Grades 2-5 Lesson 6 (22:43)

SPEAKER: Welcome to "An Introduction to Nemeth Code Symbols Used in Grades 2 to 5 and Strategies for Supporting Elementary Students in Building Math Skills. This is "Lesson 6: Building a Strong Educational Team."

Slide 2 has the objectives. You'll be able to describe the role of professionals who are supporting students in taking math classes. Describe the responsibilities of the teacher responsible for math education content. Identify ways that the student can complete their assignment for those who do not read braille, and explain how professionals can encourage students and sighted peers working together.

Slide 3 talks about the role of the teacher of students with visual impairment in supporting the student and the math teacher. Now, if we're at a specialized school or residential school, the math teacher may be the teacher of students with visual impairments as well. But if this child is not in a specialized school, most likely the math content will be taught by another professional.

So the first thing is that we want the teacher of students with visual impairment to evaluate the student's compensatory academic skills. What are their braille skills like? What are their listening skills like? What are their abacus skills like?

And based on gathering that assessment data, make recommendations to the math teacher on what are the appropriate teaching strategies for the student? Is this the type of student who needs to have the information broken down into small chunks? Is this the type of student who benefits from hands-on demonstration? So if the teacher is going to be modeling something, to potentially involve the student with a visual impairment.

And the teacher of students with visual impairment is also going to teach specialized computation methods for completing math. So this may be teaching the student abacus skills. This may be teaching the student how to use the braille writer within the math class, so for example, how do you use your braille writer to set up an array? Or how do you use your braille writer to make a simple bar graph?

And then also thinking about teaching the student to use tactile graphics efficiently to gather information. Tactile graphics as we know, represent visual information. So our students need to be very systematic in how they approach these. So if you're the teacher of students with visual impairment, are going to need to teach the systematic exploration skills.

Slide 4 talks about the role of the teacher of students with visual impairment and then math teacher, continued. So we've got some more considerations here. One other consideration related to tactile graphics is helping the student learn how to make tactile graphics. So if the students in the class are making a bar graph or a line graph, how is our student with a visual impairment going to do this?

Then of course, a big role of the teacher of students with visual impairment is to prepare the materials so the student can access the material at the same time as sighted peers. So if the

students are going to be taking a math quiz, having that material available in braille. If the students are going to be doing an activity around fractions, having manipulatives that the student can use for that fraction.

And the last point we have here is to provide hands-on manipulatives and equipment to facilitate access. So this means the teacher of students with visual impairment has to know what's coming up in the math curriculum. There has to be some communication between a person responsible for math education and that teacher of students with visual impairments so that when they do get in the class to a concept, such as division or fractions, that the right materials are there to support that student's learning.

Slide 5 talks about math standards. And math standards are not just for math teachers, just as English language standards are not just for the person responsible for English language. As a special educator, as a teacher of students with visual impairment, you need to have knowledge of your state's math standards.

Some states use the Common Core State Standards, some states have their own standards. So you need to be able to review those standards and determine what Nemeth code symbols and math concepts the student will need to succeed. That way, if there's pre-teaching that needs to happen, if there are materials that need to be there, you are going to be ready if you're in that role of the teacher of students with visual impairment.

So how is the student going to grasp these new math concepts? Are there strategies that you recognize that help facilitate that student's learning? And then of course, we need to communicate with the math teacher to be consistent in the use of terminology and strategies.

So what terminology is that teacher using and how does that terminology tie to the standards? Are there terms that you can pick up that you will become more familiar with?

I'd like you to visit with Sara Larkin, who is a nationally-recognized expert in math education for students with visual impairments. And she's going to talk a little bit about the Common Core State Standards, and how by reviewing those standards, or the standards for your state you can be better prepared as a teacher of students with visual impairments to meet your students' educational needs.

SARA LARKIN: Hi, I'm Sara Larkin. I am the state math consultant here in Iowa, specifically for kids who are blind or visually impaired, and also part of the Project INSPIRE team. I'm going to be visiting with you about the importance of the Common Core State Standards, especially for math. In the standards, there's lots of vocabulary that's also going to give you an indication of what Nemeth symbols and tactile graphic skills a student is going to need along with what you need to visit with the classroom teacher about as far as tools or materials they might be using.

So I am on the Common Core State Standard website. For your state, you may have another website where your state standards are held. I'm going to use grade 4 as an example.

A lot of times, there's an introduction for that grade level specific to math. But there's lots of keywords that are useful in here. For instance, it talks about multi-digit multiplication and multi-digit dividends. So that's going to tell me I'm working with multiplication and division at that grade level. And that I'm talking about more than just a single digit.

It also talks about fractions. So now I know that the students need to know how to do fractions. Place value means that I'm going to have to have a comma for Nemeth code. It also includes things like arrays, so types of pictures that are going to be included.

I need to look at how that student's going to make those arrays. Are they going to use a braille writer? Are they going to use manipulatives?

As I go down a little further in the introduction, it talks about things like those remainders and interpreting those remainders. A little further down the introduction, it even talks about the fact that the students are going to be drawing. So I want to teach them some drawing skills, for instance, on the Draftsman board and maybe using some stencils.

