

Understanding the 2023 Virginia *Mathematics Standards of Learning* Revision Process

A Guide To Increase Transparency, Awareness, and Participation

DOCUMENT PURPOSE

This document provides insight on the 2023 *Mathematics Standards of Learning* revision process, and shares information about five Areas of Focus that guided the development of the forthcoming 2023 *Mathematics Standards of Learning*.

GAINING PUBLIC FEEDBACK

Since January 2022, representatives from the Virginia Department of Education have gained feedback on the current *Mathematics Standards of Learning* (established in 2016) through public engagement sessions. These sessions involved K-12 educators, parents, community members, local businesses, STEM professionals, faculty from institutions of higher learning, and each of Virginia's mathematics organizations. You can access the [complete timeline](#) and see how [public feedback](#) guided the 2023 *Mathematics Standards of Learning* development. [Click here](#) to learn how to provide public feedback on the drafted 2023 *Mathematics Standards of Learning* when they are released and how to help increase transparency, awareness and participation.

THE FIVE AREAS OF FOCUS

The Areas of Focus serve as a framework to understand how the forthcoming 2023 *Mathematics Standards of Learning* were developed.¹ These Areas of Focus integrated public feedback with research to ensure all Virginia students receive an education grounded in excellence, are proficient in K-12 math, and are college and career ready.

1. [Improve K-12 Vertical Articulation](#)
2. [Incorporate Data Literacy](#)
3. [Strengthen Grade/Course Math Content Connections](#)
4. [Embed the Math Process Goals](#)
5. [Increase Rigor and Depth](#)

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AREA OF FOCUS #1

IMPROVE K-12 VERTICAL ARTICULATION

WHAT IS VERTICAL ARTICULATION?

Vertical articulation is the holistic organization and presentation of content to link developmentally appropriate grade/course-level concepts as students progress from kindergarten through high school. Vertical articulation provides educators with research-based sequencing of content and consistent phrasing of standards across grade/course levels to provide clarity around what K-12 students should know and be able to do.²

WHY THIS REVISION IS NECESSARY

Ideas in K-12 math are interconnected and developed over time. Explicitly illuminating these connections in standards enhances students' understanding of concepts and skills. The revised standards are aligned with nationally respected recommendations for developmental trajectories and content sequences necessary to promote a strong foundation for learning more advanced mathematics.^{2,3,4}

HOW THIS REVISION PROMOTES MATHEMATICAL EXCELLENCE

PROFICIENCY FOR ALL STUDENTS

- When standards are vertically aligned across grade/course levels, the math students learn is a logical and coherent progression from one year to the next, supporting deep understanding of concepts and skills.³

COLLEGE & CAREER READINESS

- Continuous learning is one of the top skills desired by employers.⁴
- Coherence in K-12 math learning will help students understand that learning builds continually throughout school, work, and life.²

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AREA OF FOCUS #2

INCORPORATE DATA LITERACY

WHAT IS DATA LITERACY?

Data literacy is the ability to work with, understand, and communicate data in context. Data literacy is quickly becoming a fundamental requirement for professionals in every discipline and industry, as traditional conceptions of data have changed. Today, data can be dynamic, complex, highly structured or unstructured, and data sets are vast and readily available.⁵ It will be vital that students know how to use an iterative process to formulate questions, collect or consider data, analyze data, and interpret results.⁵

WHY THIS REVISION IS NECESSARY

Data literacy is a valuable competency that allows students to become critical consumers of data who develop informed courses of action.² Early exposure is critical. Integrating data literacy into K-12 math standards can help students learn to ask questions about data and visualizations, as well as generate and evaluate predictions based on data.⁵

HOW THIS REVISION PROMOTES MATHEMATICAL EXCELLENCE

PROFICIENCY FOR ALL STUDENTS

- Incorporating data literacy into K-12 math learning can support students in: formulating questions, processing data, creating data visualizations, analyzing data, modeling with data, and using data to communicate⁵ for the purpose of making informed decisions in a rapidly changing world.²

COLLEGE & CAREER READINESS

- A data science skill set is required across all job sectors, not only for those entering a data science-related field.⁵
- Data science and analytics skills are part of all 17 of Virginia's Continuing Education Career Clusters.⁶

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AREA OF FOCUS #3

STRENGTHEN GRADE/COURSE MATH CONTENT CONNECTIONS

WHAT ARE GRADE/COURSE MATH CONTENT CONNECTIONS?

