

**Questions and Solutions:
The Problem-Solving Process and Interventions
for a Continuum of Services**

Session 8

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Questions and Solutions: The Problem-Solving Process and Interventions for a Continuum of Services

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Breakout Session 1
The Power of Interventions: Mathematics

1:00 pm - 3:00 pm

Donna Stofko, Mathematics Specialist
Prince William County Public Schools

Stephen Povlish, Principal
Ashby Lee Elementary School
Shenandoah County Public Schools

Michael Bolling, Director of Mathematics and Governor Schools
Virginia Department of Education

00:00:00

Dr. Cave: Okay, should I do the hand signal or spell Elvis? All right, everybody good? Everybody in? All right, so I'm gonna introduce the speakers; I hope I have it all right. But here is the big idea about introducing the speakers. What we're really modeling is this idea of collaboration and coordination in a multi-tiered system. So our first speaker is Michael Bolling, he's from the VDOE because a lot of times we'll be talking about things and obviously our tier one is to teach the standards that the VDOE has laid out. So sometimes people will say well we'll say something else, say well does the VDOE know that? Or so here we go we have that right here from Michael Bolling. The second speaker in the little group is Prince William County, Carl Knight is their supervisor of Mathematics and she won't be presenting but here to answer questions. And Donna Stofko is here, she will be presenting and the nice thing about Donna she is the coordinator for elementary math, and Amy Hickey her counterpart for secondary is here.

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Dr. Cave: And here is what Donna does, so again it's not like there is a multi-tiered system and then there is math out there tier one. Donna is at every single sub-group meeting. Donna contributes to the handbook so that it is all one thing. It's not a handbook about multi-tiered system and then math has a handbook. So it's all right there in a coordinated effort. So they are always, math is very on board. And then our other speaker is Steve Povlish and Erika Richman and one of the nice things you heard this morning was about that cooperative leadership. So Steve has all of his team, his leadership people working together and what they did was they said, you know what? We're doing this multi-tiered system; it was his second year as principal. He said, okay now we need the VDOE, you people come right to our school and let's work this through

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and let's get this figured out. So he's just gonna talk a little bit about a quick little clip in the middle about what he's done. So with that Michael Bolling first.

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Mr. Bolling: Hi everybody. You know, driving here reminded me you know, it's been cold out you know all of a sudden we go from kind of late winter to summer. And you know, it's, yeah it's a shocker you know, and every year I keep saying oh this is gonna be the year when we have a good at least two week spring and it didn't seem to happen. Maybe we'll get a little breath of that later on, but these are the days when you know, you go into class and kids say can we go outside? Can we have class outside today, you know? And years ago the more frequent answer was sure, come on. Now people are like no we might lose ten minutes in you know, and, but it just reminded me of that day. Because I think that many times when I was asked that question I was thinking the same thing you know.

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Mr. Bolling: Thank you for having me here. I'm amongst some great presenters, I know you're gonna learn a lot from the folks. I'm sorry Steve I don't know much about you, but and, and so I'm gonna spend about probably 25 minutes or so talking about kind of from a DOE perspective of what I think is important as we try to find ways to support students. And that could be through tier one, two or three, and some things that I think are important and that we at the DOE are valuing right now. And one of these big words right now that's been tossed around a lot is the idea of rigor, and you know, I, I think it has multiple meanings. And it's kind of a little bit different for each person, each school, school cultures, school division, at the state and then at the national level.

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Mr. Bolling: I mean I think that there is all different ways you can look at rigor, and it doesn't just mean harder. To me I like the word deeper than I like anything else, more than I like anything else. It's about in mathematics it's about a deeper understanding and longer-term retention. And, and you know, the toughest thing is to find those ways to, to make that accessible for all kids. We try really hard in tier one to get as many kids as we can to the side of understanding, and then we move on to tier two and provide greater supports and interventions. And then for some tier three. I think that there is a common misconception however that as we move up in the tiers there is a conception that kids; we need to find ways to make kids struggle less.

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Mr. Bolling: I'm not sure I really believe that, and don't misunderstand what I'm saying. What I'm saying is that in order to understand something, in order to know it well, in order to be able to process it, and adapt it and apply it takes some struggle. You

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remember your first year of teaching? There were very few for which first year of teaching was easy. It was a struggle. You worked hard, and you made mistakes, and you paid for those mistakes. Sometimes more than others, you got to know processes, you got to new skills, behavior management skills things like that and you developed these things over time. There is a very select few for which those people didn't really struggle it kind of came natural.

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Mr. Bolling: But this is true in mathematics learning as well. You have to struggle with the math in order to understand the math. If somebody just tells you how to do it's fleeting. My son last night, we were working on some test results that he got back on a benchmark test, he's in fifth grade. And he you know, was sitting at the table and we were doing some work, and I forgot to turn off the TV so I needed to you know, do that you know, cause he was quite distracted. And we were doing some I don't know multiplication with fractions and he started to get a common denominator, and I said can you tell me a little bit more about what you're doing right now? And tell me a little bit about why, and he was like I mean seriously he had nothing to access to explain why he was doing what he was doing. And that told me something about his level of understanding of what he was doing.

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Mr. Bolling: He was going to rules, procedures; things in his belt that he thinks are appropriate. Now I got to tell you he's a little pressured because he thinks he's automatically supposed to be good at math because I'm the math guy for the state. His mom is a reading specialist at the school he attends, that's a double whammy. You know, I mean poor guy. So you know, after he wiped the tears and said he was dumb, you know, we got through it and we talked about it and he did just fine. And a lot of the kids at the different tiers are gonna do that. He has to struggle in order to get better, and so I, I don't mean we need to make kids work harder. What I'm saying is we need to allow them to struggle before we reach in to save them and pull them out. We need to ask them a better question instead of telling them things like, now what could you do with that four?

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Mr. Bolling: That's leading them, that's not allowing them to do the thinking and trying to come up, so we got to ask them questions. So that has nothing to do with my slides that are coming up right now but I thought it was important. Teaching Directed is something that I always talk about no matter where I go, because it's something that the DOE has put out just recently. And it's a way to communicate directly with teachers. Teachers can subscribe to Teacher Direct and receive an email that lets them know. And how many have looked at this, seen this, subscribe to it? Okay, and if you haven't it's a good

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connection because people like me send out updates to the field. And we send it to our group of constituents and then they send it on to the APs, or the principals, or the you know, central office folks, and, and filters happen. Or people lose it in the email, in mail, you know, inbox and things like that. This is a direct way to get information out, and, and a thing that's a part of that is this thing called the SOL library, which not, it's not as frequently visited.

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Mr. Bolling: But if you go there and you go to here, this section here these are videos and narrated PowerPoints related to the SOL, and this has what is the meaning of rigor in instruction, and then there is one catered to mathematics, there is one for English. There is, and so you might want to take a look at those, it's a, it's a, well I mean you'd have to sit there and listen to me bantering for 15 to 20 minutes about instructional rigor in mathematics. But, and I'm much more monotone when I'm recording to a computer, but you, you might find some nuggets in there. I don't know. Oh yeah there they are, right there. And so here are the ones that are specific to mathematics over here, and it talks about what has changed in instruction and assessment. And so just keep that in mind you might want to provide that. But when we go back to instructional rigor I think about daily instruction.

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Mr. Bolling: And I think that's what teachers struggle with the most is what do you mean by increase the level of rigor of my daily instruction and assessment? And so I hope to give you a few examples of what I mean. At the same time addressing a bit about differentiation with students. So these are the big things that I think that we can do is we can consider the level of cognitive demand, that's how much thinking the kids are doing. First year teachers often struggle because they are doing all the thinking. The kids aren't, they are more tired than the kids are at the end of the day. I teach student teachers that come through VCU in mathematics, and they're like how does somebody possibly do this for 30 years? I, I've got to have a nap by four o'clock. I mean I am dying. And I'm, and I tell them it's because you're doing all the thinking, and it takes time to turn into more of a facilitator than a teller.

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Mr. Bolling: It just takes time and expertise. Now engagement level of the activity, here is, some people think that engagement means hands on. I do not agree. I think hands and minds on is a little bit better than just hands on. We can be doing something like I've seen my son do cutting out things and doing and putting together this, but there is no learning. It's all just doing and no thinking involved, and I think that that's an important thing too. Then reflect on the kinds of questions that you are asking kids, and so these are the things that we can control in classrooms. We can't control policy; we

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can't control all that stuff, what we can control is what goes on in our classroom. And this really comes down to what are your kids doing?

