

# Universal Design for Assessment

## Making Assessment Accessible for All Students

Michael Russell  
Boston College

November 9, 2017



# Establishing Common Terminology

- Need vs. Preference

# Establishing Common Terminology

- Need vs. Preference

# Establishing Common Terminology

- Representational form



Surrounded by Danger  
Dependent on Visual Vigilance



Strong Value for  
Information



Accessing Information via  
Text-based Print Too Risky



Tactile Representation  
Preferred Form of Encoding




# Alternate Representation: WATER

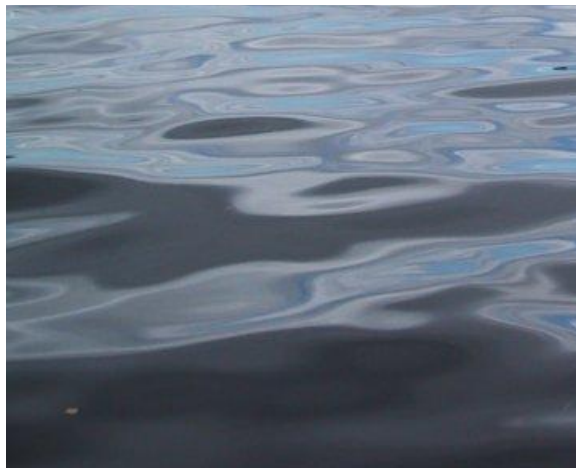
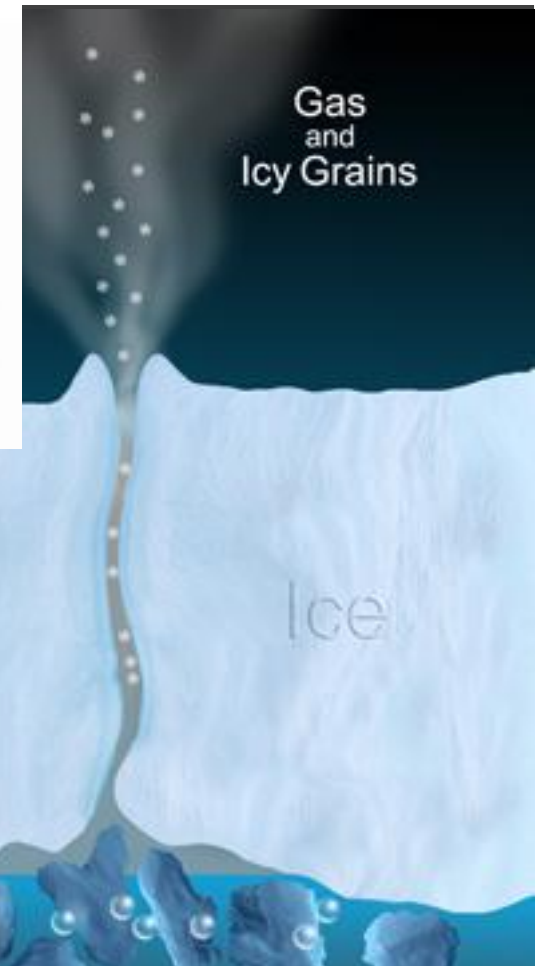
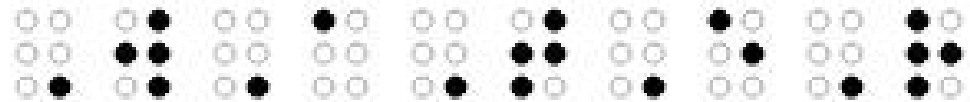
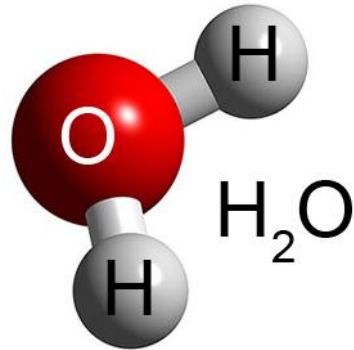
W-A-T-E-R



**maji**

water

Swahili Language (Kiswahili)		English Language (English)
maji		water
		



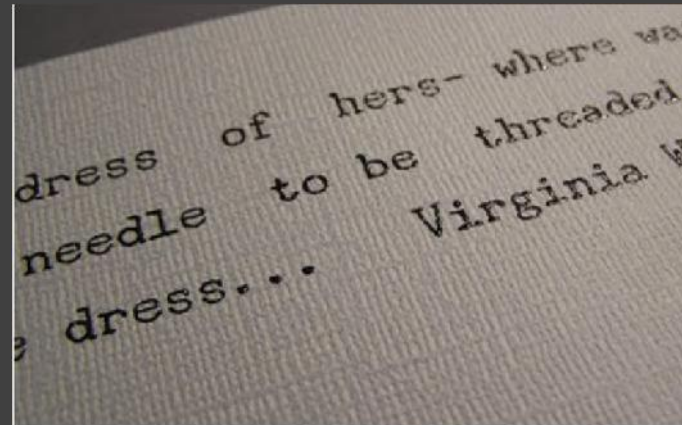
水

# Default Form & Accommodations

---



Tactile Representation  
Preferred Form of Encoding



Text-based Print  
Is an Accommodation

Accommodations exist because a default method does not function well for some people.

# Principles of Universal Design

- Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

— *Ron Mace*

# Retrofit vs. Foundation





# Retrofit vs. Foundation



# Universal Design

“Universal Design does not imply ‘one sizes fits all’ but rather acknowledges the need for alternatives to suit many different people’s needs.”

“...the essence of UDL is flexibility and the inclusion of alternatives to adapt to the myriad variations in learner needs, styles, and preferences.”