Math content connections go beyond discrete facts and skills to also focus on larger concepts and big ideas within grade/course level standards.² When connections between grade/course level math standards are explicit, students are able to acquire a depth of knowledge that allows them to demonstrate, explain, and apply math concepts and skills they have learned to settings beyond the classroom.²

WHY THIS REVISION IS NECESSARY

When math content connections are used to organize standards, students have increased opportunities to build and extend important grade/course level math topics all year long.⁴ This creates a focused and coherent curriculum that allows students more time to learn and retain important math concepts and skills in the context of related content and connected applications.

HOW THIS REVISION PROMOTES MATHEMATICAL EXCELLENCE

PROFICIENCY FOR ALL STUDENTS

- Math teaching that emphasizes big ideas and connections between concepts supports stronger student understanding⁸ and math achievement.⁹

COLLEGE & CAREER READINESS

- Achieving high scores on college entrance exams requires thorough understanding of the complexities and connections within the number system, arithmetic properties, and algebraic representations.^{10 11}
- Coherence in grade/course math learning is required to apply mathematical concepts and skills in other academic disciplines and job settings in the United States, regardless of career.²



AREA OF FOCUS #4

EMBED THE MATH PROCESS GOALS

WHAT ARE THE PROCESS GOALS?

The five Math Process Goals¹² are that students: (1) become mathematical problem solvers, (2) communicate mathematically, (3) reason mathematically, (4) make mathematical connections, and (5) use mathematical representations to model and interpret practical situations. Embedding the Math Process Goals within content standards allows students opportunities to develop mathematical ways of thinking as a basis for solving real world problems that extend beyond the classroom.¹³

WHY THIS REVISION IS NECESSARY

Being prepared to compete in a global workforce means learning to solve new and unforeseen problems. Developing this ability requires students to approach math via processes that are research-informed and emphasize authentic applications of math knowledge and skills.² These processes are central to nationally respected standards^{3,4} and frameworks² to ensure students experience the actions necessary to doing and learning math.¹⁴

HOW THIS REVISION PROMOTES MATHEMATICAL EXCELLENCE

PROFICIENCY FOR ALL STUDENTS

- Teaching with the Math Process Goals equips students with the knowledge they need to gain a comprehensive understanding that supports math proficiency.¹⁵
- Student achievement increases when students investigate math ideas in context, use various computational strategies, and collaborate around dynamic and interesting tasks.¹⁶

COLLEGE & CAREER READINESS

- Creative problem solving and collaboration are two skills desired by employers.²
- Engaging in K-12 experiences that promote critical thinking helps students learn to analyze problems, evaluate potential solutions, and implement effective courses of action.¹⁷



AREA OF FOCUS #5

INCREASE RIGOR AND DEPTH

WHAT DOES IT MEAN TO INCREASE RIGOR AND DEPTH?

Rigorous math learning experiences contain content that challenges students and promotes strategic and flexible thinking.¹⁸ Building a deep understanding of fundamental math knowledge requires engaging in complex reasoning, analysis, and interpretation.¹⁹ Increasing rigor and depth is a thread that runs through all five Areas of Focus.

