Testimony of
Ms. Cassandra Barnes
Before the House Science Committee on
"The 2004 Presidential Awardees for Excellence in Mathematics and Science Teaching"
April 14, 2005

Good morning committee members and esteemed colleagues. My name is Cassandra Barnes and I teach second grade in Milwaukie, Oregon. I have been teaching for 12 years in North Clackamas School District, which serves suburban students just outside Portland. I would like to take this opportunity to speak to you about what has made a difference in my continued professional development as a teacher, which in turn makes a difference for my students.

When I began teaching, an experienced colleague and I attended a typical one-day workshop designed to give teachers ideas to take back to their classrooms. At the end of the day, I was bored stiff and regretting the $200 I had spent to attend the conference. I complained to my colleague, who responded, "Well, I figure if I walk away with one good idea to take back to the classroom, it was worth it." I thought about that comment many times. Honestly, my first thought was, "Oh. Okay. I didn't realize that that was how it was supposed to work." The more I thought about it, the less sense it made. Would it be reasonable for me to teach for an entire day with a goal of each child taking away one small thing? No. Additionally, the format of presentations such as the one I had attended did not fit with what I believe about how we learn. Most of these one-day workshops consisted of "expert" teachers telling us how they did what they did. As attendees, we were not required to think, discuss, or apply any of the content. I was definitely not an engaged learner.

Twelve years and numerous professional development opportunities later, I consider myself an informed consumer. I now have expectations of my continuing education coursework. I expect professional development opportunities to challenge my thinking, require me to reflect deeply on my practice, and above all, result in improved learning for my students. These things do not happen in a fun, easy, six hour workshop.

Effective professional development for teachers, much like deep learning of content for schoolchildren, takes time. It must be long-term, with opportunities to apply new learning in the classroom and then reflect on the impact with colleagues. It involves planning, implementing, and reflecting on student outcomes with peers, asking ourselves and each other, "Why didn't that work? What do I need to change? What student-based evidence can I use as data to support my conclusions?"

For elementary math teachers, professional development might be additional college level coursework in mathematics, taught by professors implementing teaching practices such as those outlined by the National Council of Teachers of Mathematics. Many of us were taught mathematics in much the same way as the early workshops I attended were

taught. An expert told us what and how to think, and we were to go do just that. Many teachers are now aware that we need to re-learn mathematics the way our students are learning mathematics. Constructing models, testing conjectures, and discussing our ideas. Deepening our own understanding of the mathematics we teach will allow us to better meet the needs of our students.

Supporting the professional development of pre-service and in-service teachers is crucial. I believe in high standards for all students. I believe all children can learn mathematics with understanding. I believe that the National Science Foundation funded, standards-based curricula are improving math education for students across the country. However, I know that the difference for kids lies in the hearts and minds of the teachers who implement the curricula and standards. If the federal government wants to take steps to improve math and science education for our children, they need to focus energy and resources on providing high quality professional development for our teachers.

In addition to participating in practiced based professional development opportunities, something that has made a difference for both me and my students is the modeling provided by mentor teachers.

When I began teacher preparation coursework, I already had schema in place for what this job of teaching is all about. As a student, I had already spent years learning what teachers and students did. My early memories of mathematics in an elementary school classroom were of doing multiplication problems on the chalkboard. There was a winner in this exercise. The winner was the person who solved the problem exactly like the teacher told her to, who finished first, and who got the right answer. I also remember being told stories about borrowing eggs from the teacher next door. Apparently that had something to do with subtraction, but at the time I was pretty confused. I figured my college classes would clear all that up for me.

What I did not know then was that much has changed since I was in elementary school. Research now tells us that students learn best when given time and opportunities to construct their own understanding of concepts, with invented procedures leading to deeper understanding, rather than imitating a procedure demonstrated by a teacher.

One might expect that my college coursework provided opportunities for me to review and consider current research about teaching. Unfortunately, this was not the case. However, I was lucky enough to be influenced very early in my career by a truly masterful teacher.

As a pre-service teacher I was assigned to spend two days per week in Mr. Wong's third grade classroom. I was told that this teacher was known to be an excellent math teacher. "Oh good, I thought, this is where I will learn how to tell the egg story and how to explain multiplication to kids so clearly that they won't forget which number to put up top." I was not prepared for what I experienced in this classroom.

First of all, I never heard Mr. Wong telling anyone how to do anything. The students were doing all of the talking. They discussed and debated mathematical ideas. They used models and manipulatives to explain their thinking. They asked themselves and each other questions. Wrong answers were made public and used as sites for learning. I was amazed by the conversations the children were having. I decided rather quickly that borrowing eggs did not matter. I wanted to know how to get my students to talk and think like Mr. Wong's students.

The time I spent in that classroom helped me to re-invent my idea of what learning looks like. I learned that kids can do amazing things, as long as the teacher has some things in place. Teachers need to create a culture of collaborative inquiry, where students trust themselves and each other to make sense of important ideas. Teachers and students must learn to honor disequilibrium as an integral part of learning. Teachers must present children with engaging, non-routine tasks, while asking questions that help misconceptions to surface, rather than "explaining away" any misunderstanding.

Not every pre-service teacher has an opportunity to spend time in such a classroom. In my opinion, my experiences in Mr. Wong's classroom were pivotal. I had a picture of what was possible for my students. It soon became clear to me that the role of models and mentors in the training of pre-service teachers could influence the beliefs and practices of new teachers in a way that college coursework could never do.

I have been blessed to benefit from high-quality professional development and mentoring relationships that have helped me to define what I believe is best for children. My experiences have convinced me that if we want to support our schoolchildren and help them to achieve, we need to support our teachers.