

Item Types and Accessibility Features (Preliminary)

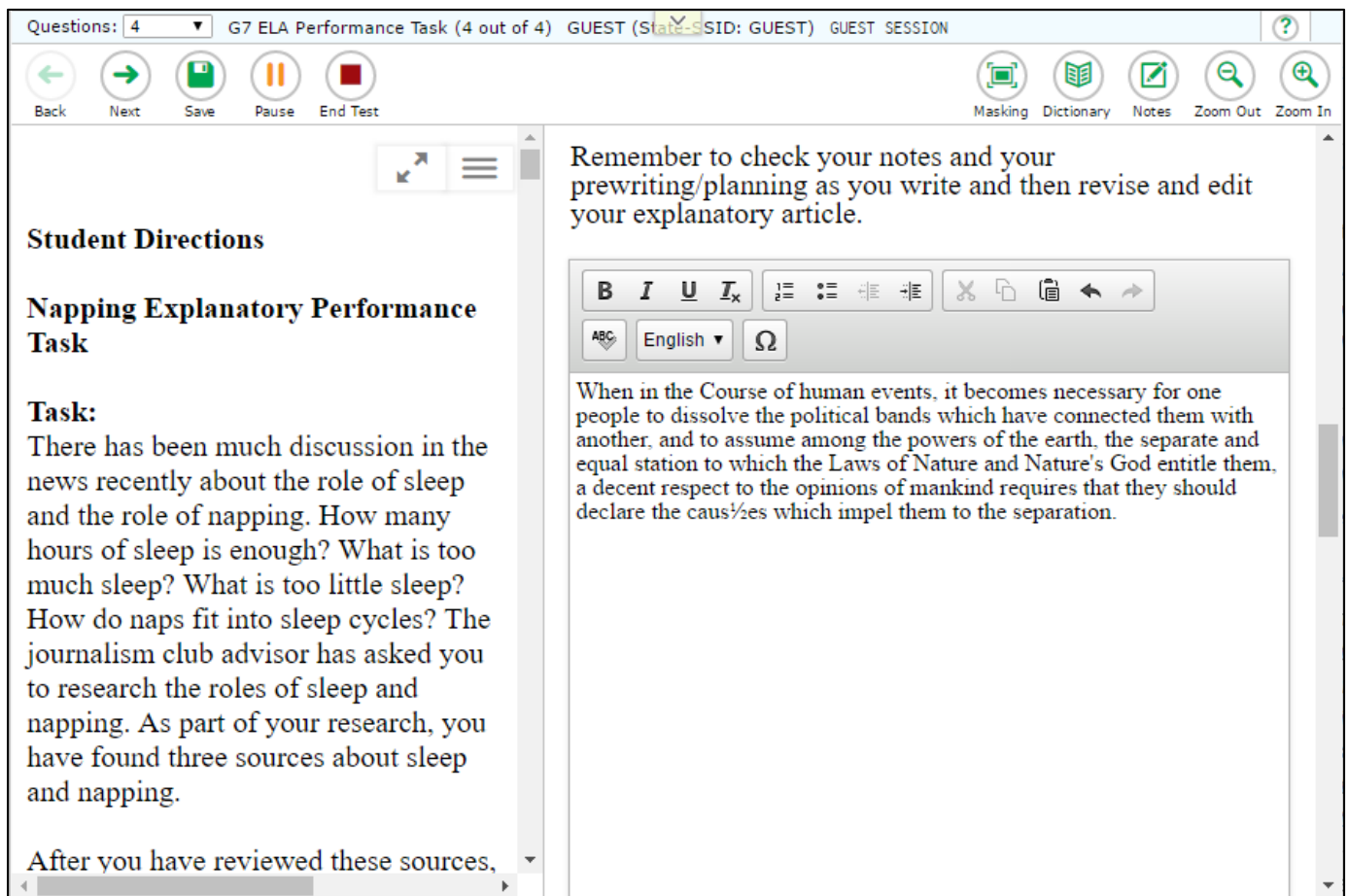
Updated 29 September 2016

1. Introduction

This document describes each item interaction type and each embedded accessibility feature for Smarter Balanced assessments. For each item type or accessibility feature a screenshot shows how the feature appears on the screen.

1.1 Testing Application

In order to emphasize the item type or feature in question, the screenshots focus on just one section, feature or item. The following screen shot shows the entire test-taking application including a passage on the left and a question on the right.



The screenshot displays the Smarter Balanced test-taking application interface. At the top, a status bar shows 'Questions: 4', 'G7 ELA Performance Task (4 out of 4)', 'GUEST (State-SID: GUEST)', and 'GUEST SESSION'. Below this is a toolbar with icons for Back, Next, Save, Pause, End Test, Masking, Dictionary, Notes, Zoom Out, and Zoom In. The main content area is split into two panels. The left panel, titled 'Student Directions', contains the 'Napping Explanatory Performance Task' instructions. The right panel displays a reading passage titled 'Remember to check your notes and your prewriting/planning as you write and then revise and edit your explanatory article.' The passage text is: 'When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.'

Student Directions

Napping Explanatory Performance Task

Task:

There has been much discussion in the news recently about the role of sleep and the role of napping. How many hours of sleep is enough? What is too much sleep? What is too little sleep? How do naps fit into sleep cycles? The journalism club advisor has asked you to research the roles of sleep and napping. As part of your research, you have found three sources about sleep and napping.

After you have reviewed these sources,

Remember to check your notes and your prewriting/planning as you write and then revise and edit your explanatory article.

When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

2. Item Types

2.1 Evidence-Based Selected Response (EBSR)

EBSR items combine two sets of stems and response options into a single item. Unlike MultipleChoice and Multi-Select item types, EBSR items cannot be displayed in horizontal or stacked layouts. EBSR items can only display response options vertically.

For Smarter Balanced, the first part of an EBSR item is multiple choice where only one answer can be selected. In the second part, multiple answers may be selected though the instructions may specify a limit to the student. In the example below, the student is only expected to select one answer from the second part.

This question has two parts. First, answer part A. Then, answer part B.

Part A

Which sentence **best** describes the lesson of the passage?

☐ (A) Animals should be protected.

☐ (B) Birds should only nest in trees.

☐ (C) Movers should listen to children.

☐ (D) Children should stay away from birds.

Part B

Which sentence from the passage **best** supports your answer in part A?

