NeSA-RMS Secure Item Writing
Nebraska Department of Education
June 2015

WELCOME!
PLEASE ADD YOUR ARROW STICKER TO THE NEBRASKA MAP! BE SURE TO GET SOMETHING TO EAT AND TO INTRODUCE YOURSELF TO THE PEOPLE AT YOUR TABLE.
Where do you teach?
Training Agenda

- Security/Confidentiality
- Agenda for the three days
- Training
  - Item Writing
  - Template Usage
- Content Specific Training
Item Writing Objectives

- To gain understanding of the characteristics of quality multiple-choice items
- To gain understanding of Webb’s Depth of Knowledge (DOK)
- To cover the layout of the Table of Specifications (TOS)
- To gain understanding of the electronic item template
- To learn how to include graphics in items
Training Objective #1

TO GAIN UNDERSTANDING OF THE CHARACTERISTICS OF QUALITY MULTIPLE-CHOICE ITEMS.
A Quality Test . . .

Validity

Reliability

Fairness
A Quality Test . . .

Validity

- Test *validity* refers to the degree to which the test actually measures what it claims to measure.

- Test *validity* is also the extent to which inferences, conclusions, and decisions made on the basis of test scores are appropriate and meaningful.
If a test is to be used to describe how well a school is conveying knowledge and abilities to students, the interpretation of the scores should be relevant and representative of that knowledge and those abilities.
A Quality Test . . .

Reliability

- Test reliability refers to the degree to which a test is consistent and stable in measuring what it is intended to measure.

- Most simply put, a test is reliable if it is consistent within itself and across time.
Validity & Reliability

How do we ensure a test has validity & reliability?

1. Follow item-writing guidelines

2. Base items on the standards and Table of Specs
A Quality Test . . .

Fairness

- Do the test scores mean the same thing for any test participant regardless of subgroup membership?
  - Gender
  - Ethnicity
  - Socioeconomic Status
  - ELL
A Quality Test . . .

- Accurately and appropriately measures what is relevant.
- Is consistent and precise.
- Does not put any group at a disadvantage.

Validity
Reliability
Fairness
# Item Writing Guidelines

## Content
- Should be clearly aligned to the identified indicator
- Should not reference material or information presented in another item
- Should focus on one idea or concept
- Should test meaningful content

## Style
- Spell out acronyms
- Minimize the use of "NOT" and "EXCEPT"
- Avoid absolutes (e.g., always, never) and vague modifiers (e.g., best, worst)
- Use appropriate vocabulary
- Ensure correct grammar, punctuation, capitalization, spelling
- Use active voice and present tense

## Item Stems
- State clearly and concisely
- Use complete sentences with ending punctuation in context
- Question mark appears at the end of the stem
- Use which before a noun and when before a verb
- Avoid negatives (capitalize if used)
- Do NOT use "Which of the following . . . . . . . ."

## Item Responses
- Homogeneous in terms of grammar, vocabulary, and text length
- Logically consistent with the stem
- Mutually exclusive (independent)
- Phrase choices positively (avoid NOT)
- Do NOT use "All (or none) of the above"
- Avoid cues to correct choice
- Ordered purposefully (by length, alphabetically, etc.)
- Are all plausible
Item Writing Guidelines - CONTENT

- Should be clearly aligned to the identified indicator
- Should not reference material or information presented in another item
- Should focus on one idea or concept
- Should test meaningful content
What is the correct equivalent fraction and percent form of .125?
A. 1/8; 9%
B. 1/8; 12 ½%
C. 1/12; 8%
D. 1/12; 12 ½%

- MA 5.1.1.d Recognize and generate equivalent forms of commonly used fractions, decimals, and percents
Which percent is equal to 0.125?

