

Count Me In! Supporting Students in Your Class with Math Difficulty

[Slide One – Count Me In!! Supporting Students in Your Class with Math Difficulty]: Teri Marx: Hi everyone, welcome to Count me In, Supporting Students in your Class with Math Difficulty. My name is Teri Marx with the National Center on Intensive Intervention. I am a Senior Researcher here at the American Institutes for Research and I work alongside the Center and many of our consultants on professional learning related to intensive intervention. Today's webinar is going to focus specifically on math concepts.

And we are excited that Doctor Sarah Powell who is an Associate Professor at the University of Texas at Austin is here with us to share about a new online; online set of course content that we have available and that is definitely applicable no matter what your role is in the field.

[Slide 2 – Webinar Format & Questions]: So, just a couple of housekeeping items before we get started. We do encourage questions throughout the presentation. So, if you can look off to your right side or where ever your kind of tool bar is, you'll see a part that says questions. If you submit a question there, we will be able to see that question. I will be talking throughout the presentation and asking some probing questions for Sarah.

And some of those questions will be questions that were submitted prior to this webinar from folks that had questions as well as any new questions that you submit during the actual webinar. We will be leaving time at the end for Q&A but, we do encourage you to ask questions throughout just in the event that we start to run short.

[Slide 3 – Today's Overview]: So, just a quick overview for today's webinar. We are going to be providing an overview of the mathematics course content. And that will include an in-depth description of the content in each of the modules so that you understand exactly the concepts that are being covered. We will also review other resources that are available. And then as mentioned, we will spend some time on questions and answers. So, please make sure that you are sending those in.

[Slide 4 – National Center on Intensive Intervention – Intensive Intervention in Mathematics Course Content]: And this is where you'll be able to find the content. So, the URL is at the top of the page. We've also included that in the chat box for you all. So, if you want to go ahead and link to the material you can do so there.

The website looks like that. It just shows kind of an introductory text around what you'll kind of be able to see in that content. And then down below, there are interactive blocks that link directly to the modules that Doctor Sarah Powell is going to be talking us through today. So, I think.

[Slide 5 – Overview of Course]: With that being said, I am going to now turn over this portion of the Webinar to Dr. Sarah Powell to provide an overview of the course. You'll be hearing me

throughout as I ask specific questions coming through and or that were submitted prior to the start of this Webinar. So, Sarah I'll go ahead and turn it over.

Sarah Powell: Alright, thank you so much Teri. Hello to all.

[Slide 6 – Modules]: We are super excited for you to join us this afternoon. For those of you who have started school, I hope it's going well so far. And for those of you who get to start next week, best of luck to the beginning of your school year. And hopefully all of the information that we're going to talk about today is going to be really helpful to you as you plan your instruction this year for students with math learning difficulties.

So, over the past two years I have worked with the National Center for Intensive Intervention and the University of Connecticut to develop a series of eight math modules related to intensive intervention in the area of mathematics. And so, each of these modules is listed here and the webinar today is going to talk through what you can learn from the modules and what you can use from these modules to inform your intensive intervention for students that struggle in different areas of math.

So, as part of this; what we call the Math Course. There are eight modules. And so, the eight modules are listed here. And I'll go ahead and provide a brief overview of these right now. And then I will get into some better detail with these as we go through this webinar. So, the first module is really an introduction to intensive intervention in the area of math. And thinking about how do you think about the good and important math content that we need to include in math intensive intervention?

Module Two is an assessment module. So, thinking about screening with an intensive intervention as well as progress monitoring and diagnostics. Modules Three, Four and Five deal with the choosing of the interventions that you are going to use with your students in intensive intervention. And then Four and Five specifically think about well, how you're going to deliver that instruction and what are some of the strategies that should be embedded within that instruction.

And then Modules Six and Seven are really about content knowledge for you the teacher. So, it's to better your background knowledge related to whole number content or rational number content. And then Module Eight is putting all of this together. So, in Module Eight we focus on fidelity of implementation as well as adaptations to an intensive intervention and how all of these fit together so that you can provide a really strong intensive intervention package for students that need it.

[Slide 7 – Within Each Module]: So, within each of these modules we have developed really five main parts that are all guided by video. And that's one of the really neat things about this course. It's that we have recorded all of the content for you. I have done most of the recordings so, you'll have to see my face a lot. But we've put this on our; on the NCII website and linked it to YouTube so that you can watch this instruction you know before you teach something the next day or over the weekend as you are prepping your intensive intervention for different students.

So, within each module you will see a video introduction and then there will be three parts to each module. And each of those three parts include different content that's important for that

module. And I'm going to talk through all of the different parts in all of modules on the subsequent slides. And then, there's also a closing video to kind of say here's what we learned and here's how this is going to be applied in your classroom as you work with students.

And then also at the end of each module you're going to see a coaching guide. So, that would be good for you as a teacher if you want to reflect on what you are doing in the classroom with your students. Or that would also be good for math specialists or other district personnel who are acting as Coaches of teachers who are implementing intensive interventions.

[Slide 8 – Using Each Module ...]: So, what I kind of thought what it would be helpful to do is to kind of show you how all of this is set up. So, for example as you access each module and you will find each part within a module. So, this is from I think Module One. It's Part Three of Module One. You can see right away that there is a video.

So, this video you can just play it and it's going to introduce you to all of the content that's important for Part Three of Module One. But then as you work through the video there might be different activities that we ask you to pause and do. And so, all of these activities are listed down here; you can see along the bottom of this page. So, for example here in Part Three of this module has activities five and six. So, these are the word versions of these activities and sometimes it might be a PDF.

