

**Strategies for Minimizing Testing Times and Improving Performance on the
Mathematics Standards of Learning (SOL) Tests:
A Summary of Interviews with School Division Staff**

With the implementation of new tests based on the 2009 *Mathematics Standards of Learning (SOL)* in 2011-2012, some divisions experienced an increase in the amount of time taken by students to complete the SOL tests while others did not. In response to concerns from school divisions about the testing times associated with these new tests, the student assessment staff at the Virginia Department of Education conducted interviews with representatives from 16 divisions whose students achieved at least a 70 percent pass rate for one or more mathematics tests and completed the mathematics SOL tests within the time frames described below.

- 75 percent or more of the students completing a mathematics grade level test (grades 3 through 8) within two hours, or
- 90 percent or more of the students completing an end-of-course mathematics test within three hours.

In all, 66 school personnel were selected by their divisions to be interviewed. Every interview included classroom teachers. Mathematics supervisors, principals, division directors of testing, and other division-level administrators participated in most interviews as well. School divisions from every region were represented, ranging from very small to very large in size and from rural to urban. In most instances, participating divisions met the criteria above for more than one mathematics SOL test.

In each interview, participants were asked to identify the primary reasons most of their students were able to complete the mathematics SOL tests within these time frames while demonstrating an overall pass rate of at least 70 percent. Common themes and practices emerged during the process, and these have been categorized into three primary areas. First, participants identified specific preparation, professional development, and administrative support that were important contributors to student success. Second, classroom practices and instructional decisions that participants believe positively impacted student performance were identified. Third, participants described practices related to data analysis and its use to inform remediation efforts.

Each of the areas described above is discussed more fully in this summary. Quotes from educators interviewed are included as well. Should you have any questions, please contact the student assessment staff by e-mail at Student_Assessment@doe.virginia.gov or by phone at (804) 225-2102.

**Strategies for Minimizing Testing Times and Improving Performance on the
Mathematics Standards of Learning (SOL) Tests:
A Summary of Interviews with School Division Staff**

Behind the Scenes: Preparation, Professional Development, and Administrative Support

- School divisions placed a BIG emphasis on consistent, ongoing professional development focused on both the 2009 *Mathematics Standards of Learning (SOL)* and best practices in mathematics instruction.
- School divisions maintained high expectations for student achievement. Professional development focused on the 2009 Mathematics SOL Curriculum Framework, with an emphasis on rigor and developing greater content understanding.
- Master schedules were adjusted to increase the amount of time spent teaching and learning mathematics.
- Master schedules were adjusted to allow for common planning time among mathematics teachers, including special education teachers, whenever possible.
- Common *unit* assessments were in place in most buildings and throughout some school divisions. It is important to note that these differ from benchmark assessments.
- Time for remediation during the school day was built into the school schedule in many school divisions. Remediation occurred early (beginning in October) and often in almost every school division.
- All mathematics instructional and assessment materials provided by the Virginia Department of Education (VDOE) were shared with teachers, including mathematics updates from the VDOE instructional staff, videos and other presentations on the VDOE Web site, and all relevant practice materials. Materials referenced may be accessed at http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/index.shtml and at <http://www.doe.virginia.gov/instruction/mathematics/index.shtml#resources>.
- Most teachers were given a demonstration of how to access the mathematics practice items and guides.
- Two school divisions built partnerships for collaboration with nearby school divisions.

Quotes from Educators:

(Please note that in some instances, information has been added parenthetically to provide context for the educator's words.)

“Our pacing in the past relied too heavily on the structure of the textbook. This year it is aligned to the Curriculum Framework.”

“Our teachers understand the mistakes students are making and why.” “Teachers are digging deeper and having richer conversations about content.” (School division

mathematics specialists and supervisors believed professional development facilitated greater understanding and discussion of mathematics content among teachers.)

*"We used example problems from a PowerPoint VDOE had provided to write similar items."
"We use everything the state provides."*

"This test is finally testing the way I have always wanted kids to learn." (A teacher with 30 years of experience shared personal feelings related to the new SOL assessment.)

"Collaboration (among teachers within a school, among schools within a school division, and between different school divisions) is HUGE!"

In the Classroom: Instructional Decisions and Mindset

- Teachers had high expectations for student achievement. They believed students could reach the goals set, and they planned instruction and developed assessments to help all students reach those goals.
- Teachers taught what was in the 2009 Mathematics SOL Curriculum Framework and assessed what was in the Curriculum Framework with a high level of awareness of vocabulary.
- Multi-step problem solving was incorporated throughout the year with an emphasis on open-ended questions, multiple responses, and multiple representations.
- Rigor was increased on all classroom assignments and assessments. Tests were especially rigorous and typically cumulative in nature.
- Common unit assessments were in place in most buildings and throughout some school divisions.
- Units were developed without regard to the order or structure of the textbook. Textbooks did not determine the depth of instruction or assessment. Some school divisions used a "backwards design" approach, first developing the unit assessment aligned with the 2009 *Mathematics SOL* and then developing instructional tasks to prepare students for the assessment.
- Teachers used spiral review and assessment throughout the year.
- Students had to justify "WHY" an answer was correct in classroom discussions and on assessments.
- Teachers purposefully increased student engagement.
- Technology-enhanced item (TEI) formats were simulated in paper/pencil format by asking more open-ended questions, posing questions having multiple responses, and limiting use of multiple choice items.
- Most teachers used the mathematics SOL practice items and supporting practice guides with their students. Mathematics practice items and the accompanying guides may be accessed at http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/index.shtml.

Quotes from Educators:

"There is a lot of interaction between students that requires them to communicate their processes and engage in discourse." "Class is a conversation."

"This is a marathon, not a sprint." "We were relentless." "I try to make class hard all year." "Rigor in daily work is key." "I ask high leverage questions all year long."

"I emphasized 'why' questions." "You have to change instruction to address rigor."

"We don't use a lot of technology, but we simulate the types of responses on TEI on our paper/pencil tests."

"You can do TEI without the technology." "Kids get the technology; teachers need to ask the questions to simulate the thinking they'll have to do."

"We have to change that mindset that there is just one answer."

"Put it in your calculator to graph it; the graph can tell you a lot." (In response to a question about specific strategies to use when students become "stuck" on a problem, this teacher shared her approach to teaching relations. She taught students to look at relations in a variety of ways: look at the graph, the table, the intercepts, the behavior, etc. If stuck, looking at the graph is a strategy to get started.)

Data Analysis and Use

- Data from classroom assessments were analyzed by the teachers (often as a group) to identify students for remediation and areas in need of remediation. In some school divisions, building-level administrators participated in these discussions.
- In the school divisions with 4X4 block schedules, all reported that students took less time AND all reported higher mathematics SOL test pass rates during the spring test administration than in fall.
- Teachers used Student Performance by Question (SPBQ) data provided to them by school administrators to inform instruction and target remediation.

Other

- Group breaks were not provided. On tests with non-calculator and calculator sections, students started work on section two when they were ready, rather than waiting for the entire group to complete section one.
- One teacher created an assignment for students to complete as they worked through the online tools practice in which students explained how the online tools worked and provided an example of when each tool might be used.

- If technical problems arose, they were handled by someone in the building and were handled quickly.