Equivalent Expressions (Grade 6)

[00:00:08.28] So, remember when I told you-- let's have everybody's attention here. Remember when I told you I went scoring?

[00:00:12.54] Yes.

[00:00:13.43] And I learned the things that were most important for sixth graders to know to be successful in seventh grade?

[00:00:20.49] Yeah.

[00:00:21.01] Well, I made a lesson to highlight one of those really important things. And we talked about properties of numbers. And so what we talked about with properties of numbers, and what we've learned about patterns, and variables, and equations-- sorry, expression-- we're going to use today, because this is something that's super important. Sixth graders really need to know this to be successful in seventh grade. So we're going to start with a focused question. Is there a reader out there? Morano, can you read the focus question for us?

[00:00:54.96] Focus question. How do we know whether expressions are equivalent?

[00:00:59.76] Great, so how do we know whether expressions are equivalent? And then keep reading. By the end of this lesson.

[00:01:04.08] By the end of this lesson, you will be to identify and create equivalent expressions using numbers properly.

[00:01:10.79] Great, so does that number property sound familiar?

[00:01:13.50] Yeah.

[00:01:14.04] Now you have expressions sound familiar? And then equivalent should sound familiar. All right. So you got a lot of materials in your basket. Why don't you just take a look. Find-- there's a sheet that looks like this. That needs to go on the floor. Find the sheet that looks like this. Make sure everyone has one. It might be yellow. It might be white. Make sure everyone in your group has one. So in a moment-- so make sure everybody has one. You can start putting your name, your class, and your date on it. You can put the other sheets back in the basket. That's why we want all the materials on the floor, so you have space.

[00:02:02.46] Can they be..the floor?

[00:02:03.35] That's fine.

[00:02:05.11] So, make sure your name, your date, and your class is on this, please, everybody. So in a moment I'm going to show you a pattern. I'm going to show you a pattern made out of toothpicks. I'm going to show you the first shapes, the second shapes, the third, maybe the fourth shape. And then your job is to create the fifth, the sixth, the seventh, then the eighth shape-- what it's going to look like. So you're thinking about the pattern. What's the pattern? Build other shapes that match it, OK?

[00:02:32.27] So you can use the back of your graphic organizer if you need to draw the pattern. You have grid paper if that'll help you draw out the pattern. And then are also toothpicks in the basket. You can use the toothpicks, if you like, to help you figure out the pattern. You will use the toothpicks in the right way. You know what to do with them.

[00:02:57.12] OK, so let me show you the pattern. I'll show you the pattern. There's the pattern. So there are four different shapes there. What's the fifth shape look like? What's the sixth shape, seventh, and eighth shape look like? I want you to draw those shapes. Also in your basket, you have pictures if this is really hard to see. So I'll give you a couple minutes. I want you to draw the next few shapes. I want you to draw in the model part of your graphic organizer. Please talk to each other to draw those next couple of patterns.

[00:03:34.07] So what does it look like? So that's the-- oh, look. That one. That one. Can you do that one, or that's one already there?

[00:03:40.56] The face is the same.

[00:03:41.43] That one was already there, right? Do you think that's right?

[00:03:44.04] So are we supposed to draw a [INAUDIBLE]?

[00:03:46.27] Right now, probably, yeah.

[00:03:48.75] Ms. Jackson, I want you guys just to look at the shapes right now, OK?

[00:03:51.61] As I see in these pictures, it's going up by one.

[00:03:53.96] It's going up by one? What's going up by one?

[00:03:56.05] The lines and shapes.

[00:03:58.61] The sides keep going up.

[00:04:00.19] The sides seem to look like they're going up. OK, can you draw what the next shape would look like?

[00:04:03.28] Yes.

[00:04:03.49] And then after that, the next three, at least the next three?

[00:04:06.18] OK, yeah. Of course.

[00:04:12.23] So there's a number of people who are finishing up their shapes. So, shape five, shape six, and shape seven. OK? So I'll give you another 30 seconds just to finish. Make sure you've labeled five, six, and seven. And then I think your shapes will look like that?

[00:04:32.80] Yep.

[00:04:33.75] Is that true?

[00:04:34.38] Yes.

[00:04:35.66] OK. Now think about think about it privately first. What do you want to complete next? Because I'm going to ask you to create an algebraic expression, complete the table, and to write a description in words of the pattern. So you're going to complete those other three quadrants according to the model that you made in that quadrant.