But you could you know download them to your computer and do them on your computer or print them off and do those activities on your own. The idea here is that as you work through the module that you are not just watching a video. But that you are actually an active participant and learning alongside the video series. And then one of the other things that we've done with all of these modules is that many times we have related videos.

And you might be really interested in showing this to some other teachers. You might be interested in watching them again. So, we have pulled out all of the video examples in which we have tutors working with students so that you can easily find those. So, down here at the very bottom of the page you can see that there is a video example where a tutor is working on adding fractions with unlike denominators. So, if you really want to kind of dig deep into that specific video, we have taken it out and put it on the slides so that it's easier for you to find. On that slide, it's the webpage so, it's easy for you to find.

[Slide 9 – Module 1: Developing a Scope and Sequence]: So, now I would like to talk about the content of each of the eight modules. So, we will start with Module One.

Teri Marx: Sarah

Sarah Powell: The title of Module One is Developing. Yes Teri?

Teri Marx: Can I pause you for just one second?

Sarah Powell: Yeah

Teri Marx: Because we did have a question that came in beforehand.

Sarah Powell: Okay

Teri Marx: And I think this would kind of be a good place to take that. The question was how do you support students who are significantly below grade level? So, if we're thinking about this content in intensive mathematics intervention; do you feel as though the content that's in this course and in the modules is relevant for students who are below grade level?

Sarah Powell: I do Teri. And in fact, when we developed this course, we thought a lot about this very question. Of you know, what do we do with students that might be in seventh grade but are performing at a second or third grade? And that's where intensive intervention comes into play. Intensive intervention would be important for a seventh grader who is struggling a little bit, but it also is essential for a student who is struggling a lot.

And this module that we're about to talk about is a really important one because the; and this is why we talk about it first. Before I ever start teaching a student that has math difficulty, I need to figure out what the content is that we should be teaching. And a lot of times teachers just teach like well this is what my curriculum says that I need to teach. But if we're doing intensive intervention with a student then we need to pick out a part. And we need to figure out where does the student have strengths and weaknesses and develop an individualized scope and sequence for those students.

So, in that way if you do have a student that's performing significantly below grade level we can go back and say alright, we need to pick up some of this second-grade material and some of this fourth-grade material. And we're going to individualize that scope and sequence. So, that when we start teaching; so, that's going to be the next thing that we think about. That content is applicable to that student.

Teri Marx: Alright, that's helpful.

Sarah Powell: So, I'll go ahead and talk through the Module One here. So, Module One is about developing a scope and sequence. As you look at the NCII website for each of these modules you will always have this brief paragraph that is like okay, here's what this module is about. And then there will always be three bullet points. And each of those bullet points address each of the parts of the module.

So, like I said before there are three parts to every module. So, for Module One the first part is about the necessity for providing intensive intervention. The second part is what are the foundational math skills necessary for math competence. And then the third part of this module would be sequencing math content for students in intensive intervention.

[Slide 10 – Module 1: Developing a Scope and Sequence]: So, in the introduction for Module One; that's me if you don't know what I look like. And I know that all of these screen shots make me look super goofy but I'm okay with that because this is important math work that teachers need to address. But this is a brief video. Usually these are only three to five minutes. Where they will just provide an overview of what's in this module. So, I would suggest watching that to get an idea of what is the content in Module One that might be applicable to me.

[Slide 11 – Module 1: Developing a Scope and Sequence]: In part one of Module One, we talk about the need for intensive intervention. And in this part, we introduce the NCII DBI Framework. That's sort of the data-based individualization framework. And that's introduced in this video. And if you can go to the next slide, I'll talk a little bit about the framework.

[Slide 12 – Module 1: Developing a Scope and Sequence]: So, hopefully most of you have seen this framework presented before. So, this is about intensive intervention. For any strong intensive intervention program whether we're thinking about math or thinking about reading or behavior, we want to have a validated intervention program in place. And so, in these parts of different modules I'm going to highlight what does a really strong validated intervention program look like. And then but we could never do an intervention without progress monitoring. That's the first green oval that you see here on this slide.

And then if students are responsive then we're going to keep doing this intervention program with the progress monitoring. But when students are not responsive then we want to conduct a diagnostic, adapt the intervention and continue to progress monitor. And so, on the videos that you see associated with this math course you are likely to see this picture of the intensive intervention framework probably at least one hundred times throughout the eight different modules. So, we used this framework to basically frame all of the work that we present in Module One and all subsequent modules.

[Slide 13 – Module 1: Developing a Scope and Sequence]: So, in Module One, part two we talk about well what math content is important for students to learn and to master. And this gets to your question Teri about students who are significantly below grade level. So, here I present some ideas about looking at what we call the pathways of standards or maybe the continuum of math learning. So, what is the continuum of math learning for students related to fact fluency? What is the continuum of math learning for students related to place value? What is the continuum of learning related to geometry?

So, we look at those individually and then we talk about well how do we put these different standards along one continuum of math learning to really engulf the math content that students need to work on within their intensive intervention? So, the video gives a lot of good examples of those continuums of math learning. And then there's some different activities where you the teacher can practice putting operation standards in order or problem-solving standards in order. And then once you do that, how does that help you identify skill gaps that a student really needs to focus on within an intensive intervention.

[Slide 14 – Module 1: Developing a Scope and Sequence]: In part three is then well what content is absolutely essential? So, we kind of expand upon part two of Module One here with part three. And we start to talk about bringing in some of the assessment data to really say okay, this student really needs to work on problem solving. This student really needs focus on pre-algebraic readiness. And this student needs to focus on initial fraction understanding.

So, the activities are really helping you seeing through if you have a student or students that really require intensive math intervention. What are some of the ways that you can think through designing that student's instruction?