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Mr. Bolling: What's the level of demand it's requiring? Are they engaged? Do they give a rip about it? And what are the kinds of questions that you're asking kids? So let's take a look at an example. Here is a very common mathematics problem, set of problems. But how could we amp that up just a little bit to number one, make it a little more engaging and make it a little bit of a deeper thinking problem? So I propose this.... Okay, you have 30 seconds to tell your neighbor why this is, this requires more thinking than the other one. Ready? Set, go.

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Mr. Bolling: ...All right, wrap it up. And we can collect things, we're gonna find similarities here, but you know, this gives a reason why you should ever have to do any kind of rounding, or conversation about it, or why it's important to round to the hundreds versus rounding to the tenths. If we rounded to the tenths what would happen in this race?

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Mr. Bolling: Lots of ties right, and so that's an issue. And so now when the kids see the Olympics coming up they're thinking about it and they remember that we did this problem one day because they happened to be rounding, they see the clock and they're like oh that's cool we learned about that. We were talking about the swimmers in a race, dah, dah, dah. Plus this is just plain boring, I mean come on I want to enjoy my job too. But kids are gonna talk with this, it's called communication, it's called discourse. Let them discuss it, let them talk about it, learn from each other, put it in context, and then ask them how would the results change? So now that takes their knowledge of they just rounded and now what can you do with it? So it switches gears on them just a little bit more, moves it up the chain in Blooms' taxonomy. So let's look at another one. What I'm gonna do is I'm gonna show you a progression of problems, the same problem amped up each time.

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Mr. Bolling: Because a lot of teachers struggle with well I don't have time to redo all my assessments. It doesn't really take as much time as you might think. That's why collaboration is so important. Get with your team, let's all pump out you know, these things quickly. Watch you can do this quickly, rectangle has a length of four and a width, I'm sorry six and a width of four, determine the perimeter. Okay now the level of cognitive demand is gonna go up, it has a length of six and a perimeter of twenty, how did we shift gears here? Somebody. Speak up. I don't need a hand, just yell it. Yeah

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they have to, well what we would call traditionally this is working backwards, but this is more like a real life problem. A lot of times we know how much material we have, and we know one constraint but we don't know what the other one would be.

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Mr. Bolling: And so this puts it in context a little bit better, and then here is my favorite part, explain your solution method. Don't care about your answer I want to know how you went about solving the problem. Not supposed to just explain it to me as the teacher on a piece of paper, you can do that, that's great. But I also want you to explain it to your partners; it's collaboration within the classroom. Not just a collaboration among teachers. Take it up another level; rectangle has a length of six and a perimeter of twenty and a third. Now at the same time this is differentiation correct? You could give this to all the same kids in the same class, but different problems, little slips of paper to different kids. Think I had a fourth one, I did. I must have pulled this from the wrong set of slides, oh well. You get the point.

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Mr. Bolling: The next one was cool, it talked about a pit bull and it said that they had bendable fencing and how could they maximize area given 50, a length of 50 feet. So they had to get into the whole notion of circles versus rectangles, you know, or another shape. And it kind of really blew it up a little bit, all right. You have your mixed numbers, subtraction and mixed numbers. Oh boy you should have seen what my son did to this, did this last night yeah. He tried to come up with common denominators for, no it was a multiplication problem. He tried to come up with common denominators for these two, he left the three I don't know it was bizarre. But I, I, oh that's interesting let's talk about what we could, all right so you have your basic level problem which is simplify. Now this is something that I think we need to take more time doing with kids.

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Mr. Bolling: Tell me before you pick up your pencil or you engage anything other than your mind, tell me is this gonna be greater than or less than one? You know, yeah it's a, but make kids think before they do their work because then they can see if their answer is reasonable. Now they have something to compare it to. I think we are quick to let kids pick up their pencils and start computing without engaging their brains first. Then they run into my son's problem. He didn't even look at the problem; well we have a big issue with not reading instructions first of all at my house. Yeah he, he just doesn't seem to think it's important. I think he, he's so competitive I think that he thinks that all tests are races. First one done must win. Maybe I've instilled that in him, no I'm just kidding. All right.

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Mr. Bolling: How about write an implied problem using this expression, so turn it over to the kids. Maybe with younger kids you wouldn't say implied, you'd say tell me a problem in your life where we might use this to solve the problem. Now that's really amping the level of, of cognitive demand way way up. Now when kids do struggle what we can do is ask them questions, not tell them what to do. So I challenge teachers to ask students first of all what they know, all right tell me what you know in this problem. Tell me what you're looking for. Tell me all the basic stuff, then what did you do to start it? Ask them to explain where they ran into trouble, and ask them why they think they ran into trouble. Then this is the most important part. You need to retell them what they've told you.

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Mr. Bolling: Because often kids think that they're saying the right words describing their problem. But they're not, that's why I, I encourage my, the student teachers that are coming through and any teacher I work with is transcribe what the kids are saying into the words and symbols that they are saying don't interpret for them. Don't make it a little better for the rest of the class, do it verbatim. And then have them reflect on it; is this what you told me? Because often they will look at it and say I didn't say that. You say, yeah that's, that's what you said, would you like to change something? And they'll often say, yeah those two things, no I didn't mean to do that thing. And, and then they have now engaged their brain, and their thinking, and their making adjustments it's called metacognition. All right, so here is one of the most important things that we can do for any kid, now ask them to think about another route.

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Mr. Bolling: Okay now that you know this what can you do, what could you do? Is there another, for the upper level kids what's another way you could solve it? I challenge you to find another way to solve it and then share it with your neighbors, so we start getting this collaboration, this discussion. What I'm talking about is effective questioning and classroom discourse. This is all 101 stuff, right? But I don't think it can be said enough. This is what we can control in our classrooms. I'll email the presentation to somebody, and it'll get to everyone magically I'm hoping. If not email me and I'll, I'll send it to you. Yeah we, we haven't put stuff on Teacher Direct yet like presentations, I, I don't know. I'll have to think about that one. Okay so we need to ask kids to justify and explain their thinking, we need to have them sharing their approaches with others. Come on what time is it?

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Mr. Bolling: I'm not getting to the point where, oh 1:25 I got to hurry. Okay, this is a really important one we got to ask them to explain other kids' approaches in their own words. Because now we're having them take themselves out of their own head and put themselves into another person's head. That's why error analysis problems are really

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really good for kids, cause they have to think like somebody else was thinking. So I would definitely encourage you to do that, and then ask them a lot of what if questions, well what if that three was a negative three? What, how would that change things? What if the slope was five and not one fifth, you know, how would that change things? So I'm gonna wrap things up here by talking about this, in the standards of learning there is quote in the introduction that says the following.

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Mr. Bolling: The content of the math standards is intended to support the five goals for students, raise your hand if you know what the five goals for student are. We got five people in the room that know, now, no. That's content, that is content, now isn't that interesting that like the content standards are intended to support the five big goals for all kids in Virginia. But we, educators don't know what those are, that means that the introduction to the Standards of Learning doesn't get a lot of reads. But it also means that I'm not doing a good enough job of communicating what I think every kid in Virginia should have. So the unveiling of the five ones this, they're called the process goals. Now you all are going, oh yeah.

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Mr. Bolling: Some of you are saying yeah, yeah I know those. NCTM has those on their website, and yeah we do that. But I challenge you to think about really when we walk into classrooms maybe to observe, or if we're in our own classroom and we think about what we do are we having kids do these things all of the time? These cut across every socioeconomic level, any kind of minority status or disability or whatever. If you focus lesson plans on getting kids to communicate, reason, make connections, use representations and solve problems, not just solving physical problems but mentally coming up with solutions and, and brainstorming ways, approaches and different things, what you're going to do is you're gonna hit all types of learners. You're gonna hit the kinesthetic ones, you're gonna hit all kinds of learners.

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Mr. Bolling: ...So I'm gonna go back one. The content is intended to support the process goals. Why are the process goals so important? It's because these skills are what make kids good employees. Think about it. You gotta communicate well, you have to make connections between things. Well I know what you're doing in your division, and what you're doing in your division and I can leverage that to do this, and they're making connections. It's not explicitly about, you know, certain mathematics but in being able to reason and use representations yeah we want to be able to show, you know, you can't always use a bulleted list.