☐ "A bird's nest sat right in the middle of Mrs. Baxter's wreath."

☐ "Jessie and Mrs. Baxter talked about the birds for a while."

☐ "One morning, Jessie saw a pink head poking out of the nest."

☐ "'You can't use this door,' Jessie said, holding her arms out stiff."

2.2 Equation (EQ)

The Equation item response area consists of one or more entry boxes and an on-screen key panel containing mathematical characters. These items are 769 pixels wide or use 100% of the available response area width (whichever is smaller). The default height is 254 pixels. The item indicates which of 11 pre-defined layouts should be used for the math input key panel.

Create an equation to calculate the Massachusetts speeding fine, f , based on the number of miles per hour, m , over the speed limit when $1 \leq m \leq 10$.

←

→

↶

↷

✖

1

2

3

f

m

4

5

6

+

-

×

÷

7

8

9

<

≤

=

≥

>

0

.

-

$\frac{\Box}{\Box}$

\Box^\Box

\Box_\Box

()

||

$\sqrt{\Box}$

$\sqrt[\Box]{\Box}$

π

i

sin

cos

tan

arcsin

arccos

arctan

2.3 Extended Response (ER) and Short Answer (SA)

The response areas for Extended Response (ER) and Short Answer (SA) item types essentially have the same appearance. Extended Response (ER) areas accommodate more text than Short Answer response areas. You can configure the character limit for both item types.

Summarize the central idea in the section “Ups and Downs.” Use key evidence from the text to support your summary.

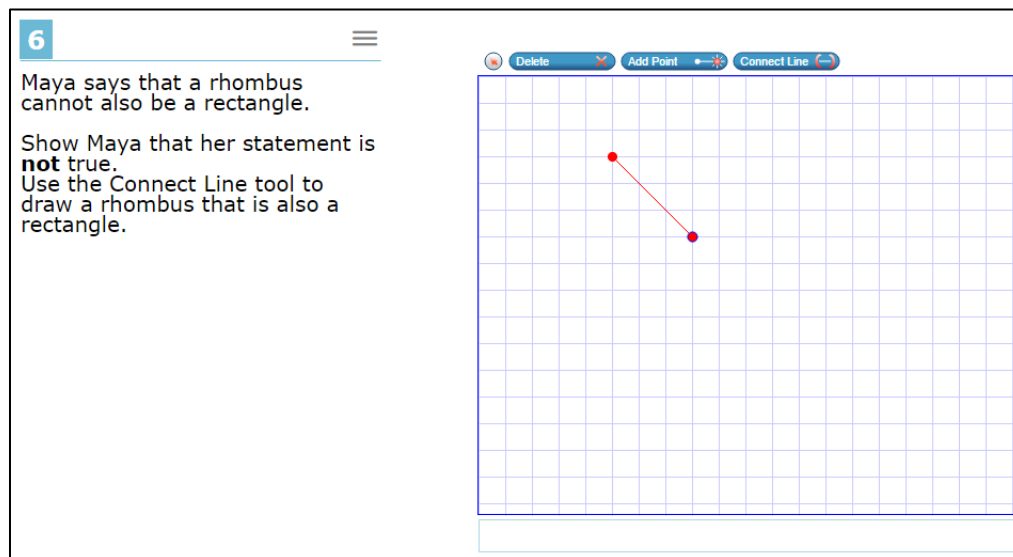


2.4 Grid Item (GI)

Smarter Balanced uses three variations of the Grid Item type, each with a distinct appearance and interaction mode.

2.4.1 Grid Item (GI) - Graphing

The Grid Item - Graphing variant response area consists of a grid in which students plot points and/or lines. The available tools include a select, delete, add point, and connect line. Depending on the item, the point or line tool may not appear. A text box below the grid offers hints on what the student can do with each tool.



The response area may have a background image on which the student plots points or lines as in this example.

7

The graphs of $y = g(x)$ and $y = f(x)$ are shown.

Use the Add Point tool to add a point that will satisfy each given condition.

- A point on the graph of g where $x = 0$
- A point on the graph of g where $f(x) > g(x)$
- A point on the graph of f where $f(x) = 0$

Grid Item – Graphing Variants may constrain points and lines; for example they may be constrained to a number line. The background, whether a simple grid, a graph with axes, or another image is simply a bitmap.

2.4.2 Grid Item (GI) – Hot Spot

The Grid Item – Hot Spot Variant response area consists of a space in which images are displayed. Clicking on certain hot spot areas causes images appear or disappear. Transparent sections of the images allow the background to show through.

In this example, the clicking on the shapes causes the selection box to appear around the shape.

4

Click **all** of the shapes that are quadrilaterals.

This is another example of a Grid Item – Hotspot variant. In this case there is a different image representing each level and they are selectively displayed according to the hotspot where the student clicks. The same technique is also used to create bar charts that may be manipulated by the student.

16

Walter puts 1050 cubic inches of dirt into the tank shown.

Click the number line to show the height of the dirt in the tank.

2.4.3 Grid Item (GI) – Drag and Drop

The Grid Item – Drag and Drop variant has a workspace with a background image. Other images can be dragged and dropped into the workspace. The drop locations may or may not be constrained. When they are constrained, dropped images snap to nearby locations.

This example of the Drag and Drop variant includes a palette of items to the left that can be drag into the workspace. The same item may be used more than once. The student may use the delete tool can be used to remove an item from the workspace.

9

Christy has \$60 to spend on plants.

She buys a peach tree for \$23 and a plum tree for \$19.

She wants to buy one more plant.

- Drag the numbers to the boxes and the symbols to the circles to create an equation to show how much money Christy has left to spend.
- Select one plant she **could** buy with the money she has left.

+
-
×
÷
18
19
23
37
41
60
102

Delete

×

○

19

=

☐ Grapevines, \$16

☒ Apple tree, \$18

☐ Pear tree, \$20


☐ Cherry tree, \$22

This example has images pre-located in the workspace that may be moved around by the student. They may be moved around but not added or deleted.

15
☰

Drag each fraction to the correct location on the number line.

$\frac{1}{4}$



$\frac{4}{4}$

$\frac{4}{1}$

$\frac{2}{4}$

2.5 Hot Text (HTQ)

The response area for Hot Text items consists of a section of text containing interactive words or phrases that students can either select (highlight) by clicking or rearrange by clicking and dragging. In the image below, the word 'stacked', outlined in light blue, is an example.

