DELTA MATH
RtI PROGRAM

7th Grade
Tier 2 Intervention Lessons

Readiness Standard 3 – 6.EE.2a

Learning Target: I will translate algebraic expressions between words and symbols

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

Table of Contents

IES Recommendations for Tier 2 and 3 intervention lessons:

2. Instructional materials for students receiving interventions should focus intensely on in-depth treatment of whole numbers in kindergarten through grade 5 and on rational numbers in grades 4 through 8. These materials should be selected by committee.	**Low**
3. Instruction during the intervention should be explicit and systematic. This includes providing models of proficient problem solving, verbalization of thought processes, guided practice, corrective feedback, and frequent cumulative review.	**Strong**
4. Interventions should include instruction on solving word problems that is based on common underlying structures.	**Strong**
5. Intervention materials should include opportunities for students to work with visual representations of mathematical ideas and interventionists should be proficient in the use of visual representations of mathematical ideas.	**Moderate**
6. Interventions at all grade levels should devote about 10 minutes in each session to building fluent retrieval of basic arithmetic facts.	**Moderate**
7. Monitor the progress of students receiving supplemental instruction and other students who are at risk.	**Low**
8. Include motivational strategies in tier 2 and tier 3 interventions.	**Low**

(Institute of Educational Sciences, Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools, 2009, p. 6)

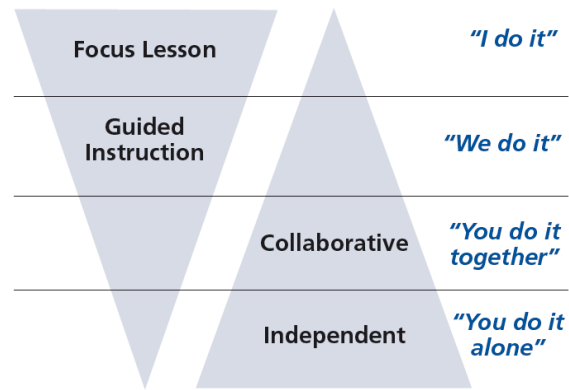# Gradual release of responsibility model

Teacher Responsibility

Focus Lesson	*"I do it"*
Guided Instruction	*"We do it"*
Collaborative	*"You do it together"*
Independent	*"You do it alone"*

Figure 1

(Dr. Douglas Fisher, Effective Use of the Gradual Release of Responsibility Model)

Planning Guide: Session 1

7th Grade - Readiness Standard 3 – 6.EE.2a

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

	Recommended Actions

Beginning
(15 min.)
	<u>Review</u> the readiness standard with the intervention group using the **Guided Review**
	
	   o Introduce the learning target and why it is important for future learning
	
	   o Read each question on the Guided Review and ask students to share what they remember from the previous school year.

Middle
(5 min.)
	➢ Ask students to <u>reflect</u> on their progress towards the learning target
	
	   o What did I remember about the learning target?
	
	   o What did I learn today about the learning target?
	
	   o How confident do I feel about doing the learning target on my own?

End *(10 min.)*	➢ <u>Assess</u> each student's progress using **Quick Check – Form A** ➢ Guide students to self-correct their **Quick Check – Form A** ➢ Guide students to <u>chart their progress</u> by recording the date and Quick Check score in their **Growth Chart** ➢ Collect each student's Quick Check and Growth Chart

After	➢ Create sub-groups to differentiate the middle of sessions 2 through 8
	
	   o Group 1 – Include students who <u>did not</u> meet the learning goal
	
	   o Group 2 – Include students who met or exceeded the learning goal

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

1.

Which expression represents the phrase?

The product of x and 5, plus 2

○ $2x + 5$ ○ $5(x + 2)$ ○ $5x + 2$ ○ $x + 5 + 2$

2.

Which expression represents the phrase?

4 less than 6 times x

○ $4x - 6$ ○ $6(x - 4)$ ○ $6(4 - x)$ ○ $6x - 4$

3.

Which expression represents the phrase?

2 times the quantity of x plus 7

○ $7(x + 2)$ ○ $2(x + 7)$ ○ $2x + 7$ ○ $7x + 2$

7ᵗʰ Grade Winter Guided Review

Readiness Standard 3 - 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

1.

Which expression represents the phrase?

The product of x and 6, decreased by 2

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

2.

Which expression represents the phrase?

3 more than 5 times x

○ $3x + 5$ ○ $5x + 3$ ○ $5(x + 3)$ ○ $3(5 + x)$

3.

Which expression represents the phrase?

4 times the quantity of x minus 6

○ $6x - 4$ ○ $6(x - 4)$ ○ $4x - 6$ ○ $4(x - 6)$

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

1.

Which expression represents the phrase?

The product of x and 3, increased by 4

○ $4x + 3$ ○ $3(x + 4)$ ○ $3x + 4$ ○ $x + 3 + 4$

2.

Which expression represents the phrase?

5 less than 8 times x

○ $8x - 5$ ○ $5x - 8$ ○ $8 - 5x$ ○ $8(x - 5)$

3.

Which expression represents the phrase?