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Mr. Bolling: You know, you can't always use a, a table when in my job, I can't always just use a table with a whole bunch of numbers. Some people don't get anything out of a table with a whole bunch of numbers; they want to see a graph. So it's being able to use different types of representations to get at things. Now I had told Regina that I was gonna talk about ARDT, which I'm not gonna do. So Regina for that I apologize, where are you? Yeah, I will say that, that it does exist and we have lots of resources at the Department of Education, and the ARDT does provide a diagnostic tool to help identify strengths and area of weaknesses for kids. It has multiple choice problems and TEI like problems; they are not SOL items, important. Okay, we do have a lot of resources.

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Mr. Bolling: And some of the most important ones will be enhanced scope and sequence lesson plans, how many people know a little bit about those? Maybe looked at them once or twice, you can search them many different ways, which is important. You can pull down these tabs and you can select multiple ones and get all the lesson plans that pertain to that SOL. So we also have some instructional videos and practice SOL items, which have been recently updated. Have you all seen those? Recently updated right? And we do have vocabulary word wall cards, and they now go up through grade eight. We're currently working on geometry and that's an extensive project. We're about 100 pages in to a 150 page I think document, and, and we're getting ready to send it, send out parts to get reviewed. So yeah I did have a slide in here that said ARDT, and I probably have a few more slides but I'm not gonna get to them.

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Mr. Bolling: But I'll let you read if you don't want to listen to me, so I, I do thank you for your time. I know you're gonna learn a lot from Donna and Steve and others here. Thank you for all you do for kids, and I will certainly get this PowerPoint to Regina and it'll include the ARDT slides in case anybody wants to see them. And, and certainly if you ever have questions you want to email, call, anything feel free. We have a staff of two and a half at the DOE in mathematics. We've got one in gifted and governor's schools and then there is, I'm included in the two and a half in the math side too. So thank you all for listening, and does anybody have any questions before I turn it over to Steve?

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Mr. Bolling: Wait time. Is anybody just dying to ask the question to the state guy about the math assessments but is kind of like I shouldn't do that in front of all these people? If so come on bring it. I'm all right, I've already had the question ten times. Okay Steve come on up and we'll turn it over to you. Thank you all for your time....

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Mr. Povlish: That's me man, thank you sir.

00:30:00

Mr. Povlish: ...Good afternoon, as Regina said I'm Steve Povlish from Shenandoah County, beautiful Shenandoah County, Ashby Lee Elementary School. This is my second year as principal, and kind of like the folks from chesterfield said yesterday, when I arrived last year RtI was sort of in place but not exactly. So it was one of the initiatives that we decided to basically say we're not gonna throw it out but we're gonna throw it out. We're gonna use what we've done in the past until I arrived to kind of fuel the fire for how we want to go in the direction we want to go. So to give you a little bit of background about Ashby Lee, while we are the smallest school in our division we have approximately 670 students. We are a title one school, we are in school improvement and if everything goes as projected this will be our last year so we are very excited for that. And I can assure that of all the initiatives that we put in place last year by far RtI has had the greatest impact on our success, okay.

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Mr. Povlish: So and to give you a little more background we have approximately 70 percent free and reduced lunch, and we, our ELL population is approximately eight percent and our special education population is approximately ten percent. So just to give you a little background of what we are all about, so Erika and I are going to talk briefly to you about what we've done in mathematics. Because if you're like us with mathematics it's always like well we got a bunch of stuff for reading but what about math, what are we gonna do now? So and keep in mind this is what works best for us. This gives you a little background, and we're gonna focus on our fifth grade class this year. This give you a little background of the incoming fifth grade class how they did last year. As you can see struggle, overall pass rate 50 percent not good. Now of course this was the first year for the new test but that is not an excuse, we cannot use that as an excuse. So this is what we had to work with this year. Now what we did was as Regina said, my internal team which and again we're very fortunate because we have both a math coach and a literacy coach this year.

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Mr. Povlish: Although that's gonna go away because of school improvement initiatives, but we got together very early on over the summer and said, what do we need to do now? Well Regina and Sandy both visited us over the summer and this was the first thing we decided to put in place, we took what was working and basically made a continuum. This is our map; this is the direction we wanted to go. And the expectation set forth by my team is that this is what you're gonna do; now that's not to say this is the only thing but this is the map. This is our road to success, and this is kind of hard to see, so we broke it down and we'll kind of blow it up for you actually. Erika is gonna talk a

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little bit about what we do in tier two, what these mean and then we'll go from there so Erika I'm gonna turn it over to you.

Ms. Richman: Okay, as a team we decided that we were gonna focus on areas of fluency, and then computation, estimation in two different arena. So we looked for interventions that had been research based and successful in other, other schools.

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Mr. Povlish: Probably my fault.

Ms. Richman: The focus math, math navigator Pearson Diagnostic and Intervention System all focus on math application. Splash Math and Number Run are apps for the iPads. Splash Math focuses on fluency as well as, focuses on is that better? So the Splash Math focuses on both computation as well as fluency, Number Run is fluency. It's based off of the Temple Run that's fairly popular, so those have engaged our students. They, especially our boy are competitive they can see their progress each day. The I Succeed Math is a program that we had, not one that we're currently utilizing.

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Ms. Richman: And so it's one of those things that is available we just need to work on it and see what we can do with it. The Practicing Basic Skills in Math, that's just to get the fluency with the timed, timed test.

Mr. Povlish: Okay, and again these are the, the expectations, this is what our staff will use, our teachers will use for our students in the different tiers. Now the materials again what we did we kind of have go kits, and again I'm gonna let Erika explain these. But what she did, she basically took the different items and has those at the teacher's disposal. So I don't know if you want to add anything about what they're looking at.

Ms. Richman: Well I think the most important thing is to have them organized, easily accessible so that they can come and get what they need and go.

Mr. Povlish: And again it's all about the accessibility to the teacher, and then we've had a lot of success with that. Nothing beats true teacher testimonials, so I'm gonna let you read this but definitely the last line if you could pay particular attention that.

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Mr. Povlish: ...I love that word contagious, that's what it's all about. Again we've talked the last two days about relationship, we talk, we've talked the last two days about what are they interested in? Michael Bolling just said that less than ten minutes ago, we have to do this. And I know what you're probably thinking, well you know, you're in school improvement you have all these funds. I can assure you that less than one percent of

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our funding went towards these items, okay our school improvement money. Because these are things that just naturally work for our students. Now I said something a little bit ago before we look at the, the proof is in the data what I showed you was that continuum and somebody asked me for a copy of it. If you just, if you want to send an email to me, or maybe I can send an email out to Regina and Sandy, we'll get that out to you. Okay, so thanks for asking for that, but on that continuum it's not to say that a teacher can't use something else. But the expectation is if a teacher finds maybe an app, or if a teacher finds something they want to try for their students all they have to simply do is let us know during our data meetings.

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Mr. Povlish: Or just simply send an email to me, and then our internal team talks about it and we let them do a trial run. And what we found is we've added a few, how many have we added roughly?

Ms. Richman: This year three.

Mr. Povlish: About, about three, but what we found was many of them fizzled out. But again that's not to say they're bad programs, or bad, bad interventions they just didn't work for our students. But again there are a few, several that we put on that continuum. But again that's our map, that's the direction we're gonna go. If you take a look at this and again I'm gonna let Erika kind of elaborate, I mean I'm a former math and science teacher so I'm all about number. Data doesn't lie, and this is the proof.

Ms. Richman: These are students; fifth grade students' performance on MCAP, the first triangle shows their fall performance. And then the middle one shows their winter, and you can see that we greatly increased our average above and even the well above average. And consequently decreased our below and well below.

00:37:01

Ms. Richman: This is an example of AIMSweb, which we use to progress monitor our students, and how our teachers use that data to drive instruction. If you can see for this student midway there is a line where they recognized that they had enough data points that maybe the intervention we were trying isn't working, so let's try something different. So they make that change, and then you can start to see we're, we're picking up a little bit. And the description that they put into AIMSweb we asked that it be very specific. Because if you just say iPad apps, if it's not working we need to know specifically what it is so we can try something different.

Mr. Povlish: And again our data meetings are once a month like many of yours, then we have the trouble shooting team that meets accordingly. But that's not to say that if a teacher has a major concern they can't bring it up prior to that meeting, but that's

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definitely the students we're going to talk about when we have those monthly data meetings.

