Tier 3
Intervention Lessons

6.EE.7

Learning Target: I will solve 1-step equations

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 solve 1-step equations

Readiness for solving equations with more than one step

Recommended Actions	
Beginning (5 min.)	➢ 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.)	➢ Model solving a word problem – "I do" *(Sessions 1, 3 and 6 only)* ➢ Guided Practice – "We do" **Sessions 1 and 2:** Solve 1-step equations (+ and x) with whole numbers using algebra tiles **Session 3:** Solve 1-step equations (+ and x) with whole numbers using drawings **Session 4:** Solve 1-step equations (x) with whole numbers and fractions using drawings **Session 5:** Solve 1-step equations (+ and x) with whole numbers and fractions using inverse operations
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 solving 1-step equations? o How confident do you feel about solving 1-step equations 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 Session 6	➢ Differentiation Options: o Allow students who met the learning goal to work independently while others do the guided practice during the next session o 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 solve 1-step equations

Readiness for solving equations with more than one step

Greg had a mystery number of dollars before earning $5 for mowing the lawn. Now, he has 9 dollars. The equation $x + 5 = 9$ dollars can be used to represent how much he had, how much he earned and how much he has now. How much money did Greg have before mowing the lawn?

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

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

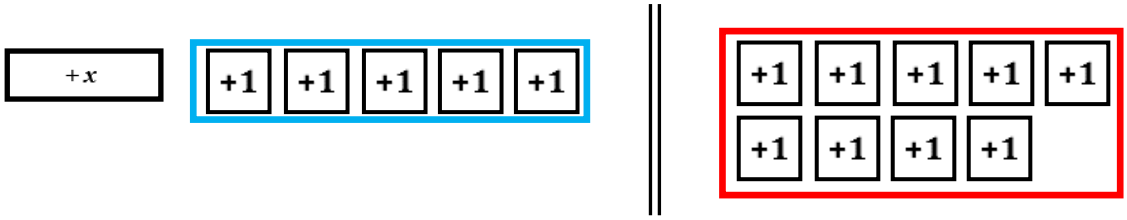
Greg had a mystery number of dollars before earning $5 for mowing the lawn. Now, he has 9 dollars. The equation $x + 5 = 9$ dollars can be used to represent how much he had, how much he earned and how much he has now. How much money did Greg have before mowing the lawn?

Step 1: Write the equation

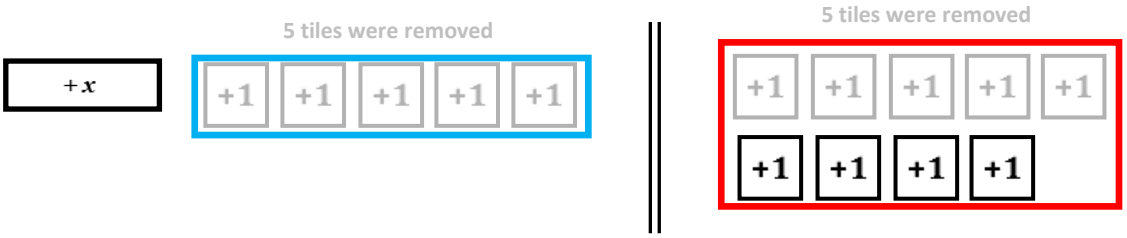
Starting Amount + Earned for Mowing = Total

x + 5 = 9

Step 2: Build each equivalent expression



Step 3: Find the value of x by taking away equal values from both expressions



Solution

x = 4

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 1: Modeling *(I Do - Teacher Notes)*

Learning Target: I will solve 1-step equations **Readiness** for solving equations with more than one step

Greg had a mystery number of dollars before earning $5 for mowing the lawn. Now, he has 9 dollars. The equation $x + 5 = 9$ dollars can be used to represent how much he had, how much he earned and how much he has now. How much money did Greg have before mowing the lawn?

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 Greg's money.

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

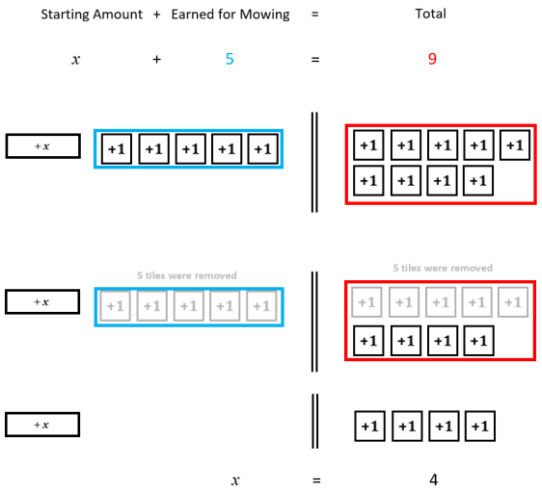
I need to find how much money Greg had before mowing the lawn.

Third, I need to determine what I know.

I know Greg started with an unknown amount, earned $5 for mowing and now he has a total of 9 dollars. (Write "Starting Amount + Earned for Mowing = Total".)

I also know that this situation can be modeled by the equation $x + 5 = 9$. (Write "$x + 5 = 9$" below the headings.)

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



I will use algebra tiles to represent this situation.

I need to use an "+x tile" and 5 "+1 tiles" to represent the expression $x + 5$.
(Place 1 "+x tile" and 5 "+1 tiles" below the equation.)

Next, I need to place 9 "+1 tiles" to represent the total.
(Place 9 "+x tiles" below the total in the equation.)

Since the 5 "+1 tiles" on the left are equal to the 5 "+1 tiles" on the right, I can remove 5 "+1 tiles" on both sides knowing the both sides remain equal to each other.
(Remove 5 "+1 tiles" from both sides of the equal sign.)

The remaining tiles show that x is definitely equal to 4 since I see 1 "+x tile" on the left and 4 "+1 tiles" on the right. (Point to the remaining tiles on each side of the 2 vertical lines.)

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

I found that Greg had 4 dollars before mowing the lawn. This makes sense because I modeled the situation using algebra tiles to represent the given equation.

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 1: Guided Practice (We Do)

Materials:

- Algebra Tiles (20 +1's and 10 +x's per student)
- Equation mat (1 per student)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, use algebra tiles to find the solution.

