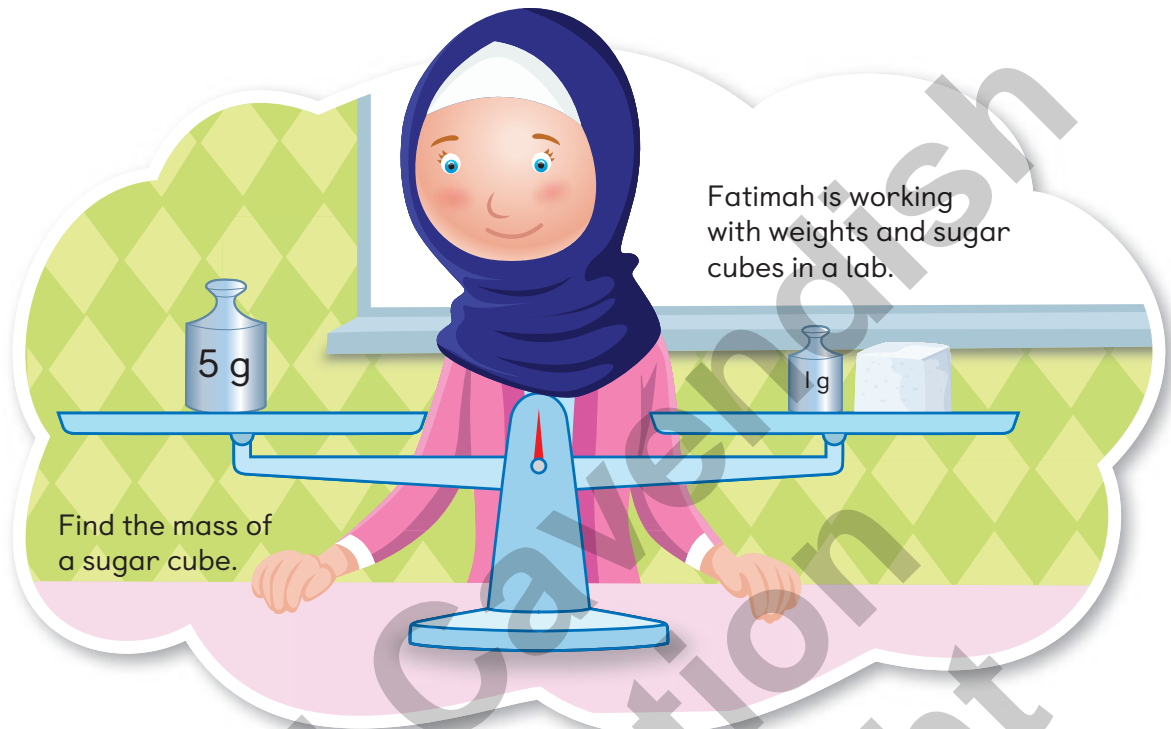
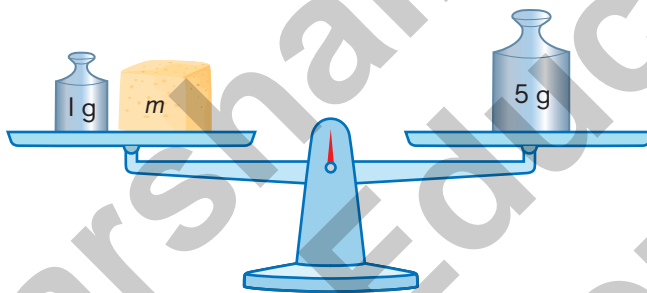


## 8A Algebraic Equations



### Learn



Let the mass of a sugar cube be  $m$  grams.

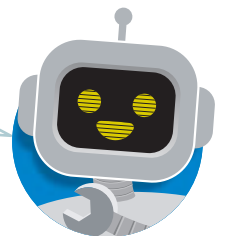
The mass of a sugar cube and a 1-gram weight = \_\_\_\_\_ + \_\_\_\_\_ grams

Since the scale is balanced, the mass of a sugar cube and a 1-gram weight is the same as the mass of a 5-gram weight.

