TRANSCRIPT OF PROCEEDINGS

BEFORE THE

COLORADO DEPARTMENT OF EDUCATION COMMISSION

DENVER, COLORADO

February 18, 2015, Part 2

BE IT REMEMBERED THAT on February 18, 2015, the above-entitled meeting was conducted at the Colorado Department of Education, before the following Board Members:

Marcia Neal (R), Chairman
Angelika Schroeder (D), Vice Chairman
Valentina (Val) Flores (D)
Jane Goff (D)
Pam Mazanec (R)
Steve Durham (R)
Debora Scheffel (R)

MADAM CHAIR: Bring our meeting back to order. Mr. Commissioner? Math Standards and learning session.

MR. HAMMOND: Thank you, Madam Vice Chair. One of the things you wanted to talk about -- I'm sorry, math standards and what we call a learning lesson. So -- you ready? Jill, did you want to start?

MS. JILL: Madam Vice Chair? Good afternoon. At the January Board Meeting, several Board members requested an opportunity to dig deeper into our math standards. So we asked our state expert, Dr. Mary Pittman, who is our Math Content Specialist, to engage the Board in a learning session on the standards. She's going to focus on examples, because you asked to actually get in and dig into some of the examples, see some problems, and to get to experience it at different grade levels. So you'll get a chance to see that in her presentation, as well as to see some of the differences between the past standards that we had, the model content standards, and our current math standards. So she'll let you see some of those differences, and engage in questions.

So I'm going to turn it over to her, so she can walk you through her presentation.

MS. PITTMAN: Hello all, thank you for this opportunity to speak to you about the math standards. As

you can imagine, as the math specialist, I get pretty passionate about mathematics. At Thanksgiving, actually, I got to meet my boyfriend's parents, and I started -- they asked me what I did for a living, and after a few moments of me talking he said, "Okay, slow down." Because I get really excited.

So Madam Vice Chair, if I happen to go too fast, will you feel free to interrupt me, and slow me down a little bit.

MADAM CHAIR: I will try. You all as well.

MS. PITTMAN: As well, yes, absolutely. I do want to introduce two people in the audience. I had the pleasure of going down to Colorado Springs, and work a little bit in Widefield District recently. And so Kevin Duren is in the audience. He is one of their people for mathematics in Widefield School District, and his Superintendent, Scott Campbell, both came up to support me today, and are in the audience. So I wanted to thank them so much. Most -- much of what I do is being able to work with districts and learn what -- how they are thinking about things, and all the different ways that our districts are implementing these standards.

So to me, if we're going to talk about the standards, the question is: What do we want our students to learn about mathematics? And knowing their math facts

is absolutely right up there. I want them to be able to -- all of our public wants them to be able to quickly say 72 divided by eight is -- and six times eight is -- and seven plus five is -- and know those without even really thinking about them anymore, because they know their math facts. So yes, and so much more.

Do we want them doing math problems quickly and efficiently? Yes, we have the algorithms called out in our standards. Those traditional algorithms that we all grew up with are called out in our standards, and we are -- said, “Yes, this is important, but so much more.” Because we want our students to be able to not only -- well, actually, get the correct answers, and understand why those answers are correct. And understanding is the mathematics.

I liken this to when you learn to play an instrument -- how many of you have ever learned to play an instrument at some point? Yeah. So you had to do all of those scales, and rhythms and they are important. They are the skills and the knowledge that we need kids -- the doing and the knowing that we need kids to do on the instruments. But at some point, if you never learned to play a song, you kind of miss the point of learning how to do the instrument, right? And so that’s what that understanding is in mathematics. It’s the moment that we learned how to play the song.

So in order to do that, we need to move beyond knowing and doing, and into that understanding. And I describe this as why is this important? Because to compete globally, I can buy a computer that will know and do very efficiently, but only humans can understand. So our kids have to understand in order to compete in this global world. So that means we have to go beyond answer-getting. We need the answer-getting, but we actually have to do the mathematics. We have to play the song. So great teachers, and schools, and districts, have always focused on what it means to do mathematics, and learn in their schools.

But too many adults are afraid of mathematics. I can't tell you how often I tell people what I do for a living, and I get the shudder -- "Oh, you are one of those math people." I want our students to walk out of school not saying, "Oh, you are one of those math people," but excited. When they see this -- a fraction problem, they are not math phobic. They don't suddenly have their anxiety raised. Instead, they are like, yeah, fractions, got it. Handled that in elementary school.

So that means we have to move beyond answer-getting, like the butterfly method. That's a trick. What's the butterfly method? Well, I almost hazard to show it to you, because it's one of those things that many of us

learned, but it's not doing mathematics. It's saying, "I'm going to take one times three, and get three, and I'm going to take one times two and get two, and then I know I have to add along the top, and I know that I have to multiply along the bottom so that I can get five-sixth." And kids pretty efficiently get the right answer when they do this. However, it does not help them when they have to solve this problem.

UNIDENTIFIED VOICE: (Inaudible).

MS. PITTMAN: Huh? You may have to solve this problem. Because the butterfly method is designed for adding two fractions together. Only 20 percent of kids from a tradition that does answer-getting, the butterfly methods tricks, answer this question correctly. Eighty percent of students that come from traditions where learning the mathematics is the goal, answer this question correctly. And we know that we're in big trouble when we get to algebra, and we only have the butterfly method to try and solve this problem.

As an algebra teacher, I want to focus on the algebraic -- the quadratics that are in there. These complex rational fractions, and not be worried about, oh my gosh, my students still only have the butterfly method, they didn't actually learn about the mathematics.

So these standards support parents and

teachers in districts in demanding better materials that don't only focus on tricks. We want them to be critical consumers. We want them to question the materials that are out there that have stamped on them that they are aligned the standards. When in reality, they are doing this kind of -- they are doing the butterfly method. That's not in our standards. That's a trick, not the mathematics. I want our kids to be able to do these kinds of fractions, and eventually those kinds of fractions, and I want all of our kids to have that access.

And when I worked -- I actually got invited, very happily so, to Colorado State University recently. And the professors -- not math education professors, actually, the math professors, came out -- 40 math professors and their grad students, came out to talk to me about the standards. When I showed them that this is what we were talking about, that -- I showed them what I'm about to show you; how does the standards actually develop these understandings? And they went, oh -- you could just feel this relaxation in them. Like, "Oh, that's what the standards are trying to do? But that's not what I'm seeing." And I said, "Yeah, but we have to read the actual standards and not rely on things that have -- that pretend to be the standards."