The author uses a word that means placed one on top of another. Click on the word in the paragraph that is **closest** to that idea.

Papermaking begins in the forest, where trees are marked to be cut down. Once the trees are cut, the biggest branches are removed. The logs, as they are now called, are stacked in huge piles at the edge of the forest. A logging truck takes them to the paper mill. At the mill, the logs go through many steps to be made into paper. After the bark is removed, the wood is chipped, then cooked with chemicals. This turns the wood into a mushy pulp. Next, the pulp is washed, bleached, and drained. Then it is sprayed onto big screens to dry. The finished sheets of paper are put onto giant rolls. Some of these rolls of paper weigh as much as 50,000 pounds! Finally, the paper is lined, cut, or folded for people to use.

2.6 Multiple Choice (MC)

For multiple choice responses, only one answer can be selected among several possibilities.

What is the author's **most likely** reason for including the "Isle Royale" section in the text?

- ☐ Ⓐ to explain why wolves are the island's only big predator
- ☐ Ⓑ to provide a related example of the information in the introduction
- ☐ Ⓒ to prove that plants in a food-chain are not an ideal source of food
- ☐ Ⓓ to demonstrate how much vegetation a moose can consume in a day

2.7 Match Interaction (MI)

For the Match Interaction (MI) types, text or images in rows are matched values in columns. The student selects the boxes where a match is valid.

Click on the boxes to match each source with the idea or ideas that it supports. Some ideas may have more than one source selected.		
	Source #1: What is an Astronaut?	Source #2: Life in Space
Astronauts feel weak when they come back from space.	<input type="checkbox"/>	<input type="checkbox"/>
Since objects are also able to float in space, astronauts can easily lift things in space that are heavy on Earth.	<input type="checkbox"/>	<input type="checkbox"/>
Astronauts have a special view of Earth from space.	<input type="checkbox"/>	<input type="checkbox"/>

2.8 Multi Select (MS)

For the Multi Select (MS) option, students are given a number of items to select to answer the questions. For the example below, two of the listed items will be selected.

<p>What are the most likely reasons the author included the section “Living Links” before the sections “Isle Royale: Predators, Prey, and Producers” and “Ups and Downs”? Select two options.</p> <p><input type="checkbox"/> The section “Living Links” introduces carnivores, and carnivores are mentioned in the last two sections.</p> <p><input type="checkbox"/> The section “Living Links” identifies humans as consumers, and humans are addressed in the sections that follow.</p> <p><input type="checkbox"/> The section “Living Links” defines a food chain before the other sections give an example of a specific food chain.</p> <p><input type="checkbox"/> The section “Living Links” explains how the sun provides energy for all living things, and the sections that follow prove that this is the case.</p> <p><input type="checkbox"/> The section “Living Links” gives examples of food chains that are recognizable before the other sections introduce a possibly unfamiliar food chain.</p>

2.9 Table Interaction (TI)

For Table Interaction (TI) item types, students are provided with a table that includes a separate area of cells in which students may enter text.

Jaleen also sold lemonade for 4 weeks in August. She compares her weekly sales in July to her weekly sales in August.

- For week 1, she sold 22 fewer cups in August than in July.
- For week 2, she sold 18 more cups in August than in July.
- For week 3, she sold 26 more cups in August than in July.
- For week 4, she sold 25 fewer cups in August than in July

Complete the table to show how many cups Jaleen sold each week in August.

August Lemonade Sales

Week	Cups Sold
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>

2.10 Writing Extended Response (WER)

Writing Extended Response (WER) item types provide more space for students to provide a longer written response. It also includes text formatting tools – bold, underline, italic, numbered and bulleted lists, indentation, clipboard, undo, redo, and spell checking.

The screenshot shows a rich text editor interface. The toolbar includes buttons for bold (B), italic (I), underline (U), strikethrough (I_x), bulleted list, numbered list, decrease indent, increase indent, cut, copy, paste, undo, and redo. Below the toolbar are buttons for ABC (spell check), a language dropdown set to 'English', and a symbol button (Ω). The text area contains the following text: "When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation."

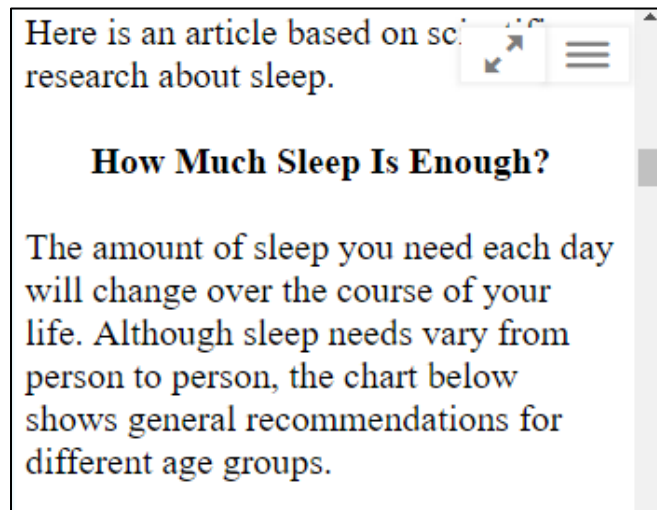
2.11 Supplementary Item Types

Supplementary item types are, *Passage* (Pass), and *Tutorial* (Tut), and *Wordlist* (Glossary).

2.11.1 Passage (Pass)

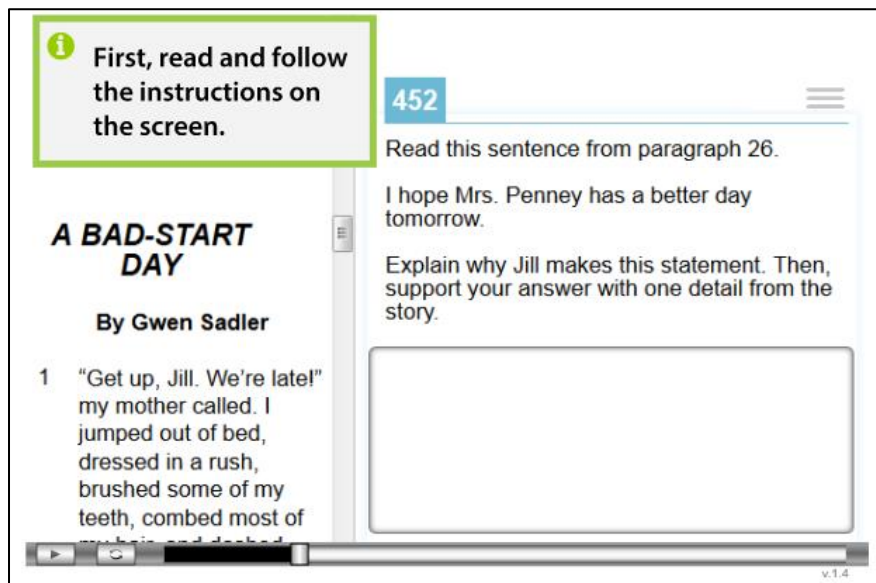
A passage is an extended stimulus that is referenced by multiple response items that follow. Typically a passage is an extended-length text in HTML format. However, it can include

multimedia such as an audio listening passage or a video. As with response items, passages may have accessibility features such as ASL video and closed captioning.



