Mississippi **A**cademic **A**ssessment **P**rogram

Grades 3 – 6 Item Writing Training

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Welcome!

As you come in:

~ Please make sure you signed in.
~ Write your name on the table tent.

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Mississippi Department of Education

VISION

To create a world-class educational system that gives students the knowledge and skills to be successful in college and the workforce, and to flourish as parents and citizens

MISSION

To provide leadership through the development of policy and accountability systems so that all students are prepared to compete in the global community

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State Board of Education Goals FIVE-YEAR STRATEGIC PLAN FOR 2016-2020

1. All Students Proficient and Showing Growth in All Assessed Areas

2. Every Student Graduates from High School and is Ready for College and Career

3. Every Child Has Access to a High-Quality Early Childhood Program

4. Every School Has Effective Teachers and Leaders

5. Every Community Effectively Uses a World-Class Data System to Improve Student Outcomes

6. Every School and District is Rated "C" or Higher

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Ice Breaker

What Is Math to You?

1) Each one of you have been given a card. Look at the card and determine how you would finish the sentence.

2) Write your sentence on the index card provided.
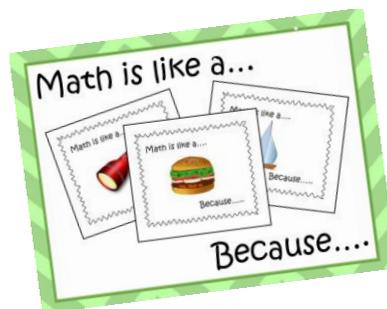
Item Writing Training Goals

- Understand grade level math standards and expectations

- Collaborate with math educators from across the state

- Develop an understanding of best practices in item writing

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Content

Alignment

What does it mean?

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Content Alignment

- Literal interpretation of the standard
- On grade level
- Skill specific
- Appropriate DOK level
- Item should be written to one standard, not overlapping standards
- Specific to sub standards (e.g., a, b, c...)

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Depth of
Knowledge (DOK)

Level 1 Recall/Reproduction
Level 2 Skill/Concept
Level 3 Strategic Thinking
Level 4 Extended Thinking

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DOK Activity

- Take out the cards from the envelope so that every member can see/read the question.

- As a team, sort each item according to the DOK level you think it best aligns.

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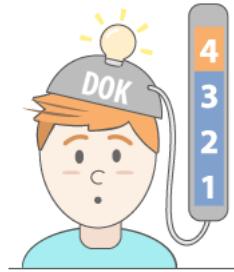
To what DOK level does this item align?

Zoe drew a rectangle with an area of 42 square inches. Which rectangle represents Zoe's drawing?

A.
6 inches

6 inches

C.
5 inches

8 inches

B.
6 inches

7 inches

D.
4 inches

9 inches

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3.MD.7b

12
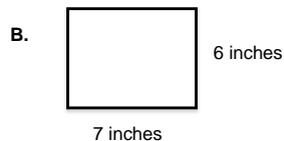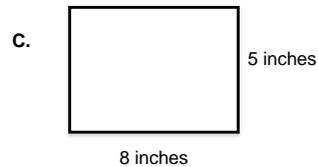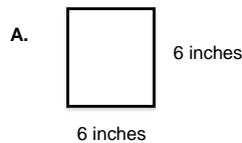
To what DOK level does this item align?

Logan and Aaron are asked if three expressions are equivalent to each other.

Expression A	$10n - 3n + 4$
Expression B	$7n + 4$
Expression C	$2(3n + n) + 4$

Logan says all 3 expressions are equivalent to each other.

Aaron says only Expressions A and B are equivalent.

Who is correct and why?

Ⓐ Both Logan and Aaron are correct because the expressions are equal when they are simplified.

Ⓑ Neither Logan nor Aaron are correct because all of the expressions have different variables, coefficients, and constants.

Ⓒ Logan is correct because when he substituted 0 into all of the expressions, he had the same answer.

Ⓓ Aaron is correct because when he simplified the expressions, he had the same answers on A and B only.

6.EE.4

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To what DOK level does this item align?

Mary sewed 4 quilts to give to her friends as presents. Each of the four quilts, in units, are shown.
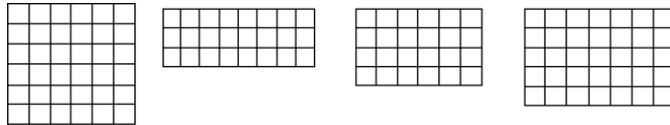
Select the box in the true column if the statement is true. Select the box in the false column if the statement is false.