-Rose & Meyer, 2000, p. 4

# Access - Two Perspectives

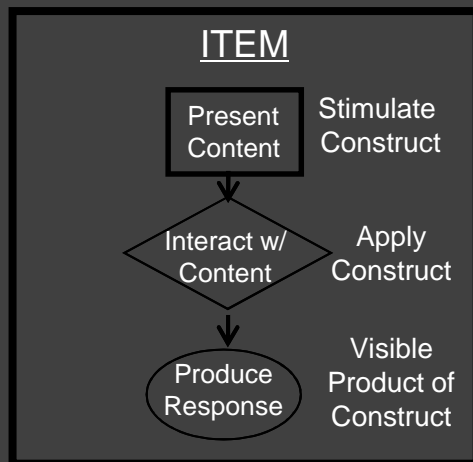
- Examinee Access to the Test



## TEST

Directions  
Prompts/Stimuli  
Response Options

- Test Accessing the Construct

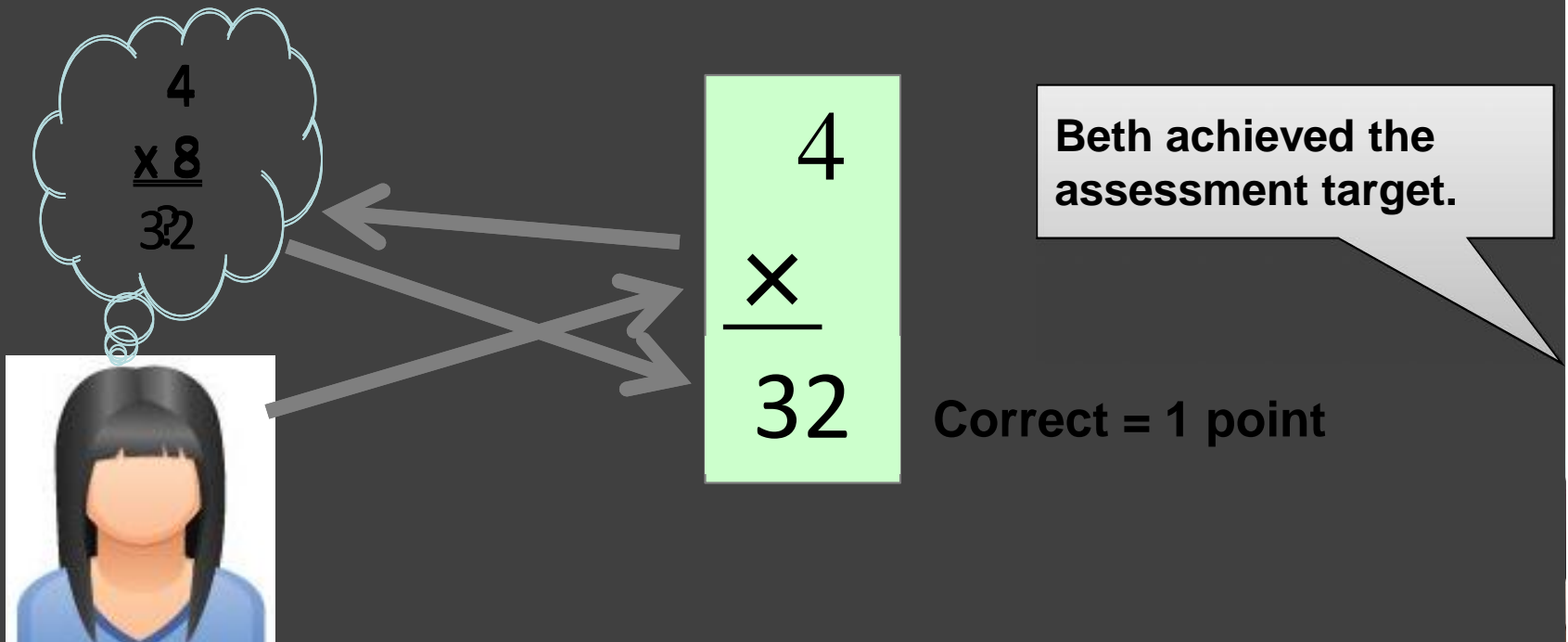
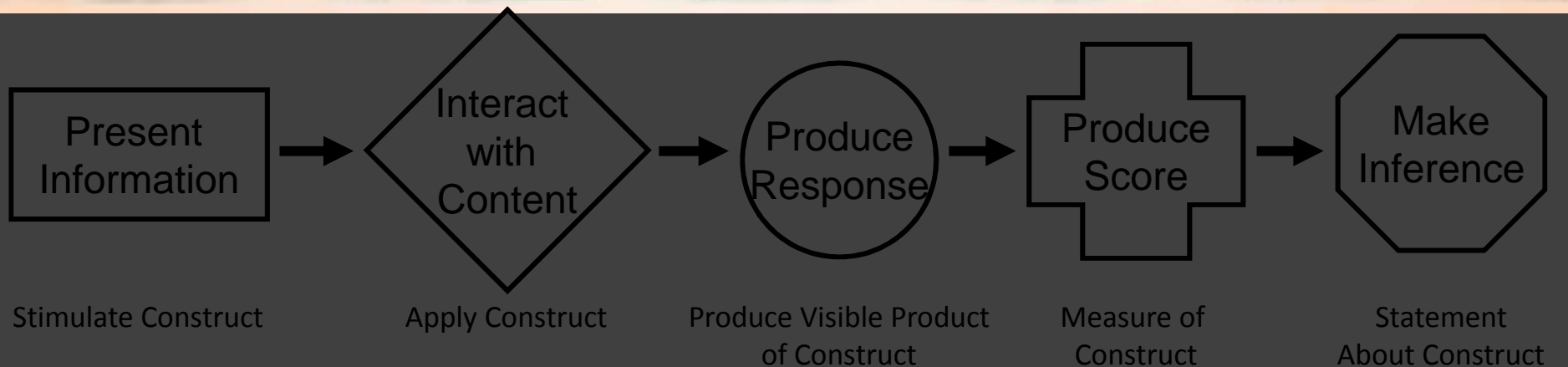


