High School / Scored Student Samples ITEM #5

SMARTER BALANCED PERFORMANCE TASK

Focus Standards and Claim

Claim 4

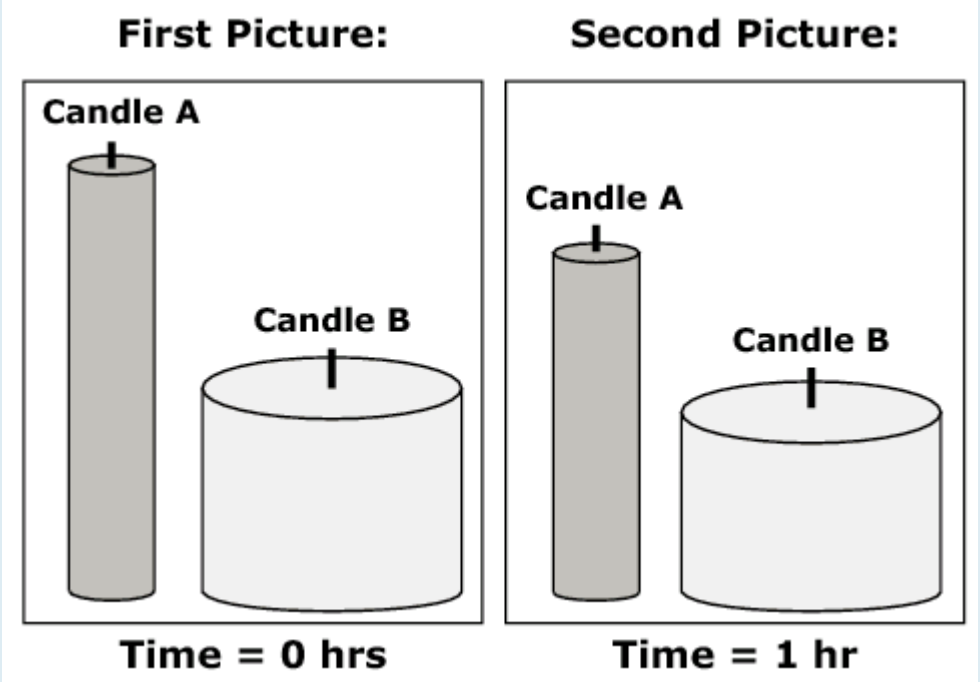
8.F.B

Stimulus

Lights, Candles, Action!

Your friend Abbie is making a movie. She is filming a fancy dinner scene and she has two types of candles on the table. She wants to determine how long the candles will last.

She takes a picture, lights the candles, and then lets them burn for 1 hour. She then takes a second picture. You can assume that each candle burns at its own constant rate.



Candle Type A initial height = 20 cm

Candle Type B initial height = 10 cm

Candle Type A height after burning for 1 hour = 16 cm

Candle Type B height after burning for 1 hour = 9 cm

You will use this information to help Abbie think about the candles she might use for her film.

Item Prompt

Now, choose either Candle A or Candle B to create an equation that will tell Abbie the height of the candle at ***t*** hours after it is lit.

Determine what the numerical values for ***k*** and ***n*** should be for the candle you chose.

Using these ***k*** and ***n*** values, write an equation that tells Abbie the height h of the candle, in cm, at ***t*** hours after it is lit.

Scoring Guide

SCORE	1 POINT	0 POINTS
	The student provides either $h = 20 - 4t$ or $h = 10 - t$ or equivalent.	All other responses

Sample Responses

Student Sample A

1 POINT

$$t = \frac{-h_a + 20}{4}$$

SCORE RATIONALE
The student wrote an equation that is equivalent to h = 20 – 4t. The response earns full credit.

Student Sample B

1 POINT

$$h_a = 20 - 4t$$

SCORE RATIONALE
The student provided a correct equation for Candle A. The response earns full credit.

Student Sample C

1 POINT

$h = 10 - t$

SCORE RATIONALE
The student provided a correct equation for Candle B. The response earns full credit.

Student Sample D

0 POINTS

$h = (-1)n + 10$

SCORE RATIONALE
The response does not include a correct equation for either Candle A or Candle B. Although the provided equation would work if the meaning of n were reassigned, the item prompt assigns each letter to a specific quantity, and it is unclear if the student misunderstood or simply ignored those assignments. The response earns 0 points.

Student Sample E

0 POINTS

$20 = 8 + 4(3)$

SCORE RATIONALE
The student did not determine correct numerical values for n and k, nor provide a correct equation for either Candle A or Candle B. The response earns 0 points.

Student Sample F

0 POINTS

$h=0+4t$

SCORE RATIONALE
The student did not determine correct numerical values for n and k, nor provide a correct equation for either Candle A or Candle B. The response earns 0 points.

Student Sample G

0 POINTS

$$t = \frac{h - 10}{n}$$

SCORE RATIONALE

The equation provided by the student would work for Candle A, but the response does not include a numerical value for n, as required by the problem. The response earns 0 points.