So each one of you, in your packet this

week, was actually given a set of the standards, and that's where we have to focus, is what does the standards actually say, and then how do our individual districts get a chance to implement those in impactful ways? So what does that look like? How does it seem different from before; if we are not teaching the tricks, that is. Because the old standards had very little about fractions. You are going to see that the limit -- there is very few words in the old standards about fractions. And we know that fractions are the gatekeeper to our mathematics. If we don't develop a strong foundation in fractions, that will keep students out of algebra, and out of integrated math when they get to high school. We always think of algebra as the gatekeeper; well, it turns out the reason that algebra is the gatekeeper is because fraction knowledge is where that suddenly becomes a big deal. You can't just get the tricks, you have to know the mathematics.

So if we just briefly look at this, we can see in third grade, they had to identify a fractional part. Now we say in second grade they have to do that, but we have different kind of verbs. We are partitioning circles, we are actually doing, not just identifying, and we are describing things, and we are recognizing. And then we have a whole bunch of standards in the third grade that we didn't have a comparison for in the old standards. These

are all about growing their knowledge and skills -- the doing, and the knowing, and their understanding about fractions, by focusing on equivalents. This is that foundation that you need in order to, by fifth grade, add and subtract unlike denominators. And it even parallels the way they learn about whole numbers.

Let me give you an example of what that might look like. We just look at the top bar. So these are two separate problems, and I have to be honest, I probably should have had the second one fly in, or on a separate slide. So just kind of focus on the top one for me. The first two have shaded in red pieces, and kids are pretty good about describing why that is one-fourth. But if they move on to the parts that have the shaded blue, it takes them a lot more work to be able to explain and justify why these last three represent one-fourth. But that justification, that complex level of thinking, is what students need and deserve. And we need to make sure that that's happening. And in our new standards, we call out that those are the kinds of understandings that they need.

I compare this to, when I'm working with three-year-old's -- how many of you have children, or grandchildren in that kind of age range, ever played with little three-year-old's? Yeah. Ever asked them how old they are? What do they all do? "How old are you?"

"Three!" Okay, well, if you're a math person and you love to mess with children's minds, you do this, "Are you three?" And you hold up two fingers on one hand, and one finger on the other hand. Because this is a different representation of that number three. Now, three-year-olds in general don't see this as three. They shake their head at me, and they say, "No, this is three." In that same way, we have to develop fraction understanding. We need them to see all of those as one-fourth, to get that solid foundation. So my five-year-olds, now, I don't let them get away with saying, "This is five." And not being able to say, "This is five." And "This is five." And all of these different ways of representing the number five. Because that's building my foundation in whole numbers, this is building my foundation in fractions.

So on that second one, we are asking about -- how much of that diagram is shaded in? What fractional amount is shaded in? Now, in this case, I could say that that's one and one-half. But I also could look at it and say it's three-fourths, because I haven't been given all the important information. And we want our students to have right and wrong answers in mathematics, so we need them to be critical of the questions that they are being given, and say, you haven't given me enough information. It's like, I'd rather have a half a million dollars, then

half of a dollar. What's the unit? And so all of these things are being developed in that third grade; that foundation.

So that when we get to fourth grade, we are no longer actually just using pictures to add and subtract same denominators, we are actually adding and subtracting mixed numbers, et cetera, and if I move forward, we are really developing that understanding of equivalents in a very symbolic way. So yeah, in third grade I was using pictures because the language of mathematics is visual.

I still remember sitting in abstract Algebra 2 as a math major, which is a very senor level course, and it's about the time where your brain starts to gloss over, and I always say to my students, this was the "my eyes have glossed over" look. My (inaudible) look. I'm like, "Oh my." So the professor had noticed my eyes have glossed over, I didn't know what was going on in the class. He was doing a proof. And he got all the way through the proof and I said, "I don't know what you were trying to prove." And he looked at me, and I said, "I need a picture." Because even in senior level, college mathematics, I still need that picture. Once I had the picture, I could now understand the symbolic that was going on.

And that's where we're aiming. We do want our kids to do the most efficient strategy, but we want it

to be done with understanding, and that's what our standards are calling out. So if I flip back to the standards -- it's hard to read, and I didn't necessarily want you to read all the standards, but you can see that very first line underneath the bold, it says, "Explain why a fraction, A over B, is equivalent to the fraction N times A, over N times B." That's what this is saying. Two-thirds is equivalent to four times two over four times three. That whenever I multiply a fraction, or any number by the number one, which is what four-fourths; we want our kids to understand that four-fourths is the number one, that I get the same amount. And then they can visually see it -- "Oh, I see two-thirds has the same quantity as eight-twelfths." And they can start to make those connections.

All of this leads us to fifth -- oops, I went too far -- fifth grade. So we are going from just having concrete materials and adding and subtracting commonly used fractions, to saying in fifth grade, "I'm going to be able to give you any group of fractions, and you need to be able to add and subtract them." Because we've laid the foundation all the way through those grade levels to be able to be successful at that fifth grade.

So now if I go back to where 20 percent of our -- some of our schools, were only getting this right, now I want to make sure that 80 percent or more -- I would

like 100 percent of our kids to be able to say, “Ah, I got it: One-half, plus one-third, plus one-fourth. I’m going to be able to find common numerators or denominators, because I know how to multiple by one, and then add those across.” So that I’m not just learning the tricks, but the mathematics behind it. So students that actually understand the mathematics can explain why the butterfly method works. They can actually use the butterfly method, but their foundation of understanding comes from the mathematics and not from a trick and just getting the answers.

So this is why we have to change what we were doing. Our previous standards led to memorize and forget, because we did too much every single year, and so we had repetitive expectations. Oh, if you didn’t get your basic facts in third grade, ah, we’ll do it again in fourth grade. Uh-uh. Second grade, I want you to know add, subtract, all your basic facts. Third grade, I want you to know all your multiplication/division basic facts. And if you don’t know them, that’s a red flag. We’ve got to make sure we do an intervention for you. The standards are very clear about it. We don’t repeat it again in fourth grade, because we’ve said: Rubber hits the road in the third.

And the same thing is true with each one of these fraction understandings. We have to make sure that

we're getting all of those bases for it. We need to have focus, that means. We can't have lots of things happening every single year. And great teachers and schools have always done this. We've always been able to look to schools that focused intently on what was important. But now our standards spell that out.