2.11.2 Tutorial (Tut)

Like a passage, a tutorial is extended HTML text which may include multimedia and accessibility features. Each tutorial is associated with a particular response type and is used to inform students how to respond to that particular interaction type.



3. Accessibility Features

There are three types of accessibility features:

- **Universal Tools** are made available to all students according to their preference.
- **Designated Supports** are made available to any student for whom the need has been indicated by an educator.
- **Accommodations** are made available to students for whom the need has been documented.

Accessibility features are also distinguished by how the content must be prepared and how they are made available to students. The categories are: Item-Embedded Features, System-Embedded Features, and Non-Embedded Features.

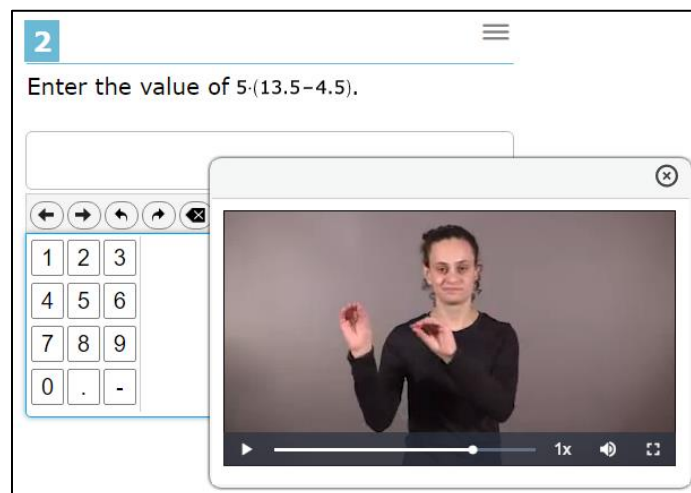
This document describes embedded features. Additional details about all accessibility features can be found in the Usability, Accessibility, and Accommodations Guidelines (UAAG) found on SmarterBalanced.org (<http://www.smarterbalanced.org/wp-content/uploads/2015/09/Usability-Accessibility-Accommodations-Guidelines.pdf>).

3.1 Item-Embedded Features

Item-Embedded appear *within* the assessment items and often require custom content to match the specific item. This category includes information that may not be visible in a conventional browser but interacts with assistive technology, such as alternative spellings for text-to-speech and braille screen readers.

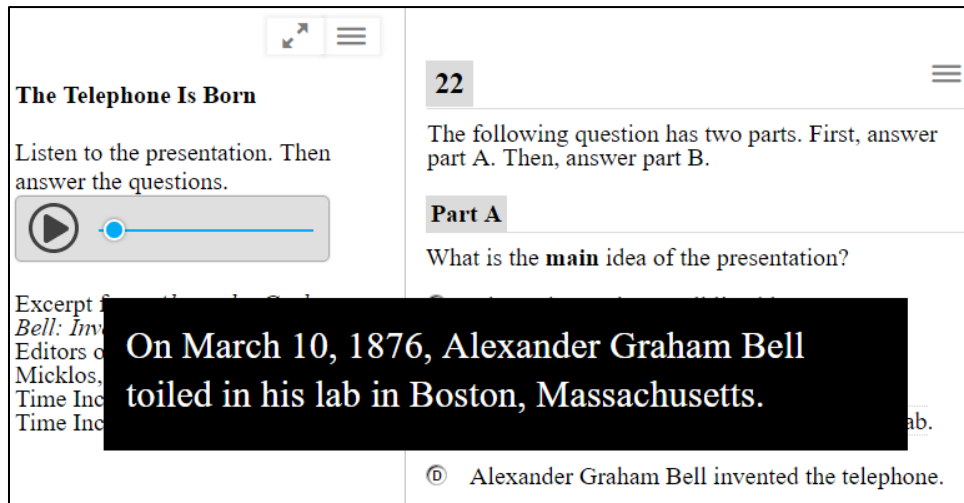
3.1.1 American Sign Language (ASL) videos (Accommodation)

American Sign Language videos are provided for math items, math performance tasks (PTs), and ELA listening sets (audio stimulus and associated items). The student launches the video by clicking on the item menu (three bars in the upper-right) and selecting “American Sign Language”



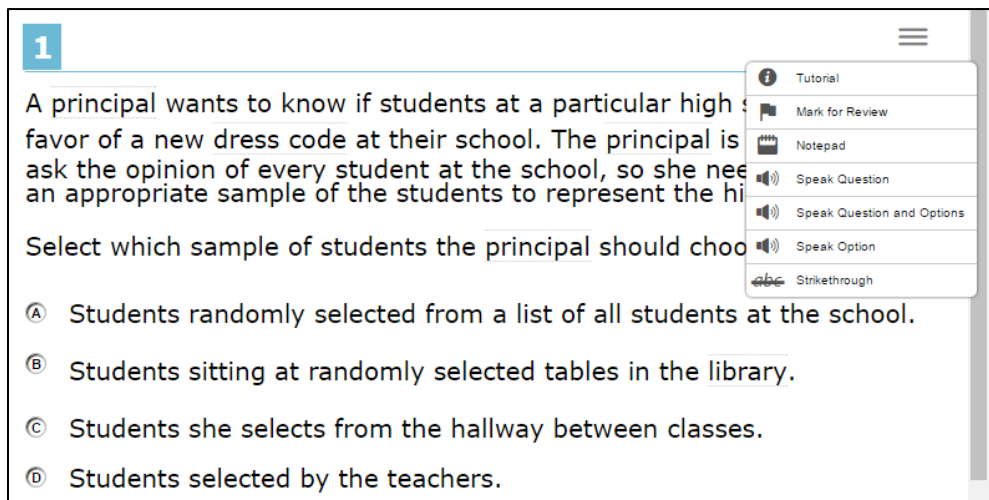
3.1.2 Closed Captioning (Accommodation)

Closed captioning is offered for listening stimuli on ELA/Literacy tests and with other audio components in the test delivery interface. When closed captioning is enabled, it appears automatically when the student begins to play an audio passage.



