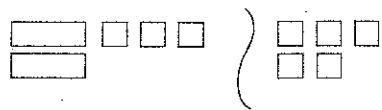




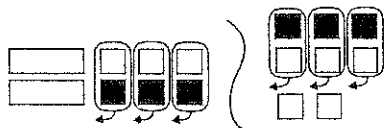
Quick Review

Algebra tiles and balance scales can both be used to model and solve equations. To solve the equation $2x + 3 = 5$:



What you do to one side of the equation, you also do to the other side.

Isolate the x -tiles by adding 3 black tiles to make zero pairs. Then remove the zero pairs.



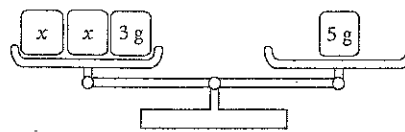
Arrange the tiles on each side into 2 equal groups. Compare groups.



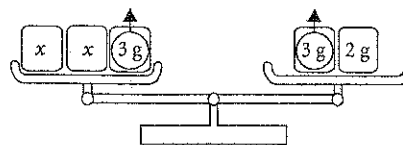
One x -tile equals 1 white tile.
So, $x = 1$.

Tip

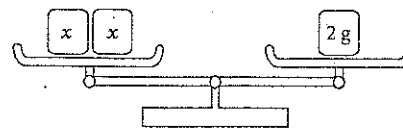
A white square tile models $+1$ and a black square tile models -1 . These are called unit tiles. White rectangular tiles model variable tiles, or x -tiles. One white unit tile and one black unit tile form a zero pair.



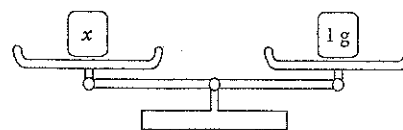
Replace 5 g in the right pan with 3 g and 2 g. Then remove 3 g from each pan.



The unknown masses are isolated in the left pan, and 2 g is left in the right pan.



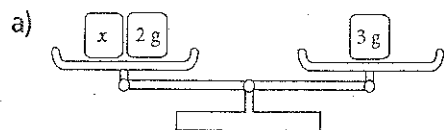
The two unknown masses balance 2 g. So, each unknown mass is 1 g.

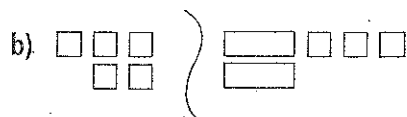


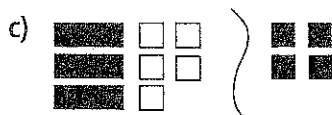
So, $x = 1$.

Practice

1. Write the equation modelled by each of the following.







Tip

To isolate the x -tile or mass, make zero pairs.

2. Construct a model to represent each equation. Then solve the equation using your model. Verify the solution.

a) $x + 3 = 9$ _____

b) $3 = 2x - 5$ _____

c) $4x + 3 = 11$ _____

d) $14 = 5x + 4$ _____

3. Draw a model for each equation and the steps of its solution. Verify the solution.

a) $a + 4 = 5$

b) $6 = c - 4$

c) $y - 2 = 4$

d) $5 = x + 3$

4. Draw a model for each equation and the steps of its solution. Verify the solution.

a) $2v = 6$

b) $4n = -8$

c) $5 = 5y$

d) $-6 = 3r$

H I N T

Line up each variable tile or mass with the same quantity of number tiles or masses in your model.



5. Draw a model to represent the steps you took to solve each equation. Verify the solution.

a) $3x + 2 = 11$

b) $-5 = 5 + 2y$

6. Five more than twice a number is seven. Let n represent the number.

a) Write an equation you can use to solve for n .

b) Represent the equation for this problem with a model. Use the model to solve the equation.

c) Verify the solution and write a concluding statement.

7. One less than three times a number is eleven. Write an equation and use a model to solve the problem. Verify the solution and write a concluding statement.



Quick Review

In Section 6.1, you solved the equation $2x - 3 = 1$ using algebra tiles. You are going to solve the same equation using algebra and compare it to the algebra tile model.

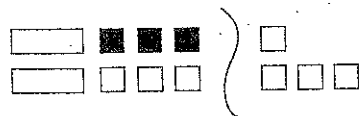
H I N T

There are two main ideas:
 1. Do *opposite* operations.
 2. Do them to *both* sides.

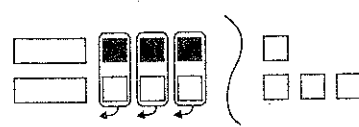
Algebra tile model



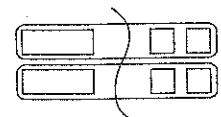
Isolate the x -tiles by adding $+3$ to both sides



Remove zero pairs.



Arrange the tiles on each side into 2 equal groups.



$x = 2$

Algebra steps

$2x - 3 = 1$

$2x - 3 + 3 = 1 + 3$

$2x = 4$

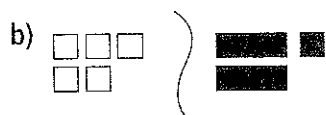
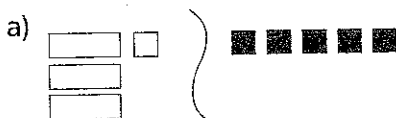
Divide both sides by 2 to isolate the x -variable:

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

$x = 2$

Practice

1. Write the equation modelled by each set of algebra tiles. Then solve the equation using both the algebra tile method and the algebra method.



2. Sketch algebra tiles to represent each equation. Then solve the equation using both the algebra tile method and the algebra method.

a) $2y - 1 = 7$

b) $-4 = 2 + 3a$

3. Use algebra to solve each equation. Verify the solution.

a) $6m + 5 = -7$

b) $3c - 2 = 2$

The solution is _____.

The solution is _____.

c) $2 + 5y = 2$

d) $4 - 3x = -5$

The solution is _____.

The solution is _____.

4. Each solution has an error. Check the solution and show that it is incorrect. Then show a correct solution.

a) $3y - 4 = 8$

$3y - 4 + 4 = 8 + 4$

$3y = 12$

$3y - 3 = 12 - 3$

$y = 9$

The solution is _____.

b) $9 = 6 - 2x$

$9 + -6 = 6 - 6 - 2x$

$15 = -2x$

$\frac{15}{-2} = \frac{-2x}{-2}$

$-7\frac{1}{2} = x$

The solution is _____.

5. For each part below, let the number be n . Write an equation and solve it algebraically, verify the solution, and then write a concluding statement.

a) Four less than three times a number is fourteen.

b) The sum of twelve and twice a number is forty-four.
