Project INSPIRE: Course 6, Lesson 4

Transcript

SPEAKER: Welcome to "Nemeth Code Symbols Used in High School and Strategies for Supporting Math Learning." This is "Lesson 4: Formatting Materials for High-School Students." Slide 2 has the objectives. You're going to be able to locate and use formatting resources. And using your resources is so important. You're going to be able to transcribe or prepare word problems. You're going to learn how to keep math expressions together and, when you have to divide math problems, when to do it properly. We're going to talk about formatting for headings, directions, numbered problems, and formal proofs.

Slide 3 is a reminder of where you can get the resources you need. The "Guidance for Transcription Using the Nemeth Code within UEB Contexts" is available from the braille Authority of North America-- BANA. And we really want to stress going to page 15, where we're going to have information about formatting beginning.

Want to let you know-- here we are in 2023, and later this year the new Nemeth Code book will be out from BANA. It has been approved. So make sure you bookmark the BANA website and check back regularly for updates.

Slide 4 is "Resources to Use When Transcribing Math Materials." The Introduction to Braille Mathematics Using Nemeth Code within UEB Contexts is available from the National Federation of the Blind. Lesson 12 has examples of formal proofs, and lesson 17 offers examples of matrices and determinants. So bookmark this website as well, folks.

Slide 5. Let's talk about formatting basics for high-school students. At this level, materials are single-spaced. I want to remind you that BANA refers to titles as "centered headings." You're going to center the title of a worksheet on the first line of the page and then leave a blank line following it. You're always going to follow the print sequence of problems, punctuation, and capitalization. And it's really important: do not change the directions or problems.

Slide 6. Now, I have an example here of a worksheet in print. So the title is "Algebra 2 Review." And I want to point out, it is bolded.

The directions say "Solve the inequality and put answers in interval notation." And then my first problem, problem 1, is the absolute value of x minus 3 over 2 is greater than or equal to 5. So let's see, on slide 7, how I'm going to braille this worksheet.

So remember, my centered heading begins at the top of the page and is followed by a blank line. So I'm going to have to make sure that heading is centered. And in previous lessons we talked about how to do that.

My directions begin in cell 5, with my runover in cell 3. Now, I begin with the opening Nemeth indicator and I'm going to place this on the same line as the direction. So you can see, at the end of the directions, that I have that opening Nemeth indicator.

My problem begins in cell 1, with runover in cell 3. So I'm going to have my numeric indicator 1, punctuation indicator period, and then space, and then I have my actual problem, and then I am going to close Nemeth Code.

One final thing I want to point out, here on slide 7, is, in print, the title of the worksheet-- "Algebra 2 Review"-- was bolded. But I do want to point out that, on our braille, we do not bold the title if it doesn't have specific meaning.

Let's go on to slide 8. And this is Activity 4A. I want you to transcribe this worksheet. When you're ready, come on back and check your work.

Slide 9 is the answer key for Activity 4A. Make sure that you centered your title, that your directions began in cell 5, that you opened up Nemeth Code properly, that you transcribed your problems accurately, and that you terminated Nemeth Code. So if you have any questions on how to do this worksheet, make sure you spend some time reviewing the material before we go on.

All right. Slide 10, we're going to talk about keeping math expressions together when possible. A math expression cannot be divided across line if it fits on a single braille line. So this is where it's important that you know how many cells you have left on your line and when your bell is going to ding if you're using a braillewriter. Of course, if you're using technology, it's very easy to see where you are on that page. Now, switch indicators can be separated from the math. Let's look at my example. The print reads "11. Find a set C and a set D where C intersects D equals empty set and C union D equals the set of 1,2,3,4,5,6,7,8." And then I've got my punctuation-- my period.

So looking at the braille, I begin with my UEB 11 period, find a set C and a set D where-- on my next line, I need to open up Nemeth, because I have to have my Nemeth indicator with my math. So I'm going to have open Nemeth indicator, beginning in cell 3, and then I have my C intersects D equals, empty set, space.

I have the word "and," so I'm going to use my single-word switch indicator. Now, folks, this is where I need to really know how long my math is going to take, because I have plenty of room on that line but I am not going to be able to get "C union D equals" and then the set of the numbers I listed. So I'm going to bring this all down to the next line. And after I finish my set of "1,2,3,4,5,6,7,8," I don't have enough room for my Nemeth terminator and period. But that's OK, because they can go on a line by themselves. Let's go on to slide 11 and talk about dividing long problems across lines. Now, when you have a math expression that will not fit on one line, you're actually going to divide it before the sign of comparison-- so, equals, less than, greater than-- you know, those types of signs-- or before an operation sign-- plus, minus, multiplication, division, and so on.

I have two examples on this slide. So in the first example, I have problem 4. I'm already in Nemeth Code. And problem 4 reads "The cubed root of 27 over 343 equals the cubed root of 27 over the cube root of 343 equals the cubed root of 3 to the third over the cubed root of 7 to the third equals 3/7. So when I go to braille this, I'm going to begin in cell 1 with my punctuation indicator, period. I'm going to braille my first expression.

On my second line, beginning in cell 3, I'm going to braille my equals sign-- my second expression. On the third line, beginning in cell 3, I'm going to braille my equals sign-- my third expression. And I can fit that "equals 3/7," my fourth expression, on that same line. So notice how I did my divisions before the sign of comparison.