3.1.3 Text-to-Speech (Designated Support for Math, Accommodation for ELA/Literacy)

Text-to-Speech uses a voice synthesizer to read the text of an item aloud to the student. It is invoked by clicking on the item menu (three bars in the upper-right) and selecting one of the "Speak" options such as "Speak Question".



3.1.4 Text-to-Speech Annotations

Text-to-Speech annotations are additional text added to an item to improve pronunciation by speech synthesizers and to provide descriptions for images and diagrams. They are used by the embedded text-to-speech feature described in section 3.1.3 and also by assistive technology such as screen readers. Special tags are embedded in the text according to WCAG and ARIA guidelines for this purpose.

3.1.5 Braille Emboss-on-Demand (Accommodation)

Braille-reading students may have the text of an item embossed on paper in braille form. Certain math items may include tactile graphics along with the text. Text-only items include a .BRF file that can be embossed by pretty much any digital embosser. .PRN files are special-format braille files that include tactile graphics. A more limited set of embossers can handle .PRN files. Smarter Balanced provides embossing files that correspond to the practice and training tests here: <http://www.smarterbalanced.org/assessments/practice-and-training-tests/>

3.1.6 Stacked Translation into Spanish (Designated Support)

Stacked Translation provides the assessment item in both Spanish and English. It is only available for math items. When stacked translation is enabled it appears automatically.

4

Selecciona la expresión equivalente a $(4x+3) + (-2x+4)$.
Select the expression equivalent to $(4x+3) + (-2x+4)$.

(A) $-2x+12$
(B) $-8x+12$
(C) $6x+7$
(D) $2x+7$

3.1.7 English Glossary (Universal Tool)

English glossary provides definitions for certain words or phrases. The word or phrase will have highlight bars at top and bottom. When the student clicks on the word then a definition appears. The definition box can be moved around the screen and closed.

1

A principal wants to know if students at a particular high school are in favor of a new dress code at their school. The principal is not able to ask the students directly, so she needs to select an appropriate group to represent the high school.

Select which sample group the principal should choose.

(A) Students randomly selected from a list of all students at the school.
(B) Students sitting at randomly selected tables in the library.
(C) Students she selects from the hallway between classes.
(D) Students selected by the teachers.

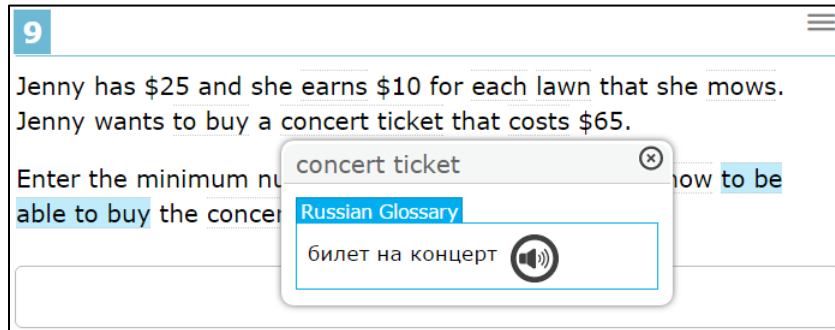
dress code

Glossary

rules about what to wear

3.1.8 Translated Glossary with Audio (Designated Support)

Translated glossary must be enabled for one of ten languages supported by Smarter Balanced. It may be combined with English Glossary. As with English Glossary, the student can click on a word highlighted by top and bottom bars and a translated glossary will appear. If both English and translated glossaries are enabled and the term has both forms then the student can choose which to view. The glossary box can be moved around the screen.



If the student clicks on the speaker icon next to the text they will hear a recording of the text from a native speaker of the language. Smarter Balanced provides translated glossaries in Arabic, Cantonese, Filipino, Korean, Mandarin, Punjabi, Russian, Spanish, Ukrainian, and Vietnamese.

3.1.9 Image Glossary

Image glossary works like English and Translated glossaries except that an image is displayed instead text and audio. Like English and translated glossaries, the image may be moved around the screen. The size can also be changed.

(Screen Shot Pending)

3.1.10 Braille Transcripts of Closed Captions (Accommodation)

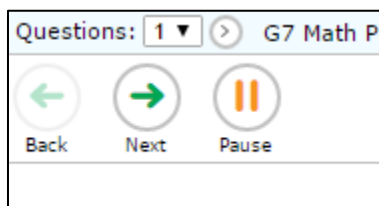
Braille Transcripts of Closed Captions are transcripts of the closed captions described in section 3.1.2 that may be embossed in the same way that item text may be embossed as described in section 3.1.5.

3.2 System-Embedded Features

System-Embedded features are provided by the online test delivery system but are not embedded in the item.

3.2.1 Breaks (Universal Tool)

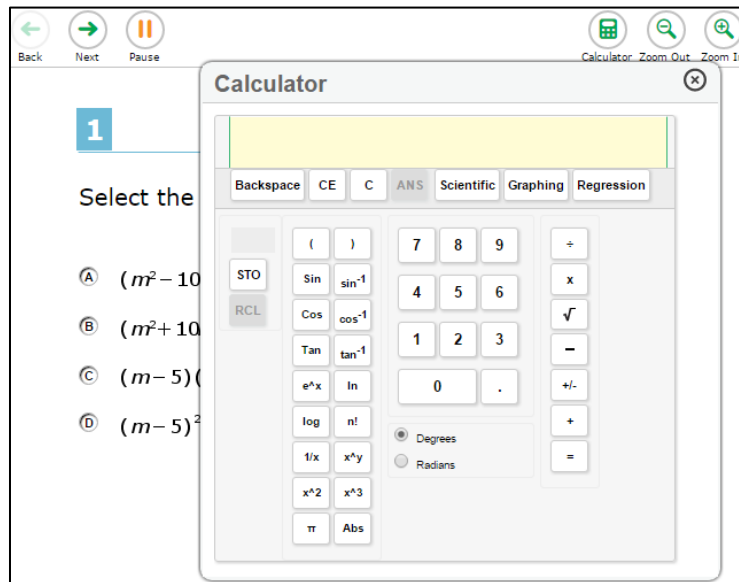
A student may take a break by clicking the pause button. They are warned that if the break lasts longer than 20 minutes then they will not be able to go back and review any questions they have already answered. If there is a problem during testing such as a power failure, the internet connection is lost, or the student's device fails then the test is automatically paused.



