

# Claim 1: Concepts and Procedures

The Smarter Balanced summative mathematics assessment and its relationship to instruction

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# What is Claim 1?

- Addresses students' ability to explain and apply mathematical concepts
- Addresses students' ability to carry out mathematical procedures with precision and fluency
- About one-half of the computer-adaptive portion of the Smarter Balanced summative test assesses Claim 1 concepts and procedures





# More Information

• More information about <u>Claim 1 on the summative assessment</u> is available online.





# Claim 1 is based on the standards

Examples of standards that describe conceptual understanding include:

- 3.OA.B.6 Understand division as an unknown-factor problem. *For example, find 32* ÷ 8 *by finding the number that makes 32 when multiplied by 8*.
- 5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
- 8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.



# Claim 1 is based on the standards: Continued

Examples of standards that describe procedural fluency include:

- 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- 6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.
- A-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.



# More information on Claim 1

- Uses the focus and coherence structures found in the standards
- <u>Claim 1 information</u> is available online.
- Look in Test Blueprints and Guidelines and Resources sections.



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# Claim 1 is based on the Mathematical Practices

- Mathematical Practices 5 through 8 offer foundational support for Claim 1
  - 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



# Grade 8 – Using tools strategically

Example Stem 2: A cone with radius 4 feet is shown. Its approximate volume is 165 cubic feet.



Enter the height of the cone, in feet. Round your answer to the nearest hundredth.





# Grade 3 – Attending to precision

Example Stem: Decide whether each equation is true or false Click True or False for each equation.

	True	False
3 × 6 = 18 ÷ 2		
4 × 9 = 36 ÷ 4		
2 × 5 = 20 ÷ 2		



# High school – Making use of structure

#### Example Stem:

**Part A:** Three equivalent equations for f(x) are shown. Select the form that reveals the zeros of f(x) without changing the form of the equation.

**Part B:** Select all values of x for which f(x) = 0.

Part A:							
	$f(x) = -2x^2 + 24x - 54$						
	f(x) = -2(x - 3)(x - 9)						
	$f(x) = -2(x-6)^2 + 18$						
Part B:							
	-54	_	18	-9	-6	-3	
	0	3	6	9	18	54	





### Grade 6 – Using repeated reasoning

**Example Stem:** The ratio of x to y is  $\frac{1}{4}$ . All values of x and y are whole numbers less than 100.



Fill in the boxes with numbers to form a table with the given ratio.





# Additional information on Claim 1 and the Mathematical Practices

• The <u>Smarter Balanced Content Specifications</u> are available online.



# Claim 1 supports a progression of learning

- There is an internal structure of coherence in the standards
  - Example: key ideas of operations are consistent across the grades
- Fluency is only assessed after conceptual understanding has been developed in previous grades





# Progressions of learning

• The progressions of learning are available online.



# How Claim 1 informs assessment

- Every cluster in Grades 3–8 and several clusters in high school have Claim 1 documents
- Evidence statements indicate specific ways a cluster is assessed
- The "Evidence Required" statements were developed my educational experts from across the nation



## Assessing conceptual understanding: Example 1

Example Stem 3: Which expression is equal to 5 × 14?

A. 
$$5 \times (10 + 4)$$
  
B.  $(5 \times 10) \times 4$   
C.  $(5 \times 1) + (2 \times 7)$   
D.  $(5 \times 4) \times (5 \times 10)$ 



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## Assessing conceptual understanding: Example 2

**Example Stem:** A game has green and blue pieces. The ratio of green game pieces to total pieces is 5:12.

Select **all** the statements that are correct about the game pieces.

- A. The ratio of green pieces to blue pieces is 7:5.
- B. The ratio of total pieces to blue pieces is 12:7.
- C. There must be 7 more blue pieces than green pieces.
- D. The ratio of total pieces to green pieces is 12:5.



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## Assessing conceptual understanding: Example 3

Example Stem: Select the appropriate box to identify the value of each expression as being rational or irrational.

	Rational	Irrational
$5\sqrt{7} + \frac{1}{7}$		
$12.4 \cdot (-11)$		
$\sqrt{4} + 17$		
$(-10\sqrt{10}) \cdot 10\sqrt{10}$		



# Assessing procedural fluency: Example 1

**Example Stem 1:** Enter the value of  $(5 \times 12) + (27 \div 9)$ .

**Example Stem 2:** Enter the exact value of  $(6 \times \frac{2}{3}) + (\frac{2}{8} + \frac{3}{8})$ .

**Example Stem 3:** Enter the exact value of  $(2 \div 0.1) - (0.3 \times 0.4)$ .



# Assessing procedural fluency: Example 2

Example Stem: This spinner is divided into 8 equal-sized sections.



Enter the probability of the arrow landing on a section labeled 2 on the first spin.



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# Assessing procedural fluency

**Example Stem 3:** Given the function  $y = \frac{1}{2}|2x - 1| + 2$ ,

- Use the Add Arrow tool to create a graph that represents the function.
- Place a point on the coordinate grid to show the yintercept of the function.





# How Claim 1 informs instruction

- Claim 1 documents help teachers develop understanding of the concepts and skills students should learn
- Classroom instruction and assessment should not be limited by the Claim 1 documents
- Claim 1 skills should be part of a rich educational experience
- Some high school standards are better fitted to Claims 2, 3, and
  4
- The mathematical practices should guide classroom instruction
- The progressions of learning are key to making connections





# Further help

 Specific Claim 2 through 4 videos to get a more complete picture of each claim and the skills students should develop through focused instruction