7 times the difference of x and 3

○ $3x - 7$ ○ $3(x - 7)$ ○ $7x - 3$ ○ $7(x - 3)$

Session 1: Self-Reflection

Learning Target: I will translate algebraic expressions between words and symbols

Briefly discuss student responses

➢ What did I remember about translating algebraic expressions between words and symbols?

➢ What did I learn today about translating algebraic expressions?

➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form A

7th Grade - Readiness Standard 3 – 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

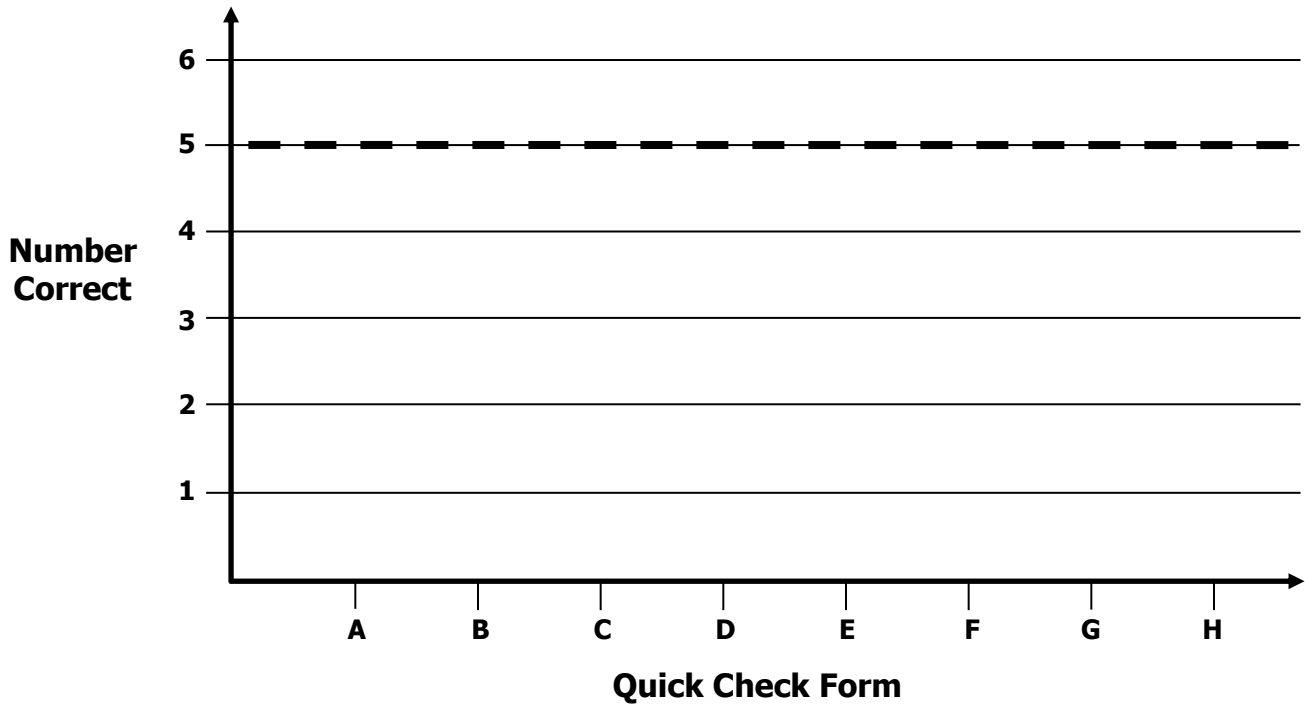|	
1. The sum of x and 6, times 4 _____	**2.** 7 more than the product of 6 and x _____
3. 9 less than 4 times x _____	**4.** The quotient of x and 10, plus 2 _____
5. 3 times the quantity of x plus 5 _____	**6.** The product of 5 and x, minus 9 _____

Growth Chart

7th Grade - Readiness Standard 3 – 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Goal: 5 out of 6 correct

Intervention	Date	Score
Session 1:		
Session 2:		
Session 3:		
Session 4:		
Session 5:		
Session 6:		
Session 7:		
Session 8:		

Planning Guide: Sessions 2 Through 8

7th Grade - Readiness Standard 3 – 6.EE.2a

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

	Recommended Actions	
Beginning (5 min.)	➢ Review the learning target with the whole group and ask each student to set a goal.	
Middle (15 min.)	**Group 1:** Students who scored below the learning goal on the previous Quick Check. ➢ Model solving a word problem – "I do" ➢ Guided Practice – "We do" **Session 2:** Translate algebraic expressions between words and symbols using algebra tiles. **Session 3:** Translate algebraic expressions between words and symbols using drawings. **Session 4:** Translate algebraic expressions between words and symbols using structure in the Translation Guide on page 10.	**Group 2:** *(Students who met the learning goal)* ➢ Independent practice – "You do alone" **Activity:** *Words and Symbols Match-Up!* *(Look for additional activities in 6th grade core instruction resources.)*

End (10 min.)	➢ Bring the students back together.
	➢ Ask students to reflect on their progress towards the learning target
	    o What did I learn today about translating algebraic expressions?
	    o How confident do you feel about translating algebraic 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**
	    o If not using Delta Math lessons, record the activity in the table
	➢ Collect each student's **Quick Check** and **Growth Chart**	

After	➢ Regroup students to differentiate the middle of sessions 3 through 8
	    o Promote students who met the learning goal to group 2
	    o Exit students who met the learning goal for a third time
	➢ Problem solve with a team to plan additional support for students who did not exit	

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

> Lisa is planning a birthday party. She would like to give a gift bag to each of her 4 guests and each bag will hold a mystery number of trinkets. Let the variable x represent the mystery number of trinkets in each gift bag. Write an algebraic expression to represent the total number of trinkets needed for all gift bags.

