Lesson 3: The Relationship of Multiplication and Addition

Classwork

Opening Exercise

Write two different expressions that can be depicted by the tape diagram shown. One expression should include addition, while the other should include multiplication.

a. 

Possible Answers: 3+3+3 or 3×3

b. 

Possible Answers: 8+8 or 2×8

c. 

Possible Answers: 5+5+5 or 3×5

Exercises

1. Write the addition sentence that describes the model and the multiplication sentence that describes the model.

5+5+5 and 3×5

2. Write an equivalent expression to demonstrate the relationship of multiplication and addition.

a. $6+6$

2×6

b. $3+3+3+3+3+3$

6×3

c. $4+4+4+4+4$

5×4

d. 6×2

$2+2+2+2+2+2$

e. 4×6

$6+6+6+6$

f. 3×9

$9+9+9$

g. $h+h+h+h+h$

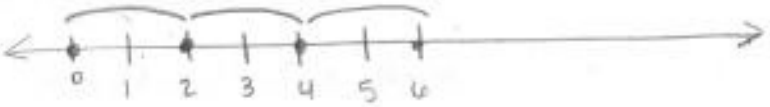
$5h$

h. $6y$

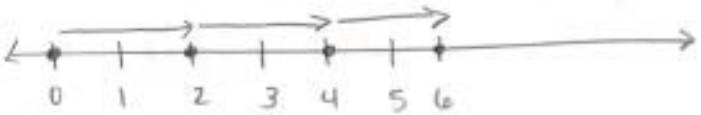
$y+y+y+y+y+y$

3. Roberto is not familiar with tape diagrams and believes that he can show the relationship of multiplication and addition on a number line. Help Roberto demonstrate that the expression 3×2 is equivalent to $2 + 2 + 2$ on a number line.

The first number line shows that there are 3 groups of 2, resulting in 6.



The second number line shows the sum of 2+2+2 resulting in 6.



Both expressions are equivalent.

4. Tell whether the following equations are true or false. Then, explain your reasoning.

a. $x + 6g - 6g = x$

True: Addition Identity

b. $2f - 4e + 4e = 2f$

True: Subtraction Identity

5. Write an equivalent expression to demonstrate the relationship between addition and multiplication.

a. $6+6+6+6+4+4+4$

$4 \times 4 + 3 \times 4$

b. $d+d+d+w+w+w+w+w$

$3d + 5w$

c. $a+a+b+b+b+c+c+c+c$

$2a + 3b + 4c$