[00:04:57.44] So in other words, what's an algebraic expression to represent what the nth term would be? What's a description of how that pattern grows? Make a table to show how many shapes-- or the number of the shape number and then the number of toothpicks. So think about what you want to start next, and then you can start it. And of course you can have conversations with the people at your table about what you're doing. We'll work on this for about seven minutes. Description?

[00:05:33.54] Yeah.

[00:05:39.94] You want us to describe the pattern?

[00:05:42.45] Yes, describe the way the pattern grows. Describe how it changes.

[00:05:46.08] The number of toothpicks the pattern grows by two per each.

[00:05:50.77] OK. And then I want you to write an algebraic expression.

[00:06:03.30] What do we see the pattern [INAUDIBLE]? I see that the pattern goes up by one.

[00:06:08.39] So let's be a bit more mathematically descriptive. Goes up by one, what kind of math words can you put in there?

[00:06:14.43] Increase [INAUDIBLE].

[00:06:17.43] That's one light.

[00:06:18.69] And then I want you to think about putting what you said in words into an algebraic expression. So we should be focusing-- moving into completing all four quadrants now. Algebraic expression. I'll explain to you [INAUDIBLE].

[00:06:32.63] That's how I got y equals 2x plus [INAUDIBLE].

[00:06:35.89] So it's a shape number, right? So, 1, 2, 3, 4. Do we start with one-- shape one or shape five?

[00:06:42.54] [INTERPOSING VOICES]

[00:06:45.37] You're doing it based on your model which is here, which starts with five and six.

[00:06:49.45] So I only do five, six, and seven, eight?

[00:06:52.07] Mhm.

[00:06:53.01] 4 9x. And then--

[00:06:57.34] Oh, okay.

[00:06:58.69] Yeah. And this the y-axis, I just use this because I just started from here.

[00:07:02.97] The relationship between the number of toothpicks--

[00:07:06.17] You got it right?

[00:07:07.22] --and the shorter number.

[00:07:08.88] How is it to be 18, 20, 22, 24?

[00:07:14.21] It's 12, 14, 16, 18, 21, 22, 23.

[00:07:18.32] 21?

[00:07:19.73] Yeah.

[00:07:21.36] Or it's-- nice expression. So tell me about this.

[00:07:24.15] So [Student name] actually explained it to me. And so we did from-- so I put y here because it's x and y, so I did the y. [INAUDIBLE].

[00:07:35.04] OK.

[00:07:35.54] Then I did two times, and it would be-- it'd sometimes add by 2, so I did [INAUDIBLE].

[00:07:42.25] OK. So I see, you started at 5, and Denise, it's look like you maybe were starting at 1? Is that OK?

[00:07:48.52] Why?

[00:07:48.82] Why is it OK? You don't sound sure. It is OK. Why is it OK?

[00:07:55.59] Because it's the same thing. I just added 1, 2, 3, 4, 5.

[00:08:01.28] You start at a lower number. So then let's go. Algebraic expression, description in words. I'm going to need volunteers to connect two of those quadrants. So you're going to have to explain how your algebraic expression relates to your model, or how your model relates to your table, or how your table relates to your description. So, I'm going to give you about two minutes to get ready. I'm going to maybe pick one or two people to explain, OK?

[00:08:23.63] Oh, I want to go.

[00:08:24.88] Miss Jackson?

[00:08:25.71] Keep working until that time. You don't understand this? Did you talk to people at your table?

[00:08:36.61] No, he never talks to--

[00:08:37.94] He never talked to us.

[00:08:39.04] These are your first-- this is your first weekend, so you should be paying attention. Let's do that side for now. Then you could do [INAUDIBLE].

[00:08:52.79] I was doing my work.

[00:08:54.79] So maybe she was doing her work. [INAUDIBLE].

[00:09:08.75] I want to do a table.

[00:09:10.36] Miss Jackson, I was going to show the next person was like, ask people to [INAUDIBLE]. Let's say you have--

[00:09:16.15] You're adding to--

[00:09:17.11] The shape number was [INAUDIBLE].

[00:09:19.83] Yeah.

[00:09:21.72] t would be, that's for [INAUDIBLE].

