

Project INSPIRE: Course 7, Lesson 6

Transcript

SPEAKER: Welcome to An Introduction to UEB Math/Science for Pre-Kindergarten - First Grade Students and Strategies for Supporting Math Learning. This is Lesson 6: Supporting the Student in Learning UEB Math/Science and Math Concepts.

Slide 2 has the objectives for this lesson. You are going to be able to describe the importance of pre-teaching UEB math/science symbols, locate and use resources for teaching math concepts, and identify and use hands-on materials and manipulatives to support student learning. We have a lot of great stuff to show you.

Let's go on to slide 3 and talk about pre-teaching UEB math/science symbols and formatting. On this slide, I have a sample problem, $7 - 1 = 6$ in spatial format. And we've gone over spatial format already in this course, but what's so important that I want to point out to you is regardless of what your role is, we need to ensure that that spatial problem in this case is formatted properly, and that we have also shown our student how to read that problem.

Where am I going to find the minus sign? Where am I going to find the separation line? How do those numeric indicators all line up? That's part of the pre-teaching process. So we're going to show our students the new symbols. In this case, it might be visible space or the tally marks or a new sign of comparison, like less than or greater than. We want to familiarize them with those symbols so that when they're in the math instructional part of their day from their classroom teacher, that they're not saying, "Wow, I've never seen this symbol before. I don't know what this means."

We also want to make sure, as I've said about the spatial formatting, that things like centered headings and how multiple-choice problems are formatted. So it's important that you take the time to pre-teach these things to your students.

Slide 4 talks about teaching new symbols. We advocate that you consider making flashcards for your student. A good way to make flashcards is to first cut off the top right corner for orientation, and then on the flashcard, to use dots 2-5, and we recommend you use three cells of these, followed by a space, then whatever math symbol you're teaching, space, and again, three cells of dots 2-5. This way, as your student reads across the flashcard, their fingers are aligned with the symbol so that they're able to tell the position of the dots in the symbol.

Slide 5 talks about correct finger placement. It's important that our students know which fingers go on which key, and that they need to use their thumb for spacing. I love the way that the teacher for this student used popsicle sticks to separate the keys to help her with positioning her fingers. You're also going to want to develop individual memory cues to help your student remember things.

As the teacher of students with visual impairments, it's important that you get to know your student and also make a determination of when pre-teaching the student concepts is important to do for that student's understanding in the general math class. Let's hear from Kari, who is a teacher of students with visual impairments, about some of the things that she pre-teaches to her students.

KARI ARNOLD: Sometimes it requires with our students that are visually impaired that we do some pre-teaching and post-teaching, where we preview the material to them, particularly in math seems to be a difficult subject for students that are visually impaired. So we might look ahead of what's coming with the math, introduce any new contractions, braille contractions, and symbols that might be involved in that new math. And then after the lesson is taught in the classroom setting, we might spend some time in the resource room, practicing that skill a little bit more to make sure that they understand it.

SPEAKER: On slide 6, I want to talk about some tools that are helpful when pre-teaching concepts to our students. The first is the Draftsman Tactile Drawing Board. This uses a special film and a stylus, so what you draw with the stylus becomes raised. In the picture, you see a large circle. And on either side of the large circle, you see smaller circles. The teachers ask the student to make each circle in half. And the student has done so accurately with the smaller circles, but hasn't done so accurately with the large circle.

APH recently came out with the Tactile Doodle, very similar to the Draftsman. It's easier to use. And you'll see in the picture that a young student is exploring a circle that she's drawing. Next, we have the 5 and 10 frames. We see a dad looking on as his daughter works with these. On the right 10 frame, she's put six blue circles and is placing the third of three yellow circles. $6 + 3 = 9$. And we also have the individual calendar kit. We see a student who is working in the month of March. He's laid out the different dates for the month of March, and he's going through to find today's date.

Slide 7 talks about the importance of teaching students organizational skills. So our students may use tools such as sorting trays. And we see a student who has one of the APH yellow sorting trays, and it's divided into three sections. They're each labeled. The one on the left is hundreds, the one on the middle is tens, and the one on the right is ones. And you'll notice that the top right corner of those labeled cards are cut for orientation. And the student is using Digi-Blocks to write a number. So she's working on her tens.

For your student, besides sorting trays, you might want to consider storage boxes, baskets, thinking about how you're going to label materials for them. And then also, it's helpful for many students if you use a non-slip surface, such as rubber shelf liner, so that materials don't move.

Slide 8 talks about building understanding of number relationships. And I have three items to talk with you about. The APH Hundreds Chart is a very valuable tool. It has a yellow background with black numbers in print and braille numbers. Each square is tactually separated by raised lines.

