



Tier 3

Intervention Lessons

7.EE.1a

Learning Target: I will add and subtract linear expressions

Readiness for 7.EE.4a: Solve equations with more than one step

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Tier 3 Intervention Planning Guide

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Recommended Actions	
Beginning (5 min.)	<ul style="list-style-type: none"> ➤ Review the learning target with the whole group ➤ Ask each student to set a goal for the day based on their previous Quick Check Score ➤ Have each student use a highlighter to plot their goal for the day
Middle (15 min.)	<ul style="list-style-type: none"> ➤ Model solving a word problem – “I do” (<i>Sessions 1, 3 and 6 only</i>) ➤ Guided Practice – “We do” <p>Sessions 1 and 2: Add and subtract linear expressions using algebra tiles</p> <p>Sessions 3, 4 and 5: Add and subtract linear expressions using drawings</p> <p>Sessions 6, 7 and 8: Add and subtract linear expressions by identifying and combining like-terms</p>
End (10 min.)	<ul style="list-style-type: none"> ➤ Bring the students back together. ➤ Ask students to reflect on their progress towards the learning target <ul style="list-style-type: none"> ○ What did I learn today about adding and subtracting linear expressions? ○ How confident do you feel about adding and subtracting linear expressions on my own? (Thumbs up, down, or sideways) ➤ Assess each student’s progress using the next Quick Check form ➤ Guide students to self-correct their Quick Check ➤ Guide students to chart their progress in their Growth Chart <ul style="list-style-type: none"> ○ If not using Delta Math lessons, record the activity in the table ➤ Collect each student’s Quick Check and Growth Chart
After Session 6	<ul style="list-style-type: none"> ➤ Differentiation Options: <ul style="list-style-type: none"> ○ Allow students who met the learning goal to work independently while others do the guided practice during the next session ○ Exit students who met the learning goal for a third time ➤ Problem solve with a team to plan additional support for students who do not meet the learning goal within 8 sessions

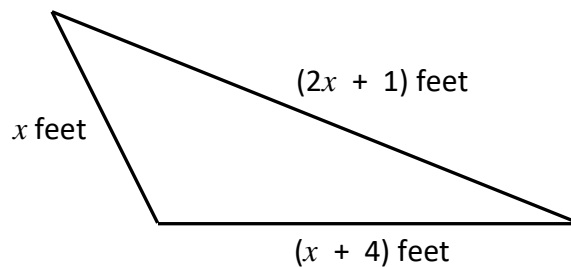


Session 1: Modeling (I Do)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Joan needs to build a fence around her triangular shaped garden to keep out the rabbits. The length of one side of the fence is an unknown number of feet (x), the second is one more foot than two times the length of the first side ($2x + 1$), and the third is 4 feet longer than the length of the first side ($x + 4$). The perimeter can be calculated using the algebraic expression: $(x) + (2x + 1) + (x + 4)$. Find the simplified expression for the perimeter of the fence. Then, find the length of fence that would be needed when the unknown, x , is equal to 3 feet.

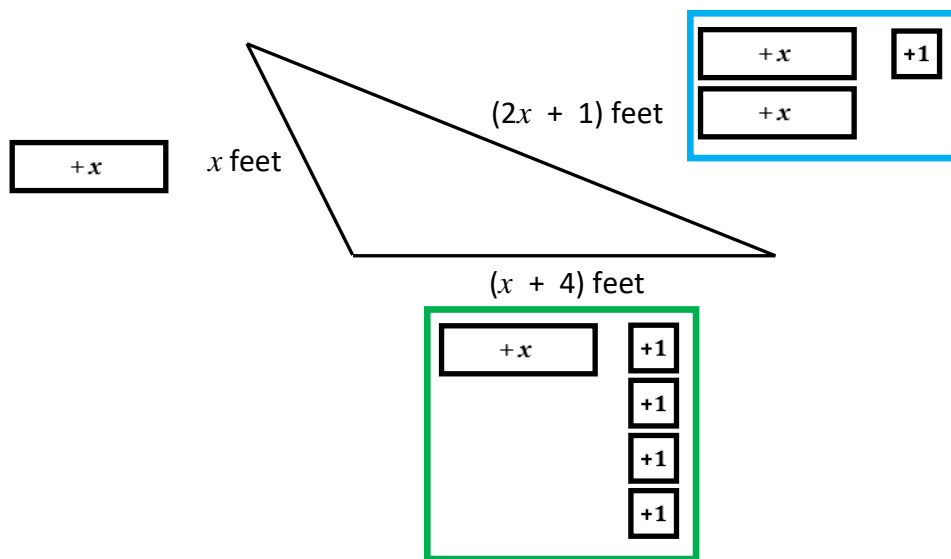


Session 1: Modeling (*I Do – Visual Support*)

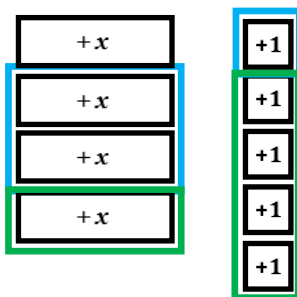
Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

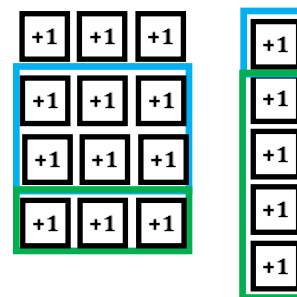
Joan needs to build a fence around her triangular shaped garden to keep out the rabbits. The length of one side of the fence is an unknown number of feet (x), the second is one more foot than two times the length of the first side ($2x + 1$), and the third is 4 feet longer than the length of the first side ($x + 4$). The perimeter can be calculated using the algebraic expression: $(x) + (2x + 1) + (x + 4)$. Find the simplified expression for the perimeter of the fence. Then, find the length of fence that would be needed when the unknown, x , is equal to 3 feet.



