Nemeth in a Box

Transcript

SPEAKER: Welcome to Nemeth in a Box for Middle School Students. This is a Project INSPIRE activity developed by Susan Osterhaus, Texas School for the Blind and Visually Impaired; Dr. Tina Herzberg, University of South Carolina Upstate; and Sara Larkin, Iowa Educational Services for the Blind and Visually Impaired.

On slide two, we talk about the purpose of Nemeth in a Box. The goal here is to teach Nemeth Code symbols in mathematical context through puzzles and games that are fun, and they challenge our students to build their reasoning skills. We're talking about students at the middle school level, and so we actually found out when we did this live with a couple of groups of students in 2021 that there were side benefits as well.

Our students were from throughout the United States and they had an opportunity to meet other students, they got to build their skills with online meeting platforms-- so every session began with practicing the key commands you need for Zoom-- and then built those social skills, like turn taking, and having empathy for others, and encouraging others. So we really weren't expecting that, but it was great to have our students grow in other ways in addition to their Nemeth Code skills.

Now, there are seven lessons in Nemeth in a Box, and for the first six lessons, the structure is very similar. We begin with going over the symbol list with the students. So, each lesson has symbols that are the focus of it. We want to make sure our students can read and write those symbols, so we spend some time going over the symbols. And you'll notice in the lesson one-- which I have the symbols up here-- these are some symbols that are introduced before the middle grades, such as the plus, minus sign, dollar sign, those types of things. Our students need to be efficient, obviously, with these beginning with second- to- fourth- grade- level- type symbols before they're ready to use them in the middle school context.

In order to practice, we have developed a maze, and so the nice thing about the maze is each one is laid out the same in braille. You start at the top left with start, and you follow the boxes. And so, we would have a student who would read what is in the box,

and then another student, and so on. If you're using this individually with just one student, then your student can read the symbols-- all of them. We provide the symbols in SimBraille, print, and words in case you're not sure how to say them-- and some of these get a little tricky when we get on to like, lessons 5 and 6, folks. And this is nice because somebody who does not know braille can still use this tool and the things that we've created with a student who is a braille-reader, even if they are not a braille-reader themselves, such as a family member or a paraprofessional.

In "What's Wrong"-- in here I have our example from Lesson 3. We asked the student to look at four items. They're looking to have it read, -5 plus (8 minus 6). Now three of these items have errors. And the idea is for the student to find out what the error is. The last box shows that problem written correctly, because it's very important that our students see accurate braille. Then we also have a challenge problem where the student has to find the two errors in the problem that is written. So "What is Wrong" is a fun activity that really gets students working on their accuracy when it comes to reading Nemeth Code.

Slide six is "Which One Doesn't Belong," and here's our example for Lesson 2. And I'm going to let Sara Larkin explain to you how "Which One Doesn't Belong" works.
SARA LARKIN: We gave them just a 2 by 2 array of four different expressions. In this case, we have 0.5, 0.25, 0.75, and then 0.3 repeating. And, of course, they are taking out this braille sheet that's labeled "Which One Doesn't Belong." They're looking at those expressions in Nemeth Code, and then this is an opportunity for them to really use discourse-- having that conversation about a topic. So in this case, the students try to figure out which of these doesn't belong, but not just that-- why doesn't it belong? That's what's cool about this one. All of them don't belong, but for a different reason. So we have 0.3 repeating is it's not finite, because it's a repeating decimal. Yeah, so it's the only one that's repeating. So they're using that terminology. 0.3, because the others are quarters. Same answer, but a different reason. How about the others? For instance, 0.5 only has one place after the decimal, so that one doesn't belong, and because it's only in the tenths column. So again, same answer, but different reason. And then 0.75 doesn't belong because it is the only one over 0.5 or greater than 0.5.
We got a different one--0.75, because the numerator isn't a 1. So, we've got our 0.5 would be like 1/2, 0.25 would be like 1/4, 0.3 repeating is 1/3 and, yes, 0.75 would be 3/4, not a numerator of one.

SPEAKER 1: So you got a great explanation from Sara Larkin, and I had a hard time trying to figure out why 0.75 didn't belong as I was doing this activity myself.
"What is the Question"-- this time we're going to look at our example here from Lesson 1. And what our students have to do is we give them the answer-- in this case 5 1/2, and they have to come up with as many math problems that lead to that answer. So I might come up with 5 plus 1/2. Somebody else might come up with 6 1/2 minus 1. Those answers have to be accurate. So we really encourage, if students are playing in a group, for them to really work to come up with problems that others aren't going to come up with.

And you can play against your student if you're the TVI, or the family member, or the paraprofessional. You don't have to know Nemeth Code to be able to come up with problems that have an answer of 5 and 1/2, in this
case.