[Slide 15 – Module 1: Developing a Scope and Sequence]: So, then at the end of module one. As I said, we have these with all of the modules. But you will find a coaching and facilitator guide. This is most helpful to people who are going to be doing coaching in schools. But I think anyone implementing intensive intervention might like to at least look through the coaching guide to see what is expected of teachers for full implementation of intensive intervention in module one.

[Slide 16 – Module 2: Mathematics Progress Monitoring]: So, now we move to Module Two. And I know that with some of the questions that came in before this webinar started. Some people were asking about diagnostics and progress monitoring measures. And so, this is going to be the module that you want to dig deep into.

So, when I think about Module Two, I think of it as the assessment module which is why I wrote that on this slide here. But all of your assessment practices that need to be in place as we are implementing an intensive intervention.

[Slide 17 – Module 2: Mathematics Progress Monitoring]: So, part one of Module Two is talking about what are the different types of assessments. So, we focus on three different types of assessments within intensive intervention. We focus on diagnostic assessments and the role of those. We focus on formative assessments and we focus on those quite a bit. And then we also mention summative assessments because many students are working towards completing a summative assessment at the end of their school year. So, this is really just an overview of the different types of assessments that you might have to use within an intensive intervention for data-based individualization.

[Slide 18 – Module 2: Mathematics Progress Monitoring]: Part Two of this is really digging deep into progress monitoring measures. Diagnostic assessments are important to use to really understand the strengths and weakness profile of students. But if we want to know if students are responsive to an intensive intervention it is essential that we use progress monitoring measures. So, this entire part of this module; so, part two of module two is about progress monitoring.

We focus on early numeracy progress monitoring measures. We focus on computation progress monitoring measures. And we focus on application progress monitoring measures. Those are the pretty common measures that we see across K-8. Also, within this module we mention some of the other progress monitoring measures that are available out there.

There are some that are available in geometry and measurements. There are some related to Algebra. But we really focus on the ones that we see schools; teachers focus on the most on in schools. And one really nice activity that ties in well with the National Center for Intensive Intervention is activity number seven. So, it's how to navigate the NCII tools chart to figure out which progress monitoring measures we should be using in the area of math.

[Slide 19 – Module 2: Mathematics Progress Monitoring]: Then Module Two also has these really cool videos. So, most of these are for the early numeracy measures. But perhaps you've never seen an early numeracy measure administered. So, we actually made a video of a tutor

administering in each of these different videos to a student. And then let's say that you want to practice giving one of these measures and scoring it before you do this with your own students.

So, on the bottom three here you will see that we have videos of a student taking the number identification measure. And then that goes with the different activities where you have the score sheet in front of you. And then you can actually score it alongside the video. So, this is really nice to give you the teacher practice with the administration and scoring of these measures before doing it in front of your actual student.

[Slide 20 – Module 2: Mathematics Progress Monitoring]: And then part three of Module Two it's well how do you; well what do we do with these scores right. So, I collected all of this data and then you're probably like okay well what do I do next? So, here we focus on how to set goals for students. And then how to recognize whether students are on track or off track to meet those goals.

A lot of this comes from some of the other work that the National Center for Intensive Intervention has done. In terms of looking at benchmarks or looking at slopes or looking at an intra-individual framework for understanding how to set goals and to monitor those goals. And there are some really nice activities here where you can connect data for some of the students that we present you with to see how that can inform instructional decision making.

But then also, let's look at your student's data. And then how are you going to design an intervention platform that's reflective for that student? So, really trying to give you some activities as the teacher. That are going to help you to really focus on the students that need the most intensive intervention and how can you use your data to guide the decisions that you make with an intensive intervention.

[Slide 21 – Module 3: Selecting and Evaluating Evidence-Based Practices]: So, that's module two. Remember that's the assessment module. Are there any questions?

Teri Marx: Yeah

Sarah Powell: Or any other things that we need to talk about in terms of assessment?

Teri Marx: There is; there was one question that was submitted in advance. And I know that you just talked about both progress monitoring and using those data to help inform instructional decisions.

Sarah Powell: Yeah

Teri Marx: But do you have any tips for the actual analysis of those data? Are there strategies that you would suggest as folks progress monitor their students? How will they know where to target intervention?

Sarah Powell: Yeah so, that's it; that's an excellent question. So, there is a resource and I'm going to hope that the amazing NCII team places this up there. The NCII has developed its own data platform. Which is housed within an Excel spreadsheet which was developed by Dr. Devin

Kearns at the University of Connecticut. He developed it in the area of reading but, it works just as well in the area of math.

But you can actual enter student's scores into this Excel spreadsheet and then it graphs those scores. So that you can; and it gives you an idea of whether students are on track to meet benchmark goals or slope goals. And so, that's a really nice resource that's already available and I think Amy just put it up there on the chat box. So, thank you Amy.

So, that's a good place to start. Also, any good progress monitoring measure should have benchmarks or a typical rate of growth. What we would call the slope data associated with it. So, if you are looking at progress monitoring measures from different companies. They should be like well what is the typical expectation for a fourth grader taking a computation measure? Or what is the typical rate of growth that we should see from week to week for a seventh grader using an applications measure?

And so, that data should really help you say like okay, I expect that the student is growing you know one digit per week. But, let's say that your student is not making that kind of growth. So, then that helps with your decision-making process.

Teri Marx: Great

Sarah Powell: Are there any other questions about assessment?

Teri Marx: Not about assessment. But I'm wondering. I'm going to go ahead and just share with you one of the questions that came in. And not that you have to provide an answer right now.

Sarah Powell: Okay

Teri Marx: But maybe as you're going through you next sections to be thinking about.