1. $x + 4 = 6$	**2.** $3x = 12$
3. $4x = 8$	**4.** $x + 3 = 11$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 1: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation.

5. $x + 5 = 8$	**6.** $2x = 10$
7. $x + 6 = 10$	**8.** $4x = 12$
9. $3x = 15$	**10.** $x + 4 = 12$

Name _____ Date _____

Learning Target: I will solve 1-step equations

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

Materials:

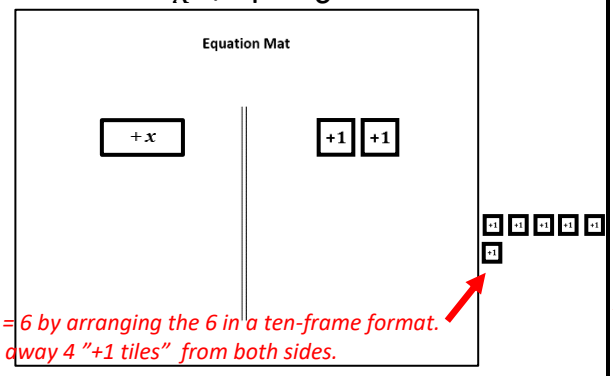
- Algebra Tiles (1 set on p. 13: 20 +1s and 16 $+x$'s per student)
- Equation mat (1 per student)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, use algebra tiles to find the solution.

1. *What number plus 4 is equal to 6?*

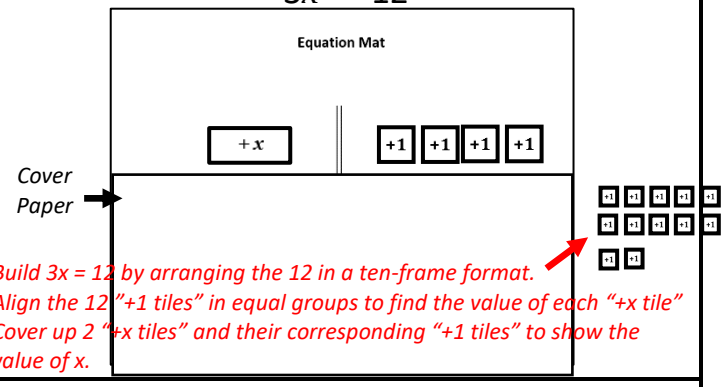
$x + 4 = 6$



Build x + 4 = 6 by arranging the 6 in a ten-frame format.
Then, take away 4 "+1 tiles" from both sides.

2. *3 times what number is equal to 12?*

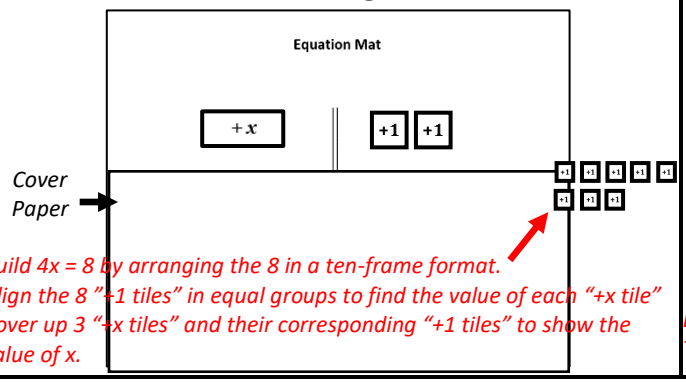
$3x = 12$



Build 3x = 12 by arranging the 12 in a ten-frame format.
Align the 12 "+1 tiles" in equal groups to find the value of each "+x tile"
Cover up 2 "+x tiles" and their corresponding "+1 tiles" to show the value of x.

3. *4 times what number is equal to 8?*

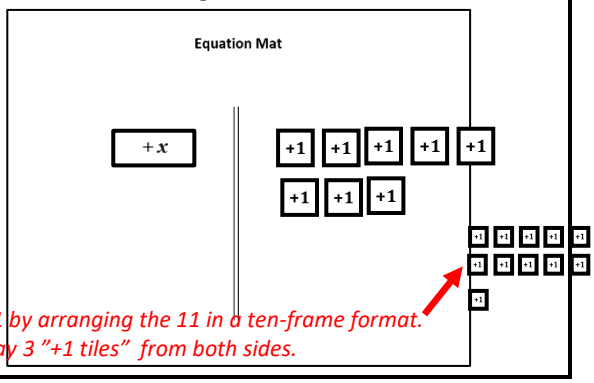
$4x = 8$



Build 4x = 8 by arranging the 8 in a ten-frame format.
Align the 8 "+1 tiles" in equal groups to find the value of each "+x tile"
Cover up 3 "+x tiles" and their corresponding "+1 tiles" to show the value of x.

4. *What number plus 3 is equal to 11?*

$x + 3 = 11$



Build x + 3 = 11 by arranging the 11 in a ten-frame format.
Then, take away 3 "+1 tiles" from both sides.

Algebra Tiles (2 sets of positive tiles)

Directions: Provide each student one set of positive tiles.

Note: $+x^2$ tiles are included, but will not be used the lessons for 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

Use for Problem 1 $x + 4 = 6$	Use for Problem 2 $3x = 12$
Use for Problem 3 $4x = 8$	Use for Problem 4 $x + 3 = 11$
Use for Problem 5 $x + 5 = 8$	Use for Problem 6 $2x = 10$
Use for Problem 7 $x + 6 = 10$	Use for Problem 8 $4x = 12$
Use for Problem 9 $3x = 15$	Use for Problem 10 $x + 4 = 12$
Use for Modelling $x + 5 = 9$	

Session 1: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form A

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for x. (Work time: 4 minutes)

