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Lesson 15: Read Expressions in Which Letters Stand for Numbers

Student Outcomes

* Students read expressions in which letters stand for numbers. They assign operation terms to operations when reading.
* Students identify parts of an algebraic expression using mathematical terms for all operations.

Classwork

Opening Exercise (10 minutes)

Opening Exercise

Complete the graphic organizer with mathematical words that indicate each operation. Some words may indicate more than one operation.

ADDITION

SUBTRACTION

MULTIPLICATION

DIVISION

SUM

ADD

MORE THAN

TOTAL

ALL TOGETHER

IN ALL

INCREASED BY

PLUS

DIFFERENCE

SUBTRACT

FEWER THAN

MINUS

LESS THAN

HOW MANY MORE

LEFT

DECREASED BY

PRODUCT

MULTIPLY

TIMES

EVERY

DOUBLE, TRIPLE

OF

AS MUCH

EACH

QUOTIENT

DIVIDE

EACH

PER

SPLIT

EXPONENTS

POWER

SQUARED

CUBED

Have different students share the vocabulary words they wrote in each category. If students are missing vocabulary words in their graphic organizers, have them add the new words. At the end of the Opening Exercise, every student should have the same lists of vocabulary words for each operation.

Example 1 (13 minutes)

Have students write down an expression using words. Encourage students to refer back to the graphic organizer created during the Opening Exercise. After providing students time to write each expression, have different students read each expression out loud. Each student should use different mathematical vocabulary.

Example 1

Write an expression using words.

* 1. $a-b$

Possible answers: $a$ minus $b$; the difference of $a$ and $b$; $a$ decreased by $b$; $b$ subtracted from $a$.

* 1. $xy$

Possible answers: the product of $x$ and $y$; $x$ multiplied by $y$; $x$ times $y$.

* 1. $4f+p$

Possible answers: $p$ added to the product of $4$ and f; $4$ times $f$ plus $p$; the sum of $4$ multiplied by $f$ and $p$.

* 1. $d-b^{3}$

MP.6

Possible answers: $d$ minus $b$ cubed; the difference of $d$ and the quantity $b$ to the third power.

* 1. $5\left(u-10\right)+h$

Possible answers: add $h$ to the product of $5$ and the difference of $u$ and $10$; $5$ times the quantity of $u$ minus $10$ added to $h$.

* 1. $\frac{3}{d+f}$

Possible answers: find the quotient of $3$ and the sum of $d$ and $f$; $3$ divided by the quantity $d$ plus $f$.

* Why is $3$ divided by $d$ plus $f$ not a correct answer?
	+ *Possible answer:* $3$ *divided by* $d$ *plus* $f $*would indicate that we divide* $3$ *and* $d$ *first and then add* $f$*, but this is not what the expression is showing.*

Exercises (12 minutes)

*Scaffolding:*

If students are using the vocabulary words well or finish early, ask students to write two different expressions for Exercises 1–4.

Students work with a partner to complete the following problems.

Exercises

Circle all the vocabulary words that could be used to describe the given expression.

1. $6h-10$

ADDITION

SUBTRACTION

MULTIPLICATION

DIVISION

1. $\frac{5d}{6}$

SUM

DIFFERENCE

PRODUCT

QUOTIENT

1. $5\left(2+d\right)-8$

ADD

SUBTRACT

MULTIPLY

DIVIDE

1. $abc$

MORE THAN

LESS THAN

TIMES

EACH

Write an expression using vocabulary words to represent each given expression.

1. $8-2g$

Possible answers: $8$ minus the product of $2$ and $g$; $2$ times $g$ subtracted from $8$; $8$ decreased by $g$ doubled.

1. $15\left(a+c\right)$

Possible answers: $15$ times the quantity of $a$ increased by $c$; the product of $15$ and the sum of $a$ and $c$; $15$ multiplied by the total of $a$ and $c$.

1. $\frac{m+n}{5}$

Possible answers: the sum of $m$ and $n$ divided by $5$; the quotient of the total of $m$ and $n$, and $5$; $m$ plus $n$ split into $5$ equal groups.

1. $b^{3}-18$

Possible answers: $b$ cube$d$ minus $18$; $b$ to the third power decreased by $18$.

1. $f-\frac{d}{2}$

Possible answers: $f$ minus the quotient of $d$ and $2$; $d$ split into $2$ groups then subtracted from $f$; $d$ divided by $2$ less than $f$.

1. $\frac{u}{x}$

***Possible answers:*** $u$ ***divided by*** $x$***; the quotient of*** $u$ ***and*** $x$***;*** $u$ ***divided into*** $x$ ***parts.***

Closing (5 minutes)

* Peter says the expression $11-3c$ is 3 times $c$ decreased by $11$. Is he correct? Why or why not?
	+ *Peter is not correct because the expression he wrote is in the wrong order. If Peter wanted to write a correct expression and use the same vocabulary words, he would have to write* $11$ *decreased by 3 times* $c$*.*

Exit Ticket (5 minutes)

Name Date

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Exit Ticket

1. Write two word expressions for each problem using different math vocabulary for each expression.
	1. $5d-10$
	2. $\frac{a}{b+2}$
2. List five different math vocabulary words that could be used to describe each given expression.
	1. $3\left(d-2\right)+10$
	2. $\frac{ab}{c}$

Exit Ticket Sample Solutions

1. Write two word expressions for each problem, using different math vocabulary for each expression.
	1. $5d-10$

Possible answers: The product of $5$ and $d$ minus $10$. $10$ less than $5$ times $d$.

* 1. $\frac{a}{b+2}$

Possible answers: The quotient of $a$ and the quantity of $b$ plus $2$. $a$ divided by the sum of $b$ and $2$.

1. List five different math vocabulary words that could be used to describe each given expression.
	1. $3\left(d-2\right)+10$

Possible answers: difference, subtract, product, times, quantity, add, sum.

* 1. $\frac{ab}{c}$

Possible answers: quotient, divide, split, product, multiply, times, per, each.

Problem Set Sample Solutions

1. List five different vocabulary words that could be used to describe each given expression.
	1. $a-d+c$

Possible answers: sum, add, total, more than, increase, decrease, difference, subtract, less than.

* 1. $20-3c$

Possible answers: difference, subtract, fewer than, triple, times, product.

* 1. $\frac{b}{d+2}$

Possible answers: quotient, divide, split, per, sum, add, increase, more than.

1. Write an expression using math vocabulary for each expression below.
	1. $5b-18$

Possible answers: The product of $5$ and $b$ minus $18$. $18$ less than $5$ times $b$.

* 1. $\frac{n}{2}$

Possible answers: The quotient of $n$ and $2$. $n$ split into $2$ equal groups.

* 1. $a+(d-6)$

Possible answers: $a$ plus the quantity $d$ minus $6$. $a$ increased by the difference of $d$ and $6$.

* 1. $10+2b$

Possible answers: $10$ plus twice $b$. The total of $10$ and the product of $2$ and $b$.