

 **AUDIO**
5:12 min

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Coach Talk: Debriefing in Problem Solving

Papillion-La Vista School District, Nebraska
November 2011

Topic IMPROVING MATHEMATICAL PROBLEM SOLVING IN GRADES 4 THROUGH 8

Practice REFLECT AND DEBRIEF

- Highlights**
- » Elementary mathematics coaches Jane McGill and Danielle Inserra discuss the importance of giving students time to make sense of problems.
 - » They comment on the use of small groups in the classroom to assist in the problem-solving process.
 - » Both coaches explain reflection techniques to model during problem solving.
 - » Non-examples are mentioned as a tool to determine the level of student understanding.
 - » They describe the debriefing process to strategically share various students' approaches to solving problems.

About the Sites Papillion-La Vista School District

Carriage Hill Elementary School Papillion, Nebraska

Demographics

- » 78% White
- » 12% Hispanic
- » 5% Black
- » 1% Asian
- » 1% Native American
- » 37% Free or Reduced-Price Lunch

Patriot Elementary School Papillion, Nebraska

Demographics

- » 89% White
- » 4% Hispanic
- » 3% Black
- » 1% Asian
- » 1% Native American
- » 5% Free or Reduced-Price Lunch

Both Carriage Hill Elementary School and Patriot Elementary School in the Papillion-La Vista School District strive to meet the needs of all students using the district's rigorous math curriculum. Mathematics instruction focuses on:

- » Problem solving;
- » Using math in everyday situations;
- » Communicating mathematical solutions and explaining the reasoning behind these solutions;
- » Hands-on experiences using a variety of manipulatives to build math understanding; and

- » Asking questions and investigating solutions so students explore and discover in problem situations.

Full Transcript



Jane McGill

00:05 My name is Jane McGill, and I am a K-6 mathematics coach in the Papillion-La Vista School District at Carriage Hill Elementary.

Danielle Inserra

00:13 And I am Danielle Inserra, a K-6 math coach in the Papillion-La Vista School District at Patriot Elementary in Papillion, Nebraska.

McGill

00:23 I think the importance of students focusing on the problem is critical because without them being able to make sense of it themselves and internalizing it, they can't make any connections to it. So I think most of the time has to be spent on making sense of the problem and talking about it and what do these numbers mean.

Inserra

00:44 And if students don't make sense of the problem and understand it, they are not able to reflect upon their own thinking and the answer that they have obtained and decide whether that answer is reasonable or not.

McGill

00:57 Students working in small groups makes it very safe for them to articulate and communicate what their thinking is, and that's really what we want in a problem-solving situation. "Is your strategy as efficient as my strategy?" "Oh, let me see your strategy. Maybe it will work better." "Is this the strategy we want to use for this problem? Is this the most efficient and effective way to do this?"

Inserra

01:24 If I was working in a small group or with a peer, we may push each other to persevere through that, find new ways of thinking, and then obtain an answer or find a solution. As teachers, we can help students be reflective in their own thinking in a couple of different ways. One might involve thinkalouds as we are modeling our own strategies, thinking aloud the processes and the reasoning that we go

through when solving a problem. But then also, when you are working with students, asking them questions: “What are you doing?” “Why did you choose to do it that way?” “How is this going to help you?” “Where is it going to lead to?” So getting them to start thinking that there is a purpose in everything that they do and every choice that they make. And by teachers asking them questions, then they start to begin to ask themselves those questions when they are working alone.

McGill  **02:21** And I like to also talk about which one of these doesn't work and why.

Inserra  **02:27** Using non-examples shows a level of understanding. If students are able to pinpoint and show where misconceptions are and be able to reason why that's not correct or why that doesn't work, that shows their level of understanding.

McGill  **02:44** I think it's important in the classroom to debrief and compare different problem-solving strategies, and we can analyze them as a classroom. We can say, “Which of the strategies do you think was the most efficient? Which strategy could I obtain easy information just by looking at it? Could I follow your thinking?” You have to establish that from the very beginning, a protocol of when is it okay to disagree, and how do you disagree in a mathematics classroom, and how do you communicate with your classmates your thinking. When students have to explain their thinking, you can also clear up any misconceptions. So they can have that discussion, and you can help students see where their mistakes may have been.

Inserra  **03:31** And as teachers, it's a great formative. I can on the spot, quickly know if my students understand or where any misconceptions are, and then I can address those at another time.

McGill  **03:43** You have to be very strategic in who you choose to share those problems with the whole class. You want to raise that level of thinking with the different strategies. Start with the one that's most common. You go to the next level. Maybe it's a little bit more difficult. Maybe they chose a strategy that maybe not everyone would use but you know that student could explain their thinking on that. And then

maybe a third student is one that only one person, that one person thought of. Maybe it's that higher level of thinking. Maybe it's that out-of-the-box answer that you just go, "Wow, that is amazing."

Inserra  **04:23** You would hope that students would learn from each other and be able to internalize that learning and then be able to use those strategies themselves, especially if that's not a strategy they are choosing to use, one that they are not most comfortable with. It also helps to keep students engaged in a sense of, when I think about if I'm always calling on students who are correct, then students may tune out. But if there may be misconceptions or errors in their thinking or solutions, then students may be more apt to be engaged in paying attention, knowing that there could be mistakes or that it may not be correct.

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