Now, the introduction kind of leads into an overview, which gives me more information about the standards. But where you're going to gather the most information of all is actually moving into those standards. So let's look at operations and algebraic thinking for grade 4. This is where I will gain a lot about the terminology that the teacher is going to be using.

It's also going to give me examples of what teachers might be showing. As I move down a little further into the standard, it's going to tell me that the student's going to have to generate patterns, which means we're going to want them on the braille writer so that they can see that pattern of numbers as it's continuing.

Let's move on to number and operations base 10 and show you a couple of examples in that standard. As I go down not far at all, all of a sudden I see there's a greater than, equals, or less than sign. So we want to make sure they know those inequalities as well.

What I really like about the standards is they are very explicit. Let's look at the fifth standard which states, "Multiply a whole digit number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models." So this tells us about how many digits to use. It also tells me about the types of arrays or area models that are going to be used within tactile graphics.

SPEAKER: So I hope that Sara's brief introduction to the Common Core State Standards and how to view those and use those in planning has been helpful to you.

Let's go ahead and go on to slide 6. I want you to get your terms on. So I've got a little problem here, 2/6 = 1/3. And I've got that in print and braille.

When I was growing up, we would say that I took 2/6 and I reduced it to 1/3. Maybe you're working with a student who isn't back in the olden days, so they're saying simplify. But you know, when you go to look in the standards, you may find it says finding equivalent fractions.

Folks, these are all the same thing. So regardless of whether you say reduce, simplify, finding equivalent fractions, one of the most important things is you need to be using the same terms that are being used in the math class. So as the person who is working with this student who has a visual impairment, you need to ensure that you're going to be using the terms that student's going to hear in class, is going to see on tests, is going to find in their book.

Slide 7 talks about the importance of pre-teaching. And I've got two sample flashcards here, both of them say 1,000. One of them has a lead-in line to 1,000, so three cells of dots 2-5, a space, 1,000, a space, and three cells of dots 2-5. That way it's putting that 1,000 in context.

The other card has just 1,000 on it with no lead-in line in braille. Which one's the right one to use? Depends on your student. Do they need that orientation? So part of getting to know your student is knowing what's going to work for them.

But if they're getting ready in the math class to talk about commas, you might have some flashcards like this to go over reading numbers with commas. So that idea of understanding what's being taught in the math class, is there a new Nemeth symbol my student needs to learn? In this case, it would be dot 6. What hands-on material can you use to familiarize a student ahead of time so they can use those materials in the math class?

What tools will the class be using? Are they going to be using calculators? So does your student need to have a calculator that talks, or know how to use the calculator on their braille note taker? Do you need to ensure that your student has those skills with the tools?

Has a student been exposed to this type of tactile graphics before if they're doing some type of activity for example, with circle graphs? Does your student have basic circle graph knowledge? If not, you're going to need to pre-teach this. I want to introduce you to Liz Egan, who is a teacher of visually impaired students, is going to talk a little bit about how she approaches pre-teaching with one of her braille students.

LIZ EGAN: Oh, so the teacher is getting ready to introduce long division. So I find what sheet, what materials she's going to use. I don't use the same problems she's using. I create my own with the teacher's approval. And then I pre-teach how to do the long division with him.

We use the Math Window so he can see how it's set up correctly. And then we practice on his braille writer, so he's brailling it in the correct format. So he's getting multiple modalities.

And I try to do this, if not a week ahead of time, then at least three or four days so we have time to practice that skill. So when he goes in the classroom to do it with his peers, he's not sitting there lost and wasting his time in the room because he's sitting there and he's floundering. I want him to be successful, so we pre-teach those skills. And that's why talking with the classroom teacher, talking with Susan, his one-on-one para, is so vital.

SPEAKER: I'm sure you got a lot of great ideas from listening to Liz. She is a wealth of information, and she actually often blogs on the Paths to Literacy website. So be sure to check her out for great ideas.

Slide 8 talks about the roles of the math teacher, the person who is teaching the content to the student. Our student who happens to be a braille reader is just one student in this class. And that teacher needs to take ownership of that student and include that student the same way other students are included.

At the same time, they do need to check in with their student to find out what's working and what's not. We really want to encourage that math teacher to talk directly to the student and to share ideas and get input. So we're not the middle person. We're more of the support person.

At the same time, that math teacher needs to let us know what the game plan is. So what content are we covering? What activities are we doing, this week, next week, the week after? And that way, the adult supporting this child, the teacher of students with visual impairment and/or the paraprofessional, can have the materials ready, can also do any necessary pre-teaching for the student.

The math teacher needs to have expectations that our student is going to succeed, just like all the other students are going to succeed in this class. We want to encourage this math teacher to verbalize, verbalize, verbalize, verbalize, what's on the board, what's going on in the demonstration. If we can train this teacher from the beginning to verbalize, our student is going to have access to information, because inevitably, just like all of us, something's going to come up, and the teacher is going to want to demonstrate or show something to the class. If they can verbalize, our student's going to be able to access it.

