
Committee Meeting

of

JOINT COMMITTEE ON THE PUBLIC SCHOOLS

"Invited presenters will speak on the subject of New Jersey's mathematics standards"

LOCATION: Committee Room 12
State House Annex
Trenton, New Jersey

DATE: June 3, 2009
11:00 a.m.

MEMBERS OF JOINT COMMITTEE PRESENT:

Senator Ronald L. Rice, Co-Chair
Assemblywoman Joan M. Voss, Co-Chair
Senator Bill Baroni
Assemblyman Ralph R. Caputo
Assemblywoman Mila M. Jasey
Assemblywoman Amy H. Handlin



ALSO PRESENT:

Melanie Schulz
Executive Director

Sharon Benesta
Chief of Staff

Meeting Recorded and Transcribed by
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ASSEMBLYWOMAN JOAN M. VOSS (Co -Chair): The meeting will come to order.

It's a pleasure to see so many people who are interested in what is happening in mathematics. I have spent the last week reading several articles on pros and cons. I like to do my homework. I'd like this to be a fair and balanced discussion of where we're going in mathematics.

I have to say that I did, at one time, supervise teachers of mathematics. And we made a concerted effort to make sure that our students, when they were not doing well on tests -- we would zero in on where the weakness was and remediate it as soon as we possibly could.

I am not a mathematician by profession. I'm a history teacher. But mathematics is so important. I am particularly concerned with the fact that many adults I come in contact with have very, very limited skills in arithmetic, let alone higher mathematics. And so I feel that this is a very, very important discussion that we're going to have today. So I welcome you.

Senator, would you like to say a few words?

SENATOR RONALD L. RICE (Co-Chair): Yes.

Thank you very much, Madam Chair.

Once again, good morning.

First of all, I concur with the Assemblywoman, Chairwoman.

I also want to take a moment to do some administrative things, Madam Chair.

As of July 1, the Joint Committee will no longer reproduce and mail manuscripts to the public. The transcripts are and will continue to be available to the public on the Joint Committee's Web site. I think

everybody understands why that is the case. Our staffs just took furlough, and workers are doing furloughs, and we're trying to figure out how to cut down on some costs, at least for the moment.

And also, I'd like to take the opportunity to welcome--

First of all, let me congratulate all the Assembly members for their primary victories last night; and those of you who took the time to go out to the polls to vote for the candidates of your choice, which are all these people here, right? (laughter)

But I want to welcome one person particularly, and that's Assemblyman Ralph Caputo. Ralph is the newest member to this Committee. I don't want any of you who attend these Committee meetings on a regular basis to take him for granted. He's an educator from the past, and he was acting superintendent of education, or whatever those titles were back in those days, in Essex County. So he kind of has an idea of how this is supposed to work, even though he may play naïve about it.

But, Ralph, welcome aboard.

ASSEMBLYMAN CAPUTO: Thank you.

SENATOR RICE: And congratulations on your re-election victory.

ASSEMBLYWOMAN VOSS: I think we have several people who--

I'm technologically impaired. (referring to PA microphone)

We have several people who are going to make presentations today. So, please, I would just ask you not to be redundant and to limit your time to about three minutes, five minutes maximum. Because as I said, we want to have everyone have an opportunity to present their case.

And I hope we will all listen attentively to what is being said. Because mathematics is an issue that is probably one of the most important that we're dealing with in education at the present moment.

So may I call, please, Commissioner Lucille Davy; Deputy Commissioner Willa Spicer; Assistant Commissioner Jay Doolan; and Director of the Office of Math and Science Education Sandra Alberti.

Just so everyone knows, everything we say in here is being transcribed for posterity, so be careful. (laughter)

COMMISSIONER LUCILLE E. DAVY: Good morning, members of the Joint Committee.

We are very happy to be here. Mathematics' standards are an issue upon which we've been spending considerable time. As many of you probably know, attention to mathematics and science was a priority of Governor Corzine's when he took office back in 2006.

As you said, Madam Chairwoman, there are lots of adults who not only, probably-- Not only do they not have the math skills that we'd like them to have, but I think they also grew up at a time when there was a dislike for math that developed in many of them. It is said that in the United States, we're the only country where young people believe that it takes some special talent to succeed in mathematics. Around the rest of the world, children are taught from a very young age that if you work hard you can succeed in math, just like everything else in life. But for some reason, our culture -- is that you have to have a special gift or talent in order to succeed in mathematics. And I think that that's probably the first part of the lift that we have to get beyond as a country, not just as a state. This is a national issue for us to face and to reckon with.

President Obama and Secretary of Education Arne Duncan have made clear that there is a national focus, in their minds, on mathematics and science as well. And in large part that's connected to the many reports that have been issued over the last five years or so related to America's long-term economic competitiveness. And that's really dependent on our ability to not only educate children to be skilled in mathematics and science, but also to produce more young people who are interested in those fields in the future. Our global competitors are succeeding at producing far more engineers, and mathematicians, and scientists. And it's important for us as a nation to face this as well.

I believe that a large part of the challenge is to help students not only enjoy mathematics, but feel that they can succeed in mathematics. And I think that's a large part of the focus that we've had in the Department. We are in the midst of revising our mathematics Core Curriculum Content Standards. And as you go through that process, you're always looking at how we can improve what we already have. We've had standards in New Jersey since the mid-'90s. It was part of the standards movement nationally. And we've used those standards quite successfully to outline what it is that we want children to learn at each grade level, not only in mathematics, but in all the content areas.

I think one of the issues we face, again not just as a state but as a nation, is the fact that we have many, many standards at each of these grade levels, and we expect children to be learning lots and lots of things, some of it in repetition so that they do a little bit in third grade, and then they do it a little bit more in fourth grade, they do a little bit more in fifth grade.

Internationally, other countries are focused on fewer, clearer standards so that you let children develop a very deep understanding of a fewer set of concepts at a particular grade level and then build upon those as they get older. And that's what some of the countries whose students are performing the best on international measures are doing.

So there's a conversation right now, not only here in New Jersey but also nationally, to look at how we might tailor our standards in a way where we have fewer of them that develop deeper understanding for our students. We live in a world that is clearly without borders. And in order to maintain America's competitive edge, we're going to have to teach all students to these high levels and more rigorous standards.

There was a time, as this Committee has heard me say many times before, when students could take two different paths out of high school and still be successful. And we know that those days have gone. They are not competing with their peers from around the globe, not just from in the neighboring community or in a nearby state. It is a global economy, and the world marketplace demands far greater skills of all of them.

We have spent the last, I guess, 12 months or so working on the revisions to our standards. And we've had lots of input. Lots of committees have worked. We've recently brought together a task force that recognized the different viewpoints, and I think you're going to hear some of that in the testimony before you this morning.

There's clearly two sides of the math conversation. I'm going to call it a *conversation* and not a *war*, like many do. But, you know, it reminds me of the problem that we faced in language arts back in the '90s, when

there was a real battle going on between what would be more traditional teaching of phonics and vocabulary, and then what would be the more modern approach of whole language. And at one point, we basically said phonics and all that is not necessary any longer. We can do language arts development, literacy development better if we just do a whole language approach. Kids will get it all inside of a whole language approach. As it turned out, research showed that you couldn't do it with either one. You really needed a balance of the two.

And my very firm belief is that we're at the same point now in mathematics. There are two schools of thought. There is one that we should just teach kids repetitive, skill-and-drill. They memorize the way you do a problem. It doesn't matter if they understand it. They just need to know how to do it. They need to know the basic format or the algorithm to solve the problem, and just repetitively provide that information -- know their facts like it's second nature.

And then there's the other side of it -- more modern approach, where I would say that there isn't as much focus on knowing the facts, knowing the answers -- perhaps more real-world or problem-based.

I would submit to all of you that what we are seeking in the Department is to create a balanced approach that marries the two of those together, that recognizes that children need to be able to do five times two without a calculator. They need to be able to understand that 20 percent of \$100 is \$20. There are some very simple things that they need to be able to do in their head. They need to be able to know that when they get an answer on a calculator that's completely outrageous and totally wrong -- that they can tell just by looking at the answer that they must have done

something wrong, that the answer couldn't possibly be accurate. So you have to bring these two together.

Without a doubt, though, we cannot teach children solely by memorizing how to do specific individual problems. We need to teach them to have conceptual understanding of what's behind the solving of those problems so that they can take that conceptual understanding and apply it in other situations. And it is that balance -- of marrying the more automaticity of the facts and the algorithms of how to solve problems with the real-world applications and with the very deep conceptual knowledge -- so that students can take what they've learned, and take it then and apply it in other situations. And that's the place that we are trying to reach.

We signed on, just a few days ago, to a national effort to develop among the states a set of what are called *Common Core Standards in Mathematics and Language Arts*. Our agreement is to participate with 44 other states that have also signed onto that effort and, I believe, three or four territories -- so the Virgin Islands, I think, Guam, etc. -- have also signed on.

We are going to be part of that effort, which means that we will be participating in the development of those standards, in the review of those standards. At the end of that work, we will then have an option to adopt or not to adopt the common core standards. And we will wait. And that will happen by the end of this calendar year. So by December of 2009, those standards will be fleshed out. They will have gone through a rigorous review. The way this is set up-- The idea is that there will be a national policy forum with national organizations such as the Business Roundtable, the National School Boards Association, the Council of the Great City

Schools, the National Education Association, the Alliance for Excellent Education, the Chief State School Officers, the National Governors Association -- all these folks coming together to share their ideas and determine what common core standards ought to look like. And then there will be a standards development group. And then there will be a validation committee of nationally recognized experts, one group in mathematics and one group in language arts. And those folks will come together and independently review the standards and independently determine whether or not they are research and evidence-based, and whether or not they will allow our children to be competitive internationally. So we want these common core standards to be internationally benchmarked.

And at the end of all of that work-- We will give input all along the way. We will then look at the end product, and we will decide whether those standards will be good enough for New Jersey. Now, it is my hope and my expectation that that's the end we will reach. However, I want to assure the Committee that if it's not -- if it means that New Jersey has to lower its standard in any way -- then we will not adopt those standards, and we will not continue to be part of that effort. It's a very important point for us to make, because it is critically important to understand that we believe, in New Jersey, that we are a leader in the standards area, and we believe that our students have already demonstrated high levels of achievement. And we are not going backwards. This is only about going forward.

To be quite candid, in a national meeting my colleague from Massachusetts stood up and said that-- And Massachusetts, by the way, gets the-- If anybody beats us on any measure, it's Massachusetts, where we're oftentimes neck and neck in national measures. Massachusetts made

it very clear as well that they were not going to accept anything that lowered the bar for Massachusetts. And what all of the Chief State School Officers agreed to -- that's colleagues like commissioners, or they may have different titles in different states. What we all agreed to was that the Massachusetts standard is really the starting point. Our highest bar in America is our starting point that we're going to benchmark internationally. And so we're going to have a higher standard.

ASSEMBLYWOMAN VOSS: Some of us have some questions.

COMMISSIONER DAVY: Yes.

ASSEMBLYWOMAN VOSS: And I'm going to defer to Senator Baroni. He can start, and then I will ask my questions.

SENATOR BARONI: Thank you, Madam Chair.

Commissioner, as you know, I have been, for a very long time, a big fan of the work that you have done as Commissioner of Education and continue to be. So please do not take this question in any way to be sarcastic. It is not meant to be.

But in preparing for today, in conversations with my colleagues and reading the material that I received in my office-- It has sort of become a societal joke. We had math, and then we had new math, and then we had new, new math. What were we doing wrong all of those years that we keep having to revise math? Please don't-- This is not tongue in cheek. I'm reading all of this material, and I keep thinking: If Massachusetts is the best, if our neighbors around the world are better, why do we need to have a year-long committee that's going to share their ideas and have a validation committee? Why the bureaucracy here?

COMMISSIONER DAVY: Well, first of all, I think that I'll start with the question you asked initially about what we did wrong. What happened?

SENATOR BARONI: I didn't mean what did *you* do.

COMMISSIONER DAVY: I understand that. I totally understand that. I haven't been the Commissioner that long. I can't take responsibility for all of it.

I think it's a couple of things. First of all, I think it is what I said earlier, kind of that cultural backdrop that we really believe (*a*) not everybody needed to do math or learn it well, and (*b*) not everybody could. I remember my parents telling me, "Don't worry. We're not good at math in our family." My guess is that most people in the room can relate to that at some point in time, where somebody said, "Don't worry. We're not good at math." My dad said to me when I was in high school, "I can't help you with that. I barely got through the math I needed to go to college." And frankly, when he got his doctorate later in life, I helped him get through statistics, because I had majored in math in college. It is that sense, I think, that some of us just couldn't do it.

And the other part of it, that I think is connected to that, is that for a long time we didn't have to teach all kids the kind of rigorous math that they need to know today in the 21st century -- not because they're all going to go out and use trigonometric functions in their daily lives -- but it is the kind of problem-solving skills and critical-thinking skills that get developed in the context of mathematical teaching, and learning, and understanding.

I think that for many years we could put kids, really, on two different tracks: one where kids who we perceived had the gray matter and the raw material to succeed on one track, and then others on what I would call a really *secondary* and *watered-down* track. The challenge to the nation today, which is why I think this focus is so different-- The challenge now is, we can't graduate students who can't do algebra. We can't allow students to enter the workforce who really have no conceptual understanding of what a fraction is, and where its place is on a number line, and how it relates to percentages, and other applications. We can't do that any longer. Those days are gone, I think, around the world.

The countries that have performed the best-- And Singapore is one that certainly comes to mind. They've been studying this and working at this now for several years. And what they determined was that we were trying to teach kids too many things. They have a very narrow set of standards and expectations at each grade level. But they go very deeply into those areas. So when children study fractions, they really study fractions. And they learn all about fractions in all different ways. And they use fractions in applications, and they understand how fractions relate to the real world and how they make sense in their lives. It's taught very, very differently.

I think that we've learned a lot and we also know that the demands are different than they were several years ago.

The other question that you asked about: Why take a year? It's not really a year. It's really six months. And I believe what these folks are going to do is take New Jersey's work, Massachusetts' work, the work of some other states around the country and bring that work together.

We've already been part, as a participant in the American Diploma Project Network-- We've already been part of a sort of standards review among the states in that network, where they looked at our standards side-by-side to see where the commonality was. And it turns out that there is a lot of commonality among the states already. This isn't going to be starting from scratch. This is really going to be taking the best of what's there, and building on that, and perhaps adding or subtracting from that.

They've talked about, though, fewer, clearer standards so that we can ensure that we can give all children access. This is about success for all children in the future. And whatever we've done to this point hasn't worked.

I think the experience in language arts is a really interesting one. Because there's no question that giving children a really rich, whole language environment changes their literacy development. It opens their world up where you recognize that the use of really good writing, really good literature changes the way they learn to read, and changes their interest level in learning how to read. I think we can learn from that and see that we really do have to come to a balance point here.

We kind of went like this (indicating) with the pendulum. We threw out the need for kids to learn their facts and be able to do mathematics -- basic mathematics without calculators. We threw a lot of that away as a country. And we went and said, "Why do you need to know the multiplication tables if you can do it on a calculator?" And I think the pendulum is sort of coming back to the middle now. And people are saying, "It's time to get middle ground."

Education is, I guess, an area that I think kind of develops over time based on what we learn, and the research, and the best practices that come out. I think it's living and breathing, and you want it to be flexible enough to change based on what we learn. There are things we know about the way children learn and about brain development that we didn't know 20 years ago that we can take advantage of as we do all of our work.

I don't know what we did wrong in the '70s. I actually think I learned the math pretty well. But I also really liked math because, I guess, I believed I could do it if I worked hard. I worked really hard at it, I had some really outstanding teachers, and I was successful. And so for me-- It's hard for me to understand why kids don't like math. But frankly, in the times that I've taught-- I've taught many kids who said to me, "Don't worry. I can't do this," or "Don't worry. I'm not good at it. I just have to get through this course," or "I just have to finish this class," or, "You know, I just have to pass this." And you really want kids to have a different viewpoint and disposition toward mathematics. And that's part of the challenge which I don't think we really thought about in the past either.