WHY THIS REVISION IS NECESSARY

Standards that provide rigor and depth afford advanced opportunities for students to think critically and transfer their learning to new contexts. Increased rigor and depth enriches student learning experiences by moving beyond the memorization of procedures and towards fluent, flexible problem solving. Allowing for increased rigor and depth can nurture every student's mathematical promise by allowing them to work through challenging tasks and explain complex concepts to others.²⁰

HOW THIS REVISION PROMOTES MATHEMATICAL EXCELLENCE

PROFICIENCY FOR ALL STUDENTS

- Regular opportunities to build deep understanding through tasks with high cognitive demand increases student math performance.²¹
- Increased focus on depth and rigor allows students to become not only skilled doers of mathematics, but also adept mathematical thinkers.²²

COLLEGE & CAREER READINESS

- The ability to complete non-routine math tasks supports transfer of math concepts and skills to new contexts and problems.²
- A rigorous K-12 math experience builds critical thinking and problem-solving skills that are highly beneficial in college and career.¹⁷

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VIRGINIA MATH STANDARDS OF LEARNING

REVISION & REVIEW PROCESS

VIRGINIA DEPARTMENT OF EDUCATION'S REVIEW TIMELINE

- **January-February 2022**
 - ◆ Board of Education (BOE) Approves *Mathematics Standards of Learning* (SOL) Timeline
 - ◆ Public Comment Period
- **May - June 2022**
 - ◆ Public Engagement Sessions
- **June 2022**
 - ◆ Math Education Advisory Committee (MEAC) Meeting
 - ◆ K-12 SOL Review Committee Convened
- **July - August 2022**
 - ◆ Virginia Department Of Education (VDOE) and K-12 SOL Review Committee Leads Review of Drafted Mathematics SOL
- **September 2022**
 - ◆ MEAC Meeting
- **November – December 2022**
 - ◆ External Review Committee Meetings
 - ◆ MEAC Meeting
- **January - May 2023**
 - ◆ VDOE Prepares Proposed Revised 2023 Mathematics SOL for First Review by the BOE

FUTURE ACTIONS (COMING SOON)

- **June 2023 (Tentative)**
 - ◆ BOE Work Session – Summary Docs and Overview
- **July 2023 (Tentative)**
 - ◆ BOE First Review of Proposed Revised 2023 Mathematics SOL
- **July - August 2023 (Tentative)**
 - ◆ Public Feedback – Proposed Revised 2023 Mathematics SOL
- **November 2023 (Tentative)**
 - ◆ BOE Final Review of Proposed Revised 2023 Mathematics SOL

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VIRGINIA MATH STANDARDS OF LEARNING

REVISION & REVIEW PROCESS

SUMMARY OF GENERAL PUBLIC FEEDBACK FOR THE 2023 REVISIONS

Below is the summary of public feedback that guided the 2023 *Mathematics Standard of Learning* revisions in mathematics and an explanation of how each piece of feedback is addressed by the Areas of Focus.

PUBLIC FEEDBACK ITEM	HOW AREAS OF FOCUS ADDRESS FEEDBACK
Increase the rigor of the math content, particularly at the elementary level	Virginia's <i>Standards of Quality</i> ²³ require a review of the <i>Standards of Learning</i> every seven years to maintain rigor (see <i>Area of Focus #5 - Increase Rigor and Depth</i>) and reflect a balance between content knowledge and the application of knowledge in preparation for eventual employment and lifelong learning (see <i>Areas of Focus #1-5</i>).
Place a greater focus on recall of basic facts in elementary grades	Increasing rigor and depth (see <i>Area of Focus #5 - Increase Rigor and Depth</i>) supports recall by grounding basic facts in deep conceptual knowledge. Strengthening grade/course math content connections (see <i>Area of Focus #3 - Strengthen Grade/Course Math Content Connections</i>) provides for multiple opportunities to practice facts and develop fluency across the school year.
Reduce the number of standards so that the curriculum goes deeper, not wider	See <i>Area of Focus #5 - Increase Rigor and Depth</i> and <i>Area of Focus #3 - Strengthen Grade/Course Math Content Connections</i> . These Areas of Focus support depth of knowledge across concepts and skills.
Embed the Virginia Department of Education Mathematics Process Goals	See <i>Area of Focus #4 - Embed the Math Process Goals</i> .
Continue to offer advanced courses	Advanced math courses will continue to be offered.