So you can see, on the last one, we had number and operations, and measurement geometry (inaudible), and then continue -- that number in operations, that yellow bar, and I sort of tried to make the colors match, has now been expanded, because number is the most important thing in K-5. So we can spend more time on fractions developing understandings, and not just tricks. Because we have spent more time on number. We can go more in depth and not -- so the reality is, this kind of understanding does take more time. We are going to wait for data analysis and probability in a major way, because that's what we've learned from great schools in other countries when we've looked at international benchmarks, as well as within this country, that we need to spend more time on number at the K-5. And the geometry there is in support of number. Remember, I said visualization is important? That's why we have the geometry there. All of this leading to make sure that all of our kids are ready.

And I have Algebra 1 and Algebra 2, and

Statistics and Geometry listed there. I could have written Integrated 1, 2, and 3. I know that a lot of our districts also do the integrated methods. That's the benefit of these standards. It doesn't shut down local control at all; it leaves it completely open to our districts to figure out: How do I make sure kids are reaching these understandings?

So that leads me to end of my last little part, which is: The math standards compel us to make mathematics relevant to students, and move beyond mere answer getting. I want our students to see that they are doing the work of mathematicians. But these standards emphasize the student's ability to be able to see mathematics in their lives, rather than being fearful of mathematics, which is so often what I get in my world now. I want students to look at taxi cabs and see a linear equation in the same way I do. I want them to see cell phone plans as being exactly the same equivalent mathematically. Both of these things can be modeled with a linear equation: Y equals MX plus B. And not be afraid when I ramble off all my mathematics and get all excited about it, because they've had that same benefit that I had, of great teachers, of understanding mathematics. Thank you.

MADAM CHAIR: Thank you. Questions?

Colleagues? Does this help -- oh, Steve, go ahead.

MR. DURHAM: Have you seen, or are you familiar with this methodology that's appeared in some videos about doing a subtraction problem with a number of boxes, as opposed to having memorized that seven minus two is five? Have you seen that?

MS. PITTMAN: I may not have seen that exact video, but I -- I can -- I've seen videos that have that similar kind of thing. Yeah.

MR. DURHAM: Does what you're doing lead to that kind of "box" solutions?

MS. PITTMAN: No. The standards --

MR. DURHAM: Kids still memorize --

UNIDENTIFIED VOICE: (inaudible)

MS. PITTMAN: Yeah, sorry, thank you.

MR. DURHAM: Kids still memorize what is seven minus two? Does that -- how far do they do it by boxes?

MS. PITTMAN: So, Madam --

MADAM CHAIR: Go ahead.

MS. PITTMAN: Sorry, I'm not very often in front of the Board. So yes, students, by the end of second grade, should be able to fluently tell me what seven minus two is.

MR. DURHAM: Flashcards?

MS. PITTMAN: Yeah. Now, how they achieve that is left to local control. So there may be districts that choose to go down that road. What the standards do is set the bar that we need the understandings and they need to hit that symbolic method. But we don't, as a state, specify what it is that students -- how students should achieve those memorizations, and those understandings.

MADAM CHAIR: Pam?

MS. MAZANEC: I've been seeing videos posted on Facebook with lessons aligned to the standards. It's all by a group called Climb Higher Colorado. And they have some videos there that I think indeed are strange, and as far as teaching math, some examples were, instead of -- instead of learning how to subtract, you get the answer by adding? And then I know there's this add ten, which I think I just read an article the other day about how it's really an old method that's been around forever, but there are some really odd methods of teaching math out there. I mean, maybe you think they are brilliant, I think they are odd to a lot of us. What's the -- what's the purpose of that? I -- I hear that, you know, kind of what you've said, like it's deeper learning. But it seems to me that a whole lot of us learned our math pretty well the old way. It's difficult to understand.

MADAM CHAIR: Go ahead.

MS. PITTMAN: So there are a lot of little parts to that, so I will try my best to answer parts of it. I do think that a lot of us learned mathematics very well. I was a product of our public schools, and I learned mathematics very well because my teachers focused on the mathematics. On the understandings that I needed to develop, and not on tricks. But I also am aware that we have an entire -- well, lots of generations of math phobics (ph). So we need to be aware of what's causing those in the ways that we can ensure that that's not going to occur. Singapore is often one of the countries that we're compared to. And Singapore said -- it's been about 10 to 15 years that they really started their process, they said. We don't -- we are an island nation, we don't have a lot of natural resources. Our only natural resource is our --

MS. MAZANEC: Kids.

MS. PITTMAN: -- humans. Yeah, our kids. So we need to make sure that we are developing the most successful students out there. And so they went around the world -- and by the way, one of the places they spent the most time was here in the U.S., because we do have great schools in the U.S. And we do have some really great research in the ways that we know that kids develop understandings in mathematics. And when we implement that, we have some real success.

And so they looked at that, and then they went back to their country, and they said: Okay, we're going to make changes based on what we saw. And in fact, now they laugh when we go over to their country to try and figure out how to teach better, because they are like, you know, we went to your country to figure this out, right? What do they do that's different? They do exactly what these standards are saying, and they do develop a visualization of kids, and they do have these deeper understandings that they want kids to have, but all in that frame of, yeah, we do want kids to understand the algorithm and use it, and we want kids to memorize their basic facts. But it's all based on understandings of the mathematics and the ability to fluently manipulate those numbers.

So is it exactly the same that their -- how their parents learned? No. And in fact, one of the things that Singapore said was: We need to educate our parents. And so the parents, when their kid is struggling, the parent has six weeks of Saturday school to relearn the mathematics in a way that's deep in understanding. So I'm not going to speak to a particular thing, because I don't know like, the particular examples you are giving. They may be horrible, they may be great, but I do know that what the standards are spelling out, is that kids need to have these deep understandings. And then how we get about that,

is left (inaudible) control.

MS. FLORES: Thank you. I just wanted to bring the teacher part of it -- that some teachers were not trained in this way. So we have a lot of training to do for teachers, and that may take some time. I wish that time had been given for when you go to a new system, then -- it usually takes about five years for that to take place, but yet, here we are with a test, where teachers haven't been trained, where materials are not out there, and is it fair to hold districts, teachers, kids -- kids accountable for what will take place? I know some districts have already been working on this, but also some districts don't have the money to buy all the textbooks, train all the teachers. So that's going to take --

MADAM CHAIR: Can she answer?