And when the time comes when the student is going to be doing diagramming or looking at models, or there's a demonstration going on in the class, this math teacher needs to understand that our student needs to have access, our student who is a braille reader. So how can this happen naturally? Thinking about where in the classroom the student's going to be sitting, if the teacher is going to be demonstrating something. A lot of this can be built naturally into the class as long as we can get that math teacher to buy in and understand the needs of the student who is a braille reader.

Slide 9 talks about paraprofessionals and the tough job that they have working with students who are visually impaired. If you're taking this course and you're a paraprofessional, we are more than excited that you are here. The role of paraprofessionals is to recognize that you are here to support the student and not interfere with the student's responsibilities.

I'm very fond of say that it's not the paraprofessional's job to earn an A in math class. It's the student's job. And you know what, if the student earns a C, or even if a student earns an F, that's the student's grade. So paraprofessionals are not there to do the work for the student. Instead, they're there to promote the student's independence. And so that means often stepping back.

Paraprofessionals are in this unique role, because if they're in a general ed classroom, they're seeing what's going on regularly. The teacher of students with visual impairment may only be there, you know, for an hour a day or every other day. So the paraprofessional has an important job in communicating with all team members to share what's working for the student and what's not.

The paraprofessional is the eyes and ears of other team members and needs to communicate clearly. At the same time, the paraprofessional needs to ensure that the student has the materials that the student needs. Now, this does not mean that the paraprofessional waits on the student hand and foot. The student needs to get up and get her own braille materials, or manipulatives, and tools necessary for the class if those are kept in a consistent place that the student knows about. And they should be, because the student needs to have responsibility for getting materials and putting them away.

There are going to be opportunities where the teacher is going to want to teach something differently, something is going to come up, a child in the class is going to ask a question. And there isn't going to be materials prepared ahead of time for the braille reader, because hey, it's happening live. Part of what that paraprofessional needs to do is to provide that last-minute access.

So is it grabbing the Math Window and writing out the division problem that the teacher is putting up on the board? Is it whispering to the student what that problem is up on the board? Is it reminding the teacher that hey, for this activity, could we have students pair up so that the student who is a braille reader has a classmate to work with? And when necessary, provide tech support, because inevitably, we all know our tech can have problems.

Let's talk on slide 10 about ways students can complete assignments. First, let's talk about the Perkins braille writer, the staple in our lives, right? The Perkins braille writer doesn't know whether or not the student is in UEB or Nemeth code. So we have the switch indicators that we have talked about throughout the course.

Students absolutely must be able to read Nemeth code switch indicators. Whether they use them in their own work is up to you and the student. However, if the student is using Nemeth code switch indicators, please do not penalize the student if they miss closing or miss opening or use an improper dot configuration. The focus needs to be on the math content.

Now, if your student is using a braille notetaker for math, they're going to be using keystrokes to be moving between UEB and Nemeth code. They're not going to be using the switch indicators. And so they need to understand that on the braille writer, you would use the Nemeth code switch indicators. But on the notetaker you use your keystrokes.

Other tools the student may use are the Draftsman the Tactile Doodle, or the inTACT Sketchpad. These are quick ways of drawing tactually. The Draftsman and the Tactile Doodle are available from APH. The student may use crayons or grease markers to make some type of tactual mark that they can go back and see which choice they picked for a multiple choice answer, for example.

Having a box of materials your student can use for making tactile graphics using the collage method. So this could be different textures of paper from the APH carousel of textures. It could be Wikki Stix. It could be different shaped stickers that you get at the dollar store. But that way when the student needs to demonstrate something to make their own tactile illustration, they have a box or a bag of materials that they know where they are that the student can go to himself to get them.

Slide 11 talks about how to get your students engaged with sighted peers. And this an important consideration, because we don't want our student to be that island in the mainstream. Our students can partner up, and the student who is sighted could draw on the Draftsman what's on the board, for example.

Or the braille reader can add braille to a group project. So for example, if they're making diagrams, the braille reader can add the braille labels to those diagrams. You can think about providing similar hands-on materials. So if they're doing some type of setting up arrays, our braille reader might have Omnifix cubes for the student to use, and they can use those with the sighted peer. So the other students in the class, they may be drawing on whiteboards. But our student who's paired up with a friend, classmate, is using Omnifix cubes.

You can encourage the students to ask questions of peers, rather than adults. So that math teacher has to allow some level of talking in the classroom. But this way, the adults can step back a little bit, the student is getting an opportunity to interact with peers, and are getting that opportunity to think about how to verbalize information. This can be a win-win for everybody.

Thinking about that math teacher and how they can set up group activities so that they want to make sure that our student who is a braille reader is in a group with classmates, and not in a group with a paraprofessional. And then you'll want to think about having the student pair their note taker to a screen so that sighted individuals, whether it's the teacher, whether it's a paraprofessional, whether it's the peers, but other people can see what that student is doing. So we've given you just a few of the ideas on how you can get your student engaged with sighted peers so they are not an island in the classroom.

I want to thank you for taking part in Lesson 6. You have one more lesson to go. And we have a very special guest speaker for you for that one. So enjoy learning about the digital workflow.