Perimeter = $4x + 5$



When $x = 3$ feet, the perimeter is 17 feet



$12 + 5$

Note: Color-coding is provided to help the interventionist make connections between the numbers, symbols and pictures. It may also help students who struggle to make similar connections.

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Joan needs to build a fence around her triangular shaped garden to keep out the rabbits...
Find the simplified expression for the perimeter of the fence and then find how much fence would be needed when the unknown, x , is equal to 3 feet.

I am going to think aloud to model solving this problem.

Your job is to watch, listen, think and ask questions.

First, it is important to know what the problem is about.

The problem is about a fence around Joan's garden.

Second, I need to determine what I need to find.

I need to find a simplified expression for the perimeter of Joan's fence and the length of fence that would be needed when the unknown, x , is equal to 3 feet.

Third, I need to determine what I know.

I know the shape of the garden is a triangle and its perimeter can be calculated using the algebraic expression $(x) + (2x + 1) + (x + 4)$.

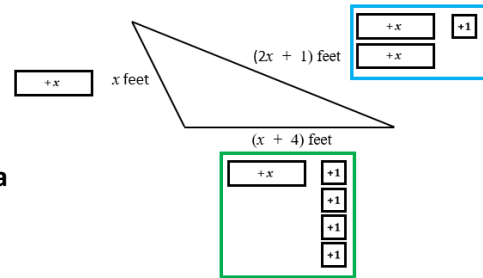
(Write the word "Perimeter" below the drawing and point to each unknown side length " $(x) + (2x + 1) + (x + 4)$ ".)

Fourth, I need to figure out what I can try.

I am going to use algebra tiles to help me model this problem.

I will place a positive x -tile next to the " x " side, 2 positive x -tiles and a positive 1-tile next to the " $2x + 1$ " side and a positive x -tile and 4 positive 1-tiles next to the " $x + 4$ " side.

(Place the algebra tiles next to each side.)



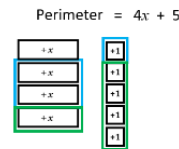
To simplify, I can combine the "like" tiles...there are 4 positive x -tiles.

(Combine the $+x$ -tiles and write " $= 4x$ " next to the word "Perimeter".)

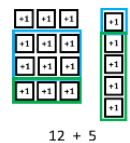
There are 5 positive 1-tiles.

(Combine the $+1$ -tiles and write " $+ 5$ " next to the " $4x$ ".)

The simplified expression for the perimeter is $4x + 5$.



When $x = 3$ feet, the perimeter is 17 feet



When x is equal to 3 feet...I am going to replace each positive x -tile with 3 positive 1-tiles.

(Write "When $x = 3$ feet" and replace the tiles.)

Now I have 3, 6, 9, 12... (Point to the groups of 3 while skip counting... and write "12" below the tiles.)

And 12 plus the 5 is 17 positive 1-tiles. (Point to the group of 5 and write "+5" and "the perimeter is 17 feet")

Joan needs 17 feet of fence when x is equal to 3 feet.

Last, I need to make sure that my answer makes sense.

This makes sense because I modeled each side length using algebra tiles. Then, I combined the like terms to find the simplified expression. Then, I replaced each x tile with 3 positive 1 tiles to find the actual perimeter.



Modeling & Guided Practice Cards

Use for Problem 1 $(3x + 2) + (x + 5)$	Use for Problem 2 $2x + (4 - 5x)$
Use for Problem 3 $(3x + 2) - (x + 5)$	Use for Problem 4 $2x - (4 - 5x)$
Use for Problem 5 $(3x + 2) + (1 + x)$	Use for Problem 6 $(2x + 3) - x + (4x + 1)$
Use for Problem 7 $(3x - 2) - (1 + x)$	Use for Problem 8 $(2x + 3) - x - (4x + 1)$
Use for Problem 9 $(2x + 3) + x - (4x + 1)$	Use for Problem 10 $(4x + 1) - (5 - 2x) + (2 + x)$
Use for Modelling $(x) + (2x + 1) + (x + 4)$	



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 1: Guided Practice (We Do)

Materials:

- Algebra Tiles (1 set on p. 13: 20 +1-tiles, 20 -1-tiles, 16 +x-tiles and 16 +x-tiles per student)
- Expression mat (1 per student)

We Do Together: (Teacher Actions)

- Say, build and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

1. $(3x + 2) + (x + 5)$	2. $2x + (4 - 5x)$
3. $(3x + 2) - (x + 5)$	4. $2x - (4 - 5x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 1: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to add or subtract each linear expression.

<p>5.</p> $(3x + 2) + (1 + x)$	<p>6.</p> $(2x + 3) - x + (4x + 1)$
<p>7.</p> $(3x - 2) - (1 + x)$	<p>8.</p> $(2x + 3) - x - (4x + 1)$
<p>9.</p> $(2x + 3) + x - (4x + 1)$	<p>10.</p> $(4x + 1) - (5 - 2x) + (2 + x)$

Learning Target: I will add and subtract linear expressions

Session 1: Guided Practice (We Do – Teacher Notes)

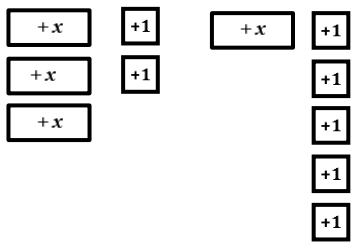
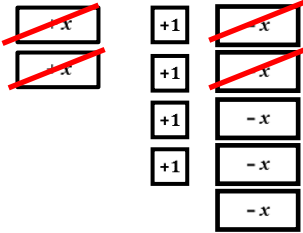
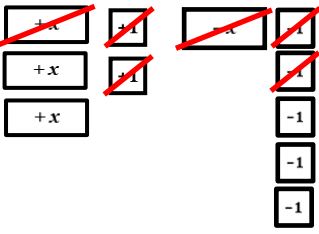
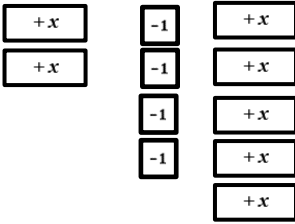
Materials:

- Algebra Tiles (1 set on p. 13: 20 +1-tiles, 20 -1-tiles, 16 +x-tiles and 16 -x-tiles per student)
- Expression mat (1 per student)

We Do Together: (Teacher Actions)

- Say, build and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

<p>1.</p> $(3x + 2) + (x + 5) = 4x + 7$ 	<p>2.</p> $2x + (4 - 5x)$ $2x + (4 + -5x) = -3x + 5$ 
<p>3.</p> $(3x + 2) - (x + 5)$ $(3x + 2) + (-x + -5) = x + -3$ 	<p>4.</p> $2x - (4 - 5x)$ $2x - (4 + -5x)$ $2x + (-4 + 5x) = 7x + -4$ 

- Re-write the linear expression using the “add the opposite to subtract” strategy.
 - Inside the parentheses
 - Outside the parentheses
- Combine like terms by adding or taking away zero pairs

Algebra Tiles (2 sets of positive tiles)

Directions: Provide each student one set of positive and negative tiles.

Note: $+x^2$ tiles and $-x^2$ tiles are included, but will not be used in 7.EE.1a

+1	+1	+1	+1	+1	+x	+x	+x	+x	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
$+x^2$		$+x^2$		$+x^2$		$+x^2$		$+x^2$	
$+x^2$		$+x^2$		$+x^2$		$+x^2$		$+x^2$	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
+1	+1	+1	+1	+1	+x	+x	+x	+x	
$+x^2$		$+x^2$		$+x^2$		$+x^2$		$+x^2$	
$+x^2$		$+x^2$		$+x^2$		$+x^2$		$+x^2$	



Algebra Tiles (2 sets of negative tiles)

Directions: Provide each student one set of positive and negative tiles.

Note: $+x^2$ tiles and $-x^2$ tiles are included, but will not be used in 7.EE.1a

-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
$-x^2$		$-x^2$		$-x^2$		$-x^2$		$-x^2$
$-x^2$		$-x^2$		$-x^2$		$-x^2$		$-x^2$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
-1	-1	-1	-1	-1	$-x$	$-x$	$-x$	$-x$
$-x^2$		$-x^2$		$-x^2$		$-x^2$		$-x^2$
$-x^2$		$-x^2$		$-x^2$		$-x^2$		$-x^2$





Session 1: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?

- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form A

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

1.

$$(x + 4) + (3x + 9)$$

2.

$$(2x - 6) + (4x - 4)$$

3.

$$(6x + 3) + (5x + 2)$$

4.

$$(5x - 6) - (x + 2)$$

5.

$$(2x + 4) - (7x - 1)$$

6.

$$(4x + 8) - (6x - 9)$$

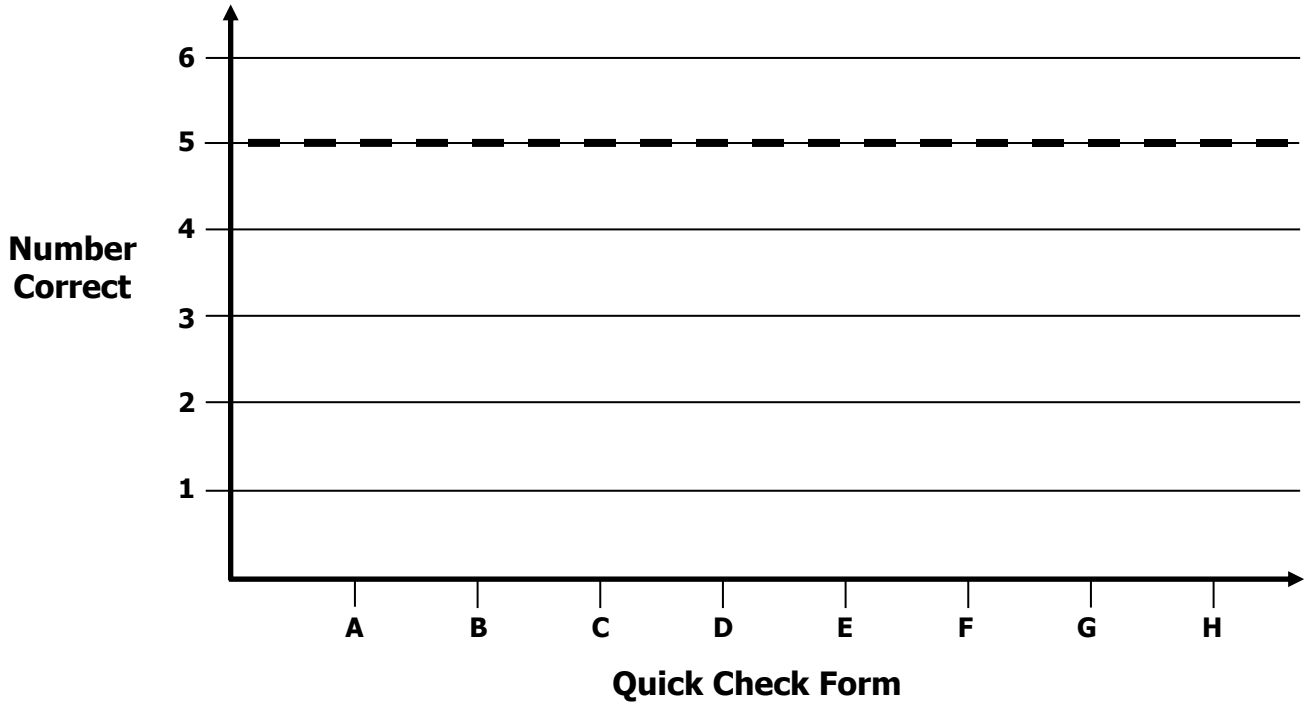


Growth Chart

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Goal: 5 out of 6 correct



Intervention	Date	Score
Guided Review		



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 2: Guided Practice (We Do)

