

Project INSPIRE: Course 5, Lesson 3

Transcript

SPEAKER: Welcome to Nemeth Code Symbols Used in the Middle Grades and Strategies for Supporting Math Learning. This is Lesson 3: Formatting Materials and Number Lines for Students in Grades 5 to 8.

Slide 2 has the objectives. You are going to be able to locate and use formatting resources. You're going to be able to transcribe and prepare the following-- word problems, and number lines that include inequalities. Third, you're going to be able to format headings, directions, number problems, and xy data tables.

So let's get started on slide 3 by talking about some resources. The first is the Guidance for Transcription using the Nemeth Code within UEB Contexts. And this is available from BANA-- that is, the Braille Authority of North America.

And specifically on page 14, you're going to find information about how to prepare number lines. As far as formatting in general, you're going to find information about that on page 15. So we give you the resource on this slide. You'll also find it on the resource list for this course.

On slide 4, you will find another resource that we list on the resource list. And this is An Introduction to Braille Mathematics using Nemeth Code within UEB Contexts. This was put together by the National Federation of the Blind. And we want to point out specifically that Lesson 17 gives you some great examples of data tables. And we'll talk about data tables later in this lesson.

Slide 5 gives you some basics on formatting. Our students are going to be getting materials in single-spaced format. So we're not doing double-spaced formatting here-- given that up long ago.

Our concept of the center headings-- what we really refer to as a title. But BANA's really big on centered headings. And when we have a centered heading or a title for a worksheet, for example, it's going to go on the first line of the page. And you're always going to leave a blank line following it.

It's really important when we're preparing materials for our students that we follow the print for the sequence the problems, punctuation, capitalization. And please do not change the directions or the problems. If you need to communicate to the braille reader about a change, you're going to do this with a transcriber's note.

On slide 6, I have a print worksheet titled Algebra Quiz. That's my title, or my centered heading. I have my directions, which are Solve for the variables. And I have three problems. In this case, problem 1 is $x + 7 = 35$. Problem 2-- $23 - b = 16$. And problem 3-- Find the value z in $z + 24 = 30$.

So let's look at this worksheet in braille. So we're going to go on to slide 7, and see that I have my centered heading, which is Algebra Quiz. Remember, one line below it. My directions begin in cell 5. So you'll see, I start my capital for the word Solve in cell 5.

Now, I chose to put my opening Nemeth indicator after the directions. In that way, I am saving some space for my student. It's going to have the consistent-- hey, the print is stopping. Now, we're going to get into the math.

My problems begin in cell 1 with runover in cell 3. I want to point out to you-- when I've brailled in Nemeth, I brailled my problem number 3. And then, I chose to open up Nemeth after brailling the problem number. And I did that for consistency.

So I open up Nemeth and Braille "Find the value of z in"-- and then, I start on the next slide with my opening Nemeth indicator. And then, I braille my problem-- "z plus 24 equals 30." Got my Nemeth terminator, and then my period.

It's really important that I'm consistent with my student. If this is the way I do it on the quiz, then I'm going to do it throughout the quiz the same way, with the indicators.

All right. We're going to want to slide 8. It's your turn. I want you to transcribe the worksheet here, for activity 3A. When you're done, please come back and check your work.

Slide 9 has the answer key for activity 3A. Ensure that you have centered your heading, done your directions properly with a 5, 3, done your problems beginning in cell 1, and that you've used your indicators to open and close Nemeth.

All right. Slide 10-- we're going to talk about creating number lines. And we have done this in a previous course. But we want to just go over the basics here. So we have some symbols that are used on basic number lines. That left pointing arrow head is dots 2-4-6. The line, or the access line, is what's it's technically called-- you're going to use dots 2-5.

When you are doing the coordinate scale marks-- some of us might think of those as tick marks-- you're going to use dots 1-2-3-5. And then, your right pointing arrow head is the opposite of your left pointing one. That's 1-3-5.

I have a number line here that goes from negative 2 to positive 4. Just would like you to take a moment or two to ensure that you're comfortable with how to braille a basic number line. And I do want to point out-- no numeric indicators are used on number lines. If you're not real comfortable with number lines, I suggest that you go ahead and braille this one just to get familiar with how to set it up.

I'm going to go ahead and go on to slide 11. And now, I want to talk about, how do I braille the inequalities on a number line? So how can my student graph those inequalities? Well, there's some symbols they need to know.

The first is, dots 1-2-3-4-5-6 are going to be our solid, or our filled-in, or our closed point. And this is going to be placed above the number line. So when I need to show a closed point or a circle that's filled in, my student is going to know to use that full set.

Now, when my student needs to do an open circle or a point that's not included, they're also going to place that above the number line. And they're going to have to do this when they have inequalities that have less than or greater than, or not equal to shown. And the way they're going to do that is with the symbol 1-3-4-6.

So when I have to show an open circle representing point not included, it's 1-3-4-6. Now sometimes, our students need to show that there's bolding in the line segment, which is important for them to be able to show what points are included in the solution. And so the symbol for this is dots 2-3-5-6.

And then, we also have bold left pointing arrowhead, which is two cells of dots 2-4-6, and bolded right pointing arrowhead, which is two cells of 1-3-5. Now, it's the math teacher's responsibility to teach your students about inequalities, and how we actually graph these. But it's your responsibility as a person who is preparing braille to ensure that your students know how to read number lines that show inequalities, and how they can prepare number lines with inequalities to demonstrate that they understand how this works.