A. 0.125%
B. 1.25%
C. 12.5%
D. 125%

- **MA 5.1.1.d Recognize and generate equivalent forms of commonly used fractions, decimals, and percents**
Spell out acronyms

Minimize the use of “NOT” and “EXCEPT”

Avoid absolutes (e.g., always, never) and vague modifiers (e.g., best, worst)

Use appropriate vocabulary

Ensure correct grammar, punctuation, capitalization, spelling

Use active voice and present tense
Which form of a gene hides the presence of another gene?
A. chromosome
B. dominant
C. mutation
D. recessive

- SC 8.3.2.a Recognize that hereditary information is contained in genes within the chromosomes of each cell
Item Writing Guidelines – ITEM STEMS

- State clearly and concisely
- Use complete sentences with ending punctuation in context
- Question appears at the end of the stem
- Use *which* before a noun and *what* before a verb
- Avoid negatives (capitalize if used)
- Do NOT use “Which of the following . . . “

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Item Writing Guidelines – ITEM STEMS

Solve: \(3(x + 2) = 12\)

A. 2
B. 6
C. 22
D. 26

- MA 8.1.3.d Select, apply, and explain the method of computation when problem solving using rational numbers
Which steps will solve the equation $3(x + 2) = 12$?

A. Divide by 3 and then subtract 2
B. Divide by 3 and then add 2
C. Multiply by 3 and then subtract 2
D. Multiply by 3 and then add 2

• **MA 8.1.3.d Select, apply, and explain the method of computation when problem solving using rational numbers**
Homogeneous in terms of grammar, vocabulary, and text length
Logically consistent with the stem
Mutually exclusive (independent)
Phrase choices positively (avoid NOT)
Do NOT use “All (or none) of the above”
Avoid cues to correct choice
Ordered purposefully (by length, alphabetically, etc.)
Are all plausible
When a ball is thrown, which of the following causes it to fall to the ground?

A. Friction  
B. Repulsion  
C. Magnetism  
D. None of the Above

- *SC 5.2.2.b* Describe changes in motion due to outside forces *(push, pull, gravity)*
When a ball is thrown, what causes it to fall to the ground?
A. friction
B. gravity
C. repulsion
D. magnetism

- SC 5.2.2.b Describe changes in motion due to outside forces (push, pull, gravity)
What is the result of the following expression: $5 + 8 \times 7 - 4 = n$?

A. 56  
B. 57  
C. 58  
D. 59

- **MA 6.3.3.b** Evaluate numerical expressions containing multiple operations with respect to order of operations
What is the value of $5 + 8 \times 7 - 4$? (Revision)

A. 29 ($5 + 8 \times 3 = 5 + 24 = 29$)

B. 57 ($5 + 56 - 4 = 61 - 4 = 57$)

C. 61 ($5 + 56 = 61$)

D. 87 ($13 \times 7 - 4 = 91 - 4 = 87$)

- MA 6.3.3.b Evaluate numerical expressions containing multiple operations with respect to order of operations

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Training Objective #2

TO GAIN UNDERSTANDING OF WEBB’S DEPTH OF KNOWLEDGE
Item Difficulty and Depth of Knowledge

Important Item Information:
- Key --- A
- Indicator --- SC8.1.1.i
- Difficulty Level --- Medium
- Depth of Knowledge --- 2
Cognitive Demand

- The kind and level of thinking required of students to successfully engage with and solve a task.

- Ways in which students interact with content.
DOK Levels

DOK 1- **Recall** Basic mathematical calculations, recall facts, perform routine procedures, answer literal questions

DOK 2- **Skill/Concept** Solve routine multiple-step problems, describe cause/effect of particular event, organize, represent, and interpret data, identify and summarize the major events in a narrative

DOK 3- **Strategic Thinking** Identify research questions, apply concept in other context, support ideas with details
Same Verb—Three Different DOK Levels

DOK 1- **Describe** three characteristics of metamorphic rocks. (Requires simple recall)

DOK 2- **Describe** the difference between metamorphic and igneous rocks. (Requires cognitive processing to determine the differences in the two rock types)

DOK 3- **Describe** a model that you might use to represent the relationships that exist within the rock cycle. (Requires deep understanding of rock cycle and a determination of how best to represent it)
Item Difficulty

Difficulty is a reference to how many students answer a question correctly.