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

Lisa is planning a birthday party. She would like to give a gift bag to each of her 4 guests and each bag will hold a mystery number of trinkets. Let the variable x represent the mystery number of trinkets in each gift bag. Write an algebraic expression to represent the total number of trinkets needed for all gift bags.

Bag 1
$+x$

Bag 2
$+x$

4 Groups of $x = 4x$

Bag 3
$+x$

Bag 4
$+x$

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

> Lisa is planning a birthday party. She would like to give a gift bag to each of her 4 guests and each bag will hold a mystery number of trinkets. Let the variable x represent the mystery number of trinkets in each gift bag. Write an algebraic expression to represent the total number of trinkets needed for all gift bags.
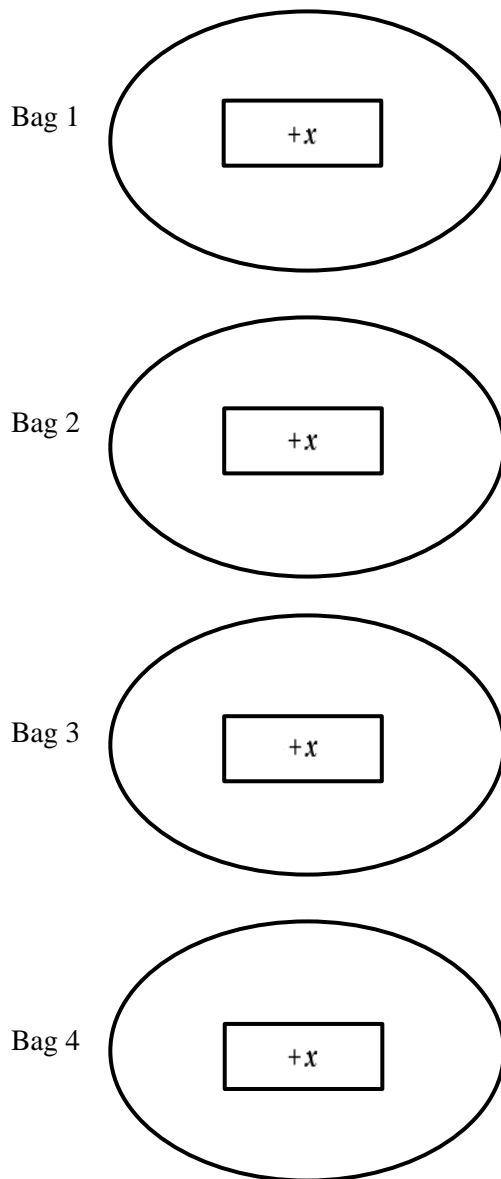
I am going to think aloud to model solving this problem.

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

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

This problem is about Lisa planning a birthday party.

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

I need to find an algebraic expression to represent the total number of trinkets needed for all gift bags.

Third, I need to determine what I know.

I know she needs to build 4 gift bags and each bag will hold a mystery number of trinkets, called x.

I also know that an algebraic expression is a phrase that contains at least a number, a variable and an operation.

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

I am going to use algebra tiles and this reference sheet to help me create an algebraic expression.

I will draw an oval to represent each bag that Lisa needs to fill.
(Draw and label 4 ovals)

Since each bag will contain a mystery number of trinkets, called x…
I need to place an x-tile in each bag.
(Place an x-tile in each bag.)

I see 4 groups of x…which I know is a multiplication situation.
(Write "4 groups of x" on the paper and point to the multiplication row of the translation chart.)

The example in the multiplication row shows that I can write 4 groups of x using symbols as $4x$.
(Point to the phrase "4 groups of x" in the multiplication row of the translation chart.)

Therefore, since the total number of trinkets Lisa needs is 4 groups of x, I can rewrite it using symbols as $4x$.
(Write "$= 4x$" next to the phrase "4 groups of x"

Bag 1 $+x$

Bag 2 $+x$

4 Groups of $x = 4x$

Bag 3 $+x$

Bag 4 $+x$
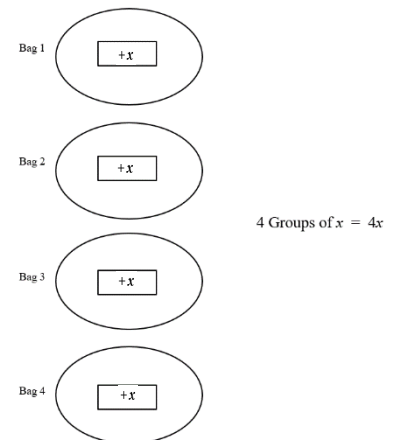
Last, I need to make sure that my answer makes sense.