ASSEMBLYWOMAN VOSS: I would just like to interject, because of the fact that I don't like a one-size-fits-all education system. And this, to me, is a big problem.

Now, I've traveled all over the state in the last couple of years looking at some wonderful schools down in Ocean County, down in Gloucester County, down in Union County. And these are technical and, I like to say, career-oriented schools, as opposed to vocational schools, because I think we have a misconception of what vocational is.

But when you see the kids in, say, a carpentry class, they do mathematics that I would not even be capable of doing, because they see how it is necessary in the projects that they're doing. And I worry about the pedagogy that is going to be part of this. Because if things are taught well, and taught correctly, and kids see how they can use what they use-- I mean, for example, geometry -- when a kid would come into my class, I would say, "How many people like geometry?" And half the class would put their hand up. And I'd say, "Well, you're going to love this class, because I teach philosophy. And the same problem-solving techniques that you use in geometry you can now apply to philosophy."

And one of the things we need to do in education is to make sure that everything our kids learn comes together, and makes sense, and is not isolated subjects. It's not like, "Now you're going to learn fractions." Well, how are these fractions going to be used in science, or how are they going to be used in--

And I think that we have tended to think that we have a one-size-fits-all education system. And I have to say that we need to go back to different tracks -- I feel. You may not feel the same way about that. But I think that we're not giving all of our kids the opportunities to learn which develop their own skills. And that, to me, is a problem. A one-size-fits-all-- I keep saying that, and I don't mean to be redundant. But that bothers me a great deal.

COMMISSIONER DAVY: We agree. We don't want a one-size-fits-all either.

Your use of the word *track* scares me, because tracking to me means that we think some students can't get access to the content at any

point in time. We do understand, and believe, and agree that not all students might do this at the same pace, that not every child might be ready to take algebra in the eighth grade. There are lots of kids in New Jersey right now who are already doing it, and they're mastering it, and they're doing very well. And for some kids, ninth grade might be a better spot for them. We also believe that not every student has to take it -- the algebra content -- in a class called Algebra I, that it can be taken in a class where there are applications. Teaching math in the real-world context is one of the principles that our task force developed as a New Jersey core principle -- that recognizing that applied problems can actually motivate children to understand mathematics. You're absolutely right. For the child in that carpentry class, they're doing mathematics and rigorous math, and they're doing it in a way that has real-world applications. That makes absolutely good sense. And certainly those are skills that young people need to have. Heck, if you're going to paint your kitchen, you're going to need to know how much paint you need. There are applications of mathematics to that if you're going to figure out how many gallons; unless you want to buy 10, and then see what you use, and then decide what you're going to take back.

It's that kind of thing. We absolutely agree with that. What we believe very sincerely is, that taught well, and with the right materials, and in the right framework, that all students can get access to this content. They're not all going to access it the very same way. Not every child is going to learn it at the same pace or in the same delivery method. But that's where I think the work that we're doing will build upon those opportunities for children to learn in many different ways.

ASSEMBLYWOMAN VOSS: Assemblyman Caputo.

ASSEMBLYMAN CAPUTO: Commissioner, so much of what you said has been so informative.

Just to pose a question or part of a conversation relative to this reform: It seems to me that we've gotten off the beaten track, in terms of our Core Curriculum, because the need has been so emphasized on testing. I think that's where we've overreacted to the success rate of our programs based upon testing. And I think teachers have gotten into feeling somewhat intimidated. So this follows through in the curriculum part -- or even math or anything else. Because they're teaching for the test, rather than applying principles that would open up some kind of individuality or application for real-life problems. So I think we have to take that into consideration when we talk about changing or reviewing how much of an impact that's going to have on the teaching-learning process -- the need to have children succeed in the testing programs that are instituted in our schools.

COMMISSIONER DAVY: If I can talk about that for a second.

The testing -- especially when people say that teachers need to stop to teach to the test, troubles me more than anything that I hear. Because if the standards are well-crafted and really right on target, and the tests are aligned at those standards, nobody should have to stop and teach to that test. Because children should be learning what's on the test, because that's what they know -- that's what their parents know and what their teachers know we are expecting them to learn. So the disconnect there is something that we still have to work at.

Now, part of that, I think, comes from the fact that we do have many, many, many standards. And when we test, we're not very clear to

teachers about which ones of those are the most important. We've been working on that already, independent of this common core standards movement or the revision of these standards. We've been speaking, and we've done -- I guess we call them *essential standards* -- the essential core standards -- clarification of standards so that we can zero in and target them so teachers know these are the standards that children should not leave this grade without mastering. And we're trying to ensure now that our tests align to those standards.

With respect to testing, you know that a lot of what happened with testing was rooted in NCLB and the requirements that the Feds put on the states to really do this quickly and to develop it using mostly state dollars. And frankly, when you develop tests, and you're being peer reviewed by the Federal government, you face the issues of: they have to be psychometrically valid, and you can't just take items off if you think they're awful after you administer them the first year. There are all kinds of testing requirements that go around it.

I think that this national movement around common core standards will lead then to assessments that are aligned to those standards, that will hopefully leave fewer and clearer standards so that testing then gets much more focused and much more zeroed in.

I will say this as well, and I didn't mention this earlier. The Secretary of Education has said that of the money -- of the Race to the Top money that's going to be available from the Federal government for states to compete for, going forward-- Of that money, he's looking to invest significant portions of that in 21st century assessments that are aligned to the kinds of standards that we're talking about developing; and also to

providing materials, including technology, that can assist in the instruction of those standards; as well as professional development for teachers to be able to use the technology and to be able to provide the instruction that will lead to the learning by students. That's really our end goal. So there's a national commitment that if this work is done right -- that for those who are part of it, there will be considerable Federal dollars behind it for the next steps.

ASSEMBLYMAN CAPUTO: Just as a follow-up: This is going to take quite a bit of understanding on the instructional part of it. The paradox exists, obviously. But once these standards are set into place, there has to be an acceptance at the classroom level, which is the most important part of what we're trying to accomplish. Because obviously teachers have been moving in a different direction. You're looking at how they're protected, how they look in terms of producing high learning standards. And that's been the result of testing. So now if we're going to retrofit the test or retrofit the curriculum, somehow the instruction staff has to be totally involved in this process. I don't know how long it will take, but it's going to be resisted, obviously, because people have been working differently -- as to what we're trying to do here; except for those teachers who are brave and go beyond what people dictate -- they're probably doing a good job of this, regardless of what the requirements are.

DEPUTY COMMISSIONER WILLA SPICER: You bring us full circle back to where Senator (*sic*) Voss started, because the issue of being able to teach well to kids who do not learn abstractly is one that's faced us for a great deal of time. And somehow or another we got in our heads that the way to do it is to slow things down -- teach the same

way, just slower and louder. And we're just learning now that that's not working. And we have to find new ways. Because now that we're required to teach all the children, we have to find new strategies.

One of the things that is really bothersome is that if you go into a classroom -- a school system, and you can see the eighth grade kids, and they're getting algebra, and they're using a textbook -- and there are other kids who are in ninth grade and even tenth grade, they're using exactly the same textbook, they're using exactly the same strategies. And when they're not learning as well as the kids in the eighth grade we say, "Oh, there's something wrong with those children." But there isn't. There's something wrong with us. We need to be able to find new strategies and ways so that the children all will learn, as the Commissioner said, perhaps not at the same pace, but not even in the same way. And if we do that, the tests will take care of themselves. We won't have to be able to pound the test into the kids. They'll be able to-- They'll learn, as the research would say.

Thank you.

ASSEMBLYMAN CAPUTO: Thank you.

COMMISSIONER DAVY: If I could just add to that too.

Your comment about making sure that teachers-- I mean, at the end of the day, none of this works-- We can put anything we want on paper. It does have to be absolutely translated and integrated into every classroom. That is the challenge.

But I would also say that I don't think that-- Whatever comes from this will not be a huge departure from where New Jersey is, because I think we are at the forefront, nationally, on a lot of this work. But I also think that it's very important for us to maintain that partnership, the

professional development opportunities, the ability to give -- not only the teachers, but the school leaders -- to give the districts time to take the change. We can't assume that they're going to wake up the next day and we just wipe out everything that was, and put something totally new in place. I don't think it will be totally new, but I also think we have to allow for the implementation of the change.

The other thing I would point out-- And, you know, we're doing this in other core curriculum areas, making these revisions. We're also moving to what we consider to be 21st century skills being integrated in all of those standards. And that's a big departure too -- the idea that students need to know how technology integrates into whatever the content area is, or how they can apply one content area and connect it to another.

We're going to give the school districts and the educators time to be able to absorb this. We're going to do a multi-year series of professional development, that will be done throughout the state, so that we really can bring about the kind of change with support. Because, again, if you didn't learn how to do it this way yourself, you certainly will want some help and support to be able to do it differently than the way you learned it. And we are already developing a system to be able to provide that.

ASSEMBLYWOMAN VOSS: Assemblywoman Jasey.

ASSEMBLYWOMAN JASEY: Just a brief comment.

I welcome this conversation, because I hope that we're not going to go through what we went through with the language arts scores. I sat on a board of ed for many years when that went on, and it was just ugly. And meanwhile, children lost time that they never get back.

So the only comments I would make is: one, that I look forward to seeing what these international/national standards are. I like the idea that this is a cooperative effort. And I think the two key pieces that you already touched on that I would emphasize are: one, we have to raise or change the expectation that every child can do math. And as an aside, I will say that my daughter, when she taught third grade -- one of her class rules was, "We love math." And year after year, consistently, parents would comment on the fact that their children were doing math that they hadn't been able to do before and enjoying it. So a lot has to do with attitude and expectation. So much has to do with that.

And the other piece of it is staff development, because it must be taught well. And many teachers are not comfortable, especially in the elementary school grades -- they are not comfortable teaching math, because they haven't learned it or been taught to teach it well. So we have to keep that in mind. We have to make sure that the resources are there for effective staff development to support any changes that we're looking at.

And so I think this is very exciting. And hopefully we have learned from past debates in other subject areas so that we don't spend too much time debating. I think we do have to have a balanced approach. I don't think it's all or nothing. And yes, I'm frustrated when I go into a store and the salesperson doesn't understand 10 percent off, plus another 15 percent. (laughter)

COMMISSIONER DAVY: I agree with you. And I think we do-- We would really be doing a disservice to our children if we didn't take what we learned from the language arts wars and say we're going to solve this one a lot faster for their sakes. We lose too many. And I totally agree.

My children were in early elementary years when that was at its heyday. And I was very fortunate that they had a teacher who went against the grain. The district policy was whole language. She had been teaching for 20 years, and she never threw out the phonics sheets, and she never threw out her phonics materials. And so she gave them the whole language that was being dictated, but she also threw the phonics in there. And I will be forever indebted, because I know that it helped our children develop the skills that served them for the rest of their schooling.

The other thing I would add, on the PD side, is -- because that is going to be critical, and it goes to what Assemblyman Caputo was also saying. If, in fact, we take part in this common core standards work, and at the end of the line we say, "Yes, these are standards that are good enough for New Jersey," and we adopt them, and we move forward, and then the money -- the Federal government has indicated-- The Secretary of Education has said that the Feds will put money behind creating and administering tests aligned to those standards. If that's the case, that would free up tens of millions of dollars in the Department of Education's budget here in New Jersey. Wouldn't it be wonderful if we could take that \$30 million -- or almost \$30 million -- and apply that money to professional development in our state that would be created and delivered statewide? We had, several decades ago -- what were they called -- *professional learning centers*?

ASSISTANT COMMISSIONER JAY DOOLAN:
Curriculum service units.

COMMISSIONER DAVY: Curriculum service units. And you probably remember this.

ASSEMBLYMAN CAPUTO: Absolutely. I'm old enough.
(laughter)

COMMISSIONER DAVY: And we gave high-quality professional development. And it was delivered statewide. It would be wonderful if we could take our dollars and, instead of sending them to the testing companies, put them in an investment in improving instruction and supporting teaching and learning in classrooms. That's my end goal here. And I really am grateful that the Committee seems to be in support of the work that we're doing on this.

Thank you.

SENATOR RICE: Madam Chair.

ASSEMBLYWOMAN VOSS: Senator.

SENATOR RICE: Commissioner, I guess I'm getting (indiscernible) at this process. It sounds wonderful. We're always doing national things and relying on other states to lead. I guess one day we're going to lead in something.

But the concern I have is: What happens after the fact? We do all this national stuff, and everybody agrees that this is the best direction to move in. And then in the state itself, the whole system falls apart because of the lack of support and resources.

Let me give you an example. Some place-- And I've always argued that we have the formulas wrong, and I never want to let us forget that. We're all going to be out of office. And, we go out, and I'm going to see you and the Governor, I'm going to say, "We have the formula wrong." We're going to be in rocking chairs. I'm going to tell you we didn't do that right. Okay?

Someplace over the last couple of weeks -- I forgot what school district it's in -- where, because of the formula, the budget, the economy, all the economic things -- that I believe language teachers had to be let go. And that function, according to the spokesperson -- the superintendent or whoever -- is going to be handled by the regular teachers.

Now, that concerns me because it goes back to: What do I know? You, like Marion Bolden, really majored in math. You are comfortable. You can handle that. But I don't know how much language you majored in, how well you can teach that. How do we go across the board, cutting resources in areas where there are specialties? This is not teaching spelling bees, and words, and things of that magnitude.

That's my concern. We're going to come back with this math piece, which is really going to require, from my perspective, math majors who understand this to keep reinforcing it. And then we're going to cut resources and say, "Well, you know, the philosophy teacher is going to teach these new standards." And then she's going to be held accountable for meeting these standards and all of that. And then she's going to get frustrated, and then she's going to the union president, and then the union president is going to agree -- because I would -- that this is not her area. "You have to give us resources." Then we wind up in political battles again. I mean, where are we with that?

And I guess another question to that-- If we have all these national people coming together to set these standards-- I've never been one to think that some commissioner, or superintendent, or senator, or assembly person has a monopoly on brains, and that's (indiscernible) we have the position.

Are teachers involved who don't have these fancy titles, who just happen to be a great math teacher in the classroom, who don't want to be the principal, they don't want to be the superintendent, they don't want to be the guru and write books? They just want to teach kids math, and they know how to do it and do it right. Are they involved in this process?

COMMISSIONER DAVY: Let me answer. I think you asked a lot of questions.

First of all, I respectfully disagree. I think New Jersey does lead in many areas. And that's one of the reasons why I think we come to this with a little bit of caution -- that we are not going to step back. And if this effort means that we're stepping back, we're not going to be satisfied with that.

I'm pretty convinced, based on what I've heard though -- including from President Obama. He's been clear about this too. He's got a vested interest in this, because he believes-- I think he's used the phraseology, "The only way to get ourselves out of this economic crisis is to educate our way out of it." I think he understands that very critically. So I think that he's pushing for this work to be done with everyone around the table nationally.

There are teachers involved in this, there are school board members involved in this. The whole idea is that this will never work unless everybody is at the table -- that you do have to have agreement, that the superintendents and other commissioners from 50 states can't sit together and say, "Well, here's what we decided. We'll just slap it on each of our states." It's not going to work that way at all. And then each state, through the process, is going to bring it back. And we will bring it back here so that

people in our state can look at it -- teachers, folks from higher ed, people in the Department, principals and supervisors. And then it will go back to this panel of validation experts. And then when it's done, it will come back to us again. At that point we'll decide, "Are we going to adopt this, or are we going to go back and do this on our own?" So I think there will be multiple opportunities to ensure that teachers and people who actually have to do the work are engaged in this.

You've probably heard me say before, we can issue papers from Trenton all we want; if it doesn't get translated into the classroom, our papers are meaningless. So we do have to do our work in a way that engages the people who do the -- where the rubber meets the road in each and every classroom -- to be part of this effort.

The other thing I want you to know is -- with respect to your concerns about: "Will people be able to teach this?" and budget issues, and things like that. The Funding Formula provides resources for people to have world language teachers. So if they're cutting a world language teacher, there has to be something else going on in that budget. And I would be happy to have my staff look at that with any district that's facing those issues. There are also considerable resources in the Formula for professional development and for coaches or facilitators to assist in the development of -- professional development of teachers wherever necessary.