\_\_\_\_\_ + \_\_\_\_\_ grams is equal to \_\_\_\_\_ grams.

$m + 1 = 5$  is an **algebraic equation**.

The two quantities  $m + 1$  and 5 are equal or balanced. The two sides of the equation are separated by an = sign.

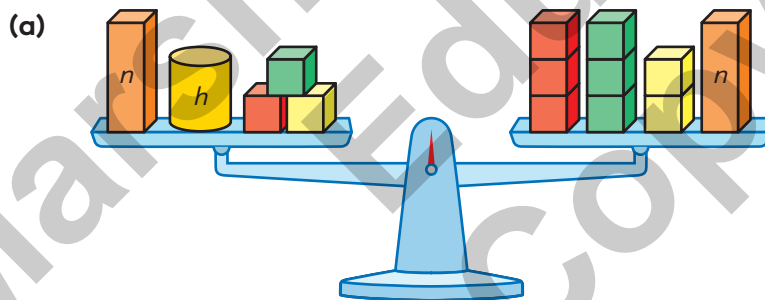


## 8B Solve Algebraic Equations by Adding or Subtracting

Pedro arranged some blocks and a cylinder on a pan balance. The pan balance shows that the two sides of the equation  $3 + h = 8$  are balanced.

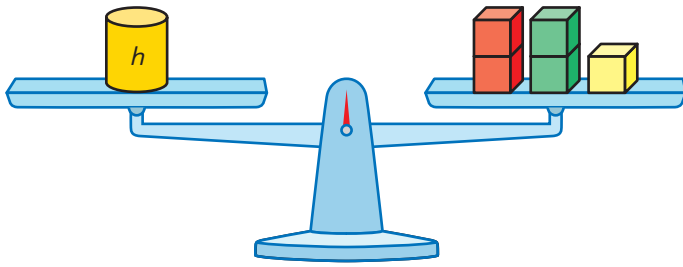
(a) What happens if Pedro adds the same number of blocks to each side?  
 (b) What happens if Pedro removes 3 blocks from each side?

### Learn

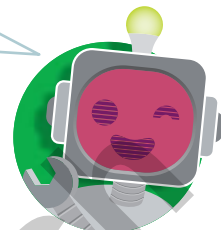


The pans are balanced when  $3 + h = 8$ .  
 When  $n$  blocks are added to each side, \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_.  
 The pans are still balanced.

(b)



We do the same things on both sides to keep the pan balanced.



When 3 blocks are removed from each side, the left pan has \_\_\_\_\_ + \_\_\_\_\_ - \_\_\_\_\_ blocks and the right pan has \_\_\_\_\_ - \_\_\_\_\_ or \_\_\_\_\_ blocks left. The pans are still balanced.

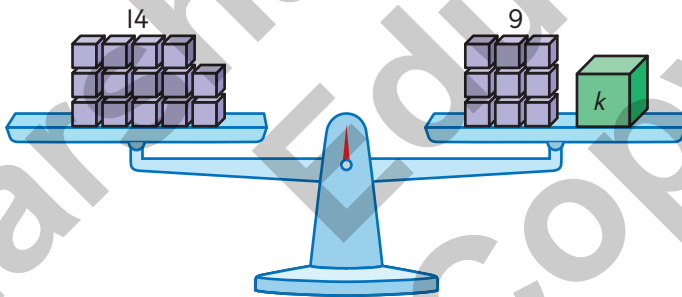
\_\_\_\_\_ + \_\_\_\_\_ - \_\_\_\_\_ = \_\_\_\_\_  
 $h =$  \_\_\_\_\_

$h$  is equivalent to \_\_\_\_\_ blocks.  
 $h =$  \_\_\_\_\_ is the solution to the equation  $h + 3 = 8$ .

