

# FSA Elementary Mathematics Assessments Grades 3-5

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National Council of Teachers of Mathematics (NCTM)
Orlando, Florida - October 2017



www.FLDOE.org



### **Topics**

- Role of the Test Development Center (TDC)
- Testing time, length, and policies
- Reference Sheet/Conversion Sheet
- Transition schedule
- 2017-2018 Assessment Schedule
- Test Item Specifications and development process
- FSA Format and Item types
- Spring 2017 lessons learned
- FSA Portal



## The Test Development Center (TDC)

- TDC is funded through a grant by the Florida Department of Education (FDOE). The grant is managed by Tallahassee Community College.
- TDC's purpose is to assist FDOE in the implementation of various aspects of the statewide assessment program.
- TDC works with contractors and Florida educators to develop test items for English Language Arts, Mathematics, Science, and Social Studies assessments.
- TDC also works with contractors and FDOE to produce and distribute interpretive products related to statewide assessments.



# Florida Standards Assessments: Proposed Testing Time and Session Length



### **FSA Session Timing**

 Sessions are built to provide student access to specific items at the same time. Once a student has submitted or finalized a session, he or she cannot return to those items.

 Students are permitted to take personal breaks, as needed.



#### **Reporting Categories**

Grade 3 Mathematics Reporting Categories	% of Test
Operations, Algebraic Thinking, and Numbers in Base Ten	48
Numbers and Operations – Fractions	17
Measurement, Data, and Geometry	35

Grade 4 Mathematics Reporting Categories	% of Test
Operations and Algebraic Thinking	21
Numbers and Operations in Base Ten	21
Numbers and Operations – Fractions	25
Measurement, Data, and Geometry	33

Grade 5 Mathematics Reporting Categories	% of Test
Operations, Algebraic Thinking, and Fractions	39
Numbers and Operations in Base Ten	28
Measurement, Data, and Geometry	33

(Available under the "About the FSAs" link from www.fsassessments.org)



#### **Test Design Summary**

#### Percentage of Points by Depth of Knowledge Level

Grade/Course	DOK Level 1	DOK Level 2	DOK Level 3	
3 – 8	10% - 20%	60% - 80%	10% - 20%	

#### **Test Length**

This table provides the approximate range for the number of items on each test.

Number of Items
60 – 64
60 – 64
60 – 64

Note: Approximately 6-10 items on all of the tests listed above are experimental (field test) and are included in the ranges above but are not included in students' scores.

(Available under the "About the FSAs" link from www.fsassessments.org)



FSA Calculator Summary			
Assessment	Calculator Permitted		
Grades 3, 4, 5, and 6 Mathematics	CBT - None		
Grades 7 and 8 Algebra 1 Geometry	Computer based scientific calculator or hand-held scientific calculator		

FSA Reference Sheet			
Assessment Calculator Permitted			
Grades 3 Mathematics	CBT – None		
Grades 4, 5, 6, 7 and 8 Algebra 1 Geometry	Hard copies may be provided for students		



# **Conversions** will be provided in a pop-up window for the grades 4-8 and EOC CBTs.

#### Grade 4 FSA Mathematics Reference Sheet

#### Grade 5 FSA Mathematics Reference Sheet

#### **Customary Conversions**

1 foot = 12 inches 1 yard = 3 feet 1 mile = 5,280 feet 1 mile = 1,760 yards 1 cup = 8 fluid ounces 1 pint = 2 cups 1 quart = 2 pints 1 gallon = 4 quarts

1 pound = 16 ounces 1 ton = 2,000 pounds

#### Metric Conversions

1 meter = 100 centimeters 1 meter = 1000 millimeters 1 kilometer = 1000 meters 1 liter = 1000 milliliters

1 gram = 1000 milligrams 1 kilogram = 1000 grams

#### Time Conversions

1 minute = 60 seconds 1 hour = 60 minutes 1 day = 24 hours 1 year = 365 days 1 year = 52 weeks

#### Formulas

A = IW P = 2I + 2W

#### **Customary Conversions**

1 foot = 12 inches 1 yard = 3 feet 1 mile = 5,280 feet 1 mile = 1,760 yards 1 cup = 8 fluid ounces 1 pint = 2 cups 1 quart = 2 pints 1 gallon = 4 quarts 1 pound = 16 ounces 1 ton = 2,000 pounds