But as I said before, we can be part of this effort. And the Feds can take some of this testing burden away from us -- the financial expense. We will have money to help support and provide professional development in a way that we have not been able to for a very long time. So I think we'll see how this plays out, but I think there's great opportunity here.

I agree with you. The teachers have to be comfortable that they have the skills to be able to successfully do this. And I think we have examples. We have a Professor at Rutgers up in Newark, Roberta Schorr, working with the Newark School District, and I guess about 20 others around the state right now, where she's doing professional development for elementary school teachers up to eighth grade -- early elementary and middle school teachers in mathematics. And that program is working very successfully. The challenge is that we don't have enough money to do that everywhere.

So I think we know what to do. We're going to need to have resources to put behind it to help make sure everybody gets access to those opportunities.

ASSEMBLYWOMAN VOSS: Just a very quick--
I'm sorry.

SENATOR RICE: Make a note, because I don't want-- I may be wrong, but I believe I read that statement in the paper -- some reason I keep thinking it's Paterson. Because I recall it's up in that area. I was thinking to myself, "Well, there's such a diversity of language here." But would you look into that and let me know?

COMMISSIONER DAVY: Yes.

SENATOR RICE: It may not be Paterson, but the Assemblywoman is not here, so I can't clear it with her. But someplace in the state there was an article, about a week or two ago, that the classroom would take care of it through the regular teacher.

ASSEMBLYWOMAN VOSS: I just have a quick question.

COMMISSIONER DAVY: Can I just add one thing?

ASSEMBLYWOMAN VOSS: Go ahead.

COMMISSIONER DAVY: I'm sorry. Roberta Schorr is actually here. I think she may be testifying later. There she is. So she can talk about what she's doing. It's wonderful.

I'm sorry.

ASSEMBLYWOMAN VOSS: In the schools that I worked with -- in the elementary schools, some of the teachers were math and science, and some of the teachers were history and English. And one teacher did not, at a grade level, teach all subjects. And I think this is a disservice (*sic*) to the children, because when you have an elementary school teacher who happens to love literature, or history, or something, then math and science suffer. And so my question to you is: Are we doing this in the elementary schools? And it's also not fair to a child to have one teacher for an entire year, and they may have issues, personality clashes, whatever. And so even little children need more than one teacher in control of their instruction. And my question is: Are we doing this in our elementary schools, or was my situation unique?

COMMISSIONER DAVY: Well, I think that's another example of where one size doesn't fit all. I think there are some schools that do that and use it quite successfully, because that's what works best for them. I don't know.

Willa, do you want to add anything to that?

DEPUTY COMMISSIONER SPICER: No. It really varies. There are many schools that are doing it. There are more schools that are doing it starting with fourth grade, and moving from there. And every day

there are more. But that doesn't work for everybody, and not everybody is doing it that way.

So they have data that let's them know: "Is this the right way to go? Are our kids really learning well?" That helps in the decision making.

ASSEMBLYWOMAN VOSS: Thank you.

That's a wrap. Thank you very much.

SENATOR RICE: Commissioner.

COMMISSIONER DAVY: I'm sorry.

SENATOR RICE: Commissioner, would you keep this Committee abreast and informed about what's taking place with whoever is attending and representing New Jersey at these national meetings, and what the progress is?

COMMISSIONER DAVY: Absolutely. We'll give you reports along the way, including making you aware of what comes out and what's presented so that the Committee can look at it. I know you've all done a lot of homework on this, so we'll definitely make sure we put you on our list of people we share this information with as we go along. Absolutely.

ASSEMBLYWOMAN VOSS: Commissioner, I think Assemblywoman Handlin has a question.

I'm sorry.

COMMISSIONER DAVY: Oh, I'm sorry.

ASSEMBLYWOMAN HANDLIN: Thank you.

First of all, my thanks not only to the Senator for convening the meeting on this topic, but to Assemblywoman Voss whose passion about this issue is really inspiring.

So thank you, just at the outset.

I had just a quick personal observation and then a couple of comments.

I really was struck by what you said about your father, because I was kind of there too. I didn't encounter what we might call really, really *higher-level math* until I entered my doctoral program, at which point I needed to master higher-level statistics, and calculus, and so on, and things like stochastic process and all that.

And I specifically mentioned the term *stochastic processes*, because I struggled and struggled until the light went on. And the light went on for me when someone described what I was learning as a language. And what they said was, "You have to understand mathematics not as a series of processes, but as a language that helps you to describe the world."

Again I bring that up, because I want to say I'm very, very heartened by your opening remarks. It seems to me the same way we learn a language, piece by piece, chunk by chunk, word by word, is akin to the way we learn math, or I think the way we try to learn math. That is, again, word by word, chunk by chunk. At some point we put those words and those chunks together, and then we begin to-- We develop fluency. So it seems pretty obvious to me that we need to be doing exactly what you said we're doing, which is to come at this from both ways at once and meet in the middle. We need the rote memorization at the beginning just in exactly the same way when you learn a language. You have to memorize some things. There's no way around that. But if we do that right and link it to a feel for what can be accomplished, how those pieces can fit together, the

way they can create eloquence, then we've got it. So that's just a personal reaction.

A couple of more specific things: One, what I always worry about is-- We're talking about professional development and so forth. And that's all wonderful, but I guess we all know that no matter how we decide to teach mathematics, at the end of the day, the folks who are going to make it all happen are the teachers in the classrooms. And we're only going to get the best results with kids when we have -- when we're able to attract and retain the teachers who really want to be doing this.

And so one of the questions I have for you is: What are we-- How are we working to find the best mathematics teachers out there and give them what they need and what they want so they'll keep working for us in New Jersey, working for our kids, working in our schools, working to implement all the new standards? That's one question.

The second -- that I guess we haven't heard as much about recently, but it used to be a hot topic, and I continue to be concerned -- is the gender gap in mathematics. Do you believe that that's out there? I'm curious to hear your professional assessment as to whether or not girls are continuing to lag behind boys in mathematics. And if so, what are we doing about it?

COMMISSIONER DAVY: First, let's talk about the teachers.

By the way, I agree that it's like learning a language. I had a paper here on the common-ground principles that we developed for New Jersey, and one of them is related to the comment you made about the fact that it is like learning a language, and students need to be fluent with the terminology and understand the terminology.

With respect to the teachers, we're doing a couple of things. First of all, I think New Jersey continues to enjoy competitive salaries for teachers, which helps us to retain people in the profession. But we're also interested in recruiting more people, especially into mathematics and science teaching, and especially into the secondary areas -- so the biology, chemistry, physics teachers, teachers that will teach Algebra I, geometry, the high school classes.

We are working very hard on creating some opportunities. You may remember the Legislature passed, just a few months ago, a bill that allowed us to put some pilot programs out there for math and science teachers related to displaced workers, and to attract them to go into urban areas. We have had an overwhelming response in both cases to a math project that's just getting underway, and a science project as well. It is absolutely mindboggling how many people are interested. So many so that they've turned lots of people away, because we're doing this in small cohorts. I mean, it is a pilot. And the idea is, we'll do a small group, and we'll see if it works, and we'll make sure that if there are things that have to be changed, before we go too far we'll fix the areas of weakness. But we had incredible interest in both of those. So those two programs will start -- one this Summer, one will be begin in September. And we will begin then to be producing teachers in math and science or secondary education, particularly for urban areas. And I think that's something that we have got to continue doing. It's certainly something that we would hope to make permanent, once we know for sure that this is a viable way of bringing adults who might not have chosen teaching as their first profession into teaching. It is really important for us, if we're going to succeed, to have teachers -- to have

enough teachers available who can teach children this content. But I also believe that there are many teachers in the field already who, with the professional development -- to help them do things a little bit differently than they may have learned how to teach when they were being taught in their preservice program. And if we can provide them with professional development about how to do, for example, a different way of teaching Algebra I-- There are different methods of teaching algebra besides the books that you and I probably remember that were page after page of problems. There's a series called *interactive math*, the IMP -- the Interactive Math Program -- that doesn't look anywhere near a math book that we remember. It is more problem-oriented. So it talks about -- they want to plant a garden. It lays out a real-world problem, and then it embeds the math within that. And it goes all the way up through Algebra II and statistics embedded in all that -- some calculus in some of it too. It's really quite interesting to see a very different approach to mathematics. But honestly, if you are like me, and you prepared to be a teacher back in the '70s, you might not know exactly how to use that program successfully in your classroom. So you want to make sure you have professional development to be able to do it differently than the way you're used to teaching the material. And so I think there are many teachers out there now that would welcome that opportunity to have really good professional development. And I think when Roberta talks later, maybe you will want to ask her about some of what she's doing. She's working with teachers who have been in the classroom. And she is really strengthening their ability to reach all students in a very different way. The results are very, very exciting.

On the gender gap: I think that the gender gap is closing. It's funny that you say that, because when I went to high school-- I was lucky enough in middle school to sort of be-- I guess we took some kind of a standardized test that was math-aptitude oriented. And some of us got put into this class where we got on a track that allowed us to take algebra before everybody else. That class was half females and half males. And we went all the way through with half females and half males. We all made it through. Women did not drop out along the way -- or girls, at that time, did not drop out. And that's because there was a commitment back in the '70s to helping us succeed. The teaching was exceptional.

So I didn't think growing up that there was a gender gap. I got to college, on the other hand, majoring in mathematics, and that was very male dominated in the major. And most of the women dropped out before we got to the end. In fact, if I remember right, only two of us finished -- two of us, as women, finished the math major. It's one of the reasons why-- I mean, I think the teaching was very different. It's one of the reasons why I think I have such strong beliefs about how important the teaching is and helping people believe that they can be successful. Because I watched women drop out.

But I think what we see in our results now are those gaps-- Those gender gaps are closing. Women might not be choosing to take the more rigorous math when they have a choice. But I think when they're in those classes, they tend to do as well, if not, in some cases, better than their male counterparts.

Interestingly, I went to a Cisco Networking Academy competition about a week-and-a-half ago up in Edison. They were students

from throughout the state. I was very gratified to see an incredibly diverse group of children -- very diverse group ethnically from all over the state, all kinds of districts. What I was very disappointed to see was there were only four women -- four girls in the entire group. Most of them were boys. And I was disappointed. And I mentioned that, by the way. I was so proud of the diversity, ethnically, but the male-female thing-- And these are kids who actually choose to take the Cisco Networking Academy program. And they're interested in being able to do networking of computers. It's very tech-oriented. And so, for whatever reason, it's not attracting many females. But even the girls, by the way, were diverse, which I thought was great.

So I think there's still work to be done. I think when women find their way into the classes, they succeed. But I think we still have some work to do to encourage them to take those classes and to follow those paths.

ASSEMBLYWOMAN HANDLIN: Thank you.

ASSEMBLYWOMAN VOSS: Just to follow up on what you said: In observing teachers in math and science classes, the teachers always defer to the boys. And this is statistically proven at this point. So I think that was certainly a deterrent to girls.

I have to say, when I did my dissertation, I did qualitative, not quantitative. (laughter) Because math -- I never learned the language well.

COMMISSIONER DAVY: What you say about the teachers and calling on boys-- I think part of the reason why-- I did not have that experience, even though it was many years ago. I think part of the reason was I had some really strong female math teachers. At that time, many of

the math teachers in high school were men. Women taught English, and history, and things like that -- the world languages. But I had some really strong women math teachers, and that made a huge difference because they did not tolerate any of that nonsense.

But I also think that you do have to be-- I mean, if anything I think it was the guys who used to put down anybody who they thought was asking a stupid question, whether it was a male or a female. And that's a different classroom dynamic that has to be dealt with. But I don't see that when I'm out visiting schools, although, honestly, I don't visit nearly as many as I would like to. And I certainly haven't done a representative sample of any kind. I think that's part of the area that we do have to continue working on. But I think there's a lot more consciousness about that now than there ever was before. So I think that means people are beginning to focus on addressing it.

Thank you very much.

ASSEMBLYWOMAN VOSS: Thank you.

Now may I ask Dr. Sandra Stotsky to come forward?

Thank you very much for being here today.

S A N D R A S T O T S K Y, Ed.D.: Thank you very much.

ASSEMBLYWOMAN VOSS: Push the button. (referring to PA microphone)

DR. STOTSKY: Am I on?

ASSEMBLYWOMAN VOSS: Red is on.

DR. STOTSKY: Put the red on.

ASSEMBLYWOMAN VOSS: You're on.

DR. STOTSKY: I'm on. Okay. Thank you.

Thank you very much. I very much appreciate the opportunity to speak to you, Assemblywoman Joan Voss, and Senator Ronald Rice, and the other members of the Joint Committee.

I believe that you have had a statement of mine passed out to you already, and so you have that in front of you. I am not going to read that aloud to you because you already have it. I'm going to also make some other comments.

I would like to begin, before I introduce who I am and my credentials for speaking, to comment first of all on a very good point that was made earlier about the teacher question. Because that is, indeed, the focus of my own professorship at the University of Arkansas, which began only a year-and-a-half ago.

The issues we face in K-12 mathematics education in this country are not as the media has often portrayed them. And we've heard this sort of mischaracterization of the debate. It's not a debate between traditional mathematicians who want drilling on skills and don't want conceptual understanding, and a group of math educators who do want conceptual understanding and a more inquiry-based approach to learning. That's not what the issue has really been about at all, from the perspective of many of us who have been involved in all aspects of the field for many years.

The basic issue is a content issue: What should be the content of the K-12 mathematics curriculum? What do you want kids to finally know by the end of Grade 12? What should be the content from grade to grade? And what do you want them to know, be able to do in mathematics so that they can go on to post-secondary education, whether it's a two-year,

or four-year college, or some other kind of career setting, so that they don't have to be placed in remedial mathematics settings? So that is the major issue that has bedeviled us for a long time.

But parallel to that issue has been a decline in teacher quality, academically, that we have been able to verify by economists who've looked at the issue in other ways. For 30 years or more, there has been a decline, particularly at the elementary school level, where the basic building blocks of every subject are developed. That decline in teacher quality has aggravated the situation to the point where we now have to spend millions, if not billions, of dollars nationally on professional development to teach licensed teachers what they should have learned before they got their license.

That is my perspective. I believe in front-loading, not back-loading. You must have preparation programs that prepare your elementary teachers or special education teachers who deal with K-8 children with the mathematics knowledge they need.

Two weeks ago, in Massachusetts -- and I will get into a little bit more about Massachusetts, after hearing some very flattering comments from your Commissioner about Massachusetts. But I am on the Board of Education in the state of Massachusetts, and I'm very acquainted with these issues.

We had the first results of a mathematics licensure test for perspective elementary and special education teachers. And it was just developed and came into play two months ago -- the first test administration. The big hot potato was the cut score. How many are you going to allow to pass? This norm-setting committee consisted not just of

mathematicians, but of math educators from around the state plus a few others without license. They recommended a cut score that allowed only 27 percent to pass. Their instruction from the Commissioner had been, “We want to make sure that we have elementary teachers who get a license and can teach the math that we expect taught in K-6 or K-8.” And only 27 percent were allowed to pass. That was the vote unanimously of the board. And we heard from most other groups in the state who agreed with that. There will be, for three years, a slight increase in the number who are allowed to pass, but eventually they too have to pass this test.

Now, what is this test? It’s a 40-item test, and the pass score was 24 out of 40. I want you to understand what we’re talking about -- 24 items out of 40. Now, this is Massachusetts. This is a state that has some of the best public and private colleges and universities in the country. We have elementary ed programs in almost all of them. And yet the quality in mathematics of those wanting to go into elementary and special education is such that, in mathematics, only 27 percent could meet. What this means for the rest of the country we can’t even imagine, because we can’t imagine any other state, including New Jersey, doing any better on this score than we could do.

Now, let me go into some of my credentials before I go into the points of my talk, which I will try to make as brief as possible.

First of all, while I am now a Chaired Professor in Teacher Quality at the University of Arkansas, I have been at the Department of Education in Massachusetts -- Deputy Commissioner of Education, directly under the Commissioner of Education at that time, David Driscoll. And I was in charge of the development of all our state standards, all of our

teaching licensing regulations, all of our teacher tests, and all of our criteria for professional development -- the whole ball of wax. It was an enormous job.