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Mr. Povlish: And then we adjust accordingly, and really just to wrap up kind of the nuggets has been the theme the last couple days. Again the monthly data meetings all hands on deck, again every division is differently. We are very very fortunate in Shenandoah County that from our school board office it's a, it, Rtl, Rtl, I mean we've been in it for numerous years. In fact Sandy Hook was one of the pilot schools originally, so it's kind of filtered down. But it's, it's really helped because all hands on deck and also at the elementary school level we have a team concept. Together everybody achieves more, so all the elementary schools we get together once a month and we talk about the data. We talk about what's working in your school? Well this is what's working at my school; again it's about that collaborative piece that you heard Michael Bolling talk about and over the last few days. And the IE schedule, again that was the last Rtl conference, we had Dr. Rettig here. Do we have a perfect IE schedule? No, but ours looks different this year than it did last year. Where again last year even though it was our first year it was, I'd like to say it was an organized hodge podge.

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Mr. Povlish: We had, we had some growth but this year the expectation is the teachers have lesson plans that we discuss at the data meetings. And we look on a regular, look at on a regular basis and we're already talking about next year, how can we change our IE schedule to best meet the needs of all of our students? And that's not just the struggling students, we cannot forget about our gate students as well, and that's, that's where the enrichment piece comes in. And then of course the balance of reading and math, again it's, I feel your pain. I know there is tons of stuff for reading but what about math? Again these are just the things that have worked well for us. There is, there are things out there but you have to try them, and my suggestion to you is kind of like one of the first Rtl meetings we had I think it was last year, the ready, fire, aim concept. Yeah just do it, just try it, there is Mr. Knight, Mr. Phil Knight he can pay me for that later, but just do it. Just try and if it's not working adjust accordingly, and that, that's my best advice for you. Minimal funds, again these you know, the apps are how much? The apps are, are petty.

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Ms. Richman: Ninety-nine cents, a dollar. Some of them like with Splash Math you can download a free version, which contains a portion of it, but it's a start.

Mr. Povlish: Again it doesn't take a whole lot of funding, and dedication determination. Again our mantra is we want to give them a goal, a direction and an expectation, and we talk about it on a regular basis. We plan accordingly and we adjust accordingly, and that

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self-reflective piece that you've heard about the past two days, and past two years if you've been with, at these meetings, these conferences again all hands on deck. Give them the direction, so any questions? Anything at all? I promised I would keep it brief.

Respondent: When do they do the games on the app? Like Math time?

Ms. Richman: Those are during our intervention and enrichment time.

Respondent 2: What does your IE schedule look like? Like I mean I know you say it's, it depends on what your needs are and things like that, but what do your kids do for your, I say for enrichment per se, like how do you schedule that.

Mr. Povlish: Well again it's, we have the master schedule and every grade level has approximately a half hour a day.

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Mr. Povlish: And then it's broken down by need, and then what we're actually trying to do is next year we want to do a little bit more where they can possibly do vertical planning and vertical, integrate the second grade plan with third grade to talk about the better meeting the needs of the students for IE time. That is, that has been one of our biggest challenges is the schedule because you know, even I have told Dr. Rettig there is now such thing as a perfect schedule. But you know, that's okay you make due with what you can, so again it's, it's all about the students.

Ms. Richman: With that it also comes back to the all hands on deck, when we provide training for a new intervention we include our resource teachers. So that during their planning or at some other time they can pull you know, a student or a small group so that gives us more staff to, to work with.

Mr. Povlish: That's a real good point, I'm not sure if you heard Erika, but during our IE time we have literally all hands on deck. PE teacher, resource teachers, language arts, everybody is doing something there with a different group, and how we do that is you know, I may talk to my PE teacher and I know the one favors math.

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Mr. Povlish: The other one favors reading that just works out very well, so again we put the students who need the reading, reading interventions and just do it accordingly, good question yeah.

Respondent 3: What does your monthly data meeting entail, look like, involve?

Mr. Povlish: That's probably another presentation, but basically in a nutshell once a month grade levels meet with the coaches, myself, the title teachers, the specialist, and

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then we have already predetermined the students we're gonna talk about. We normally look at those students who have X amount of data points below that line. Okay, they're, well so in other words if there is three or four points, data points below that line we definitely talk about that. Then our problem solving team if they've, if we don't get to them that's when we go, or if they're, if there is a discussion, cause kind of the general rule of thumb with us is about a minute per student roughly. I mean that's best-case scenario, in all honesty it's probably a minute and a half to two minutes. But then again you get through those students, are we gonna keep it, are we gonna change it and then go from there.

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Mr. Povlish: Good question, yeah.

Respondent 4: What is the process when you move from your data meetings to your problem solving team, which, which students make that leap?

Mr. Povlish: Well again the main thing for us are those students who we need more time to discuss. In other words at the data meeting we know that it's gonna take a little more collaboration amongst the team members to say hey let's work out a better intervention for this student. So then again our, our problem solving meetings are normally the next week during that time slot, which is the teacher's planning time. Yeah good question, anything else? Okay, that one? And I will send that continuum to Regina and Sandy and they can send it out to you. If you have any questions please don't hesitate to call me, and I thank you for your time. Thank you.

Ms. Stofko: First time I've used a wireless mic like this, so I'm it's a little weird.

00:44:02

Ms. Stofko: But okay as long as you can hear me that's good. Thank you for having me today it's my, my privilege, my pleasure to be here and to have this conversation that everybody is challenged with. That is me, I'm Donna, I am from Prince William County Schools and we like you are faced with some of the same challenges everybody is, in particular with mathematics. So I wanted to share a little bit first about who we are. We are a very large school district; we're the second largest school district in the state of Virginia. We have a lot of kids, we have a diverse population and we have probably the same concerns and challenges that you do. It was really great hearing Steve's point of view from the school level, and I think this will be interesting just to take it up a notch and take a view from the division level of where, let's, some strategies and things that we have seen across our district being used.

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Ms. Stofko: Here is what I hope to be able to do with you today. I hope to be able to share with you some research that is targeted specifically at mathematics, and be able to share with you some resources that we're using, as well as probably the most important thing is nice that Michael Bolling hit this too, have some conversation about how we can meet some of the needs that we all have regarding intervention in tier one, in the core instruction. So let's begin with just a look at what should we be seeing in what we would consider a high quality math classroom? And this, some of these slides you're going to see some research quoted down at the bottom there to, that you could go back and reference. But essentially we're looking at a classroom in which conceptual understanding; procedural fluency and competence are developed simultaneously.

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Ms. Stofko: This research is backed up by probably a recent publication that you may remember from the National Mathematics Advisory Council that makes that very same comment. That these ideas about conceptual understanding, procedural fluency and problem solving be developed simultaneously through instruction, and that if you're in a situation where you're having teachers who are focused on one of these to the exclusion of other two then that's misguided. That it should be in a balanced or a blended sort of fashion, and so this is a pretty, this, this kind of details it a little bit further. And I'm gonna let you just take a second and read that....

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Ms. Stofko: And only one of those is one that I think is worthy of taking out and being specific to math because all of these bullet points really could speak to any content area not just math. But the one that I'm the most concerned about is the last one. And that has to do with developing students' enjoyment, their attitude, and improving their disposition about math. And that begins with all of us as adults, there is a pervasive acceptance in our culture that if you are quote, not good at math that it's okay to say that. But the last time that you heard somebody say I'm not good in reading is when? So it's breaking this idea that it's okay, and somehow that it's okay to not be good in math.

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Ms. Stofko: But everybody in our society would agree that it's not okay to not be good in reading, so it begins right there. That, that we all have to help students understand that we can all be good in math, and that with proper supports we can all get there. That it's not a have and a have-not situation, it's not a situation where I'm good in math so naturally my children are going to inherit the math gene and they're also going to be good in math. So this is an area that I think we can very very with determination correct because if we express even if maybe we have to sell ourselves of it first that we love and enjoy math, that we acknowledge the struggle but we appreciate the work that

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students do to get there then we have a better chance of moving kids where we need them to be.

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Ms. Stofko: Rather than letting them off the hook with I just don't like it, I'm not good at it. If any of you are involved in elementary school or middle school you know that probably by the time some students reach fourth grade they are very free to say I don't like math. It's too hard. And I think that's heartbreaking, and certainly by the time they get to middle school they're pretty well shut down if that's the attitude they've developed in elementary school. So Michael talked about a little of this, so I'm gonna hit this only briefly. But we have specific content standards that we work on in math, and this is one of the areas that makes teaching math and maybe reading somewhat different. Because we have specific areas that we're going to, to hit that in each of these areas may be somewhat different than all of the other areas.