So I've got three examples for you on slide 12. The first one says, Graph x is less than 3. So my number line goes from negative 1 to positive 5. We want to show our students that there are two left pointing arrowheads. So we're going to have dots 2-4-6, dots 2-4-6. Then, we want the student to be able to show they have a bolded line beginning from that left pointing arrow head to 3. So they're going to use dots 2-3-5-6. Going to need a couple of cells of those two cells. And then, I'm going to use my symbol for the coordinate scale mark. Then, my student is going to braille the 0, two more symbols showing the bolded, dots 2-3-5-6, other coordinate scale mark, and so on, until they get to 3. When they braille the 3 below the coordinate scale mark above it, they're going to braille dots 1-3-4-6 to represent that open circle.

Let's look at example 2. So it says, Graph x is greater than or equal to negative 2. So I have a number line that's going from negative 2 to positive 3. Begin with one left pointing arrowhead using my axis line at 2-5 and my coordinate markers. Above the negative 2, my student puts a full cell. And then, we're going to show that it is a bolded axis line for the rest of this number line. So that's using dots 2-3-5-6, and then using a double right pointing arrow head at the end. So we're showing that that circle above negative 2 is filled in.

Third example is, Graph negative 2 is less than x , which is less than or equal to 1. So here, I have a number line that goes from negative 3 to positive 3, begins with one left pointing arrowhead. The axis line is 2-5 until I get to the negative 2. My student's going to put their open circle above the negative 2-- so that's dots 1-3-4-6-- and then, is going to begin to use the double bolded axis line, dots 2-3-5-6 until they get to the 1. When they get to the 1, they're going to put a full cell-- dots 1-2-3-4-5-6 above the 1 to

represent the full circle. And then, for the remainder of the number line, they're going to use dots 2-5 for the axis line.

So go ahead and review these. Again, you might want to try brailleing them just to get more familiar with them. Make sure you understand when you're bolded and when you're not bolded, when you use an open circle, when you use a full circle.

Right. Let's go on to slide 13, which is activity 3B. And we want you to interline the worksheet. And make sure that you notice that there's a blank line before and after each number line. I haven't pointed that out to you before. But that is something that we do. So you're always going to put a blank line above and below a number line. All right.

Come on back when you're ready. OK. Slide 14 has the answer key to activity 3B. Did you do your bolding properly, and your arrowheads properly? Make sure your full circles are where they need to be, and your one open circle. All right. Super.

Now, it's time for you to actually make some number lines here on slide 15, which is activity 3C, where we want you to create the number lines for three inequalities. So it's your turn to create number lines. When you're ready, please come back.

All right. Slide 16 has the answer key for the three problems that you needed to braille the three inequalities. Go ahead and check to make sure that you brailled everything properly, and that you really understand the concepts.

Now, we're going to talk about data tables on slide 17. When you have a table that only uses natural numbers-- 0, 1, 2, 3, et cetera-- I want you to transcribe these in UEB. But when you have a data table that perhaps has fractions, negative numbers, exponents, those types of things, you're going to use Nemeth Code. Whether you're transcribing a data table in UEB, or a Nemeth Code, you're going to leave a blank line above and below the table.

You're going to start your first column heading in cell 1. And then, you're going to use a separation line between the column headings. And I'll show you that in just a second.

Your columns-- you need to pay attention to how long they are, because your separation line should extend across the width of the whole column. And we'll take a look at that on the next slide. When you have columns, we want you to leave two blank cells between the column separation line.

So you really have to do some planning out on how wide the widest part of your column is. And then, you're going to leave two cells. And then, start the next column.

Let's go on to slide 18 and look at an example of a data table. I'm going to start by just pointing out a couple things that we need to keep in mind. Our column headings are x and y. We're always going to begin a data table in the first cell.

When I do a separation line in braille, it's dot 5, then cells of 2-5 for the width of the line. Remember, I leave two blank cells between the end of a separation line and the start of the next one. So my data table here has two columns-- x and y, of course. And I have in column x the numbers 1, 2, 3, and in column y, 0.5, 1.5, 2.5.

So if I look at my braille, I start out with English letter indicator x. I'm going to have figured out that the length of the separation line needs to be two cells. I know I need to leave two more spaces.

So that's going to let me know that I'm going to do my English letter indicator y in cells 5 and 6. So I do my separation line under the English letter indicator x dot 5-2-5, two spaces. And then, I have figured out that the width of column y needs to be four cells to accommodate my 0.5 and the other decimals.

So I do dot 5, three cells of 2-5. And then, I simply, folks, just put my numbers where they go. So on the next row, which would be the third row of this table, I have 1, two spaces, 0.5.

Next row-- 2, two spaces, 1.5. Next row-- 3, two spaces, 2.5. So it's important that I line things up with my data table.

Let's go on to slide 19. And it's your turn to go to work for activity 3D. Please transcribe the worksheet below. Make sure you pay attention to where to start those directions. We're going to have you come back when you're ready.

And slide 20 is the answer key to activity 3D. So ensure that you started your data table after a blank line from those directions, that you used your opening and closing Nemeth indicators properly, and that the lengths of your separation lines are appropriate.

OK. We are done with lesson 3. It's time for you to go on to lesson 4, where you'll start to learn about methods and materials that we use with middle school students in math. Thank you.