## Learn Together

I. Solve the equations.

(a)



$$14 = k + 9$$

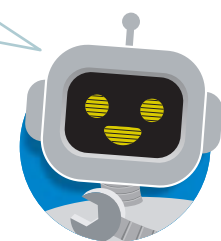
14 ○ \_\_\_\_\_ =  $k + 9$  ○ \_\_\_\_\_  
 \_\_\_\_\_ =  $k$

(b)

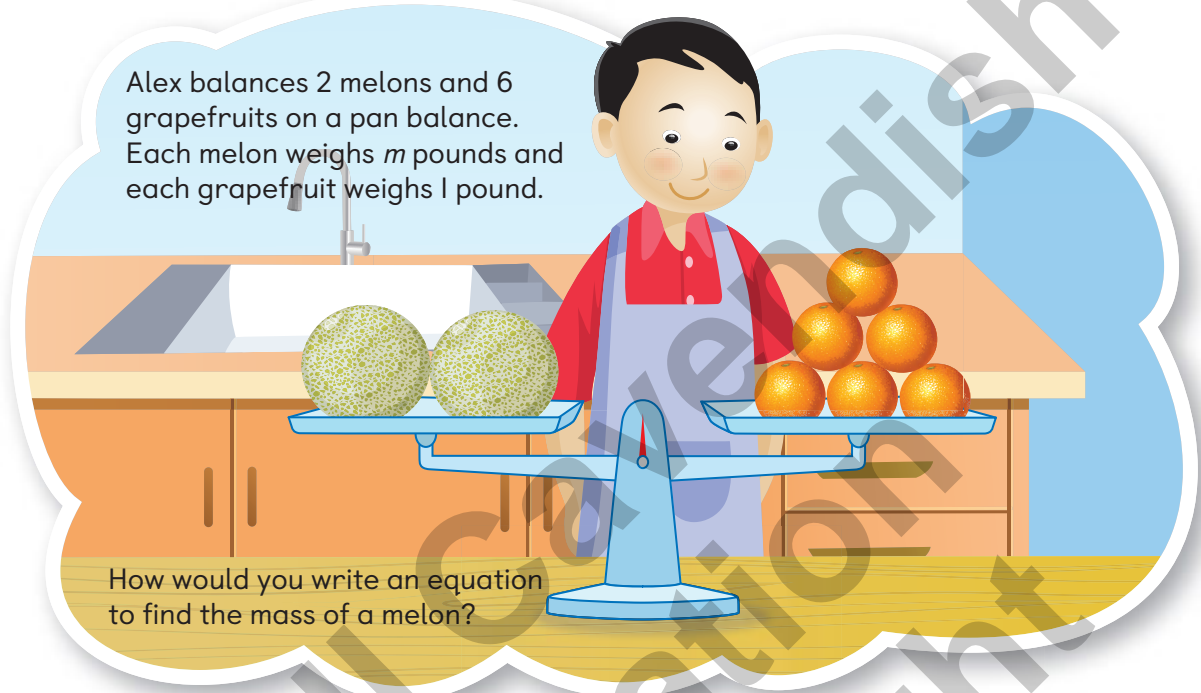
$$4 + j = 22$$

$4 + j$  ○ \_\_\_\_\_ = 22 ○ \_\_\_\_\_  
 $j =$  \_\_\_\_\_

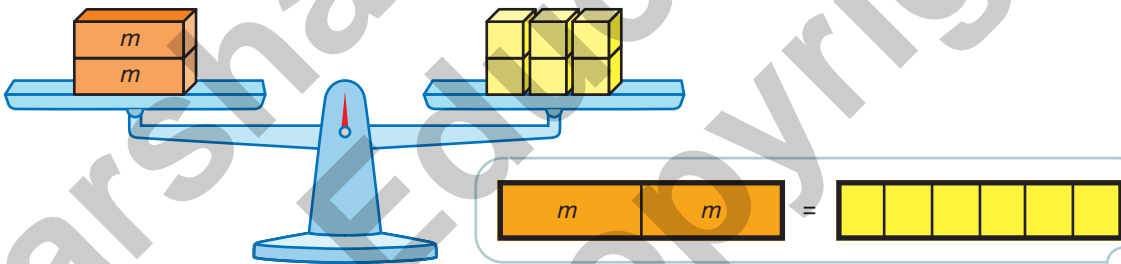
Subtract \_\_\_\_\_ on both sides.



