Smarter Balanced Mathematics
Claim Distribution Overview

Office of Superintendent of Public Instruction (OSPI)

In the spring of 2015, Washington state students in grades 3–8 and 11 took the Smarter Balanced Comprehensive Assessments for mathematics. The results of these assessments were reported to the U.S. Department of Education for purposes of determining adequate yearly progress. A cut-score for each assessment indicating progress toward college and career readiness was determined by the Smarter Balanced Assessment Consortium.

This Claim Distribution document contains information on the Mathematics K–12 Learning Standards, also referred to as "the standards," that are eligible to be assessed on the mathematics exams in high school. This is the same information found in the Smarter Balanced Item Specification documents. This claim distribution, however, does not represent the emphasis of content on the Smarter Balanced summative assessment. The summative assessment blueprint provides information on the emphasis of content and claim on the assessment.

In this document, the mathematical content is listed by conceptual category, domain, cluster, and standard as written in the standards. In the tables, the dark blue in a row denotes a priority assessment cluster. The light blue in a row denotes a supporting assessment cluster.

Smarter Balanced developed four "Mathematical Claims" that state what students should know and be able to do in the domain of mathematics, and on which the Smarter Balanced assessment system will provide data. This document shows how the standards will be assessed across these same claims. The letters in the Claim 1 column match the target letters used in the Smarter Balanced Claim 1 Item Specification documents. The light and dark blue cells in the Claims 2–4 columns identify the clusters and standards that will make up the majority of the items for that claim. All standards are eligible for assessment in Claims 2–4, but the light and dark blue standards and clusters make up the majority of the items for that claim.

The table on the next page shows how the Standards for Mathematical Practice support each of the four claims.

Standards for Mathematical Practice:

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.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Smarter Balanced Assessment Claims

Claim	Brief Explanation	Practice Standard
1	***Concepts & Procedures*** Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.* This claim addresses procedural skills and the conceptual understanding on which developing skills depend. It is important to assess student understanding of how concepts link together and why mathematical procedures work the way they do. This relates to the structural nature of mathematics.	5, 6, 7, 8
2	***Problem Solving*** Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.* Assessment items and tasks focused on Claim 2 include problems in pure mathematics and problems set in context. Problems are presented as items and tasks that are well-posed (that is, problem formulation is not necessary) and for which a solution path is not immediately obvious. These problems require students to construct their own solution pathway rather than follow a provided one. Such problems will therefore be unstructured, and students will need to select appropriate conceptual and physical tools to use.	1, 5, 7, 8
3	***Communicating Reasoning*** Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.* Claim 3 refers to a recurring theme in the content and practice standards—the ability to construct and present a clear, logical, convincing argument. For older students, this may take the form of a rigorous, deductive proof based on clearly stated axioms. For younger students, this will involve more informal justifications. Assessment tasks that address this claim will typically present a claim and ask students to provide, for example, a justification or counterexample.	3, 6
4	***Modeling and Data Analysis*** Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.* Modeling links classroom mathematics and statistics to everyday life, work and decision-making. Students use modeling and data analysis to choose and use appropriate mathematics and statistics to analyze and understand situations, to make predictions, find solutions and improve decision making based on results from the model. The standards feature modeling as both a mathematical practice at all grades and a content focus in high school.	2, 4, 5

*Smarter Balanced Content Specifications

High School Claim Distribution by Conceptual Category, Domain, Cluster, and Standard							
Conceptual Category	**Domain**	**Cluster**	**Standard**	**Smarter Balanced Claims***			
				Claim 1	**Claim 2**	**Claim 3**	**Claim 4**
Number and Quantity	The Real Number System	N-RN.A Extend the properties of exponents to rational exponents	N-RN.A.1				
			N-RN.A.2	A			
		N-RN.B Use properties of rational and irrational numbers	N-RN.B.3	B			
	Quantities	N-Q.A Reason quantitatively and use units to solve problems	N-Q.A.1	C			
			N-Q.A.2				
			N-Q.A.3				
	The Complex Number System	N-CN.A Perform arithmetic operations with complex numbers	N-CN.A.1				
			N-CN.A.2				
		N-CN. C Use complex numbers in polynomial identities and equations	N-CN.C.7				
Algebra	Seeing Structure in Expressions	A-SSE.A Interpret the structure of expressions	A-SSE.A.1a				
			A-SSE.A.1b				
			A-SSE.A.2	D			
		A-SSE.B Write expressions in equivalent forms to solve problems	A-SSE.B.3a	E			
			A-SSE.B.3b				
			A-SSE.B.3c				
			A-SSE.B.4				
	Arithmetic with Polynomials and Rational Expressions	A-APR.A Perform arithmetic operations on polynomials	A-APR.A.1	F			
		A- APR.B Understand the relationship between zeros and factors of polynomials	A-APR.B.2				
			A-APR.B.3				
		A-APR.C Use polynomial identities to solve problems	A-APR.C.4				
		A-APR.D Rewrite rational expressions	A-APR.D.6				
	Creating Equations	A-CED.A Create equations that describe numbers or relationships	A-CED.A.1	G			
			A-CED.A.2				
			A-CED.A.3				
			A-CED.A.4				
	Reasoning with Equations and Inequalities	A-REI.A Understand solving equations as a process of reasoning and explain the reasoning	A-REI.A.1				
			A-REI.A.2	H			
		A-REI.B Solve equations and inequalities in one variable	A-REI.B.3	I			
			A-REI.B.4a				
			A-REI.B.4b				
		A-REI.C Solve systems of equations	A-REI.C.5				
			A-REI.C.6				
			A-REI.C.7				
		A-REI.D Represent and solve equations and inequalities graphically	A-REI.D.10	J			
			A-REI.D.11				
			A-REI.D.12				
Functions	Interpreting Functions	F-IF.A Understand the concept of a function and use function notation	F-IF.A.1	K			
			F-IF.A.2				
			F-IF.A.3	K			
		F-IF.B Interpret functions that arise in applications in terms of the context	F-IF.B.4	L			
			F-IF.B.5				
			F-IF.B.6				
		F-IF.C Analyze functions using different representations	F-IF.C.7a	M			
			F-IF.C.7b				
			F-IF.C.7c				
			F-IF.C.7e				
			F-IF.C.8a				
			F-IF.C.8b				
			F-IF.C.9				
	Building Functions	F-BF.A Build a function that models a relationship between two quantities	F-BF.A.1a	N			
			F-BF.A.2				
		F-BF.B Build new functions from existing functions	F-BF.B.3				
			F-BF.B.4				
	Linear, Quadratic, and Exponential Models	F-LE.A Construct and compare linear, quadratic, and exponential models and solve problems	F-LE.A.1a				
			F-LE.A.1b				
			F-LE.A.1c				
			F-LE.A.2				
			F-LE.A.3				
			F-LE.A.4				
		F-LE.B Interpret expressions for functions	F-LE.B.5				
	Trigonometric Functions	F-TF.A Extend the domain of trigonometric functions using the unit circle	F-TF.A.1				
			F-TF.A.2				
		F-TF.B Model periodic phenomena with trigonometric functions	F-TF.B.5				
		F-TF.C Prove and apply trigonometric identities	F-TF.C.8				