I found that Lisa will need a total of $4x$ trinkets. This makes sense because I modeled the situation using algebra tiles and referred to the translation sheet to see how the situation can be represented using symbols.

Translation Guide

7th Grade - Readiness Standard 3 – 6.EE.2a

	Words	Phrases	Pictures	Symbols
Addition	*Add* Plus Sum More Increased Added	**Add** x and 5 x **plus** 5 The **sum** of x and 5 5 **more** than x x **increased** by 5 5 **added** to x	 x 5	$x + 5$
Subtraction	*Subtract* Minus Less Decreased Subtracted Difference	**Subtract** 4 from 6 6 **minus** 4 4 **less than** 6 6 **decreased** by 4 4 **subtracted** from 6 The **difference** of 6 and 4	 *The difference is 2*	$6 - 4$
Multiplication	*Multiply* Times Product Twice Doubled	**Multiply** x and 3 3 **times** x The **product** of x and 3 **Twice** as much of x The value of x is **doubled** *(Not Shown)*	 *3 groups of x*	$3x$ $2x$
Division	*Divide* Divided Quotient *Per*	**Divide** x by 3 x **divided** by 3 The **quotient** of x and 3 *Miles **per** hour*	 $\frac{x}{3}$ *The answer to a division problem may be represented as the size of each equal part.*	$x \div 3$ or $\frac{x}{3}$ *miles ÷ hours* or $\frac{miles}{hours}$
Grouping with ( )	*Quantity*	4 times the **quantity of** x plus 3 4 times the **sum** of x and 3 3 times the **quantity of** x minus 4 3 times the **difference** of x and 4 *(Picture Not Shown)*	 *4 groups of x + 3*	$4(x + 3)$ $3(x - 4)$
Equality	*Equals* Equal Equivalent Same Value As	x **equals** 4 x **is equal to** 4 x is **equivalant** to 4 x has the **same value as** 4	Equation Mat 	$x = 4$

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 2: Guided Practice (We Do)

Materials:

- ➢ Algebra Tiles (1 set on p. 14: 20 +1s and 16 +x's per student)
- ➢ Expression mat (1 per student)
- ➢ Translation Guide

We Do Together: (Teacher Actions)

- ➢ Label the operations and special groupings. Then, build and write the algebraic expression using symbols.

1. 5 less than 9 _____	**2.** The sum of x and 3 _____
3. 2 times the quantity of 4 plus x _____	**4.** The difference of 5 and 2 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 2: Guided Practice (We Do - Continued)

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

➢   Students take turns leading to say, build and write each algebraic expression using symbols.

5. 5 more than x _____	**6.** The difference of 7 and 3 _____
7. 3 times the quantity of x plus 2 _____	**8.** The product of x and 4 _____
9. 2 times the quantity of 1 plus x _____	**10.** 4 less than the quantity of 2 times x _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 2: Guided Practice (We Do – Teacher Notes)

Materials:

➢ Algebra Tiles (1 set on p. 14: 20 +1s and 16 +x's per student)

➢ Expression mat (1 per student)

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Label the operations and special groupings. Then, build and write the algebraic expression using symbols.

1. *subtract* 5 less than 9 [+1][+1][+1][+1][+1] [+1][+1][+1][+1] 9 − 5 _____	**2.** *add* The sum of x and 3 [+x] [+1][+1][+1] x + 3 _____
3. *multiply* *add* 2 times the quantity of (4 plus x) [+1][+1][+1][+1] [+x] [+1][+1][+1][+1] [+x] 2(4 + x) _____	**4.** *subtract* The difference of 5 and 2 5 [+1][+1][+1][+1][+1] 2 [+1][+1] *The difference is 3* 5 − 2 _____

Algebra Tiles (2 sets of positive tiles)

7th Grade - Readiness Standards 3, 4, 5 and 6 – 6.EE.2a, 6.EE.2c, 6.EE.4, 6.EE.7

Directions: Provide each student one set of positive tiles.

Note: $+x^2$ tiles are included, but will not be used 6.EE.2a and 6.EE.7

+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	$+x$	$+x$	$+x$	$+x$

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

+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	$+x$	$+x$	$+x$	$+x$

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

Modeling & Guided Practice Cards

7th Grade - Readiness Standard 3 – 6.EE.2a

Use for Problem 1 5 less than 9	Use for Problem 2 The sum of x and 3
Use for Problem 3 2 times the quantity of 4 plus x	Use for Problem 4 The difference of 5 and 2
Use for Problem 5 5 more than x	Use for Problem 6 The difference of 7 and 3
Use for Problem 7 3 times the quantity of x plus 2	Use for Problem 8 The product of x and 4
Use for Problem 9 2 times the quantity of 1 plus x	Use for Problem 10 4 less than the quantity of 2 times x

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

> ➢ What did I learn today about translating algebraic expressions?

> ➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The product of x and 2, plus 4 _____	**2.** The sum of x and 2, increased by 5 _____
3. 7 less than twice x _____	**4.** 9 increased by the sum of x and 6 _____
5. 7 times the quantity of 4 minus x _____	**6.** The quotient of 5 and x, plus 9 _____

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

Lisa is planning a birthday party. She would like to give a gift bag to each of her 3 guests and each bag will hold 2 more than a mystery number of trinkets. Let the variable x represent the mystery number of trinkets in each gift bag. Write an algebraic expression to represent the total number of trinkets needed for all gift bags.

Learning Target: I will translate algebraic expressions between words and symbols

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Lisa is planning a birthday party. She would like to give a gift bag to each of her 3 guests and each bag will hold 2 more than a mystery number of trinkets. Let the variable x represent the mystery number of trinkets in each gift bag. Write an algebraic expression to represent the total number of trinkets needed for all gift bags.

Bag 1

$+x$ **+ +**

Bag 2

$+x$ **+ +**

3 Groups of x + 2 = $3(x+2)$

Bag 3

$+x$ **+ +**

Session 3: Modeling *(I Do - Teacher Notes)*

7th Grade - Readiness Standard 3 – 6.EE.2a

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

> Lisa is planning a birthday party. She would like to give a gift bag to each of her 3 guests and each bag will hold 2 more than a mystery number of trinkets. Let the variable x represent the mystery number of trinkets in each gift bag. Write an algebraic expression to represent the total number of trinkets needed for all gift bags.
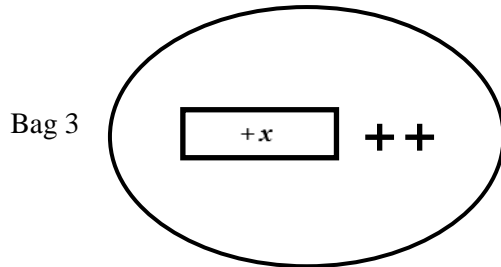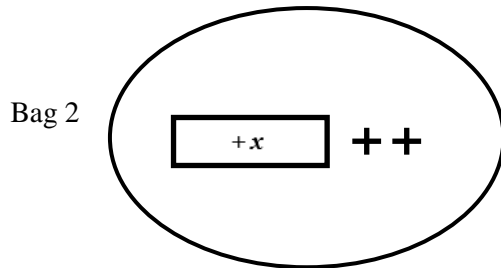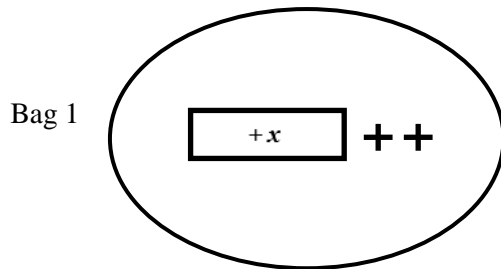
I am going to think aloud to model solving this problem.

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

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

This problem is about Lisa planning a birthday party.

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

I need to find an algebraic expression to represent the total number of trinkets needed for all gift bags.

Third, I need to determine what I know.

I know she needs to build 3 gift bags and each bag will hold 2 more than a mystery number of trinkets, called x.

I also know that an algebraic expression is a phrase that contains at least a number, a variable and an operation.

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

I am going to draw algebra tiles and use this reference sheet to help me create an algebraic expression.
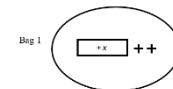
I will draw an oval to represent each bag that Lisa needs to fill.
(Draw and label 3 ovals)
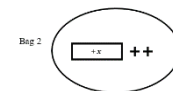
**Since each bag will contain 2 more than a mystery number of trinkets, called x...
I need to represent an x-tile and 2 "+1" tiles in each bag with a drawing.**
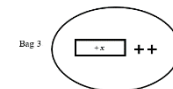
I will use a rectangle labeled with a positive x to represent an x -tile and 2 "plus signs" to represent the 2 "+1" tiles
(Draw the x-tile and 2 "+"s in each bag.)

I see 3 groups of $x + 2$...which I know is a multiplication situation.
(Write "3 groups of x + 2" on the paper and point to the multiplication row of the translation chart.)

The example in the multiplication row shows that I can write 3 groups of "x plus 2" using parentheses.
*(Point to the phrase "3 groups of x + 2" in the multiplication row of the translation chart…
 and write "= $3(x + 2)$" next to the phrase "3 groups of x + 2")*

Bag 1 $\boxed{+x}$ ++

Bag 2 $\boxed{+x}$ ++

Bag 3 $\boxed{+x}$ ++

3 Groups of $x + 2 = 3(x + 2)$

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

I found that Lisa will need a total of 3 times the quantity of $(x + 2)$ trinkets.
(Point to $3(x + 2)$" on the Modeling paper.)

This makes sense because I modeled the situation by drawing algebra tiles and referred to the translation sheet to see how the situation can be represented using symbols.

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 3: Guided Practice (We Do)

Materials:

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Label the operations and special groupings. Then, draw and write the algebraic expression using symbols.

1. The sum of x and 3, times 2 _____	**2.** 4 more than the product of 5 and x _____
3. The difference of 5 and 2 _____	**4.** The quotient of $2x$ and 3 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 3: Guided Practice (We Do - Continued)

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

➢ Students take turns leading to say, draw and write each algebraic expression using symbols.

