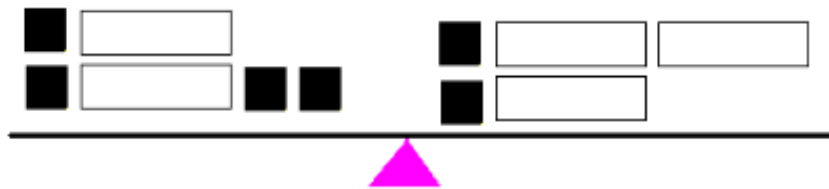


# Using Algebra Tiles to Build a Concrete Representation Solving Equations



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## Subtracting Integers Using Models I

### Lesson 1, Activity 1C

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Make a model of the number of unit squares in Column 1. Then physically remove the number of unit squares shown in Column 2 from the set of unit squares shown in Column 1. Record the answer by sketching the number of unit squares left. Column 4 will be used in a later lesson.

	Column 1	Column 2	Column 3	Column 4
1.	□ □ □ □	□ □		
2.	□ □ □ □ □ □	□		
3.	□ □ □ □ □ □ □	□ □ □ □ □		
4.	□ □ □ □ □ □	□ □ □		
5.	□ □ □ □ □	□ □		
6.	□ □ □ □ □	□ □ □ □		
7.	□ □ □ □	□ □ □		
8.	□ □ □ □ □ □ □ □	□ □ □ □		
9.	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■		
10.	■ ■ ■ ■ ■	■ ■		
11.	■ ■ ■ ■ ■ ■ ■	■ ■		
12.	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■		
13.	■ ■ ■	■ ■		
14.	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■		
15.	■ ■ ■ ■ ■ ■ ■ ■	■ ■		
16.	■ ■ ■ ■	■ ■		

## Subtracting Integers Using Models II

### Lesson 1, Activity 1C

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Make a model of the number of unit squares in Column 1. Then physically remove the number of unit squares shown in Column 2 from the set of unit squares shown in Column 1. Record the answer by sketching the number of unit squares left. Column 4 will be used in a later lesson.

	Column 1	Column 2	Column 3	Column 4
1.	□ □ □ □	■ ■		
2.	□ □ □ □ □ □	■		
3.	□ □ □	■ ■ ■ ■ ■		
4.	□ □	■ ■ ■		
5.	□ □ □ □ □ □	■ ■		
6.	□ □ □ □ □	■ ■ ■ ■		
7.	□ □ □ □ □ □ □	■ ■ ■		
8.	□	■ ■ ■ ■		
9.	■ ■ ■ ■ ■ ■ ■ ■	□ □		
10.	■ ■ ■ ■ ■	□ □		
11.	■ ■ ■ ■ ■ ■ ■	□ □		
12.	■ ■ ■ ■ ■	□ □ □ □ □		
13.	■ ■ ■ ■ ■	□ □		
14.	■ ■ ■	□ □		
15.	■ ■ ■ ■ ■ ■ ■	□ □		
16.	■ ■ ■ ■ ■	□		

