Florida

jacobbe@coe.ufl.edu

Essential questions for our session

○ Why is problem solving important?

○ How can we structure our learning environment to promote math learning and encourage problem-solving behaviors?

Why is problem solving important?

- Common Core State Standards for Math
 - Standards for Mathematics Content
 - Standards for Mathematical Practices
- Teaching math via problem solving provides a way to engage students in mathematics content and problem solving.
 - It fosters the perception that the two aspects are intertwined.

Norms

- Social norms
 - I will actively listen to each person's contribution.
 - I will not participate in side conversations while someone is speaking.
- Mathematical norms
 - I will use tables, graphs, pictures, symbols, and words to assist me while doing mathematics.
- Sociomathematical norms
 - I will give explanations followed by mathematical justification.
 - I will use "I think..." statements when speaking.
 - I will comment on peers' ideas rather than the person sharing them.
 - If I disagree with a comment then I will ask that person a question followed by why I disagree.

Tasks

- ◊ Open, complex, and realistic word problems
- ◊ Mrs. Marriott's muffins (5.OA.3 - Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.)
- ◊ The King's oranges (5.NF.6 - Solve real world problems involving multiplication of fractions and mixed numbers e.g., by using visual fraction models or equations to represent the problem.)

Problem-solving Discourse

- Teacher
 - Reminded students by asking “How do you know the strategy is appropriate?” or “How do you know your solution is correct?”
 - Used “What about...?” or “A previous student suggested...” to encourage multiple perspectives or address necessary procedures to learn.
- Students
 - Began peer-to-peer collaboration by asking “How did you do it?”.
 - Copied the strategies onto their papers for future use.

What might students say?

- “The way it [feelings about problem solving] changed was like from there to here. I had a difficult question, in the summer I get aggravated, but now I *kind of* (emphasis added) get aggravated but I get more into it and work hard and then if I don’t [understand] I ask a student how to do it” (Logan).
- “At first, I thought it [instructional intervention] was going to be boring. When we got to the middle, I started understanding that you were helping us and I started understanding word problems. ...And then by the end, I loved it.” (Henry)
- “This [instructional strategy] is more fun because we get to talk to each other.” (Krystal)

How can you adapt your learning environment for teaching math through p-s?

- Be a problem solver with your students
- Support their learning needs
- Employ modified think-pair-share
- Facilitate reflection on math concepts and strategies
- Scaffold (i.e., differentiate your instruction)
- Focus on sharing ideas and the content will come through the instruction

THANK YOU FOR COMING!

**DO YOU HAVE ANY QUESTIONS OR
COMMENTS?**

Jonathan Bostic
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