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Ms. Stofko: And may need a different approach in terms of instruction, and through these content standards we need to be ensuring that our students have opportunities to be working in these process goals that Michael talked about. It is only when we have classrooms where these things are present, and these things I'm talking about are those process goals, that we are going to have students who are able to do what VDOE is asking us and what we want in terms of citizens in our future society. We want students who are problem solvers, and that's the ultimate goal of both of these things. So these content standards we have are the pieces that we build to lead us toward the goals of mathematics. And so this piece is at everybody's heart, you probably have it up on your refrigerator.

00:51:02

Ms. Stofko: You probably have it on your bedside table, so this is not something I have any intention of explaining to you. But I put it in this PowerPoint because one of the things that I want to, that I have been experiencing and struggling with is that there, there seems to be somewhat of a perception that in this tier one instruction that that's not being viewed as a place to provide intervention. And I like this particular graphic because it says universal intervention. And so what sometimes is happening is students are receiving instruction during their core and math time and then they're struggling and the kneejerk reaction is to do what? Pull them out; I heard it somewhere over here. The kneejerk reaction is to pull them out. The kneejerk reaction is to say we need to go right to tier two when, when my hope is that the kneejerk reaction can be let's take a look at tier one very closely and let's be sure that, that the needs are being met of our children in tier one.

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Ms. Stofko: While at the same time figuring out what we can do perhaps in tier one to offer that intervention before that child gets much further behind than where he is, it's the idea of prevention or early intervention. So then when I, when I go down that road with anybody then the question usually is, okay well then how does this look in a classroom? How does this look in a math classroom? Well that's where differentiation comes in, and, and we're all very quick to say let's differentiate our classrooms. But when is the last time you, your teachers, or your colleagues have read recent literature on differentiate instruction.

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Ms. Stofko: In particular Carol Ann Tomlinson, she's written like a gazillion books, and of the gazillion books I'm going to be honest with you and say I've read one of them. But there is all sorts of work out there being done in the world of differentiation, and I think that probably the best thing we can do is go right back to the research and read what does it really mean to differentiate instruction and then think about how this applies to math. So there are some other resources that I think are work looking at. This is a book I read recently and I love it. It is called From Reading to Math, and it is talking about all of the best practices and research that's working currently in reading or at least the research that's out there for reading and how we can take some of that and move it right over to math. Or think about some of the same ideas in math, and so being careful though to be thinking about letting the research talk to us about what this is saying.

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Ms. Stofko: So this book has really struck a nerve with me, and is one that's really giving me a lot of food for thought and doesn't take a long time to read. Another one that is worth some time is a book called Guided Math. This is on my hit parade, this is a book by an author named Steve Leinwand it is called Accessible Mathematics and in this book he describes ten shifts that we need to be making in terms of looking at our math classrooms. One is he makes a big point about telling us that we probably do need to be taking a look at what is happening in reading and thinking about how to apply that over to math. So that's a book I would highly encourage and then there is another book out there that is, I, and this is, and actually not one that I've read.

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Ms. Stofko: But it is one that I am being told by our title one math specialist from who, that I work with that this is an excellent resource and is one that provides some great activities and strategies to use if you're trying to move into more small group instruction. Is my microphone still working okay? Okay, so this is what the research says it means, differentiation. Or at least this is what Carol Ann Tomlinson says it means. So we're looking at various approaches to what students need to learn, how they need to learn it, and how they are going to show what they know. That boils down to what you have

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probably heard content process and product. And so how are we going to differentiate in such a way that we can do these things to meet the needs of a range of learners in the classroom?

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Ms. Stofko: Michael showed you some really good examples of scaffolding tasks. That's one way. So in our district we are working on trying to figure out or how we can think about some of the ways, the things that teachers are doing in reading and how that might look in math. Just like that book I was telling you about, but I have some worries and concerns about some of it because sometimes teachers are doing all the same thing in reading, and that being guided reading. And they're doing it every day, every day of the week and so I've begun asking my question, which is why I went to do some of this reading like the book I just showed you. I began to question, okay so how would that looking math? And that's why I went to the book on differentiation so what, what we need to keep in mind is that the differentiation or the grouping that can occur can occur in small groups.

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Ms. Stofko: But that the groups shouldn't always be grouped by like readiness, or like learning styles, or like interests. They should be sometimes that way, and sometimes not that way. Sometimes kids need to be mixed up with different abilities, or different learning styles, or different interests. Sometimes you might have kids not working in groups at all but maybe they would be working with a partner, and sometimes that partner is of like interest, ability or readiness. And sometimes they're different, if it's happening every day the same way everyday that's where I get concerned about that. Maybe the differentiation occurs individually.

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Ms. Stofko: So in other words different assignments or different tasks during time when students are working independently. I think about that perimeter problem that Michael shared. Or as a whole class you can have activities that you're doing as a whole class and still differentiate within that. So perhaps there is a game that ultimately is going to be played in partners, but, but some of the students are going to play the same game on one game board and if any of you, I'm gonna give an example that I'm familiar with and some of you will connect. There is a game called Fraction Tracks, that is a game that if you play one version of the game it's played on a zero to one board, but if you play a different version of the same game it's played on a zero to two board. So it extends the game for some students, so that can be modeled in whole class and differentiated in that way.

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Ms. Stofko: I guess the bottom line is that the differentiation or the grouping should be happening just one way every day all the time, and sometimes that grouping is something the teacher decides based on what the teacher is seeing. And sometimes that grouping can occur because students are selecting their groups. So here are some examples cause this is what teachers began asking me. They didn't want to, they didn't want to hear all this, maybe you didn't either. But what they wanted, they wanted to know, okay well how does, how, how about in the math block, what's it look like in the math block? Well okay so here is one example, maybe you've got a warm up for a couple of minutes, 15 minutes. And maybe you've got a chunk of time, in this example 50 minutes, but in that 50 minutes chunk of time you're going to let research drive and research I mean best practices so cooperative learning and small groups drive what happens in that whole group instruction.

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Ms. Stofko: So we have whole group, we whole group in the way of like a introductory type of lesson, some small group and maybe some partner work. And at the end of that time maybe we have ten minutes to bring everybody together. Well so that's one way. Here is another way. We shorten up the warm-up time, so back on that other example who remembers how many minutes I had for warm up? I had 15, well maybe on that day I'm doing a problem of the day, something that requires a little bit more time. But because now I'm going to do something a little different here I'm gonna shorten up that warm-up time and instead I'm going to have something that, that won't take 15 minutes like a problem of the day would. So in this case maybe I'm shortening up this block of time to 35 minutes. Now this, I should have prefaced by saying in Prince William County at grades three through five we have seventy-five minutes allocated for math at grades three through five.

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Ms. Stofko: At K-2 we have 90 minutes, so I'm showing you here what amounts to a 3-5 example of how this could be broken out. Now with this that means that I have about 30 minutes left that I could do some small group work. So the first example I shared perhaps would be a day where I need to develop a concept really well. And I need to be sure; I need to touch base with all of my kids. I need to be working with each of the groups. But on this day I don't need so much of that time so I'm gonna shorten that time and now I've got time where I can have groups. And one of those groups can be to support students who are struggling. And maybe here I would be differentiating by ability because I noticed the day before, or I noticed on my benchmark assessment that I have a certain group of kids that need work in this particular area.

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Ms. Stofko: So this is an opportunity for me to bring them together for that purpose, and maybe I'm going to intentionally plan a schedule like this a couple times a week. Because I am getting closer to the SOL and I know that I have kids that need to work in certain areas. Here is another example. This might look more like what you heard me mention a minute ago about guided reading. So we have like a rotation of sorts where one of those stations is a teacher station. And then you have stations set up that if it were my perfect world the stations would be set up so that they match the content that's been developed thus far, so you have a variety of learning opportunities set up that meet the needs of the students.

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Ms. Stofko: And hopefully are differentiated because in one way shape or form, or you wouldn't be putting them in this sort of scenario. And then there is another scenario that looks like this. Same idea, but what's different? The difference is right here. In this example you've got small groups happening, you had a short, both of them have a, like a warm up, both of them have like a mini lesson, but what's different is in this example the teacher doesn't have a group over at the table. So then what is the teacher doing? The teacher is walking around to each table probably taking some anecdotal records, which are assessments, probably sitting down with each group and engaging with them as part of that.

