

Project INSPIRE: Course 7, Lesson 3

SPEAKER: Welcome to "An Introduction to UEB Math/Science for Pre-Kindergarten and 1st Grade Students and Strategies for Supporting Math Learning." We're in Lesson 3: "Tally Marks, Multiple Choice Problems, and Spatial Problems."

Slide two has the objectives for Lesson 3. So you're going to be able to read and write tally marks, read and write problems with multiple-choice answers, and read and write spatial problems.

So let's go on to slide three, and let's talk about tally marks.

Now, in braille, to represent a tally mark, you're going to use dots 4-5-6. The print horizontal or diagonal strikethrough represents the counting of the fifth item, so what we're talking about here, folks, is if you look at my print example, I have four tally marks with a horizontal line going through them. Now, sometimes we will see those four tally marks with a diagonal line going through them.

Irregardless of whether it's horizontal or diagonal, in braille we're going to use the strikethrough symbol, which is dots 2-5. So what happens for our braille reader is we get to choose. We can either use five tally marks to represent five, so 4-5-6 five times, or we can get and use the strikethrough symbol, and that, folks, is dots 2-5. So if you look at my example for how to do five tally marks, you'll see that my first way, as I said, is five cells of dots 4-5-6. My second way is to do four cells, a dot 4-5-6 and then a dot 2-5 to symbolize that is the fifth tally mark striking through.

So it's important when we group tally marks that we put a space after a group of five just like we do in print. So I've got three examples here for you. My first example is, how do I write 2 with tally marks? Two cells, 4-5-6. Ta-da! Now I want to write a 7 using tally marks. So I have my two choices again. The first way I can do it is to do five cells of dots 4-5-6, so five tally marks, space, and then two cells of dots 4-5-6 or two more tally marks.

The second way I can do it is four cells of dots 4-5-6, four tally marks, and then my 2-5. Remember, that's representing that strikethrough symbol, that fifth tally mark: space, and then two tally marks, again, dots 4-5-6.

Oh, I'm going up to 13 tally marks. All right. Again, two ways I can do it. In the first way, I have a group of five tally marks, space, a group of five tally marks, space, so I'm up to 10, and then three tally marks representing 3. So I have 13 tally marks.

My other way of brailleing this would be to do four tally marks, dots 2-5 for that strikethrough symbol, space, four tally marks, again, that strikethrough symbol, dots 2-5, space, and then three tally marks. So those are my two ways of representing the number 13.

Slide four talks about multiple choice answers using the Grade 1 symbol indicator. Now, remember, that Grade 1 symbol indicator is dots 5-6, and its job is to let that braille reader know that what is following is a

letter and not a contraction. So if we have dots 5-6 followed by dots 1-2, we're saying to the braille reader, "Hello, this is the letter B. This is not the word 'but.'"

In UEB, when you're using letters for problem choices, you're going to put that Grade 1 indicator in front of each letter. However, we do have three exceptions, and that is the letters A, I, and O, and that's because those are words. Now, whether our answer choices are capitalized or lowercase, whether they have punctuation or they don't have punctuation, we're going to follow what is done in the ink print. We're not going to start inventing a different way of doing it. So if they're lowercase with periods, we're going to do lowercase answer choices with periods.

Very important: when you're formatting your multiple-choice questions, you're going to begin the question in cell 1 with our runover in cell 5, so that means that your second line, third line-- those are all going to begin in cell 5. Our answer choices begin in cell 3, and when we have runover, we're going to be in cell 5. Now, with these young students, the chances of have of us having runover and going to cell 5 is pretty slim, but I really want you to understand that when you do have longer answer choices, we are going to begin in cell 3 with runover in cell 5. So make a mental note of that. Or note on your PowerPoint slide. I want to go on to slide five, and I want to look at a problem that has capitalized answer choices. My problem reads 1 period 52 minus underscore equals 34, and my choices, which are all capitalized, are A 16, B 18, C 20, and D 28, and all four of those letter choices have a period following them. So I'm going to always begin that problem in cell 1, so I've got 1 period, space, 52, my minus sign, which is dots 5-3-6, my underscore, which is dots 4-6, dot 3-6, space, my equal sign, space, 34.