Sarah Powell: Okay

Teri Marx: So, the question that came is was how interventions can be provided in Tier One as well as anything that we should be doing in Tier Two and Tier Three? So, I know that you're moving into kind of some of the evidence-based practice portion.

Sarah Powell: Yeah

Teri Marx: So, I wasn't sure.

Sarah Powell: I am

Teri Marx: If you could maybe highlight where you think some of the connections could be made to core instruction?

Sarah Powell: Um hum

Teri Marx: As well as where we think things might come to rest within Tier Two and Tier Three?

Sarah Powell: Well Teri, we are heading into the territory that's going to be really important for the person that's asked this question. So, in Modules Three, Four and Five we're going to talk a lot about how to deliver instruction and what that instruction should look like. And especially in Modules Four and Five. We are going to talk about how to use explicit instruction. How to use you know schema-based word problem instruction.

And those are things that aren't just really good Tier Two and Tier Three intensive intervention practices. Those are things that also have strong research base in the Tier One classroom. And so, while we designed this math course here to be focused on those students that are experiencing difficulty with math and not meeting their grade level benchmarks in math. Almost all of these practices; these aren't exclusive to special education or intensive intervention.

These are practices that are good math practices. So, I hope that that will help the person that asked that question. Or at least get them started there and then I'm always happy to follow up to provide more detail about what we would like to see in Tier One.

[Slide 22 – Module 3: Selecting and Evaluating Evidence-Based Practices]: Alright so, module three now we shift from; module one kind of set us up. Module Two starts to talk about the assessments that are necessary to use within intensive intervention. And then Module Three gets us to thinking about well okay, how am I going to teach these things? So, we've got this scope and sequence established and we've got the assessments in place.

So, Module Three is really about this whole idea of evidence-based practices. Which we all know that term and we've heard it pretty regularly. But, what does that mean? And so, we talk about well there's different forms of evidence-based practices. And so, we really focus on evidence-based intervention and what's the difference between an evidence-based intervention and an evidence-based strategy.

So, we talk about these different forms of evidence and why they're both important. It's important to pull them both in; evidence-based intervention and evidence-based strategies to inform your instructional platform within intensive intervention.

[Slide 23 – Module 3: Selecting and Evaluating Evidence-Based Practices]: So then, part two of this module then says okay well we need to use these evidence-based practices so where do we find them? This brings us back to the NCII website and the tools chart. This time the academic tools chart instead of the progress monitoring tools chart. And I kind of overview you know what should we be looking for?

And so, actually this slide has; behind my body there just on the slide. We need assessment data that shows results. We need to make sure that these things have been replicated. And we need to make sure that the data have occurred in studies and with students who are similar to you own. So, really being like a thoughtful consumer of these evidence-based practices when we want to start to build the instructional platform.

[Slide 24 – Module 3: Selecting and Evaluating Evidence-Based Practices]: And then part three is well then how do we make an instructional platform? So, this is really the jumping off point of implementing an intensive intervention. And so, we take these ideas about evidence-based interventions and evidence-based strategies and we think about the content that needs to be taught. And then how we're going to progress monitor that content.

And then this is going to be put together. It's going to be at the very top of that NCII's the DBI framework; that which we call the instructional platform. And this is going to like put all of that together. So, activity number six here is an excellent activity to do at the teacher level. So, you've got a student and here's what their data says where they need work. You have figured out the content that you need to teach.

And so now, how are you going to pull together a collection of interventions or strategies to then teach that content to that student? So, all of the stuff that we have accrued. All of the knowledge accrued across Modules One, Two and Three lead us here to the instructional platform and the development of that instructional platform.

[Slide 25 – Module 4: Instructional Delivery]: So, then as we head into Modules Four and Five, we've got that instructional platform. And so, then Module Four is about how you deliver the platform. And Module Five is strategies that should be embedded within that instructional platform. And so, this is; I think Modules Four and Five even though they're separate they kind of co-occur. If you're working through module four, I would hope that you are also working through Module Five as well. And they as I say at the bottom of the slide, they provide this really nice overview of what should be in a strong instructional platform.

[Slide 26 – Module 4: Instructional Delivery]: So, part one of Module Four; this is all about delivery of instruction. And when we think about intensive intervention we can't think about intensive intervention without explicit instruction. And so, this part is how do you use explicit instruction in the area of math with an intensive intervention. And so, this is I would say really essential information that every teacher needs to watch and work through. We use the same framework about explicit instruction as the explicit instruction course that's also available from NCII.

And as you see kind of on this video snapshot, my colleague at the University of Connecticut; Devin Kearns who is a really strong expert in the area of explicit instruction. He actually pops up and helps us with introducing this set of slides. So, if you're familiar with Devin's work you will see him on the slides along with me. And if you go to the next slide, I will show you.

[Slide 27 – Explicit Instruction]: This is not within the math course. But, the NCII also has an explicit instruction course and this is a screenshot from that. You can follow this web address or if you just Google NCII explicit instruction it's the first hit that comes up. But Devin and his colleagues have put together four modules that really dig deep into explicit instruction.

And some of these have math examples. Some of them have reading examples. Some of these are writing examples. But we take the framework presented by Devin and his colleagues in this explicit instruction course and then we apply it specifically to mathematics. So, part one of

Module Four is the explicit instruction module of how to do explicit instruction within math intervention.

Teri Marx: So, Sarah real quick...

Sarah Powell: Yeah

Teri Marx: We did have a question that came in that asks if there were pre-requisite skills that educators would need to effectively provide intervention?

Sarah Powell: Oh, no.

Teri Marx: So, do you think that this explicit instruction content is that pre-requisite?

