SIMPLIFY EXPRESSIONS

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Like terms are the same kind of tile. We can group them together.

x x x + x x = 5x x x 1 1 1 = 2x + 3

x tiles and 1 tiles are different, so 2x + 3 cannot be made any simpler.

1 Write each as simply as you can.

a) x x + x x x = ☐

b) x x 1 + x 1 1 1 = ☐

c) x x x ~~x~~ 4x take away 1x = ☐

2 Write how many x tiles and y tiles there are altogether.

a)

x x x
x x x
x x x

3 lots of 3x = ☐

b)

y y y y
y y y y

2 lots of 4y = ☐

3 Write each term in the correct box.

3a 5 2b a 7b 9 4a

a terms	b terms	numbers

4 Use the number fact to help you simplify the expression.

a) 4 × 3 = ☐ so 4 × 3a = ☐

b) 12 ÷ 4 = ☐ so 12b ÷ 4 = ☐

SIMPLIFY EXPRESSIONS

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Add like terms:	4m + 2m = 6m	3x + 2y cannot be simplified
Multiply:	2a × 4 = 8a	$a \times a = a^2$ 2a × 3b = 6ab
Divide:	12x ÷ 3 = 4x	or $\frac{12x}{3} = 4x$

1 Simplify by collecting like terms.

a) 4m + 6m ☐ b) 9p – 2p ☐

c) 3x + 2y + 5x ☐ d) 7a + 4 – 2a + 1 ☐

2 Simplify.

a) 5 × 3y ☐ b) 2a × 4 ☐ c) m × m ☐

d) 3c × 2d ☐ e) 4x × 2x ☐ f) 6 × p × q ☐

3 Simplify.

a) 10x ÷ 2 ☐ b) $\frac{18y}{6}$ ☐

c) $\frac{8ab}{4}$ ☐ d) $\frac{9m}{m}$ ☐

4 Spot the mistakes.

a) Ravi writes 5m + 4n = 9mn. What has he done wrong?

.....

b) Mia writes 5y × 2y = 10y. Write the correct answer. ☐

SIMPLIFY EXPRESSIONS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Collect like terms: $5a + 3b - 2a \equiv 3a + 3b$. Multiply: $3x \times 4y \equiv 12xy$. Divide: $\frac{15x^2}{5x} \equiv 3x$

FLUENCY

1 Simplify fully.

a) $5k + 3h - 2k + h$ ____

b) $4y \times 5$ ____

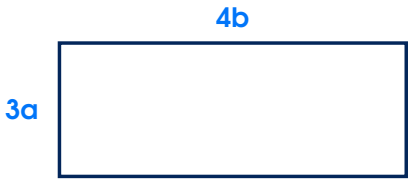
c) $3g \times 7g$ ____

d) $2r \times 3s \times r$ ____

e) $20pq \div 5q$ ____

f) $\frac{15t^2}{3t}$ ____

2 Write simplified expressions for this rectangle.



a) Area = ____

b) Perimeter = ____

REASONING

3 Jo and Ben simplify the same expression.

Jo says $\frac{8pq}{2p} \equiv 4q$. **Ben says** $\frac{8pq}{2p} \equiv 4pq$.

Who is right? Explain how you know.

.....

4 Write three different multiplications that simplify to $18ab$.

____ ____ ____

Use different numbers and letters in each one.

SIMPLIFY EXPRESSIONS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) a + a has the same value as a × a. ALWAYS SOMETIMES NEVER

b) 3p × 2 ≡ 6p ALWAYS SOMETIMES NEVER

c) 2x + 3y can be simplified to 5xy. ALWAYS SOMETIMES NEVER

d) x^2 is greater than 2x. ALWAYS SOMETIMES NEVER

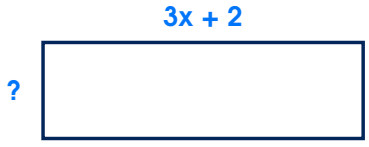
PROBLEM SOLVING

2 Complete the multiplication grid. Simplify each answer.

×	2a	3b
4		
$5a^2$		

3 This rectangle has length 3x + 2 and perimeter 10x + 6.

Find the width of the rectangle. _____



★ CHALLENGE FOR ALL

4 Simplify fully.

a) $\frac{6m \times 4m}{5m + 3m}$ _____

b) $\frac{9xy \times 2x}{6x}$ _____

c) Write your own fraction like these that simplifies to 2ab.

_____

STEP 3 · SIMPLIFY EXPRESSIONS

ANSWERS

BUILDING BLOCKS

1 a) 5x · b) 3x + 4 · c) 3x

2 a) 9x · b) 8y

3 a terms: 3a, a, 4a · b terms: 2b, 7b · numbers: 5, 9

4 a) 12, so 12a · b) 3, so 3b

SUPPORT

1 a) 10m · b) 7p · c) 8x + 2y · d) 5a + 5

2 a) 15y · b) 8a · c) m^2 · d) 6cd · e) $8x^2$ · f) 6pq

3 a) 5x · b) 3y · c) 2ab · d) 9

4 a) 5m and 4n are not like terms, so they cannot be added: 5m + 4n is already simplified · b) $10y^2$

CORE

1 a) 3k + 4h · b) 20y · c) $21g^2$ · d) $6r^2s$ · e) 4p · f) 5t

2 a) 12ab · b) 6a + 8b

3 Jo is right: 8 ÷ 2 = 4, p ÷ p = 1, so only q is left. Ben has not divided the p.

4 e.g. 9a × 2b, 3a × 6b, 18 × ab, 6ab × 3 (any three correct)

GREATER DEPTH

1 a) Sometimes: true for a = 0 or a = 2; false for a = 3 (6 and 9) · b) Always · c) Never · d) Sometimes: true for x = 3 (9 > 6), false for x = 1 (1 < 2)

2 4 × 2a = 8a, 4 × 3b = 12b, $5a^2 \times 2a = 10a^3$, $5a^2 \times 3b = 15a^2b$

3 Width = 2x + 1 (two lengths are 6x + 4, leaving 4x + 2 for two widths)

4 a) 3m · b) 3xy · c) e.g. $4a^2b \div 2a$, or 10ab ÷ 5 (any correct)