



Equivalent Expressions Distributive Property

Color-by-Number Bundle

6 Themed Pictures • 72 Problems • 144 Total (Basic + Advanced)

GRADE 6 MATH

6.EE.A.3

6.EE.A.4

6 SEASONAL THEMES

APPLE

PUMPKIN

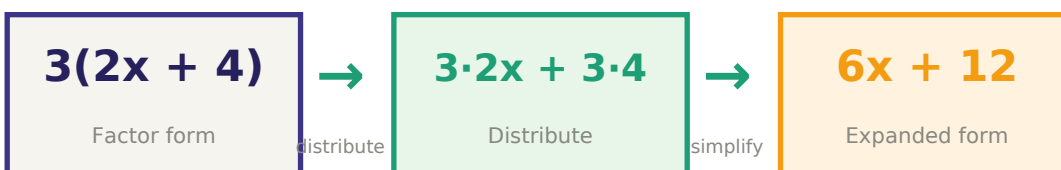
TURKEY

SNOWMAN

HEART

BUTTERFLY

- 12 Printable Color-by-Number Worksheets
- Complete Answer Keys with Colored Pictures
- Step-by-Step Solutions & Teaching Notes
- CCSS Alignment Chart & Anchor Chart
- Built-in Differentiation (Basic + Advanced)



Check: if $x=5 \rightarrow 3(10+4)=42$ and $6(5)+12=42$ ✓

Teacher Tip: Have students use colored pencils or highlighters to trace the multiplier as it “visits” each term inside the parentheses. This kinesthetic-visual reinforcement helps students who struggle with the abstract notation, especially multi-variable expressions like $4(2x + 3y + 1)$.

THREE-COLUMN WORKED EXAMPLES

Example A: Expansion

Problem: Expand $4(2x + 3)$

Step 1: Multiply 4 by each term inside the parentheses.

Step 2: $4 \cdot 2x = 8x$

Step 3: $4 \cdot 3 = 12$

Step 4: Combine: $8x + 12$

Answer: $8x + 12$

Check: $x=5 \rightarrow 4(13)=52$;

$8(5)+12=52$ ✓

Example B: Factoring

Problem: Factor $24x + 18y$

Step 1: Find the GCF of 24 and 18 $\rightarrow 6$.

Step 2: Divide each term by 6: $24x \div 6 = 4x$.

Step 3: $18y \div 6 = 3y$.

Step 4: Write 6 outside, $(4x + 3y)$ inside.

Answer: $6(4x + 3y)$

Check: $x=1, y=2 \rightarrow 24+36=60$;

$6(4+6)=60$ ✓

Example C: Combine Like Terms

Problem: Simplify $5x + 3y - 2x + 4y$

Step 1: Group x-terms together: $5x - 2x$.

Step 2: Group y-terms together: $3y + 4y$.

Step 3: Combine: $5x - 2x = 3x$.

Step 4: Combine: $3y + 4y = 7y$.

Answer: $3x + 7y$

Check: $x=2, y=1 \rightarrow$

$10+3-4+4=13$; $6+7=13$ ✓

Common Student Misconceptions

- 1. Multiplying only the first term.** Students write $3(2x + 4) = 6x + 4$ (forgetting 4×3). Reinforce: the multiplier must visit every term.
- 2. Sign errors with subtraction.** $5(2x - 7) \rightarrow 10x - 35$, not $10x - 7$. The negative sign travels with the term.
- 3. Factoring out too little.** For $24x + 18y$, stop at $6(4x + 3y)$, not $2(12x + 9y)$. Always ask: “Is there a larger common factor?”

PICTURE 1 — DISTRIBUTIVE PROPERTY — EXPANSION (BASIC)

Theme: Back-to-School (Apple) | **CCSS:** 6.EE.A.3 | **Skill:** Apply the distributive property to expand expressions

Directions: Solve each problem. Match your answer to the Color Key. Color the picture region with the matching problem number.