3.2.2 Calculator (Universal Tool)

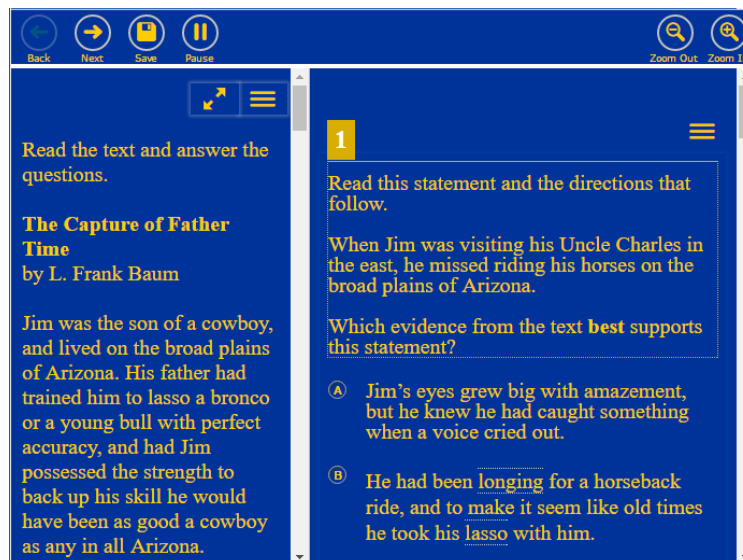
For math tests, the student may bring up an online calculator. However, certain items disable the calculator when it would interfere with the object of the item. The student brings up the calculator by clicking the calculator icon in the upper-right.

Different calculators are enabled according to the student's grade. In advanced grades they may select from Scientific, Graphing, and Regression calculators.



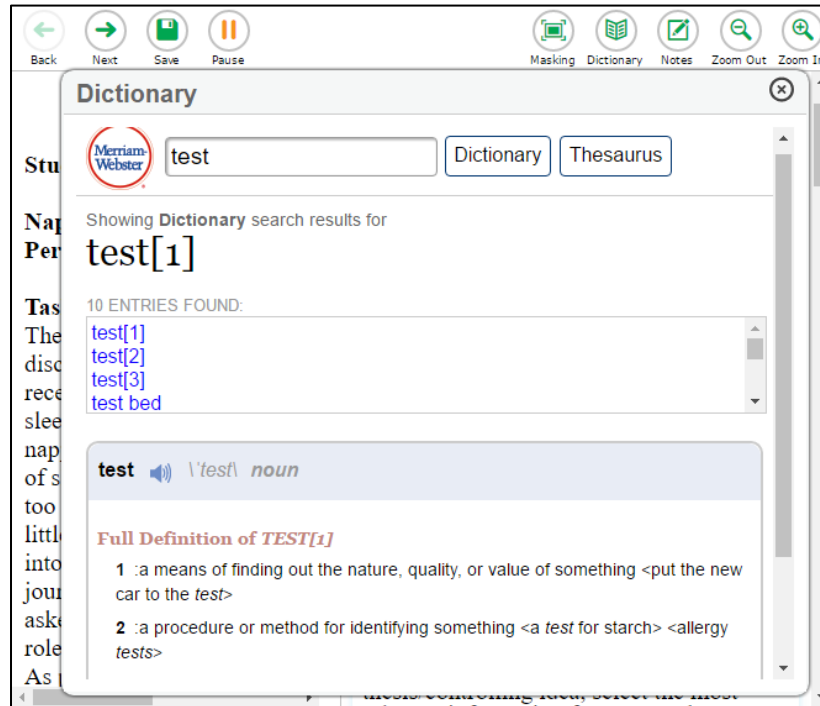
3.2.3 Color Contrast (Designated Support)

Color contrast changes the foreground and background colors in which the test is displayed. The selection must be made in advance and affects all items on the test. Options are Black on White (default), Black on Rose, Yellow on Blue, Medium Gray on Light Gray, Reverse Contrast (white on black). This example is yellow on blue.



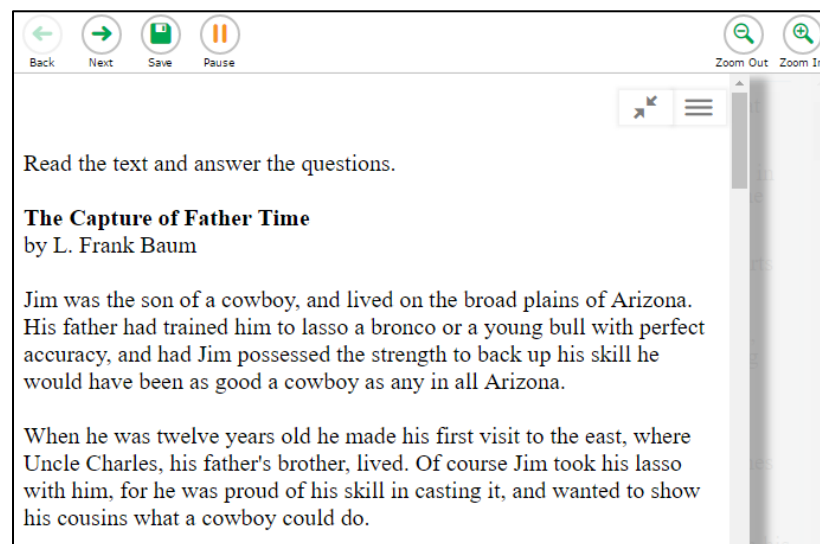
3.2.4 English Dictionary (Universal Tool)

The embedded dictionary is only available for certain ELA/Literacy items. The student invokes the dictionary by clicking the dictionary icon in the upper-right (near notes and zoom tools). This brings up a dictionary window that the student can use to look up word definitions. The student can move the dictionary around on the screen and continue to work on their answer to the question while the dictionary is visible.