MS. FLORES: -- some time. I'm making a point.

MADAM CHAIR: Oh. I thought it was a question. Go ahead.

MS. FLORES: It's rhetorical.

MS. PITTMAN: So do you want me to respond?

MS. FLORES: Yes, I would like it, yes.

MS. PITTMAN: Okay. So I don't disagree that it takes time, and that our teachers need to continue to -- to be part of that professional development process.

One of the benefits that we have, actually, being with other states, multi-states that have adopted similar standards to us, is that we have lots of resources developed in those kinds of ways.

So an interesting thing, I was just out in a small district on the Western Slope, Plateau Valley, and their -- some of their students -- struggling math students, actually at the middle level, went to their teacher and said, “We want to create a website that has resources for us to go to and benefit from.” You know, be able to quickly show other kid, hey, this is out there in case you don’t understand this. And so it’s the cutest little website. They’ve created their website, and they went back to that teacher and said, “I need your lesson plans like two weeks in advance.” And he laughed, because he’s like, “I don’t give my principal lesson plans two weeks in advance.” They said, “But we need them that much in advance. We need to know what we’re learning in advance, so that we can make sure we’ve got that website up-to-date.”

MS. FLORES: That is cute.

MS. PITTMAN: It’s -- not only is it cute, but these kids have had now -- last year they made a year and a half’s growth in mathematics. These are kids that we usually -- we want to make a year and a half’s growth,

because they need to catch up, but generally do not. Like, we find that most of our struggling math students don't catch up.

MS. FLORES: They get further and further behind?

MS. PITTMAN: They get further and further behind. But they are seeing the benefit of being able to watch that video online that describes this, and be able to download all the kinds of worksheets that we've been used to seeing from when we were kids, but then also like a visual resource of what that might look like.

MS. FLORES: Thank you.

UNIDENTIFIED VOICE: Thanks for the presentation. I have three questions: What do you say to the criticisms that have said -- that have indicated that Common Core standards of which Colorado's Math Academic Standards are 85 percent under; is that correct?

MS. PITTMAN: That is correct. That is correct.

UNIDENTIFIED VOICE: What would you say to at least three criticisms that I've heard, and examples that I've seen; first that we should be teaching algebra in eighth grade, not in ninth grade, because it doesn't render kids ready for upper level math in high school, which was the whole purpose of looking at our standards -- or one big

purpose.

A second criticism is that we've rendered mathematics into number sense, as opposed to rigor with mathematical symbols. And so that's why there's a lot of discourse in the problems, and a lot of justifying, and a lot of, you know, looking at an error, and talking about why there's an error and all that. And one might say, "Well, that's understanding what's behind it." But some would say, "You spend a lot of time rendering math discourse or language, you have less time to actually learn formulas and their application when you look at the numbers of instructional minutes available in a classroom for math."

And a third criticism is that -- and I haven't looked deeply into this one, but here is a quote from a discussion that was had in Tennessee, "Common Core essentially rejects topics that may only be approached in a Euclidean fashion. To read the standards, you would not think so, but all of the testing depends on a Cartesian approach, as opposed to a Euclidean and a Cartesian approach."

And so the kinds of questions -- and you know, in your presentation is helpful to look at that, but we don't see the depth of the -- we don't see the scope and sequence, we don't see the -- the addition of a discourse

as opposed to, or I guess in addition to the whole formula mathematical calculation piece. The algorithms that are taught to the kids are -- go beyond the traditional ones in their -- have the estimation stuff again. That could be said, "Well, that helps kids understand." But are they mastering traditional algorithms that render them ready for higher level math in high school, particularly with algebra not being taught in ninth grade. So those are at least three things that have come to my attention, talking with math teachers. And I'm trying to look deeply at how I might think about that, because we just look at example items. But I wonder how you'd address those. It's probably a longer discussion.

MADAM CHAIR: Go for it.

MS. PITTMAN: Okay. I will do my best. I think there's about four actually in there. So I will do my best to answer each one. I'm going to start with actually the algorithm conversation. The only algorithms that are called out in our standards, are our traditional algorithms. So when students are adding and subtracting, they stack them on top of each other, whether they use the word "borrowing" or regrouping, all of those basic things that we learned about how to add and subtract multi digit numbers, are identical. Now, we might do some build-ups in different ways to that, but the ultimate thing that they

have to be able to master is that symbolic algorithm.

UNIDENTIFIED VOICE: So what's I've -- excuse me -- what I've been told, and looking at some of the text -- you know, we have a limited number of textbook publishing companies, and they have tried to get ahead of this and align their content with Common Core. So what -- what I've heard is that estimation, number lines, are algorithms that are taught in addition to traditional algorithms. And so when you divide up the instructional time, kids aren't mastering traditional algorithms.

MADAM CHAIR: Go ahead.

MS. PITTMAN: I'm not sure that I'm going to agree that vendors have done their due diligence, is my honest answer. I -- usually when I mast (ph), say that as a state employee, it is up to districts to make the decision about what materials are best. And then I say, "Buyer, beware." They are not changing things. Most of the things that we're seeing online that we don't like, are from a time prior to these standards.

So the idea of number lines -- number lines are there as a visual to support that algorithm, so we do want kids to be able to master an understanding of a number line, because when I go to teach -- in fact, I had a longer PowerPoint that looked at number lines too, and they said, (inaudible). So one of the things that we want kids with

number lines to do, is be able to see it as connected to measurement, because a ruler is a number line.

But then also, when I'm a seventh grade teacher trying to teach integers, if you've ever tried to teach a kid the understanding of why when I subtract a negative, I'm actually adding a positive. This understanding can be done very successfully, and they can then very quickly move to symbolic form when they have an understanding of the number line. But if they don't have it -- as a middle school teacher, I spent a lot of time pulling my hair out saying: That's not a method that I can use, because I'm -- their cognitive load is too high. They've got too much time trying to learn a number line at the same time that they're -- that I'm trying to get them to understand this more complex topic of integers.

UNIDENTIFIED VOICE: And so -- just appreciate the time to discuss this --

MADAM CHAIR: No, go ahead, please.

UNIDENTIFIED VOICE: But when you look at a traditional math series like Saxon math, and compare it with a more recent series like GO Math. I'm not sure I'm agreeing with you that the current publishers are actually going back to older methods. I mean, I -- and again, this is up to the district to look at the curriculum obviously, but you know, we're talking about the standards and what

they prompt as far as what the publishers do. And I'm not sure I'm seeing current publishers falling short, because they are reverting to old algorithms. So that's just for districts to think about.

