Common Core Georgia Performance Standards Framework
Fifth Grade Mathematics • Unit 1

Practice Task: Expression Puzzle

In this task, students will practice interpreting numeric expressions by matching the numeric form to its meaning written in words, without evaluating the expression.

STANDARDS FOR MATHEMATICAL CONTENT

MCC.5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

STANDARDS FOR MATHEMATICAL PRACTICE

- SMP 1. Make sense of problems and persevere in solving them.
- SMP 2. Reason abstractly and quantitatively.
- SMP 3. Construct viable arguments and critique the reasoning of others.
- SMP 6. Attend to precision.

BACKGROUND KNOWLEDGE

Students should have had prior experiences writing expressions. In this task, students will practice matching an expression written as a numeric calculation to its written form in words. In order to do this, students will need to be able to use and apply the commutative and associative properties of addition and multiplication as well as the correct order of operations. They will also need to apply third grade standard MCC3.NF.1 by understanding that dividing by a whole number is the same as multiplying by a unit fraction with that whole number as its denominator. For example, one-half of a quantity is the same as dividing by two, and one-third of a quantity is the same as dividing by three.

COMMON MISCONCEPTIONS

- Students may choose the wrong operation because they don't fully understand the meaning of each of the four operations and the vocabulary associated with each operation. Reviewing contexts for each operation and vocabulary such as product, sum, difference, etc. before doing this activity may be helpful.
- Students may try to match the numbers in an expression to the word forms of those numbers. The puzzle has been written with distractors that use the same numbers in different operations. Therefore, students will need to carefully consider the correct operation and order when selecting the matching puzzle piece.

ESSENTIAL QUESTIONS

How can an expression be written?

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MATERIALS

- Directions and questions sheet for Expression Puzzle
- Expression Puzzle sheet (may be printed on cardstock and laminated; should be cut into 15 puzzle pieces
- Teacher answer key

GROUPING

Individual or partner task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Comments

This task will allow students to practice interpreting numeric expressions in words without evaluating them. They will practice matching expressions written in words to the expressions written symbolically by completing a puzzle.

Task Directions

Students will follow the directions below from the student Directions and Questions sheet.

Directions:

- Complete the puzzle by matching the edge of each puzzle piece. If the edge has an expression that is written with numerically with symbols, then it should be matched to a written description of the expression. If the edge is written in words, then it needs to be matched to its symbolic representation.
- When the puzzle is completed, it will form one large rectangle.
- Some expressions do not have a match. Those expressions will be located on the outside perimeter of the puzzle.
- Be careful! Matching the correct operations and order of those operations is equally important as matching the words and numbers on the puzzle pieces. There are distractors that use the same numbers but have incorrect operations or order.
- As you decide which puzzle pieces go together, you and your partner or group members should discuss why the pieces will or will not fit together.

After completing the puzzle, answer the following questions.

- 4. How did you decide which cards matched?
- 5. What did you consider as decided why puzzle pieced did or did not fit together?
- 6. Give an example of when you used the commutative property. Explain how the commutative property is used in your example.
- 7. Give an example of when you used the associative property. Explain how the associative property is used in your example.
- 8. Give an example of when you had to pay attention to using the correct order of operations. Explain why this was important in your example.
- 9. In card #11, what operation did you use to represent one third? Explain why this operation worked.

