Project_INSPIRE_Course_4_Lesson_1

SPEAKER: Welcome to Geometry and Tactile Graphics for Students in Grades 3 to 8. This is Lesson 1: Basic Shapes and Angles Used in Geometry. Slide two has the objectives. You're going to be able to read and write the names of basic shapes, you're going to be able to read and write problems containing geometric math expressions, and read and write problems containing shapes to represent omitted material.

Let's go on to slide three and talk about what a shape is in Nemeth code within UEB context. Now, we have what's called the shape indicator that alerts the braille reader that what comes in the next cell is a shape. And that shape indicator is dots 1-2-4-6. And you could think of a shape as a miniature picture of a geometric figure or another object.

So for example, the picture of a circle or a picture of an angle. For regular polygons, and these are squares, for example, you're going to begin with the shape indicator and then you're going to follow that by the number that represents the number of sides. So the way I braille a square is shape indicator, four.

For irregular polygons, triangles, circles, diamonds, what I'm going to do is I'm going to use the symbol that's assigned for that shape. And I'm going to show you that here in just a second. So it's going to be shape indicator and then what's a sign for that. So let's look at this on slide four.

So, for example, if I want to tell the braille reader that we have a circle, it's shape indicator C. A square, as I told you, is shape indicator, four. A parallelogram, shaped indicator, G. A triangle, shape indicator, T. And an angle is shape indicator, dots 2-4-6. And I think of that as looking like an angle so that it helps me remember that one.

Let's go ahead and go on to slide five and talk about spacing and capitalization with shape symbols. Regardless of how things look in print, folks, you're always going to put a space between the shape symbol and its descriptor. So if I have a shape in print and then there's a space between it and the letter or letters that come after it, in braille, I'm going to do the same thing.

But sometimes, in print, there is no space between them. I'm still going to put a space. A lot of times in math we use italics when showing, for example, angle A or circle P. In braille, we're going to ditch the italics. It doesn't have meaning here. So let's look at my first example, which actually is angle A.

So in print, I see that the angle sign and the A are touching each other. In braille, I'm going to do shape indicator, that's dots 1-2-4-6, my angle symbol 2-4-6, space, cap A. Even though in print there was no space between the angle and the cap A, I'm going to put it in braille. The same thing with circle P. Shape indicator C for circle and then cap P. So I am using my consistent way of brailling.

If a shape is followed by letters, I want you to remember that each letter is individually capitalized. And the way I actually think about this is this first example triangle ABC. In my

mind, I think about a triangle and I think about side A, side B, and side C. They're each separate sides, they each get their own capital. And that personally helps me in remembering.

So to do my triangle ABC, I'm going to do my shape indicator, T for triangle, space, cap A, cap B, cap C. I've got my parallelogram, shape indicator G, space, cap L, cap M, cap N, cap O. So parallelogram LMNO in print. There's no space between the parallelogram and the L. But in braille, there is.

Slide six talks about signs of comparison used in geometry. And with signs of comparison, remember, we always put a space on either side. So I've got three examples for you. The first one uses the symbol for similar. So I have triangle XYZ is similar to triangle ABC.

So the way I'm going to do this as I'm going to start with my shape indicator, T, space, cap X, cap Y, cap Z, space. And then, my symbol for similar, which is dot 4, dots 1-5-6, and a space after that. Because remember, signs of comparison, space on either side. It triangle ABC. So shape indicator, T, space, cap A, cap B, cap C.

Let's look at the second example. This is saying angle C is congruent to angle D. So the way I'm going to braille this is shape indicator, my angle sign. So shape indicator, 2-4-6, space, C, space, and then to braille congruent, it's dot 4, dot 1-5-6. And then, my equals sign, 4-6, 1-3, space, shape indicator, my angle sign, space, D.

And then, when we want to show something that's non-congruent, we're going to use very similar to congruent, but you'll notice that we put the 3-4 in front of it. So let's take a look at angle one is not congruent to angle two. So shape indicator, angle, space, numeric indicator, one, space, dot 3-4, dot 4, dot 1-5-6, my equal sign, space, I'm going to do angle two.

So shape indicator, angle, space, 2. Let's go on to slide seven and it's your turn to do Activity 1A. So I want you to interline the following. You only got three examples there. You can do it. When you're ready, come on back.

Alright, slide eight, how did you do on Activity 1A? Check your work. If you need to go back and review please do. Slide nine. Now, it's time for you to transcribe. So I've got Activity 1B for you to complete. When you're ready, please come back and check your work. Slide ten is the answer key to Activity 1B. Again, if you missed anything, please go back and make sure you review the information before you go on.

Slide 11, we're going to talk about measures of angles. And we use the letter M to represent measure, and we put that in front of the angle. There is never an English Letter Indicator. So it's always just the M followed by the angle symbol. How do you braille the degree? The degree is a superscript. So it's dots 4-5, dots 4-6, dot 1-6. So that's how we represent degree.

So let's look at my first example. The measure of angle 2 equals 30 degrees. So I've got my M, my shape indicator, angle symbol, space, 2, space, equals, space, and then 30 degrees. Numeric indicator 30 and then that degree symbol: 4-5, 4-6, 1-6. Very similar. I've got the measure of angle DEF equals 90 degrees. So it's the same thing.