Sarah Powell: Yes

Teri Marx: Okay

Sarah Powell: I would say that it's one of the pre-requisites. So, when teaching math, you have to balance two things. One is you have to balance your pedagogical knowledge. So, like how do you teach? And really if you are teaching any learner who is struggling with anything, we need to think about going to explicit instruction and making sure that that is amazing. Because the research base around explicit instruction; that's really like the strongest foundation of research that we have in anything related to Special Education.

So, I would say in terms of pre-requisite skills. Do you know what explicit instruction is? Do you know how to model? Do you know how to design effective practice opportunities? And then, do you know how to engage students with an explicit instruction that's all about asking good questions, providing strong feedback, being very planned and organized with your learning.

And what I just talked about there are what is in Modules Five, Six and Seven of the explicit instruction course. So, that would be a pretty important pre-requisite knowledge. And the same way, you can't be a good math teacher without understanding math content. So, being that really amazing math teacher is that pedagogical knowledge and understanding the math content.

And in our Math course, Modules Six and Seven are really designed for teachers to improve their knowledge related to whole numbers and rational numbers. So, I think it's a nice combination. But if we are thinking about pre-requisite skills, I would really suggest starting with the explicit instruction course. And then deep diving into the math course that NCII has given us. Next question?

[Slide 28 – Module 4: Instructional Delivery]: So, part; oh, this is in Module Four. This is part one. Remember how I said earlier that we've got lots of video examples of a tutor working with a student? Here's a set of seven different videos where you can see like well what does explicit instruction look like Sarah? If you're asking that question.

And a lot of our examples are from elementary grades and a lot of our examples are from middle school. So, you can actually see like using algebra tiles to solve an equation. So, we have kind

of a representative sample of what we would think would occur in terms of explicit instruction across grade K-8.

[Slide 29 – Module 4: Instructional Delivery]: So, part two of Module Four gets into this idea of using multiple representations. So, as we deliver instruction and we use our best explicit instruction we also need to bring in ways for students to see and interact with math in different ways. And that's where multiple representations come into play.

Multiple representations; a lot of you probably think about these as like the concrete representational abstract or the CRA. So, we talk about the need for concrete materials. The need for virtual manipulatives. The need for pictorial representation. So, that then students really understand what the abstract of mathematics means.

[Slide 30 – Module 4: Instructional Delivery]: And then, part of two here has some video examples. Here we can see using some different concrete manipulatives and pictorial representations as well as emphasizing the abstract. So, you can kind of see how all of those build to bring in a nice picture of multiple representations for a student.

[Slide 31 – Module 4: Instructional Delivery]: And then part three of Module Four is the focus on mathematical language. So, the mathematical language that we use for students is really essential. Because as I've read it before, in math every student is a language learner. Like we are all learning the language of math. And so, we have to provide explicit instruction about the vocabulary and the terms that we are using within intensive intervention.

Because students write in mathematics, they read in mathematics, they listen in mathematics and they speak in mathematics. And so, we have to pay attention to this language so that students can engage in math learning fully. I'm not calling exactly; calling my articles out exactly. But I worked with my colleague Elizabeth Hughes and Elizabeth Stevens and we wrote two articles that are both in Teaching Exceptional Children about how to pay better attention to your math language at the elementary level and at the middle school level.

And so, our activities that are presented here are activity eight and activity nine. They go along with those articles. So, I think those are a good read if you think you want to beef up the math language that you're providing to students. So, in module four it's all about.

Teri Marx: Sarah

Sarah Powell: I'm sorry, what is it?

Teri Marx: Sorry, I was going to say that there are two questions. Just kind of around this area.

Sarah Powell: Yeah

Teri Marx: So, one of the questions that we received in advance that I think kind of connects with some of what you were just talking about. But it's specifically around supporting students with math; supporting their math development for children with language disorders.

Sarah Powell: Yeah

Teri Marx: So, if we know that we're working with a student that already has a language disorder what recommendations would you have within mathematics instruction to support them?

Sarah Powell: Yeah so, kind of going back to what we just talked about. Explicit vocabulary instruction is really essential. In like first and second grade we see that students' kind of in the math world need to know between 100 and 200 different terms. By third grade that jumps up to over 300 and by middle school students are kind of responsible to know 400-500 terms and probably more in math.

And so, actually explicitly teaching the language that we are using. So, you know I might be pulling in some language arts strategies. I might be having different word walls or different math journals and vocabulary exercises. There's also a lot of technology that will help you practice math vocabulary but, being explicit with this idea that students are language learners in math.

And then beyond that, whenever you're doing anything math; we have a lot of students in many of our projects that have reading difficulty and writing difficulty. So, providing the same supports that you would in perhaps a reading class. You would also bring them into the math class. So, reading things aloud, reading things with the student. But making sure that the students have the opportunity to read in math, to write in math and then to speak in math.

So, they're speaking with you. They're using these formal terms. And if people are really interested in this, I have more resources that I can get into at another time. But, paying attention to it is the first thing that we need to think about. Was there another question Teri?

Teri Marx: No, I think we can move forward. There's one, that I think.

Sarah Powell: Okay

Teri Marx: I'm hoping that we can get through some of the other content in the modules.

[Slide 32 – Module 5: Instructional Delivery]: And then perhaps.

Sarah Powell: Yep

Teri Marx: Hold off on the question that came in.

Sarah Powell: Okay, perfect. So, module four is about how you deliver the instructional platform that you have developed.

[Slide 33 – Module 5: Instructional Strategies]: Module Five gets into three things that the research shows are important to embed within your intensive intervention. So, those three things are the following.