5. 2 times the quantity of x plus 4 _____	**6.** The difference of x and 3, increased by 2 _____
7. The product of 3 and x _____	**8.** 3 more than twice x _____
9. 2 times the difference of 5 and 3 _____	**10.** The quotient of x and 4 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

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

Materials:

➢   Translation Guide

We Do Together: (Teacher Actions)

➢   Label the operations and special groupings. Then, draw and write the algebraic expression using symbols.

1. *add* *multiply* The sum of $(x$ and $3)$ times 2 $\boxed{+x}$ **+ + +** $\boxed{+x}$ **+ + +** $\underline{\quad\quad 2(x + 3) \quad\quad}$	**2.** *add* *multiply* 4 more than the product of 5 and x $\boxed{+x}$ $\boxed{+x}$ $\boxed{+x}$ **+ + + +** $\boxed{+x}$ $\boxed{+x}$ $\underline{\quad 5x + 4 \quad}$
3. *Subtract* The difference of 5 and 2 **+ + + + +** **+ +** $\boxed{}$ $\underline{\quad\quad 5 - 2 \quad\quad}$	**4.** *divide* The quotient of $2x$ and 3 $\boxed{+x}$ $\boxed{+x}$ *The answer to a division problem may be represented as the size of each equal part.* $\dfrac{2x}{3}$ $\underline{\quad\quad\quad\quad}$

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

> What did I learn today about translating algebraic expressions?

> How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form C

7th Grade - Readiness Standard 3 – 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The difference of x and 9, times 4 _____	**2.** 6 more than the product of 10 and x _____
3. 9 less than x times 4 _____	**4.** The sum of x and 2, divided by 4 _____
5. 6 times the quantity of 2 plus x _____	**6.** The quotient of 5 and x, minus 9 _____

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

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

Which expression represents the phrase?

2 times the quantity of x plus 7

○ $7(x + 2)$ ○ $2(x + 7)$ ● $2x + 7$ ○ $7x + 2$

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

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

Which expression represents the phrase?

multiply   *add*

2 times the <u>quantity</u> of $(x$ plus $7)$

$2 (x + 7)$

○ $7(x + 2)$ ○ $2(x + 7)$ ● $2x + 7$ ○ $7x + 2$
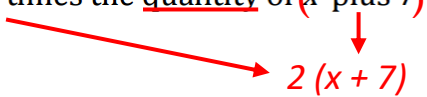
Session 4: Modeling *(I Do - Teacher Notes)*

7th Grade - Readiness Standard 3 – 6.EE.2a

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

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

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.

This problem is about Lisa translating words to symbols on a Delta Math readiness screener.

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

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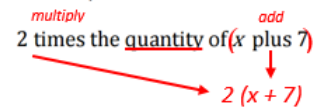

Third, I need to determine what I know.

I know that the words were "2 times the quantity of x plus 7" and the answer she chose was "2x + 7".

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

I am going to use the structure in this reference sheet to help me write the words as symbols.

When I see the word "quantity", the translation guide helps me remember that parentheses are needed.
(Underline the word "quantity", draw parentheses around the x plus 7 in the phrase and an empty parentheses below the problem. Then, point to the bottom row on the Translation Guide.)

Which expression represents the phrase?

multiply — *add*

2 times the <u>quantity</u> of $(x$ plus 7$)$

→ $2\ (x + 7)$

○ $7(x + 2)$ ○ $2(x + 7)$ ● $2x + 7$ ○ $7x + 2$

I also know that times is a word that usually indicates multiplication and plus usually indicates addition.
(Write "multiply" above "times" and "Add" above "plus" in the phrase.)

The quantities 2 and x plus 7 will be multiplied together…so I need to write a 2 in front of the parentheses.
(Draw an arrow from the "2" in the phrase and write a "2" in front of the parentheses.)

And the quantity x is being added to 7…so I need to write an addition sign between the x and 7.
(Write "(x + 7)" inside the parentheses.)

I see that this is an answer choice, but not the one that Lisa chose…therefore, she must have been incorrect.

I think Lisa chose her answer because she saw the number 2 and the variable x added to 7.

And I don't think she noticed the word "quantity" to indicate the need for parentheses.

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

I found that Lisa was not correct. It makes sense because I read the problem very carefully looking for all words that mean grouping, operations and quantity…and then referred to the translation guide to make sure that I represented each word accurately.

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 4: Guided Practice (We Do)

Materials:

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Say the algebraic expression, label the operations and special groupings. Then write it using symbols.

1.	2.
The sum of x and 5, times 3 _____	3 more than the product of 8 and x _____
3.	4.
7 less than twice x _____	The quotient of $4x$ and 9 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 4: Guided Practice (We Do - Continued)

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

➤ Students take turns leading to say, label and write each algebraic expression using symbols.

5. 2 times the quantity of x minus 4 _____	**6.** The difference of x and 3, divided by 2 _____
7. The quotient of 5 and x _____	**8.** 7 more than twice x _____
9. 7 times the difference of 10 and x _____	**10.** The product of x and 4 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 4: Guided Practice (We Do – Teacher Notes)

Materials:

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Say the algebraic expression, label the operations and special groupings. Then write it using symbols.