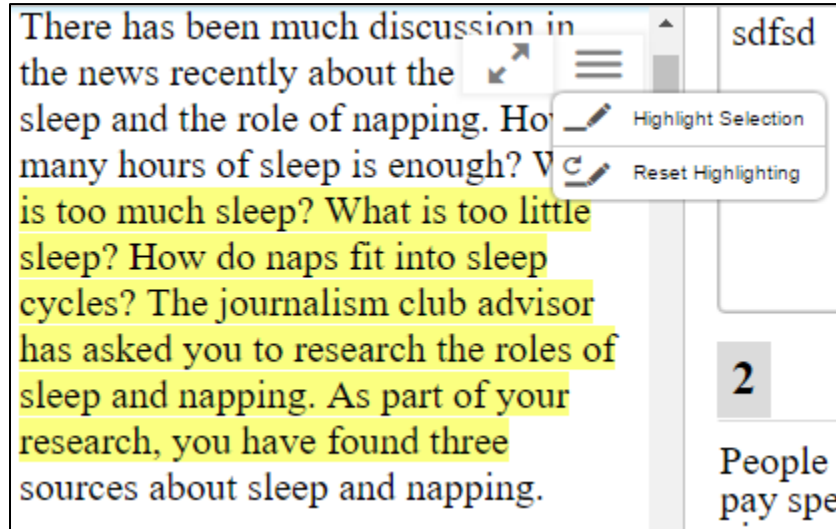
3.2.5 Expandable Passages (Universal Tool)

Clicking on the expanding passages icon (two diagonal arrows, upper-right) expands the passage to take over most of the screen. Clicking the icon again returns the passage to normal size so that the adjacent questions may be seen.



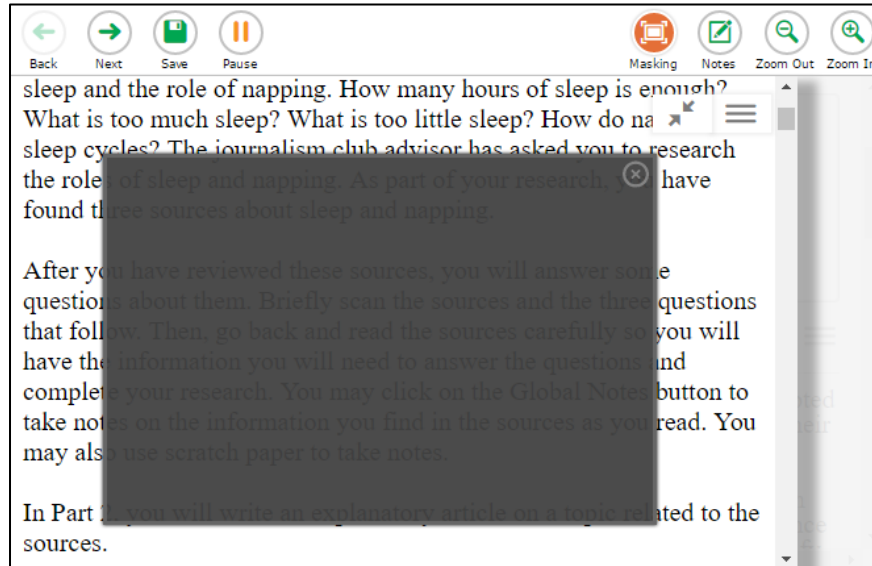
3.2.6 Highlighter (Universal Tool)

The student may highlight text in a passage or a question. To highlight text a student selects the text, invokes the item menu (three bars in the upper-right) and selects “highlight selection”. Highlighting can be cleared by selecting “reset highlighting” in the item menu.



3.2.7 Masking (Designated Support)

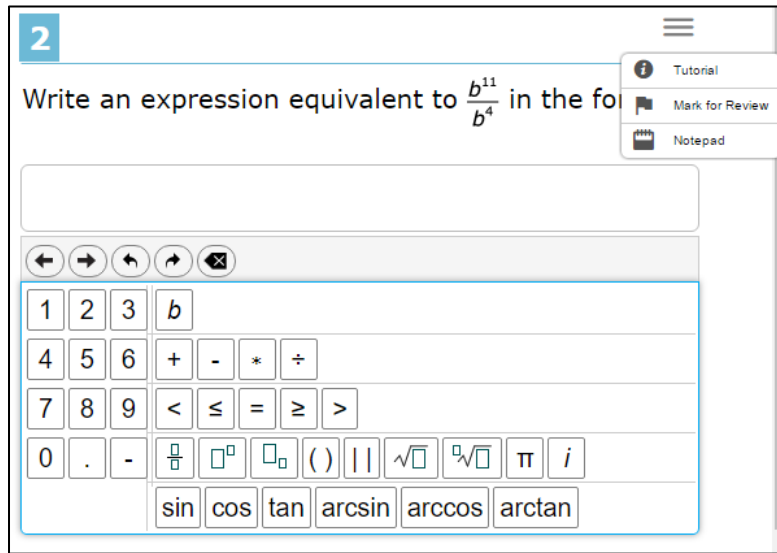
Masking lets a student block out certain parts of an item. The student clicks the “masking” button and then draws a rectangle over the area to be blocked off.



3.2.8 Mark for Review (Universal Tool)

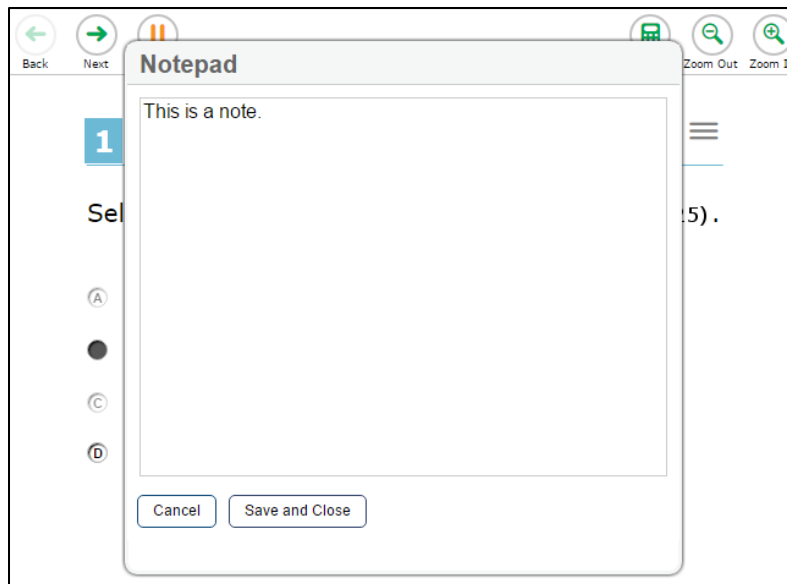
Mark for Review lets the student mark a question for later review. When the student reaches the end of a segment or of a test they are offered a list of all items and those marked for

review will be highlighted. Mark for Review is invoked using the item menu (three bars in the upper-right).



