The Virginia Council for Mathematics Supervision (VCMS) provides these comments, suggestions, and feedback after our review of the 2016 Mathematics Standards of Learning (SOL). VCMS membership includes over 150 mathematics leaders from across the Commonwealth. Our collective knowledge includes teaching these standards in K-12 and higher ed classrooms across Virginia, preparing and presenting professional development on these standards, participating on review committees for SOL assessments, participating on committees that wrote and reviewed the standards prior to 2016 approval, and participating in creating materials shared by VDOE (Just In Time Quick Checks, Rich Mathematical Tasks, Vertical Alignment documents, etc.). As a group, we are well versed in the content, instruction, and assessment of the current SOL and seek to provide feedback for the revision.

The Virginia Department of Education has developed the Profile of a Virginia Graduate. In doing so a new set of expectations has been established. Education should serve to develop the 5 C's which seek for students to advance in critical thinking, creative thinking, communication, collaboration, and citizenship skills. The Standards of Learning for Mathematics should be reframed around the 5C's. Imagine a mathematics education that encourages students to think critically while taking a creative approach to problem-solving. This education would develop students' communication, collaboration, and citizenship skills. Now more than ever before, these are skills that must be emphasized to children while in school. We seek standards that support this vision. Therefore, we believe the 2023 standards will serve the students of Virginia better if the included concepts develop skills that support future college or career readiness, and are organized so that essential concepts provide explicit connections and teach complete ideas. We also request that essential concepts be limited in number so that educators can provide a rigorous education that includes enough time to establish a deeper understanding and mastery of material instead of a curriculum that promotes the repetitive practice of disconnected skills.

In the 2016 standards curriculum framework the Essential Knowledge and Skills begins with "The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to" and then the list of skills begins. In our experience, the skills become the primary thing the students are expected to learn, and the process skills are an add on or a special event. We submit that instead the 2023 standards are written such that we explicitly teach problem solving, mathematical

communication, mathematical reasoning, connections, and representations. We believe these are best taught through the use of rich mathematical tasks and application problem examples incorporated in the “understanding the standard” portion of the curriculum framework. Additionally, the 2023 standards should explain when the use of technology is appropriate as used in the world outside classrooms.

The 2023 standards must reflect current and future mathematics needs of the citizenry. Understanding, analyzing, and interpreting data must take a starring role in these standards. It will be essential to provide explicit connections to other disciplines, career, and life, thus the standards must include only enduring, essential, and relevant content. It will be important to evaluate each standard to determine if there is value in the standard for all children and if learning that content will provide a foundation for use that isn’t available through appropriate technology. The focus in the standards should be on understanding the problem, determining an efficient solution method (with or without the use of technology), and interpreting the solution in the context of the problem.

The standards should be few enough in number that time is provided for deeper understanding and that deeper understanding doesn’t get confused with more practice and speed at disconnected skills. The number of skills expected at each grade level in the 2016 standards cause instructional challenges and preclude deeper, more thorough understanding. Tricks and algorithms are provided to quickly move through the great number of skills. While these may serve a child for one year, they result in gaps in their understanding and compound difficulties in subsequent learning. The standards we select should have long lasting implications beyond being used for the next assessment.

Some skills exist because of antiquated methods and aren’t relevant for most students any longer. These skills should be removed or modified to use appropriate technology to access. Some skills have become obsolete and/or no longer relevant to our participation in society so we should instead address concepts that are a better use of instructional time.

We believe it is the duty of the standards to meet student needs. We must be careful to not impact student choice of other content by affecting co- or pre-requisite courses. We know that with change comes the need to learn. We must provide teachers with the

professional learning around the use of data and statistics and how best to help students learn this essential addition to the standards. Additionally we must help teachers transition from teaching a checklist of skills to truly teaching children how to apply their knowledge and think mathematically.

VCMS has chosen to provide high level considerations instead of suggestions on specific standards as our members will do that on their own or their division's behalf. We trust that the educators who carry out the standards revision will take into account the principles we described here.