Materials:

- Algebra Tiles (1 set on p. 13: 20 +1-tiles, 20 -1-tiles, 16 +x-tiles and 16 +x-tiles per student)
- Expression mat (1 per student)

We Do Together: (Teacher Actions)

- Say, build and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

1. $(4x + 2) + (x + 5)$	2. $3x + (4 - 5x)$
3. $(5x + 2) - (x + 3)$	4. $4x - (3 - 5x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 2: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to add or subtract each linear expression.

<p>5.</p> $(5x + 2) + (1 + x)$	<p>6.</p> $(3x + 2) - x + (4x + 1)$
<p>7.</p> $(4x - 2) - (1 + x)$	<p>8.</p> $(5x + 3) - x - (4x + 1)$
<p>9.</p> $(3x + 4) + x - (4x + 1)$	<p>10.</p> $(5x + 1) - (4 - 2x) + (3 + x)$



Session 2: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?

- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form B

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(4x + 1) + (x + 6)$	<p>2.</p> $(3x - 5) + (4x - 6)$
<p>3.</p> $(2x + 8) + (5x + 2)$	<p>4.</p> $(8x + 10) - (3x + 1)$
<p>5.</p> $(7x - 6) - (5x - 2)$	<p>6.</p> $(3x + 10) - (6x - 4)$

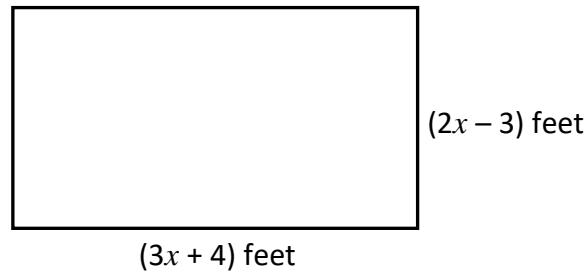


Session 3: Modeling (I Do)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Tony needs to build a fence around a rectangular pond. The width of the pond is three feet less than two times an unknown number of feet $(2x - 3)$. And, the length of the pond is four feet more than three times the same unknown number of feet $(3x + 4)$. The perimeter can be calculated using the algebraic expression: $(2x - 3) + (3x + 4) + (2x - 3) + (3x + 4)$. Find the simplified expression for the perimeter of the fence. Then, find the length of fence that would be needed when the unknown, x , is equal to 5 feet.