# What is an Assessment?

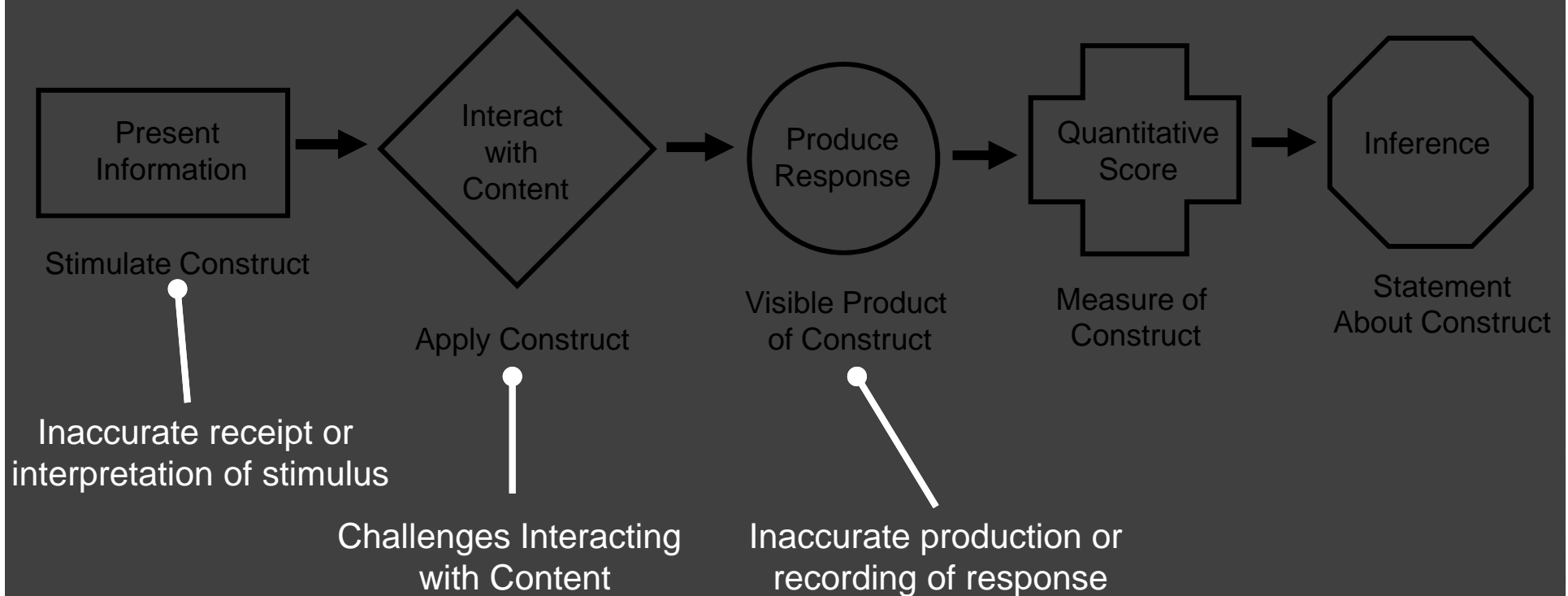
- A sample of observable behaviors believed to be the product of a construct of interest
- Constructs are unobservable
- Observable behaviors used to make an inference about the construct



# How an Item Functions



# Barriers to Proper Item Functioning



Jimmy is the star on his football team. This season he scored ten touchdowns, kicked twenty extra points, and had eight field goals.

What is the total number of points Jimmy has scored this season?

104



Native English  
No Identified Needs

*What is  
a field  
goal?*



English Language Learner  
No Identified Needs

*What is this  
question  
asking me?*



Native English  
Identified Dyslexia

The header features a light orange background with a pattern of binary code (0s and 1s) and faint, repeating text of "http://www".

# Imagine...

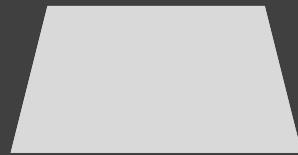
Ability to concentrate on the  
problem is one of the  
constituent parts of the  
successful mental work



# Imagine...

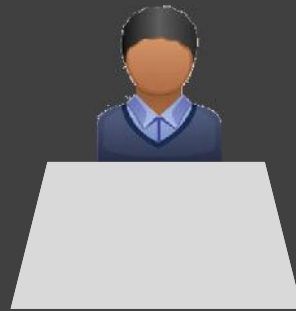
We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

# **Universal Design Provides Foundation for Accessible Assessment**



# Universal Design Provides Foundation for Accessible Assessment

**Familiar Context**



# Universal Design Provides Foundation for Accessible Assessment

Larger Font





# Universal Design Provides Foundation for Accessible Assessment

Unnecessary Use of Color



# Universal Design Provides Foundation for Accessible Assessment



*One Size Does Not Fit All*

# Universal Design Provides Foundation for Accessible Assessment



*One Size Does Not Fit All*

Braille

# Universal Design Provides Foundation for Accessible Assessment



*One Size Does Not Fit All*

Read  
Aloud

Braille

# Universal Design Provides Foundation for Accessible Assessment



Jimmy has been searching a park for coins. He found ten nickels, twenty pennies, and eight dimes. What is the total amount of money Jimmy found?

وقد جيسي، تبحث، حديقة للمنتزهات، ووجد 10 نقود، 20 نقود، و 8 نقود. ما هي المبلغ الإجمالي للمبلغ الذي وجدته جيسي؟

Jimmy ha estado buscando un parque para las monedas. Encontró diez monedas de cinco centavos, monedas de veinte y diez centavos ocho. ¿Cuál es la cantidad total de dinero que Jimmy encontró?

Ο Jimmy έχει ψάξει ένα πάρκο για τα κέρματα. Βρήκε επινεκάδονοι δέκα, είκοσι πένες, και οκτώ δεκάδες. Ποιο είναι το συνολικό ποσό των χρημάτων που βρέθηκαν Jimmy;



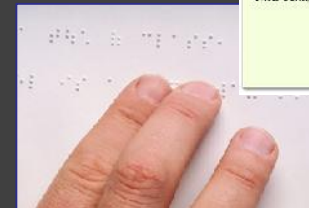
*One Size Does Not Fit All*

Read  
Aloud

Braille

Translation

# Universal Design Provides Foundation for Accessible Assessment



Jimmy has been searching a park for coins. He found ten nickels, twenty pennies, and eight dimes. What is the total amount of money Jimmy found?