“What is the value of 10*10?”
DOK 1 – basic mathematical calculation
Most students can answer the question easily and most will get it right.

“What is the value of 68*42?”
DOK 1 – basic mathematical calculation
Will the same number of students get the answer correct?

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Training Objective #3

- TO COVER THE LAYOUT OF THE TABLE OF SPECIFICATIONS
# Table of Specifications (TOS)

- Important to use TOS as a guide
  - Red-Tested Indicator
  - Highest DOK level Tested
  - Item Total
Training Objective #4

TO GAIN UNDERSTANDING OF THE ELECTRONIC ITEM TEMPLATE
How to save items...

- Begin by doing a “save as” with the item template.
- Save it in the folder on flash drive named (for example) “Grade3 NESA Math Group A”
- Begin each new indicator with “_1” and save each item that follows for that item sequentially.
- Begin with the original item template with each new indicator
- A corresponding graphic has the same “save code” except the letter “g” and number is added to the end
  Example: MA3.1.1.a_1g1
How to save items...

MA6.2.5.d_1

- MA = subject
- 6.2.5.d = indicator
- 1 = item number within the set

- Graphics would be named
  - MA6.2.5.d_1g1
  - MA6.2.5.d_1g2

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How to save items after review...

After review-
Naming remains the same but
“Save As” in the folder marked Final

* Keep all work on the flash drives
How to use the template

Example...
Training Objective #5

TO LEARN HOW TO INCLUDE GRAPHICS IN ITEMS
Graphics

- Describe or sketch graphics
- Sketch
  - Blank piece of paper
  - Include graphic name MA6.2.5.d_1g1 and group name
  - If possible include multiple graphics for the same question on the same paper-label each with the correct name
  - Can add description if needed
- Describe
  - Be specific as possible so reviewers and DRC graphic design can get it right
- Either way
  - In the item it just need to say “Graphic 1”
- Sketches go in Yellow Folder
  - Each group has a folder
If a Graphic is Created Electronically:

- Save in a Word or Excel document; title the document with the appropriate item name.
- There should be a separate document for each item requiring a graphic. The stem graphic, as well as a graphic for each response can be placed in the same document.
- Place the appropriate name by each graphic.
If a Graphic is Created Electronically:

- Leave the graphic in its created form, so that it can be edited.
- If you create a table, leave in table format.
- If you make a spreadsheet, leave the graphic in a spreadsheet.
Bonus Objective

- BIAS AND SENSITIVITY
Types of Bias

- Stereotyping
- Gender Bias
- Regionalism
- Ethnic or Cultural Bias
- Socioeconomic or Class Bias
- Religious Bias
- Ageism
- Bias against Persons with Disabilities
Topics

- Avoid topics that could be offensive or controversial
- Carefully consider what context is needed to meet the standard
- Think about all of our students when composing items
Questions to ask yourself as you write and review

- Do the items (questions and responses), passages, and graphics
  - Demean any religious, ethnic, cultural, or social group?
  - Unnecessarily portray any person or group in a stereotypical manner?
  - Contain any other form of bias—gender, regionalism, ethnic or cultural, socioeconomic or class, religious, age-related—or bias against persons with disabilities?
Questions to ask yourself as you write and review

- Are there any topics that are not described clearly enough with the result that they might disadvantages a student for any reason?
- Are there any terms, difficult words, culturally specific concepts or ideas, figures of speech, jargon, or slang that might disadvantage a group of students?
- Are the questions and activities in the items or on the test as whole relevant to the life experiences of the students responding to items?
Questions to ask yourself as you write and review

- Is the test pool of items and graphics balances across ethnic groups and genders, including an adequate representation of
  - females and males in both traditional and nontraditional roles?
  - female and male names?
  - minority groups in various environments and occupations?
  - names from various minority groups?
Questions to ask yourself as you write and review

- Whenever possible, does the content show minority groups in everyday situations and as being fully integrated in society, reflecting the diverse, multicultural composition of the society as a whole?
THANK YOU!

QUESTIONS?