MS. PITTMAN: So I want to be clear that I didn't suggest that going backwards was necessarily the right direction. We do want our kids to master the algorithms in the same way that as a medical professional, I want to cure cancer. I want to be able to save people with cancer. But I'm not going to use the same treatment that I used 100 years ago, 50 years ago, or 20 years ago. The end result I want to have be the same, but I'm going to use the most up-to-date methods for that. Now --

UNIDENTIFIED VOICE: I was just -- I was just commenting on your comment. I thought you were saying that the newer publishers were not -- were falling short of Common Core, because they were getting back to previous algorithms just in that one example, and as I look at (inaudible) there is school math and other curriculum, I don't really agree with that. But I may have misunderstood you.

MADAM CHAIR: Go ahead.

MS. PITTMAN: So I guess what I would say is: The majority of the ways of thinking about visualizing mathematics, or teaching mathematics that you're seeing in

these publishers, are not an advent of these standards. They started occurring more like 20 years ago. These standards very particularly are trying to make sure that they take what was best from some of that movement of being able to have kids visualize and understand mathematics, but have that same very strict goal of saying, "I want kids to be able to do those algorithms and understand mathematics to be successful." I do want to really make sure I comment, because I know we're going to run out of time soon. The algebra question?

UNIDENTIFIED VOICE: Yes.

MS. PITTMAN: Because I think that's an important one. That we -- when you look at the eighth grade standards, they are equivalent to what used to be Algebra 1. So a lot of our kids that would have gone to a straight Algebra 1 course in eighth grade, are now taking eighth grade, because what's now an Algebra 1, is often very similar to what used to be an Algebra 2. And what's an Algebra 2, is often very close to what's in pre-calculus. Utah, for instance has said that kids are going to go straight from pre -- from Algebra 2, into calculus. Some of our districts have done that similar thing. Some of them have chosen that nope, they still -- kids still need a pre-calculus class. We by no means though say that kids cannot take algebra in eighth grade. We still have a

large percentage of kids taking algebra in eighth grade. But we want to be clear with our parents and our kids about the new expectations for that.

UNIDENTIFIED VOICE: I would just encourage people to read (inaudible) from October 14, from the American Principal's Project that talks in depth about the importance of algebra in eighth grade, so that it sets kids up for success in high school. I think what you're saying is that they could, but the Common Core doesn't kick those --

MS. PITTMAN: No, it requires every kid to learn -- sorry, my apologizes for --

MADAM CHAIR: Keep going.

MS. PITTMAN: It requires every kid to learn what is algebraic thinking in eighth grade. Not algebraic thinking, algebra. Your traditional algebra at eighth grade. So it doesn't lead to chance that some kids would do algebra. To me, algebra is not the name of the course, it's the content that I want them to learn.

UNIDENTIFIED VOICE: So that would be a deeper discussion, but as I looked at the standards and -- I -- I'm not sure I think that's right, that they're at the eighth grade level. I think they are at the high school level, and I think that's one of the problems, but --

MADAM CHAIR: Well, in the picture, it did

say in eighth grade, equations -- expressions and equations. So that is in the eighth. That's -- actually, it's in sixth through eighth math.

UNIDENTIFIED VOICE: That's not the whole algebra, so --

MADAM CHAIR: No, but it's probably a pretty big part of Algebra 1.

MS. PITTMAN: Most of Algebra 1 previously, and I'm happy on this point to actually turn back and talk to like, districts on this. Most of what was previously Algebra 1 was linear equations with a small amount of quadratics. And quadratics were then mastered in Algebra 2. And now we say, all of linear equations, basically, ended up in eighth grade, as well as systems of equations. And we in Algebra 1 are mastering all of quadratics, so completing the square, which is like -- and things that we would need to call FOIL, but all the quadratic things that you think of as very traditional mathematics, are all in that Algebra 1 course that used to be reserved for Algebra 2. And then Algebra 2 gets into a lot of the pre-calculous kinds of ideas like trigonometry, et cetera.

UNIDENTIFIED VOICE: All right, I'll look more deeply. Can you address that third one --

MADAM CHAIR: There's one more question, yeah.

UNIDENTIFIED VOICE: Euclidean verses --

MS. PITTMAN: Yeah, so the -- there's actually a strong movement back in these standards to Euclidean geometry. So one of the things that we had done in our old standards was basically eliminate proof. Kids were not doing geometric proofs. And that is the hallmark of a Euclidean geometry course. Now are there also a heavy emphasis on the Cartesian approach? Yes. If you're looking at a computer screen right now, that's the basis of that computer screen. We need kids to be able -- Cartesian just mean coordinate grid. Understanding geometry, and being able to see what it looks like on coordinate grids. Being able to do the lines around geometry, the graphing, the equations around geometry. That's an important piece, because that's how we write our computer code. I want my kids to be able to not just use a computer, but understand it. So that's very important. But we have by no means given away the Euclidean part of geometry.

We are very much expecting kids to do very formal two-column proofs in the same way that all of us did. And -- and I would say there's a generation that we actually didn't give that to in Colorado.

UNIDENTIFIED VOICE: Thanks.

MADAM CHAIR: Other questions? Jane?

MS. GOFF: Well, it's related in a way. We

have had, nationally and in Colorado, there's been some degree of feedback from public, (inaudible) students, from kids in various grade levels. And primarily, what it has been around is the mechanicals. The mechanical parts. The equipment, the interface, ease of access, how many times does it get thrown off, and reboot and all --

MADAM CHAIR: You're talking about the test?

MS. GOFF: (Inaudible).

MADAM CHAIR: Are you talking about the test?

MS. GOFF: Yeah, that sample, when we did the field test last -- last year. I just -- I wonder, is there any feedback that's available from students about the content? About the skill (inaudible). Beyond -- beyond the mechanics of a -- using an iPad for the first time, and typing (inaudible), I'd be interested to know -- I think -- I think that would be key information for the adult community to hear about.

MADAM CHAIR: Go ahead.

MS. PITTMAN: I'm actually going to pause and say that that's not my area of forte, is the test per se. When it --

MS. GOFF: Maybe I'm (inaudible). I don't -- I don't know whether there is anything to share on that specifically. (Inaudible).