#### Metric Conversions

1 meter = 100 centimeters 1 meter = 1000 millimeters 1 kilometer = 1000 meters 1 liter = 1000 milliliters 1 gram = 1000 milligrams 1 kilogram = 1000 grams

#### Time Conversions

1 minute = 60 seconds 1 hour = 60 minutes 1 day = 24 hours 1 year = 365 days 1 year = 52 weeks



# Transition Schedule: Paper-based to Computer-based



#### **CBT to PBT Transition Schedule**

## TEST FORMAT BY YEAR FOR FLORIDA'S STATEWIDE ASSESSMENTS 2014–2019

Assessment		2014–15	2015–16	2016–17	2017–18	2018–19
		FLORIDA S	TANDARDS AS	SESSMENTS		•
Grade 3 ELA R	eading	PBT	PBT	PBT	PBT	PBT
Grade 3 Math	ematics	PBT	PBT	1 <sup>st</sup> year CBT	CBT	PBT
Crede 4 ELA	Writing	PBT	PBT	PBT	PBT	PBT
Grade 4 ELA Reading		PBT	1 <sup>st</sup> year CBT	CBT	СВТ	PBT
Grade 4 Mathematics		PBT	PBT	1 <sup>st</sup> year CBT	CBT	PBT
Crada E ELA	Writing	PBT	PBT	PBT	PBT	PBT
Grade 5 ELA Reading		1 <sup>st</sup> year CBT	CBT	CBT	CBT	PBT
Grade 5 Math	Grade 5 Mathematics		CBT	CBT	CBT	PBT
Crada C ELA	Writing	PBT	PBT	PBT	PBT	PBT
Grade 6 ELA	Reading	CBT	CBT	CBT	CBT	PBT
Grade 6 Mathematics		CBT	CBT	CBT	CBT	PBT



### 2017-2018 Assessment Schedule



Florida Standards Assessments (FSA)			
FSA Engl	ish Language Arts (ELA) and Mathematics		
Dates	Assessment		
March 1–9, 2018	Grades 8–10 ELA Writing		
March 5–9, 2018	Grades 4–7 ELA Writing		
April 9–13, 2018	Grade 3 ELA Reading		
April 16–May 11, 2018	Grades 4–10 ELA Reading Grades 3–8 Mathematics		



### FSA Item Specifications and Development Process

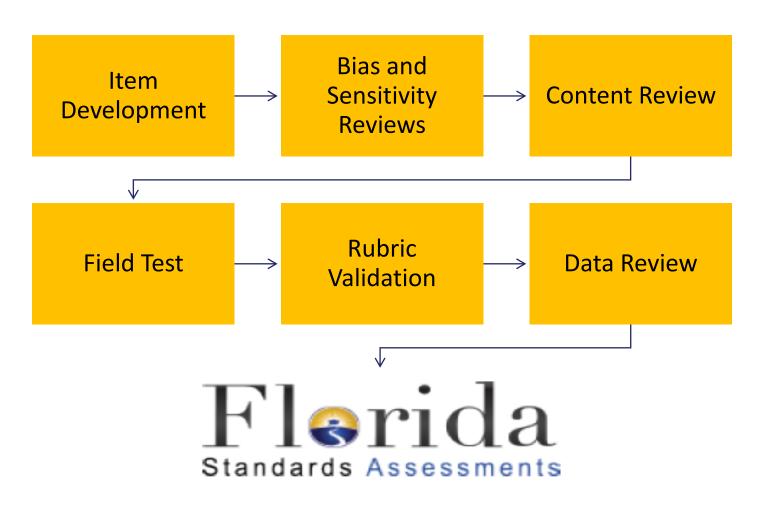


## **FSA Test Item Specifications**

- Item specifications for grades 3–8, Algebra 1, and Geometry are posted on the FSA portal at <a href="http://fsassessments.org">http://fsassessments.org</a> under the About the FSAs section.
- All specifications will be revised by Fall of 2017 based on new legislation to remove Algebra 2 and add new Multi-Interaction Item type description.
- There will be an update to grades 3-6 Item
   Specifications to reflect the changes from HB 7069 after
   Spring 2018 testing.