Remember, we said that answer choices begin in cell 3. We also said that with the letters A, I, and O, you do not need a Grade 1 indicator. So I'm going to begin my answer choice for with capital indicator A period, space, and then my 16. But notice that for choices B, C, and D I begin each of those with a Grade 1 indicator, capital, the particular letter, period, space, and then that answer choice. So I want you to pay attention: no Grade 1 indicator with that A period, and that A could be lowercase or it could be uppercase, folks. It doesn't matter whether it's upper or lowercase.

Slide six is talking about lowercase answer choices so just as I said, we're going to look at a problem here where I'm not going to use a Grade 1 indicator with my choice A. So this problem reads, "2 period, which problem has the largest sum?" My four choices: a 24 minus 2, b 18 plus 3, c 26 minus 5, d 19 plus 6. Each of these answer choices happens to have a period, so again, I'm going to follow that ink print beginning in cell 1 with my 2 period, space, writing out that word problem, which problem has the greatest sum, going to begin my answer choices in cell 3. So I've got the letter a period and then the problem 24 minus 2.

Beginning in cell 3 for the second choice, it's Grade 1 indicator b period, and then 18 plus 3. Third choice is Grade 1 indicator c period 26 minus 5, and then that last one, of course, is our choice d, which, again, begins in cell 3, Grade 1 indicator d period and then 19 plus 6.

OK. We're going to go on to slide seven, and I'm going to put you to work on Activity 3A. Please interline the multiple-choice problem. And when you're ready, come on back, and let's check your work.

All right. Slide eight has the answer key to Activity 3A. How did you do? Did you start your problem in cell 1? Your answer choices in cell 3? Check out where you put your Grade 1 indicators. I bet you did really well with this, folks.

All right. We're going to go on to slide 9. Time for you to do some braille here on Activity 3B. So I've got another multiple-choice problem, and I'd like you to braille it, making sure that you start the problem and the answer choices where you're supposed to and being careful about those Grade 1 indicators. When you're ready, come on back.

And now on slide 10, I've got the answer key to Activity 3B. Make sure you check your work, and when you're feeling good about braille problems with multiple-choice answers, we'll move on.

Slide 11, really want to make sure that you're clear that it's really, really important that you are consistent in how you prepare your materials because this, in turn, is going to allow your students to more easily and quickly navigate the braille materials. So formatting is just as important as the math material itself. So, whether we're talking about our little folks that we're talking about today, folks, that we're talking about your preparing materials for a high school student in geometry class, consistency, consistency, consistency with formatting.

Now, depending on the need of our young students, our pre-kindergarten and kindergarten and first grade students, you may select to include a space before and after the sign of operation in horizontal problems. That is allowed in UEB. If you do make the decision to put in that space, again, you want to be consistent with the materials that you're preparing. Don't go back and forth.

You want to follow print formatting for spatial problems, and so this includes where we actually place the sign of operation. And we're going to talk about this as we move into the next slides. So for example, if we have a plus sign that's to the left of the second addend, that bottom number, then you're going to braille the plus sign to the left of that second addend. So you have to pay attention with positioning of the symbols in these horizontal problems.

Let's go on to slide 12 and look at a spatial problem. So my spatial problem in print says 17 minus 6. Now, folks, I know that you know that I have a 7 in my ones column in that top addend and a 6 in my ones column in that second addend and then I have a 1 in my tens column in that first addend of 17, and by and large, there is no number in the tens column in that second addend.

And the reason I'm pointing this out is this really has to do with how we're going to set up this problem for our braille readers because-- very important here-- we need to keep that math problem, that numbers part of the problem, free from the indicators and symbols. In this case, we're talking about the numeric indicator, and we're talking about the minus sign.

Now we're in numeric mode when we're actually writing a spatial problem, so we know the braille reader is going to not be seeing the letters A and G and the letter F. They know that we're in numeric mode, so we are talking about numbers. We really need to be consistent about where we put our signs of operation and how long we extend that horizontal line.

So let's look at my example. I have 17 minus 6. Again, this is written in horizontal format. I've made the decision to put my horizontal line below the number. So in other words, my dot 5 is going to be below my numeric indicators in my number. So you're going to learn as we move along that you have some choice here, but I've made the decision that I'm going to put my horizontal line underneath my numbers. So what do I braille on the first line? I braille numeric indicator 17. I go down to my second line. Now I need to make sure that I braille my minus sign so that my numeric indicator for the 6 is going to line up with my numeric indicator for the 17. Really important, folks. We've got to line things up. So notice how my numeric indicator for the 6 lines up for my numeric indicator for the 17.