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Use technology to support inquiry and advance student thinking	Understanding role of technology is a key element of Data Literacy (see <i>Area of Focus #2 - Incorporate Data Literacy</i>).
Promote real-world application	The Math Process Goals involve application to real-world contexts (see <i>Area of Focus #4 - Embed the Math Process Goals</i>), as does building fluency with data (see <i>Area of Focus #2 - Incorporate Data Literacy</i>).
Create greater connections between standards within and across grade/course-levels and disciplines	See <i>Area of Focus #3 - Strengthen Grade/Course Math Content Connections</i> and <i>Area of Focus #1 - Increase Vertical Articulation</i> .
Emphasize data analysis	See <i>Area of Focus #2 - Incorporate Data Literacy</i> .
Focus on computational fluency	Increasing rigor and depth (see <i>Area of Focus #5 - Increase Rigor and Depth</i>) supports computational fluency by grounding procedures in deep conceptual knowledge. Linking grade/course-level essential understandings (see <i>Area of Focus #2 - Incorporate Data Literacy</i>) provides for multiple opportunities to procedures and build fluency across each school year.
Provide support for teachers during implementation	The Virginia Department of Education is very interested in working with K-12 school divisions and Virginia's mathematics organizations in order to provide professional learning around the areas of focus.
Obtain parent engagement and support	Obtaining parent and community involvement is one of the primary goals of this guide.
Make no changes to the current <i>Mathematics Standards of Learning</i>	Virginia's <i>Standards of Quality</i> ²³ require a review of the <i>Standards of Learning</i> every seven years to maintain rigor (see <i>Area of Focus #5 - Increase Rigor and Depth</i>) and reflect a balance between content knowledge and the application of knowledge in preparation for eventual employment and lifelong learning (see <i>Area of Focus #1-5</i>).



VIRGINIA MATH STANDARDS OF LEARNING

INCREASING TRANSPARENCY, AWARENESS & PARTICIPATION

PROVIDING PUBLIC FEEDBACK

In the next few months the Virginia Department of Education will release a draft of the 2023 *Mathematics Standards of Learning*. Here are some actions you can take to increase awareness of the five Areas of Focus and support public engagement in the review process.

PROVIDING PUBLIC COMMENT

When the public comment period is open, visit the [Virginia Department of Education website](#) to share feedback on the proposed 2023 *Mathematics Standards of Learning*.

ACTIONS YOU CAN TAKE TO INCREASE PUBLIC FEEDBACK

- **Spread the word.** Send this guide to your friends, colleagues, and neighbors.
- **Post on social media.** Share this document to engage your community.

ADDITIONAL ACTIONS

Here are some other possible actions you can take to increase transparency, awareness and participation in providing public feedback on the 2023 *Mathematics Standards of Learning* revisions.

If you are a **K-12 District** or **School Leader**, here are two additional actions you can take.

- Provide professional development opportunities for teachers to discuss the standard revisions and provide public comment.
- Send a message to families, host a town hall, and/or hold virtual office hours to inform them about the standard revisions and the public comment period.



If you are a **K-12 Teacher** or **Staff Member**, here are two additional actions you can take.

- Engage with colleagues to explore the standard revisions and draft public comment.
- Contact your principal to suggest or support community engagement events.

If you are a **Parent/Guardian** or **Community Member**, here is an additional action you can take.

- Voice your thoughts and/or help organize outreach to explore the standard revisions and provide public comment.

If you are a **University STEM Educator** or **STEM Field Professional** here are two additional actions you can take.

- Ask your dean of admission or company leader to voice their thoughts, make a statement, and/or help organize outreach to explore the standard revisions and provide public comment
- Consider writing an op-ed or contacting local news to increase transparency, awareness and participation during the public comment period.



VIRGINIA MATH STANDARDS OF LEARNING

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