3.2.9 Notepad (Universal Tool)

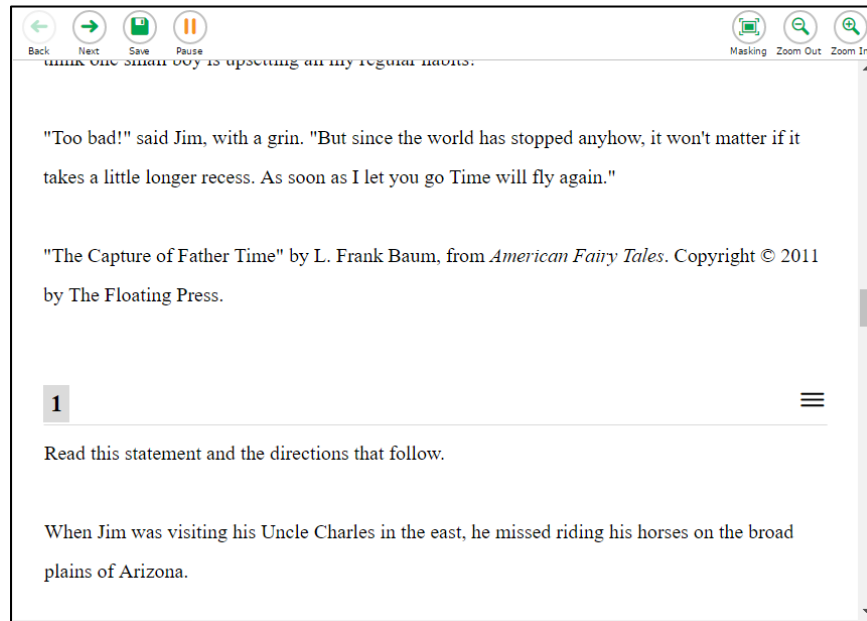
The notepad allows students to take notes associated with an item or with the test as a whole. It is invoked using the item menu (three bars in the upper-right).




3.2.10 Streamline (Accommodation)

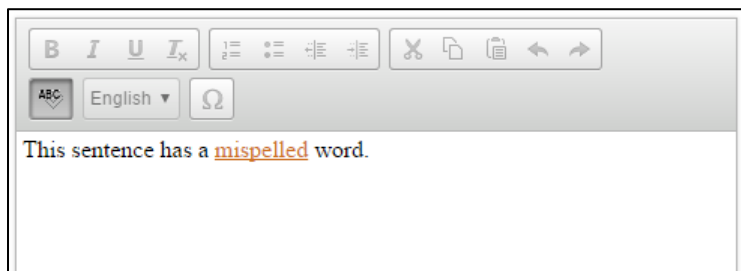
When one or more questions are associated with a reading passage normal display is to show the passage on the left with the questions on the right. Each section can be scrolled

independently. In streamline mode, the passage is displayed above with questions below. This works better with certain screen readers and may be better for certain students.



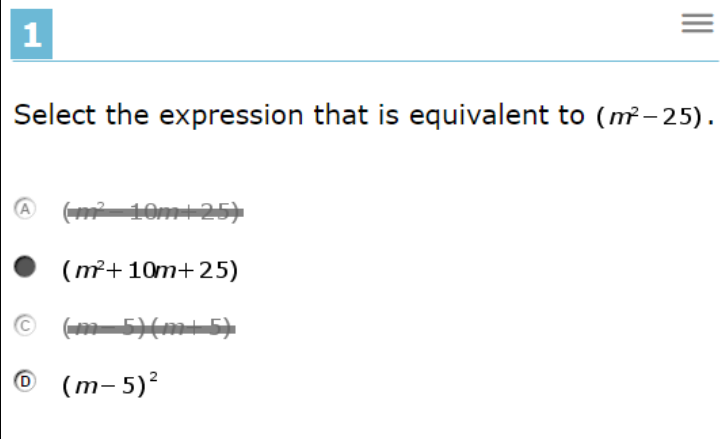
3.2.11 Spell Check (Universal Tool)

Spell checking is only available for Writing Extended Response (WER) items. The text editor section of this item has a spell check button  that will highlight all misspelled words. Clicking on a misspelled word offers a selection of likely replacements from which the student can choose.



3.2.12 Strikethrough (Universal Tool)

The strikethrough tool enables the student to strike out answers that they believe to be incorrect. It is invoked by clicking on the item menu (three bars).



1

Select the expression that is equivalent to $(m^2 - 25)$.

(A) ~~$(m^2 - 10m + 25)$~~

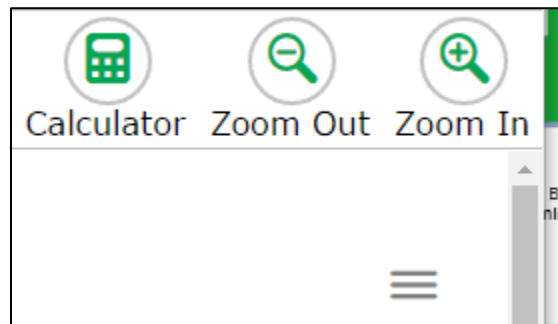
☒ $(m^2 + 10m + 25)$

(C) ~~$(m - 5)(m + 5)$~~

(D) $(m - 5)^2$

3.2.13 Zoom (Universal Tool)

The zoom buttons in the upper-right allow the student to increase the size of text and graphics. This affects all items in the test including glossaries, graphics, and so forth.



3.3 Non-Embedded Features

Non-Embedded are provided by the test administrator or organization. Examples are a paper multiplication table, translated test directions, or a bilingual dictionary. See the Usability, Accessibility, and Accommodations Guidelines (UAAG) for more detail

(<http://www.smarterbalanced.org/wp-content/uploads/2015/09/Usability-Accessibility-Accommodations-Guidelines.pdf>).