وقد جيمي، تمسك، حزمة من العملات، ووجد 10 نقود، 20 سنتات، و 8 قطع نقدية. ما هو المبلغ الإجمالي لأموال جيمي؟

Jimmy ha estado buscando un parque para las monedas. Encontró diez monedas de cinco centavos, monedas de veinte y diez centavos ocho. ¿Cuál es la cantidad total de dinero que Jimmy encontró?

Ο Jimmy έχει ψάξει ένα πάρκο για τα κέρματα. Βρήκε επενεκάδωννι δέκα, είκοσι πένες, και οκτώ δεκάδες. Ποιο είναι το συνολικό ποσό των χρημάτων που βρέθηκαν Jimmy;



*One Size Does Not Fit All*

ASL

Read  
Aloud

Braille

Translation



# Universal Design Provides Foundation for Accessible Assessment



# Universal Design for Assessment

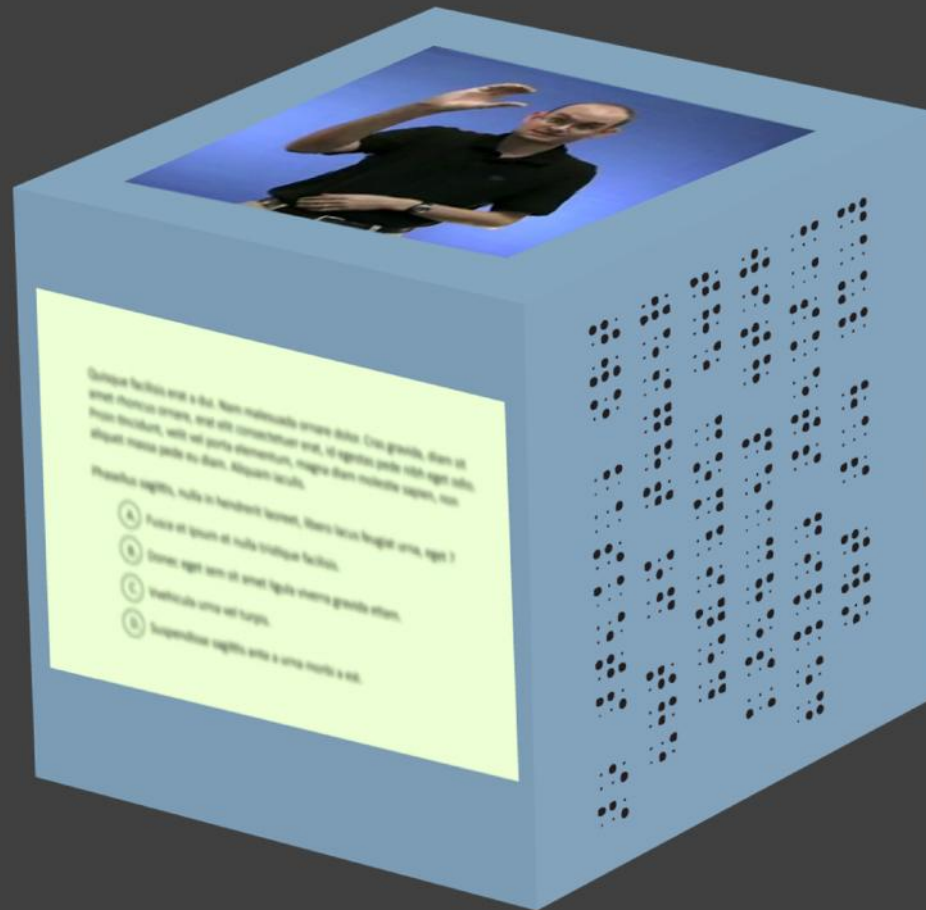
Flexibly adjust to enable students to:

- Access test content
- Interact with content
- Respond to content

# Digital Item

---

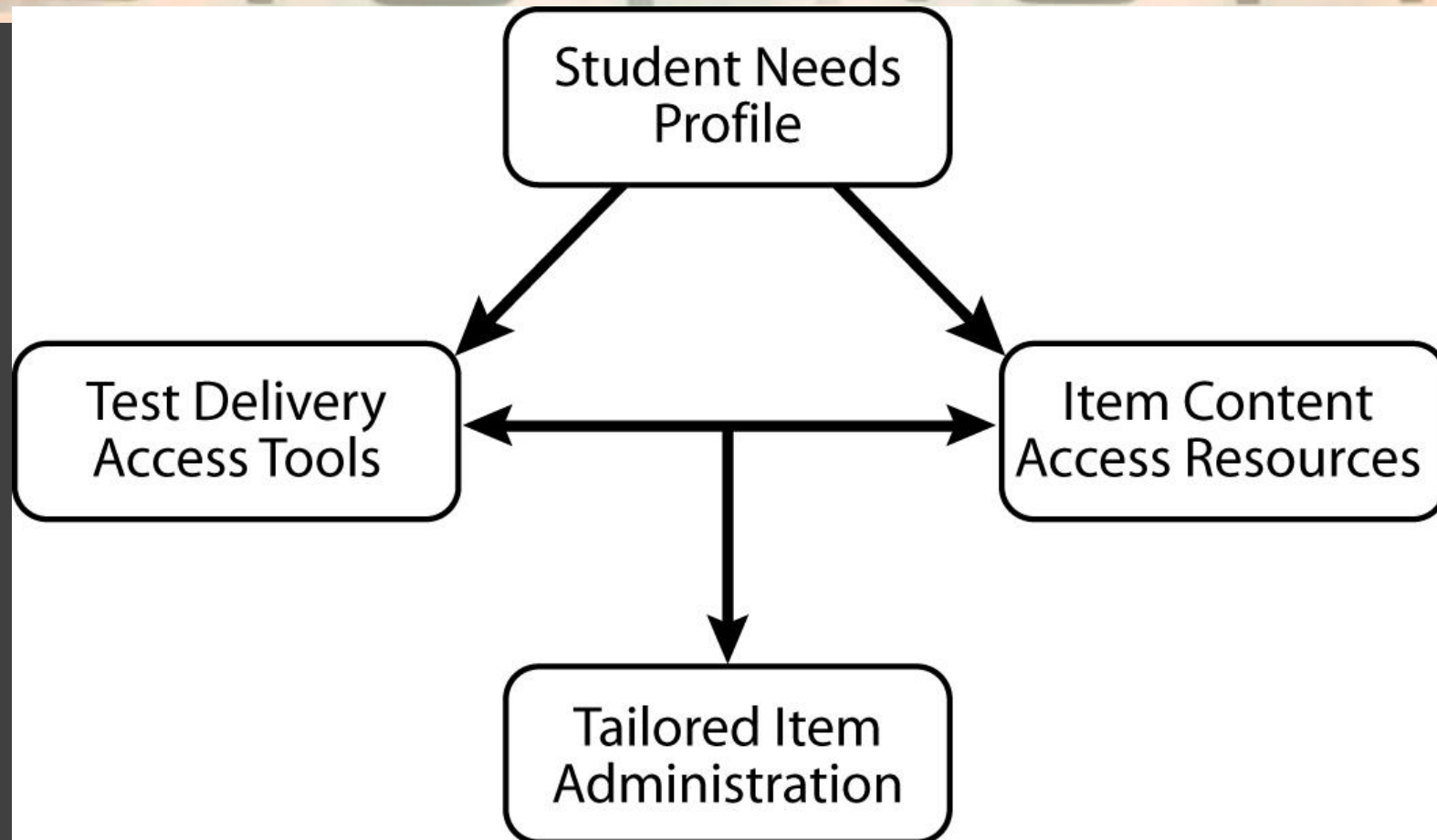
- Digital Version of Item



Multi-Faceted, Variety of Representational Forms, Tailored to Student

# Tailored Test Experiences

---

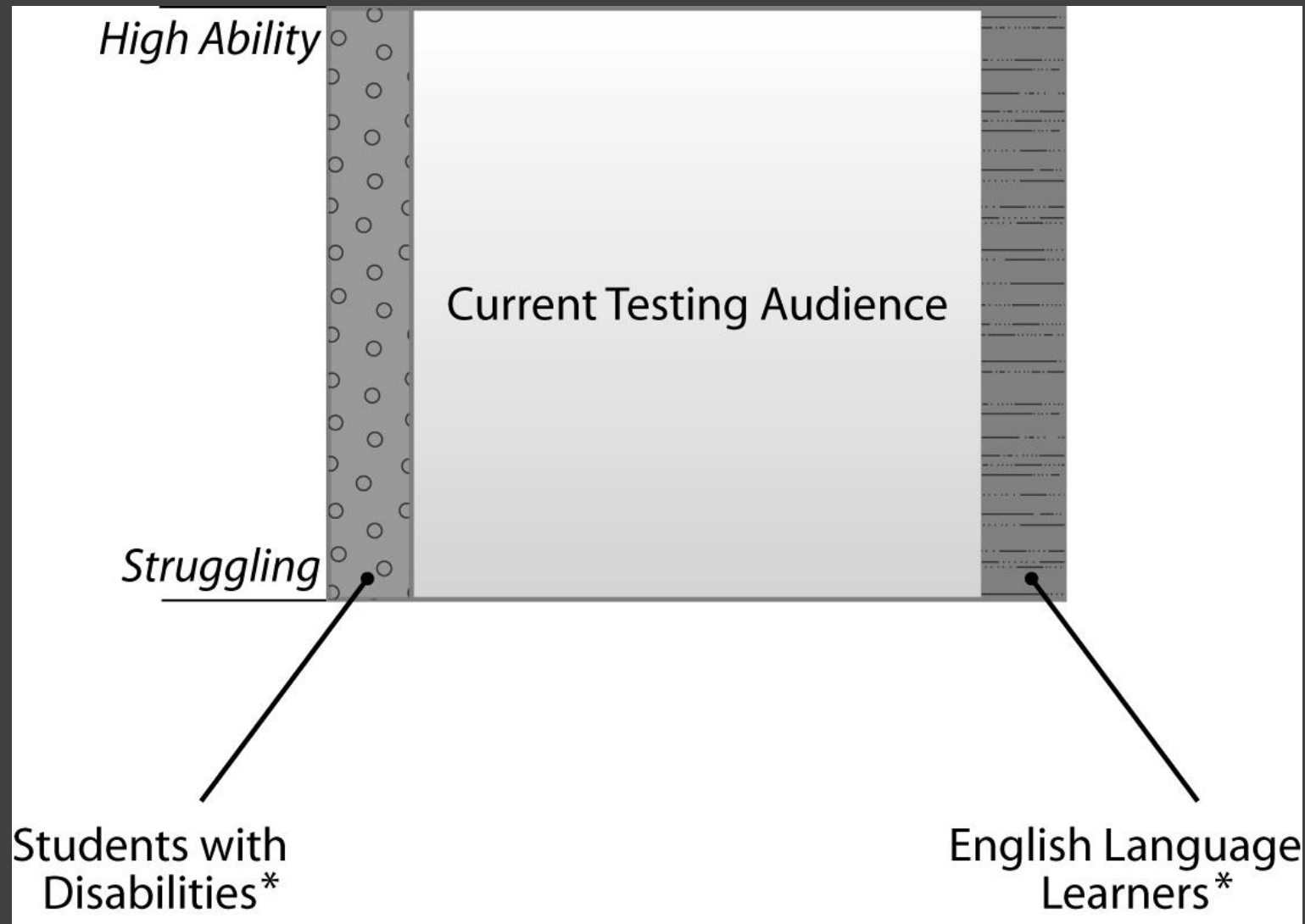


# Quick Demonstration

- NimbleTools Assessment Delivery System

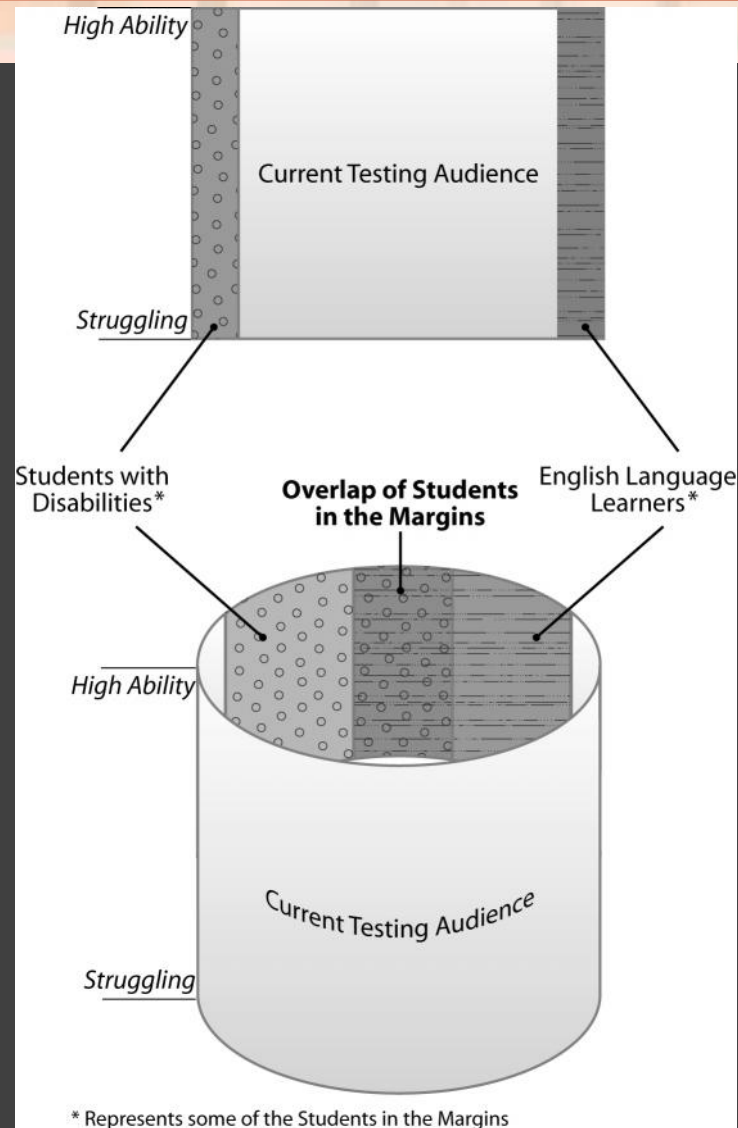
# Students Who Need Access Supports

---





# Students Who Need Access Supports



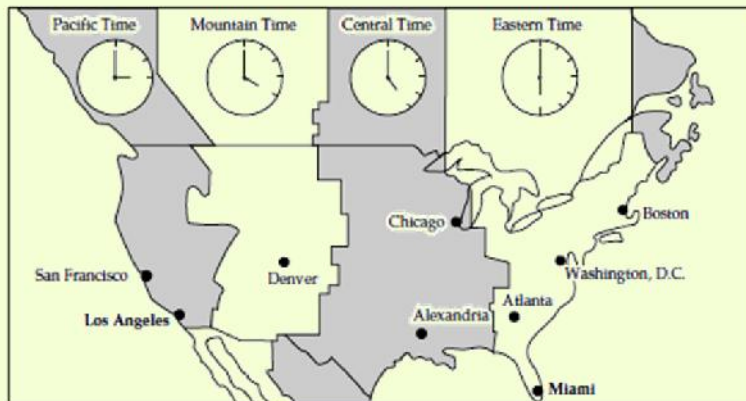
# Accessibility Considerations

- Vision
- Cognitive Load
- Language
- Motor Skills

# Vision

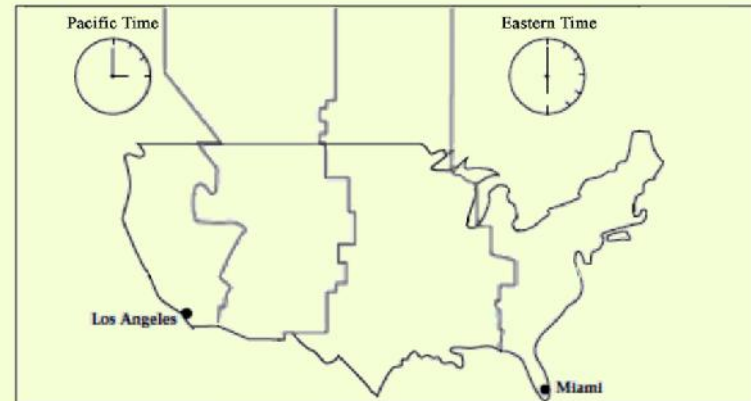
- Minimize the use of graphics
- Simplify the complexity of graphics

- **22** The continental United States is divided into four time zones: Eastern Time, Central Time, Mountain Time, and Pacific Time.



A fifth grade class in Miami, Florida, wants to exchange information by computer with a fifth grade class in Los Angeles, California. When the Miami class logs on to the computer at 2:30 p.m. Eastern Time, what time will it be in Los Angeles?