[00:09:24.53] OK.

[00:09:25.00] No, [INAUDIBLE].

[00:09:26.62] OK, plus two more. So I want you to make an expression. Just put it on paper and then check it.

[00:09:33.07] OK, but I have a question now.

[00:09:35.51] Yeah.

[00:09:36.00] Since it's a one, it's not like a rectangle.

[00:09:38.92] Well, it's like a [INAUDIBLE].

[00:09:41.19] [INTERPOSING VOICES]

[00:09:47.75] You're right. It's not like a rectangle.

[00:09:51.28] So, s times t plus 2, right?

[00:09:54.40] Uhuh. So you want-- if s stands for shape, then you're going to put a 1 there. Can everybody see this? Can you see the fountain, right? You can? Then you might need to move, so you can see it. S stands for-- right, if s is shape. And then you want to say 1. And then what's t-- going to be toothpicks, OK. So 4?

[00:10:13.24] 4 plus 2 equals [INAUDIBLE].

[00:10:15.11] Does that equal 1?

[00:10:16.81] No.

[00:10:17.41] No. So I'm not sure that that's the right expression.

[00:10:21.05] Oh.

[00:10:21.48] Do you understand what we did? Jayden, so you thought of something [INAUDIBLE] the table.

[00:10:26.27] OK.

[00:10:26.73] OK. So I found someone to talk to us about the shape.

[00:10:30.38] Can I do the table?

[00:10:33.83] That looks good. Those are good.

[00:10:35.29] Can I do the table?

[00:10:37.13] [INTERPOSING VOICES].

[00:10:41.04] OK, so we have a Doc Reader for you, Kaylee. And you're going to connect. Yeah, she's going to connect her algebraic expression to the table. You want to do it on the board, or you want to do it on the Doc Reader?

[00:10:54.32] [INAUDIBLE]

[00:10:54.81] OK, fine. The whiteboard or the other board?

[00:10:57.25] Yay, Teacher Kaylee

[00:11:00.49] OK, so my algebraic expression is--

[00:11:03.42] Kaylee, you can put it on the white board. Not with that marker though. [INAUDIBLE]. Yeah, write on there.

[00:11:11.20] Oh, the SMART Board. So your algebraic expression is 2s plus 2. And I got this because the shape number, as seen on table, we had shape number one. And then 1 times 2 equals 2. And then add 2, and you get 4, which is the total number of toothpicks. So that's how the algebraic expression relates to the table. And my example is the shape number. So 2 times the shape number is 2. So that's equal 4. And then add 2 equals 6. Understand?

[00:11:47.41] Oh, but don't you have to use the number of toothpicks [INAUDIBLE]?

[00:11:51.10] Yeah, the shape number. And then you add two to get the number of toothpicks. That's how you get the total number of toothpicks.

[00:11:58.76] So, let me see if I understand what you're saying. You are missing the number of toothpicks. You're saying how do I know it equals the number of toothpicks? So that's a great expression. I wonder how can we represent where toothpicks would be here, right? What do you think, Max?

[00:12:22.79] If you want the toothpicks, you can put t equals 2s plus 2 and that would be

[00:12:28.12] Does that make sense?

[00:12:29.09] Yeah. So, Ronald, does that kind of what you were asking?

[00:12:31.94] Yeah.

[00:12:32.25] Yeah. So if we do like this-- I'm trying it to make it smaller.

[00:12:35.54] Oh yeah, I can rewrite it.

[00:12:36.72] That's not gonna work. But we basically say equal equals t. OK. And that's an equation. It has an equal sign. [Student name] has a question. [Studet name] a question.

[00:12:48.12] I was asking if I could show

[00:12:50.01] Oh, I think we only need one for now, because we're going to move on to a second activity. This is just to get us warmed up. You have a question, [Student name]? What is it?

[00:13:00.89] If it's an expression, so it has the equal sign in it?

[00:13:03.74] Yes.

[00:13:05.77] You're right. So what I should have written was algebraic expression or an equation. That would have been more clear. You're right. Does that make sense, guys? What Kaylee would have wrote was an expression. And now we have an equation that equals t. Thanks for pointing that out.

