

Smarter Balanced Assessment Consortium: Mathematics Guidelines for Inclusion of Measurement Conversions and Formulas



Conversions or formulas that are allowable with a particular item type will be given either in the item stem or in the stimulus for a performance task.

Measurement Conversions

LIST A: The measurement conversions listed here are not included in directions for any item type at any grade level in either the Smarter Balanced summative or interim assessments.

- 1 foot = 12 inches
- 1 yard = 3 feet
- 1 meter = 100 centimeters
- 1 kilometer = 1000 meters
- 1 kilogram = 1000 grams
- 1 liter = 1000 milliliters
- 1 hour = 60 minutes
- 1 minute = 60 seconds
- 1 week = 7 days

LIST B: The measurement conversions listed here are given only in performance task stimuli, and not in computer adaptive testing (CAT) items. The first grade level at which tasks are eligible for the given conversion is listed in brackets, and the conversion is then allowable in performance tasks at subsequent grades as appropriate to the task. Item authors must still attend to the language as written in the standards for a particular grade level (e.g., attending to limits within the standard such as expressing a larger unit in terms of a smaller unit).

- 1 cup = 8 fluid ounces [Grade 4]
- 1 mile = 5280 feet [Grade 5]
- 1 mile = 1760 yards [Grade 5]
- 1 pound = 16 ounces [Grade 4]
- 1 pint = 2 cups [Grade 4]
- 1 quart = 2 pints [Grade 4]
- 1 gallon = 4 quarts [Grade 4]

All measurement conversions not appearing in List A or List B may be given in CAT item stems and performance task stimuli as appropriate for a particular item or task with respect to the standards for the item or task's intended grade level.

Formulas

LIST C: The formulas listed here are not included for any item type at any grade level in the Smarter Balanced summative or interim assessments.

- Perimeter or area of a rectangle
- Perimeter or area of a parallelogram
- Perimeter or area of a trapezoid
- Perimeter or area of a square
- Perimeter or area of a triangle
- Circumference or area of a circle
- Arc length
- Area of a sector of a circle
- Sum of interior angles of a polygon
- Measure of one interior angle of a regular polygon

- Surface area of a rectangular prism
- Surface area of a cube
- Surface area of right pyramids with a rectangular or triangular base
- Volume of a right rectangular prism
- Volume of a cube
- Quadratic formula
- Pythagorean Theorem

LIST D: The formulas listed here are given only in performance task stimuli, and not in computer adaptive testing items. The first grade level at which tasks are eligible for the given formula is listed in brackets.

- Volume of a cone [HS¹]
- Volume of a sphere [HS]
- Volume of a cylinder [HS]

All formulas not appearing in List C or List D may be given in CAT item stems and performance task stimuli as appropriate for a particular item or task with respect to the standards for the item or task's intended grade level.

Angle Measurement Facts and Ratios

LIST E: The angle measurement facts and ratios listed here are not included for any item type at any grade level in the Smarter Balanced summative or interim assessments.

- Number of degrees in a circle
- Sum of interior angles of a triangle
- Side length ratios in a 45-45-90 triangle
- Side length ratios in a 30-60-90 triangle
- Trigonometric ratios for sin, cos, and tan

All angle measurement facts and ratios not appearing in List E may be given in CAT item stems and performance task stimuli as appropriate for a particular item or task with respect to the standards for the item or task's intended grade level.

¹ Since applications of volume formulas are not considered major work in grade 8, performance tasks that measure more complex applications of such formulas are reserved for high school.