	True	False
The area of Quilt 1 is 36 square units.		
The area of Quilt 4 is greater than the area of Quilt 3.		
Quilt 2 and Quilt 3 have the same area.		
The area of Quilt 1 is less than the area of Quilt 4.		

3.MD.8

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To what DOK level does this item align?

Find the sum.

$$1\frac{1}{2} + \frac{2}{3}$$

Ⓐ $1\frac{1}{6}$

Ⓑ $1\frac{3}{5}$

Ⓒ $2\frac{1}{6}$

Ⓓ $2\frac{1}{2}$

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5.NF.1

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To what DOK level does this item align?

What is the greatest common factor of 35 and 49?

Write the answer in the box.

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6.NS.4

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To what DOK level does this item align?

Which statement represents the equation?

$6 \times 7 = 42$

Ⓐ 6 times as many as 7 is 42.

Ⓑ 6 times as many as 42 is 7.

Ⓒ 7 is 42 times as many as 6.

Ⓓ 7 is 6 times as many as 42.

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4.OA.1

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Understanding DOK—Big Ideas Revisited

- Verbs do not dictate DOK level
- Level increases if it is not common knowledge, (difficulty)
- DOK level
  - Does not equal rigor
  - Should equal the "process"
- Writers
  - Aim for DOK 2 and DOK 3
  - No DOK 4 items on this assessment

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Unpacking the Standard

What does this standard mean?

6.G.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Depth of Knowledge (DOK) Level	Knowledge/ Concept	Skills
☐ Recall	What do students need to know/understand?	What do students need to be able to do?
✖ Skill/Concept	**Underline the Nouns**	**Circle the Verbs**
✖ Strategic Thinking	List Nouns:	List Verbs:
☐ Extended Thinking		

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Now it's your turn…

- As a team, "unpack" one of the Geometry standards for your grade level.

- Determine what a student should know, understand, and be able to do by completing the alignment document.

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Item Writing
Basics

Item Writing Basics

- No barriers
- Accessible for all students
- Short sentences
- Most important ideas first
- One idea, fact, or process introduced at a time
- Simple, uncluttered graphics and line drawings

Multiple Choice Basics

- Alignment to standard
  - Right down to the verb
- Clearly worded
  - Avoid negatives when possible
- Written as a question
  - Not as a completion statement
- Parallel construction to choices

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Multiple Choice Basics

- To interpret the question
  - Students should not have to read the choices
- Avoid absolutes
  - "None of the Above" and "All of the Above"
- Use of
  - "What" or "Which"
- Eliminate
  - Any unnecessary or nonfunctional words
  - Excessive prepositional phrases

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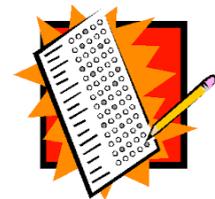
Multiple Choice Basics

- Avoid window dressing
  - Put questions in context
- Avoid cluing or clang associations
- Avoid phrases or topics that
  - Date an item or limit its lifespan
- Avoid misleading graphics
  - Graphics should be clear and labeled

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Question #1

Revise this question to match the guidelines.

What must be true of a right triangle?

A. The angles must sum to 360 degrees

B. All 3 sides must be equal

C. The height must be half of the base

D. There must be one right angle

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Question #2

Revise this question to match the guidelines.

Quadrilaterals all have _____.

A. 2 sides

B. 3 sides

C. 4 sides

D. 5 sides

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Parts of an Item

I.   Directions with appropriate directional line
II.   Stem
III. Graphic- sketch/drawing/picture to support your item (if needed)
IV.   Answer choices
   a) Distractors (incorrect answers)
   b) Rationales (reason answer is incorrect)

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Parts of an Item

Solve for the missing value. **Directions**

$$3x + 6 = 18$$ Stem

Write the answer in the box. **Directional Line**

$$x = \boxed{}$$

Answer

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Distractor/Rationale Item

In addition to the correct answer, create three distractors and provide your rationales for the question.

A cake recipe calls for ½ cup of sugar. Anna wants to triple the recipe. How much sugar does she need?

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Distractor/Rationale Item

What rationale did the writer have in developing these distractors?

A rectangular playground has a perimeter of 104 meters. The length of the playground is 30 meters. What is the area, in square meters, of the playground?

