

Accessibility of Technology-Enhanced Tests for Students with Vision and Motor Disabilities

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Purpose

A key feature of next-generation assessments will be their use of desktop, laptop, and touch-screen tablet technology for delivery of tests and collection of student responses. These assessments will include technology-enhanced (TE) items and tasks featuring interactivity, multimedia, varied response requirements including drag-and-drop and constructed responses, and complex scoring. Two of the more difficult accessibility challenges are visual disabilities that impede access to information presented in visual modalities, such as computer screens, and motor disabilities affecting a student's interaction with physical interfaces such as keyboards, mice, and touchscreens. The purpose of this project is the investigation of accessibility of TE items and tasks for students with vision and motor disabilities through a series of empirical studies resulting in guidelines and recommendations for test developers and educators.

Evidence

Data sources include expert review, cognitive labs with individual students, teacher panels in participating states, and large-scale field testing. Experts in the instruction and assessment of students with vision and motor disabilities have conducted a review of prototype item and task types, technology-enabled accessibility features, and accommodations to produce an analysis of the anticipated accessibility for each item type with its associated technology-enabled accessibility features and with or without person- and computer-delivered accommodations. When item types are not accessible for students with vision and/or motor disabilities, technology-enhanced features that would make them accessible are being investigated. If item types are not amenable to technology-enhanced features, person-delivered accommodations and special tools that would permit accessibility will be evaluated. Alternate methods to assess the constructs will be explored and additional assessment item or task types will be produced.

The drag-and-drop item interface is inherently inaccessible to students who cannot see the screen or use a mouse or touchscreen to navigate. These items are difficult to transcribe into braille or print. However, these types of items may be intuitive, motivating, and efficient for students without vision or motor disabilities.

Read the sentences below. They are not in the correct order. Put the sentences in the correct order.

"Next time let's come earlier and catch even more fish!" Andy added.
 "That sounds like a great idea," said Grandpa Bill.
 "Anytime, buddy," his grandpa answered.
 "Thank you, Grandpa Bill, for helping me learn to fish!" Andy exclaimed.

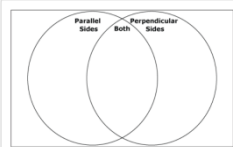
Read the sentence below.

The storms form over warm waters and sometimes strike land.


Sort the words as they are used in the sentence into the box that shows the correct part of speech.

Words	Noun	Verb	Adjective
storms			
form			
warm			
waters			
strike			
land			

Place the polygons below where they belong in the Venn diagram.

-parallelogram	
-rectangle	
-rhombus	
-square	
-trapezoid	

A rectangle and a parallelogram are shown below.



What are attributes of both shapes? Choose all that belong.

Attribute	Yes	No
Four sides	<input type="checkbox"/>	<input type="checkbox"/>
All equal sides	<input type="checkbox"/>	<input type="checkbox"/>
Two pairs of parallel sides	<input type="checkbox"/>	<input type="checkbox"/>
Four angles	<input type="checkbox"/>	<input type="checkbox"/>
All equal angles	<input type="checkbox"/>	<input type="checkbox"/>
Two pairs of equal sides	<input type="checkbox"/>	<input type="checkbox"/>

Label the quadratic equations with the x-values that make the equations true.

$x = -3$	drop correct response	$x^2 - x - 6 = 0$
$x = -2$	drop correct response	$3x^2 - 12x - 15 = 0$
$x = -4$	drop correct response	$6x^2 - 6x - 72 = 0$
$x = -1$	drop correct response	$6x^2 - 18x - 24 = 0$

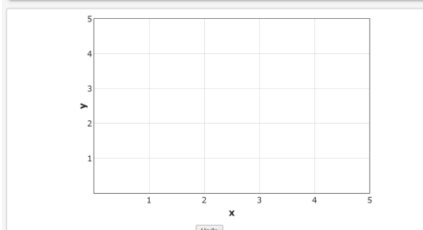
Reorder the expressions in the box below to show how to simplify the following expression.

$$\sqrt{2x^3} + \sqrt{8x}$$

2^2x^2
$\sqrt{2}4x^4$
$4x^2$
$\sqrt{16x^4}$

Click-to-select interfaces are accessible for switch systems and can be translated into braille and print.

Select two points to form a line that represents a proportional relationship.



Buttons: Undo, Erase All, < Back, Clear, Next >, Review & End

Read the sentences below about Andy catching a fish. Choose all of the verbs from the highlighted words.

Suddenly, an enormous fish broke the lake's surface. It flashed in the light. A spray of water leapt into the sky as the fish thrashed in the water.

Read the paragraph below.

Spiders are invertebrate creatures in the Araneae order of the class Arachnida in the phylum Arthropoda. A spider has up to eight eyes, eight legs, and seven silk-producing glands in its abdomen. These glands secrete proteins that are extruded through spinnerets to produce different kinds of silk. Many spiders, particularly orb, funnel, sheet, and cob-weaving spiders, use this silk to build webs with which they use to catch prey.

Match the word on the left with the correct word or phrase on the right.

Arachnida	spider type
invertebrate	phylum
Araneae	type of creature
funnel	order
Arthropoda	class

Buttons: < Back, Clear, Next >, Review & End

Significance

The project will result in a clearer understanding of the types of technology-enhanced assessments and tasks that are and are not accessible for students with blindness, low vision, or motor disabilities. The ultimate result of this study will be a set of guidelines and recommendations for valid accessible assessments that provide the greatest score comparability and lead to sound inferences about achievement measured with technology-enhanced items and tasks for students with vision and/or motor disabilities. Through individualized cognitive labs, large-scale data collection, and the chance to use powerful methodological procedures on large groups of students with low-incidence disabilities, definitive outcomes regarding the usefulness of assessment procedures, tools, and accommodations as well as the validity of score inferences can be obtained.