<table>
<tr>
<td>

1.

add   *multiply*

The sum of $(x$ and $5)$, times 3

$3(x + 5)$

_____

</td>
<td>

2.

add   *multiply*

3 more than the product of 8 and x

$8x + 3$

_____

</td>
</tr>
<tr>
<td>

3.

subtract   *multiply by 2*

7 less than twice x

$2x - 7$

_____

</td>
<td>

4.

divide

The quotient of $4x$ and 9

$\dfrac{4x}{9}$

_____

</td>
</tr>
</table>

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

> ➢ What did I learn today about translating algebraic expressions?

> ➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form D

7th Grade - Readiness Standard 3 – 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The sum of x and 3, divided by 4 _____	**2.** The product of 4 and x, plus 7 _____
3. 10 less than 8 times x _____	**4.** The quotient of x and 4, minus 2 _____
5. 8 times the quantity of 4 plus x _____	**6.** The difference of 5 and x, times 9 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 5: Guided Practice (We Do)

Materials:

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Label the operations and special groupings. Then, draw and write the algebraic expression using symbols.

1. The difference of 7 and 3 _____	**2.** 4 more than the quotient of x and 2 _____
3. 3 more than twice x _____	**4.** The product of $2x$ and 3 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 5: Guided Practice (We Do - Continued)

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

➢   Students take turns leading to say, draw and write each algebraic expression using symbols.

5. 2 times the quantity of x plus 4 _____	**6.** The quotient of x and 3, increased by 2 _____
7. The sum of 3 and x _____	**8.** 3 more than twice x _____
9. The difference of 5 and 1 _____	**10.** The product of x and 4 _____

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

➢ What did I learn today about translating algebraic expressions?

➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The sum of x and 6, times 4 _____	**2.** 7 more than the product of 6 and x _____
3. 9 less than 4 times x _____	**4.** The quotient of x and 10, plus 2 _____
5. 3 times the quantity of x plus 5 _____	**6.** The product of 5 and x, minus 9 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 6: Guided Practice (We Do)

Materials:

➢   Translation Guide

We Do Together: (Teacher Actions)

➢   Label the operations and special groupings. Then, draw and write the algebraic expression using symbols.

1. The sum of x and 4, times 3 _____	**2.** 2 more than the product of 7 and x _____
3. 5 more than twice x _____	**4.** The quotient of $4x$ and 2 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 6: Guided Practice (We Do - Continued)

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

➢ Students take turns leading to say, draw and write each algebraic expression using symbols.

5. 5 times the quantity of x plus 3 _____	**6.** The sum of x and 4, increased by 1 _____
7. The quotient of x and 3 _____	**8.** 8 more than twice x _____
9. The difference of 7 and 2 _____	**10.** The product of x and 4 _____

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

> ➢ What did I learn today about translating algebraic expressions?

> ➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The product of x and 2, plus 4 _____	**2.** The sum of x and 2, increased by 5 _____
3. 7 less than twice x _____	**4.** 9 increased by the sum of x and 6 _____
5. 7 times the quantity of 4 minus x _____	**6.** The quotient of 5 and x, plus 9 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 7: Guided Practice (We Do)

Materials:

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Say the algebraic expression, label the operations and special groupings. Then write it using symbols.

1. The sum of x and 2, times 6 _____	**2.** 7 more than the product of 3 and x _____
3. 5 less than twice x _____	**4.** The quotient of $6x$ and 8 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 7: Guided Practice (We Do - Continued)

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

➢   Students take turns leading to say, label and write each algebraic expression using symbols.

5. 3 times the quantity of x minus 5 _____	**6.** The difference of x and 2, divided by 9 _____
7. The quotient of 7 and x _____	**8.** 4 more than twice x _____
9. 2 times the difference of 3 and x _____	**10.** The product of x and 3 _____

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

➢ What did I learn today about translating algebraic expressions?

➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form G

7th Grade - Readiness Standard 3 – 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The difference of x and 9, times 4 _____	**2.** 6 more than the product of 10 and x _____
3. 9 less than x times 4 _____	**4.** The sum of x and 2, divided by 4 _____
5. 6 times the quantity of 2 plus x _____	**6.** The quotient of 5 and x, minus 9 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 8: Guided Practice (We Do)

Materials:

➢ Translation Guide

We Do Together: (Teacher Actions)

➢ Say the algebraic expression, label the operations and special groupings. Then write it using symbols.

1. The difference of x and 5, times 3 _____	**2.** 3 more than the quotient of 8 and x _____
3. 7 more than twice x _____	**4.** The product of $4x$ and 9 _____

Learning Target: I will translate algebraic expressions between words and symbols   7th Grade - RS 3 - 6.EE.2a

Session 8: Guided Practice (We Do - Continued)

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

➢   Students take turns leading to say, label and write each algebraic expression using symbols.