- **22** The continental United States is divided into four time zones: Eastern Time, Central Time, Mountain Time, and Pacific Time.

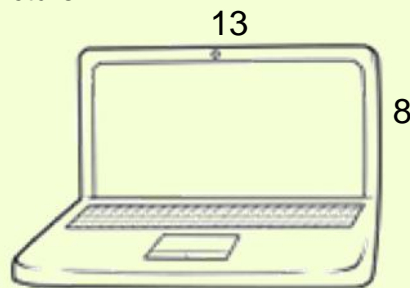


A fifth grade class in Miami, Florida, wants to exchange information by computer with a fifth grade class in Los Angeles, California. When the Miami class logs on to the computer at 2:30 p.m. Eastern Time, what time will it be in Los Angeles?

# Cognitive Load

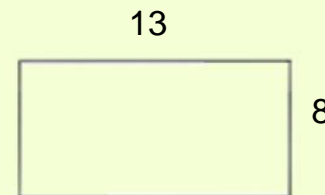
- Minimize the amount of information contained in an item
- Simplify the layout of an item
- Avoid items that spread information across multiple

In school, Myra uses a desktop computer. Myra's mother began a new job and received a laptop computer. Myra's mother's laptop screen seems smaller than the computer Myra uses at school. What is the area, in square inches, of the laptop screen as shown in the picture?