[00:13:19.44] OK, so now we have acclimated ourselves to a writing expression, I'm wondering about equivalent expression. I'm wondering if there were more ways to write that pattern-- if there were more ways to express that pattern, right? So here are a bunch of ways, perhaps, we could have written that expression. I wonder which of these are equal to the expression that Kaylee wrote. So Kaylee gave us 2n plus

[00:13:53.93] [INTERPOSING VOICES]

[00:13:57.90] And what did s stand for, Kaylee?

[00:13:59.60] Shape.

[00:14:00.55] Shape. So if I write 2n because all of these have n's, what do my n's stand for?

[00:14:06.67] Number.

[00:14:07.53] Shape number, right? It's still the variable. So you're right, Kaylee. You did to 2n. I'm going to write it like this for the sake of consistency because all of these have n. So I'm wondering which of these nine are equal to the expression that Kaylee gave us. I'm wondering. You're going to have to figure it out. So look in your basket. Have one person, or handout, that math sheet. Make sure your name, your date, and your class are on it.

[00:14:36.78] What do we do with the finished ones?

[00:14:39.31] Just put them to the side.

[00:14:48.09] So everybody should have a sheet. And you'll also find this-- I don't know. What color is this? Salmon?

[00:14:54.57] It's pink.

[00:14:55.56] So you'll have the pink sheet that reminds you of the property, properties that we recently spoke about. So there are only two. So, everybody doesn't need it. Maybe it's just one per pair. So let's have somebody read the instructions for us first just so we're on the same page before we just jump in. [Student name], can you read the instructions please?

[00:15:16.64] Determine if these expressions are equivalent to our target expression. Use mathematical to support your answer and write yes or no bonus. Write what property you could use to put your answer.

[00:15:29.61] Just to remind you of the properties, I want to know if these are equivalent expressions. OK? Let's work. So you can write yes or no. OK, so which one are we looking at first?

[00:15:44.94] I guess-- I think one for that, actually. Because we would have-- I think she wrote 2s plus 2, so I thought 2n was the shape and the number, it's kind of the same thing, so I thought it would actually be similar terms.

[00:16:00.00] Right, and I think Max will use x, so it's still fine.

[00:16:03.62] Yeah, we both use y. So you both use x, great No, you use x. X.

[00:16:09.29] 2 with an s?

[00:16:10.24] Yes, because that was the same one we used. And now what about with number two? Is that equal to our target expression?

[00:16:16.39] No.

[00:16:17.11] You say no. You say yes. They say yes.

[00:16:19.84] I say yes.

[00:16:20.25] I don't know what's right. I don't know.

[00:16:22.18] Yeah, so I think 1 plus 1 is 2, right? That's two n's.

[00:16:25.16] [INTERPOSING VOICES]

[00:16:28.11] Duh.

[00:16:30.56] Do you want to do the beginning first and then come back and do the bonus? OK. So, the first one is obviously yes.

[00:16:46.19] And there's the same thing here.

[00:16:49.28] Do you think [INAUDIBLE]?

[00:16:52.18] Yeah, because this is 2 times n, and then this is n times n.

[00:16:59.68] Give us an example of how that's different.

[00:17:02.48] OK, look.

[00:17:04.46] The same thing's here.

[00:17:06.43] No, it's not. Because look, if n's, let's say, 5, this is the same as 5 times 2. That's 10. This, if 10 minus 5, that's a 5 minus squared. Square is the number times n, itself, so it's 5 times 5 plus 5.

[00:17:27.50] Does that make sense, [Student name]?

[00:17:29.66] It makes sense to me.

[00:17:30.72] Can you explain it back to me? Probably not. We're going to try this over again. Let's hear Amber explain it to [Student name]. Pay attention.

[00:17:38.80] That's the same thing he just wrote.

[00:17:42.90] [INTERPOSING VOICES].

[00:17:44.65] Let's talk to the board. So, [Student name] was talking about number five. OK.

[00:17:50.03] Did you guys get an answer for five yet.

[00:17:51.73] No, I don't understand this.

[00:17:54.68] OK. So I finished, and I only have two problems. So what I was thinking was that this is obviously Katy's, right, up there, so it's a yes.

[00:18:05.15] Yeah.

[00:18:06.05] And then this one is also yes, because you know, the distributive property is going to be 2 times n plus 2 times 1, which is 2n plus-- 2 which is 2

[00:18:15.41] So let's mark on the paper. Because remember the Angry Birds? Where is that? Where is that?