Slide eight talks about Boggle, and we use this game in Lessons 2, 4, and 6 to review previous materials. I have my Boggle card from Lesson 4. Now, the first thing you want the student to do is to go ahead and get familiar with the symbols on that Boggle card-- so another way to review.

Once the student's done that, you want to make sure they understand the rules. When you are playing Boggle, a symbol box needs to connect either horizontally, vertically, or diagonally to the box containing the next symbol in the problem. When you have more than one player, it's important to know an individual only gets a point if nobody else has the same problem. Also, your problems have to actually be real problems and not just random numbers put together. So, let me show you how this actually works.

Let's take a look at how I would do the problem 5 / 2 is less than or equal to 3.5. 5 / 2 is the second item in the first row, and the first item in the first row is less than or equal to. So I can connect 5 / 2 to less than or equal to, and if I go down to the first item in the second row, I have 3.5. So these three boxes are connected: 5 / 2, less than or equal to, and 3.5.

I'm going to show you another example. So we're going to go down to the bottom of our card, and I'm going to start with -4, which is the third symbol in the third row, and I'm

going to go to the plus sign, which is the fourth symbol in the third row, and then down to 0.4, which is the fourth symbol in the fourth row. So these three items -4, plus, 0.4 all connect together. So lots of fun for adults and for students to play. We love Boggle. Slide nine is BINGO. Now BINGO is a Lesson 7 activity, and we have two games in Lesson 7 that really pull it all together. And what we've done with BINGO is you'll find that we have a version for the Tiger where you can cut apart the strips so they have both the print and braille on them. We also have print in SimBraille, and we also have braille. And we set them up in strips so that anybody who is a print or a braille reader can cut those strips apart, mix them up, and then read those off when we're playing the BINGO game. We've also provided 12 BINGO cards.

So, again, we can get groups of students together, we can send it home with a family, you and your student can play. We give you lots of variability. The student might be the BINGO caller. An adult might be the BINGO caller.

Basically, it's BINGO. When somebody calls out one of the items, you go through your BINGO card, and you put a marker on it. Use a Wikki Stix. Use a tactile marker. If you put this Bingo card onto a cork board, you can use push pins-- whatever works for your student.

The nice thing about BINGO is you can play traditional: 5 across, 5 down, 5 diagonal. Or your student may want to play blackout, or all four corners, so whatever works for you and your student. The idea is we're reinforcing reading and saying aloud Nemeth Code symbols in a fun way.

Now we have another fun game in Lesson 7, and you can do them in either order. You don't have to play BINGO first. You might want to play Jeopardy. Now Jeopardy-- I think we've all seen Jeopardy with Alex Trebek and others, so we know how that game works.

So we give you a Jeopardy board that is a PowerPoint-- that may be helpful if you're a print reader, that you might want to use that. We also have a listing of the Jeopardy questions and answers in print. What the student gets is a Jeopardy board where it has the name of the categories, and at 100, 200, 300, 400, and 500. And what we encourage is that the student marks off what has been called out.

So for Fractions and Inequalities 300, you're going to say to the student, "the opening mixed number indicator." And the student would say, "What are dots 4-5-6, dots 1-4-5-6?" You know what, folks, you can actually flip it around, too. You could say to the students, "Dots 4-5-6, dots 1-4-5-6," and the student would need to ask the question, "What is the mixed number opening indicator?" Now, I mentioned that we had students both in the spring of 2021 and in the summer of 2021 use Nemeth in a Box, and they met for 90 minute sessions. You don't have to do 90 minutes. If it takes you a month to get through a lesson, no problem. You have flexibility here.

But we wanted to share with you, in closing, just a couple of things our students have said that they really liked about Nemeth in the Box. One said, "Getting to know some of my blind peers from around the country." Another said, "I enjoyed 'Which One Doesn't Belong.' I enjoyed this because I got to give my own opinion on which one I thought was different, and I also got to listen to others' opinions and choices." Now, I really like that--that idea that I need to pay attention to what other people are saying and consider what they have to say.

Another said, "I really enjoyed working as a team and figuring out the problems and the games." And that's because we sometimes put students into breakout rooms, so they got to work in smaller groups. So, let's say you're doing a summer program or a Saturday program, that's another idea for you. And our last student said, "I enjoy the fact that I learned a lot more Nemeth symbols while still having fun." I couldn't agree more. Susan, Sara, and Tina, who facilitated the Nemeth in a Box sessions, had just as much fun as the students, and we know you will too. The Project INSPIRE team will be developing Nemeth in a Box for high school students, and UEB Technical in a Box for middle school students. Be sure to check the Project INSPIRE website often for updated information. The address is https://www.uscupstate.edu/academics/school-of-education-human-performance-and-health/graduate-programs/project-inspire/.