Now, as I pointed out, the number 6 does not have a digit in the tens column, so I am leaving a space. And that's really important because I want to get that 6 in the ones column lined up with the 7 in the ones column and the 17. Notice how I start my horizontal line mode with my dot 5 under the numeric indicator, and then I have dots 2-5, dots 2-5, that separation line for the length of my problem. And again, I'm going to leave a blank line above this problem and a blank line below this problem.

Let's go on to slide 13 and talk about spatial problems across the line. Now, BANA, the Braille Authority of North America, doesn't have established rules about how space spatial problems across the line. So here at Project INSPIRE, we are recommending that you leave two blank cells between problems for these young students in pre-kindergarten to first grade. I really want to stress again that consistency and spacing for spatial problems. This is on the entire worksheet or the entire test, so that entire document you're brailleing.

Now, I want you to look at my three spatial problems and how I've brailled those. My first problem is 4 minus 2. My second problem is 10 minus 3, and my third problem is 12 minus 6. Now, let's look at that very first problem, 4 minus 2. I want you to recognize that I put my horizontal line beginning under the numeric indicator. Very important, so dot 5, dots 2-5.

If I would have just put it under the actual digit, I wouldn't have had room for the dot 5 and the dot 2-5, so I needed to put that horizontal line beginning under the numeric indicator. Since I've done it for that problem, I have to do it for all the problems on this page. So my second problem is 10 minus 3, so again, that horizontal line begins with dot 5 underneath numeric indicator and two cells of 2-5. Notice how my 0 and my 3 in my ones column is lined up. Exact same thing with 12 minus 6. The position of the digits and the position of that horizontal line, so consistency, consistency, consistency.

All right, slide 14-- you know us in braille. There's always another way to do it or at least a lot of the time. So I want to show you an alternate method for spatial problems that are going across the line. So we

have what's called a numeric passage indicator. This is two cells of dots, 3-4-5-6. And we also have what's called the numeric terminator, dots 3-4-5-6, dot 3.

So I like to think of this similar to the way I think about capitalization. I can turn on numeric mode and say, "everything's math until I terminate." So to turn on numeric mode, I'm going to do dot 3-4-5-6, twice, do all my mathy kind of stuff. And then, "Hey, braille reader, I am stopping numeric mode with my numeric terminator, dot 3-4-5-6, dot 3."

So those same problems we just looked at in horizontal format on one line, which were 4 minus 2, 10 minus 3, and 12 minus 6-- the way I can braille them is to start numeric mode, two cells of 3-4-5-6, immediately followed by those problems, the exact way that we talked about brailing them, with one exception. Look for me, folks, where I started my horizontal line. I don't have a numeric indicator, and because I need to make sure that my horizontal line has both a dot 5 and a 2-5, and my first problem, 4 minus 2, is only one digit, I'm going to have to start that horizontal line right underneath the minus sign. So look very carefully at the problem 4 minus 2. You'll see I begin my horizontal line right under the first cell, that dot 5 and the minus sign. Take a close look because I did that first problem 4 minus 2 that way. I had one problem on the page that required this that happened to be the first problem, but it could have been the fifth problem.

But I have to look at that whole page. Then I'm going to start all my problems horizontal line underneath the sign of operation, in this case, the minus sign. When I'm done with my problem, on this line, we're going to break that rule that says leave a blank line above and below with these numeric mode indicators, and I'm going to go right to the next line and do my Nemeth mode terminator. So that's another thing to think about. When I'm in a numeric mode, those indicators-- I don't have to leave the blank line above and below the spatial problems.

I bet you you're feeling great about spatial problems, so much so that you're ready to go on to slide 15 and do Activity 3C, so I've got four spatial problems in a row for you to interline. When you're ready, come on back.

All right. Let's go on to slide 16. I've got the answer key for Activity 3C. How did you do interlining all those problems? I hope you got them correct. If you're feeling good about this, we're going to go on to slide 17, and we're going to have you actually interline some more spatial problems. But notice, this time we're using that numeric passage indicator and terminator. So go ahead and interline these problems on slide 17, and when you're ready, come on back.

We're at the end of Lesson 3 with slide 18, which is the answer key to Activity 3D. So if you went ahead and interlined these problems correctly and the problems in Activity 3C, well, then you're ready to move on to Lesson 4. Thank you so much.