## Subtracting Integers Using Models III

### Lesson 1, Activity 1C

Name: \_\_\_\_\_ Date: \_\_\_\_\_

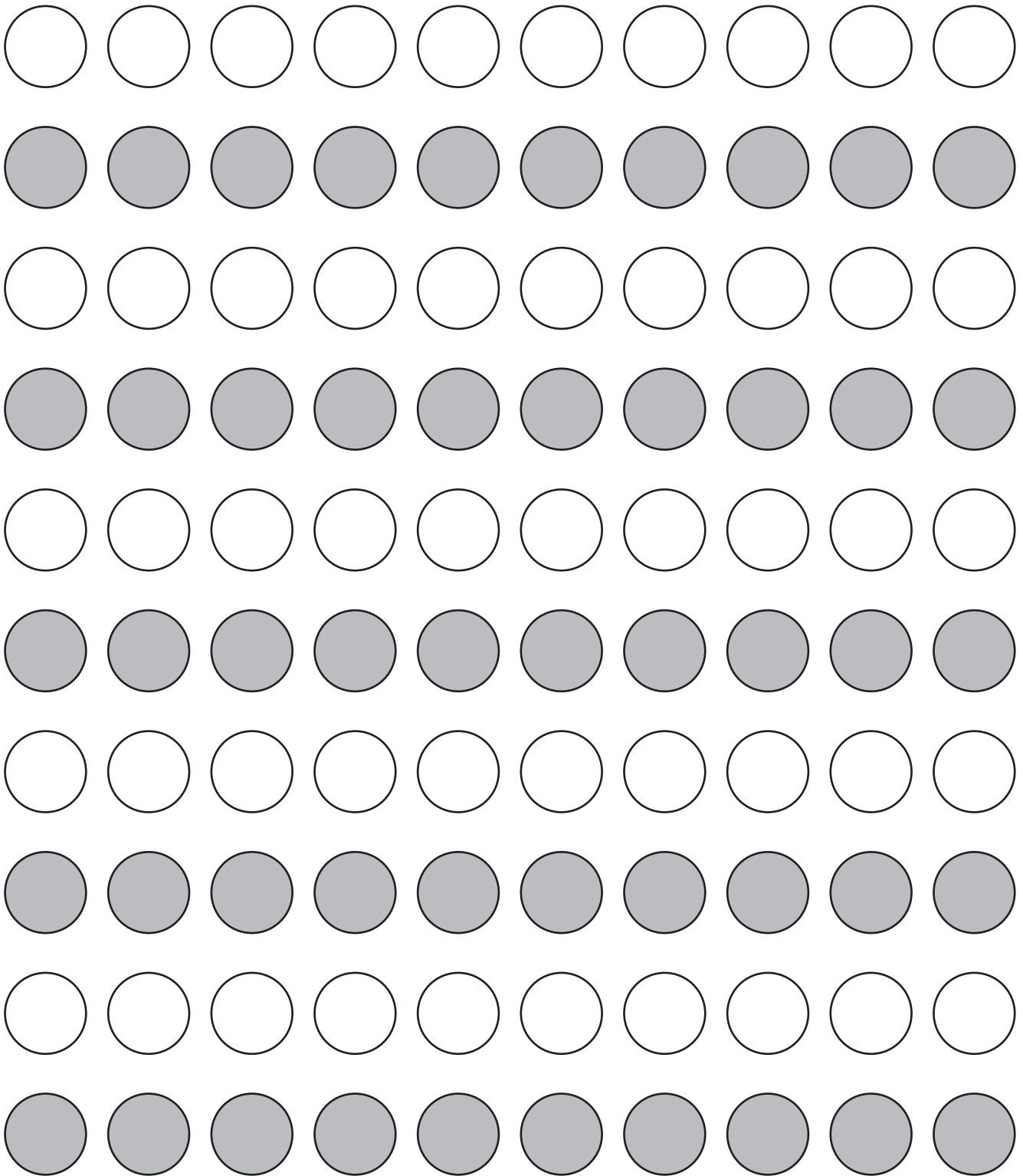
Make a model of the number of unit squares in Column 1. Then physically remove the number of unit squares shown in Column 2 from the set of unit squares shown in Column 1. Record the answer by sketching the number of unit squares left. Column 4 will be used in a later lesson.

	Column 1	Column 2	Column 3	Column 4
1.	□ □ □ □	□ □ □ □ □ □		
2.	□ □ □ □ □ □	□ □ □ □ □ □ □ □		
3.	□ □ □	□ □ □ □		
4.	□ □ □ □ □ □	□ □ □ □ □ □ □ □		
5.	□ □ □ □ □	□ □ □ □ □ □ □ □ □ □		
6.	□ □ □ □ □	□ □ □ □ □ □ □ □ □ □ □ □		
7.	□ □ □ □	□ □ □ □ □ □ □ □		
8.	□ □	□ □ □ □ □ □ □ □ □ □		
9.	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■		
10.	■ ■	■ ■ ■ ■ ■ ■		
11.	■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■		
12.	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■		
13.	■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■		
14.	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■		
15.	■	■ ■ ■ ■		
16.	■ ■	■ ■ ■ ■ ■ ■ ■ ■		