Base 10 blocks are another valuable tool. So we have the 100s, we have the flats, which are the 10s, and we have the 1s. So those are another tool that are often in classrooms, not specifically for visually impaired students, but are very helpful. And then a 120 chart so that the student can use this to count to 120. So three tools, among many, that can help students understand number relationships.

Slide 9 is the APH product, HANDS-ON Kit: Functional Activities for Visually Impaired Preschoolers. And it's all packaged up there for you with nice yellow trays that are divided in many different configurations. There's manipulatives and a teacher book. This is a Montessori-based activities curriculum that comes with a guidebook for teachers. So if you're not familiar with Montessori, not to worry. And we like this quote directly from the APH website, that this product "helps children develop skills such as concentration and visual coordination, ability to complete a cycle of activity, and socialization skills.

Also helps develop a sense of order and a positive self-image." Don't want you to think that our tools are specific for visually impaired students, have to be used in isolation. So you can bring other students into activities. And your student can get some benefits from socializing with other children.

Let's go on to slide 10, and I want to talk about FOCUS in Mathematics Kit, the second edition available from APH. And we have a lot of topics that are in this kit. Numbers and operations, geometry, algebra, measurement, data analysis, all for our young learners in pre-kindergarten to first grade. I have some of the materials shown in my slides, including small work play trays with dividers, base ten blocks for units, rods and flats. And you also get a teacher book that comes with the FOCUS in Mathematics Kit. I do want to point out-- and this is very important if your student is a UEB math/science learner-- that the worksheets and flashcards that come with the FOCUS in Mathematics kit are in Nemeth, so you're going to need to prepare your own.

Let's go on to slide 11 and talk about some more products from APH. These are for number and algebraic reasoning. So love, love, love, our Feel 'n Peel UEB Braille-Print Numbers 0 to 100. You can do so much with these things, folks. We got our 100s board and manipulatives, the UEB edition. So make sure, when you're ordering, if your student is a UEB math/science person, that you order the UEB edition. We've got consumable 100s charts. And then we have MathBuilders Unit 1, which focuses on matching, sorting, and patterning. We do want to caution you that the MathBuilder Unit 1 materials does have a few worksheets with problems that are numbered in Nemeth, so you may want to re-braille those worksheets or take the time to explain to your student that there's two ways to do math and point out those numbers that are in Nemeth, so in the lower part of the cell.

Let's go on to slide 12, lots more great things from our friends at APH. We've got geometry and graphing products that we can use with our young students. So MathBuilders Unit 6 is the geometry kit. And again, I want to point out that the reference sheets and worksheets that come with MathBuilders Unit 6 are in Nemeth. So you're going to need to prepare those for UEB math/science learners and the code that they're used to seeing. Lots more Feel 'n Peel stickers. Love the symbols and stars. And of course, the Feel 'n Peel Carousel of Textures is another great resource.

Shape Board is a great way to help your students, circles, triangles, working on all those shapes. We got textured sorting circles and shapes, embossed graph sheets. I like the 1-inch ones with our younger students in that 10 by 10 grid.

And one of my favorite products of all time, the Picture Maker Wheatley Tactile Diagramming Kit. You can do so much with that kit and also encourage your students to make their own drawings. So if, in class, the teacher is having children draw squares and triangles and circles, the Wheatley's a great quick tool to have your student use to do their drawing right alongside their peers, who may be using paper and pencil or an app on their device that might not be accessible to our students.

Slide 13 takes us into addition and subtraction products that are available from APH. And you'll see the Math Drill Cards in Braille and Large Print, Addition Facts in UEB, and they also have the Subtraction Facts in UEB. And I have a photo here where I've organized my work tray with divider into three piles. So my student has the flashcards that they're going to be working on the left. So this one says 18 minus 9. If my student gets the problem correct, I have them place the flashcard in the next section, the middle section. And those that they get incorrect, I have them place in the far-right section. And that way, we can go back and review the ones that they had a challenge with.

Slide 14, I love those products from APH, so we're going to keep them coming. The game kit and material bag with four dice and six game tokens is a lot of fun for whatever game they're playing in the classroom. And this way, it's accessible to everybody. Graphic Art Tape, you're going to use that all the time. Anything that needs to be outlined and shown, Graphic Art Tape is great for that. The Puzzle Form Board Kit is another great tool. We really love the fractional parts and whole circles.

