The Washington State
BOARD OF EDUCATION

Math Focus Standards for Graduation Pathways

The State Board of Education, in collaboration with the Office of Superintendent of Public Instruction, is developing resources to support implementation of a performance-based pathway to graduation for high school students across the state of Washington. This is in alignment with the following requirement: HB 1308: High School Graduation Pathway Options - Various Provisions.

The intent of this document is to provide guidance for schools and districts on the number and assortment of **mathematics** standards and practices which must be incorporated into the design of the learning experience and assessed within the performance-based graduation pathway. *Throughout this document "learning experience" is used as it was explained in related legislation: "may take a variety of forms, such as a project, practicum, work-related experience, community service, or cultural activity, and may result in a variety of products that can be evaluated, such as a performance, presentation, portfolio, report, film, or exhibit"* (please see HB 1308 for more information). Flexibility with the selection of some of the standards is necessary in order to ensure that the learning experience can be designed to be both student-centered and responsive to interests and goals of the student.

Since the ultimate goal is for students to produce evidence of meeting high school mathematics learning standards by demonstrating knowledge and skills in a real-world context, aligned to the student's High School and Beyond Plan, performance-based learning experiences[1] will be created based on a combination of the high school mathematics standards and mathematics practices (Figure 1). Both the standards and practices are identified by the Washington State Mathematics Standards for High School.

Figure 1. Guidance on selection of mathematical practices

Mathematical Practices[2]	Guidance
1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically.	Educators should support the design of projects that allow students to produce evidence of meeting all eight of the mathematical practices, however, if that isn't authentically possible, students must produce evidence for the majority of them (5+).

[1] Defined in HB 1308: High School Graduation Pathway Options - Various Provisions (p. 4 lines 33 - 37).
[2] *Taken directly from the Washington State Mathematics Standards for High School*

Figure 1. Guidance on selection of mathematical practices	
Mathematical Practices[2]	Guidance
6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	

In order to complete the Mathematics Performance-Based Graduation Pathway, students should select and/or design cohesive and coherent learning experiences that provide them the opportunity to carry out activities and solve problems in a way that reflects the complex nature of such tasks in the world outside of the classroom. The learning experiences must be designed to enable students to provide evidence of meeting at least two high-school level math standards in each of at least two conceptual categories - meaning they will produce evidence for a minimum of four standards (Figure 2). Note that these are individual standards (not a whole cluster). The student's evidence for the math standards will be assessed using local scoring criteria, while evidence of meeting the mathematical practices will be assessed using the Performance-Based Graduation Pathway statewide rubric.

Figure 2. Guidance on selection of standards from conceptual categories	
Conceptual Categories[3]	Guidance
1. Number and Quantity 2. Algebra 3. Functions 4. Geometry 5. Statistics and Probability	1. Modeling of the standards is inherent. 2. Where authentically possible, educators should support the design of projects that elicit a balance of evidence of procedural knowledge and conceptual understanding.

Students and educators should be able to work together to identify these high-school level standards without restriction, while still ensuring that they will be able to produce evidence of meeting ideally eight (8), but no less than five (5), mathematics practices in order to complete the performance-based graduation pathway (Figure 3).

[3] *Taken directly from the Washington State Mathematics Standards for High School*

Figure 3. Evidence Requirements				
At least two high-school level math standards in each of at least two conceptual categories *(selected and scored using local criteria)* **Not the whole cluster of standards.* **Evidence is needed for 4+ standards.*	+	Ideally eight (8), but no less than five (5), mathematics practices *(assessed with statewide rubric)*	=	Completion of performance-based graduation pathway

These requirements will create the conditions for students, educators, or other stakeholders across the state of Washington to successfully create authentic learning experiences that ultimately allow the student to produce evidence of meeting high school mathematics learning standards by demonstrating knowledge and skills in a real-world context, aligned to the student's High School and Beyond Plan.

This approach also ensures the learning experience can be adjusted in such a way that it is meaningful for students and communities. For example, if the learning experience requires students to design a business plan, they would need to create and solve equations in order to predict business expenses and profits, to identify important quantities within a practical situation connected to their business proposal and map their relationships, and they would need to test propositions or conjectures with specific examples, using appropriate equations.

Learning experiences have to be designed in such a way that they require students to model and utilize math within the context of a real-world situation, in doing so the student will both contextualize and decontextualize the mathematics to demonstrate knowledge and skills.

While the focus of this document is to describe the mathematics focus standards for the performance-based graduation pathway, learning experiences that are developed may also inherently give students the opportunity to practice and provide evidence of skills present in Washington's Profile of a Graduate.

Resources

National Council for the Teachers of Mathematics (NCTM) Essential Concepts for High School

O*Net OnLine https://www.onetonline.org/ (Use the search field in the upper right corner of page to search a career, results list "mathematics" under skills for different careers. The + to the left of that will list math disciplines.)