#### **FSA Mathematics Item Development Process**



www.FLDOE.org

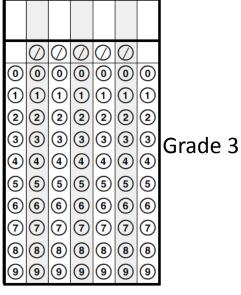


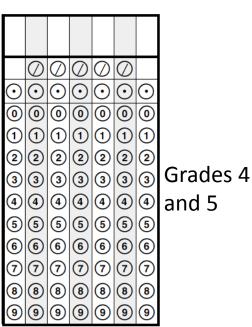
## **FSA Format and Item Types**

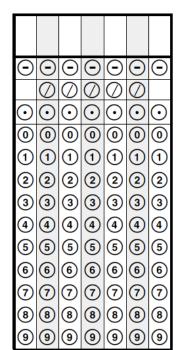


## FSA Format – **Paper Accommodated Tests**

 Paper-based accommodated tests may consist of multiple choice, multiselect, matching, and gridded-response questions.







Grades 6 - 8, and EOC's

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# FSA Format – Computer-Based Tests for Grades 3, 4, and 5

 Computer based exams may consist of multiple choice, multiselect, matching, table, open response, and technology enhanced questions (using online tools and manipulatives).



# Item Types for FSA Mathematics and EOC Assessments

- Multiple Choice
- Multiselect
- Equation Editor
- GRID (Graphic Response Item Display)
- Hot Text
- Open Response
- Matching
- Table Response
- Editing Task Choice



# Multiple Choice Items

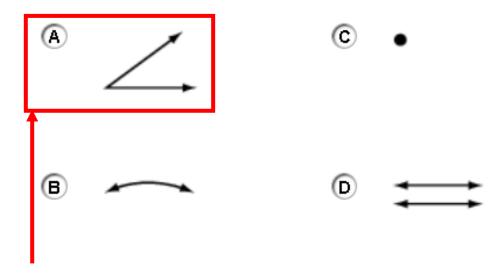
Multiple choice items require the student to select a single answer option. Multiple choice items consist of:

- a context (mathematical or real-world);
- a question;
- a single correct answer; and
- three plausible distractors.



# Multiple Choice Items

#### Which is an angle?



Click on an answer option or row to select it as your answer.



## **Multiselect Items**

- Multiselect items allow the student to select more than one answer option. These are different from multiple choice items, which allow the student to select only one response.
- Some items may ask the student to select a specific number of responses, while other items may ask the student to select all correct responses.
- Multiselect items consist of:
  - a context (mathematical or real-world);
  - a question;
  - two or more correct answers; and
  - several plausible distractors.

## **Multiselect Items**

Select all the statements that correctly compare the two numbers.



Click the checkbox next to each option you want to select as a response. You may select more than one option.



## **Multiselect Items**

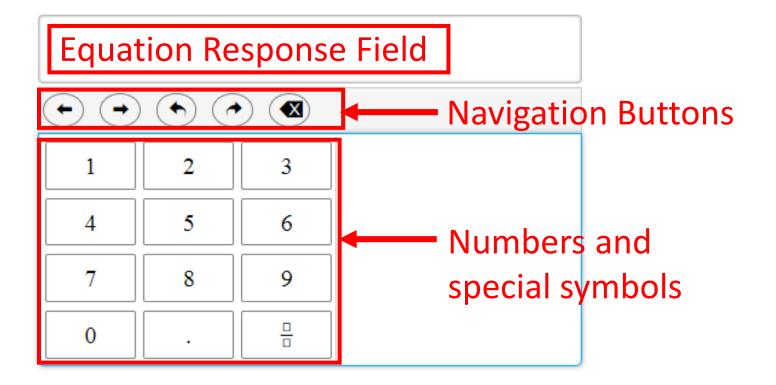
- Multiselect items are worth one point.
- Multiselect items do not have partial credit.
- A student must select all correct answers to receive credit for the item.



- Equation items require the student to enter a valid statement that answers the question.
- The response may be a number, an expression, or an equation.
- Equation items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.



What is the value of the expression  $6 \times (4+3)$ ?





Create the expression using numbers and symbols.