High School Claim Distribution by Conceptual Category, Domain, Cluster, and Standard							
Conceptual Category	**Domain**	**Cluster**	**Standard**	**Smarter Balanced Claims***			
				Claim 1	**Claim 2**	**Claim 3**	**Claim 4**
Geometry	Congruence	G-CO.A Experiment with transformations in the plane	G-CO.A.1			■	
			G-CO.A.2			■	
			G-CO.A.3			■	
			G-CO.A.4			■	
			G-CO.A.5			■	
		G-CO.B Understand congruence in terms of rigid motions	G-CO.B.6			■	
			G-CO.B.7			■	
			G-CO.B.8			■	
		G-CO.C Prove geometric theorems	G-CO.C.9			■	
			G-CO.C.10			■	
			G-CO.C.11			■	
		G-CO.D Make geometric constructions	G-CO.D.12				
			G-CO.D.13				
	Similarity, Right Triangles, and Trigonometry	G-SRT.A Understand similarity in terms of similarity transformations	G-SRT.A.1a			■	
			G-SRT.A.1b			■	
			G-SRT.A.2			■	
			G-SRT.A.3			■	
		G-SRT.B Prove theorems involving similarity	G-SRT.B.4			■	
			G-SRT.B.5			■	
		G-SRT.C Define trigonometric ratios and solve problems involving right triangles	G-SRT.C.6	O	▒		
			G-SRT.C.7				
			G-SRT.C.8				
	Circles	G-C.A Understand and apply theorems about circles	G-C.A.1				
			G-C.A.2				
			G-C.A.3				
		G-C.B Find arc lengths and areas of sectors of circles	G-C.B.5				
	Expressing Geometric Properties with Equations	G-GPE.A Translate between geometric description and the equation for a conic section	G-GPE.A.1				
			G-GPE.A.2				
		G-GPE.B Use coordinates to prove simple geometric theorems algebraically	G-GPE.B.4				
			G-GPE.B.5				
			G-GPE.B.6				
			G-GPE.B.7				
	Geometric Measurement & Dimension	G-GMD.A Explain volume formulas and use them to solve problems	G-GMD.A.1				
			G-GMD.A.3				■
		G-GMD.B Visualize relationships between 2d and 3d objects	G-GMD.B.4				
	Modeling with Geometry	G-MG.A Apply geometric concepts in modeling situations	G-MG.A.1				■
			G-MG.A.2				■
			G-MG.A.3				■
Statistics and Probability	Interpreting Categorical and Quantitative Data	S-ID.A Summarize, represent, and interpret data on a single count or measurement variable	S-ID.A.1	P			▒
			S-ID.A.2				▒
			S-ID.A.3				▒
			S-ID.A.4				▒
		S-ID.B Summarize, represent, and interpret data on two categorical and quantitative variables	S-ID.B.5				■
			S-ID.B.6a				■
			S-ID.B.6b				■
			S-ID.B.6c				■
		S-ID.C Interpret linear models	S-ID.C.7		■		
			S-ID.C.8		■		
			S-ID.C.9		■		
	Making Inferences and Justifying Conclusions	S-IC.A Understand and evaluate random processes underlying statistical experiments	S-IC.A.1				■
			S-IC.A.2				
		S-IC.B Make inferences and justify conclusions from sample surveys, experiments, and observational studies	S-IC.B.3				■
			S-IC.B.4				■
			S-IC.B.5				■
			S-IC.B.6				■
	Conditional Probability and the Rules of Probability	S-CP.A Understand independence and conditional probability and use them to interpret data	S-CP.A.1		■		
			S-CP.A.2		■		
			S-CP.A.3		■		
			S-CP.A.4		■		
			S-CP.A.5		■		
		S-CP.B Use the rules of probability to compute probabilities of compound events in a uniform probability model	S-CP.B.6				
			S-CP.B.7				

*In Claims 2–4, the blue-shaded clusters and standards make up the majority of the items for that claim. All clusters and standards are eligible for assessment in Claims 2–4. The summative assessment blueprint provides information on the emphasis of content and claim on the assessment.