

**Lesson 16: Write Expressions in Which Letters Stand for Numbers**

**Classwork**

**Opening Exercise**

Underline the key words in each statement.

- a. The sum of twice  $b$  and 5  
Handwritten: + above sum, x2 above twice
- b. The quotient of  $c$  and  $d$   
Handwritten: a superscript 5 above quotient
- c.  $a$  raised to the fifth power and then increased by the product of 5 and  $c$   
Handwritten: + above increased, X above product
- d. The quantity of  $a$  plus  $b$  divided by 4  
Handwritten: ( ) above quantity, + above plus, ÷ above divided
- e. 10 less than the product of 15 and  $c$   
Handwritten: - above less than, X above product
- f. 5 times  $d$  and then increased by 8  
Handwritten: x above times, + above increased

**Mathematical Modeling Exercise 1**

Model how to change the expressions given in the Opening Exercise from words to variables and numbers.

- a. The sum of twice  $b$  and 5  $2b+5$
- b. The quotient of  $c$  and  $d$   $\frac{c}{d}$
- c.  $a$  raised to the fifth power and then increased by the product of 5 and  $c$   $a^5+5c$   
Handwritten: a superscript 5 above raised to the fifth power

d. The quantity of  $a$  plus  $b$  divided by 4

$$\frac{(a+b)}{4}$$

e. 10 less than the product of 15 and  $c$

Handwritten diagram for problem e: A circle around 15, an arrow from  $c$  to 15, and a plus sign. To the right,  $10 - 15c$  is written and crossed out with a large 'X'.

f. 5 times  $d$  and then increased by 8

$$5d + 8$$

**Mathematical Modeling Exercise 2**

Model how to change each real-world scenario to an expression using variables and numbers. Underline the text to show the key words before writing the expression.

Morgan has 4 more dollars than Kailey. If  $y$  is the amount of money Kailey has, write an expression to show how much money Morgan has.

Handwritten work for Morgan's problem:  $K \rightarrow y$ , Morgan  $\rightarrow +4$ ,  $y + 4 = m$ , and  $y + 4$  written above a line with 'Morgan' written below it.

Camden is missing half of his assignments. If  $a$  represents the number of assignments, write an expression to show how many assignments Camden is missing.

Handwritten work for Camden's problem:  $C = \frac{1}{2}a$  labeled 'equation', and  $\frac{1}{2}a$  or  $\frac{a}{2}$  written above a line.

Kaleb's weight has tripled since his first birthday. If  $w$  represents the amount Kaleb's weighed on his first birthday, write an expression to show how much Kaleb weighs now.

Handwritten work for Kaleb's problem:  $K = 3w$  and  $3w$  written above a line.

Nate brings cupcakes to school and gives them to his five best friends, who share them equally. If  $c$  represents the number of cupcakes Nate brings to school, write an expression to show how many cupcakes each of his friends receive.

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Mr. Smith combines his atlases and dictionaries and then divides them among 10 different tables. If  $a$  represents the number of atlases and  $d$  represents the number of dictionaries Mr. Smith has, write an expression to show how many books would be on each table.

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To improve in basketball, Nick's coach told him that he needs to take four times as many free throws and four times as many jump shots every day. If  $f$  represents the number of free throws and  $j$  represents the number of jump shots Nick shoots daily, write an expression to show how many shots he will need to take in order to improve in basketball.

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### Exercises

Mark the text by underlining key words, and then write an expression using variables and/or numbers for each statement.

1.  $b$  decreased by  $c$  squared
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2. 24 divided by the product of 2 and  $a$

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3. 150 decreased by the quantity of 6 plus  $b$

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4. The sum of twice  $c$  and 10

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5. Matayus had \$35 but then spent \$ $m$ .

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6. Gabby saved her money and was able to quadruple the original amount,  $m$ .

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7. Zabby increased her grade,  $g$ , by 4 points and then doubled it.

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8. Jacob had  $m$  pieces of candy and ate 5 of them. Then, he split the remaining candy equally among 4 friends.

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## HOMEWORK

NAME \_\_\_\_\_

Mark the text by underlining key words, and then write an expression using *variables and numbers* for each of the statements below.

1. Jaden can type  $w$  words per minute. Mason can type 4 times as many words as Justin. Write an expression that represents the rate at which Mason can type.

\_\_\_\_\_

2. Aneiya swam  $y$  yards yesterday. Alanah swam 5 yards less than half the amount of yards as Aneiya. Write an expression that represents the number of yards Alanah swam yesterday.

\_\_\_\_\_

3. A number  $d$  is decreased by 5 and then doubled.

\_\_\_\_\_

4. Gavyn had  $n$  baseball cards, and Zack had  $s$  baseball cards. They combined their baseball cards and then sold 10 of them.

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5. The sum of 25 and  $h$  is divided by  $f$  cubed.

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