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Ms. Stofko: So it looks very similar to the one that I did before, but the one I did before the teacher has a group of kids and a concern that I have about that is what are the other kids doing? What are the other kids doing? So this other scenario needs to be carefully, well they all need to be carefully thought out and carefully planned, but this scenario is the most dangerous to me if done poorly. Because in this scenario you have a group of students, you have a whole class of students that might get 15 to 20 minutes of time with the teacher and of that 75 minute block of time you really don't know necessarily what they've been doing unless you are carrying over some really good ideas from reading about how to manage that. So what drives the decision to do any one of these structures?

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Ms. Stofko: Or why not do all of them? But on any given day what would drive the decision to do that one as opposed to the first one I shared with you? Okay I'm hearing ongoing assessment what else? Somebody up here in the front is gonna get chosen here in a minute, or I'll just give it up. So go back to, you remember the slide where I laid out the content standards and the process standards? A lot of what is going to drive which of these scenarios you're going to go to, and they're, that, what I shared with you isn't all. Look there is another one; there is one called Your Thoughts. Cause I don't

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have the magic bullet, I don't have all the answers. But what's going to drive the decision about how you're gonna structure your class is going to be based on assessment but it's also going to be based on the content you're teaching.

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Ms. Stofko: The specific content you're teaching, so its going to look very different possibly if you're teaching lessons on geometry than what it might look like if you're teaching lessons on arithmetic. And all of these things are carefully planned and thought out in terms of how to do that. In any one of these, even in this scenario you could be, if you're differentiating appropriately then you are preventing students, or you're providing intervention in that way before they get too far behind. So that was all tier one, thinking about tier one and what should be happening in tier one, and then once you get to a place where you're seeing students are struggling and you've done all of these things in terms of differentiating and really working at best practices in your classroom to support these students.

01:07:06

Ms. Stofko: And then you begin looking at okay well we still have some. We don't have as many as we did before, but now we have some. Well there is research out there that helps us guide us about what the tier two piece can do and what it can look like, and it comes from the What Works Clearinghouse. If you get my PowerPoint if you click on that image it'll take you right there. Or if you go to What Works Clearinghouse and you just do a search for that document you'll get right to it. And it's worth a read. What I'm going to do at this point is spend a few minutes on this piece, in other words focusing on the tier two, well actually tier one and tier two, but that's where your head is gonna go at this point is tier two. So this piece however is all kids, talking about screening. That's part of the Rtl piece.

01:08:00

Ms. Stofko: And so I thought I would share with you briefly some of the things that we are doing in that way. So we've got a lot of things going on at K-2, some of these are things you are familiar with cause maybe you're doing some of these things too. We have some things down here at 3-5 that we're working with, and we by the way I didn't mention in my opening; we are a site-based managed school system. So what that means is we have 62 elementary schools, or a total of 83 schools that all do their own thing. So when you see a list like this a lot of that is because schools are able to, to make decisions like this under our, under our system of site based management. So we have a lot of, a variety of things happening. At the middle school you'll see similar things to probably some of the things you're doing.

01:09:04

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Ms. Stofko: But here is a caution that I'm going to make, all of this is good, you know, whatever it is that you're using in your screening kids is great. But none of it matters if you don't do this. If all you do is you look at the reports, or you look at the numbers in a spreadsheet, or you look at numbers in a table, or you look at a graph and you don't look at the student work then you have nothing to build on to develop intervention that's going to target and be focused on the student needs in math. Probably true for anything else too, but especially in math. So here is an example of that, it's funny Michael did not see my PowerPoint and I have seen his but he didn't, he didn't mention his previous times about error analysis. But I'm gonna take you through this. This is a student's solution to a problem. Can you look at the solution and then talk with a partner please about what you think his misconception might be?

01:10:05

Ms. Stofko: ...How many of you think you know what Joey's misconception is? Okay, I'm gonna wait another ten seconds to see if you can, so see if I get more hands. Notice I didn't say what Joey's misconception is, I said, do you have an idea of what his misconception might be?

01:11:00

Ms. Stofko: Will you raise your hand now and tell me if you have an idea what it could be? No, I'm not gonna call on you I just am curious to see if you have a thought, okay. Nod of head is good, okay so you've talked with your partner. You have an idea, now I'm gonna show you another problem. When I show you this problem I want you to compare and contrast the, the idea you had about his misconception to this next one, here you go.... All right how many of you now see, see something different than what you thought?

01:12:03

Ms. Stofko: ...So what do you think is happening here? Okay, all right I'm hearing, let's see if there is anybody that agrees, I'm hearing that Joey might be adding these two numbers here before he multiplies, okay. Is that what you thought he was doing here? Okay how many had a different idea of what you thought he was doing here than adding these two numbers before he multiplied? What did you think he was doing? Oh, okay you thought he was multiplying two times two, and then multiplying four times four.

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Ms. Stofko: Oh, okay you thought he was doing four times two, and then times two. Oh okay, interesting did anybody think he was doing it yet a different way? Did anybody see I think he was doing it like the way that I just, what was that?... Two times seven plus two, two times, two times seven, fourteen plus two and that makes 16, wow. That's one that's never come up before, wow. Okay, so here is the third one, let's compare and

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contrast. What do you think about this third one, does this confirm or extend our thinking?

01:14:04

Ms. Stofko: Did the same misconception follow him to this problem? Okay, so if all we depended on however is some benchmark test or some assessment where a student solves a problem, bubbles in the answer, you get a report and that report says that Joey is showing trouble with two digit multiplication with a one digit factor that tells you absolutely nothing other than he got the answer wrong. And now you know so much more, but here is a problem even with the so much more you now know, that is this right here. What intervention strategies could be used to help Joey with this concept? So the intervention strategies is where everything is, brings you to this room today.

01:15:03

Ms. Stofko: What intervention strategies can he use? So in some cases we are in a situation where we will have teachers that simply don't know what to do, and that what that teacher might do is go and reteach the algorithm. And if we're going to try to help Joey probably what we need are more strategies in our own toolbox in order to support his understand. There may be another way, so here is an example. Let's look at this problem again. In other words what we were doing there isn't the only way to think about a two digit multiplication problem with a one digit factor, or two digit factors, or any number of factors. So maybe this is what he, what could be, what would help Joey. If Joey could think about decomposing the first factor into 20 plus 7 and he thinks about 4 plus 20 is 80, and 4 times seven, I mean I'm sorry 4 times 20 is 80 and 4 times 7 is what, 28?

01:16:11

Ms. Stofko: And then add those two numbers together and we have 108. Not only would Joey have a higher likelihood of getting the answer correct but it makes sense and is connected to place value concepts. And here is yet another way, so maybe instead of breaking it up in terms of tens and ones Joey thinks about or we help Joey think about benchmark numbers, benchmark numbers being friendly numbers. Numbers that we can work with, and 25 is a favorite of kids because of quarters. So now we have most kids are going to know four times twenty-five is one hundred, and four times two is eight, and I add those together and I have one hundred eight.

01:17:04

Ms. Stofko: Or yeah, and so it's when we lack the, the ideas or things like this to be able to say to a student do you have another strategy that you can work with that will help you understand? Or if we see back on those examples that he's very digit focused and not incorporating place value then we as their teachers whether we're their general

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education math teacher or a specialist working with Joey these are the things that we need to have ready. And not ready to teach Joey, but ready to help Joey get there. Now I didn't even put up here things like base ten blocks, area models and other ways.

01:18:00

Ms. Stofko: So you looked at, you looked at these universal assessments, you looked at student work, but there is another assessment that's really important to look at too and that's diagnostic. And diagnostic assessments do all of these things. You learn so much about a student when you sit down one on one with them and you have a conversation with them. And most of the time some people are going to say I have 30 or more students and I don't have time, and maybe that's true. But you have time for some of your students. And when you see how much you, you grow and you learn from doing this type of thing most will begin doing something like this with all of their students. So I'm gonna show you an example of this. I'm gonna ask you to meet a child. The child is [Cena ?], this is her picture. She is seven and a half years old. She is in the second grade.

01:19:00

Ms. Stofko: What I would like you to do is to observe and I'm gonna ask you not to blink because it's very quick. I'm going to ask you to observe [Cena ?] in the whole classroom setting, and I'm gonna pause the video in a blink. And when I do I'm going to ask you to think about what you can gather about [Cena's ?] understanding of place value based on that short video clip you're going to see.... This is where everyone is crossing their fingers and hoping technology works, and we have no sound. Bummer. So we need our techie guy.