Let's look at my second example. So my problem is number 8. 99 times 6, open bracket, open parentheses, 5 minus 1, close parentheses, times, open parentheses, 2 plus 4, close parentheses, close bracket, plus 37 divided by 1/2 equals question mark. So my braille reader-- we're already in Nemeth-- begins with numeric indicator 8, punctuation indicator period, beginning in cell 1, braille out my problem, 99 times 6, open bracket, open parentheses, 5 minus 1, close parentheses, times, open parentheses, 2 plus 4, close parentheses, close bracket, plus 37.

There's not enough room on the line to braille the "divided by 1/2 equals question mark." So, since we're at a sign of operation, I'm going to bring that "divided by 1/2 equals question mark" to the second line, and I will begin that in cell 3.

Folks, let's go on to slide 12 and talk about an example of a word problem. Now, when you number word problems, you can have them in UEB for numbering or in Nemeth. And that depends on whether or not you're in Nemeth Code at that point.

We're going to give you an example here of a piecewise equation. We talked about these in Lesson 3. Remember, there's always a blank line above and below a piecewise equation. And large grouping symbols begin in the same braille cell, so I have to line things up. And I'll show you that here in just a moment.

But I want to point out that if I have a period, it's placed at the end of the first line of the equation. And you will see this in BANA's new Nemeth Code book coming out later in 2023, that this is the way to do it. So we want to show you the right way to do it, here at the beginning of 2023.

So I am in the middle of a math worksheet. I am on problem number 9. And my problem reads "Graph y equals, a large open brace-- my first line is "2 over x, comma, x does not equal 0." And then I have, on the second line, "negative 3, comma, x equals 0." And then I have my period.

On problem 10, I have "State the interval, open parentheses, 5, comma, 7, close bracket, using inequality notation." So let's take a look at how I braille these. So I'm going to begin with my UEB, 9, period, graph. Then I have a blank line.

In cell 3, I open up Nemeth, and then I begin my equation. I have y equals, enlarged open brace. On my first line, I have that fraction "2 over x comma, x does not equal 0."

Now, notice, I have my punctuation indicator period right there. Then I go down to my second line. I make sure that I am lining up my open brace, and then I braille that second line of the piecewise equation-- minus 3, comma, x equals 0.

I'm going to put a blank line next. And then I'm going to end Nemeth, with my Nemeth terminator. Back in UEB, I've got 10, period, "state the interval," open Nemeth. I've got my parentheses opening-- minus 5, comma, 7, and my closing bracket. I'm going to then close Nemeth and have "using inequality notation," period.

Slide 13 is Activity 4B. It's your turn to transcribe two problems for us. Make sure that you remember about where to begin problems, where carryover goes, where punctuation goes, and where your blank line goes. Good luck. When you're ready, after you've transcribed, please come on back.

Slide 14 is the answer key to Activity 4B. Check your work carefully. If you have any questions, go back and review.

Let's go on to slide 15, and we're going to talk about formal geometry proofs. Now, with a proof, you're going to leave a blank line between the auxiliary paragraphs and the beginning of the formal proof. And I'm going to show you some examples here in just a moment.

You're going to start each step in cell 1. After each step number, you're going to transcribe S for Statement or R for Reason. There's no space between the number and the subsequent letter. And again, you'll see this in my examples.

If necessary, if you happen to have runover, each step begins in cell 3. So we'll take a look at that. I want to point out that it's really important that each step from the Statements column is immediately followed by the corresponding step from the Reason column.

Let's go on to slide 16 and look at an example of a formal proof. Now, in print, I have my auxiliary statements, which are the given and the proof. And then I have a table where in the first column I have my statement and in the second column I have my reason. And each statement or reason is numbered. So let's look at how we do this for the braille reader.

So I begin my auxiliary statement, in this case, "given, colon." I begin that in cell 3, with runover in cell 1. The same thing when I braille a Prove colon. I begin in cell 3. And if I had runover in this case, it would begin in cell 1. Very important: I put a blank line after my auxiliary statements.

Now, how am I going to present this table of statement and reason to my braille reader? I'm not going to do it in table format. I'm going to do statement, reason, statement, reason.

So I begin with "1, capital S, period." I'm in UEB, folks. Then I need to open up Nemeth, to put the statement. Notice how I close Nemeth at the end of the statement. So I'm back in UEB, and I'm going to do "1, capital R, period"-- in this case, I have the word "given."

So I'm still in UEB. I'm going to do-- again, starting in cell 1-- "2, capital S, period," open up Nemeth, and I'm going to continue along. So I'm going to be alternating my statements and my reasons, going to always be starting in cell 1, with any runover in cell 3.

Folks, we know that you have been working hard on the content in this course. So we're going to move you right into Activity 4C, on slide 17, and ask you to transcribe the auxiliary paragraphs and formal proof. When you're ready, come on back.

All right. Slide 18 is the answer key to Activity 4C, where we show you both the print and the braille for this formal proof. We've covered a lot of information in this lesson and the three previous lessons, so that we hope that you have the Nemeth Code knowledge for high-school-level math. In lessons 5 and 6, we're going to be talking about methods and materials in lesson 5 and calculators in lesson 6. So we'll see you for lesson 5. Thank you.