I was the one who shepherded the development of our present K-12 math standards that have been referred to; also our K-12 science standards, as well. Those are the standards that have made Massachusetts first on NAEP tests at Grades 4 and 8 in math, and within the top half dozen of the so-called country's -- we registered as a country -- on the TIMMS test for 2007. And in science we were tied for first. So I would not claim that the standards are the whole story, because I know better. But they are part of the story. Our standards helped to propel us. We have good state assessments based on those standards. We have stronger teacher licensing regulations and stronger teacher tests. They will become even stronger, because now our colleges of education really have the sword of Damocles held over their head. If they do not prepare future elementary teachers to pass this math licensure test, they simply won't get licensed. What's going to happen? No one knows. This just happened two weeks ago. So they have to beef up their programs.

But I have also done one more thing that is very relevant to what we're talking about. And that is that I was on the National Mathematics Advisory Panel for two years. I was appointed by then Secretary of Education Margaret Spellings. And that Panel met for two years, from 2006 to 2008, released its official report -- the final report -- last year, in March. This was a Panel of 20 scholars and researchers -- I am, by training, a researcher in education, as well as an educator -- from all over the country who looked at all of the high-quality research, but also drew upon

the professional judgement of mathematicians to lay out what should be the components of high school algebra. Who else knows better than mathematicians what the content of their own discipline is? I will point out why that is very important in a few minutes. We also looked at all the research that was available on instructional issues and other issues for which there was a body of high-quality research available. That final report lists all of the recommendations and findings we could come up with. The state of research in mathematics education is abysmal. We have very little to draw on that tells us what to do, instructionally. Therefore we were, in a way, as eclectic as possible. If you don't have any basis in research to say that all children should work in small groups, all children should develop their own algorithms, or all children should work with real-world problems, then you have no authority to mandate these kinds of approaches in any state document. And we weren't referring to any particular state. We were just talking about this in general.

I have three major points that I want to make to you today as part of your inquiry into the state of development of math standards, both state-wise and nationally. My first point is to indicate, which I have done in my paper -- consider that part one -- to indicate how the New Jersey Department of Education can develop internationally benchmarked mathematics standards -- a process that I think will need to begin again and begin in an open, democratically framed way, as we tried to do in Massachusetts in the past year -- with a very clear set of procedures; with a very clear indication of who is being put on the committee, why; and to have progress reports made officially at all the critical junctures. We had a road map. We're still in the process now of working out some tweaks to the

road map, but we have just finished with our road map on the board of education. And our actual standards will begin to be written this Summer. We know that we're still going to go ahead with our own standards, even though Massachusetts, yesterday, has just joined the national standards project, which is what I will refer to as the same project New Jersey has just joined as well.

We're developing our own because we know that we already have probably one of the best sets of standards in the country, but we know that it can be better in many ways. Why do we know that it can be better? Because we've gotten feedback not only from our teachers in the field, whom I value enormously -- they're the people in the trenches -- but we have an array of mathematicians -- the real stakeholders, the real users, the faculty in engineering, mathematics, and science at our state, and public, and private universities -- who know what mathematics students need in order to succeed in post-secondary education. We've gotten feedback, so we need to -- we know what we need to do to make our very good standards even better.

And so my first point will be to recommend that you continue with your process of your own, because there's no reason at this point to buy a pig in a poke. And we really have no idea what's going to come out of this national project, about which I will have a few words to say in a minute.

I also want to indicate very briefly why the State Legislature itself should set up what I would call a *state-level review and validation committee* of its own. This is my basic recommendation to you as members of your State Legislature. A state-level review and validation committee

based on the basic political principle of checks and balances-- You have to understand that I have a long history in the League of Women Voters (laughter), and I believe very strongly in basic checks and balances, and democratic procedures everywhere. I was even President of my local League at one time. So I thoroughly internalize them. And I believe very strongly that we need to follow those basic principles. And we need, at the State level, a check and balance to what is happening at the Federal level, because the Federal level has become very enclosed, self-referential, and has not opened itself up in many ways that I will specify.

We also need a state-level review and validation committee which will evaluate those national standards in addition to their own selected validation committee. That's the part that the League of Women Voters person in me says is wrong. But you also need to have your own committee to look at the State assessments that might be based on State standards, whether you develop your own or whether you use the ones that come from on high. You do not want -- and I'm going to become very metaphorical here -- you do not want to sell your soul for the money that will be dangled by the Federal government. You really need to beware of selling your soul for that incentive, that major carrot that's going to be dangled. I understand how badly we need that money at the state level. We're all in the same boat. But we cannot have mathematics standards that, yes, would make us competitive with Cyprus and Zimbabwe, but not with Korea, Japan, India, Singapore, Flemish Belgium, the Czech Republic, and all of the high-achieving countries in the world. We want math standards that are internationally benchmarked, yes, but by the top six

countries, not the bottom six. So we haven't heard any specifications, but that's going to be part of the game.

I am known as a very blunt person. So when I speak, I sort of say what I think in very clear language.

Third, I am going to indicate why this national standards project really needs to earn the confidence of the public or any state legislature before that pig in a poke is bought.

Let me now go on to talk very briefly about what you all know and what we all know, as far as the way our government functions at different levels. State standards are not a governor's responsibility. They are the responsibility of a board of education, and they must go out for public comment. So you have to remember that whether you develop your own standards or you take the ones that are developed at the national level, they need to go out for public comment, and they need to be voted on, and you need to have a thorough process in place for getting whatever feedback you want from your teachers, from your mathematics community, and all of the stakeholders at the post-secondary level.

My fear -- and I say this now from a civic perspective -- my fear is that this national project may be inadvertently, because we have governors and state superintendents involved -- may be bypassing state legislatures and the public process of approval in order to get to the real goal, which is the development of assessments based on state standards. Because I know in Massachusetts that the real teeth are in state assessments. Everyone knows that. The real teeth are in the assessments which, by law, must be based on state standards. That's probably in every state's law. So therefore, whatever state standards you adopt, those state

assessments must be based on them. And if they're to be shaped by on high, then you need to be sure that they are truly first class and truly competitive for American school children compared to countries elsewhere.

What has been very intriguing to me and rather disturbing, which should be disturbing to all of us, is that, so far, the National Governors Association and CCSSO, which I will use as an acronym -- Council of Chief State School Officers -- so far have refused to tell us who the people are on the drafting committees. I have been trying to find out the names for a month. And I think this is an extraordinary cloak of secrecy when you have two bodies -- that are private, but they're based on people who have either elected positions or certainly know the laws that govern public bodies -- that have not seen fit to make known who are the people on these drafting committees -- ELA and math -- why they were chosen, what their academic credentials are. We just went through this on the board of ed in Massachusetts. And we insisted on knowing the academic credentials of the reviewers. We know who is on the committee. We have those kinds of informational facts. But we need to know why these people are there, why they were chosen, and who chose them. We need to have a public process for their meetings, we need transcripts available just as you have for this meeting. In other words, we need accountability. And right now there is no accountability at the Federal level for these two private groups developing national mathematics standards. And I want accountability.

And so this is where the State Legislature can play a hand and insist that this kind of information needs to be made available now, not after you get a first draft of something presented to you. What has been

made known -- here in New Jersey, but it hasn't been announced in the newspapers -- is who the Chair of this particular math drafting committee is. I know this person, also, from involvement in Massachusetts reviews of our math standards. This particular person has no mathematics degree at any level. I don't know why this particular person is the Chair of the committee. There may be other reasons, but we need to know why this particular person was chosen. I would have thought a mathematics specialist, someone with an advanced degree in mathematics would have been chosen by Achieve, the College Board, or ACT to be the Chair of the math committee.

We also do not know who all the reviewers of the drafts are going to be. I know, through informal feedback, that only one nationally known mathematician has been asked to serve as a reviewer. I find this extraordinary. And then I read in the paper that the validation committee will be selected by names proposed by the governors of the states, that the names will be chosen by the NGA and the CCSSO. Yes, they say the committee will be independent, but how can it be independent of the group of people who chose them? That's why the State needs to have checks and balances, its own validation committee in place.

Otherwise, this group at the top right now-- It really needs to work very hard to avoid the appearance that it is going to somehow create a stacked validation committee that will approve a stacked drafting committee. This is the impression coming out. And so we need to have public confidence built, far better than it has been, by the kinds of things we know of -- from open meeting laws, the sunshine laws. We need to have openness about what the procedures are for the people. Otherwise, this

national project will, unfortunately, deal a death blow to a very important national need, and that is: We do need national standards. I'm not opposed to them at all. We need national standards in mathematics and in science, in particular. But they need to be developed through an open process, which is it not taking place. And that state legislatures like New Jersey, and when I go back home in Massachusetts, can also point out.

If all of you recall, if you have long enough memories, about 20 years ago the standards movement began. It began with the National Governors Association, when President Bill Clinton was in charge of the National Governors Association and Albert Shanker was in charge of the union -- the AFT. That was when the standards project began. And what was tried at that time was to have all the professional teacher organizations develop their own standards. You may remember the fiasco with the history standards in the early '90s, and then there was a fiasco with the English standards. I was part of NCTE, because I come from the field of reading research, literacy. I know all about the reading wars. And I was part of NCTE. And they came up with 12 vague statements of standards, because they didn't like standards at all but wanted to accept the money at that time that was being dangled for the development of national standards. That killed national standards from professional teacher organizations.

We then had what you all are aware of: the development during the mid-'90s of state standards in every single state, including Massachusetts. And now we are trying a different tact for math, and science, and possibly more -- certainly including English. That is to have two groups, NGA and CCSSO, develop national standards through some yet-to-be-specified process, that includes no checks and balances as of yet,

so that we can finally begin to have, maybe, national standards that we all accept.

But we do need to make sure that we have an open process, that we have checks and balances, and that we have the people on the committees, for, say, mathematics in particular, who represent math instructors -- the end users, the stakeholders who represent high school teachers of math who, to this day, have been underrepresented on every committee I know. On the National Math Panel we had only one algebra teacher. We should have had more. We fortunately had one. But we need to have representation by people who know the discipline, and who are there to make sure that the content of mathematics -- and the content of science, when we do those standards -- represent what those people, who know that subject area, know high school students should know in order to do well at the college level if we want all of our students to go to college. And I know most of us want most of our students to go on at least for post-secondary education.

And that was part of our goal in Massachusetts. I will finish up in one minute. When we developed strong standards, strong teacher tests, strong teacher licensing regulations, and strong state assessments, the basic push was to make sure that all children could learn and that all children would develop higher achievement in all major subjects. That has happened in Massachusetts in mathematics. Our minority groups in Massachusetts now are higher than their peers in any other state in the union. And we have done this through making sure that they had really high content objectives and high expectations.

There is nothing that says that has been the wrong path to take. Unfortunately, the message has come from another group -- and here's where I will be ending -- called the 21st Century Skills Partnership, that has no research base behind it whatsoever, to say that we now need to add a layer of skills that are called *global awareness*, plus a few other things, to our content standards, because that will be the silver bullet.

As a researcher, we know that there is no research behind any of what has been proposed. But, yes, all of us want kids who can critically think, who can do effective communication. These are all motherhood issues. The point is: What develops them? And for those who are in psychology, which is where I've discovered many of our best answers come from -- developmental and cognitive psychologists -- they will tell you that the knowledge base that children acquire is the basis for the skills they will use and learn. And unless they have the knowledge base to begin with, the knowledge base that helps them to understand what they're reading, all the focus on skills is a distraction and a waste of time. And that is what you in New Jersey, we in Massachusetts, and all of the rest of the states need to be able to discern -- when we're being given a good sales pitch or when we're really getting a very solid product.

Now, I end now. But I'm perfectly happy to field any questions from anyone about all of the hot potatoes I may have sort of strewn out among all of you here.

Thank you very much.

ASSEMBLYWOMAN VOSS: Thank you very much for a very cogent presentation. I agree with many of your points.

Assemblyman, Do you have a question?

ASSEMBLYMAN CAPUTO: Well, now that you've recognized me-- Were you asked to serve on this group that the Commissioner spoke about?

DR. STOTSKY: Serve on what group?

ASSEMBLYMAN CAPUTO: On this reform group.

DR. STOTSKY: You mean the national standards project?

ASSEMBLYMAN CAPUTO: Yes.

DR. STOTSKY: No. I'm in the field of English language arts, by the way.

ASSEMBLYMAN CAPUTO: But you're speaking about mathematics.

DR. STOTSKY: I'm speaking about mathematics, because I know the issues in mathematics as well as I know them in other areas. And I was on the National Math Panel.

ASSEMBLYMAN CAPUTO: I see. Have you been asked to serve under this administration?

DR. STOTSKY: On these two national projects?

ASSEMBLYMAN CAPUTO: Yes.

DR. STOTSKY: No, I have not been asked.

ASSEMBLYMAN CAPUTO: Thank you.

ASSEMBLYWOMAN VOSS: Assemblywoman Jasey, do you have a question?

ASSEMBLYWOMAN JASEY: No, thank you.

ASSEMBLYWOMAN VOSS: Senator.

SENATOR RICE: Yes. First of all, let me just say that I enjoyed your presentation. I certainly concur with many of your comments,

not so much from an academic perspective, just from common sense. Oftentimes at the State we don't use that kind of judgement in decision making.

But I'd like to ask the staff to get with you. I'd like to get more information on this 21st century skill partnership, because New Jersey and the education community -- between corporate America and (indiscernible), particularly in the urban education area -- everybody wants to tell us how to educate our kids. Money is being poured in here from all kinds of left and right organizations under the auspices of helping. People are coming in under the auspices of wanting to be good citizens and residents, but they're being put in positions, with a lot of outside money, to run for public office in order to, just in my mind, take over the whole public education system under the auspices of helping us teach our kids all these subject matters.

But you indicated something in terms of the contents, and what contents should be from the grades, what you want the kids to really know, students really know. But then you went down, and you started to speak about this decline in teachers' quality. That is, I think, a real serious area of focus.

DR. STOTSKY: You're absolutely right.

SENATOR RICE: Because those of us who are not teachers or academicians, but understand how we learn -- at least those of us in the older generation -- and the process of what a teacher was really like, can see, in this new generation of teachers, some changes given technology and everything else. But even beyond the technology, the willpower-- And I'd like to think, from observations, that a lot of this quality has been diminished not so much because of skill sets, but because of the things we

have done in government to give some teachers control of their destiny and the classroom -- of teaching students.

For example, you can't show love anymore by patting somebody on the back. And kids need reinforcement. You can't be mom and dad and discipline every kid. Because if you were to do what the nuns used to do and spank somebody's hand, that's a no-no. But the content is where I'm going with this. You indicated at the grade level we should do all these things first.

My question is: Is it not true that once you get to this end of the scale, those same elements apply? And maybe that's why the quality is lacking?

DR. STOTSKY: That's an absolutely accurate observation -- that we can develop very high-level math standards. But unless we develop the teaching core, which has been alluded to here -- everybody's aware of it. But unless you can develop a teaching core that can teach to those standards, then what good are they. You need, particularly in the early grades, which is where we know the situation is really very dire-- When we do get high school math and science teachers, generally they've majored in their subject, and they're prepared to be able to teach. But our elementary teachers have not been prepared to teach math and science well. Typically they don't like math and science. They're not even prepared to teach history well, nor have they been prepared to teach reading well. I mean, part of the problem is that we haven't prepared them to teach almost anything well. They've learned other kinds of things in their preparation programs. The reason for Reading First, as you may know, was to make sure that K-3 teachers at least began to learn what the National Reading

Panel recommended was research-based, in terms of phonemic awareness, phonics, vocabulary, explicit vocabulary teaching, reading comprehension skills, and fluency. Those were major findings.

But the point was that we've had teacher training institutions that have not taught our prospective teachers many of the things they should have been teaching them. In mathematics, it's very obvious, and that was why I brought in the mathematics test that was just given in Massachusetts as an example. Because we're the first state to have actually given a 40-item math licensure test to our prospective teachers. No other state has done that yet. So we're the ones who finally uncovered the horror show at the elementary school level.