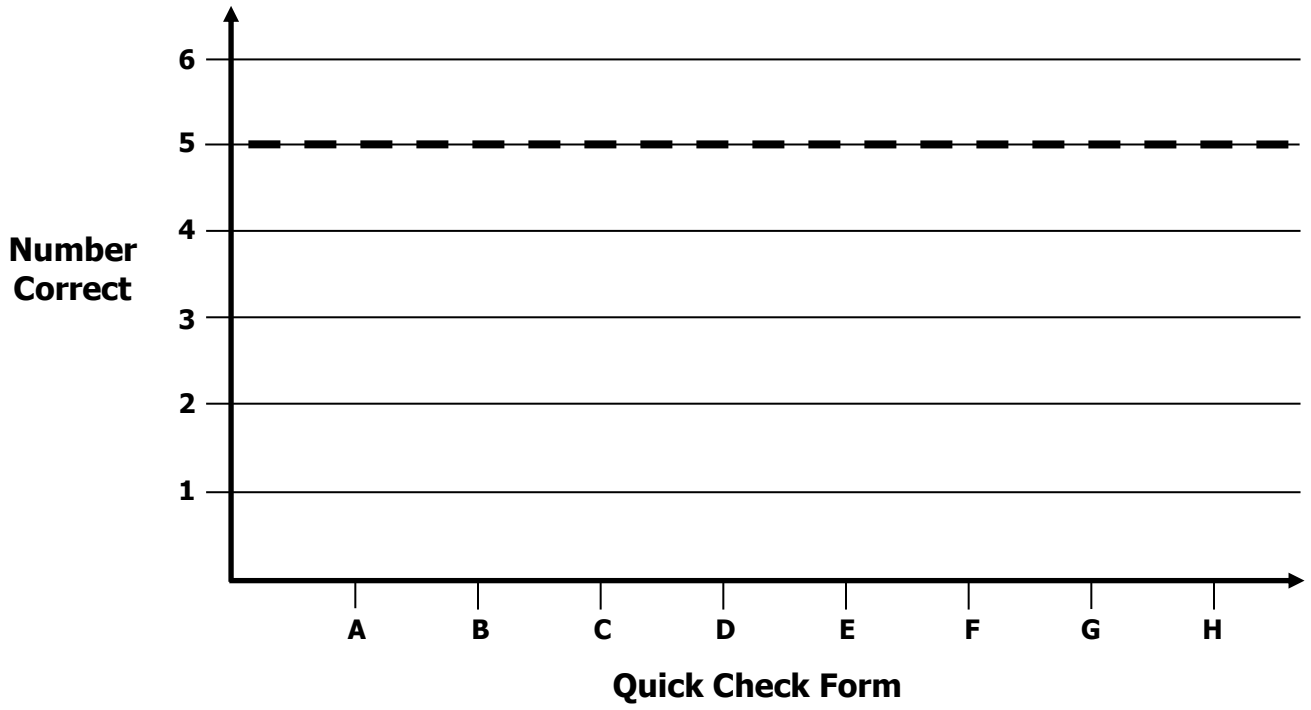
1. $x + 6 = 12$	**2.** $x + 3\frac{1}{2} = 9$
3. $4x = 20$	**4.** $\frac{1}{4}x = 6$
5. $x + 2\frac{3}{4} = 7$	**6.** $\frac{2}{3}x = 8$

Growth Chart

Name_____ Date_____

Learning Target: I will solve 1-step equations.

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:		

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 2: Guided Practice (We Do)

Materials:

- Algebra Tiles (20 +1's and 10 +x's per student)
- Equation mat (1 per student)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, use algebra tiles to find the solution.

1. $x + 4 = 7$	**2.** $4x = 12$
3. $2x = 8$	**4.** $x + 5 = 11$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 2: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation.

5. $x + 3 = 8$	**6.** $3x = 12$
7. $x + 6 = 9$	**8.** $5x = 10$
9. $2x = 14$	**10.** $x + 6 = 11$

Session 2: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form B

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for *x*. (Work time: 4 minutes)

1. $x + 4 = 16$	**2.** $x + 2\frac{1}{3} = 4$
3. $3x = 15$	**4.** $\frac{1}{4}x = 2$
5. $x + 3\frac{2}{5} = 8$	**6.** $\frac{3}{4}x = 9$

Session 3: Modeling (I Do)

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

Greg worked very hard and earned all A's on his report card. As a reward, his mom doubled his normal weekend computer gaming time to 8 hours. If x represents the amount of gaming time on a normal weekend, the equation $2x = 8$ can be used to find his normal gaming time. How much time does Greg normally get for weekend gaming?

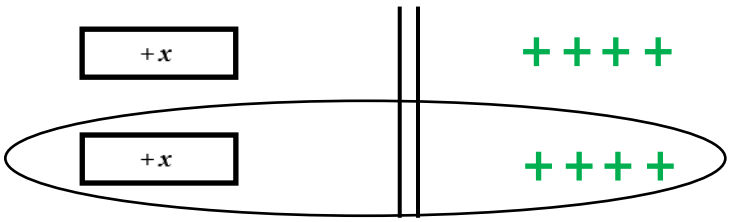
Session 3: Modeling *(I Do – Visual Support)*

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

Greg worked very hard and earned all A's on his report card. As a reward, his mom doubled his normal weekend computer gaming time to 8 hours. If x represents the amount of gaming time on a normal weekend, the equation $2x = 8$ can be used to find his normal gaming time. How much time does Greg normally get for weekend gaming?

Doubled Gaming Time	=	Total
$2x$	=	8



x	=	4

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 solve 1-step equations **Readiness** for solving equations with more than one step

Greg worked very hard and earned all A's on his report card. As a reward, his mom doubled his normal weekend computer gaming time to 8 hours. If x represents the amount of gaming time on a normal weekend, the equation $2x = 8$ can be used to find his normal gaming time. How much time does Greg normally get for weekend gaming?

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 Greg's weekend gaming time.

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

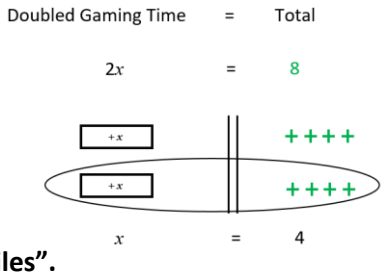
I need to find how much time Greg normally gets for weekend gaming.

Third, I need to determine what I know.

I know Greg's mom doubled his normal gaming time and now he has 8 hours.
(Write "Doubled Gaming Time = Total".)

I also know that this situation can be modeled by the equation $2x = 8$.
(Write "2x = 8" below the headings.)

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



I am going to create a math drawing of algebra tiles to represent this situation.