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Task Answer Key

	ix This Wei The	- J							
_	(2 x 4) + 8	sum of 55	5.	(2 x 3) + 6	333 then nd	m	(8 + 2) + 4	han the 5 and 5	
33 x B3 + 3	Card #1	Five less than the sum of 2,345 and 555	P,345 + 555 - 5	Card #15	Subtract 33 from 333 then find one third	333 - 33 + 3	Card #11	555 times more than the difference of 2,345 and 5	
m	Six more than the product of 3 times 2	Five in	a.	Two times larger than 4 plus 8	Subtrac	<u>m</u> .	One third the size of the product of 2 and 6	SSS the different	
52	(3 x 2) + 6	s of 33		(8 + 4) x Z	of the ISSS	+5	(6 x 2) ÷ 3	then	
p,345 – 555 x 5	Card #5	Three times the size of 33 plus 333	B33 +33 x 3	Card #3	One fifth the size of the sum of 2,345 and 555	p,345 + 555 +5	Card #14	Add 33 and 333 then subtract 3	
	add 8 and 2 then multiply by 4	Three		Three times larger than the sum of 2 and 6	8 8		Eight times the size of the product of 4 and 2	Adv	
	4 x (8 + 2)	Add 333 and 33 then divide by 3		3 x (6 + 2)	Stimes as much as 2,345 added to 555	555 + 2,345 x 5	2 x 4 x 8	33 less than the quotient of 333 and 3	
333 - 33 x 3	Card #3		B3 + 333 +3	Card #13			Card #7		
	Six times as large as 3 plus 2	Add 33	E ppy		One half the size of 8 and 4	Stim	<u></u>	Subtrect 2 from 8 then multiply by 4	33 83
45	(3 + 2) x 6	Five more than 2,345 plus 555	none than 2,345 plus 555 P,345 + 555 + 5	(4 + 8) ÷ 2	# m	_	4 x (8 - 2)	as 555	
5 x 555 + 2,345	Card #9			ore than 2,3 555 345 + 555	Card #6	33 times as much as the difference of 333 and 3	B33 - 3 x 33	Card #10	2,345 times as much as 555 plus 5
<u>-</u>	Two more than the difference of 8 and 4	Fige	2	Two more than the quotient of 6 and 3	33 tin		One half the size of 3 times 6	2,345 1	
555	(8 - 4) + 2	an 2,345	555 times larger than 2,345 plus 5 P,345 + 5 x 555	(6 ÷ 3) + 2	33 more than the sum of 3 and 333	3 + 333 + 33	(6 x 3) + 2	quotient by 3	
p,345 + 5 + 555	Card #2	s larger th plus S		Card #12			Card #4	33 none than the quotient of 333 divided by 3	
27.	Six times as much as the difference of 3 and 2	555 time		Three times the difference of 6 and 2	33 more	m	Four times the size of 8 divided by 2	33 more of 3;	

FORMATIVE ASSESSMENT QUESTIONS

• The questions listed above on the student directions and questions sheet are the formative assessment questions for this task.

DIFFERENTIATION

Extension

- Students can solve each expression.
- Students can determine which expressions would have the same value if the grouping symbols are removed.
- Students can create their own expression puzzle.

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Intervention

- Modify puzzle to use expressions that only include operations, not parentheses.
- Tell students that puzzle card #1 is should be located in the top left-hand corner of the puzzle and that puzzle card #2 is not the next puzzle piece.
- Find sets of 2 cards that match instead of completing the entire puzzle.
- Reduce the number of puzzle pieces.
- Remove the distractors that do not have matches from the outside of the puzzle as shown below.

	the sum of 555	s · lss	+-	Subtract 33 from 333 then find one third	<u>.</u>		ŧ		
Card #1	Five less than the sumpl 2,345 and 555	p,345 + 555 - 5	Card #15	ract 33 from 33 find one third	B33 - 33 + 3	Cerd #11	É		
Six more than the product of 3 times 2	Fin		Two times larger than 4 plus 8	Subt		One third the size of the product of 2 end 6	İ		
(3 x 2) + 6	size of 33	×	(8 + 4) x 2	as of the ord 555	s+ <u>k</u>	(6 × 2) + 3	Į		
Card #5	Three times the size of 33 plus 333	833 + 33 x	Card #8	One fifth the size of the sum of 2,345 and 555	P,345 + 555 +5	Card #14	į		
add 8 and 2 then multiply by 4			Three times larger than the sum of 2 and 6	9 8		Eight times the size of the product of 4 and 2	!		
4 × (8 + 2)	hen divide	E +	3 × (6 + 2)	as 2,345 555	5 x ls	2 x 4 x 8			
Card #3	Add 333 and 33 then divide by 3	B3 + 333 +3	Card #13	Stines as much as 2,345 added to 555	555 + 2,345 x 5	Card #7	I		
Six times as large as 3 plus 2	Add 3	One helf the size of 8 \$\frac{1}{2}\$ and 4		Subtract 2 from 8 then multiply by 4	!				
(3 + 2) × 6	,345 plus	5-1	(4 + 8) + Z	h as the S and 3	33	4 × (B - 2)	i		
Card #9	more than 2,345 555 P,345 + 555 +5	555 555 345 + 555	555 535 5345 + 552	Five more than 2,345 plus 555	Card #6	33 times as much as the difference of 333 and 3	B33 - 3 x 33	Card #10	
Two more than the difference of 8 and 4		_	Two more than the quotient of 6 and 3	33 to		One helf the size of 3 times 6	1		
(8 - 4) + 2	than 2,345	555	(6 + 3) + 2	than the sum of 3 and 333	88	(6 × 3) + 2			
Card #2	55 times larger than 2,345 plus 5	P,345 + 5 x 555	Card #12	ore than the and 333	3+333+33	Card #4	-		
	į		- 4 moins ac-	33 more			į		