How that gets remedied remains to be seen, because there has got to be math coursework provided for future elementary teachers. But we do know that the quality of the teaching corps has steadily gone down hill. One good reason, of course, has been that-- I taught elementary school many years ago. But women like me had many other opportunities -- the younger generation of women who went on to medicine, law, graduate school. And so you've had a different level of people going into elementary education from the generation that I was in when I taught. I taught third grade for several years. I know what it's like to be in a classroom. I've also taught at the high school level in earlier life. But we have not replaced those women with equally able women.

This, by the way, makes us very different from all of our competitors. If we're going to compete with the Singapores, the Finlands, and all the other countries of the world-- They take their prospective teachers from the top 10 percent of their high school graduating classes.

Ours come from the bottom 30 percent of our college classes. There is the answer right there to a lot of the problems. Whatever your programs are in mathematics, they can't be taught by most of our teachers. Whether they're traditional or reformed, it doesn't make any difference. They need to know more mathematics.

SENATOR RICE: That's the point I'm getting to. We started off your conversation -- you articulated that there's a content issue. And we were talking about young people at this age learning. And then the issue became, under the contents, we need to be clear on what we want them to know.

DR. STOTSKY: Right. And we need to do that with teachers too, as well as with students.

SENATOR RICE: That's my point. So my point is that if there's a decline, it seems to me-- If I'm coming in to be a teacher, before I even start to move the teacher forward, I should want the same elements to play -- what is it I want them to know from here, to here, to here, to here.

DR. STOTSKY: That's right.

SENATOR RICE: And then maybe the top 10 percent of those who go into teaching will really be -- all of those in the bottom 30 -- at the top. So the numbers become (indiscernible).

I just want to be clear. Because I'm saying if I teach content here -- because we want to know what we want them to know -- and I have a diminution of quality over here, then maybe we're not asking ourselves what they should know. Because I've always said that there was too much in school when I went that I didn't really need to know, at least at the level

they were trying to give it to me. I needed more time on something else. They didn't want to give the time. It's a money thing.

But I just wanted to be clear on that, because I think it's important for the Committee -- the record to reflect that if we're going to look at education-- I just always had a problem with looking at education from the bottom, to high school, and then act like beyond there's nothing else, when these are the students we're bringing back to take on higher education. And my attitude is that if we're going to fund higher education, we need to raise the same questions that we start down here with, at that level, as though it's all the same.

DR. STOTSKY: If you expect more conceptual understanding from students, you need to have teachers who have that same conceptual understanding. I mean, it's an old truism. You cannot teach what you do not know. And if we have teachers who do not know sufficient math and science to teach, their students aren't going to be able to reach that level, no matter what the textbooks contain.

ASSEMBLYWOMAN VOSS: You made two points that I concur with 1,000 percent. And one of them that you just mentioned was that the lowest 30 percent of our college graduates are going into teaching. I was in teaching for more than 40 years, and so I saw, as the new teachers were coming in, the standards were not there. And it was very difficult to hire some people for our school system because of their lack of skills. And that is a very major problem that we have to address.

The other thing you brought up that I think we really have to emphasize is, when people are on these committees that are making decisions as to what is going to be taught and how it is going to be taught, it

would be a very good idea if they were educators and not, as you said, people who are not in the field. And I think, unfortunately, that has been the norm instead of -- in almost all of the states -- that people who are making these decisions are not the educators. They're not in the trenches. And that's a very big problem for me and, I think, for many other people.

DR. STOTSKY: And more than being educators, they need to be content specialists in whatever area you're talking about. If you want to develop K-12 science standards-- That's, of course, what we did in Massachusetts. We involved the expertise of the many scientists we have in the Boston area particularly to advise us on the content. I'm not distaining pedagogy. I've been a teacher, and I value good teaching, and I know what good teaching looks like. But you have to base your teaching on accurate content in each area. You need a historian or a political scientist to tell you what your history standards are, academically; scientists to tell you what your science standards are, correctly speaking; and a mathematician to tell you correct mathematics. Then you deal with how you approach, pedagogically, teaching at different levels. But you must prepare your teacher corps, as they do in other countries, to be able to teach those standards before they walk into the classroom, not with continuing professional development for the next 30 years of their life.

ASSEMBLYWOMAN VOSS: Does anyone have a question?

ASSEMBLYMAN CAPUTO: This is a very broad subject here. We're getting into a lot of different subjects.

Should I put this on? (referring to PA microphone)

Even if we accept your suggestion that 30 percent of the -- we're taking the lowest end of college graduates. These people are hired by school systems, and there are principals who should be evaluating--

DR. STOTSKY: Oh-- (laughter)

ASSEMBLYMAN CAPUTO: You're going to laugh, but it's not a laughing matter, you know.

DR. STOTSKY: No, no, that's another whole issue -- the leadership in the schools.

ASSEMBLYMAN CAPUTO: It's not a laughing matter at all. In other words, principals and supervisors should be evaluating these new teachers who are nontenured. And if they're not measuring up -- and there are many of them who don't -- and they're given tenure automatically, that seems to be a very, very serious problem.

DR. STOTSKY: That's a serious issue.

ASSEMBLYMAN CAPUTO: During those first three years, these people should be evaluated very, very carefully. And if they don't have the expertise, and they've been given an opportunity to improve, tenure should not be granted. So this is wider than just people not having all the skills or whatever. It takes in the whole-- We're indicting the whole system.

DR. STOTSKY: It's the entire system that needs to be picked up.

ASSEMBLYMAN CAPUTO: We're indicting the whole system, and I don't think that's fair. But if it is true, and we have people who are getting through the cracks -- and I'm sure that's true in a lot of cases -- then we have to get into the administration and supervision of our

nontenured teachers. And if they don't fit, they shouldn't be there. It's very simple. Because I can remember a day when people were brought into the system, including myself, who never saw a supervisor -- in an urban district, for example, maybe once every six months. So tenure was granted to many people almost on an automatic basis. And I think that's something that we've got to get more intimately involved in, in terms of examining people's credentials after the fact.

Because if this group of people are just heading toward our systems, then we're going to weed out a lot of people if we play by the rules.

DR. STOTSKY: It's a problem in every state.

ASSEMBLYMAN CAPUTO: I mean, isn't that true in Massachusetts?

DR. STOTSKY: Absolutely. We have the same problem.

ASSEMBLYMAN CAPUTO: But do you weed them out?

DR. STOTSKY: This is part of what we're trying to develop -- an attitude that before tenure is granted, there must be a careful evaluation, after you have induction and mentoring programs. There has to be supports given to new teachers as well.

But the first issue is to make sure that you license. I mean, that's where you can begin. You have a licensing procedure that at least gets your teachers academically to the level that you want them at. That's been one of the missing issues in this country, because we have 50 different licensure systems across the country.

ASSEMBLYMAN CAPUTO: What do you mean by that? What do you mean by licensing.

DR. STOTSKY: You have licensure tests.

ASSEMBLYMAN CAPUTO: Certification, you're talking about.

DR. STOTSKY: Well, certification ends with a teacher test. That's the licensure test. We have it in all other professions. Lawyers have to pass -- a prospective lawyer must pass a bar.

ASSEMBLYMAN CAPUTO: In New Jersey they have to take an exam.

DR. STOTSKY: Right. There are exams in every state. But you have to look at what is on these exams. This is part of my research, and I've done a lot of research on what it is that we assess, in terms of a teacher -- prospective teacher's academic knowledge, so that you can feel assured that the new teacher coming into the classroom will, for example, now have an adequate knowledge of math. That's what this math -- this new licensure test is about.

ASSEMBLYMAN CAPUTO: It's a lot of things. Don't you think it's a good program at the college level? It's a test that should be of the highest standard. It's also the ability of an administrator or hiring individual to evaluate people before they come in. And also it has to be continued once -- prior to being granted tenure.

ASSEMBLYWOMAN VOSS: Assemblyman, we're all very, very passionate about this subject. But we must be out of here by 2:30, 3:00 at the latest. And I think it's about 1:10 at this point in time.

There are many, many people who are going to give testimony. And so I ask you, respectfully, to not be redundant and to try and keep your comments to about five minutes so that-- I have a very long list of people who would like to speak on the subject.

ASSEMBLYMAN CAPUTO: Assemblywoman, this testimony went on for more than five minutes. I just want you to know that.

ASSEMBLYWOMAN VOSS: I know.

ASSEMBLYMAN CAPUTO: I appreciate that. Thank you.

ASSEMBLYWOMAN VOSS: Thank you so much.

DR. STOTSKY: My pleasure.

ASSEMBLYWOMAN VOSS: Dr. Joseph Rosenstein, would you please--

J O S E P H G. R O S E N S T E I N, Ph.D.: I was going to say, "Good morning," but I guess it's, good afternoon. (laughter)

My name is Joe Rosenstein. I'm a Professor of Mathematics at Rutgers. I've been there for 40 years, and I guess I therefore qualify as an expert mathematician.

I'm proud to announce that my youngest daughter graduated from Rutgers a few weeks ago, and she is going to be an elementary school teacher. And she was not in the bottom 30 percent of her class. Indeed, she graduated magna cum laude. (laughter) So I'm very pleased that she's doing that.

So the reason I'm here, I guess, is because I played a major role in the development and adoption of the math standards in New Jersey, first in 1996, and again in 2002. One of the things we did in 1996 was to develop a document called the *New Jersey Math Curriculum Framework*. Those of you -- maybe none of you -- who were in the Legislature in the beginning of 1997 saw then Governor Christine Whitman show this to the State Legislature in her State of the State message.

So this is a framework that was based on the standards. And I must tell you that in that framework, we speak of high expectations for all students, a very important part of the 1996 standards. And also we talk about the balance between -- that has to be held between the different perspectives. I have to disagree-- Although I agree with many of the things the Commissioner said, I have to disagree with her on this point: In New Jersey, there has never been two sides in mathematics, as there was in phonics and world language. The reason for that is that from the start, we recognized that that balance had to be there. And so, for example, although it may have happened in some other states, in New Jersey we never threw away the idea of the importance of being able to multiply two by five.

All those things are in this document, are in the standards that were originally proposed. Our standards did achieve that balance, and we achieved that balance by looking at all the perspectives and trying to do what was best for all students, recognizing that each teacher needed to implement the standards in his or her classroom according to the students who were there. And that meant sometimes focusing on skills and sometimes focusing on understandings. So we have never had two sides in New Jersey until perhaps now. And still there are no two sides. Everyone agrees that, as our previous speaker said, both conceptual understanding and basic skills are needed. So there really is no debate about any of these things.

It is true that Massachusetts is first in the nation, but New Jersey has not been far behind. As the Commissioner said, we are a leader in the standards area. Our mathematics standards have been among the best ones. I was told once that, "There are many framework documents on

my shelf” -- this was by an educator in Florida, I believe -- she said, “But your framework comes off of my shelf.”

We have been a leader, and we have not been far behind Massachusetts. On the fourth grade NAEP 2007, New Jersey was tied with four other states for second place behind Massachusetts. On the eighth grade, again we were tied for third place with a dozen other states. So it’s not as if something with our standards is badly broken and needs fixing. Of course our standards can be better, and we need to make them better. And we have major challenges. Our students are not doing all that well, but they’re not doing as badly, by far, as students in other parts of the country.

Furthermore, if we take demographics into consideration, New Jersey looks even better. For example, 30 percent of New Jersey’s population is African-American and Hispanic, whereas the corresponding percentage in Massachusetts is only 15 percent. We have greater challenges. And the fact that we have performed so well shows that what we’ve been doing is good.

The states we were tied with for second place were New Hampshire, Vermont, Minnesota, Kansas. They’re states which don’t have the diversity that we have. New England and the Midwest are not like New Jersey at all. As someone mentioned before, there are dozens and dozens of languages spoken in New Jersey households. And many kids come to school without having a strong background in English. And yet we’re doing very, very well. We have a long way to go and much to do, but we have to give ourselves some credit too. And it’s quite possible that our students’ high performance is related to our standards.

The standards that are often mentioned in conjunction with Massachusetts are -- and have been mentioned by some of the people who are speaking after me -- are Indiana and California. Their standards are, evidently, very similar to those in Massachusetts. At least that's what we're lead to believe. But in Indiana, with similar standards as Massachusetts, they're well behind New Jersey. And California, which has apparently similar standards to Massachusetts, is one of the poorest performing states in the country. So perhaps it's not Massachusetts standards that account for their success. Indeed, Massachusetts was one of the top-performing states in the country before the recent standards were adopted. So their performance may not have been as a result of their standards.

Let me say also a word about the international comparisons. The assumption is that the reason the other states are doing better is because their curriculum or their standards are better. Certainly, that's part of it, but that's far from all of it. Cultural factors play a very important role. For example, in those three countries which I mentioned -- Singapore, Korea, Japan -- it is the norm for students to have after-school activities. All students have after-school activities in math. So, of course, they do better.

Moreover, in a country like Singapore, which is the best in the world, it's not so surprising, because a substantial portion of their working-class people live in Malaysia, and their kids go to school in Malaysia, not in Singapore. So, of course, they're going to do better.

Moreover, the students in those countries, unlike students in this country, listen to what their elders tell them. And if they're told, "Learn," they learn. That's not quite the way it happens here. So we can't just assume that international, world-class standards are -- that these

countries have world-class standards. Their standards work for them, and their standards may, in fact, be very good. And there's much that we can learn from them, quite possibly. But their standards are not simply the answer.

I want to say a word about the role of mathematicians. I gave you an existence proof -- that's mathematical language for saying that, "Yes, our standards did have a mathematician on the panel" -- myself. I want to say something about the role of mathematicians. There are two important roles that mathematicians can play. One is ensuring that the standards are mathematically correct; and secondly, ensuring that the same is true of the test items on the assessments. I can't speak for the second. I've had nothing to do with New Jersey assessments. But in ensuring that the standards are mathematically correct is one role that I've played over the past dozen years. And to the best of my knowledge, although some people disagree with what's in New Jersey's standards-- To the best of my knowledge, no one has found any mathematical flaws in them.

The problem is that many prominent mathematicians make pronouncements about math education without having any expertise to support their pronouncements. The fact that someone is a mathematician does not mean that they know anything at all about mathematics education, either at the K-12 level or the college level. They may, but not necessarily. And some of them have made very striking pronouncements, which clearly evidences their lack of understanding of how children learn. They may know the content, but knowing the content is not sufficient. It's also important to understand how that content is learned, and in what order it's learned, and what grade levels it's learned, and what the

difficulties are in learning it. Those are things that mathematicians, typically, do not have expertise about.

So furthermore, while it's important to involve mathematicians in the process, it is important that the ones who are involved are people who are, in fact, willing to learn. The fact that they know mathematics does not mean that they know anything about how math is learned, as I found out myself as I started dabbling into this 25 years ago. Indeed, many of my colleagues find it hard to understand why most people have difficulty with mathematical concepts since it comes so easy to them. And they're very quick to criticize teachers and schools for failing to prepare students for college. But they're unaware of the large number of students who fail their own classes.

I have learned a great deal about mathematics and how students learn mathematics from my association with New Jersey's math teachers, most of whom do not have Ph.D.s in mathematics. Unfortunately, by and large, the mathematicians who are now the darlings of the mathematically correct group, like those on the National Math Panel, are very scornful of teachers and education. It's very unfortunate.

The previous speaker spoke about mathematicians as the end users of college students. That's true only to a small extent. Only a small percentage of the students in our K-12 system end up going to college and majoring in subjects which require them to take substantial mathematics. However, since the staple of college mathematics is calculus, college mathematicians tend to see mathematics from the perspective of preparation for calculus, so they focus on algebra and they scorn other

topics like probability, statistics, discrete mathematics, which are more useful for most students than an exclusive focus on calculus preparation.

While I believe that every student should master algebra, as the Commissioner said -- that as Bob Moses has argued, it's the civil right of the 21st century -- I do not agree with the National Math Panel that everything should be focused on algebra. They had mathematicians there who were focused on calculus, and so they focused on algebra. That is not necessarily the best focus. I don't agree that kids should routinely take algebra in eighth grade. The previous speaker noted that over half of Massachusetts students take Algebra I by Grade 8. I do not regard that as a meritorious achievement, particularly because -- as she also noted -- many of the teachers at those grade levels don't have the background. I would much prefer that the only students who take algebra in the eighth grade are those who really learn it on their own, as I did and as most mathematicians did, rather than having large numbers of students take algebra early and then hit a stone wall when it comes to Algebra II later on, because they didn't really learn it well.