[00:18:19.95] Yes, yesterday.

[00:18:20.44] Right, the Angry Birds. So, remember if we distribute this Angry Bird to this pig, that's Angry Bird times pig. And then, really, the distributive property of multiplication, Jennifer. So, this Angry Bird to this Angry Bird, Angry Bird times Angry Bird. And of course there's a plus sign. You're still adding. OK, so let's use it here. Multiply 2 times n.

[00:18:40.89] Can't do it.

[00:18:43.17] Oh, no. Yeah, you can-- 2n.

[00:18:44.75] We can't add unlike terms, but we can certainly multiply them by 2.

[00:18:48.53] 2n times 2-- plus 2, sorry.

[00:18:51.02] So, plus 2, very good. And we use the distributive property. Here. OK. Where else can you use the distributive property. Maybe you want to use the distributive property if you can first here. Do it here. Oh, and this is-- yes.

[00:19:02.94] It would be 2n, right?

[00:19:04.30] I did, besides the distributive property, [INAUDIBLE].

[00:19:06.18] Was this what she just said?

[00:19:07.64] Miss Jackson.

[00:19:08.85] That's a great way to do it too. That's also a great way to check. I want you to continue to use different properties-- so, the distributive property, or the associative property, definitely the commutative property. Right, Jennifer.

[00:19:20.10] What do I do for these?

[00:19:22.38] Is this equal to our target expression? Yes or no.

[00:19:25.19] Wait, where's our target expression?

[00:19:26.40] On the board-- 2n plus 2.

[00:19:27.98] 2n plus 2. No.

[00:19:30.61] No, so put a no. Keep going.

[00:19:32.31] Wait, but how do you these? I'm still confused.

[00:19:35.54] So this is the one that we started with, right, so this is obviously yes. There were different students at different classes started with different ones, so I just put that one on there. You tell me about this. Is this-- [Student name], number two. Is number two equivalent to our target expression? You say no. Why not?

[00:19:50.76] Because if n plus n equals n.

[00:19:59.46] No, wouldn't n plus n equals 2n?

[00:20:03.84] Yeah, I have n plus n, and that's 2n. So, write 2n. Write 2n.

[00:20:08.07] 2n plus 2.

[00:20:09.03] And then what's left?

[00:20:11.85] Oh yeah, I think it is--

[00:20:12.98] Yeah, it's correct. Yes.

[00:20:14.23] Yes. Very good. Keep going.

[00:20:17.29] The answer was yes.

[00:20:19.11] Yeah.

[00:20:23.74] So what strategy are you guys using?

[00:20:30.87] 2n plus n equals 2n.

[00:20:32.44] 2n equals 2n. [INAUDIBLE]

[00:20:41.81] That's a great strategy. And you?

[00:20:43.67] Yeah.

[00:20:44.16] Same thing. So I'm going to challenge you. Now that you used that strategy, how [INAUDIBLE]-- to use what we know about collecting like terms-- and to use what we know about the properties we talked about yesterday, the distributive property, the commutative property, especially, to simplify these expression. Think about-- you don't have to erase what you've done-- but, you know, the rest of them.

[00:21:05.12] So then it would be like 2n and then plus 2 times 1.

[00:21:11.09] Right. And then 2 times n is 2n. And then 2 times 1 is 2. So that's why [INAUDIBLE] So does this circle mean a yes?

[00:21:21.70] [INAUDIBLE]

[00:21:24.15] OK. And so, your strategy worked. We found that out before. And then the strategy we just talked about, collecting like terms, also works. OK, great.

[00:21:44.46] We have about two minutes, yeah.

[00:21:55.37] Great, good job. You used the distributive property.

[00:22:03.99] Oh my god, just watch. Just watch. Look. Look, you said, plug in n plus 2. And look at what we did yesterday. We multiplied that--

[00:22:11.68] Yeah.

[00:22:12.18] So 2 times 2 is 4, plus 1 is 5.

[00:22:14.18] Oh, but don't forget--

[00:22:15.62] --to seize--

[00:22:16.05] --don't forget, there's the distributive property here. Remember we talked about this yesterday 2-- sorry, a times the quantity of e plus z, right? The distributive property tells us that we have to multiply this number by both of these numbers. Should

[00:22:32.63] So did you do that here?