A. 510
B. 660
C. 1,110
D. 1,320

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MAAP Item Types

TAO	Description	Item Classification
Choice	• Regular Multiple Choice • M of N Multiple Choice (2 of 5 or 3 of 7)	Multiple Choice
Inline Choice	Drop Down Options	Technology Enhanced
Drag and Drop	Drag and Drop	Technology Enhanced
Match	Multi-Select Table	Technology Enhanced
Line Match	Matching	Technology Enhanced
Text Entry	Type-in-Text	Constructed Response (currently, MAAP only allows text entry for numbers & symbols only)
Two-Part	Part A/Part B	Varies

Questar currently uses TAO as their item development platform.

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Choice Items

- Answer choices are A-D.
- *Standard Choice items <u>do not</u> have a directional line.*

Which expression is the expanded form of the number 341,652?

Ⓐ 300,000 + 4,000 + 600 + 50 + 2

Ⓑ 300,000 + 41, 000 + 600 + 50 + 2

Ⓒ 30, 000 + 40,000 + 1,000 + 600 + 50 +2

Ⓓ 300,000 + 40,000 + 1,000 + 600 + 50 + 2

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Choice M of N Items

Which groupings represent 36 apples placed equally into baskets?
Select **two** answer choices.

Ⓐ 6 apples in 4 baskets

Ⓑ 6 apples in 6 baskets

Ⓒ 7 apples in 4 baskets

Ⓓ 8 apples in 3 baskets

Ⓔ 9 apples in 4 baskets

Choice M of N:
Select 2 of 5; Select 3 of 7

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Matching/Line Match

Draw a line from each equation in Column A to an equation in Column B that is equal.

Column A

485 − 255 = ?	○
296 + 504 = ?	○
800 − 420 = ?	○

Column B

○	375 − 145 = ?
○	600 − 220 = ?
○	640 + 160 = ?

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Match (Multi-Select Table)

Identify the characteristics of each geometric shape by clicking on the correct cell or cells. Shapes may have more than one of the characteristics listed.

	Parallel sides	Only one 90° angle	More than one 90° angle	All sides equal	No parallel sides or right angles
Right Triangle					
Rectangle					
Square					
Circle					

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Drag and Drop

Drag each expression on the left to its equivalent value.

2^7

3^5 $\square$ = 12 $\square$ = 14 $\square$ = 15 $\square$ = 64 $\square$ = 128 $\square$ = 243

4^3

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Text Entry (Type-in-Text)

The basket attached to each model balloon is a rectangular box. The box is 10 inches long and 8 inches wide. The volume of the box is 400 cubic inches. What is the height of the box (in inches)?

Write the answer in the box.

[   ] inches

Include appropriate units

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Text Entry (Type-in-Text)

A soccer game started at 2:15 p.m. and ended at 3:35 p.m. How long did the game last?

☐ minutes

What is missing?

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Item Writing
Practice

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Item Writing Practice

- Read the item.

- What changes need to be made to improve the item?

- Complete this process for each item.

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Stand Up, Hand Up, Pair Up

- Leader says, "Stand up, hand up, pair up!"

- Participants: Stand up with one hand in the air until you find the closest partner who is not from your table.

- Partners greet each another.

- Leader asks partners to discuss the changes to the item.

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Ready, Set, Create

- With a partner, create an item from scratch. It can be a choice item or technology-enhanced item.

- Use a Numbers and Operations (NBT/NF) or Number System (NS) standard from your grade level.

- Remember your guidelines and all necessary components.

- When finished, transfer final product to white paper.

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Individual Exit Activity

Part 1: Improve given item to meet guidelines and criteria.
~ For Part 2 and 3, use the standards given in the table.
Part 2: Write one multiple choice item.
Part 3: Write one technology-enhanced item.

Be sure to include:
•Directions (with directional line)
•Stem
•Graphic/Sketch (if needed)
•Answer Choices
   •Distractors (incorrect answers)
•Rationales (plausible reason a student would choose)

Grade 3	Grade 4	Grade 5	Grade 6	
3.G.1	4.G.1	5.G.1	6.G.1	6.SP.1
3.G.2	4.G.2	5.G.2	6.G.2	6.SP.2
	4.G.3	5.G.3	6.G.3	6.SP.3
		5.G.4	6.G.4	6.SP.4

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Wrap-Up

- All participants are required to complete the survey, evaluation, and the exit task sheet.
- Please turn in all paperwork on your way out and pick up your CEU certificate.
- Thanks for coming and have a great afternoon!

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Contact Information

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