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Expression Puzzle

Directions:

After

- Complete the puzzle by matching the edge of each puzzle piece. If the edge has an expression that is written with numerically with symbols, then it should be matched to a written description of the expression. If the edge is written in words, then it needs to be matched to its symbolic representation.
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 as matching the words and numbers on the puzzle pieces. There are distractors that use the
 same numbers but have incorrect operations or order.
- As you decide which puzzle pieces go together, you and your partner or group members should discuss why the pieces will or will not fit together.

1.	How did you decide which cards matched?
 2.	What did you consider as decided why puzzle pieced did or did not fit together?
3.	Give an example of when you used the commutative property. Explain how the commutative property is used in your example.
4.	Give an example of when you used the associative property. Explain how the associative property is used in your example.
5 .	Give an example of when you had to pay attention to using the correct order of operat Explain why this was important in your example.
6.	In card #11, what operation did you use to represent one third? Explain why this operation worked.

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<u>Teacher note:</u> The puzzle pieces for this task are located on this page and the next page. They should be cut out into 15 pieces before doing the puzzle. The puzzle pieces could be copied on card stock and laminated for durability and future use.

	$(2 \times 4) + 8$	ım of	5	$(2 \times 3) \div 6$	3 then		$(8 \div 2) + 4$	in the and 5
333 x (33 ÷ 3)	Card #1	Five less than the sum of 2,345 and 555	(2,345 + 555) -	Card #15	Subtract 33 from 333 then find one third	$(333 - 33) \div 3$	Card #11	more that of 2,345
ω,	Six more than the product of 3 times 2	Five le	(2)	Two times larger than 4 plus 8	Subtrae f)	One third the size of the product of 2 and 6	555 times difference
5	$(3 \times 2) + 6$	of 33		$(8+4) \times 2$	of the 555	5	$(6 \times 2) \div 3$	hen
(2,345 – 555) x	Card #5		(333 + 33) x 3	Card #8	One fifth the size of the sum of 2,345 and 555	(2,345 + 555) ÷	Card #14	Add 33 and 333 then subtract 3
(2,3	Add 8 and 2 then multiply by 4	Three t		Three times larger than the sum of 2 and 6	One fi	(7)	Eight times the size of the product of 4 and 2	Add
	4 x (8 + 2)	hen		3 x (6 + 2)	2,345	5	2 x 4 x 8	otient
333 – 33 x 3	Card #3	Add 333 and 33 then divide by 3	divide by 3 $(33 + 333) \div 3$	Card #13	5 times as much as 2,345 added to 555	(555 + 2,345) x	Card #7	33 less than the quotient of 333 and 3
	Six times as large as 3 plus 2	Adı		One half the size of 8 and 4	5 tim	(5)	Subtract 2 from 8 then multiply by 4	33 le

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145	$(3+2) \times 6$	2,345 plus	+ 5	$(4+8) \div 2$	as the and 3	3	4 x (8 – 2)	ıch as
(5 x 555) + 2,345	Card #9	Five more than 2,3. 555	555)	Card #6	as much	(333 – 3) x 33	Card #10	5 times as much as
(5)	Two more than the difference of 8 and 4	Five n		Two more than the quotient of 6 and 3	33 tin diffe		One half the size of 3 times 6	2,345
55	(8-4)+2	ı 2,345	55	$(6 \div 3) + 2$	sum of 3		$(6 \times 3) \div 2$	otient y 3
$(2,345 \div 5) + 555$	Card #2	times larger than 2,345 plus 5	(2,345 + 5) x 555	Card #12	33 more than the su and 333	3 + 333 + 33	Card #4	more than the quotient of 333 divided by 3
(2,	Six times as much as the difference of 3 and 2	555 time		Three times the difference of 6 and 2	33 moi		Four times the size of 8 divided by 2	33 mol of 3