There's no evidence to show that taking algebra early increases the pipeline of students going into scientific careers. Indeed, my own research shows we suffer a shortage in part because AP courses and the lockstep preparation for them turn kids off to math and science.

I also don't agree with the mile-wide, inch-deep analysis of U.S. mathematics that emerges from a narrow focus on algebra. Our students, for example, need to know statistics, a subject that is not taught in many other countries and, therefore, is absent from international exams. They

need to know statistics because in order to read the papers, they need to be able to understand what those charts mean.

Of course, students in other countries with a narrower curriculum will do better on exams that test a smaller number of subjects. But that doesn't mean that we should water down our curriculum so that it matches theirs. So, for example, the idea that we should limit our content to fewer topics is not clearly a good idea. That's not a research-based idea. They've done better -- those countries that have done that have done better on international exams -- of course they will -- because, in fact, students spend 100 percent of the time on those limited ideas.

The danger with the national standards project is that the same thing will happen. That is to say the core curriculum that is going to be developed will be much weaker than what New Jersey has, much weaker than what Massachusetts has, and the political and financial pressures to go along with that national curriculum will be very, very great. I mean, the Commissioner spoke about what we could do with the funds we could save. Yes. And the previous speaker spoke about selling our soul because of those funds. Yes. And it's going to be very hard to withstand the pressure and maintain a state's high standards in the face of those weaker standards that are likely to emerge.

It should be noted that-- One person asked before: Why does it take so long to develop standards that we already know what it is? The standards are-- As a person who's had a lot of experience writing standards -- not just reading them, writing them -- they are incredibly intricate, because what you do at one grade level impacts other grade levels. What you do in one topic impacts other topics. So if you make a small change, it

will have ramifications all up and down the math curriculum. So small changes make a big impact.

The research is not there to support most of the conclusions that people come to. So it's not surprising, for example, that we in New Jersey may focus on percentages at the sixth grade, whereas another state focuses on them in the seventh grade or the fifth grade. And the research to support one or the other is not there. So the different states are doing it differently. So what's going to happen is that a uniform curriculum will come up, and each state will say, "That's not the way we do it. We're going to have to revise everything in order to follow that." And it's not clear that it's an advantage to have a single curriculum which everyone follows exactly. It may be better to have guidelines for K-8 rather than have grade-by-grade guidelines. But the pressure-- Once this comes out, the pressure to adopt it is going to be very great, and we may very well end up with a much narrower curriculum and therefore one which is watered down.

We need to provide our students -- all of our students -- with a better math education. But our incentives should not be that students in other countries are doing better than ours on international exams. The reason for that is primarily cultural, as I said before, not educational.

As you may know, I have criticized the Department of Education very sharply for its handling of the math standards in the past months. It very hastily created and distributed a version of the standards that was lacking in quality. As I indicated to the Committee, over the past few months I and a group of 15 math supervisors, under the sponsorship of the New Jersey Math and Science Education Coalition, have reviewed very carefully both the December version of the standards developed by the

DOE's writing team and the February version the DOE released, and have developed a version of the standards that draws on the best of both documents.

I believe that this document can serve as the basis of a development of a new set of standards that will likely be among the strongest set of standards in the nation. I have encouraged the Department to make use of this document and have volunteered to work with the Department to develop a set of standards that will win the praise of mathematics educators throughout the state.

I would be happy to share this document with any mathematician who wishes to offer constructive comments, and commit myself to take all such comments seriously. I have spent 20 years working to improve math education in the state and am willing to listen to input from all those who share that goal. I believe that a collaborative effort will lead to successful math standards, and I encourage the Department to accept this offer.

I have things to say about many of the other things people spoke about, but maybe I should just stop and see if you have any questions and then make a few more comments.

ASSEMBLYWOMAN VOSS: Any questions?

Senator.

SENATOR RICE: I apologize. I was out of the room. I came in and heard you mention something about after-school activities.

DR. ROSENSTEIN: Yes.

SENATOR RICE: Could you just repeat that statement for me?

DR. ROSENSTEIN: Yes. In some of the countries, particularly the ones I mentioned before -- Japan, Korea, Singapore -- it is routine for kids to have tutoring after school in mathematics. We don't do that. We have some of that. But certainly that is a major factor in their success. Now, whether we should do more of that-- Obviously, the more we can do, the better. But we shouldn't (indiscernible) the success of students from those countries simply to their curriculum or the textbook that they're using. Certainly those are factors, but that's not all there is to it.

SENATOR RICE: The reason I raise that is because in New Jersey we keep cutting back on after-school activity funding.

DR. ROSENSTEIN: Right.

SENATOR RICE: And we have legislation that we passed recently that I sponsored. It only took me 20 years to move it. But no money.

DR. ROSENSTEIN: I understand.

SENATOR RICE: But I know how to get the money. But when you mentioned that, I just wanted to use it to make sure that when we get the Governor to sign this legislation -- I think it's being amended, and I suspect he's going to sign it -- that at least when we go into the districts, we can let them know that whatever their curriculum -- at least what their after-school activities are going to be -- that maybe it needs to have some strong tutorial components. I just wanted to be sure that I heard that (indiscernible).

DR. ROSENSTEIN: The time that kids spend on math makes a big difference. I know this from my own family experience. And so the

more we can offer kids, the better they will do. The assumption we all make -- and I've seen nothing in the past 15 years that will counter that assumption -- is that all kids can learn math. As the Commissioner said in the very beginning, all kids can learn math. If they fail to learn math it's our failure, not theirs.

SENATOR RICE: But do you feel-- Well, first of all, I hated math. I just did well in it because I had to. I guess I memorized everything. I can't do most of it now. If someone wants to ask me to do fractions -- and I don't blame the kids, because I can't do them. And to be quite frank, I'm willing to bet you most of you can't do them either. So don't kid me. I know the deal. You don't use them every day.

But there was some concern. If, in fact, it's an after-school activity, in terms of tutorial, do you believe, as was articulated today -- with where the nationals are going with these new models -- it should at least be incorporated in something more applied than just a continual? In other words, the Commissioner and others spoke of the fact that-- I mean, if I want to do math in school, or at least if I'm going to -- and I'm bored. But you can convince me to be in an after-school program where I get tutorial -- should at least be locked into -- say, if it's carpentry, lock it to carpentry so I can see the application of it.

DR. ROSENSTEIN: Absolutely. As I pointed out before, the kids in other countries often learn things because they accept their elders' advice that this is important stuff for them to know. That's not so here. And we have to address that. And one way of addressing that is by trying to interest the kids, trying to involve the kids, trying to engage the kids in learning mathematics. One way of doing that is, as you suggested, by doing

it through applications. Another is to do it by more experimentation. Another way of doing it is by doing things that interest them, which may not be career oriented but they find engaging. So all of those are quite important.

Now, I don't know whether the best way of doing that is after school. I'm not an advocate for after school or any other way of solving the problem. But the point is that in these other countries, one reason they're successful is because the amount of time kids spend with mathematics is much more than we do here.

One problem with the standards, and with the move of the standards toward an emphasis on assessment, is that the notion of experimenting with mathematics is being lost, that it's like saying that a student in science shouldn't do lab experiments. Lab experiments make the science come alive for the student. The student can learn it, get an appreciation, a love for it, an interest in it.

The same thing is true of mathematics. If mathematics is-- If the focus of mathematics, as the previous speaker said, is exclusively on the content, and the focus of the standards are exclusively on assessment, then the chances of getting the kids to be engaged is much less than if there is more experimentation, more opportunity for exploration.

One major change in the standards is going to be that the word *explore*, which was in many of the standards -- in the indicators in the previous version of the standards -- has been purged. The idea of students exploring is an anathema because it can't be assessed. However, students must explore ideas at one grade level in order for them to achieve mastery at the next grade level. To simply say, "We're not going to mention it at the

early grade level, we'll only talk about mastery at grade level 4," ignores the fact that in order for them to achieve mastery at grade level 4, they have to have exploration and introduction at early grades.

ASSEMBLYWOMAN VOSS: Doctor, thank you so much. But we have about eight people from the Coalition.

And I would like to kind of jump out of order here, because I would like maybe four of you to come up. And if you can limit your comments to a specific subject and no more than five minutes, because we're really, really--

UNIDENTIFIED SPEAKER FROM AUDIENCE: We'll follow directions, I promise.

ASSEMBLYWOMAN VOSS: Okay.

I'm sorry, I didn't mean to be in informal. But you said you just wanted to speak for, like, one minute.

ROBERTA Y. SCHORR Ed.D.: Yes.

ASSEMBLYWOMAN VOSS: Come on up.

DR. SCHORR: My apologies. I have a grandchild I need to pick up in a few minutes.

ASSEMBLYWOMAN VOSS: Put your mike on. (referring to PA microphone)

DR. SCHORR: Oh.

ASSEMBLYWOMAN VOSS: Is it red?

DR. SCHORR: Yes. Okay, thank you.

I'll keep my remarks very brief. I know it's getting late.

I too want to underscore the fact that the differences that we often see across countries is very culturally based. And I can't underscore

that enough, having visited these schools in these other countries and participated in the classrooms. And I have my own videotapes of them. I can tell you that there are huge societal differences in these places. And I want to underscore that.

That said, one of the things that I commend the math panel for recognizing is the role that dispositions play in mathematics achievement. How you feel about doing mathematics, and your fundamental belief in your ability to do it, happens when you're given conceptually challenging mathematics to solve. A lot of people think -- and this is often the case in many classrooms -- that we should reward and constantly reinforce kids for doing mediocre work. I don't agree with that. I believe that we all develop a deep sense of our own integrity and our own identity with regard to achievement when we're given challenging problems to solve and we're allowed the time, and supported to solve them in ways that are authentic.

And we all know that when we're given a tough problem, oftentimes we have to -- we get frustrated, we reach impasse. But that frustration -- we view it as just a part of the pathway toward success, not a part of the pathway that reinforces our own inability to do things. And so as part of the work that we do -- that I do, that I really find makes the biggest difference, regardless of district -- and I know I've spent a lot of time in Newark public schools and in other school systems throughout the state. When you help teachers to build emotionally safe classrooms with conceptually challenging, and important, and deep mathematics, then kids do well. And you know what? The better the kids do, the better the teachers do. It's a reciprocal, upward spiral. And to that end, I think that it's important to support teachers in those ways. And I commend the

Department for looking toward all kinds of mechanisms by which to achieve that.

So I think that with regard to State standards, I personally commend the Department for looking toward national models, because we may have slight differences across the way we look at our standards. But I have visited, as part of teams from the National Science Foundation, cities and states throughout the country, including Massachusetts. And I can tell you that the differences aren't as big as you think. And I support national standards with the caveat that the Commissioner mentioned: that if in any way they fall short of our expectations, then we're not obligated to go along with them.

And so I will limit my comments to that, although I could speak beyond.

ASSEMBLYWOMAN VOSS: Thank you, Dr. Schorr.

Does anyone have a question? (no response)

Thank you so much. I'm sorry about having to--

UNIDENTIFIED SPEAKER FROM AUDIENCE: Because of the time -- just a little out of order -- Amy Flax can go next, if that's okay.

ASSEMBLYWOMAN VOSS: All eight are not speaking, right?

UNIDENTIFIED SPEAKER FROM AUDIENCE: Correct.

ASSEMBLYWOMAN VOSS: Okay. So Amy Flax is going to come up.

UNIDENTIFIED SPEAKER FROM AUDIENCE: You said we have to keep it under five minutes, and you have to be out of here by 3:00.

ASSEMBLYWOMAN VOSS: Yes.

UNIDENTIFIED SPEAKER FROM AUDIENCE: Okay.

ASSEMBLYWOMAN VOSS: And there are several other people too.

A M Y F L A X: Good afternoon, members of the Joint Committee on the Public Schools.

My name is Amy Flax, and I'm a Co-Founder of the New Jersey Coalition for World Class Math. I have a bachelor's and master's in electrical engineering, and worked many years as a systems engineer in the telecommunications industry. Most recently, I became a certified mathematics teacher.

I am the New Jersey Coalition for World Class Math's representative on the New Jersey Department of Education Math Task Force. I, as a member of this Task Force, can articulate the problems--

Better? (referring to PA microphone)

ASSEMBLYWOMAN VOSS: If it's red, it's on.

MS. FLAX: It's red.

ASSEMBLYWOMAN VOSS: Okay.

MS. FLAX: Do I need to repeat, or am I okay?

ASSEMBLYWOMAN VOSS: No.

MS. FLAX: I, as a member of this Task Force, can articulate the problems with this Task Force and why we must have clearly documented processes and procedures for writing and reviewing standards. The makeup of this Task Force is a hindrance to achieving world class math standards. It is heavily weighted to those -- those members who are responsible for the 1996 and 2002 math standards, which have failed our children in the classroom for the past 13 years -- a failure seen in the high remediation rates in our college classrooms throughout the state. Many

members of this group have conflicts of interest, some receiving millions of dollars in grants, and many who stand either a financial loss or gain dependent upon the final product.

With shortcomings such as these, how did this Task Force come about? We believe that this Task Force was thrown together as a reaction to critics who felt not adequately part of the process. Such reactionary maneuvers would not be necessary if there was a defined process and procedure to produce world class math standards. This absence of procedures is both apparent and impactful, such as follows: no written plan for the revision process of writing and reviewing standards, no consistency within the Task Force, different groups reference different documents, contradictions on what Commissioner Davy articulated to our Coalition and what Willa Spicer articulated to the Task Force, refusal to have mathematicians involved in the process who have experience with world class math standards, ignoring the NMAP. The NMAP is our country's most recent and comprehensive document on math education. We believe that this Task Force is failing the public, our students, and the DOE.

Here are some examples: The Task Force was charged to look for balance between two opposing viewpoints, instead of what is scientifically proven, based on empirical data, to be the best interest of our children. The Task Force used a document, reaching for common ground in K-12 mathematics education, that predated the NMAP. This led to discussion on calculator usage, disposition, and debate of these standard algorithm. If the NMAP and world class math standards were used as benchmarks, the Task Force would not be debating, and wasting time and money on these issues.

A member of the Task Force was asked to produce a white paper on calculator usage. This paper cited examples from Mississippi, Nevada, New Mexico, Wyoming, and West Virginia. Four out of five states are failing academically, and four out of five have poorly written state standards. New Jersey education should model success. For this to occur, there must be documented processes and procedures for all content areas. Standards content writing is not about consensus or reaching common ground. Standards content is either set high or they are not. A compromise is failure for the children.

I ask you, the legislators and our representatives, to write a bill to address this lack of procedures in standards writing for our State. Successful states already provide a road map for this. Our children deserve to compete with the best in the world.

Thank you for the opportunity to speak today.

ASSEMBLYWOMAN VOSS: Thank you.

And could you provide us with a copy of your statement? Senator Rice, and I think the other members of the Committee, would like to have that.

MS. FLAX: Thank you.

UNIDENTIFIED SPEAKER FROM AUDIENCE: If we go quickly like this, can we get a few more in?

ASSEMBLYWOMAN VOSS: Four for now, and then I have four people on hold who have also -- need to have some time.

UNIDENTIFIED SPEAKER FROM AUDIENCE: Okay.

Ms. Anne Clarke.

ASSEMBLYWOMAN VOSS: Anne Clarke, okay. Five minutes.

Red light. (referring to PA microphone)

A N N E C L A R K E: Good afternoon.

Thank you for the opportunity to speak today.

My name is Anne Clarke. I'm a member of the New Jersey Coalition for World Class Math. I have a master's degree in chemical engineering and work for a Fortune 5 (*sic*) company, for 11 years, in a variety of roles in engineering, manufacturing, and corporate auditing.

Today I will share information that I hope will persuade you that we need disclosure and transparency as to who is at the policy-making table, and what their biases and conflicts of interest are. I am not focusing criticism on the individuals whose publicly available information I will share, but on the DOE.