I will draw 2 "+x tiles" to represent the 2x…and 2 vertical lines to represent the equal sign…
(Draw 2 "+x tiles and the 2 vertical lines below the equation.)

Next, I need to draw 8 "plus signs" as 2 equal groups corresponding to both "+x tiles".
(Draw the "plus signs" by alternating between each "+x tile" as you count to 8.)

The math drawing shows that each x is equal to 4 since there are 4 "plus signs" in each group.
(Draw a loop around the bottom "+x tile" and its corresponding "plus signs".)

The drawing shows the solution to 2x = 8 is 4.
(Write the solution "x = 4".)

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

I found that Greg normally gets 4 hours of gaming time per weekend. This makes sense because I modeled the situation using a math drawing of algebra tiles to represent the given equation.

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 3: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, use a math drawing to find the solution.

1. $x + 3 = 12$	**2.** $3x = 18$
3. $12 = 4x$	**4.** $13 = 5 + x$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 3: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation using math drawings.

5. $x + 5 = 8$	**6.** $2x = 10$
7. $10 = x + 6$	**8.** $12 = 4x$
9. $3x = 15$	**10.** $x + 4 = 12$

Name _____ Date _____

Learning Target: I will solve 1-step equations

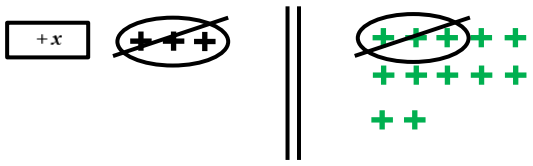
Session 3: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, use a math drawing to find the solution.

1. *What number plus 3 is equal to 12?*

$x + 3 = 12$

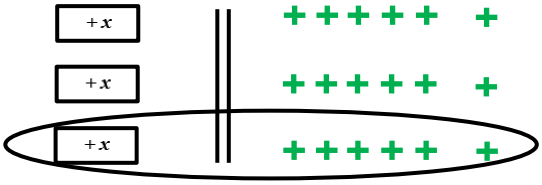


$x = 12 - 3 = 9$

Draw x + 3 = 12.
Then, cross out 3 "plus signs" from both sides.

2. *3 times what number is equal to 18?*

$3x = 18$

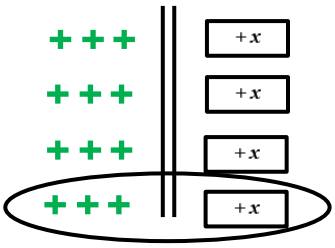


$x = 18 \div 3 = 6$

Draw 3x and align the 18 plus signs into 3 equal groups.
Draw a loop around the bottom x and its corresponding plus signs to show the value of x.

3. *12 is equal to 4 times what number?*

$12 = 4x$

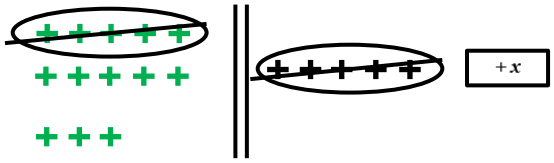


$x = 12 \div 4 = 3$

Draw 4x on the right side and align the 12 plus signs into 4 equal groups.
Draw a loop around the bottom x and its corresponding plus signs to show the value of x.

4. *13 is equal to 5 plus what number?*

$13 = 5 + x$



$x = 13 - 5 = 8$

Draw 13 = 5 + x.
Then, cross out 5 "plus signs" from both sides.

Session 3: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form C

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for x. (Work time: 4 minutes)

1. $x + 5 = 6$	**2.** $x + 2\frac{1}{4} = 9$
3. $6x = 30$	**4.** $\frac{1}{6}x = 3$
5. $x + 4\frac{2}{3} = 7$	**6.** $\frac{2}{5}x = 8$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 4: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, use a math drawing to find the solution.

1. $x + 4 = 11$	**2.** $4x = 20$
3. $12 = 3x$	**4.** $14 = 6 + x$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 4: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation using math drawings.

5. $x + 3 = 9$	**6.** $5x = 10$
7. $15 = x + 7$	**8.** $21 = 3x$
9. $2x = 14$	**10.** $x + 5 = 17$

Session 4: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form D

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for x. (Work time: 4 minutes)

1. $x + 9 = 11$	**2.** $x + 4\frac{1}{3} = 6$
3. $2x = 14$	**4.** $\frac{1}{3}x = 8$
5. $x + 1\frac{3}{5} = 9$	**6.** $\frac{2}{3}x = 10$

Session 5: Modeling (I Do)

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

Greg was not able to complete all of his chores. Therefore, he only earned $\frac{1}{4}$ of his allowance, which was $5. If x represents his normal allowance, the equation $\frac{1}{4}x = 5$ can be used to find his normal allowance. How much is Greg's normal allowance?

Session 5: Modeling (I Do – Visual Support)

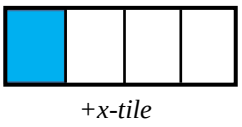
Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

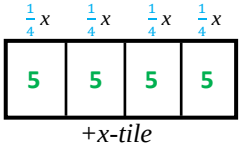
Greg was not able to complete all of his chores. Therefore, he only earned $\frac{1}{4}$ of his allowance, which was $5. If x represents his normal allowance, the equation $\frac{1}{4}x = 5$ can be used to find his normal allowance. How much is Greg's normal allowance?

$\frac{1}{4}$ of Allowance = Amount Earned

$\frac{1}{4}x$ = 5



+*x*-tile



+*x*-tile

$x = 20$

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 5: Modeling *(I Do - Teacher Notes)*

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

> Greg was not able to complete all of his chores. Therefore, he only earned $\frac{1}{4}$ of his allowance, which was $5. If x represents his normal allowance, the equation $\frac{1}{4}x = 5$ can be used to find his normal allowance. How much is Greg's normal allowance?

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 Greg's allowance.

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

I need to find how much money Greg normally gets.

Third, I need to determine what I know.
I know he only earned $5, which was $\frac{1}{4}$ of his normal allowance.
(Write "$\frac{1}{4}$ of Allowance = Amount Earned".)
I also know that this situation can be modeled by the equation $\frac{1}{4}x = 5$. (Write the equation below the labels.)