MS. PITTMAN: So I'm going to -- Jill just said this might be your interpretation, so I'm going to see if I've got your interpretation right, because I'm not always sure that I -- I don't want to answer it if --

UNIDENTIFIED VOICE: She knows what --

MS. PITTMAN: She know what you're asking her. So is the question basically -- I'm used to doing math on paper, pencil and now suddenly now I might be asked to think about the representations on the computer?

MS. GOFF: No, not so much that, it's the -- it's actually the content of the questions. It's not the -- the administration of the exams. The actual content. If kids made any comments after the field test.

MS. JILL: Madam Vice Chair, if it's okay, we'll ask Joyce Zurkowski to answer that question related to comments from the field tests.

MADAM CHAIR: Thank you.

MS. ZURKOWSKI: Madam Chair. And we can get you more information after the board meeting. Students were asked about the content of the test and two specific questions that they were asked was, "How would you rate the difficulty of this assessment compared to what your course work is?" And in most cases, what students indicated, is the test is rigorous, it's hard. There is a lot of information. It's asking kinds to understand, not just be

able to apply the tricks. Also, asked students about whether or not they had been exposed to this content in -- in their instruction. And again, when we looked at math compared to English language arts, there are many more students who indicated there was a lot of new content on this assessment that we haven't seen before.

UNIDENTIFIED VOICE: And that was given at what point in the year? Was that spring? (Inaudible)

MS. ZURKOWSKI: (Inaudible) Correct. That was given in the spring.

UNIDENTIFIED VOICE: Thanks, that helps.

MS. ZURKOWSKI: You're welcome.

MADAM CHAIR: So has that feedback been sent to the districts? From the kids?

MS. JILL: Madam Chair, I think it is fair to say, as I toss it back to Mary, that she has been working very closely with districts about the new expectations and the understanding of what's actually in those standards. I think the conversation that you just had in terms of what is eighth -- what are those eighth grade standards, and how do they relate to what we used to have. And I'm hoping that districts have heard repeatedly, those eighth grade standards are not the same eighth grade standards we used to have, and they are much more reflective of what we used to call Algebra 1.

MADAM CHAIR: Which is, when I looked at the Algebra 1 questions, and I -- Mary heard me say, “Really?" It’s because it wasn’t what I expected to be looking at. So it really is a progression of some kind, or a different name, maybe? Well, not only sharing that with our teachers, but certainly with our parents so they are cognizant of that. Thank you very much. Any other --

UNIDENTIFIED VOICE: The training.

MADAM CHAIR: -- questions? Comments? Thank you, all of you. And thanks for coming. Did you guys have some comments that you wanted to make? District folks? We would love to hear you.

MR. DUREN: Should I come to the table?

MADAM CHAIR: Sure, wherever you’re comfy.

MR. DUREN: My name is Kevin Duren, and I am from Widefield School District 3, in Colorado Springs. And I just want to -- I don’t have a prepared statement, I wasn’t ready to do this, but I just want to say that the standards -- and I’ve done a lot of research and study, and there is a leadership group that I have in Colorado Springs at Widefield, that has really taken a charge of digging deep, and kind of getting a sense of what the standards are asking us to do.

I think the biggest benefit that we have seen across the board, is that it really allows our

students to have a deeper understanding, a conceptual idea of what is taking place, and the transference between what they learn in third to fourth grade, and fourth to fifth grade, if it's done correctly -- if it's implemented corrected, that we're going to see students that had a foundational understanding, and a knowledge, that goes beyond just memorization. I think memorization is one of those key things that tends to disappear when you're under pressure and under stress. And so if you've ever been in a stressful situation, and somebody is asking questions, and you can forget your own mother's name under stress.

UNIDENTIFIED VOICE: (Inaudible).

MR. DUREN: If -- if they're -- if we have a deeper foundation of an understanding, and a conceptual idea of what we're asking students to know from grade to grade, then teachers are going to see the benefit of having students that have that experience from being exposed to the standards, from having that -- that level of depth that has been emphasized at every grade level, so that we can see a higher end of student at the high school. I don't see that this is going to impact students taking a calculus class. I think we're going to see more students ready to take on those harder level courses, because they are more comfortable. They have a intuition about what mathematics is, and are able to bring their own experience, and develop

an understanding that's connected to, you know, different aspects of the world. They can apply it in reference to learning new -- new ideas and new concepts.

I have two sons that are both engineers; one in computer engineering, one in civil engineering. I have a daughter in nursing. And you know, going through my household, you're going to know math. I was a math teacher for ten years, and then a principal, and now I have this position in my district. And I don't think that it wasn't the schools position at that point to really dig deep, and to press the -- the understanding and the application, and -- and how to conceptually understand what they were learning in school. I did that from home because I had the background knowledge. I had the understanding of, here's why you're doing this, and here's how it connects, and here's how it connected from what you were doing back in the earlier grades.

What the standards are doing, is allowing teachers to have time, opportunity, and a resource in which to take what we're teaching, and make sure that they have that conceptual understanding, so that it can build their own foundational skill set, with understanding how it really applies to the real world. And so that's -- that's one of the benefits that I see. I'm excited about this group of standards because it's taking time to allow

teachers to professionally develop themselves. Yes, teachers are going to have to take some time to really develop an understanding of what they were -- what they are trying to teach. Because it is different. It's not different because it's weird, it's different because it's deep.

I -- I'm just now starting to understand some of the algorithms at a deeper level, as I'm going into other classes, fifth grade classes, learning how they're developing some ideas about the -- the algorithms for say, division. I'm starting to learn where that comes from, where the roots of that is, and so, you know, it just becomes a -- a -- a bigger understanding for everybody.

MADAM CHAIR: So allow me to just ask you one question, I think it relates to Miss -- Dr. Flores' question, about what's it going to take to bring our teachers to a level of comfort?

MR. DUREN: I think districts are going to have to look at developing some professional development.

MADAM CHAIR: And -- and how about in your district? What --

MR. DUREN: What we're doing --

(Overlapping)

MADAM CHAIR: -- can you share us?

MR. DUREN: Sure, absolutely. I would love

to.

MADAM CHAIR: Real quickly, because I'm in trouble.

MR. DUREN: What we're doing, is we're taking teacher leaders who are willing to take on this challenge at every grade level. And so, K through 12, and every -- every topic, we have people that are willing to dig deep to develop what is the underlying threats of what we're trying to do at this grade level, and how does it apply to the next grade level. Or this course, and how does it apply to the next course. I think you have to --

MADAM CHAIR: Are they developing the curriculum then, to share with their colleagues? Is that the process?