5. 2 times the quantity of x plus 4 _____	**6.** The difference of x and 4, divided by 2 _____
7. The quotient of 7 and x _____	**8.** 7 less than twice x _____
9. 7 times the difference of 3 and x _____	**10.** The product of x and 5 _____

Learning Target: I will I will translate algebraic expressions between words and symbols

Briefly discuss student responses

➢ What did I learn today about translating algebraic expressions?

➢ How confident do I feel about translating algebraic expressions on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form H

7th Grade - Readiness Standard 3 – 6.EE.2a

Name_____ Date_____

Learning Target: I will translate algebraic expressions between words and symbols.

Directions: Write the expression that represents each phrase. (Work time: 4 minutes)

1. The sum of x and 3, divided by 4 _____	**2.** The product of 4 and x, plus 7 _____
3. 10 less than 8 times x _____	**4.** The quotient of x and 4, minus 2 _____
5. 8 times the quantity of 4 plus x _____	**6.** The difference of 5 and x, times 9 _____

Independent Practice (You Do)

Learning Target: I will translate algebraic expressions between words and symbols

Readiness for solving equations with more than one step

Title of Game: Play "**Words and Symbols Match-up**!"

Number of Players: 2

Objective: To match all of your **"Words"** cards to the equivalent **"Symbols"** cards.

Materials:

➢ 1 set of **Words** and **Symbols** cards per group

➢ 1 recording sheet per player

Set-up:

➢ Deal all 10 **Words** cards face down in a row.

➢ Deal 5 **Symbols** cards face up to each player.

Directions:

➢ **Player 1** goes first
- o Take a card from the row of face down **Words** cards and turn it face up
- o Write the problem on the recording sheet
- o And, find the answer in simplest form

➢ If **Player 1** has the **Symbols** card, place it face up on top of the **Words** card, take both cards and say:

"The operation(s) in the expression is/are ___."

➢ If **Player 1** does not have the answer to the **Words** card, turn the **Words** card back over.

➢ **Players 1 and 2** alternate turns. The **winner** is the first player to match all 5 of their cards.

Symbols Cards (Set A)

7th Grade - Readiness Standard 3 – 6.EE.2a

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

$\dfrac{x}{2}$ Set A	$2x$ Set A	$x + 2$ Set A	$x - 2$ Set A
$\dfrac{x}{3}$ Set A	$3x$ Set A		
$2(x + 3)$ Set A	$2x + 3$ Set A	$2(x - 3)$ Set A	$2x - 3$ Set A
$\dfrac{x}{2}$ Set A	$2x$ Set A	$x + 2$ Set A	$x - 2$ Set A
$\dfrac{x}{3}$ Set A	$3x$ Set A		
$2(x + 3)$ Set A	$2x + 3$ Set A	$2(x - 3)$ Set A	$2x - 3$ Set A

Set A₁ (rows 1–3), Set A₂ (rows 4–6)

Words Cards (Set A)

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

Set A₁

The quotient of x and 2 Set A	The product of x and 2 Set A	The sum of x and 2 Set A	The difference of x and 2 Set A
The quotient of x and 3 Set A	The product of x and 3 Set A		
2 times the sum of x and 3 Set A	3 more than twice x Set A	2 times the quantity of x minus 3 Set A	3 less than 2 times x Set A

Set A₂

The quotient of x and 2 Set A	The product of x and 2 Set A	The sum of x and 2 Set A	The difference of x and 2 Set A
The quotient of x and 3 Set A	The product of x and 3 Set A		
2 times the sum of x and 3 Set A	3 more than twice x Set A	2 times the quantity of x minus 3 Set A	3 less than 2 times x Set A

Symbols Cards (Set B)

7th Grade - Readiness Standard 3 – 6.EE.2a

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

Set B₁			
$\dfrac{4x}{5}$ Set B	$4x$ Set B	$x + 4$ Set B	$x - 4$ Set B
		$x + 5$ Set B	$x - 5$ Set B
$4(x + 5)$ Set B	$4x + 5$ Set B	$4(x - 5)$ Set B	$4x - 5$ Set B

Set B₂			
$\dfrac{4x}{5}$ Set B	$4x$ Set B	$x + 4$ Set B	$x - 4$ Set B
		$x + 5$ Set B	$x - 5$ Set B
$4(x + 5)$ Set B	$4x + 5$ Set B	$4(x - 5)$ Set B	$4x - 5$ Set B

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

The quotient of $4x$ and 5 Set B	The product of x and 4 Set B	The sum of x and 4 Set B	The difference of x and 4 Set B
		The sum of x and 5 Set B	The difference of x and 5 Set B
4 times the sum of x and 5 Set B	5 more than the product of 4 and x Set B	4 times the quantity of x minus 5 Set B	5 less than 4 times x Set B
The quotient of $4x$ and 5 Set B	The product of x and 4 Set B	The sum of x and 4 Set B	The difference of x and 4 Set B
		The sum of x and 5 Set B	The difference of x and 5 Set B
4 times the sum of x and 5 Set B	5 more than the product of 4 and x Set B	4 times the quantity of x minus 5 Set B	5 less than 4 times x Set B

Set B₁ (rows 1-3), Set B₂ (rows 4-6)

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?