Fourth, I need to figure out what I can try.
I am going to use a math drawing to model the situation.
(Draw the +x tile, 2 vertical lines and 5 plus signs under the equation.)

My picture is not accurate yet…I need to represent 1 quarter of x...
(Point to the 1 quarter in the equation.)

So I will separate the + x tile into 4 equal parts and shade 1 fourth of it.
(Draw 3 vertical lines to create fourths…then shade the first section.)

To find his normal monthly allowance, I need to find the value of the whole x.
(Point each of the four sections of the "+x tile".)

In order to make it easier to find the whole, I am going to redraw the x tile with 4 equal parts.
(Draw another x-tile separated into fourths, below the mat drawing.)

Since each part is one-quarter of the whole, I am going to write "¼ x" above each part.
(Write " ¼ x" above each part of the "+x tile".)

The original drawing shows that "¼ x" is equal to 5, so I am going to write "5" in each of the 4 sections.
(Write "5" in the 4 sections of the "+x tile".)

Now I can see that the whole value of x is equal to 20.
(Point to the 4 groups of 5 and write $x = 5 \cdot 4 = 20$ below the math drawing.)

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

I found that Greg normally gets $20 for allowance. This makes sense because I modeled the situation using algebra tiles to represent the given equation.

Name _____ Date _____

Learning Target: I will solve 1-step equations

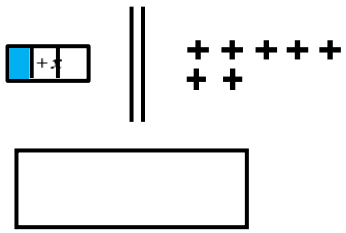
Session 5: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, complete the math drawing to find the solution.

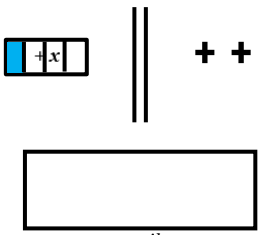
1. *"1 third of what number is equal to 7?"*

$\frac{1}{3}x = 7$



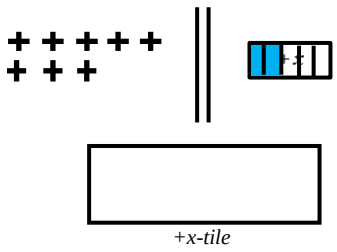
2.

$\frac{1}{4}x = 2$



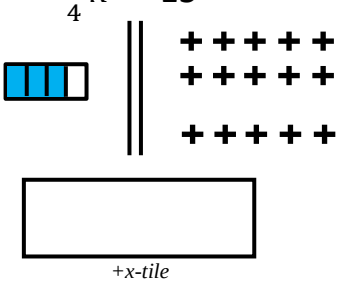
3.

$8 = \frac{2}{5}x$



4.

$\frac{3}{4}x = 15$



Name _____ Date _____

Learning Target: I will solve 1-step equations

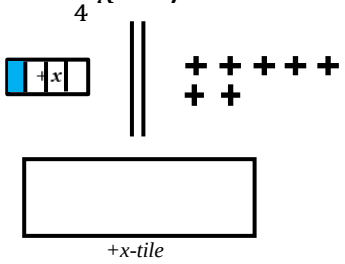
Session 5: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation.

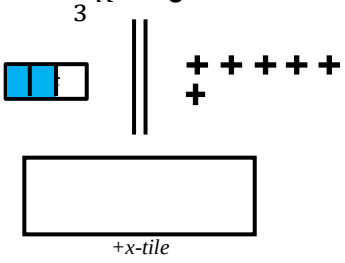
5. *"1 fourth of what number is equal to 7?"*

$\frac{1}{4}x = 7$



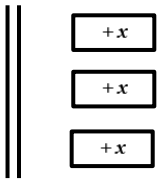
6.

$\frac{2}{3}x = 6$



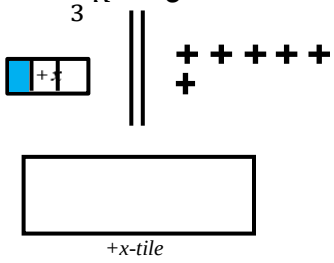
7.

$6 = 3x$



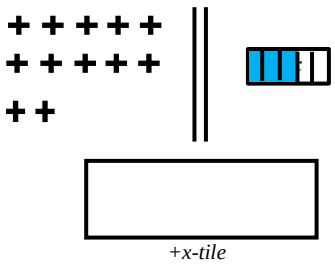
8.

$\frac{1}{3}x = 6$



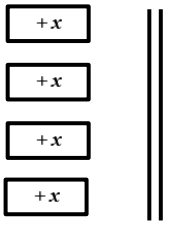
9.

$12 = \frac{3}{5}x$



10.

$4x = 12$



Name _____ Date _____

Learning Target: I will solve 1-step equations

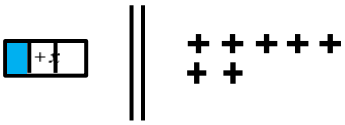
Session 5: Guided Practice (We Do – Teacher Notes)

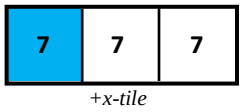
We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, complete the math drawing to find the solution.

1. *1 third of what number is equal to 7?*

$\frac{1}{3}x = 7$

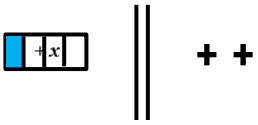


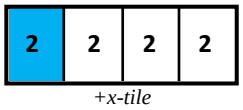


$x = 7 \cdot 3 = 21$

2. *1 fourth of what number is equal to 3?*

$\frac{1}{4}x = 2$

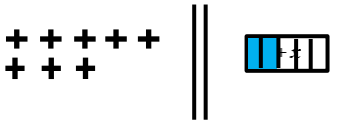


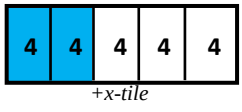


$x = 2 \cdot 4 = 8$

3. *2 fifths of what number is equal to 8?*

$8 = \frac{2}{5}x$

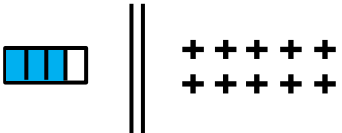


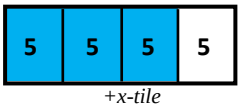


$8 = \frac{2}{5}x \rightarrow 4 = \frac{1}{5}x \rightarrow x = 4 \cdot 5 = 20$

4. *3 fourths of what number is equal to 15?*

$\frac{3}{4}x = 15$





$\frac{3}{4}x = 15 \rightarrow \frac{1}{4}x = 5 \rightarrow x = 5 \cdot 4 = 20$

Session 5: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form E

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for *x*. (Work time: 4 minutes)