Who decides who gets to sit at the table for setting education policy in New Jersey? For the standards clarification project, it was, quoting from a waiver, "a small group of principals and instructional leaders from the New Jersey Chapter of the Association for Supervision and Curriculum Development." They, "believed that the Understanding by Design model was the best for curriculum design." So just over a year before the standards were to be revised, the State launched a project to clarify the old standards. Why? I don't know. Why not just write a new set of clear, more coherent standards, then help districts write curricula based on this new set?

Districts are being told to use these clarification documents to design curricula, yet these documents do not appear to have ever been

approved by the State Board. Grant Wiggins was paid over \$100,000 for the first month of the standards clarification project, and over \$200,000 for the total project. The DOE has links to videos he produced for the project, sending people to his Web site where he sells his products and services. Now that he has clarified our standards, he is redesigning our high schools for an undisclosed sum. Grant Wiggins is selling to New Jersey his curriculum framer, an online tool to design curriculum endorsed by the DOE and part of a \$9,000 package sold to 12 of our districts.

I question this, because he has already been paid \$1.6 million for the creation of this work by a grant from the U.S. government from post-Katrina reconstruction funds. He designed a full year of math and language arts curricula for Mississippi, yet no school in Mississippi is using this as a complete program. But now the DOE is buying the curriculum framework for New Jersey.

Advice for the DOE: caveat emptor. Grant Wiggins also has a deal with Pearson, a textbook publisher, to review all their new textbooks. The DOE allows him to promote this on the New Jersey High School Reform Consortium blog, which is also posted on his Web site selling his products and services. He is all over the place. He's a businessman. He's doing what we should expect. Perhaps Deputy Commissioner Spicer can explain who the small group from the ACSD was that invited him to the table and why his obvious for-profit interests do not raise eyebrows at the DOE.

ASSEMBLYWOMAN VOSS: I have to stop you for a moment, because the gentleman is not present, nor is the Commissioner or the Deputy Commissioner. And so I don't know if it's proper to say some

of the things you are saying when no one is here to debate. Do you understand what I'm saying?

MS. CLARKE: I understand. I want to say that-- That's why I made the point I'm really not focusing on the individuals, but rather the DOE's procedures. And also, everything is from public information. Either I could find it on the Internet from my home or we got it from Open Public Records requests. I think I can back up everything. I can move on to the next part of my--

ASSEMBLYWOMAN VOSS: That would be good.

MS. CLARKE: Okay. Who else has been invited to sit at the table for math education policy? There are the big four in New Jersey math education: Rosenstein, Caldwell, Milo (phonetic spelling), and Schorr. Together, this year, they have received grants totaling over \$1.5 million and have received over \$26.5 million in total for math education programs over the last 10 years. They have a stake in the game. And the DOE always seems to have a seat at the table for them. They all sell products and services related to their expertise to teachers, districts, and states, with New Jersey, of course, being their primary target.

Dr. Rosenstein has written his specialty, discrete math, into New Jersey standards and has received over \$7.5 million in grants over the last 10 years for this area alone. Achieve's review of New Jersey's 2002 math standards states, "New Jersey's revised standards go further than those of any other state Achieve has reviewed in the areas of data analysis, probability, and discrete mathematics." And, "The fact that a good many of the topics in data probability and discrete mathematics section of the New Jersey standards are likely to be unfamiliar to the majority of teachers,

especially veteran teachers, exacerbates the challenge of strengthening teachers' knowledge base. For New Jersey to be successful in modernizing its mathematics program of study, it will have to put an aligned, aggressive program of professional development in place.”

Dr. Caldwell is a program author for Pearson, a math textbook publisher, and is available to give workshops and presentations for their products, according to the Pearson Web site.

Do you want me to move on to Dr. Schorr? (laughter)

ASSEMBLYWOMAN VOSS: We're very concerned about--

And Dr. Rosenstein--

DR. ROSENSTEIN: Since I am here, I can respond.

ASSEMBLYWOMAN VOSS: Yes.

MS. CLARKE: My point is not about Dr. Rosenstein, it's about the DOE's composition -- about who sits at the table, and who gets to sit on the Task Force, and why it isn't public. Who decides, who issues the invitations, do they put public biographies out, and do we have processes and procedures?

SENATOR RICE: Madam Chair.

ASSEMBLYWOMAN VOSS: Yes.

SENATOR RICE: Through the Chair, I hear you loud and clear. And we probably want to get more focus on these areas of standards. But you're saying to me -- what I'm hearing are some very interesting things that I would like to take a look at.

What I would like to do is have a copy of your written testimony.

We also want to make sure that we don't place ourselves, at this particular hearing, on a thin line between potential litigation, nonlitigation, and things of that magnitude. I know that's not your intent. And I also know you're not really trying to attack the various named persons, but we are using names. And so we have to be cautious.

But I'm interested, given my background and concern about this whole system, in what you have to say. So if you could leave a copy of that with us. And if we can stay, with the other speakers, on point -- like, for example, we're trying to determine-- We can't determine what standards should look like. But we're trying to hear, as standards are set up -- whether it's in the Philippines or someplace else -- how they really get there. Your statement is really kind of geared toward that question. And it raised the questions: How do we get there? Do we get there by using these actors? Do we get there by making assumptions with various things being done? Do we do a process this way? So it's a process of things. If you could leave that, I would appreciate it.

ASSEMBLYWOMAN VOSS: We're just concerned about personal references and things of that sort which can be not a very good thing to do.

Dr. Rosenstein.

DR. ROSENSTEIN: I'll just respond very briefly to that.

ASSEMBLYWOMAN VOSS: You have to come up.

UNIDENTIFIED SPEAKER FROM AUDIENCE: Is he going to have five minutes?

DR. ROSENSTEIN: No, I will not take five minutes.

I think it's rather sad that this kind of personal attack can be made upon people who've devoted thousands and thousands of days -- thousands of hours, I should say first -- thousands of days working to improve math education in the state; not just me, but all the others as well. The grants that we have achieved are grants for professional development of teachers, at least in my case. And they require a huge amount of energy expended in trying to improve math education. Do we get anything for the grants? Yes, small amounts. And it's true that we do have some claim in this. However, the extent of our personal involvement and the extent of our conflict of interest is really very minor. I don't know what she said about the previous one that she spoke about -- millions of dollars. I guarantee you millions of dollars have not passed the table of any of the four people she has mentioned who are New Jersey educators.

And it's really very sad, I think, that this group would treat people who operate very, very professionally and who devoted their lives to improving math education in the state -- would treat them so shabbily as to sort of say that they're just in it for themselves, which is what basically the speaker was saying.

Thank you.

UNIDENTIFIED SPEAKER FROM AUDIENCE: Do we still have two more people?

ASSEMBLYWOMAN VOSS: Yes, but please refrain from any personal attacks. Okay?

UNIDENTIFIED SPEAKER FROM AUDIENCE: They weren't attacks. So I apologize for--

ASSEMBLYWOMAN VOSS: Okay.

UNIDENTIFIED SPEAKER FROM AUDIENCE: But they were just-- They were public-- It's public information and tax dollars.

ASSEMBLYWOMAN VOSS: Unfortunately, when you name names it is construed as being a personal attack, and we cannot allow that.

UNIDENTIFIED SPEAKER FROM AUDIENCE: Noted.

Thank you. And we apologize.

ASSEMBLYWOMAN VOSS: Stick to the facts. Okay?

SENATOR RICE: Let me go on record while they come up here.

I'm the Senator in the state that's known for the Rice rules. And one of the rules is that unfortunately, unlike city council meetings-- We want to hear from our public, but we kind of keep control and charge because of where we are. And I think that as professional people and organizations -- whether we agree or disagree -- information's important to us. And I think you can articulate them in a manner--

What the last speaker from your organization-- The real issue that I heard -- if you just toss out all the names and all the dollars and cents -- was that if you want to set standards, these are the things you should be looking at. If the states have a process, and they have to change it, this is the way you change the process. So if we can stay focused on the issue of standards -- how we get to standards and policies, I think that's more appropriate for this forum. Anything else that may be in your articulation or your written statements -- if you would leave those statements with us; certainly, intellectually, we can read and comprehend what is being said. Even if it's subliminal, we will know that. Okay?

So would you kindly do that for us under the Rice rules? And if not, we're going to have to smile at you, say we love you, pray for you, but good bye. (laughter)

ASSEMBLYWOMAN VOSS: Would you state your name; and please, again, be brief, be sincere?

YVONNE A. GREENBAUN: Good afternoon to everyone.

I will be brief.

My name is Yvonne Greenbaun. I'm on the mathematics faculty at Mercer County Community College. And I'd like to address the standards in regard to remedial education in the state.

I'd like to start with a quote. And it says that, "Proof that high schools are failing is the number of first-year college students who take remedial classes," Education Commissioner Lucille Davy said. "In two-year colleges, 80 percent need remedial math or English classes. In four-year colleges, 40 to 50 percent need them."

These numbers are expected to rise this coming Fall as the placement score to test out of remedial or developmental mathematics courses has been raised, statewide. I'd like you to know that mathematics remediation will cost the community colleges somewhere around \$179 million this year.

I know that facts versus higher-order thinking, or basic skills versus conceptual understanding is part of the debate we hear these days. But judging by the numbers, many students have been left behind on both of these.

For instance, your NJ STARS are testing into developmental mathematics at the rate of about 62 percent statewide. In addition to that,

your graduation rates may be a little bit misleading. You have about 15 percent of students who don't take the HSPA, who pass out via SRA. And these are the students who come to us at the community college and who swell the ranks of those remedial courses. So in addition to that, you need to look at dropouts and the cost to the State.

But as I said, I will be brief. College remediation is a very serious issue facing the State. It's certainly tied in with how the standards are, what they're doing-- And I think the time has come to stop treating the standards, the assessments, teacher recruitment, and accountability as separate silos. It's time to stop using a triage approach to education. It's time to stop clamoring for more money as *the* answer and let us all work to something that will be a response that will provide a lasting solution.

And with that statement, I'm going to turn it over to the next speaker.

Thank you.

ASSEMBLYWOMAN VOSS: Thank you.

MARIA DeLUCIA, Ph.D.: I am Maria DeLucia. I am a faculty member and Chair of the Mathematics Department of Middlesex County College.

And to piggyback on what my colleague has said, it is unrealistic for us to expect students who do not understand the mathematics to be able to pass a State assessment test. And it was quoted in the newspaper on Sunday that our students -- only 10 percent of our students were below -- failed the NAEP. Well, if you look at it, sure, only 10 percent. But 38 percent were at basic. What is basic? Basic is: they have some knowledge of fractions, some knowledge of decimals. They don't

have the fundamental understanding. In eighth grade, 23 percent did not perform proficiency -- or they performed below basic on the NAEP. What had happened from fourth grade to eighth grade? Those are the students who will eventually be in our remedial programs. As Chair of the Mathematics Department, I will have, in the Fall, 52 basic math sections. What is basic math? It is anywhere from fourth and fifth grade math: fractions, decimals, percents, addition and subtraction of whole numbers -- 52 sections. What does that cost the State? Can we have world-class standards? Yes, we can have world-class standards. But let's make sure that the teachers who are teaching our children are adequately prepared.

It has been made a recommendation by the Association of Math Teachers of Educators, the Conference Board of Mathematical Sciences, and NCTM that our teachers have more than just one course in mathematics, that they be required to take anywhere from three to four courses. It's not the content; it's what they need to know. Do they need to take a statistics course? Maybe. Do they need to take a college algebra course? Maybe. Do they need to take a calculus course? No. Not every student should aspire to take calculus. What they need to take are relevant, rigorous courses with integrity so that they can be prepared to teach our students. Not only do they have to have the content, but they also have to have the pedagogical skills. You cannot teach what you don't know. But you cannot teach if you don't have the skills to teach.

And people have said that everybody's invited to the table. I don't see many two-year college faculty members being invited to the table to be part of the standards or be part of the programs. I don't know of very many two-year faculty members who have been invited to the table. So of

people being invited to the table, there's one very important sector being left out, and that's the two-year colleges. We have 50 percent of the college student body in the state at the two-year schools. And our college enrollment is increasing with the NJ STARS. And so far at Middlesex County College, we are running a Summer program for 100 NJ STARS who will lose their scholarships in the Fall if they do not place out of remediation this Summer.

Thank you.

ASSEMBLYWOMAN VOSS: Thank you.

SENATOR RICE: Madam Chair, just real quickly.

Just for your information, your statement is right on point, and that's the kind of statement we want.

But let me say this: This Committee has been very much concerned and committed to community colleges. We understand the importance of it. And I'm asking the staff to get more information to determine who at the community colleges, if anybody, is at the table. And if not, why not? Because it's this Committee also that took the lead in the articulation agreements with community colleges and four-year colleges. And to me it's a contradiction to be changing standards -- at least working on standards or improving standards -- whatever word we want to use -- in the Department of Education and not have community colleges at the table on everything we do in education -- or transition from grade school to a four-year institution. So I just need to get that on the record and find out why that's not. But that's something we will look into -- I'll look into.

DR. DeLUCIA: Thank you.

TERRY Y. FUNG, Ph.D.: My name is Terry Fung.

I just want to emphasize a few things here, and I will make it real short.

First of all, the requirements for the elementary school teacher are too low. In some cases, the teacher may have only taken one college math course. The teacher may not have adequate knowledge of the math content they teach their students. If students do not get taught the math skills properly in elementary school, they will continue to struggle in middle and high school. Also, teachers themselves may have math anxiety. They may pass this on to their students. As a result, everybody hates math. If this continues, no one will know how to do math, and they will just accept that they can't do math and give up. Our society seems to accept this. This is unacceptable. Until we change our mentality and tell our children they can do it, we cannot move forward.

And the other thing is, in the last 10 years, our math standards have been supporting the hands-on approach in exploring math. While the intention may have been good, students are not learning the concepts. We spend too much time exploring the concepts and they don't get to the basics. This doesn't mean we shouldn't use these methods. Teachers should start with exploring math and hands-on activities, and then teach their students the mathematical formulas.

All this is a vicious cycle. One reason we have so many remedial students is that they may have been taught by their teacher who were once remedial students. This must end. This can be changed if elementary school teacher requirements are increased and math standards go back to the basics. This means that instead of just talking about the reason behind the math, actually doing the math.

To achieve this, we must change our math standards. Current standards cover so many topics again, and each topic appears again and again in each grade. Well, I have seen my children learn the average, median, mode, range, and outlier from second grade to seventh grade. I, as a mathematician, do not know what is the significance of learning this topic six times throughout elementary and middle school. In fact, they may have to see them in future courses. You should seriously consider changing our math standards so that our children will learn something meaningful in school.

The class time is limited. If we spend time to explore math again and again, we will have less time to learn basic skills. To make up for the lost time, teachers give students calculators to speed up the tedious calculation. This is not a sufficient solution.

In conclusion, all the reasons previously stated have been causing the high remedial rates in our country. The best way to lower the remedial rate is to go back to the basic way of teaching math. It is absolutely necessary that children learn the basics. We all know our math standards are not strong enough, but they can be improved. And this will lower remedial rates. You have the power and the responsibility to do just that.

Thank you.

ASSEMBLYWOMAN VOSS: Thank you very much.

SARAH-KATE MASKIN: I'm the last one.

ASSEMBLYWOMAN WATSON COLEMAN: Okay.

MS. MASKIN: And I will be under four minutes. You can time me. (laughter)

My name is Sarah-Kate Maskin.

Thank you, Assemblywoman Joan Voss, Senator Ronald L. Rice, and the rest of the Committee members for this opportunity today.

Real quick, I think the biggest message that our Coalition would like to give to you, the Committee, is that there is no process and procedure documented in place anywhere. And you've heard a lot of that today from other people.

The fact that, Mr. Chairman, you had to ask the Commissioner for a report back-- That is something that should be documented so everyone knows what the next step is going to be. The fact that Dr. Rosenstein and his group have written their own set of standards and are willing to offer it to the Department of Ed illustrates that there is no set process and procedure. The fact that there is no one for the voice of the community colleges sitting at the table demonstrates that there is no documented and outlining road map of processes and procedures. And that is our biggest concern, whether it's math or any of the Core Curriculum Content Standards.