[00:22:34.71] [INAUDIBLE] so I plug in numbers, too.

[00:22:39.24] OK, so-- I mean, you could write-- so make this so it will be 4.

[00:22:42.86] I don't think so.

[00:22:44.24] 3n plus 5 is 10.

[00:22:46.48] Take away 3--

[00:22:49.76] Ooh.

[00:22:59.98] OK.

[00:23:00.46] All right, so I did 3 times 2, plus 5, minus 3, minus 2. So [INAUDIBLE]

[00:23:10.68] Great. What about--

[00:23:12.54] [INAUDIBLE]

[00:23:14.08] Wonderful. Now, I wonder if there's another way to do this, because you plugged in that sign ahead of table. Yes, that is yes. Let's see if we can use some of our other--

[00:23:22.24] Strategies?

[00:23:22.67] --strategies. So maybe we can collect like terms.

[00:23:26.74] Oh! Oh! 3n and n.

[00:23:30.05] 3n and n. These are like terms, right? OK, use that strategy. It works.

[00:23:56.53] All right. Are you guys in the middle of something? OK, you're checking. OK.

[00:23:59.36] Jennifer says this is what she did.

[00:24:01.04] So let's look at like terms, right? I see you put a little arrow, I mean, like, a little rainbow by the n. And I have a minus n. If I rearrange these guys so the like terms are right beside each other-- and you can do that-- so, like, the associative property of addition, I can move things around into different groups.

[00:24:23.42] So if this is-- mm-hmm.

[00:24:25.54] We had 5 plus [INAUDIBLE]

[00:24:31.28] Right. So tell me what this equals now.

[00:24:37.49] 2n plus--

[00:24:38.92] Unn-mm. What does this say?

[00:24:40.84] N plus --minus n.

[00:24:44.39] What's n minus n?

[00:24:46.07] [INAUDIBLE]

[00:24:46.95] 1 minus 1?

[00:24:48.72] 0.

[00:24:49.16] 10 minus 10?

[00:24:50.47] 0.

[00:24:50.91] 8 minus 8?

[00:24:51.75] 0.

[00:24:52.29] This is 0. This is 0.

[00:24:53.85] Oh.

[00:24:54.24] What's 1 minus 1?

[00:24:56.39] 0.

[00:24:56.89] OK. Tell me about that. All right, ladies and gentlemen. Let's bring it back to the larger. We're going to run out of time.s And I had a quiz for you. And I know you love quizzes.

[00:25:04.20] Quiz?

[00:25:04.64] No!

[00:25:05.08] So let's have everybody's attention this way. You might still be working. I think a lot of you are finished. Let's do some checking.

[00:25:13.26] So the moment of truth. Check it out. You need to check. You check with the other people, not with me.

[00:25:25.57] I did!

[00:25:26.06] You did? You checked that?

[00:25:27.05] Me and [Student name] checked.

[00:25:28.04] How did you check that? I just put that there. Double check. Double check. Double check, please. Is it OK? Good.

[00:25:41.28] Is there one that you had a question about? Just one. Denise? Ssh.

[00:25:49.33] Number 7.

[00:25:50.30] Number 7. Why is number 7 yes? Why is number 7 yes, Ronald?

[00:25:55.49] Number 7 means yes, because let's say you're using 2 and 5-- which I used 2-- 3 times 2 is 6. 6 plus 5 is 11. Minus--

[00:26:10.29] So another-- oh, I'm sorry. Go ahead. Sorry. Keep going.

[00:26:11.81] Minus 2 is 9, minus 3 is 6, which is the number amount of toothpicks. But if you're using 5, 3 times 5 is 15, plus 5 is 20, minus 5 is 15, minus 3, which is 12.

[00:26:31.85] So in other words, you plugged in a number, and you got-- if I was at shape number two, I would have 6 toothpicks. And so, your checked it with your table?

[00:26:40.16] So that's one way to know that that's correct. I wonder if we can just maybe use one of our properties, the commutative property, or maybe the associative property, both of addition, just to collect some like terms, or rearrange these. What do you think, Selma?

[00:26:54.80] So for number 3--

[00:26:57.48] So 7, let's continue to talk about 7.

[00:26:59.76] OK. So, I was using-- What I used for 7 was, since, like, I couldn't remember the parentheses, let's say you put parentheses around 3n-- yeah, what is that? It would be multiplication, and multiplication does it first.