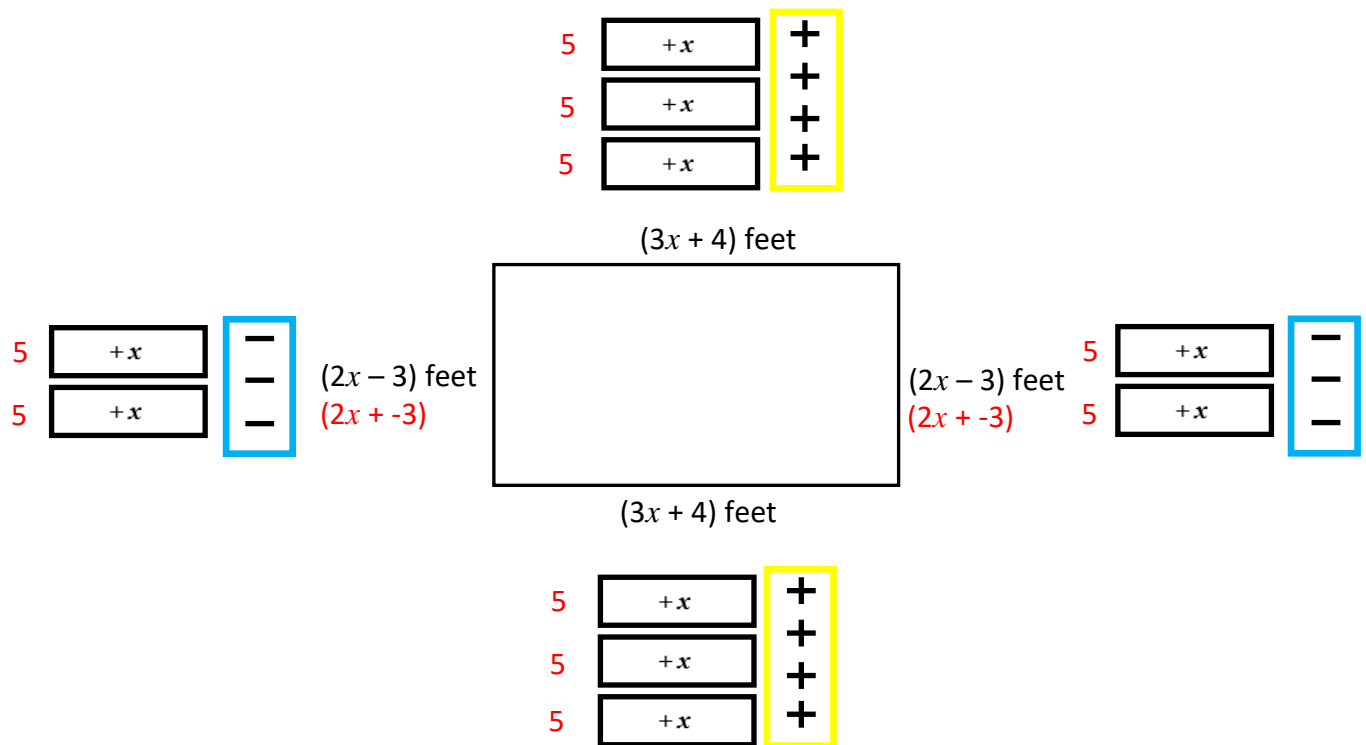


Session 3: Modeling (I Do – Visual Support)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Tony needs to build a fence around a rectangular pond. The width of the pond is three feet less than two times an unknown number of feet ($2x - 3$). And, the length of the pond is four feet more than three times the same unknown number of feet ($3x + 4$). The perimeter can be calculated using the algebraic expression: $(2x - 3) + (3x + 4) + (2x - 3) + (3x + 4)$. Find the simplified expression for the perimeter of the fence. Then, find the length of fence that would be needed when the unknown, x , is equal to 5 feet.



$$\begin{aligned} \text{Perimeter} &= 10x + 8 + -6 \\ &= 10x + 2 \end{aligned}$$

When $x = 5$ feet, the perimeter is 32 feet

$$\begin{aligned} &10(5) + 2 \\ &50 + 2 \\ &52 \end{aligned}$$

Note: Color-coding is provided to help the interventionist make connections between the numbers, symbols and pictures. It may also help students who struggle to make similar connections.



Session 3: Modeling (I Do - Teacher Notes)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Tony needs to build a fence around a rectangular pond...

I am going to think aloud to model solving this problem.

Your job is to watch, listen, think and ask questions.

First, it is important to know what the problem is about.

The problem is about a fence around a rectangular pond.

Second, I need to determine what I need to find.

I need to find a simplified expression for the perimeter of the fence and the length of fence that would be needed when the unknown, x , is equal to 5 feet.

Third, I need to determine what I know.

I know the shape of the pond is a rectangle and its perimeter can be calculated using the algebraic expression $(2x - 3) + (3x + 4) + (2x - 3) + (3x + 4)$.

(Write the word "Perimeter" below the drawing and point to the length " $(3x + 4)$ " and width " $(2x - 3)$ ".)

Fourth, I need to figure out what I can try.

I am going to draw algebra tiles to help me model this problem.

Before I begin, I need to change my subtraction signs to an equivalent of adding the opposite to help me see the math.

(Point to the subtraction sign in the width.)

Subtracting 3 is equal to adding negative 3, so I need to rewrite each width as $2x + -3$. (Rewrite each width.)

Now I will draw 3 positive x -tiles and 4 plus signs next to each length and 2 positive x -tiles and 3 negative signs next to each width.

(Draw the algebra tiles next to each side.)

To simplify, I can combine the "like" tiles...there are 10 positive x -tiles.

(Point to the $+x$ -tiles and write " $= 10x$ " next to the word "Perimeter".)

There are 8 positive and 6 negative signs...

(Point to the positive and negative signs and write " $+ 8 + -6$ " next to the " $4x$ ".)

Which gives 6 zero pairs and a value of 2 positives...so the simplified expression for the perimeter is $10x + 2$.

(Write " $= 10x + 2$ ".)

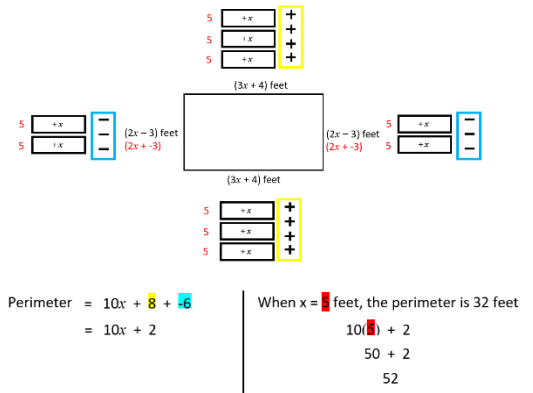
When x is equal to 5 feet...it is like replacing each positive x -tile with 5 plus signs.

(Write "When $x = 5$ feet" and write "5" next to each positive x -tile.)

Now I have 10 groups of 5 (Write " $10(5) + 2$ ".)

Last, I need to make sure that my answer makes sense.

This makes sense because I changed all subtraction to adding the opposite and then modeled each length and width by drawing algebra tiles. Then, I combined the like terms to find the simplified expression. Then, I replaced each x tile with 5 to find the actual perimeter.





Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 3: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Say, draw and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

1. $(3x + 2) + (x + 3)$	2. $2x + (5 - 4x)$
3. $(2x + 3) - (x + 4)$	4. $4x - (2 - 6x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 3: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to draw and add or subtract each linear expression.

5. $(4x + 2) + (1 + x)$	6. $(3x + 5) - x + (2x + 3)$
7. $(4x - 2) - (1 + x)$	8. $(3x + 5) - x - (2x + 3)$
9. $(4x + 2) + 3x - (2x + 3)$	10. $(3x + 1) - (4 - 2x) + (2 + x)$

Learning Target: I will add and subtract linear expressions

Session 3: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Say, draw and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

<p>1.</p> $(3x + 2) + (x + 3) = 4x + 5$	<p>2.</p> $2x + (5 - 4x)$ $2x + (5 + -4x) = -2x + 5$
<p>3.</p> $(2x + 3) - (x + 4)$ $(2x + 3) + (-x + -4) = x + -4$	<p>4.</p> $4x - (2 - 6x)$ $4x - (2 + -6x)$ $4x + (-2 + 6x) = 10x + -2$

- Re-write the linear expression using the “add the opposite to subtract” strategy.
 - Inside the parentheses
 - Outside the parentheses
- Combine like terms by adding or taking away zero pairs



Session 3: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?

- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form C

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(2x + 5) + (x + 5)$	<p>2.</p> $(2x - 4) + (3x - 2)$
<p>3.</p> $(6x + 1) + (x + 2)$	<p>4.</p> $(10x + 4) - (6x + 2)$
<p>5.</p> $(8x + 7) - (3x - 4)$	<p>6.</p> $(2x - 9) - (6x - 5)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 4: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Say, draw and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

<p>1.</p> $(4x + 1) + (x + 3)$	<p>2.</p> $2x + (5 - 3x)$
<p>3.</p> $(4x + 1) - (x + 4)$	<p>4.</p> $3x - (4 - 6x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 4: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to draw and add or subtract each linear expression.

5. $(2x + 3) + (1 + x)$	6. $(3x + 1) - x + (2x + 3)$
7. $(2x - 3) - (1 + x)$	8. $(3x + 1) - x - (2x + 3)$
9. $(2x + 3) + 3x - (2x + 4)$	10. $(2x + 1) - (5 - 3x) + (2 + x)$



Session 4: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?

- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form D

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(2x + 1) + (4x + 5)$	<p>2.</p> $(2x - 3) + (5x - 4)$
<p>3.</p> $(7x + 1) + (x + 3)$	<p>4.</p> $(8x + 4) - (6x + 5)$
<p>5.</p> $(3x + 8) - (5x - 4)$	<p>6.</p> $(3x - 9) - (x - 5)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 5: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Say, draw and add or subtract each linear expression.

(Both partners build the original expression and only one rearranges their tiles to simplify the expression.)

1. $(3x + 2) + (x + 1)$	2. $2x + (3 - 4x)$
3. $(4x + 3) - (x + 5)$	4. $5x - (2 - 3x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 5: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to draw and add or subtract each linear expression.

5. $(5x + 2) + (1 + x)$	6. $(4x + 3) - x + (3x + 2)$
7. $(5x - 2) - (1 + x)$	8. $(4x + 3) - x - (3x + 2)$
9. $(5x + 2) + 3x - (2x + 7)$	10. $(4x + 1) - (4 - 3x) + (3 + x)$



Session 5: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?
- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form E

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(x + 4) + (3x + 9)$	<p>2.</p> $(2x - 6) + (4x - 4)$
<p>3.</p> $(6x + 3) + (5x + 2)$	<p>4.</p> $(5x - 6) - (x + 2)$
<p>5.</p> $(2x + 4) - (7x - 1)$	<p>6.</p> $(4x + 8) - (6x - 9)$



Session 6: Modeling (I Do)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

On the Delta Math readiness screener, Isabelle selected the following answer choice. Is she correct? If not, why do you think she chose her answer?

Find the simplified equivalent expression.

$$(4x + 3) - (x - 2)$$

- $5x - 1$ $3x + 1$ $5x + 5$ $3x + 5$



Session 6: Modeling (I Do – Visual Support)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

On the Delta Math readiness screener, Isabelle selected the following answer choice. Is she correct? If not, why do you think she chose her answer?

Find the simplified equivalent expression. *Add the opposite to subtract*

$$\begin{aligned} & (4x + 3) - (x - 2) \\ & (4x + 3) - (x + -2) \\ & \underline{(4x + 3)} + \underline{(-x + 2)} \end{aligned}$$

- $5x - 1$ $3x + 1$ $5x + 5$ $3x + 5$

$$\begin{array}{r} 4x + -x + 3 + 2 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 3x + 5 \end{array}$$

- Re-write the linear expression using the “add the opposite to subtract” strategy.
 - Inside the parentheses
 - Outside the parentheses
- Group like terms
- Combine like terms by adding or taking away zero pairs



Session 6: Modeling (I Do - Teacher Notes)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

On the Delta Math readiness screener, Isabelle selected the following answer choice. Is she correct? If not, why do you think she chose her answer?

First, it is important to know what the problem is about.

This problem is about Isabelle answering a problem on a Delta Math readiness screener.

Second, I need to determine what I need to find.

I need to find if Isabelle chose the correct answer. And if she was not correct, I need to consider why she made the choice that she did.

Third, I need to determine what I know.

I know that Isabelle chose “ $3x + 1$ ” as the simplified answer and I know that the negative sign in front of a number, variable or parentheses is equal to adding the opposite of the number, variable or what is inside the parentheses”. (Write “Add the opposite to subtract”)

Fourth, I need to figure out what I can try.

Find the simplified equivalent expression. *Add the opposite to subtract*

$$\begin{aligned}
 &(4x + 3) - (x - 2) \\
 &(4x + 3) - (x + -2) \\
 &\underline{(4x + 3)} + \underline{(-x + 2)}
 \end{aligned}$$

I am going to try writing equivalent expressions by adding the opposite to subtract...beginning inside the parentheses.

(Draw an arrow pointing to the subtraction sign inside the parentheses.)

$4x + 3$ minus the parentheses does not change...

(Write “ $(4x + 3) - ($ ”.)

- $5x - 1$
 $3x + 1$
 $5x + 5$
 $3x + 5$

And x minus 2 inside the parentheses has the same value as x plus the opposite of 2, which is x plus negative 2.

(Write “ $x + -2$ ”.)

$$\begin{array}{r}
 4x + -x + 3 + 2 \\
 \swarrow \quad \searrow \quad \swarrow \quad \searrow \\
 3x \quad + \quad 5
 \end{array}$$

Next, I will change the subtraction on the outside of the parentheses to adding the opposite of $x + -2$.

(Write “ $(4x + 3) +$ ”.)

And the opposite of $x + -2$ is negative x plus a positive 2. (Write “ $+ (-x + 2)$ ”.)