It is clear that much progress has been made. And we are grateful to the Commission for leading this tremendous undertaking. I actually had the same question that Senator Baroni asked. Why, less than a month ago, were we not willing to partner with an already proven successful state standard such as Massachusetts, but as of yesterday our State is willing to participate with 45 other states with an unknown outcome? Why is New Jersey willing to participate in the unknown when we could have simply participated with what -- and modeled after proven success?

In the long-term, our Coalition believes that legislation is necessary to set forth a process by which New Jersey writes, revises, and reviews all of its Core Curriculum Content Standards. Presently -- and you've been witness to this today -- no written documented process exists. This absence of protocols allows the process to be overwhelmingly impacted by those who may have either power, connections, or ideological biases. We need to turn a new chapter that removes such impediments to establishing education standards. That's the long-term.

In the short-term, these are our three recommendations to your Committee: one, require that New Jersey's new math standards meet world-class levels, modeling after the success -- proven success of Massachusetts, California -- and I agree with Dr. Rosenstein, they have not implemented their highly ranked written state standards, but their standards exist. They have to get the next part in place. And we'd like the NMAP -- which is our country's biggest, and most comprehensive, and most recent document that has, I think, studied 16,000 empirically based research reports -- using that as the guiding framework for our math standards. Number two, require that New Jersey's standards' process be free of financial and research-based conflicts of interests. And number three, require that New Jersey's math standards be reviewed by an eminent panel of non-New Jersey affiliated mathematicians to preserve objectivity. We need this process to be transparent. We need it to model after success. And there needs to be objectivity.

Just because New Jersey has agreed to participate in this Common Core State Standards Initiative does not guarantee that what is

presented will necessarily be adopted by our State. The ultimate decision rests in the hands of our State Board of Ed.

The Governor, the Commissioner, our legislators, and the State Board of Education must be given an objective, unbiased, and critical review of any set of standards set before them. It is absolutely necessary to establish, as Dr. Stotsky has recommended, our own internal review and validation committee, independent of the national one, to discern if the national standards will provide the necessary framework to prepare our students mathematically.

We must ensure that all of our Core Curriculum Content Standards are written, revised, and reviewed to include and deliver objectivity, content area experts, transparency, and modeling after proven success. Simply, the citizens of New Jersey expect, and the children deserve, a Department of Education that is both accountable and transparent when providing the components of public education.

Again, thank you for your time and the great degree of thoughtful consideration you bring to the oversight of our public schools.

ASSEMBLYWOMAN VOSS: Thank you.

And can we please ask you for a copy of your testimony as well?

MS. MASKIN: Yes.

ASSEMBLYWOMAN VOSS: Okay. Thank you for being succinct and brief.

Do you want to say anything? (no response)

Is there anyone who is not from the Coalition for World Class Math that wishes to speak?

UNIDENTIFIED SPEAKER FROM AUDIENCE: That's you.
You're not from our Coalition.

JEROME DANCIS, Ph.D.: I'm not from New Jersey.

ASSEMBLYWOMAN VOSS: You're not from New Jersey.

What's your name please, sir?

DR. DANCIS: My name is Jerome Dancis. I'm an Associate Professor Emeritus of Mathematics at the University of Maryland.

I've provided you with a set of reports. Probably about a third or more of that has been said by other people, and I will try not to be redundant.

But anyway, we college professors are distressed, actually, by the poor and continuing-to-worsen understanding of arithmetic and algebra by large numbers of college students. It's not a static situation. It's getting worse. And it's not just the students going into remedial. We see this in the calculus courses also. And, in fact, a part of the students who take high school calculus, when they arrive at a college campus, are told to take two giant steps backwards and retake pre-calculus before we even permit them to retake calculus. So at least on this point I will agree with Joe that it's not necessary for students to take algebra in Grade 8, because these are the ones who take calculus and then have to take pre-calculus when they get to college.

I'd like to go on to the question of the fact that the teachers -- well, teachers don't know the math. Well, a big problem with fractions is that there are many middle school math teachers who don't know how to add fractions. And a popular way-- In this country, a popular way for certifying teachers is to take the Praxis II exam. And the first rule of the

Praxis II math test is that the middle school math teachers get to use calculators, so there's no need for them to know how to add fractions to get a perfect score on the Praxis II exam.

And it's not just the teachers. Three years ago I was briefly an official in the state of California to read middle school math textbooks. And after reading them, it was clear to me why students are not learning math, because there was very little in the way of useful instruction. And more than that, it was clear that the writers had no training in how to write mathematics correctly. And there was also a fair number of what I call the *myths*. I mean, we were reading through-- Like Death Valley is 200 feet -- excuse me, is minus 200 feet below sea level. Well, I see the minus sign and I think *typo*, until I see this extra minus sign was consistent in this book and that it was consistent in books by three other publishers. So there was a whole collection of myths that the textbooks have. So it's crucial that not only the teachers, but also the writers of the textbooks, and the math cultures, and the specialists know the mathematics.

And so I'm happy to tell you that the U.S. Secretary of Education has said -- actually in response to a question I asked -- "I agree that we can use a ton of this stimulus package resources to send teachers back to schools and universities to get the" -- well to get the content of the knowledge that they need in order to be able to teach properly. So the Secretary of Education has said there's money for this. I would say go get it.

On the question of the so-called *math wars*, I always thought that there were three sides. And the third side is actually college math professors. And we're the smallest side, which almost nobody has ever

heard of. Maybe they've heard of us, but they don't listen to us. (laughter)
And we've always believed that you have to have both conceptual understanding, as well as knowing how to add fractions and multiply.

But I will-- Well, okay, but now I-- I have to throw in a math problem. Here's a math problem.

ASSEMBLYWOMAN VOSS: We're not good math students.

DR. DANCIS: Here it is. A child-- You go to the store. you buy a loaf of bread for \$2, potatoes and milk for \$1, and you give the clerk a \$5 bill. What is the change?

ASSEMBLYWOMAN VOSS: Two dollars.

DR. DANCIS: Okay. The next question is: What grade should this be taught at?

ASSEMBLYWOMAN VOSS: First, Kindergarten?

DR. DANCIS: Oh, you agree with me.

So in the February draft of the New Jersey Standards, it's Grade 7.

ASSEMBLYWOMAN VOSS: What? I'm sorry.

DR. DANCIS: That question is-- In the February draft of the New Jersey Standards, this first shows up in Grade 7.

ASSEMBLYWOMAN VOSS: I don't know. I've never seen the standards for mathematics.

DR. DANCIS: The reason is that it's a two-operation problem. The student has to do both an addition and a subtraction. And this is--

ASSEMBLYWOMAN VOSS: I'm incredulous. I'm sorry.

DR. DANCIS: Problems that involve both an addition and a subtraction are avoided big time in American textbooks, they're avoided big

time by the reform math side of this group who keep saying conceptual understanding. But conceptual understanding for them -- for a problem of this order-- I mean, this higher level of conceptual understanding does not exist until Grade 6.

ASSEMBLYWOMAN VOSS: We have-- It's amazing.

SENATOR RICE: That's problematic and something we need to look at from the Committee's perspective, because what happens is that-- The reason it's important to me, and maybe I think differently than people, maybe it's my growing up-- You know, we start to talk about preschools. The whole idea of preschool was to get away from babysitting. So we said daycares are not going to get money unless they go into starting to create cognitive skills. Because I couldn't understand why we were told that the kids going to first grade or going to Kindergarten were 18 months behind. I said, "How can you go into Kindergarten being 18 months behind when you haven't learned anything?" (laughter) That's when I heard about this thing about cognitive skills.

And so if, in fact, we see that at that early age we should be teaching, and youngsters should be learning cognitive skills, the world around them -- that there is a conceptual level of a life that begins a lot earlier on simple things. Do you understand what I'm saying? (affirmative responses) So it shouldn't take me until the seventh grade to grab some basic concepts. So it's something that needs to be looked at.

I didn't mean to interrupt you, but that bothered me when you said that. And then I read your statement here.

But go ahead. I'm sorry.

UNIDENTIFIED SPEAKER FROM AUDIENCE: We have the standards, if you'd like to read them.

ASSEMBLYWOMAN VOSS: I'm sorry?

SENATOR RICE: We'll get them later.

MS. SCHULZ (Executive Director): I have them too. I have them right here.

ASSEMBLYWOMAN VOSS: We have them.

DR. DANCIS: There is one good set of textbooks for the elementary school grades, according to me and some other mathematicians. And that's the Singapore textbooks. They were written in English for Singapore children for whom English is not a first language. And on the back of my handout, there are the extremely good results of using this. In an inner-city, Title I school in California, it wasn't just a question of using these really good textbooks, which really explain the material and for which -- and which do these two-step problems in Grade 3 -- not as good as Grades 1 and 2 that I would like, but certainly not Grade 6 or 7. And we get these -- well, anyway -- really good results.

Now, they also had a really good math coach. And it's really important to have a really good math coach. And I think the best use of the stimulus package money would be to train math coaches in the mathematics, because you have too many math teachers to train them all right away. But you can train a math coach in each and have a math coach in each elementary school who knows mathematics. If it was up to me, I would make it a requirement for being an assistant principal in an elementary school.

ASSEMBLYWOMAN VOSS: Interesting.

DR. DANCIS: But nobody asked me. (laughter)

The other thing I would throw out, which is somewhat separate-- No Child Left Behind says that the state has to have a Grade 10 math test. And what I would do is, I would go to the main campus of Rutgers University, and then I'd say, "Lead me to your math placement test," and just copy out all the Algebra I questions from that math placement test, and arithmetic questions, and say, "Okay, that's the Grade 10, No Child Left Behind-demanded math test. The students who score high will get a certificate saying, 'You are minimally ready for college math.'" And, of course, the actual passing score can be set as low or as high as you want.

And I hope you find some of my other remarks amusing.

ASSEMBLYWOMAN VOSS: I'm listening very carefully.

DR. DANCIS: Oh, all right.

The other thing-- The average score on the SATs, nationwide, is about 500. If somebody does just the arithmetic and the pre-algebra questions, they should be able to score about 600. But the problem is SAT is really good at finding these two-step questions that involve, say, an addition and subtraction or a multiplication and subtraction. I put one in there. And since these types of questions are avoided in the curriculum, this is why the students' average score is 500 instead of 600 or higher. And if the State of New Jersey would like to see a jump in the math SAT scores, I would say to take all the arithmetic and pre-algebra questions from the PSAT and include them in the standards for middle school.

ASSEMBLYWOMAN VOSS: Dr. Dancis, can you kind of come--

DR. DANCIS: I'll stop. (laughter)

ASSEMBLYWOMAN VOSS: Thank you very much. But as I said, we have to leave this room momentarily.

SENATOR RICE: Before we leave, when you're finished, I'd like to ask one question.

ASSEMBLYWOMAN VOSS: Does anyone else want to add something?

SENATOR RICE: Excuse me, doctor, before you leave, just a question on your chart here. It's my understanding that these-- After the books were purchased and used, I suspect -- that was in 2006. So I guess the analysis is the top chart to the bottom -- what occurred before and afterwards.

DR. DANCIS: Yes, because it's both the purchase of the textbook and this math professor. Dr. Sagher was the math coach.

SENATOR RICE: In 2006, the scores went up to 67 percent in the second grade, and 2007 it was 66 percent -- kind of dipped one -- then 70. But then as we move over--

Can you kind of explain what happened in Grade 4? They're supposed to be getting better, right?

DR. DANCIS: No, I don't know.

SENATOR RICE: Oh, okay. There must have been a language problem. Okay, no problem. (laughter)

DR. DANCIS: I think the official way that you're supposed to read these is diagonally, because if you read diagonally, it's the second graders in 2005 that became the third graders in 2006, became the fourth graders in 2007--

SENATOR RICE: Okay. I will read it that way.

DR. DANCIS: But the results are dramatic, and they're dramatic within one year.

ASSEMBLYWOMAN VOSS: And different material.

Senator, would you like to make some closing remarks?

SENATOR RICE: Yes.

Thank you everybody for your patience. I found this--

First of all, I want to commend the Chairwoman. This is a very interesting subject. I hated math. (laughter) I still hate math, probably. But I like listening to this stuff. This is interesting stuff. But it also taught me why I hated math. (laughter) But I do know there's a lot of work to be done. Because the one thing New Jersey is doing-- And I don't lay blame on anyone. I really hold all of us in government collectively accountable for doing the right things. And I think that we get it -- at least from this hearing -- is that there has to be standards, as we know. And we also know that we have to make our kids competitive. But we also know that we need to pay attention to what young people can learn at what levels of education and life, and where we should start some things. That became clear to me.

What I would like to suggest -- and I am concerned about the one issue. Because every time we leave things to the whim of government-- Commissioners come and go. That's what bothers me, Chairwoman. Governors come and go, and legislators come and go. And I really think that those of us who have an interest on this Committee should take a look and do some research about maybe preparing, real soon, some legislation that would help lay the foundation for setting up the processes and procedures. Because we have enough people on this Committee with

education backgrounds, who have at least been where you are in this maze of confusion, and have some ideas -- based on what they know from life experience, as well as what they're hearing -- at least what a foundation should look like, and legislation.

So, Melanie, maybe if you could poll the Committee and find out which members would like to work on some legislation. I have a problem (indiscernible) sponsor in the Senate. We need to do that right away -- work with OLS -- and introduce something.

That does a couple of things. Number one, it gives us something to work with as a foundation that we can monitor a lot better, because I understand some of this is not being monitored correctly, with the wrong questions being asked.

But number two, it sends a signal to the administration that some of the concerns you have, that you may not have answers from the administration -- they need to start getting to you, because we're coming forward as a legislative body.

So I just need to say that.

Thank you.

ASSEMBLYWOMAN VOSS: Thank you.

I want to thank everybody for coming. I've spoken with many of you prior to this meeting. And as a lifelong educator, this is very, very important to me. I'm very concerned about the STARS program, I'm very concerned about the 70 percent remediation that is being done in our community colleges. This is absolutely unacceptable. And as I said, I'm so concerned because I love teaching. I absolutely love it. And I think that when you love the subject that you teach, it goes into your children, and

they love it. And it's so important that we have the brightest and the best going into education, which unfortunately does not seem to be. We've got to do something to create that incentive. And I go all over saying, "The best thing in the world I ever did was to become a teacher, because I never regretted one single day going to work, because I just loved what I did." And I think that we have to have young people who feel that way. And I know there are people in this room who feel that way. And we can have the brightest and the best kids if we have the brightest and the best teachers. And I don't mean brightest in the sense-- You don't have to have an IQ of 200 or whatever. I mean people who just really want to impart that knowledge to their students. And that's the thing that I think is, unfortunately, missing to a great degree.

And I think that we have to think very carefully about the standards, because we're not giving the kids the foundation that they need. And that's why I was so concerned about this. I'm not a big hypothetical person. I like the facts, and I like a very firm foundation upon which to build.

So I want to thank you all for coming today. And this is definitely not the end of the discussion.

So thank you.

Assemblywoman.

ASSEMBLYWOMAN JASEY: Just briefly, I also appreciate everybody's attendance today. We have a tremendous amount of material here to read.

I'm deeply committed to improving education in New Jersey. I hear about this all the time on a personal level, as well as through my

colleagues, having spent quite a bit of time on the board of ed in my district. So I think I'm glad that we're finally dealing with it. And I think we have almost a perfect storm, if you will. I see crises as opportunities. And I think the fact that we have this focus on standards, but at the same time we have an economic crisis -- that is actually, I think, an opportunity for us to go out and recruit our best and brightest, our top 30 percent, to come into the teaching profession.

So I think there's good news out there. I don't think it's all dismal. And I think the fact that we're having this conversation, this hearing, is a good thing. And I look forward to working with all of you and bringing everybody to the table so that we can do what's best for the children of New Jersey. Because they are our future, and they're the ones we need to be focused on.

Thank you for coming.

ASSEMBLYWOMAN VOSS: Thank you very much.

And meeting adjourned.

(MEETING CONCLUDED)