[00:27:16.93] Let me write here. I'm going to write what you said, because I think you can move them, Selma. I think you can rewrite this expression to say-- eyes here-- 3n minus n, and then plus 5, and then minus 3. What do you think about that?

[00:27:32.72] Yes.

[00:27:33.14] That's OK. Right? Because this is still a positive 3n. That's still a plus 5. This is still a minus n. And that's still a minus 3. So it's OK that we arranged it that way.

[00:27:44.33] So the associative property of addition, pretty much. OK, keep going, Selma.

[00:27:48.58] And then, after that, I would, like, plug [INAUDIBLE]

[00:27:51.97] You would plug?

[00:27:53.54] Oh, no, no, sorry.

[00:27:55.99] I mean, you can. But would anybody do anything different?

[00:27:58.54] Yes. Wait, for what?

[00:28:02.04] Yeah, instead of plugging-- instead of plugging and chugging? What would you do, Amber? Arianna?

[00:28:12.89] You could simplify.

[00:28:13.86] Just simplify. So tell me what to do to simplify.

[00:28:18.24] You would do-- it's hard, 'cause it's, like, variables and, like--

[00:28:30.73] Jennifer, what do you think?

[00:28:32.66] Like, to, like, how you could solve it?

[00:28:35.55] How we got to simplify it.

[00:28:36.51] OK. So the same thing as salt, right? OK, for starting with the 3n, we would-- since n and n equal-- yeah, so we could just-- it's just like 3n minus n, and 1-- since we're subtracting 1n, it would be 3 minus 1, which is 2n.

[00:29:00.98] Right.

[00:29:01.44] Plus--

[00:29:01.90] So I've got 3 ns. That's what 3n means, right?

[00:29:06.56] Yes.

[00:29:06.90] [INAUDIBLE], that's what 3n means, right? 3 ns. And then I'm taking away an N. So how many ns do I have left over?

[00:29:12.94] 2.

[00:29:13.37] 2 ns. So then, 3n minus 1n is 2n. And then, I know you know-- so this is maybe where you got a little stuck-- what's 5 minus 3?

[00:29:20.53] 2.

[00:29:21.30] 2. Is this expression the same as our target expression? OK, so we did a great-- you all did a great job. I'm really proud of you.

[00:29:30.96] Listen--

[00:29:31.14] Thank you.

[00:29:31.89] --we're going to have to have your exit slip late. But let me just ask you one question. What were some strategies? Can you name some strategies you used to sum-- I'm sorry-- to find out if these expressions were equivalent? So in other words, let me go back to our focus question. How do we know those expressions were equivalent? Turn and talk for, like, 30 seconds.

[00:30:22.52] It would be harder to find that.

[00:30:35.64] [INAUDIBLE] Should I do [INAUDIBLE] volunteer? Volunteer. OK, so let's hear maybe from just two or three groups. What's one strategy you used to summarize? Jennifer?

[00:30:46.17] Oh, I didn't say strategy. I said, how would you help--

[00:30:50.70] Oh, OK. How did you know whether the expressions were equivalent?

[00:30:53.55] Oh, OK. So once we-- so for question one, we answered the expression--

[00:31:00.73] [BUZZER]

[00:31:01.91] --once we answered the expression, then after we simplified everything, that's how we looked back and Kayleigh's answer. And then, we checked if it was kind of the same thing-- simplify--

[00:31:15.68] So I heard this word, simplify. And that's a great way to think about it So we can simplify using, what, Jeremy? Wait, no, don't move!

[00:31:23.50] The variable?

[00:31:24.38] We're using the variables. Everybody, what do we call-- what do you say--

[00:31:28.84] The associative property?

[00:31:30.21] The associative property, yes, we definitely used property. Enriqua?

[00:31:33.41] Distributive?

[00:31:34.32] We used the distributive property. What did we do with those terms? What kind of terms?

[00:31:39.48] Inequality?

[00:31:40.88] Inequalities?

[00:31:41.81] Inefficient terms?

[00:31:44.60] Unlike terms?

[00:31:45.53] Are they unlike terms, or were they--

[00:31:47.50] Like terms!

[00:31:50.50] So we collected like terms. And we collect [INAUDIBLE] way to say that.