COLOR KEY — Match Your Answer to a Color

Red	Orange	Yellow	Green	Blue	Purple
#1: $6x + 12$ #7: $12x + 6$	#2: $2x + 10$ #8: $6x + 10$	#3: $12x + 4$ #9: $4x + 12$	#4: $5x + 10$ #10: $10x + 5$	#5: $12x + 18$ #11: $8x + 16$	#6: $7x + 7$ #12: $9x + 9$

1. Expand: $3(2x + 4)$

=
2. Expand: $2(x + 5)$

=
3. Expand: $4(3x + 1)$

=
4. Expand: $5(x + 2)$

=
5. Expand: $6(2x + 3)$

=
6. Expand: $7(x + 1)$

=
7. Expand: $3(4x + 2)$

=
8. Expand: $2(3x + 5)$

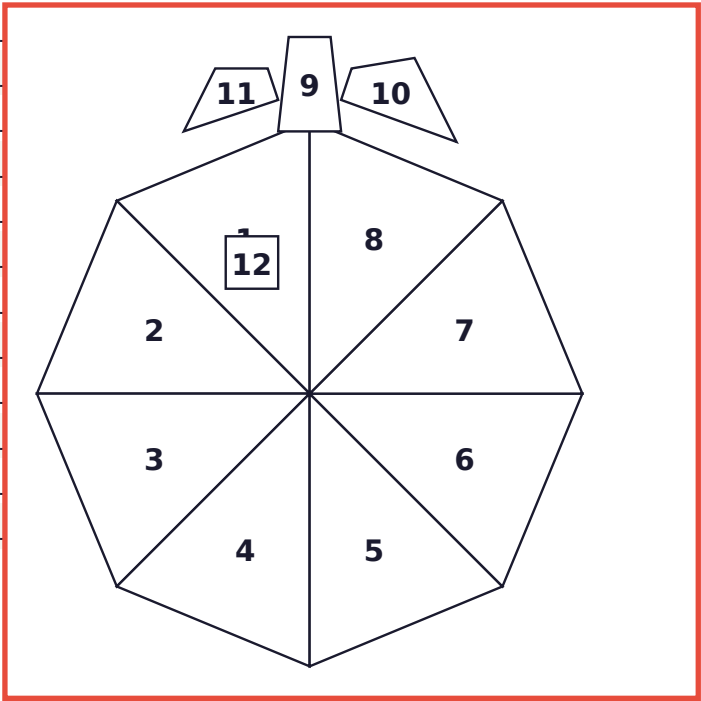
=
9. Expand: $4(x + 3)$

=
10. Expand: $5(2x + 1)$

=
11. Expand: $8(x + 2)$

=
12. Expand: $9(x + 1)$

=

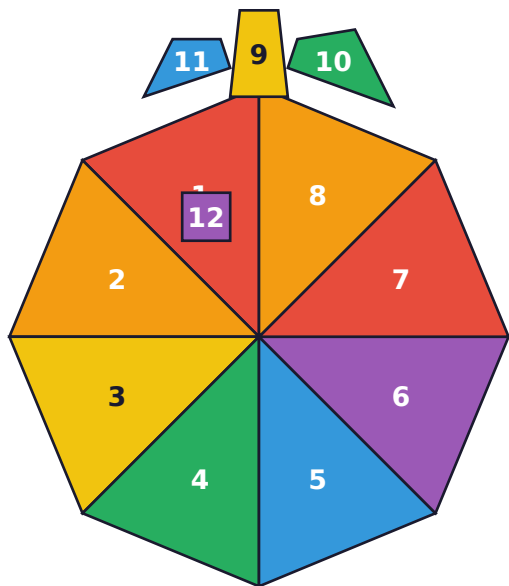


Skill Reminder — Distributive Property: Multiply the outside term by each term inside the parentheses. $a(b + c) = ab + ac$. Watch signs: $3(2x - 5) = 6x - 15$, not $6x + 15$.

Self-Check: Before coloring, verify each answer appears in the Color Key. If your answer is not listed, revisit your work. When the picture is fully colored, compare with a classmate — matching pictures confirm correct answers.