Now that all terms are being added together... (Point to the addition signs.)

I can regroup the like terms... $4x$ and negative x are like terms as well as 3 and 2. (Write “ $4x + -x + 3 + 2$ ”.)

4 positive x 's plus a negative x has one zero pair and is equal to 3 positive x 's...

(Draw two number bonds and write “ $3x$ ”.)

And 3 plus 2 is equal to 5... (Draw two number bonds and write “ $+ 5$ ”.)

This is not the answer choice that Isabelle chose...therefore, she must have selected an incorrect answer choice.

I think that Isabelle chose her answer because she only noticed one of the negative sign and subtracted 3 minus 2 to get 1 instead of adding the opposite...3 plus 2 which is 5.

Last, I need to make sure that my answer makes sense.

I found that Isabelle was not correct. It makes sense because I thought about the problem as rewriting all subtraction signs as adding the opposite and then combined like terms to find the correct answer... $3x + 5$.



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 6: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Add or subtract each linear expression.

<p>1.</p> $(7x + 2) + (x + 5)$	<p>2.</p> $2x + (4 - 8x)$
<p>3.</p> $(8x + 2) - (x + 5)$	<p>4.</p> $6x - (9 - 5x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 6: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to add or subtract each linear expression.

<p>5.</p> $(3x + 2) + (1 + x)$	<p>6.</p> $(2x + 3) - 5x + (4x + 1)$
<p>7.</p> $(3x - 2) - (1 + x)$	<p>8.</p> $(2x + 3) - 5x - (4x + 1)$
<p>9.</p> $(2x + 3) + 5x - (4x + 1)$	<p>10.</p> $(4x + 1) - (5 - 2x) + (2 + x)$



Learning Target: I will add and subtract linear expressions

Session 6: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Add or subtract each linear expression.

<p>1.</p> $(7x + 2) + (x + 5)$ $7x + x + 2 + 5$ $8x + 7$	<p>2.</p> $2x + (4 - 8x)$ $2x + 4 + -8x$ $2x + -8x + 4$ $-6x + 4$
<p>3.</p> $(8x + 2) - (x + 5)$ $(8x + 2) + (-x + -5)$ $8x + -x + 2 + -5$ $7x + -3$	<p>4.</p> $6x - (9 - 5x)$ $6x - (9 + -5x)$ $6x + (-9 + 5x)$ $6x + 5x + -9$ $11x + -9$

- Re-write the linear expression using the “add the opposite to subtract” strategy.
 - Inside the parentheses
 - Outside the parentheses
- Group like terms
- Combine like terms by adding or taking away zero pairs



Session 6: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?

- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form F

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(4x + 1) + (x + 6)$	<p>2.</p> $(3x - 5) + (4x - 6)$
<p>3.</p> $(2x + 8) + (5x + 2)$	<p>4.</p> $(8x + 10) - (3x + 1)$
<p>5.</p> $(7x - 6) - (5x - 2)$	<p>6.</p> $(3x + 10) - (6x - 4)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 7: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Add or subtract each linear expression.

<p>1.</p> $(8x + 2) + (x + 7)$	<p>2.</p> $3x + (6 - 8x)$
<p>3.</p> $(9x + 2) - (x + 7)$	<p>4.</p> $6x - (4 - 9x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 7: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to add or subtract each linear expression.

<p>5.</p> $(7x + 2) + (5 + x)$	<p>6.</p> $(2x + 3) - 8x + (6x + 1)$
<p>7.</p> $(7x - 2) - (5 + x)$	<p>8.</p> $(2x + 3) - 8x - (6x + 1)$
<p>9.</p> $(2x + 3) + 9x - (4x + 1)$	<p>10.</p> $(4x + 1) - (8 - 6x) + (2 + x)$



Session 7: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?

- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form G

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(2x + 5) + (x + 5)$	<p>2.</p> $(2x - 4) + (3x - 2)$
<p>3.</p> $(6x + 1) + (x + 2)$	<p>4.</p> $(10x + 4) - (6x + 2)$
<p>5.</p> $(8x + 7) - (3x - 4)$	<p>6.</p> $(2x - 9) - (6x - 5)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 8: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Add or subtract each linear expression.

<p>1.</p> $(8x + 2) + (x + 5)$	<p>2.</p> $8x + (4 - 8x)$
<p>3.</p> $(9x + 2) - (x + 5)$	<p>4.</p> $7x - (9 - 5x)$



Name _____ Date _____

Learning Target: I will add and subtract linear expressions

Session 8: Guided Practice (We Do - Continued)

You Do Together: (As a class, or in small groups)

- Students take turns leading to add or subtract each linear expression.

<p>5.</p> $(3x + 9) + (1 + 5x)$	<p>6.</p> $(6x + 3) - 7x + (4x + 1)$
<p>7.</p> $(3x - 9) - (1 + 5x)$	<p>8.</p> $(6x + 3) - 7x - (4x + 1)$
<p>9.</p> $(2x + 3) + 9x - (4x + 5)$	<p>10.</p> $(6x + 1) - (7 - 2x) + (2 + x)$



Session 8: Self-Reflection

Learning Target: I will add and subtract linear expressions

Briefly discuss student responses

- What did I learn today about adding and subtracting algebraic expressions?
- How confident do I feel about adding and subtracting algebraic expressions on my own? (*Thumbs up, down, or sideways*)



Quick Check - Form H

Name _____ Date _____

Learning Target: I will add and subtract linear expressions.