And one of our all-time favorites is the Tactile Tangrams Kit. And I have the teacher edition manual pictured here, and then some of the tactile tangrams. So we have a plastic sheet with a raised drawing of the shapes, and the student can fill in the shapes with the appropriate tangram piece. So a good way to talk about different shapes, how shapes can be manipulated. You can do a lot with the Tactile Tangram Kit. And you're going to find some good ideas in that teacher manual.

Slide 15, we just keep them coming, even more APH products. And so MathBuilders Unit 7 is focused on fractions, mixed numbers, and decimals. And as with the unit 1 and 6 that we've already mentioned to you, that we have some of the materials are in Nemeth, and so you're going to have to think about making your own UEB labels for the manipulatives. So just review the APH kits in this MathBuilder series. Figure out what is in Nemeth that would be challenging for your student, and prepare that in UEB. And then all these great activities and manipulatives will be in the code that your student is learning at this time.

On slide 16, we're going to talk about hands-on materials and manipulatives for math and science. These are not APH products so you have to buy them separately. Wikki Stix is a great product, very versatile. So in the picture, out of Wikki Stix, a circle, square, and triangle have been made, and the student has cards with these words on them and has to correctly match up the shape name to the actual shape. You could

give the child the shape name and have the student use their Wikki Stix to make the shape, circle, square, and triangle.

Another great use of Wikki Stix is underlining. So in the picture, I have three rows of numbers, and the child has little pieces of Wikki Stix and needs to underline the first number shown when it appears again later in the line. So in the first line, we have the number 22 is first. So the student reads 29, 21, 22, and 20, and has correctly put a piece of Wikki Stix under 22. In the second line, the student is looking for the number 48, and in the third line, the number 35. And we have a very bright student who has underlined all the numbers properly.

Digi-Block Store has the classic block-of-100 and the power block-of-100. And we see in the picture that a student is using Digi-Blocks to form a number, and she's doing this on an APH tray with the two dividers. Slide 17 talks about hands-on materials and manipulatives for math and science additional products that we want you to think about. The Math Window has a braille basic math kit that's in UEB. There's a lot of kits with the Math Window so make sure that you're ordering the UEB one.

Didax, that's where you can get your teddy bear counters, your unifix cubes. And then EASY LLC, we really like the inTACT Sketchpad, and I have an example of that where we have a big circle, a square, a triangle and a rectangle drawn on that tool. So another tool to use with your students.

Slide 18 is an example of an activity that you can create for pre-kindergarten students called Building a Train. You're going to need to get your materials, which are foam stickers, craft sticks, and then make flashcards labeled 1 to 7. Be very easy to add print to these flashcards, so your student who's a braille reader can do this activity with somebody who's a print reader. So the student will shuffle these flashcards and then pick a card. And using the foam stickers and the popsicle stick or the craft stick, if you want to call it that, the student is going to make their train, and then they can go around and race that train. So that's a fun way that you can practice counting concepts, as they put these foam stickers onto the crafts stick.

Slide 19 is an activity that we often see used with kindergartens. It's Tens and Ones, working on place value. We've made it easy for you where we've prepared in braille a place value chart. So it says place value at the top, and then we set it up in table format. So the first column is tens, the second column is ones, and the idea here is that the student will put down their base 10 rods and unit cubes to represent the numbers on flashcards.

So you're going to have flashcards, braille numbers 1 to 99. Students are going to pick up the flashcard from the deck. So I've picked up a card from the pile that says 25 in braille. I'm going to read that card, and then I'm going to take with my Digi-Blocks and I'm going to put down two rods under the heading tens and 5 units under the heading ones to create the number 25.

Slide 20 is a kindergarten activity called Rebuild a Hundreds Chart. So this hundreds chart has been cut apart into different chunks. And the idea is that you give the student the chunks all mixed up, and the

student has to assemble this hundreds chart to put it back together, so that the numbers are in order from 1 to 100.

Slide 21 is our last one for this lesson, and it's another activity that I want to show you. This one's for first grade students, and it's a maze. And we also have this posted for you so you can download this maze. The nice thing is you can adapt it and make other mazes. But you'll notice that we're going to start at the top left and the first box says start. I have a little door, a little break in the braille cells that are going vertical, to help the student orient to where they need to move. So after start, I move to the right, and I've got the problem $20 \text{ minus } 11$. So the student would say the answer and then move to the next box, moving to the right, $13 \text{ plus } 4$, and so on. And the very last box says finish.

So download this maze, give it a try with your students, and we hope that through this lesson, you've gotten some ideas of both products that are available for purchase and activities that you can create yourself to use with your students in pre-kindergarten through first grade. You are ready to go on to our last lesson, so move on to Lesson 7. Thank you.