★ **Extension Challenge:** Create your own equivalent-expression problem that matches one of the unused color codes. Trade with a partner and solve each other's problems. If both your answers match the Color Key, you both earn bonus points!

ANSWER KEY — PICTURE 1: APPLE (Basic)



#	Problem	Answer	Color
1	Expand: $3(2x + 4)$	$6x + 12$	Red
2	Expand: $2(x + 5)$	$2x + 10$	Orange
3	Expand: $4(3x + 1)$	$12x + 4$	Yellow
4	Expand: $5(x + 2)$	$5x + 10$	Green
5	Expand: $6(2x + 3)$	$12x + 18$	Blue
6	Expand: $7(x + 1)$	$7x + 7$	Purple
7	Expand: $3(4x + 2)$	$12x + 6$	Red
8	Expand: $2(3x + 5)$	$6x + 10$	Orange
9	Expand: $4(x + 3)$	$4x + 12$	Yellow
10	Expand: $5(2x + 1)$	$10x + 5$	Green
11	Expand: $8(x + 2)$	$8x + 16$	Blue
12	Expand: $9(x + 1)$	$9x + 9$	Purple

STEP-BY-STEP SOLUTIONS (SELECTED PROBLEMS)

Problem 1: Expand: $3(2x + 4)$
 → **Answer:** $6x + 12$ (Red)

Problem 5: Expand: $6(2x + 3)$
 → **Answer:** $12x + 18$ (Blue)

Problem 9: Expand: $4(x + 3)$
 → **Answer:** $4x + 12$ (Yellow)

Teaching Notes for Apple: Watch for students who multiply only the first term. For $3(2x + 4y)$, they may write $6x + 4y$ instead of $6x + 12y$. Reinforce that the multiplier visits every term inside the parentheses. For the Advanced version, the negative sign in $5(3x - 2)$ must travel: $5 \times (-2) = -10$, so the answer is $15x - 10$.

PICTURE 2 — FACTORING WITH THE DISTRIBUTIVE PROPERTY (BASIC)

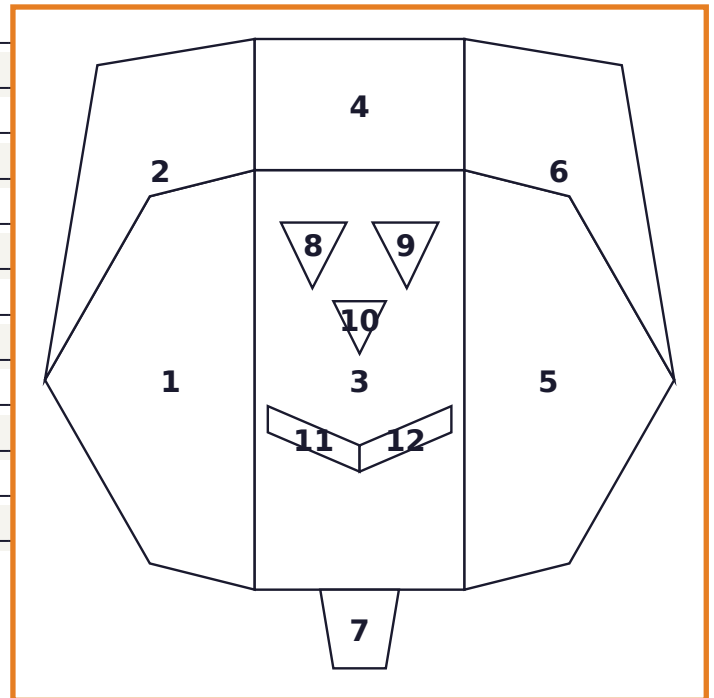
Theme: Halloween (Pumpkin) | **CCSS:** 6.EE.A.3 | **Skill:** Factor expressions using the GCF and distributive property

Directions: Solve each problem. Match your answer to the Color Key. Color the picture region with the matching problem number.