[Slide 34 – Module 5: Instructional Strategies]: In part one we talk about building fact fluency. So, I really have not met many students that struggle with math that don't also struggle with fact fluency. So, here we talk about strategies for building fact fluency. But that's

something that needs to occur every day within your intensive intervention session. So, we get into that in part one.

We talk about many different strategies that help build fact fluency. It doesn't have to just be a worksheet. But part one pays attention the necessity for a fact fluency building activity to be embedded within your intensive intervention.

[Slide 35 – Module 5: Instructional Strategies]: Part two is probably one of my favorite things to think about if you know me. It's about word problem instruction. Because we ask students to show their math competency through word problem solving. If you are not providing good problem-solving instruction every time you do intensive intervention you are doing your students a disservice.

Because, we can't just do problem solving activities on Friday. We can't just leave it for two weeks before any high stakes tests that students are going to take. And so again, it's something that needs to be embedded within your intensive intervention. And so, we focus on schema-based word problem solving as the research says that's the most effective approach.

This is a long module. I think it comes in at over an hour. But we go through all six schemas that we see across grades K-8. And we talk about these different schemas and there's these different activities where you can identify the different schemas and additive problems and multiplicative problems. But I think this is a very good overview of what does effective problem-solving strategies; what do those look like when they are presented with an intensive intervention.

And then Module Five; part three of this module because I just said that we had an hour-long video about word problem solving.

[Slide 36 – Module 5: Instructional Strategies]: Part three has a very brief video about motivational strategies. So, that's like the third strategy that should be embedded within any intensive intervention session. Something that motivates the student to participate in the lesson to be actively involved. And so, we talk about some different motivational components. This is pretty brief but also very important.

So, by the end of module five you have thought about the delivery of instruction and then three strategies that should be embedded within your daily teaching with intensive intervention. And those are building fluency, effective problem-solving instruction and a good motivational component.

[Slide 37 – Module 6: Whole-Number Content]: So, then as we head to module six. Modules Six and Seven are really to help increase teacher knowledge about whole-number content and rational number content. We realize that there is a lot more math content out there than just whole numbers and rational numbers. But those are essential. They are the foundation to everything that students will do later in mathematics.

So, we developed these two modules to really increase teacher knowledge around math content. So, I'll go through these rather quickly. So, Module Six focuses on whole numbers.

[Slide 38 – Module 6: Whole-Number Content]: Part one of Module Six really gets into the concept of addition, subtraction, multiplication and division. So, we talk about the different ways to think about adding. There're two concepts of subtraction. The same thing with multiplication and division. This is really nicely tied to the schema instruction in part two of Module Five. But really this is all about conceptual understanding of the four operations.

So, for you as a teacher if you're kind of like you know I'm not sure what she's talking about when she says there's two ways to think about subtracting. This would be a really important module for you to watch to increase your knowledge about whole number content.

[Slide 39 – Module 6: Whole-Number Content] So, part one of this module talks about concepts. Well then part two talks about procedures. So, here we get into some of the different algorithms that are out there to add, subtract, multiply and divide whole numbers. There's the use of alternate algorithms that might be important for you to pull in especially for students that have been practicing long division one way for four years and it hasn't clicked yet. Let's try another way. And so, this is getting into the procedures of whole numbers that are important to emphasize with students.

[Slide 40 – Module 6: Whole-Number Content]: So, then part three of Module Six is like well what does this look like? So, we actually have some examples where tutors are working with some students. The video examples as you can see are posted there at the bottom if you just want to watch those. But as you watch these, I actually go through and say look how this tutor did explicit instruction. Look how she modeled. Look at these multiple representations. Look at these counters that she's pulling in.

That's hitting the multiple representation piece. And then I also say like well look at the language that she's using here. There is how we're adhering to clear and concise math language.

[Slide 41 – Module 7: Rational-Number Content]: So, Module Seven is somewhat repetitive to module six. But instead of whole number content it's rational number content.

[Slide 42 – Module 7: Rational-Number Content]: So, part one of Module Seven is everything you ever wanted to know about the three model fractions. That's the length model, the area model and the set model or fractions. And then the concepts that should be emphasized so that students really understand what a fraction represents. Part two if we go to the next slide.

[Slide 43 – Module 7: Rational-Number Content]: The focuses on rational number procedures. So, this gets into the procedures for how we're going to add, subtract, multiply and divide fractions. We get into a lot of representational models about how to help students to understand what does it mean to multiply fractions and divide fractions? I think that that might be really helpful to a lot of teachers.

[Slide 44 – Module 7: Rational-Number Content]: Part three then puts this all together. So, what does this look like? So, here we can see a student and a tutor working together. On this slide, I'm actually making note of all of the vocabulary that they used during the sessions. So, how is that vocabulary use, how is it taught and how is it emphasized by the tutor?

[Slide 45 – Module 8: DBI for Intensive Mathematics Intervention]: So, then we come back to more of like the pedagogical skills with module eight. So, this is module that puts all of these things together. But there are a few things in module eight that are really essential for intensive intervention.

[Slide 46 – Module 8: DBI for Intensive Mathematics Intervention]: So, part one of Module Eight is well how do we do this with fidelity? So, if we choose an evidence-based intervention or an evidence-based strategy we need to make sure that we're doing that to the greatest extent that we can possibly do that. So, we look at different fidelity checklists. We look at that qualitative component related to fidelity. But this is really like well how implement this as it is meant to be implemented?

[Slide 47 – Module 8: DBI for Intensive Mathematics Intervention]: Then part two is a really important part of Module Eight and the intensive intervention process. And this is making adaptations within intensive interventions. So, we focus on six adaptations that are really essential to make and probably not all at one time. But these are important to make when students are not making adequate progress with your intensive intervention.