01:20:00

Ms. Stofko: ...Can you stop it Amy and, we had sound and now we don't. We even tested it.... So while we're waiting for the technology to work I want you to work I want you to think about 27 times four. And I want you to think about the two strategies I shared with you, and see if you can think about another way to work that problem.

01:21:00

Ms. Stofko: Or practice those two strategies if they're unfamiliar to you. What is he thinking? ...No it's giving it away, no it's at the very beginning.

[Video - See Ms. Stofko's PowerPoint presentation]

01:22:00

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Ms. Stofko: ...Okay, that was your whole glimpse of [Cena ?] in whole group instruction, so let's flip back because I'm gonna ask you to think about something. What I'm asking you to think about now is what do you, just in that little short blip of time you're the teacher, what do you think about [Cena ?]? Talk to your partner for two seconds....

01:23:00

Ms. Stofko: ...Thank you I think it's gonna work out perfectly. Okay, so will you, is there anybody willing to share your thoughts about [Cena ?] sort of loud enough so that most people in the room can hear? You thought what was a vocabulary issue? Okay, okay, did she get the correct answer? She did get the correct answer but you are questioning her, the, and by vocabulary which vocabulary are you thinking about? Specifically, but what specific part of place value?

01:24:01

Ms. Stofko: Like ones and tens that type of thing? Okay I'm gonna repeat that is that okay? Okay so what she was saying is that she believes that [Cena ?] has an understanding of what a group of ten is, and that there were some left over. Do you all have that agreement? Okay, so you're the teacher and on a fly your gut reaction about [Cena ?] is what? She has got it, is she one that's gonna, that is in your brain right this minute the one you're worried about? Okay at least for that moment in time right, cause most of teaching happens on the fly and on your feet. And there are 29 other kids in the room when that's happening, so now what do you think about this? Could [Cena ?] complete this worksheet from a traditional textbook?

01:25:03

Ms. Stofko: Could [Cena ?] complete this worksheet from a traditional textbook? In our district we have at grades K, one and two a grading system where students earn either an N, an S, or an S+ at grade two. Do you think that [Cena ?] would get in the, a grade of an S or an S+ on that paper? Okay, and the message being sent home to mom and dad is what? Okay so you might, you might already be guessing where I'm going with this, so now you get to see the other side. And what you're going to see now is [Cena ?] in a one on one interview.

[Video - See Ms. Stofko's PowerPoint presentation]

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Ms. Stofko: Now talk to your partner. What do you now think about [Cena's ?] understanding of place value?

[Video - See Ms. Stofko's PowerPoint presentation]

Ms. Stofko: Okay so are we in agreement that [Cena ?] is lacking an understanding of the concept of place value?

01:30:01

Ms. Stofko: If we are also in agreement that an understanding of place value means that we have an understanding of what the quantities mean and the relationships between them so that we would have ten ones or ten units in the tens place. And [Cena ?] while in one setting wasn't able to, was seemed to get it if I let you see the entirety of that video Marilyn Burns does this with her two more times and gets the same result. And then concludes the video by saying that students need a lot of opportunities to develop concepts like this. And that worksheets and digit oriented arithmetic type things aren't going to get the kids to understand place value. So maybe it's not falling apart for [Cena ?] yet. When do you think it will?

01:31:00

Ms. Stofko: And by it I mean her confidence in mathematics or her achievement in math, where is it going to affect it? By third grade, I would say so it might even effect her here in second grade. Right now [Cena's ?] enthusiasm and her confidence for math are very high, did you see that in her whole group? You saw her go look, she was very confident. She seems very happy. In that one on one interview she was very happy. It won't take many experiences of not understanding something conceptually before that's shattered and that confident enthusiastic happy [Cena ?] is then saying I don't get it, I'm dumb, it's hard, I don't like math. So here is another recommendation, and this is something that, that we're working on in our district, and that is that when you get to a place where you decide that, that you have students who are in need of a more focused and long term and intensive intervention as in tier two or tier three for mathematics it is best to focus that intervention in these areas at these grade levels.

01:32:17

Ms. Stofko: And that is because the research is telling us that if we do that it carries over to their areas of mathematics like measurement, geometry etc. That, that there are a lot of areas of mathematics that you can work on, but if you work on in your tier two time with students areas that develop conceptual understanding, procedural fluency and problem solving in these areas then you will move the kids along faster than if you're all over the place and one day you're doing something in geometry, and the next day you're working on something in statistics. This is focused intervention.

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01:33:00

Ms. Stofko: And this is a piece that I think is real important, and many of you are, are thinking yep that's, that's where we're having some problems. Word problems, this, the recommendations coming from, from this group are saying that if we develop underlying or help students to have instruction that we're solving word problems that's based on the common underlying themes or structures that that's what kids need. And what that means is focusing on word problems in a way that makes sense, in a way that makes sense. So here is an example of a structure. So this structure is we call bar model, it actually comes to us from Singapore, it's sometimes referred to as a strip model. And it's used to represent, to help students represent part, part, whole in word problems and identify what the parts are.

01:34:03

Ms. Stofko: In other words extract important information that they need to make sense of the problem. So here is a problem, and so if you would think to yourself what information in that problem is represented in either parts, or part, or whole? ...And so in this situation we know a part, we have four non-fiction books. We know another part, we have three non-fiction books. What's missing is the total. So what students can see when they use a model like this is oh I need to combine those two things in order to get the total. Here is another example.

01:35:00

Ms. Stofko: Think to yourself, what do we know and what do we need to find out? Here is what we know. We know there were 686 biscuits. Here is a part we know, and what do we need to find out? The other part, now some of you are thinking one thing and some of you are thinking another thing. So some of you are thinking, oh that's a subtraction problem, and some of you are thinking, oh that's a missing add-in problem. Because if I use my other example back here I added these two to get this. So in this example why couldn't I add these two pieces or set it up as an addition equation to get that?

01:36:05

Ms. Stofko: So I would have I don't know this, question mark plus this is going to give me this. And students can think about how to solve an addition problem sometimes easier than they can solve a subtraction problem. They might be thinking about this the difference between this and this, in which case they might be thinking in terms of subtraction. But it values or lets the kids take the information in the problem, set up the problem or at least make sense of it before they determine what operation they're going to use to solve it. And this case either addition or subtraction would work to solve that problem, there is no one right way. So here is another example, and what I'm going to ask you to think about in this problem is what makes this problem unique or different than the other ones I just shared with you?

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01:37:00

Ms. Stofko: ...It's a four letter word. Times two, multi-step problems so a model like this can also be used to support students who are challenged by problems that have more than one step in order to solve them. So I'm gonna let you think for a minute before I show you how I thought about it. How could you set that up with a bar model, you might even use your paper and pencil, scratch paper you have there and sketch out an example of how you're thinking about that, what it might look like, or just get it in your mind's eye. What do you think a bar model would look like to represent that?

01:38:00

Ms. Stofko: Think about what I just showed you on the other slide.... You ready for the unveiling? Have an idea of what you think it might be? Okay, so what do I know? I know the total, I know one part, and I also know that the part that I don't know has to be divided up into how many pieces? Six pieces, now students will do a model like this in different ways, so this is again one way to model that. but it should give you a really good idea that if kids can lay out in a diagram like this the important parts of a problem they can make sense of the problem then come up with an equation that they can use to solve that problem.

01:39:09

Ms. Stofko: All of this sense making needs to occur before they jump to what operation am I going to use to solve the problem? Sort of like comprehension is to reading, they need to comprehend and understand the problem before they tackle the arithmetic to get there. So why use structures like this? Here are some, just a few good reasons.... One of them I hope is striking a nerve. So key words, sometimes teachers will think students need help solving word problems.

01:40:00

Ms. Stofko: One way to get there is if they learn all the key words that would lead them towards a solution or lead them to an operation then they'll have success with word problem. So here is an example if you're not familiar with what I mean by key words, how many all together? All together means what? If that strategy is taught, it means to add. How many in all? It could also mean to multiply in both cases. How many are left? How many more? Okay, so what happens is that students when they're taught strategies like this they are then learning a hunt and peck method for solving word problem sand they are not making sense of the problem at all. They're looking at the problem, they're extracting the numbers, they're looking for a keyword and then they put those numbers together in any which way that they think is gonna get an answer.