• •	• • (	• 🛛	)			
1	2	3	+	-	×	÷
4	5	6	<	=	>	
7	8	9		()		
0		<u>-</u>				



• • •						
1	2	3	n			
4	5	6	+	-	×	÷
7	8	9	<	=	>	
0		<u> </u>	()			



About the Navigation Buttons for Equation Items

Navigation Button	Description
Move Left	The straight left arrow button allows you to move the cursor before an existing character.
Move Right	The straight right arrow button allows you to move the cursor after an existing character.
Undo	The curved left arrow button allows you to undo the previous action.
Redo	The curved right arrow button allows you to redo the previous undone action.
Delete	The delete button allows you to delete characters.



- Although understanding decimals is not part of the grade 3 standards, some grade 3 equation items may contain the decimal point. While decimal equivalents would be scored/accepted as correct responses, students are encouraged to use fraction responses to demonstrate precision.
  - This is also important in the case of repeating decimals (e.g., 1/3) to ensure that students do not round unless an item specifically directs to round.



## **GRID**

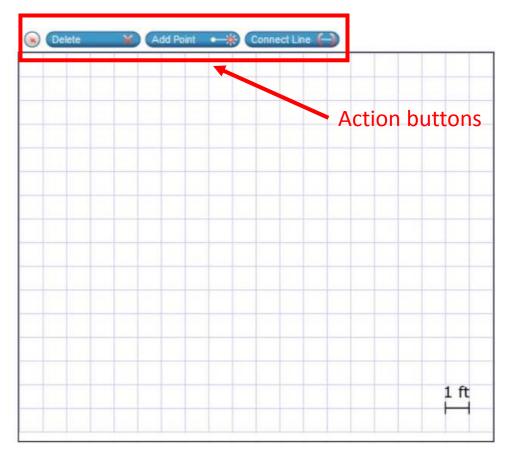
- GRID (Graphic Response Item Display) items may require the student to use the Add Point, Add Line, or Add Arrow buttons to create a response on a grid. Students may also have to highlight or draw by clicking.
- GRID items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.



# **GRID** (with action buttons)

A shipping box in the shape of a rectangular prism has a height of 6 feet (ft) and a volume of 96 ft<sup>3</sup>.

Use the Connect Line tool to draw a possible base for the box.



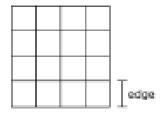


## **Hot Text Items**

- Hot text items require the student to either click on a response option or drag a response option to another location.
- Hot text items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.

## **Hot Text Items**

Mike creates a design for a square kitchen floor. Each tile measures 1 foot square. An example of the design is shown.



Mike found that the expression  $4n + 2n^2 - 2n$  would give the total number of edges for a design of any size, where n is the length, in feet, of one side of the design.

Select an expression and an explanation to match the meaning of the value the expression represents.

Expression
п
2/1
2n² - 2n
$4n + 2n^2$

Explanation	
Area of the design	
Perimeter of the design	
Number of edges in one row of the design	
Number of edges inside the design	



# **Open-Response Items**

- Open-response items require the student to use the keyboard to enter a response into a text field.
- Different types of open-response items may appear on the test.
- Open-response items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.



## **Open-Response Items**

In the ordered pair (0, 4), what does the 4 represent in terms of its location on the coordinate plane?

Type your answer in the space provided.

Click on the text box and type your answer using the keyboard.



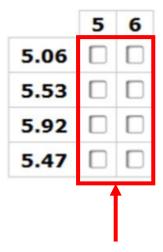
## Matching Items

- Matching items require the student to check a box to indicate if information from a column header matches information from a row.
- Matching items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.



## Matching Items

Select the value of each decimal number when it is rounded to the nearest whole number.



Click in the boxes to highlight the desired options.



### **Table Items**

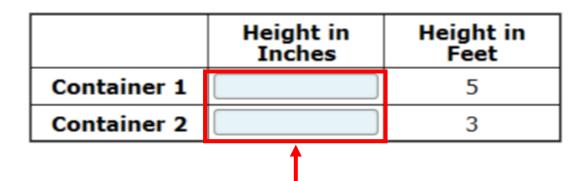
- Table items require the student to type numeric values into a given table. The student may complete the entire table or portions of the table depending on the question that is being asked.
- Table items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.



### **Table Items**

The table shows the height of two containers, in feet.

Complete the table to show the height of each container, in inches.



Click in each box to type the numeric response to complete the table.



### **Editing Task Choice Items**

 Editing task items require the student to click on a highlighted word or phrase and select the replacement word or phrase from a menu.