MR. DUREN: Yes, ma'am, they are developing a professional development to then go out and share with all of their colleagues, and we have time that's specifically developed just for mathematics, so that we bring in everybody that teaches math, and we share what those -- those opportunities are. And so we get everybody sort of speaking the same language and having an understanding beyond what social media is telling us, you know, what it is that we're supposed to be doing.

MADAM CHAIR: Thank you very much, thanks for coming.

MR. DUREN: Absolutely, thank you.

MADAM CHAIR: Thank you, Mary. The next item is item 13.01, regarding Elementary and Secondary Education Act, Flexibility Waiver Renewal. Mr. Commissioner?

MR. HAMMOND: Thank you, Madam Vice Chair. Back in February 2012, we received our first approval of Colorado's waiver request, which in itself assisted our districts. Instead of having to deal with two (inaudible) systems one, and also the many things that came with it. Also, as you recall, and those board members present, we made some adjustments to that based upon the comments received from the Board, which will be very similar to what we're going through today, and at the next time we bring this back for hopeful approval at the March meeting, because it is due at the end of March if we are to have a waiver.

So with that, I -- we want to start the discussion. If you have things you've thought about, you also this morning discussed issues you might want to see in there. And so we'll turn it over to Keith Owen.

MR. OWEN: Madam Vice Chair?

MADAM CHAIR: Go.

MR. OWEN: Good afternoon members of the Board. My name is Keith Owen. I also want to introduce --

have our team here introduce themselves. We'll be talking to you today. So why don't I start with Pat Chapman.

MR. CHAPMAN: Pat Chapman, Executive Director of the Federal Programs Unit.

MS. PEARSON: I'm Alyssa Pearson, I'm the lead in the Accountability and Data Analysis Unit.

MR. OWEN: So now I want to share with that, the topics for today, and I wanted to just briefly highlight the things -- the main points that we're going to go through during our conversation with you. We're going to give you some of the background around the Colorado ESA Waiver to No Child Left Behind. We're also going to talk about the requirements of the ESEA Waiver, the impact of the current ESA Waiver -- ESEA Waiver on Colorado, and then the next steps for the renewal of a waiver.

So some of the background information: You might recall that ESEA, which is often referred to as NCLB, No Child Left Behind, and ESEA is the Elementary and Secondary Education Act. You'll hear that acronym being thrown around quite a bit this afternoon as well. It was actually due for reauthorization in 2007, and there has been an issue with getting it reauthorized with Congress. And in 2011, Secretary Duncan and President Obama invited states to request waivers from certain components of the ESEA. By showing a commitment to these four core

principles, and the four principles are listed on the PowerPoint presentation right there.

The first principle was the College and Career Ready Standards, aligned assessments. Principle 2 was a state development system of differentiated recognition, accountability and support. Principle 3 was an educator evaluation system tied to improving student achievement, and principle 4 was a reduction of administrative burden.

No, I will finish the timelines real quick. So with that -- with that piece, in February of 2012, you might remember, those of you that were on the Board back then, that we had talked, and had a conversation about the increasing burden of No Child Left Behind on school districts, and the impact that that was having. You might remember, 2014, the expectation is that 100 percent of students are proficient or advanced on the annual assessments that are given every year.

So 2012, we had a conversation about the -- the benefits of a waiver. We applied for a waiver, received a two-year waiver for NCLB. April 2014, USDOE offered an opportunity to extend that waiver a year, so we took advantage of that opportunity, extended it, and right now our current waiver is set to expire at the end of the 2014-2015 school year. So this summer. So USDOE, in early

winter, so December, January, put out the information about the opportunity to request an additional waiver, and what that process would look like. Some states fell into an earlier timeline of January submission, and they are going through that process right now. Colorado was not one of those states, because of where we're currently at with implementing educator effectiveness. We were in the timeline that is for March 31st submission deadline.

So that's currently where we're working towards. And again, we'll talk about the process for submission, but I'm going to have Mr. Chapman outline some of the requirements under the ESEA waiver, Madam Vice Chair.

MR. CHAPMAN: Madam Vice Chair?

MADAM CHAIR: Yes.

MR. CHAPMAN: So what I'm going to cover is the -- are the ESEA waiver requirements tied to each of the principles; why we thought it was a -- it made sense to apply for the waiver, what we submitted as part of our waiver request, and ultimately what was approved.

So for Principle 1, we had to demonstrate that we had adopted, and were implementing college and career ready standards, including alternate standards for students with the most significant cognitive disabilities, and English language proficiency standards for English

learners. We also had to demonstrate that we were providing supports for teachers in the implementation of the new standards. It's important to note that under Section 11.11 of Title 1, that states are required to adopt standards, and align assessments regardless of whether they have a waiver.

Also for Principle 1, we had to annually submit our timeline for annually administering assessments aligned to those new College and Career Ready Standards, including assessments aligned to the alternate standards, and assessments aligned to the English language proficiency standards. They -- these assessments had to be administered within a specific timeline, beginning in 2014-2015. The four -- the standards, there's no -- there wasn't a requirement that the standards had to be the Common Core, they just had to be aligned. If -- if you wanted to do a different standard, you had to engage in a process of convening IHE's and in the development of those standards. For the assessments there is no requirement that we be part of a consortium. Again, they just have to be aligned to the standards.

For Principle 2, we basically had to describe our system of differentiated recognition, accountability, and support. Including laying out our strategy for holding schools and districts accountable for

improving school and student performance. We had to have a system that differentiated schools by performance level. We had to identify the highest performing schools as reward schools. We had to identify the lowest performing schools as priority schools, and then we also had to identify schools with low disaggregated graduation rates, or low achieving disaggregated student sub-groups as focus schools.

We also had to have a plan to provide resources and interventions and supports that lead to the continuous improvement of the school, and district performance. We also had to establish annual measurable achieve -- annual measurable objectives, set -- set performance targets, ambitious but attainable performance targets, annually assess schools and districts against those -- the performance against those targets, and report the results publicly.

For Principle 3, and it's worth noting that -- that an educator evaluation system isn't a requirement of ESEA. It was, however, a requirement of the waiver. For that, we had to develop and adopt guidelines for a new system of educator evaluation that was to be developed in concert with stakeholders, create timelines for the implementation by 2014 to 2015, incorporate the state assessment results and student growth into that system, and

it's state -- the U.S. Department of Education has offered states that are transitioning to new assessments an additional year to fully implement our teacher and principal evaluation systems. So we -- we would need to include that with our waiver renewal.