The diagram below shows the dimensions for a computer screen. Find the area of the screen.

Dimensions of Screen



# Language

- Simplify vocabulary
- Simplify sentence structure
- Avoid unusual names, places, and terms
- Place problems in familiar contexts such as school-

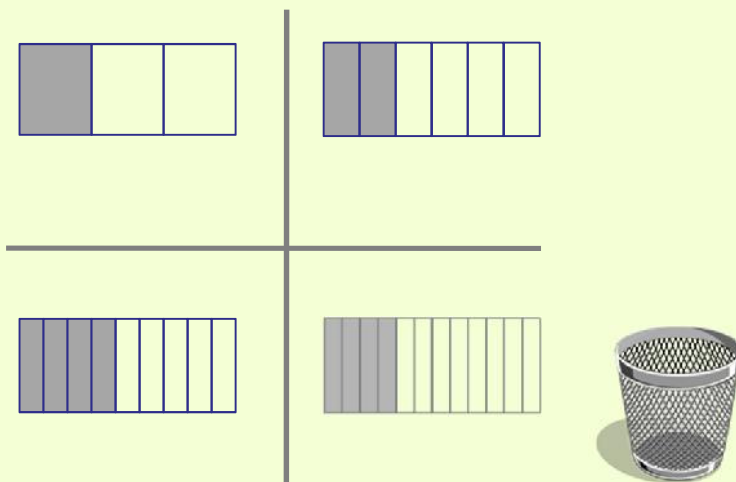
Paris went on a trip to Belgium and bought a large box of chocolates containing 36 pieces that she wants to share evenly with her three friends. How many pieces will each friend receive?

Maria has a box of 36 candies. Maria wants to share the pieces evenly with three friends. How many pieces will each friend receive?

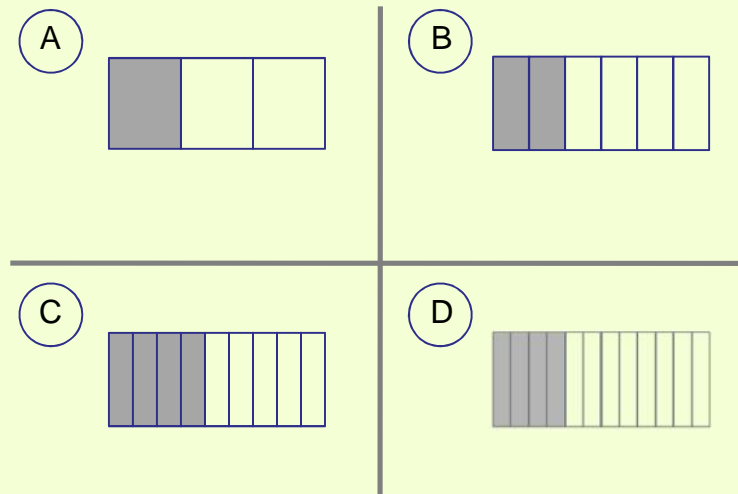
# Motor Skills

- Limit the number of required manipulations
- Avoid precise manipulations such as selecting a single point in a graph
- Minimize the length of constructed-responses

The drawings below show four different ways of dividing a rectangle into equal sized sections and shading the equivalent of  $\frac{1}{3}$  of the sections. One of drawings is inaccurate. Place the inaccurate drawing into the trash can.



The drawings below show four different ways of dividing a rectangle into equal sized sections and shading the equivalent of  $\frac{1}{3}$  of the sections. One of drawings is inaccurate. Select the drawing that is inaccurate.





# Universal Design Applied to Evaluation

- Evaluation requires data collection for participants
  - Surveys
  - Questionnaires
  - Assessments
  - Interviews

# Universal Design Applied to Evaluation

- Accurate information from people requires:
  - Understanding of what is asked
  - Engagement with the data collection task
  - Ability to reflect thinking accurately through responses

# Universal Design Applied to Evaluation

- Potential Strategies:
  - Alternate representations
  - Alternate modes of data collection
  - Multiple methods for responding