1. $x + 6 = 12$	**2.** $x + 3\frac{1}{2} = 9$
3. $4x = 20$	**4.** $\frac{1}{4}x = 6$
5. $x + 2\frac{3}{4} = 7$	**6.** $\frac{2}{3}x = 8$

Name _____ Date _____

Learning Target: I will solve 1-step equations

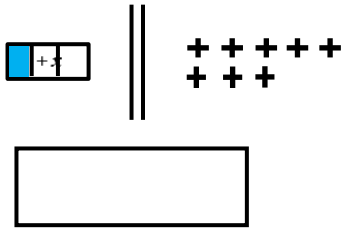
Session 6: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, complete the math drawing to find the solution.

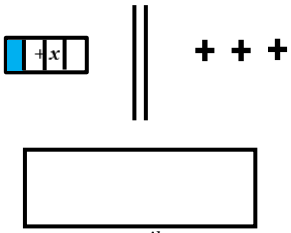
1. *"1 third of what number is equal to 7?"*

$\frac{1}{3}x = 8$



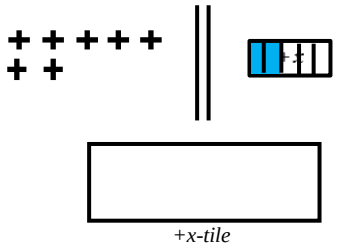
2.

$\frac{1}{4}x = 3$



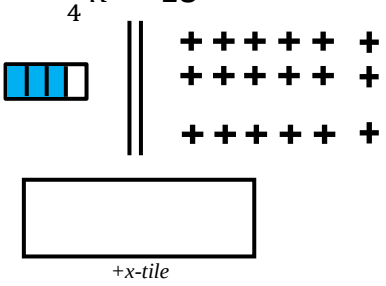
3.

$7 = \frac{2}{5}x$



4.

$\frac{3}{4}x = 18$



Name _____ Date _____

Learning Target: I will solve 1-step equations

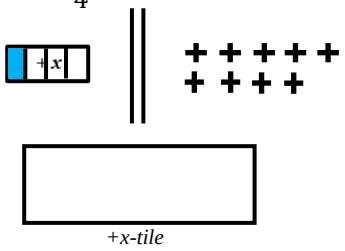
Session 6: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation.

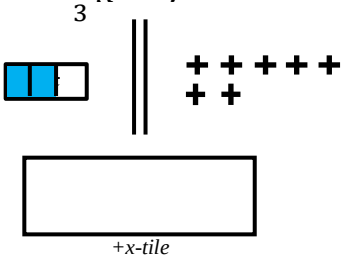
5. *"1 fourth of what number is equal to 7?"*

$\frac{1}{4}x = 9$



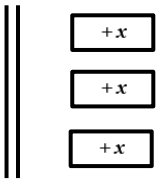
6.

$\frac{2}{3}x = 7$



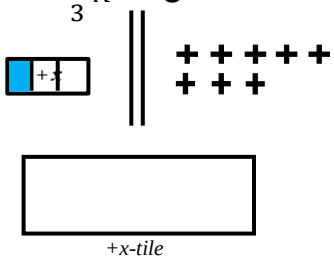
7.

$12 = 3x$



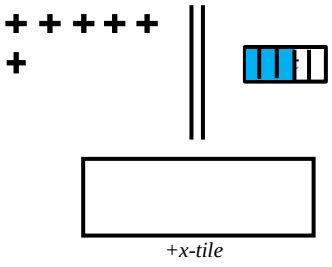
8.

$\frac{1}{3}x = 8$



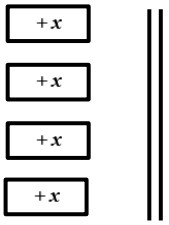
9.

$6 = \frac{3}{5}x$



10.

$4x = 20$



Session 6: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form F

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for *x*. (Work time: 4 minutes)

1. $x + 4 = 16$	**2.** $x + 2\frac{1}{3} = 4$
3. $3x = 15$	**4.** $\frac{1}{4}x = 2$
5. $x + 3\frac{2}{5} = 8$	**6.** $\frac{3}{4}x = 9$

Session 7: Modeling (I Do)

Learning Target: I will solve 1-step equations

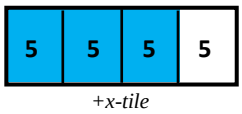
Readiness for solving equations with more than one step

Greg showed his mom how to solve the equation $\frac{3}{4}x = 15$ using a drawing. His mom appreciated learning a new solution method and said, "when I was your age, we were taught to solve equations using **inverse operations**. We would find the value of x by "undoing" any operations on it. Since x is being multiplied by 3 fourths, we would "undo" multiplication by dividing both sides of the equal sign by 3 fourths…like this…"

Find 1 difference and 1 similarity between the two methods.

Greg's Drawing

$\frac{3}{4}x = 15$



$x = 15 \cdot \frac{4}{3} = 20$

Greg's Mom's solution using inverse operations

$\frac{3}{4}x = 15$

$\div \frac{3}{4} \quad \div \frac{3}{4}$

$1 \cdot x = \frac{\cancel{3} \cdot 5}{\cancel{15}\ 1} \cdot \frac{4}{\cancel{3}}$

$x = 20$

Session 7: Modeling (I Do – Visual Support)

Learning Target: I will solve 1-step equations

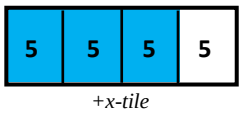
Readiness for solving equations with more than one step

Greg showed his mom how to solve the equation $\frac{3}{4}x = 15$ using a drawing. His mom appreciated learning a new solution method and said, "when I was your age, we were taught to solve equations using **inverse operations**. We would find the value of x by "undoing" any operations on it. Since x is being multiplied by 3 fourths, we would "undo" multiplication by dividing both sides of the equal sign by 3 fourths…like this…"

Find 1 difference and 1 similarity between the two methods.