COLOR KEY — Match Your Answer to a Color

Red	Orange	Yellow	Green	Blue	Purple
#1: $6(x + 2)$ #7: $9(x + 3)$	#2: $4(x + 2)$ #8: $3(2x + 3)$	#3: $5(2x + 3)$ #9: $5(3x + 5)$	#4: $6(2x + 3)$ #10: $8(2x + 3)$	#5: $4(2x + 5)$ #11: $6(2x + 5)$	#6: $7(2x + 3)$ #12: $9(2x + 3)$

- | | | |
|------------------------|---|-------|
| 1. Factor: $6x + 12$ | = | _____ |
| 2. Factor: $4x + 8$ | = | _____ |
| 3. Factor: $10x + 15$ | = | _____ |
| 4. Factor: $12x + 18$ | = | _____ |
| 5. Factor: $8x + 20$ | = | _____ |
| 6. Factor: $14x + 21$ | = | _____ |
| 7. Factor: $9x + 27$ | = | _____ |
| 8. Factor: $6x + 9$ | = | _____ |
| 9. Factor: $15x + 25$ | = | _____ |
| 10. Factor: $16x + 24$ | = | _____ |
| 11. Factor: $12x + 30$ | = | _____ |
| 12. Factor: $18x + 27$ | = | _____ |



Skill Reminder — Factoring: Find the GCF of all terms, divide each term by the GCF, and place the GCF outside the parentheses. $ab + ac = a(b + c)$.

Self-Check: Before coloring, verify each answer appears in the Color Key. If your answer is not listed, revisit your work. When the picture is fully colored, compare with a classmate — matching pictures confirm correct answers.

★ **Extension Challenge:** Create your own equivalent-expression problem that matches one of the unused color codes. Trade with a partner and solve each other's problems. If both your answers match the Color Key, you both earn bonus points!

PICTURE 4 — PROPERTIES OF OPERATIONS (BASIC)

Theme: Winter (Snowman) | **CCSS:** 6.EE.A.3 | **Skill:** Apply properties of operations to write equivalent expressions

Directions: Solve each problem. Match your answer to the Color Key. Color the picture region with the matching problem number.

COLOR KEY — Match Your Answer to a Color

Red	Orange	Yellow	Green	Blue	Purple
#1: $3y$ #7: $5b$	#2: $4x$ #8: $6x$	#3: $3a$ #9: $5k$	#4: $5m$ #10: $6n$	#5: $7x$ #11: $5p$	#6: $3y$ #12: $4z$

1. Simplify: $y + y + y$

2. Simplify: $x + x + x + x$

3. Simplify: $2a + a$

4. Simplify: $3m + 2m$

5. Simplify: $4x + x + 2x$

6. Simplify: $5y - 2y$

7. Simplify: $b + b + b + b + b$

8. Simplify: $2x + 3x + x$

9. Simplify: $6k - k$

10. Simplify: $3n + n + 2n$

11. Simplify: $4p + p$

12. Simplify: $7z - 3z$
-
- Skill Reminder — Properties of Operations:** Use the commutative, associative, distributive, or identity property to rewrite expressions efficiently. $y + y + y = 3y$.
- Self-Check:** Before coloring, verify each answer appears in the Color Key. If your answer is not listed, revisit your work. When the picture is fully colored, compare with a classmate — matching pictures confirm correct answers.
- ★ **Extension Challenge:** Create your own equivalent-expression problem that matches one of the unused color codes. Trade with a partner and solve each other's problems. If both your answers match the Color Key, you both earn bonus points!
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PICTURE 5 — IDENTIFY EQUIVALENT EXPRESSIONS (BASIC)