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# Shaded and Un-Shaded Discs 1

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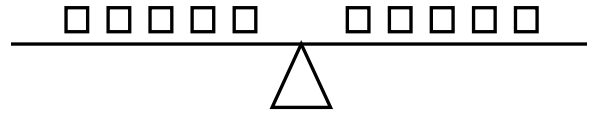


## Actions with Balanced Scales I

### Lesson 4, Activity 4A

Name: \_\_\_\_\_ Date: \_\_\_\_\_

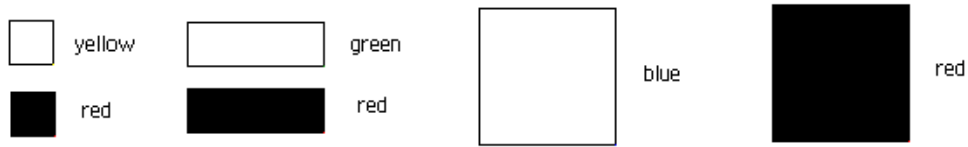
Tell what would happen to the balanced scale at the right if each of the actions listed below were taken. Remember, the scale is reset after each action.



1. Two red squares were added to the right side.
2. One yellow and one red square were added to the right side.
3. Two yellow squares were removed from the left side and one yellow square was removed from the right side.
4. A red square was added to the right side of the scale and a yellow square was added to the left side.
5. One red square was added to each side of the scale.
6. Three red squares and three yellow squares were added to the left side of the scale.
7. One yellow square was removed from each side of the scale.
8. Two yellow squares were placed on the right and two red squares were placed on the left side of the scale.
9. A red square was placed on the left and a yellow square was removed from the right.
10. Two yellow squares were removed from the left and two yellow squares were added to the right side of the scale.

# Solving Equations with Algebra Tiles

## Part I



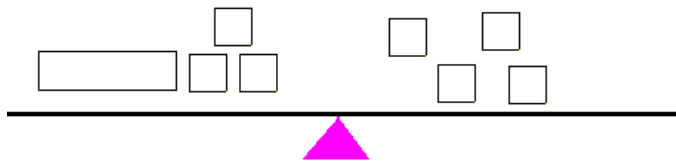
Each of the pieces of the algebra models represent an algebraic expression:

small yellow square - 1 unit tile  
 green rectangle -  $x$  tile  
 blue square -  $x^2$  tile

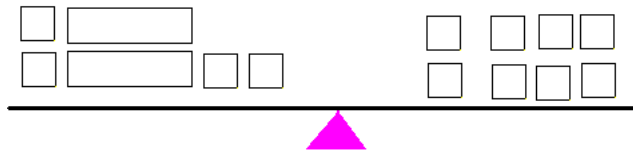
small red square - negative 1 unit tile  
 red rectangle - negative  $x$  tile  
 red square - negative  $x^2$  tile

Algebra tiles can be used to solve equations.

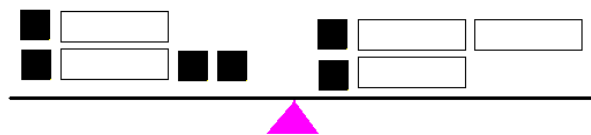
1. Set this picture up on your equation balance. By doing the same step to both sides of the equation, try to get the green rectangle by itself. What does one green rectangle equal? Describe your steps. Is there another set of steps you could use to find the value of one green rectangle? Does the value of the green rectangle make sense?