Directions: Write each simplified equivalent expression. (Work time: 4 minutes)

<p>1.</p> $(2x + 1) + (4x + 5)$	<p>2.</p> $(2x - 3) + (5x - 4)$
<p>3.</p> $(7x + 1) + (x + 3)$	<p>4.</p> $(8x + 4) - (6x + 5)$
<p>5.</p> $(3x + 8) - (5x - 4)$	<p>6.</p> $(3x - 9) - (x - 5)$



Independent Practice (You Do)

Learning Target: I will add and subtract linear expressions

Readiness for solving equations with more than one step

Title of Game: Play “**Add and Subtract Linear Expressions Match-up!**”

Number of Players: 2

Objective: To match all of your “**Problem**” cards to the equivalent “**Answer**” cards.

Materials:

- 1 set of **Problem** and **Answer** cards per group
- 1 recording sheet per player

Set-up:

- Deal all 10 **Problem** cards face down in a row.
- Deal 5 **Answer** cards face up to each player.

Directions:

- **Player 1** goes first
 - Take a card from the row of face down **Problem** cards and turn it face up
 - Write the problem on the recording sheet
 - And, find the answer in simplest form
- If **Player 1** has the **Answer** card, place it face up on top of the **Problem** card, take both cards and say:
“The like-terms in the expression are ____.”
- If **Player 1** does not have the answer to the **Problem** card, turn the **Problem** card back over.
- **Players 1 and 2** alternate turns. The **winner** is the first player to match all 5 of their cards.



Problem Cards (Set A)

Storage Suggestions: Copy the **Problem (Set A)** cards and **Answer (Set A)** cards in two different colors.
Store 1 set of each in a sealable bag for each pair of students.

Set A ₁	$(3x + 5) + (x + 1)$ Set A	$(3x + 5) + (x - 1)$ Set A	$(3x + 5) - (x + 1)$ Set A	$(3x + 5) - (x - 1)$ Set A
	$(5x - 3) + (x - 1)$ Set A	$(5x - 3) - (x + 1)$ Set A	$(5x - 3) + (x + 1)$ Set A	$(5x - 3) - (x - 1)$ Set A
	$(x + 5) + (x - 2)$ Set A	$(x + 5) - (x - 1)$ Set A		
Set A ₂	$(3x + 5) + (x + 1)$ Set A	$(3x + 5) + (x - 1)$ Set A	$(3x + 5) - (x + 1)$ Set A	$(3x + 5) - (x - 1)$ Set A
	$(5x - 3) + (x - 1)$ Set A	$(5x - 3) - (x + 1)$ Set A	$(5x - 3) + (x + 1)$ Set A	$(5x - 3) - (x - 1)$ Set A
	$(x + 5) + (x - 2)$ Set A	$(x + 5) - (x - 1)$ Set A		



Answer Cards (Set A)

Storage Suggestions: Copy the **Problem (Set A)** cards and **Answer (Set A)** cards in two different colors.
Store 1 set of each in a sealable bag for each pair of students.

Set A ₁	$4x + 6$ Set A	$4x + 4$ Set A	$2x + 6$ Set A	$2x + 4$ Set A
	$6x - 4$ Set A	$4x - 4$ Set A	$6x - 2$ Set A	$4x - 2$ Set A
	$2x + 3$ Set A	6 Set A		
Set A ₂	$4x + 6$ Set A	$4x + 4$ Set A	$2x + 6$ Set A	$2x + 4$ Set A
	$6x - 4$ Set A	$4x - 4$ Set A	$6x - 2$ Set A	$4x - 2$ Set A
	$2x + 3$ Set A	6 Set A		



Problem Cards (Set B)

Storage Suggestions: Copy the **Problem (Set B)** cards and **Answer (Set B)** cards in two different colors.
Store 1 set of each in a sealable bag for each pair of students.

Set B ₁	$(7x + 9) + (x + 1)$ Set B	$(7x + 9) + (x - 1)$ Set B	$(7x + 9) - (x + 1)$ Set B	$(7x + 9) - (x - 1)$ Set B
	$(9x - 7) + (x - 1)$ Set B	$(9x - 7) - (x + 1)$ Set B	$(9x - 7) + (x + 1)$ Set B	$(9x - 7) - (x - 1)$ Set B
	$(x + 9) + (x - 7)$ Set B	$(x + 9) - (x - 7)$ Set B		
Set B ₂	$(7x + 9) + (x + 1)$ Set B	$(7x + 9) + (x - 1)$ Set B	$(7x + 9) - (x + 1)$ Set B	$(7x + 9) - (x - 1)$ Set B
	$(9x - 7) + (x - 1)$ Set B	$(9x - 7) - (x + 1)$ Set B	$(9x - 7) + (x + 1)$ Set B	$(9x - 7) - (x - 1)$ Set B
	$(x + 9) + (x - 7)$ Set B	$(x + 9) - (x - 7)$ Set B		



Answer Cards (Set B)

Storage Suggestions: Copy the **Problem (Set B)** cards and **Answer (Set B)** cards in two different colors.
Store 1 set of each in a sealable bag for each pair of students.

Set B ₁	$8x + 10$ Set B	$8x + 8$ Set B	$6x + 10$ Set B	$6x + 8$ Set B
	$10x - 8$ Set B	$8x - 8$ Set B	$10x - 6$ Set B	$8x - 6$ Set B
	$2x + 2$ Set B	16 Set B		
Set B ₂	$8x + 10$ Set B	$8x + 8$ Set B	$6x + 10$ Set B	$6x + 8$ Set B
	$10x - 8$ Set B	$8x - 8$ Set B	$10x - 6$ Set B	$8x - 6$ Set B
	$2x + 2$ Set B	16 Set B		



Questions for Solving Word Problems

Q₁

What is the problem about?

Q₂

What do I need to find?

Q₃

What do I know?

Q₄

What can I try?

Q₅

Does my answer make sense?



Steps for Solving Word Problems

Q1. What is the problem about?

Q2. What do I need to find?

Q3. What do I know?

Q4. What can I try?

Q5. Does my answer make sense?