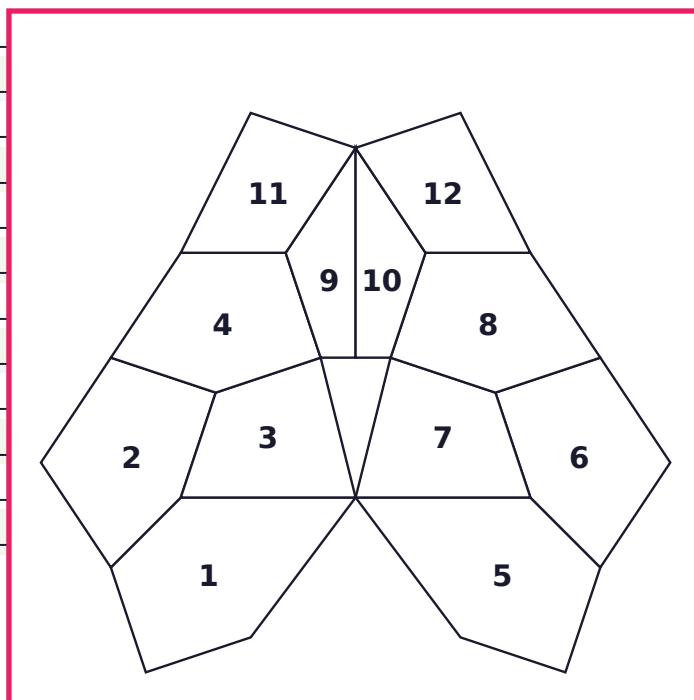
Theme: Valentine's Day (Heart) | **CCSS:** 6.EE.A.4 | **Skill:** Identify equivalent expressions by substitution

Directions: Solve each problem. Match your answer to the Color Key. Color the picture region with the matching problem number.

COLOR KEY — Match Your Answer to a Color

Red	Orange	Yellow	Green	Blue	Purple
#1: 10 #7: 10	#2: 11 #8: 11	#3: 17 #9: 17	#4: 18 #10: 18	#5: 13 #11: 13	#6: 14 #12: 14

- If $x=2$: $3x+4 = ?$ = _____
- If $x=3$: $2x+5 = ?$ = _____
- If $x=5$: $4x-3 = ?$ = _____
- If $x=4$: $5x-2 = ?$ = _____
- If $x=6$: $2x+1 = ?$ = _____
- If $x=4$: $3x+2 = ?$ = _____
- If $x=1$: $6x+4 = ?$ = _____
- If $x=5$: $x+6 = ?$ = _____
- If $x=8$: $2x+1 = ?$ = _____
- If $x=6$: $3x = ?$ = _____
- If $x=4$: $3x+1 = ?$ = _____
- If $x=5$: $2x+4 = ?$ = _____



Skill Reminder — Equivalent Expressions: Substitute the same value into both expressions. If the results match for several test values, the expressions are equivalent.

Self-Check: Before coloring, verify each answer appears in the Color Key. If your answer is not listed, revisit your work. When the picture is fully colored, compare with a classmate — matching pictures confirm correct answers.

★ **Extension Challenge:** Create your own equivalent-expression problem that matches one of the unused color codes. Trade with a partner and solve each other's problems. If both your answers match the Color Key, you both earn bonus points!

WHAT'S INSIDE

THE FULL RESOURCE

31 pages • 144 problems • Basic + Advanced • 6.EE.A.3 + 6.EE.A.4

A complete Grade 6 color-by-number bundle for equivalent-expression practice.

Includes teacher-facing guidance, printable practice, answer keys, and an anchor chart.



APPLE

BACK-TO-SCHOOL

Distributive
Property -
Expansion

**BASIC + ADVANCED
ANSWER KEY**



PUMPKIN

HALLOWEEN

Factoring with
the Distributive
Property

**BASIC + ADVANCED
ANSWER KEY**



TURKEY

THANKSGIVING

Combining Like
Terms

**BASIC + ADVANCED
ANSWER KEY**



SNOWMAN

WINTER

Properties of
Operations

**BASIC + ADVANCED
ANSWER KEY**



HEART

VALENTINE'S DAY

Identify
Equivalent
Expressions

**BASIC + ADVANCED
ANSWER KEY**



BUTTERFLY

SPRING

Mixed Review -
All Skills

**BASIC + ADVANCED
ANSWER KEY**

INCLUDED BEYOND THE WORKSHEETS

12 Printable color-by-number worksheets

1 CCSS alignment chart + anchor chart

12 Answer keys with colored pictures

Selected step-by-step solutions + teaching notes

6 seasonal themes across the year: Back-to-School, Halloween, Thanksgiving, Winter, Valentine's Day, Spring