- Editing task choice items consist of:
  - a context (mathematical or real-world);
  - a question; and
  - a response area.



### **Editing Task Choice Items**

Johnny wants to find the equation of a circle with center (3, -4) and a radius of 7. He uses the argument shown.

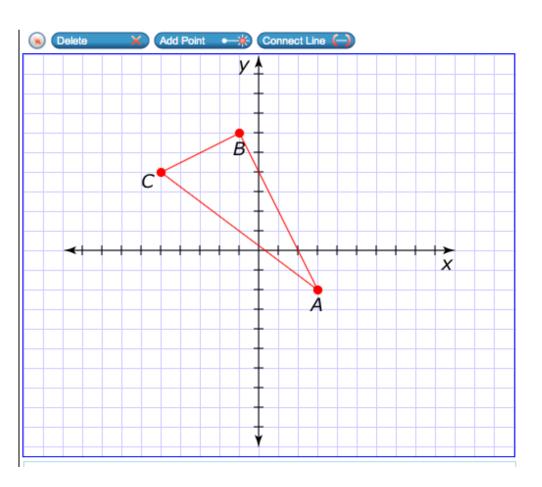
There are three highlights in the argument to show missing words or phrases. For each highlight, click on the word or phrase that correctly fills in the blank.

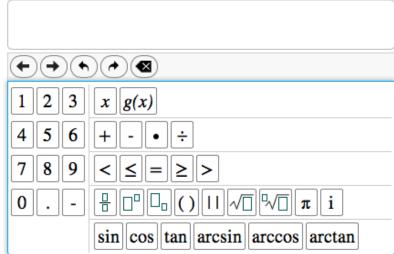
#### Johnny's Argument

Let (x, y) be any point on the circle. Then, the horizontal distance from (x, y) to the center is \_\_\_\_\_?\_\_\_. The vertical distance from (x, y) to the center is \_\_\_\_\_?\_\_\_. The total distance from (x, y) to the center is the radius of the circle, 7. The \_\_\_\_\_?\_\_\_ can now be used to create an equation that shows the relationship between the horizontal, vertical, and total distance of (x, y) to the center of the circle.



### Items could combine more than one item type.







### **Lessons Learned**

Lessons Learned are based on an initial basic analysis of student performance on individual items from the Spring 2017 FSA administration.



### **Grade 3**



# Lessons Learned – MAFS.3.OA and MAFS.3.NBT Operations and Algebraic Thinking and Numbers and Operations in Base 10

- In general, students are performing well in these Domains.
  - Students tend to perform better with addition rather than subtraction and multiplication rather than division.
  - Students show difficulties in MAFS.3.OA.4.8.

#### Example – Page 21 of *Grade 3 Mathematics Item Specification*

A bookstore has 4 boxes of books. Each box contains 20 books. On Monday, the bookstore sold 16 books. How many books remain to be sold?



## **Lessons Learned – MAFS.3.NF Numbers and Operations - Fractions**

- Students showed success in MAFS.3.NF.1.1 and MAFS.3.NF.1.2
  - Students tend to perform better with fraction representation in the form of 1/b rather than a/b.
- Students struggled in MAFS.3.NF.1.3
  - Students show difficulties in recognizing and generating fraction equivalence. (3.NF.1.3b)
  - Students are challenged with expressing whole numbers as fractions, and recognizing fractions that are equivalent to whole numbers, including equivalent to one. (3.NF.1.3c)



## **Lessons Learned – MAFS.3.NF Numbers and Operations - Fractions**

Example – Question 8, Session 1, FSA Mathematics Practice Test

Select all the fractions that are equivalent to a whole number.

 $\frac{3}{3}$ 

 $\frac{15}{7}$ 

 $\frac{5}{10}$ 

 $\frac{1}{6}$ 

 $\frac{8}{2}$ 



## Lessons Learned – MAFS.3.G and MAFS.3.MD Geometry and Measurements and Data

- Students showed success in:
  - recognizing shared attributes for defining a category. It is noted that students performed better with illustrations of figures rather than in text-only format. (G.1.1)
  - understanding measurement of time intervals, volumes and masses. (MD.1.1)
  - using picture or bar graphs for solving one- and two-step problems. (MD.2.3)
- Students are struggling with:
  - showing measured data on a line plot. (MD.2.4)
  - recognizing area as additive. (decomposing a composite shape) (MD.3.7d)
  - solving real-world problems involving perimeter. (MD.4.8)

#### Example – www.CPALMS.org

**Exit Ticket** 

James made a card for his mother. His card had a perimeter of 12 inches. Which of the cards below has a perimeter of 12 inches?