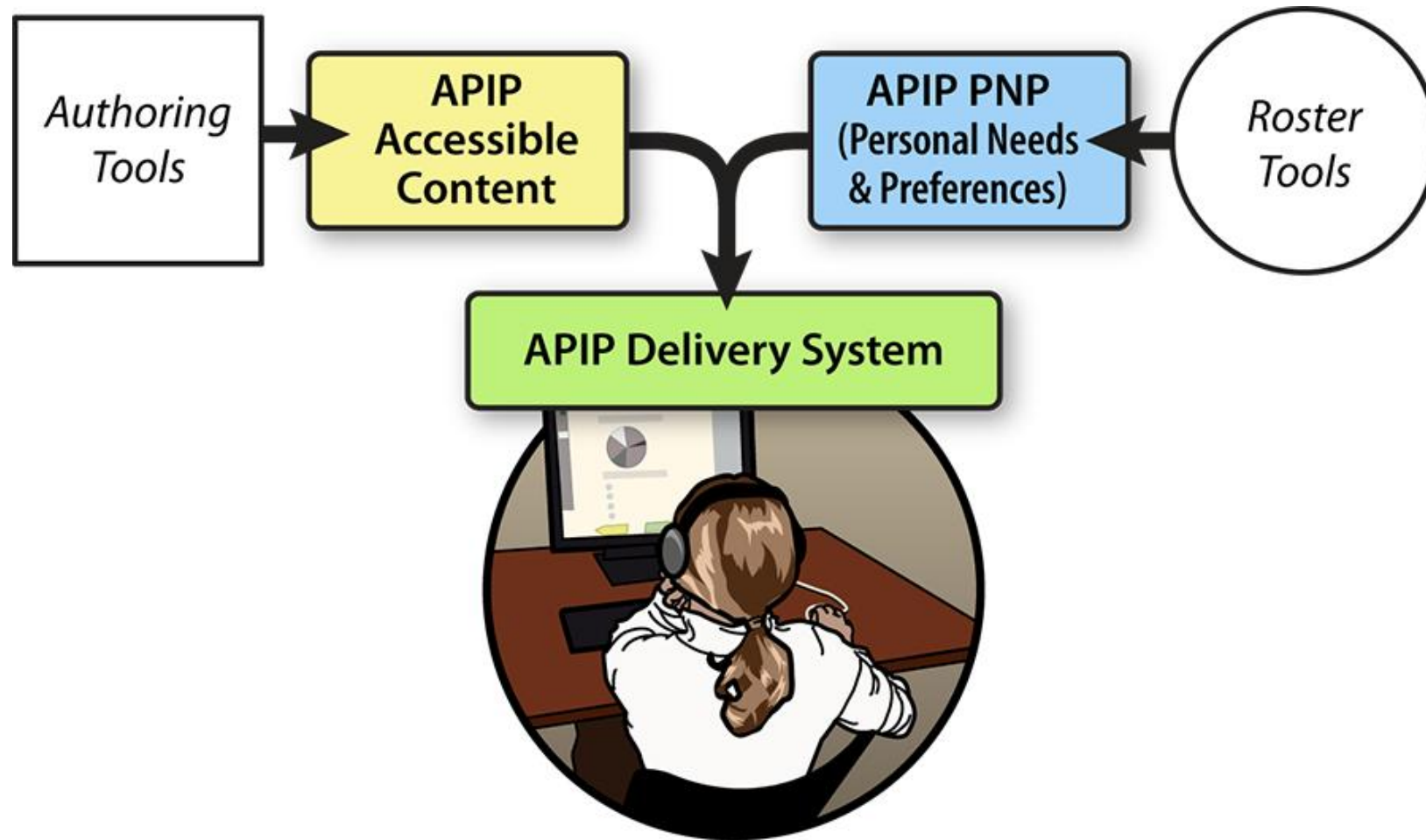
# Universal Design is a Balancing Act

- Improve access without altering the construct
- Definition of the construct being measured or evaluated
- Careful consideration of how access supports might alter the construct measured

# Universal Design is a Balancing Act

- Improve access without altering the construct
- Definition of the construct being measured or evaluated
- Careful consideration of how access supports might alter the construct measured

# APIP Basics





# PNP Form

etoolr  
NISTRATOR

[home](#)

[students](#)

[test assignment](#)

[test ticket](#)

[LOG OUT](#)

**Jeff Gilligan**

**Accessibility/Accommodation Assignment**

***Student Accommodations for Test: Default (All Tests)***

Assign to: **Default (All Tests)** ▼

Copy Accommodations from: **Select a Test** ▼

Reading	Visual	Stimulation	Environment	Language
<input checked="" type="checkbox"/> Read Aloud	<input checked="" type="checkbox"/> Magnifier	<input checked="" type="checkbox"/> Custom Masking	<input type="checkbox"/> Allow Breaks	
	<input checked="" type="checkbox"/> Color Overlay	<input checked="" type="checkbox"/> Answer Masking		
	<input checked="" type="checkbox"/> Reverse Contrast	<input checked="" type="checkbox"/> Auditory Calming		
	<input checked="" type="checkbox"/> Color Choice			

Last Updated 2009-03-04 13:53:06 by Jeff Gilligan

**Delete Accommodation**

for Default (All Tests)

# Accessibility Policies

## Universal Tools

### Embedded

Breaks, Calculator, Digital Notepad, English Dictionary, English Glossary, Expandable Passages, Global Notes, Highlighter, Keyboard Navigation, Mark for Review, Math Tools, Spell Check, Strikethrough, Writing Tools, Zoom

### Non-embedded

Breaks, English Dictionary, Scratch Paper, Thesaurus

## Designated Supports

### Embedded

Color Contrast, Masking, Text-to-speech, Translated Test Directions, Translations (Glossary), Translations (Stacked), Turn off Any Universal Tools

### Non-embedded

Bilingual Dictionary, Color Contrast, Color Overlay, Magnification, Read Aloud, Scribe, Separate Setting, Translation (Glossary)

## Accommodations

### Embedded

American Sign Language, Braille, Closed Captioning, Text-to-speech

### Non-embedded

Abacus, Alternate Response Options, Calculator, Multiplication Table, Print on Demand, Read Aloud, Scribe, Speech-to-text

# Accessibility Policies

## Universal Tools

### Embedded

Breaks, Calculator, Digital Notepad, English Dictionary, English Glossary, Expandable Passages, Global Notes, Highlighter, Keyboard Navigation, Mark for Review, Math Tools, Spell Check, Strikethrough, Writing Tools, Zoom

### Non-embedded

Breaks, English Dictionary, Scratch Paper, Thesaurus

## Designated Supports

### Embedded

Color Contrast, Masking, Text-to-speech, Translated Test Directions, Translations (Glossary), Translations (Stacked), Turn off Any Universal Tools

### Non-embedded

Bilingual Dictionary, Color Contrast, Color Overlay, Magnification, Read Aloud, Scribe, Separate Setting, Translation (Glossary)

## Accommodations

### Embedded

American Sign Language, Braille, Closed Captioning, Text-to-speech

### Non-embedded

Abacus, Alternate Response Options, Calculator, Multiplication Table, Print on Demand, Read Aloud, Scribe, Speech-to-text

# Consortia Accessibility Policies

## Universal Tools

### Embedded

Breaks, Calculator, Digital Notepad, English Dictionary, English Glossary, Expandable Passages, Global Notes, Highlighter, Keyboard Navigation, Mark for Review, Math Tools, Spell Check, Strikethrough, Writing Tools, Zoom

### Non-embedded

Breaks, English Dictionary, Scratch Paper, Thesaurus

## Designated Supports

### Embedded

Color Contrast, Masking, Text-to-speech, Translated Test Directions, Translations (Glossary), Translations (Stacked), Turn off Any Universal Tools

### Non-embedded

Bilingual Dictionary, Color Contrast, Color Overlay, Magnification, Read Aloud, Scribe, Separate Setting, Translation (Glossary)

## Accommodations

### Embedded

American Sign Language, Braille, Closed Captioning, Text-to-speech

### Non-embedded

Abacus, Alternate Response Options, Calculator, Multiplication Table, Print on Demand, Read Aloud, Scribe, Speech-to-text

# Questions & Comments