So, the adaptations that we talk about are implementing with greater fidelity, embedding behavioral supports and increasing the dosage. Those three are kind of like your initial set of adaptations. Those are usually pretty easy adaptations to put into place. The fourth adaptation has at least thirty for forty different working components but that's adapting math content.

So, how can you adapt math content to be much more responsive to a student's needs? The fifth adaptation that we talk about is how can we do better with our explicit instruction? And then the sixth adaptation that we talk about is how do we explicitly teach students to transfer math knowledge from one type of math content to another? So, those are the six adaptations that we break down in this video that you can see. And so, it really gives you a good idea of well so if this is not good enough what are some of the things that I can do to make it better so that my student does start to become responsive to the intensive intervention instead of showing no or stagnant growth?

[Slide 48 – Module 8: DBI for Intensive Mathematics Intervention]: And then finally part three of Module Eight is the last one. It really puts this all together. I kind of made a note over here that this might be one of the things to watch first. It really tries to review all of the eight modules and put it all together. And so, it's a pretty full overview but it really gets into the idea of what are you going to see across the eight modules and how does all of this stuff that we talked about; how does it fit within an intensive intervention framework in math for students that have learning difficulties?

[Slide 49 – Modules]: So, to finish up here. Those are our eight modules. Module One is scope and sequence. Module Two – assessment. Module Three is finding evidence-based practices. Modules Four and Five are delivery of those evidence-based practices. Modules Six and Seven are increasing your teacher knowledge. And then Module Eight puts it all together.

[Slide 50 – Other Resources]: So, there are a few other resources also available throughout the math course.

[Slide 51 – Course Overview]: So, let me show these to you and then we will answer some questions. So, there's a course overview that we have provided on the website. Here you can see that this is the course overview for parts one, two and three of module one. But if you're kind of looking for some like very specific stuff within a module you can read this overview to say like oh, there it is. I want to know what foundational math is important across grade levels. Then you can go to part two of module one and that information will be there for you to view.

[Slide 52 – Preparation Standards]: If you are interested in figuring out well how do we address the CEC standards within each of our modules. There is a spreadsheet for you that looks exactly like this. Where you can see how we think we addressed different standards in part one, part two and part three of each of the eight modules.

[Slide 53 – Readings]: We also have some suggested reading. So, I know that this is one of the questions. It's like well how can I learn more about this? And so, we put together some of our favorite very teacher friendly articles. So, most of these are in Teaching Exceptional Children and or they are practice articles in Learning, Disabilities, Research and Practice. But we have the links to all of these articles if you want to learn more about math language or more about intensive intervention or more about schema-based word problem instruction.

So, for every module I think we listed anywhere from four to six or seven different readings. They are not mandatory. But they might be really nice to increase your knowledge around these different topics.

[Slide 54 – Lessons and Videos]: And then finally, we have some example lessons along with a lot of different videos that show how to use manipulatives in these six areas that are placed here on this slide. So, if you want more information about place value or if you want more practice activities related to computation of fractions, the NCII has prepared these really nice teacher friendly booklets. And then there are videos that accompany almost all of the examples within these booklets. So, that you can use this to increase some of your intensive intervention practices with your students.

[Slide 55 – Project STAIR]: And then finally. This is a project that I am working on and this is an OSEP funded project. This is specifically for middle school. But a lot of these things apply for elementary students as well. This is our Project STAIR which is trying to get students to be ready for Algebra in eighth or ninth grade. We have made an entire set of middle school specific videos related to math practices.

Right now, we have about one hundred videos on our Project STAIR website. We have a YouTube channel that you can find or if you want, I can send you the link. Where if you want even a deeper dive into some of this math content specifically for middle school students. Our Project STAIR resources would be a good reach out at that point.

[Slide 56 – Questions]: So, finally we come to the time where we have questions. So, we've got ten minutes left and I'll go ahead and let Teri Marx ask the questions. And then we can discuss the responses to these questions.

Teri Marx: Absolutely. First of all, Sarah thank you so much. This is wonderful information. And we've already had some people kind of chiming in and saying that they feel that the resources are really great.

Sarah Powell: Good, that's great.

Teri Marx: Yeah, I mean, you did a lot of really great work and we are happy that you worked with the Center.

Sarah Powell: It was a while and so I'm glad that we can start to use this; that people can start to use the materials.

Teri Marx: Definitely. So, we did have one question that came in during the presentation that was around high school teachers and courses. So, are you; are there suggestions that you have either for students with intensive needs within the high school setting and or any additional things that; you know tips or things for high school teachers?

Sarah Powell: Um hum

Teri Marx: Maybe following this course content guidelines?

Sarah Powell: Yes

Teri Marx: Even though a lot of what we are discussing is at the elementary and middle school levels.

Sarah Powell: Yeah

Teri Marx: Are there any ideas for that?

Sarah Powell: Yeah, so, that's a really great question. You know one of the things when we developed this course, we somewhat had to focus on some specific grade bands. And so, we focused on grades K-8. That is not to mean that most if not all of the material that we talk about is not appropriate for high school students. For a lot; in my experience, there's not a huge difference from what a ninth grader with IEP goals in math needs versus a seventh grader with IEP goals in math.

And so, for high schoolers, really hitting that explicit instruction and really focusing on the multiple representations. We had an example I guess two years ago where a tenth grader was having some difficulty with some geometry related to interior and exterior angles. And we bought in geometry manipulatives where they were actually constructing their own shapes and measuring that with a protractor. And the kid said that they don't remember the last time that they touched something in math. And so, you know even though these are sixteen-year olds it doesn't mean that they don't need to be touching hand model manipulatives or virtual manipulatives to be able to understand what the math actually means.