4 in.

3 in.

3 in.

3 in.

4 in.

3 in.

3 in.

4 in.

3 in.

4 in.



### **Grade 4**



## **Lessons Learned – MAFS.4.OA**Operations and Algebraic Thinking

- Students generally showed an understanding of how to use operations with whole numbers, understanding factors and multiples, and generating and analyzing patterns.
- Students are struggling with multi-step word problems wherein remainders must be interpreted. (OA.1.3)

Example – Question 5, Session 1, FSA Grade 4 Mathematics Practice Test

Joanna has \$54. She is shopping for umbrellas that cost \$12 each. She writes the following equation to model the situation.

$$54 \div 12 = 4 \text{ r } 6$$

What does the number 6 represent about Joanna's money?



## Lessons Learned – MAFS.4.NBT Numbers and Operations in Base Ten

- MAFS.4.NBT 1.1, 1.2 and 1.3 (generalize place value understanding and operations with whole numbers) – Students showed success in the understanding and application of these standards.
- MAFS.4.NBT.2.4 Students overall were more successful with addition than subtraction.
- MAFS.4.NBT.2.6 Students were less successful with using various strategies to find whole number quotients and remainders – in particular the use of rectangular arrays and/or models.



## **Lessons Learned – MAFS.4.OA**Operations and Algebraic Thinking

Example – CPALMS.org

One student found the quotient of 889 divided by 7 by using the area model below. The student determined that  $889 \div 7 = 127$ .

	100	20	7
,			
	889	189	49
	<u>-700</u>	<u>-140</u>	<u>-49</u>
	189	49	0



## **Lessons Learned – MAFS.4.NF Numbers and Operations - Fractions**

- MAFS.4.NF.1.1 and 1.2 Students are struggling with equivalent fractions and comparison of fractions.
- MAFS.4.NF.2 Students showed some understanding of the basic addition/subtraction of fractions with like denominators, but are showing less success with multiplying a fraction by a whole number.
- MAFS.4.NF.3.5 Students have shown improvements with items requiring addition of fractions with unlike denominators 10 and 100.

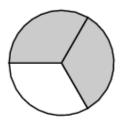


## **Lessons Learned – MAFS.4.NF Numbers and Operations - Fractions**

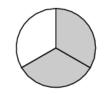
#### Example – Question 6, Session 1, FSA Grade 4 Mathematics Practice Test

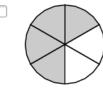
Kari represented a fraction by shading parts of the model shown.

#### Kari's Fraction Model

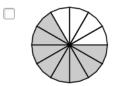


Select all the models that have been shaded to represent fractions equivalent to Kari's fraction.













## Lessons Learned – MAFS.4.MD and MAFS.4.G Measurement and Data and Geometry

- MAFS.4.MD.1.1 and MD.1.2 Students showed improvements with measurements and conversions, as well as word problems involving distances, money, and intervals of time.
- MAFS.4.MD.1.3 Students continue to show difficulties with the application of area and perimeter formulas for rectangles.
- MAFS.4.MD.2.4 Students have shown some growth with presenting data on a line plot, but still struggle with this concept.
- MAFS.4.G.1.1-1.3 Students generally showed an understanding of the Geometry standards.

#### Example - CPALMS website

The area of Miguel's rectangular garden is 450 feet. The garden is 9 feet wide. How many feet of fencing will Miguel need to buy to enclose the garden on all four sides?



### **Grade 5**



## **Lessons Learned – MAFS.5.OA**Operations and Algebraic Thinking

- MAFS.5.OA.1.1 and 2.3 Students are generally successful with evaluating expressions and analyzing patterns and relationships.
- MAFS.5.OA.1.2 Students appear to need more practice in writing simple expressions that record calculations with number and interpret numerical expressions without evaluating them.

Example – www.CPALMS .com

Can you write an expression to show multiplying the sum of 4,878 and 3,297 by 4?