01:41:02

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Ms. Stofko: And if it's a multiple-choice test the answer is one of those answer choices because the distractors are going to be one of those that would use a keyword incorrectly. So our current SOL test if you've looked at released items, even the old released items but even more so with the new ones, you will see very few examples in word problems where they have key words in them, like in all, all together, how many more those kinds of things. Cause the state has figured out that some teachers are teaching these keywords and kids are not making sense of word problems. So the word problems are developed without the use of keywords. As important as that is in these multi-step problems using keywords will usually fall apart. Because the keyword is going to be somewhere in the problem and the students see a word, and they think it means to subtract.

01:42:05

Ms. Stofko: When in reality they're adding, like so and so, Joey has five marbles, Carol has four more marbles, how many marbles are there? And they see the word more and they subtract. So I'm going to show you another video, the video is Marissa. Marissa is in middle school while the video is cueing up read this problem and think about it....

01:43:00

Ms. Stofko: Yes. Thank you.

[Video - See Ms. Stofko's PowerPoint presentation]

01:44:00

Ms. Stofko: ...Okay so in case you didn't, didn't take me at my word that this an issue that we need to, lets see a strong word, erase from our instruction in terms of intervention that will support students in their work with word problems, single step or multi step, the important thing is focusing on understanding what the problem is about and setting it up. Modeling the problem, not hunting and pecking words and putting numbers together. The sad thing is it never occurred to her that 300 and some buses, there is no common sense there. But that's where this child is right now, and she's in middle school and that's sad.

01:45:00

Ms. Stofko: So I was in a classroom yesterday, this little slide got added at 6:15 this morning, aren't you impressed? It was added because it helps me to make the case that if we want students to be better at word problems then we need to be sure that they're doing problems. So in our district we are encouraging teachers to, to do a lot of problem solving with their students, maybe more so than ever before in light of the, the what we see in the SOLs and what students need. And this is one student example I saw hanging on a chart in a classroom that I thought was really great. This is first grade,

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because it had the child explain the problem, draw a picture of it, write an equation for it, and then not just one way to solve the problem but more than one way to solve the problem or think about the problem. That's a great model.

01:46:00

Ms. Stofko: That's first grade but that could just as easily bump those numbers up, change them up, make them different and that's fifth, that eighth, that's anything. Okay, visual representations are also recommended for tier two. Frankly everything that I've talked about in the last few minutes, the whole time is tier one and tier two, tier one, tier two and tier three. But these recommendations are specific to tier two in supporting struggling learners, and so I guess you can just say do these things more. So visual representations what does that look like in math? It's gonna look like this, it's gonna look like models, pictures, manipulatives. Models that maybe not all of us understand but we need to grow to understand them because they will support students' understanding of math. And models like the one I was just circling, the area model for multiplication connect so beautifully to other topics that students are going to be doing when they progress to the secondary grades in Algebra one.

01:47:09

Ms. Stofko: So it's an example of the work they could do in arithmetic in the elementary grades they can connect to when they're working in algebra. Same model, visual representations for fractions means a lot of different ways to represent with measurement models, set models, region models, hands on, minds on as Michael was saying and more than one way to represent these concepts. It's an example I'm gonna give is really interesting to me, we have two items on an end of unit test that we are giving, that teachers are giving to students. And two of the questions are exactly the same type of question, and it's leading to a similar solution path.

01:48:05

Ms. Stofko: But one of the questions has students working with cookies and brownies and the next question has them working with ribbon. And the questions and the concerns I'm getting from teachers about the test items are the second one. And the teachers are not even seeing the connection between these two problems, same problem, same idea but one is a measurement model and the other one is a region model. So maybe the experiences need to be more varied. Okay, here is another example, visual representations. And so here are some materials we're currently using, and I'm gonna show you kind of a plethora of stuff. So whoops sorry, so a couple of years ago we had a lot of teachers who were telling us that we had students who were struggling with fact fluency.

01:49:05

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Ms. Stofko: And so we did a lot of research on our end to try to select some resources that we could recommend to teachers who were challenged by this, and I don't, I guess I don't really want to be like a sales promoter, but I'm just gonna share with you where we landed on a couple of things. This particular product is one that we recommended, it's called Origo Box of Facts and it has an accompanying book called Book of Facts. And the reason that these materials became one we recommended is because of a connection that you just saw. It's this one. So these are an example, it's hard for you probably in the back to see of the cards that we are using in this, in these materials. This is in the multiplication and division set, so in this example okay I'm going oh I don't have to talk loud.

01:50:04

Ms. Stofko: So you have this array that represents a two by ten, no two by ten, and if I do that what do I now have? So it's, it's, it's a way to use a visual representation to help students to see the connection between thinking about the nines times tables connecting to something they probably already know which is their tens. And thinking about what it means if they go to something they know, so using facts they know to help them with something they don't know. So there is different sets of cards that go with that that support different strategies. This one was close to ten, or getting, numbers close to ten.

01:51:00

Ms. Stofko: But there are others, this one is doubling and there are more. So if you're interested you can come up and look, and so what we did is we offered a lot of professional development to support this. And it wasn't just about using these materials, it was more about understanding basic computation and fact fluency in general, and developing an understanding of those concepts. Then later recently our most recent adventure into the work we're trying to do to support this is at the K-2 level we are now using materials called Assessing Math Concepts, these materials have a screening component. And then the nice this is, so it's an assessment, there are nine of them. It's used at K, one and two, that once the assessment is given then it points the teachers to lessons that support where students are having difficulty.

01:52:00

Ms. Stofko: So here is a, I'm gonna flip through some of these. So this is a report that comes out of that, and it, this helps the teacher because it shows kind of like a group of students that are having trouble in a particular area. And then once you have that identified then you can, it links to books called Developing Number Concepts. The materials are developed by Kathy Richardson who has been at this work with Marilyn Burns, well two separate people but doing similar work, Kathy Richardson at the K-2 level. And so these are materials that are phenomenal and support the work we're trying

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to encourage teachers to do in the classroom in tier two. But it sets them up with some good lessons to work with students in identified areas on that assessment. Okay so I have some testimonials, this is first grade teacher.

01:53:00

Ms. Stofko: This is actually at the same school from the place that I showed you the word problem example. This one is a little bit longer, in summary it says she loves it. So at three-five the program that we're using is, or encouraging use of because remember I said we're a site-based managed school system is a program called Math Navigator. This is a modular based type thing, so it's, you, you would also give a screener to students. It helps you identify areas of weakness, and then points you into particular modules. These materials are developed by America's Choice, which is a research lab, Phil Daro was head of all of this. And if you are familiar with Phil Daro or not he is instrumental in the work that was done for the common core state standards in math. So he is very well known and respected in these circles, so these materials are conceptually based and they help repair students' misconceptions that they come with.

01:54:05

Ms. Stofko: Like for example [Cena ?] and her misconception that she now has about place value. So I have been collecting some data on this because in our division it may be the same as yours but I can give our people in our division all the research in the world from other divisions and they'll say, well that's all well and good. Who has used it in Prince William? So I began keeping some data, and basically what this, what this does is for students it's a, I didn't say all this but I'll do it now. It's a 20 day thing, 20 day program and the first day is a pre-test, the last day is a post-test and the, the students, the software that keeps up with this matches kids by the kids who took the pre-test and the ones who took the post-test.

01:55:01

Ms. Stofko: So we can measure growth from the beginning to the end of the modules that the kids participated in and look at only the students that were there from the beginning to the end. So these are totals of kids that were there beginning and end in particular areas. Notice the focus areas that you see here, they're going to be in the areas that the research is telling us. Number sense and computation with whole numbers and fractions, so here are three schools. These three schools are three title one schools. They are one on each end of the county, as I said we're a huge county. So these are three title one schools on three different ends of the county of, of teaches that were using these materials. So it kind of gives you the perspective from a, a disadvantaged population stand point. Time? Do we have it? Okay.

01:56:00

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Ms. Stofko: Okay so if you are interested in this, this is where you can go to download this presentation. You have a hard copy of it, but if you're interested in the actual PowerPoint and the links that take you to those two videos that we saw today, then go to that link and download it. And then if you want to link to those videos then you have to have it open in slideshow video, and the links are available on the slides. This is me, email me if you have any questions and this is our math website. Any resources that we have available are yours. We're more than happy to share, so anyway thank you for letting me speak with you today and have a great afternoon.... We're using it under--