Greg's Drawing

$\frac{3}{4}x = 15$



$x = 15 \cdot \frac{4}{3} = 20$

Greg's Mom's solution using inverse operations

(Operations that undo each other)

$\frac{3}{4}x = 15$

Undo multiplication by dividing $\div \frac{3}{4} \quad \div \frac{3}{4}$ *Do to one side as you do to the other!*

Any number divided by itself is 1 $1 \cdot x = \frac{\cancel{3} \cdot 5}{\cancel{15}_{1}} \cdot \frac{4}{\cancel{3}}$ **Use the "multiply by the reciprocal" to divide strategy*

$x = 20$ *Then, multiply after simplifying by the common factor, 3.*

**To divide by a fraction, we can multiply by its reciprocal. (See 7th Grade - RS 1 - 6.NS.1 - Session 4)*

Session 7: Modeling *(I Do - Teacher Notes)*

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

…

Find 1 difference and 1 similarity between the two methods.

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 Greg and his mom solving an equation two different ways.

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

I need to find 1 difference and 1 similarity between the two solution methods.

Third, I need to determine what I know.

I know that both Greg and his mom solved the equation $\frac{3}{4}x = 15$ using 2 different solution methods.

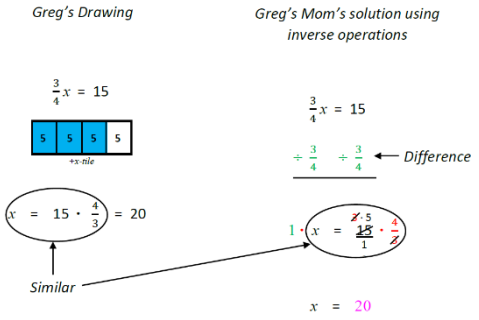
(Point to both equations and write "Operations that undo each other".)

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

I am going to try finding a number expressions that is different in both solution methods and one that is the same.

I see that Greg's mom divided both sides by 3 fourths…but I don't see any division expressions in Greg's writing...

(Write the word "Difference" and draw an arrow pointing to the "$\div \frac{3}{4}$".)



Also, I see the equation "x = 15 · $\frac{4}{3}$" in both solution methods.

(Write the word "Similar" and draw arrows pointing to the both equations "x = 15 · $\frac{4}{3}$".)

I think Greg's mom used the "multiply by the reciprocal" method for dividing fractions because 15 divided by 3 fourths became 15 times 4 thirds.

(Point to the "$\div \frac{3}{4}$" and then the "15 · $\frac{4}{3}$".)

She wrote $1 \cdot x$… (Point to the 1)…**since any number divided by itself is equal to 1.**

And, she turned the whole number, 15, into an equivalent fraction by making the denominator 1.

Then, she rewrote the 15 as two of its factors…3 and 5…(Point to the 3 · 5)…

so that she could cancel the common factors…3…since 3 thirds is equal to 1 whole. (Point to the 3 · 5)

Therefore, Greg's mom multiplied 5 times 4 to get her solution. (Point to the 5 · 4 and 20.)

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

I found that Greg normally gets $20 for allowance. This makes sense because they both used the same solution equation to get their answers…and the only difference was that Greg used his understanding by drawing a picture and his mom used her understanding by using the inverse operations solution method.

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 7: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, find the value of x using the "inverse operations" solution method.

1. $2x = 10$	**2.** $x + 7 = 10$
3. $\frac{2}{5}x = 20$	**4.** $x + 3\frac{1}{4} = 9$
5. $9 = x + 4$	**6.** $9 = \frac{3}{4}x$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 7: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation.

7. $4x = 12$	**8.** $x + 4 = 12$
9. $\frac{1}{2}x = 12$	**10.** $x + 3\frac{1}{3} = 10$
11. $10 = x + 3\frac{2}{5}$	**12.** $15 = \frac{3}{4}x$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 7: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, find the value of x using the "inverse operations" solution method.

1. *2 times what number is equal to 10?*

$2x = 10$

Undo multiplication by dividing — $\div 2 \quad \div 2$ — *Maintain Equality*

$1 \cdot x = 10 \div 2$

Any number divided by itself is 1

$x = 5$

2. *What number plus 7 is equal to 10?*

$x + 7 = 10$

Undo addition by subtracting — $-7 \quad -7$ — *Maintain Equality*

$x = 3$

3. *2 fifths of what number is equal to 10?*

$\frac{2}{5}x = 20$

Undo multiplication by dividing — $\div \frac{2}{5} \quad \div \frac{2}{5}$ — *Maintain Equality*

$1 \cdot x = \frac{\cancel{2} \cdot 10}{1} \cdot \frac{5}{\cancel{2}}$

Any number divided by itself is 1

Use the division strategy "multiply by the reciprocal"

Simplify using the common factor, 2.

$x = 50$

4. *What number plus 3 and 1 fourth is equal to 9?*

$x + 3\frac{1}{4} = 9$

Undo addition by subtracting — $-3\frac{1}{4} \quad -3\frac{1}{4}$ — *Maintain Equality*

$x = 8\frac{4}{4}$

Ungroup one whole as 4 fourths

$-3\frac{1}{4}$

$x = 5\frac{3}{4}$

5. *9 is equal to what number plus 4?*

$9 = x + 4$

Maintain Equality — $-4 \quad -4$ — *Undo addition by subtracting*

$5 = x$

6. *9 is equal to 3 fourths of what number?*

$9 = \frac{3}{4}x$

Maintain Equality — $\div \frac{3}{4} \quad \div \frac{3}{4}$ — *Undo multiplication by dividing*

Use the division strategy "multiply by the reciprocal"

Simplify using the common factor, 3.

$\frac{\cancel{3} \cdot 3}{\cancel{9}} \cdot \frac{4}{\cancel{4}} = 1 \cdot x$

Any number divided by itself is 1

$12 = x$

Session 7: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form G

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for x. (Work time: 4 minutes)

1. $x + 5 = 6$	**2.** $x + 2\frac{1}{4} = 9$
3. $6x = 30$	**4.** $\frac{1}{6}x = 3$
5. $x + 4\frac{2}{3} = 7$	**6.** $\frac{2}{5}x = 8$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 8: Guided Practice (We Do)

We Do Together: (Teacher Actions)

- Translate the equation into a phrase with meaning. Then, find the value of x using the "inverse operations" solution method.