## **Lessons Learned – MAFS.5.NBT Numbers and Operations in Base Ten**

- MAFS.5.NBT.1 Students are generally successful in understanding the place value system (NBT.1.1). Students still struggle with explaining patterns involving multiplication/division with powers of 10 and exponents (NBT.1.2). In addition, students need more practice involving rounding decimals (NBT.1.4).
- MAFS.5.NBT.2 Students showed growth of the basic addition, subtraction, multiplication, and division involving decimals to hundredths.

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Example – Page 23 of <i>Grade 5 Mathematics Item Specification</i>		
Select all the numbers that round to 4.3 when rounded to the nearest tenth.		4.24
		4.31
		4.35
		4.219
www.FLDOE.org		4.30



## **Lessons Learned – MAFS.5.NF Numbers and Operations - Fractions**

- MAFS.5.NF.1.1 Students are generally successful in adding/subtracting fractions, but struggled when an unknown value needs to be determined.
- MAFS.5.NF.2 Though improvements have been made, students are still struggling with multiplying and dividing fractions.

Example – Page 28 of *Grade 5 Mathematics Item Specification* 

What is the missing number in the following equation?

$$\frac{11}{14} - \frac{\Box}{4} = \frac{4}{14}$$



## Lessons Learned – MAFS.5.MD Measurements and Data

- MAFS.5.MD.1.1 Students have shown growth, but still struggle with conversions in solving multi-step, real-world problems.
- MAFS.5.MD.2.2 Students continue to struggle with operations on fractions given data presented in line plots.
- MAFS.5.MD.3 Students have shown success in the understanding and application of volume.

#### Example – Question 11 Session 2, FSA Grade 5 Mathematics Practice Test

Michael is measuring fabric for the costumes of a school play.

He needs 47 feet of fabric. He has  $12\frac{1}{2}$  yards of fabric.

How many more **yards** of fabric does he need?



### Lessons Learned – MAFS.5.G Geometry

 MAFS.5.G.1 – Students have shown an understanding of graphing points in the first quadrant on a coordinate plane(MAFS.G.1.1), but they tend to struggle with interpreting coordinate values of points in the context of the situation (MAFS.G.1.2).

 MAFS.5.G.2 – Students have shown growth, but still struggle in the classification and organization of two-dimensional figures using Venn diagrams.



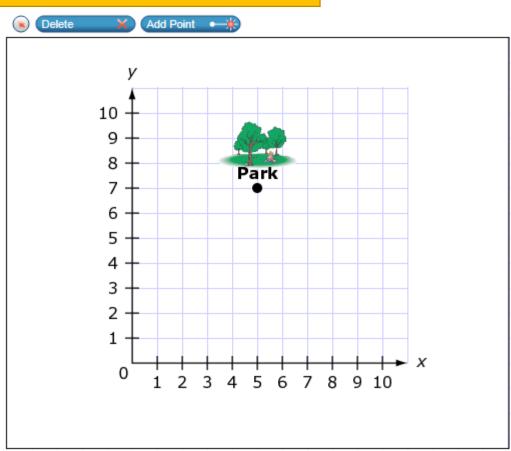
### Lessons Learned – MAFS.5.G Geometry

#### Example – Question 9, Session 1, FSA Grade 5 Mathematics Practice Test

The location of a park is shown on the coordinate plane.

Dan left his house, went 2 units up and 3 units right, and arrived at the park.

Use the Add Point tool to plot a point that shows the location of Dan's house.





### **FSA Portal**

http://fsassessments.org/



Home Students & Families Test Administration Technology Resources About the FSAs













This portal is your source for information about the Florida Standards Assessments.

Florida's K-12 assessment system measures students' achievement of Florida's education standards, which were developed and implemented to ensure that all students graduate from high school ready for success in college, career, and life. Assessment supports instruction and student learning, and test results help Florida's educational leadership and stakeholders determine whether the goals of the education system are being met.

For information about FCAT 2.0 or NGSSS EOC Assessments, please visit <a href="http://www.fldoe.org/accountability/assessments/k-12-student-assessment">http://www.fldoe.org/accountability/assessments/k-12-student-assessment</a>.

For more information about Florida standards, course descriptions, and standard resources, please visit <a href="https://www.cpalms.org">www.cpalms.org</a>.



Tweets by @EducationFL

FL Dept of Education Retweeted





### **TDC Contact Information**



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### **Presentation Link**

https://fctm.net/tdcpresentations/



### **Questions?**



## www.FLDOE.org

