

## **MEMORANDUM**

**To:** Licensure Division, Virginia Department of Education

**From:** Virginia Mathematics and Science Coalition

**Date:** May 9, 2015

**Subject:** Proposed change to the licensure requirement for grade 6-8 Mathematics Specialists

This is a response to a proposed change to the licensure requirement for grades 6-8 Mathematics Specialists to require that they have grades 6-12 mathematics endorsement. While we have strongly supported the Virginia Department of Education in its quest for higher standards, this proposed change would likely kill the emerging program to recruit, train, and induct into service middle school Mathematics Specialists.

Although middle school mathematics teachers must be familiar with the content of both elementary and high school mathematics, it does not follow that the type of coursework suitable for a high school teacher is preferred or even adequate for teachers of the middle grades. Professional society recommendations are very clear on this point. From the Conference Board of the Mathematical Sciences, *Mathematical Education of Teachers*: “Teachers of middle grades students must be able to build on their students’ earlier mathematics learning and develop a broad set of new understandings and skills to help students meet these more sophisticated mathematical goals. Teaching middle grades mathematics requires preparation different from preparation for teaching high school mathematics.” And from the Mathematical Association of America, *Committee on the Undergraduate Program in Mathematics*: “A teacher preparation program for high school mathematics teachers is generally not adequate for preservice teachers who are planning to teach middle school mathematics. The mathematics topics taught in middle schools are substantially different from those taught in high schools, and the needs and mathematical sophistication of the students are substantially different.” The appropriate way to view preparation as a middle grades mathematics specialists when compared with secondary licensure is as advanced training with a different focus, not as training that is less advanced. Requiring a secondary endorsement for middle grades specialists is a distraction from the primary goal of achieving the most sophisticated mathematical knowledge appropriate for the middle grades curriculum.

The higher standards proposed here exceed the realistic possibilities for Middle School Mathematics Specialists. It is analogous to requiring that all nurses acquire a M.D. degree to increase their effectiveness in critical situations, an idea which would eliminate most nurses whose role and need is well recognized.

The Mathematics Specialist preparation program in Virginia was initiated through the Virginia Mathematics and Science Coalition by university partners including Virginia Commonwealth University (the federal funding leader with over 20 million dollars in National Science Foundation

grants), Norfolk State University, the University of Virginia, Longwood University, George Mason University, and Virginia Tech as well as leadership of K-12 mathematics community in Virginia. Working through the VDOE the licensure endorsement for K-8 Mathematics Specialists were crafted and established.

These efforts supported by strong statistically significant positive results have led to national recognition of Virginia as a prominent leader in the Mathematics Specialist movement. National Science Foundation research using matched treatment/control schools demonstrated statistically significant gains for grades 3-5 students on the Virginia Mathematics SOL for students having a Mathematics Specialist compared to those in a matched control school having no Mathematics Specialist. These gains were reflected in 10-20 gains in SOL scores in the second and third years under a Mathematics Specialist.

Numerous publications and presentations have resulted from the work to develop the Mathematics Specialist program which has now spanned more than two decades. The National Council of Teachers of Mathematics have recognized these efforts and commissioned a Mathematics Specialist Handbook by Virginia leaders and Mathematics Specialists that has been recently published.

While the research that has been completed focuses on Mathematics Specialists in grades K-5, current work focuses on grades 6-8 Mathematics Specialists where similar research is on-going. Two cohorts of statewide middle school Mathematics Specialists supported by National Science Foundation grants have completed the program or are currently in training. The expansion of the program into Middle School Specialists is a direct result of requests from school systems across the state. A Virginia Mathematics and Science Coalition Task Force first reviewed the program structure for Elementary Specialists and made upgrades to reflect the expanded needs for Middle School Mathematics Specialists. These upgrades included a special middle school focus in the educational leadership and research courses accompanied by additional coursework in algebra and geometry. Also, upgraded requirements for admission to the master's degree program for preparation as a Middle School Mathematics Specialist required a middle school endorsement. Even so, it is not expected that the Mathematics Specialist would likely be uniformly welcomed to assist middle school teachers with teaching Carnegie credits in algebra or geometry. The certification to teach these courses is beyond the normal middle school certification requirements. While it would be theoretically advantageous if Mathematics Specialists could be prepared to serve these specialized teachers, in our view it would be unrealistic to the point of having no Mathematics Specialist candidates for such roles.

Now to the data relative to Mathematics Specialists which our partner institutions have trained, placed, and researched, recognizing that not all of the nearly 500 licensed Mathematics Specialists have been produced by these programs. Our two cohorts of 45 Middle School Mathematics Specialists in Training, who serve from systems from south side Virginia to southwest Virginia to the urban crescent and the northern neck, reflect only 13 who have the grade 6-12 certification. The issue is much more critical in rural districts which have fewer Mathematics Specialist candidates. Notably, among these Mathematics Specialists who are in rural school districts (11 Mathematics Specialists serving in 10 districts) only 3 have the grade 6-12 certification). **No** Mathematics Specialist in a position to achieve the 6-12 mathematics endorsement could be found for training in 70% of these districts. However, administrators in these districts highly attest to the value of their

Mathematics Specialists in their system roles and applaud their ability to function effectively with their level of training. Working with principals, often in the absence of system Mathematics Supervisors, these Specialists are lauded by system leaders and superintendents for their work in establishing the systems' vision for good mathematics instruction and working as a team in achieving this goal. Special workshop series for principals have been developed in conjunction with the VDOE and the Virginia Association for Mathematics Supervision and Curriculum Development. These workshops have been highly subscribed and strongly touted for linking the work of Mathematics Specialists and principal teams in the schools.

As stated above the Coalition does not think the program could operate statewide with the requirement of a 6-12 mathematics endorsement. However, some additional mathematics course work for all middle school specialists would be desirable, and the coalition would welcome the opportunity to develop desirable additional mathematics requirements for all Middle School Mathematics Specialists. We ask your consideration in examining the new Middle School Mathematics Specialists licensure proposal to ensure that it does not eliminate the promising program that it attempts to support. Current research examining the effect on middle school Mathematics Specialists on student achievement as measured by SOL scores should provide additional insight within the next year.

We appreciate your consideration in continuing our cooperative work on Mathematics Specialists for the past twenty-five years. Please note that the Mathematics and Science Coalition represents numerous organizations around the state. Thank you very much.