Got my M. Then, I've got my shape indicator. I've got my angle symbol. And then I got cap D, cap E, cap F, space, equals, space, and then my 90 degrees. So the 90 and then my degree sign dots 4-5, dots 4-6, dots 1-6.

Slide 12 is about the signs of operation used in geometry. You do not put a space between the measurement of an angle and a sign of operation. And we've talked about signs of operation throughout these courses. So that's a pretty solid rule with few exceptions.

So let's look at the measure of angle 1 plus the measure of angle 2 equals 90 degrees. So I'm going to do M, shape indicator, angle, space, 1 plus M, shape indicator, angle, space, 2, space, equals, space, 90 degrees. So do you see how after I have angle 1, I put that plus sign right away. And then, the M, shape indicator, angle.

It's the same thing in the measure of angle AOB plus the measure of angle BOC equals the measure of angle AOC. Start out with my M, my shape indicator, angle, space, cap A, cap O, cap B, my plus sign, my M, my shape indicator, angle symbol, space, BOC, each one capitalized, of course, space, equals, space, M, shape indicator, angle, space, cap A, cap O, cap C. So take a moment to make sure you got this here on slide 12 before we go on to slide 13.

Slide 13 talks about shape symbols that represent omission. Something's missing. My student's got to fill it in now. When shapes are representing omission, and our students are in fourth grade or on up, we're going to use these symbols we've been talking about today, like shape indicator C for circle.

But if our student is prekindergarten and kindergarten, first, second or third grade, you are physically going to make the shape in a tactile way. So it might be a sticker, it might be graphics tape. We've got a little example here. Diamond plus 4 equals triangle. So I would physically make a diamond, braille my plus sign, 4, space, equals sign, space, and then, I would physically make a triangle.

My student who is in fourth grade might have the problem 7 times circle equals 35. So I want my students to fill in a 5. So the way I'm going to braille this is numeric indicator, 7, times sign, shape indicator, C, space, equal sign, space, 35.

My second example here is a fraction. So square over 4 equals 10 over 40. So my numerator in the first fraction is being shown by a square, meaning the student needs to fill in the 1. So I'm going to open my fraction, dots 1-4-5-6. My shape indicator, 4 representing the square. My horizontal fraction line dots 3-4. My denominator of 4. I'm going to close that fraction. 3-4-5-6, space, equals, space. And then, I have the fraction 10 over 40. Ten-fortieths.

Okay, slide 14. We are talking about my friend the multipurpose indicator with a regular polygon, which in this case, is a square. So a regular polygon means that all the sides are equal. And we use the shape indicator, 4 to represent a square. Our multipurpose indicator is a dot 5. And it does a lot of things. So I'm going to show you what it does here.

I'm going to place the multipurpose indicator after the square, in this case, to tell the braille reader that the square has finished and it's now time for the number that follows. So let me show you in my first example.

50 equals 100 square 2. So the numeric indicator, 50, space, equals, space, 100. Okay, I've got a square. So my shape indicator, 4. Great. I know how to do that. I follow that 4 representing the square with a dot 5 because this is not a 42-sided shape, folks. I have to have a way to tell the braille reader that the square has stopped and the number follows.

The same thing in y minus 7 square 5 equals 67. So I do Y, minus 7, shape indicator, 4 for my square, I need to stop the square with my multipurpose indicator, my dot 5, before I hit number 5. Otherwise, I have a 45-sided shape. Space, equals, space, 67.

We are on to slide 15, and it is your turn to do some transcribing with Activity 1C. So please transcribe the three problems. And when you're ready, come on back. Slide 16 is the answer key. So make sure that you brailled everything correctly before we go on. If you missed something, I want you to go back and review and try brailling it again.

Slide 17 has to do with shapes that are surrounded by text. Now, you all know that we combine UEB and Nemeth code. And so we have our opening and closing Nemeth indicators that we use. So when I have a sign of shape, I obviously am in math. And so I need to make sure that that sign shape is inside of my Nemeth code indicators, my switch indicators.

So let's take a look here. I've got problem four. "In the problem" comma, "'square' represents an even number and 'triangle' represents an odd number." So here I am. I'm in UEB. I'm brailling along. I've brailled my problem number, "I the problem". Now, I need to show the braille reader the square.

So I'm going to open up Nemeth with dots 4-5-6, 1-4-6, space, put my square symbol, which is shape indicator, 4, space, going to do 4-5-6, 1-5-6, my closing Nemeth indicator. I'm backing in UEB. I continue along, "represents an even number and". Here we go. Got a triangle.

So I'm going to open Nemeth code, space, triangle, symbol space, I'm going to terminate Nemeth code, space, and then I'm back into UEB "represents an odd number" period. So we're going to start and stop Nemeth if we have to use a shape.

So I want you now on slide 18 to do Activity 1D where you're going to get to practice what we just talked about, which was shapes combined with words. When you're ready, please come back and check your answers. And here we are on slide 19. You are now able to check your answers to Activity 1D. And congratulations, you're finished with Lesson 1. We've got a lot crammed in here. But I hope that you're feeling very confident with the shape symbol and how we use this in geometry. Going to go ahead when you're ready and have you go on to Lesson 2. Thank you.