So, bringing in those multiple representations. And then another thing with high school is, what is the language? How are you supporting students in terms of learning math vocabulary and

those different things related to language? When it gets to high school and word problem solving. Most of word problem solving is under algebra. So, really ensuring that students have a strong foundation in algebra is going to be really essential. And there are some algebra progress monitoring measurements available.

I know that Leanne Ketterlin Geller and her research team at SMU have some algebra progress monitoring measures. As do Anne Foegen and her research team at Iowa State. And so, even though we didn't include those like target; show specific examples of those in this math course. Those are available. And so, most of the frameworks that we're talking about here really apply to high school in the same way that it applies to elementary and middle school.

Teri Marx: Great, thank Sarah. And if there are any follow up questions feel free to ask. And we did have another question that came in. This is about what mathematics learning trajectories or learning progressions were used for the scope and sequence work?

Sarah Powell: Ah so, for the scope and sequence we relied on the; well we didn't rely on a single one. But we were able to use the common core state standards. So, you'll see on; within module one and some subsequent modules. You'll see the standards that are included in the Common Core. Just because we wanted to find really one set of standards that most states either know or adhere to.

Now with the scope and sequencing and this is the interesting part about this. It's that we say okay here is the common trajectory for students perhaps in the place value learning right. But then, we mix it all up because this is intensive intervention. And so, students may have a little bit of strengths in one of these areas and weaknesses in another. And so, actually within those videos you'll see how we place standards on top of each other because this fluency standard is related to place value and this place value standard is related to word problem solving.

But we really emphasize that for every student within intensive intervention that is a different scope and sequence. And so, while we might have some resources like those that are out there from like Achieve the Core that have these like nice little you know line up along the Math continuum of learning. For students that are in intensive intervention, we as teachers need to be very reflective and say okay, I don't need to focus as much on that. But I do need to focus a lot here, here and here.

And so, with that scope and sequence we use the Common Core state standards as kind of like okay, this is our starting point. But now, let's individualize it. And that's the whole thing that's different about intensive intervention in that you would; that is different than what you would see in a Tier One setting.

Teri Marx: Thanks. I'm going to ask one of the questions that came in in advance.

Sarah Powell: Okay

Teri Marx: And feel free for the folks that are still on. You can go ahead and ask any questions that you have. We have just a few minutes left to tap into Sarah's expertise. So, feel free to ask any questions. Sarah, you talked a little bit about progress monitoring, diagnostics and those types of assessments.

Sarah Powell: Yes

Teri Marx: Do you have any recommendations around screening tools?

Sarah Powell: Ah, well I will turn every person to the NCII website for screening tools. So, with screeners most schools typically have something in place. And you know we're seeing everything in schools from like usage of the MAP to using iReady to like all kinds of things. Some schools will actually use their progress monitoring measures. Some schools are using AIMSweb or DIBLES Math.

You can actually use like a small set of progress monitoring measures. Perhaps like the first three that you administer and those can also be used as a screener. So, I would say too that I don't want to; I guess say that one product is any better than the other. But you want a screening tool that's going to give you data across your school or your school district about how a single student is performing compared to students in that school or district and then students in a national sample.

So, that I can say this student is performing at the fourth percentile nationally. I should have a lot of concern about this student and they should be involved in intensive intervention. So, with any screener and any progress monitoring measure I always want to ask well what's the normative data that you have that I can use to then help make smart decisions about these students? And then with diagnostics, diagnostics are typically you know standardized assessments that we can use to understand how a student is performing in math.

And the three that we are using in our research projects right now and that doesn't mean that they are the best. But they give us really good information. We use the TEMA or the Test of Early Mathematics Ability in the very early grades. So, pre-school you know kindergarten and first grade. We use the Key Math Three which is; really could be used across grades K-12. So, we usually use that across grades you know 1-8 or 1-7.

And then in our Project STAIR that I told you briefly about we're using the DOMA which is the Diagnostic Online Math Assessment. Because that's transitioning to pre-algebraic and algebraic readiness. So, you know the Key Math has a little bit on algebra but really, we see algebra as like the most essential math skill for high schoolers to have proficiency with. So, we transitioned to that as a diagnostic and I think that it provides diagnostic information in either thirteen or fourteen areas of pre-algebraic readiness.

So, those are some of the ones that we'll use with some of our research projects. And then we also employ progress monitoring measures to ensure that students are making adequate progress.

Teri Marx: Great so, can you just clarify one more time? We have one more last-minute kind of question. What did you say the diagnostic was for K-8 that you were just talking about? Can you just say that again?

Sarah Powell: Well we use; the most often we use the Key Math Three. So, that's; it's a pretty popular one in schools. But it measures students math performance in ten different areas. So, it really gives you some nice, deep analytics about how does a student perform with addition and

subtraction and how is that different from geometry and how is that different from applied problem solving.

So, when you are trying to make those adaptations to intensive interventions within an intensive intervention framework it's really important that your diagnostic gives you really detailed information about student's strengths and weaknesses. And then that goes back to that thing that we were just talking about, the scope and sequence right. So, if I see that a student has weaker place value skills based on the diagnostic then I'm going to amp up the place value instruction that we provide within an intensive intervention.

Teri Marx: Great, wonderful. Thank you so much Sarah. We are right at four o'clock.

Sarah Powell: Your welcome. Great

Teri Marx: We want to be mindful of everybody's time and thank you so much for this content. And folks, please feel free to visit the website and pass this information along to your colleagues. We're excited that all of you were able to join us.

Sarah Powell: Yeah

Teri Marx: And we hope that you have great school year. Thank you so much.

Sarah Powell: Alright, thank you very much.

[End of Transcript]