1. $2x = 18$	**2.** $x + 7 = 12$
3. $\frac{2}{5}x = 10$	**4.** $x + 2\frac{1}{4} = 6$
5. $13 = x + 4$	**6.** $18 = \frac{3}{4}x$

Name _____ Date _____

Learning Target: I will solve 1-step equations

Session 8: Guided Practice (We Do - Continued)

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

- Students take turns leading to solve each 1-step equation.

7. $4x = 24$	**8.** $x + 5 = 12$
9. $\frac{1}{2}x = 15$	**10.** $x + 3\frac{1}{3} = 9$
11. $8 = x + 3\frac{2}{5}$	**12.** $24 = \frac{3}{4}x$

Session 8: Self-Reflection

Learning Target: I will solve 1-step equations

Briefly discuss student responses

- What did I learn today about solving 1-step equations?

- How confident do I feel about solving 1-step equations on my own? *(Thumbs up, down, or sideways)*

Quick Check - Form H

Name_____ Date_____

Learning Target: I will solve 1-step equations.

Directions: Solve each equation for x. (Work time: 4 minutes)

1. $x + 9 = 11$	**2.** $x + 4\frac{1}{3} = 6$
3. $2x = 14$	**4.** $\frac{1}{3}x = 8$
5. $x + 1\frac{3}{5} = 9$	**6.** $\frac{2}{3}x = 10$

Independent Practice (You Do)

Learning Target: I will solve 1-step equations

Readiness for solving equations with more than one step

Title of Game: Play "**Solve 1-step Equations Match-up**!"

Number of Players: 2

Objective: To match all of your **"Equation"** cards to the equivalent **"Solution"** cards.

Materials:

- 1 set of **Equation** and **Solution** cards per group
- 1 recording sheet per player

Set-up:

- Deal all 12 **Equation** cards face down in a row.
- Deal 6 **Solution** cards face up to each player.

Directions:

- **Player 1** goes first
  - Take a card from the row of face down **Equation** 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 **Solution** card, place it face up on top of the **Equation** card, take both cards and say:

  Example "2 times what number is equal to 10…I undid multiplying by 2 with dividing by 2"

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

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

Equation Cards (Set A)

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

Set A_1	$x + 5 = 6$ Set A	$x + 1 = 6$ Set A		
	$2x = 6$ Set A	$3x = 6$ Set A	$\frac{1}{3}x = 6$ Set A	$\frac{2}{3}x = 6$ Set A
	$9 = x + 4$ Set A	$9 = x + 4\frac{1}{3}$ Set A	$8 = 2x$ Set A	$8 = \frac{2}{3}x$ Set A
Set A_2	$x + 5 = 6$ Set A	$x + 1 = 6$ Set A		
	$2x = 6$ Set A	$3x = 6$ Set A	$\frac{1}{3}x = 6$ Set A	$\frac{2}{3}x = 6$ Set A
	$9 = x + 4$ Set A	$9 = x + 4\frac{1}{3}$ Set A	$8 = 2x$ Set A	$8 = \frac{2}{3}x$ Set A

Solution Cards (Set A)

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

Set A_1	$x = 1$ Set A	$x = 5$ Set A		
	$x = 3$ Set A	$x = 2$ Set A	$x = 18$ Set A	$x = 9$ Set A
	$x = 5$ Set A	$x = 4\frac{2}{3}$ Set A	$x = 4$ Set A	$x = 12$ Set A
Set A_2	$x = 1$ Set A	$x = 5$ Set A		
	$x = 3$ Set A	$x = 2$ Set A	$x = 18$ Set A	$x = 9$ Set A
	$x = 5$ Set A	$x = 4\frac{2}{3}$ Set A	$x = 4$ Set A	$x = 12$ Set A

Equation Cards (Set B)

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

Set B_1	$x + 3 = 12$ Set B	$x + 4 = 12$ Set B	$x + 3\frac{1}{4} = 12$ Set B	$x + 4\frac{3}{4} = 12$ Set B
			$\frac{1}{4}x = 12$ Set B	$\frac{3}{4}x = 12$ Set B
	$15 = x + 3$ Set B	$15 = x + 4\frac{1}{3}$ Set B	$15 = 3x$ Set B	$14 = \frac{2}{3}x$ Set B
Set B_2	$x + 3 = 12$ Set B	$x + 4 = 12$ Set B	$x + 3\frac{1}{4} = 12$ Set B	$x + 4\frac{3}{4} = 12$ Set B
			$\frac{1}{4}x = 12$ Set B	$\frac{3}{4}x = 12$ Set B
	$15 = x + 3$ Set B	$15 = x + 4\frac{1}{3}$ Set B	$15 = 3x$ Set B	$14 = \frac{2}{3}x$ Set B

Solution Cards (Set B)

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

Set B_1	$x = 9$ Set B	$x = 8$ Set B	$x = 8\frac{3}{4}$ Set B	$x = 7\frac{1}{4}$ Set B
			$x = 48$ Set B	$x = 16$ Set B
	$x = 12$ Set B	$x = 10\frac{2}{3}$ Set B	$x = 5$ Set B	$x = 21$ Set B
Set B_2	$x = 9$ Set B	$x = 8$ Set B	$x = 8\frac{3}{4}$ Set B	$x = 7\frac{1}{4}$ Set B
			$x = 48$ Set B	$x = 16$ Set B
	$x = 12$ Set B	$x = 10\frac{2}{3}$ Set B	$x = 5$ Set B	$x = 21$ Set B

Questions for Solving Word Problems

Q_1 ***What is the problem about?***
Q_2 ***What do I need to find?***
Q_3 ***What do I know?***
Q_4 ***What can I try?***
Q_5 ***Does my answer make sense?***

Steps for Solving Word Problems

Q_1. *What is the problem about?*
Q_2. *What do I need to find?*
Q_3. *What do I know?*
Q_4. *What can I try?*
Q_5. *Does my answer make sense?*