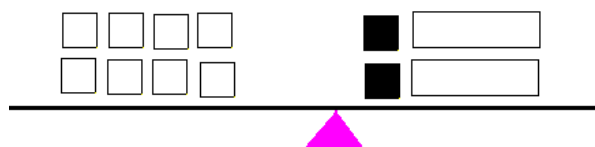
2. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



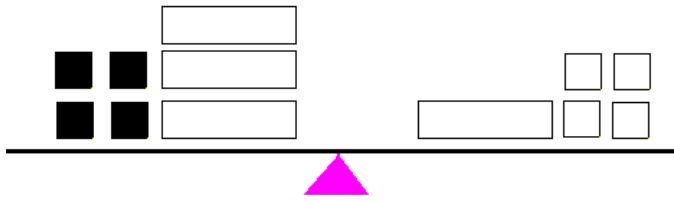
3. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



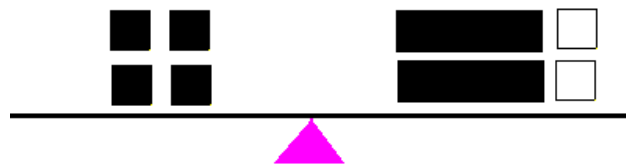
4. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



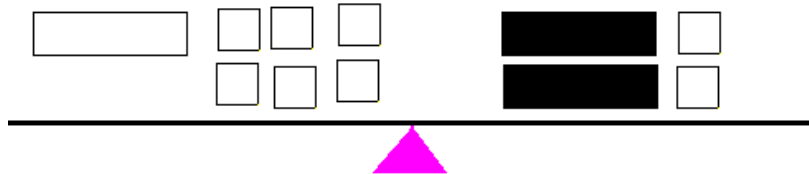
5. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



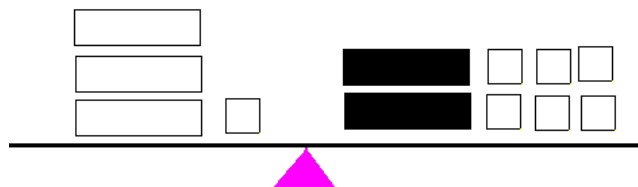
6. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



7. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



8. Set up this new picture and again solve for the value of the green tile. Is there more than one set of steps that you can use to find the value of the green rectangle? Does your answer make sense?



# Solving Equations with Algebra Tiles

## Part II



Each of the pieces of the algebra models represent an algebraic expression:

small yellow square - 1 unit tile  
 green rectangle -  $x$  tile  
 green square -  $x^2$  tile

small red square - negative 1 unit tile  
 red rectangle - negative  $x$  tile  
 red square - negative  $x^2$  tile

Algebra models can be used to solve equations.

1. Use the algebra models to represent  $x + 3 = 4$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
2. Use the algebra models to represent  $2x + 4 = 8$ . Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
3. Use the algebra models to represent  $-2x + -4 = -2 + 3x$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
4. Use the algebra models to represent  $8 = -2 + 2x$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
5. Use the algebra models to represent  $-4 + 3x = x + 4$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
6. Use the algebra models to represent  $-4 = -2x + 2$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
7. Use the algebra models to represent  $x + 6 = -2x + 2$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
8. Use the algebra models to represent  $3x + 1 = -2x + 6$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?

# Solving Equations with Algebra Tiles

## Part III



Each of the pieces of the algebra models represent an algebraic expression:

small yellow square - 1 unit tile  
 green rectangle -  $x$  tile  
 green square -  $x^2$  tile

small red square - negative 1 unit tile  
 red rectangle - negative  $x$  tile  
 red square - negative  $x^2$  tile

Algebra models can be used to solve equations.

- Use the algebra models to represent  $2x + 3 + ^{-1}x = 5$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $3x + 4 + ^{-1}x = 8$ . Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $9 = 1x + ^{-3} + 3x$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $^{-3} = 3x + 2 + 2x$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $2x + ^{-4} + 3x = ^{-2} + 3x + 3$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $6 + ^{-5}x + ^{-4} = 6 + ^{-2}x + 2$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $2(x+1) = 3(x+^{-2})$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?
- Use the algebra models to represent  $3(x+1) + 1 = 2(2x+^{-3}) + ^{-3}x$  on the equation balance. Find the value of  $x$  by doing the same thing to both sides of the balance until you have the  $x$  (green rectangle) by itself. Does this value make sense?

# Algebra Table



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# Balance Scale

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