

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.



NeSA-RMS Secure Item Writing



Welcome!



NeSA-ELA Secure Item Writing



Where do you teach?

The logo for Nebraska State Assessment (NeSA), featuring the text "NeSA" in white on a red background that is shaped like the outline of the state of Nebraska.

NeSA

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



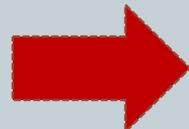
Training Objective #1



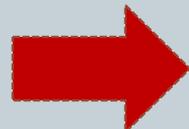
**TO GAIN UNDERSTANDING OF
THE CHARACTERISTICS OF
QUALITY MULTIPLE-CHOICE
ITEMS.**



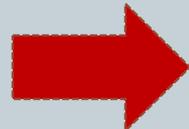
A Quality Test . . .



Validity



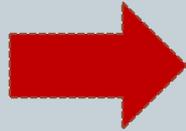
Reliability



Fairness



A Quality Test . . .

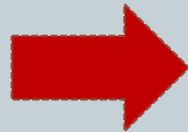


Validity

- 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.



A Quality Test . . .

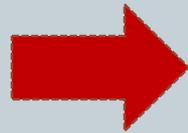


Validity

- 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 . . .

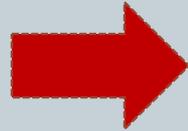


Reliability

- 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.



A Quality Test . . .

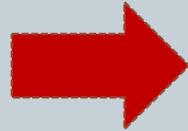


Validity & Reliability

- 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

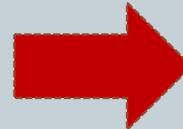
- Do the test scores mean the same thing for any test participant regardless of subgroup membership?
 - Gender
 - Ethnicity
 - Socioeconomic Status
 - ELL



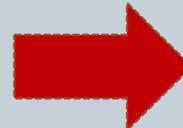
A Quality Test . . .



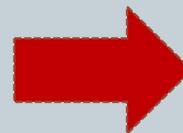
- Accurately and appropriately measures what is relevant.
- Is consistent and precise.
- Does not put any group at a disadvantage.



Validity



Reliability

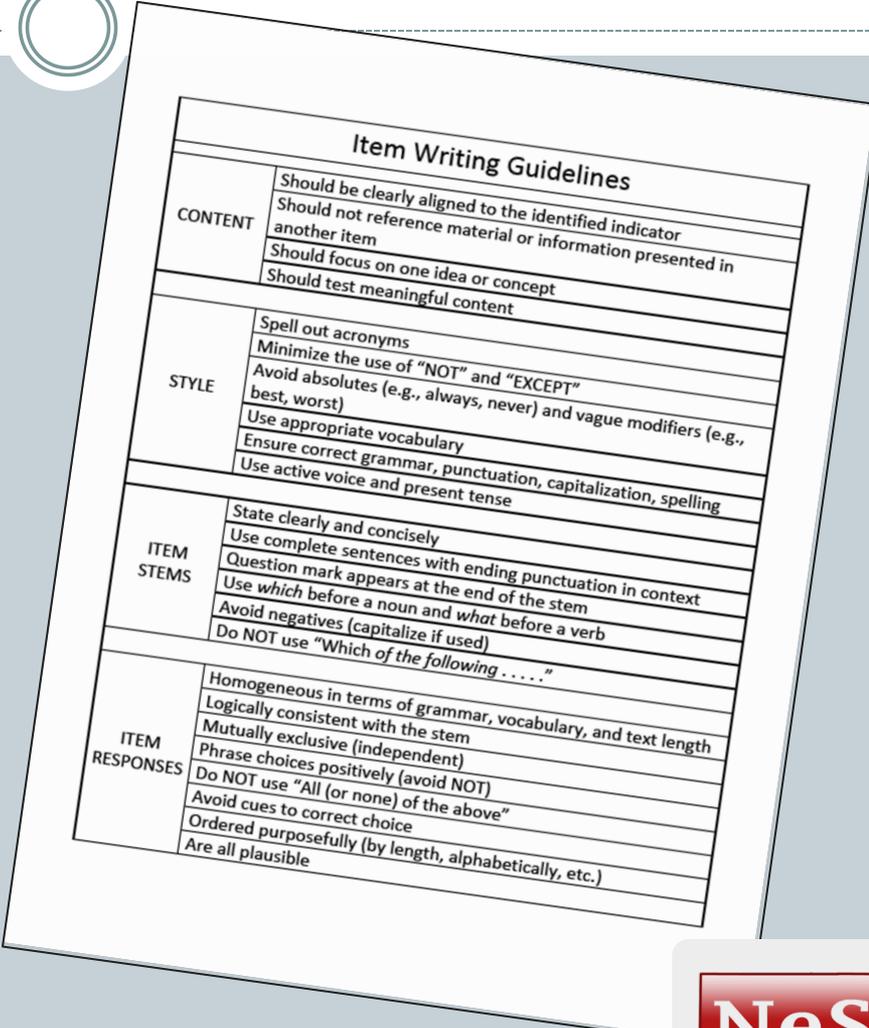


Fairness



Item Writing Guidelines

- Content
- Style
- Item Stems
- Response Options



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
ITEM STEMS	Use active voice and present tense
	State clearly and concisely
	Use complete sentences with ending punctuation in context
	Question mark appears at the end of the stem
	Use <i>which</i> before a noun and <i>what</i> before a verb
ITEM RESPONSES	Avoid negatives (capitalize if used)
	Do NOT use "Which of the following"
	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



Item Example - CONTENT



What is the correct equivalent fraction and percent form of .125?

- A. $1/8$; 9%
- B. $1/8$; $12\frac{1}{2}\%$
- C. $1/12$; 8%
- D. $1/12$; $12\frac{1}{2}\%$

• ***MA 5.1.1.d Recognize and generate equivalent forms of commonly used fractions, decimals, and percents***

Item Example - CONTENT



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***



Item Writing Guidelines - 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 Example – STYLE



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*”



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***



Item Writing Guidelines – ITEM STEMS



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***

Item Writing Guidelines – 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 – ITEM RESPONSES



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)***



Item Writing Guidelines – ITEM RESPONSES



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)***



Item Example



What is the result of the following expression:
 $5 + 8 * 7 - 4 = n?$

- 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***



Item Example



What is the value of $5 + 8 * 7 - 4$? (Revision)

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

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

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

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

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



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?



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 NESAs 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

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 disadvantage 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?

The logo for Nebraska State Assessment (NeSA), featuring the text "NeSA" in white on a red background that is shaped like the outline of the state of Nebraska.

NeSA