So why did we think it made sense to apply for a waiver? In 2011, we were two years into implementing our new system of accountability under 163. We had a system in place that included performance indicators, frameworks, school plan types and accreditation ratings. We also included growth in the annual assessment of school district performance. On the federal side, we were doing AYP, and some of you may remember that under AYP, we were looking move students to partial proficiency, not proficiency. So those determinations were made based on the percentage of students that were partially proficient or above. AYP didn't really consider student growth. It was a stair step approach, so targets had to increase each and every three years, and we were nearing the 100 percent proficiency target.

So in general, we had two sets of criteria -- you had the state system, and we had the federal system that we were using to access school and district performance. So accountability pre-waiver, we had the state system that did consider achievement and growth. It

had resulted in leveled performance, performance levels assigned to schools and districts. On the federal side, we had -- basically considering achievement to partially proficient, and it was really -- AYP was a pretty blunt instrument. Either you made it, or you didn't. You could have 30 targets, you made 29, you missed one, you were identified for improvement. So increasingly we were having a -- discrepancies between those schools, and districts that were identified by the state system, and those that were identified by the federal system as being in need of improvement.

So the -- the next chart, I think it does that. It's a nice graphic. It shows that -- of the 91 districts that were identified for improvement, only 18 were in common. We had 24 identified by the state, and we had 67 identified by the -- by Title 1. Or 85 identified by Title 1. Only 18 districts were in common, where the two systems identifying similarly with the schools. We only had 71 schools that were identified by both systems. We had larger numbers that were identified by each system independently.

So really, we were sending mixed messages to students and parents and educators about the performance, the quality of their schools. We had two sets of labels, and consequences identified in play, with regards to

schools that were identified for improvement that really resulted in an inability to target the resources and the supports and the interventions on the schools and the districts that needed them most.

Finally, there were a lot of it -- administrative burdens tied to trying to implement two systems for both the state, and school districts, and there's a lot of duplicity in those requirements, in that -- that the state requirements in some ways are similar to the federal requirements.

So what were our goals in applying for the waiver? We really wanted to align the two systems to create a new single accountability system that -- that targeted college and career readiness as opposed to partial proficiency. We wanted to incorporate growth and consider growth as part of the assessment of school and district performance, and really try to eliminate some of the red tape, and streamline, and simplify the accountability system. We also wanted to be able to focus resources and supports on the schools and the districts that needed them most, and we're hoping to reduce the administrative -- administrative and regulatory burdens, and report -- reporting costs tied to ESEA requirements.

The next -- really that's -- I'll just go ahead and say what that says. Really, we put forth -- in

submitting our waiver, we put forth our state system to meet those federal requirements that were tied to AYP, and -- and Title I improvements. So we submitted our state system, we had to make adjustments, but ultimately, in February, 2012, we did receive approval of a two-year waiver. In 2012, and '13, we made minor amendments to our waiver, and then in April of 2014, we received a one year extension of our waiver. That's scheduled to end at the end of this 2014-2015 school year. They did approve most of what we had submitted.

As I said, we did have to make some adjustments. But really, we were able to use our system of school district performance frameworks as a replacement for AYP. We are able to incorporate growth in our system of accountability. We are able to use our unified improvement planning process to meet those requirements that -- that schools and districts identified for improvement, develop an improvement plan, and we're able to -- they did sign off on our timelines and implementation plans for college and career ready standards, and the aligned assessments, and the principal -- the teacher and principal evaluation system.

We did include in our waiver request to retain School Choice and SES, and so we -- we continue to make that a requirement of schools and districts that are

identified for improvement. We did modify SES somewhat. Those schools that are identified, are assigned a plan type of priority improvement, or turnaround, all offer SES and Choice. Title 1 will pay for the cost of transportation for students; parents of the students that want to send their child to another school. We expanded SES to include English language development providers. We strengthened the role of parents in the design of the SES programs, so parents are required to be a part of the planning of this SES offering of that particular school. And we are also targeting students based on proficiency level, as opposed to family income. So students who are non-proficient are eligible for supplemental educational service -- services.

MADAM CHAIR: Thank you. Good morning.

MS. PEARSON: Madam Vice Chairman. I talk a little bit about impact. Pat's kind of mentioned it already, but I'm going to talk a little bit more.

So some of the impacts that we've seen as a result of having this waiver, is that we now have a single accountability system in the state that measures and values the performance of schools based on growth. So we have a -- in the past we really were only using proficiency; proficiency to a partial proficiency standard. Now, we have a way of saying: Achievement matters, how kids are doing compared to the standard matters, but also what

really matters when we identify high or low performing schools, is whether or not they are showing growth for students. So that was a huge impact of our waiver.

We have a hot align message now about high performing and low performing schools. Really, for those of you who were not as involved in the past, it was so confusing when you'd get a message of: Well, this school isn't making AYP, but they are doing really well as a state, and there is reasons for that, and you dig into the data, and there is good reasons, but it was just a confusing process to have publicly.

We can target the Title 1 improvement dollars now, where they are most needed, for those schools that really are low achieving, and low growth, so that we know they are really struggling there. We've reduced some of those administrative and reporting burdens, the improvement planning requirements are now aligned with the state system, parent notification is again, a single message to parents.

And one of the biggest impacts really is thinking about, if we had lived under a system of AYP, where would we be right now? Because we are past 2014, we would have had a goal of 100 percent proficiency -- partial proficiency for all schools. We've run -- Pat's team has run some numbers to look at what that would happen. And

there's some ballpark estimates -- we have to do it pretty quickly. But it looks like overall about 84 percent of schools in this state would not be meeting AYP -- 87 percent of Title I. So that's a very different --

(Meeting adjourned)

C E R T I F I C A T E

I, Kimberly C. McCright, Certified Vendor and Notary, do hereby certify that the above-mentioned matter occurred as hereinbefore set out.

I FURTHER CERTIFY THAT the proceedings of such were reported by me or under my supervision, later reduced to typewritten form under my supervision and control and that the foregoing pages are a full, true and correct transcription of the original notes.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 22nd day of January, 2019.

/s/ Kimberly C. McCright
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Certified Vendor and Notary Public

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