# 8D Solve Algebraic Equations by Multiplying or Dividing



## Learn



Weight of the melons = \_\_\_\_\_ lb

Weight of the grapefruits = \_\_\_\_\_ lb

\_\_\_\_\_ = \_\_\_\_\_

The weight of 2 melons is equal to the weight of 6 grapefruits.

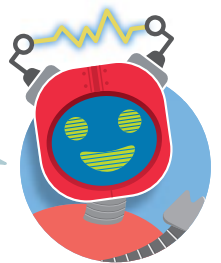
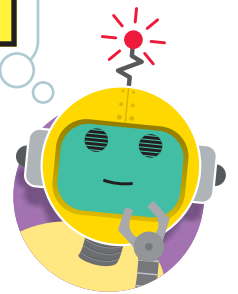
$$2m = 6$$

$$2m \div \underline{\hspace{2cm}} = 6 \div \underline{\hspace{2cm}}$$

$$m = \underline{\hspace{2cm}}$$

To keep the both sides balanced, we divide both sides by the same number.

The weight of a melon is \_\_\_\_\_ pounds.



## Learn Together

1. Solve the equations.

(a)  $3a = 21$   
 $3a \div \underline{\hspace{2cm}} = 21 \div \underline{\hspace{2cm}}$   
 $a = \underline{\hspace{2cm}}$

(b)  $90 = 5b$   
 $90 \bigcirc \underline{\hspace{2cm}} = 5b \bigcirc \underline{\hspace{2cm}}$   
 $\underline{\hspace{2cm}} = b$

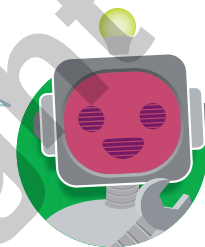
We divide both sides of the equation by the same number.



(c)  $\frac{c}{3} = 7$   
 $\frac{c}{3} \times \underline{\hspace{2cm}} = 7 \times \underline{\hspace{2cm}}$   
 $c = \underline{\hspace{2cm}}$

(d)  $\frac{d}{5} = 8$   
 $\frac{d}{5} \bigcirc \underline{\hspace{2cm}} = 8 \bigcirc \underline{\hspace{2cm}}$   
 $d = \underline{\hspace{2cm}}$

We multiply both sides by the same number.



## Practice On Your Own

1. Solve the equations.

(a)  $7w = 84$

(b)  $11x = 110$

(c)  $\frac{y}{6} = 8$

(d)  $\frac{z}{5} = 10$

## Think!

2. **CONSTRUCT VIABLE ARGUMENTS** Amanda solved the equation as shown. Do you agree with her?

$$\frac{3e}{4} = 6$$

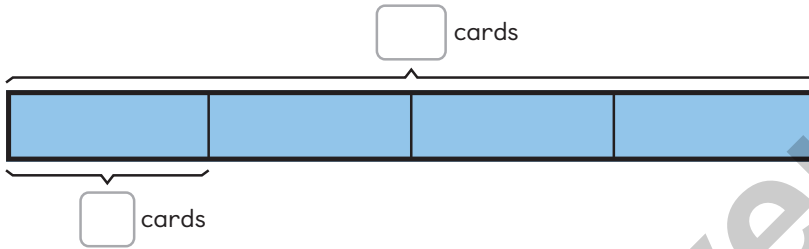
$$\frac{3e}{4} = \frac{24}{4}$$

$$3e = 24$$
$$e = 8$$

# Learn Together

Fill in the missing expression, form an equation, and solve each problem.

1. Karen has 4 packs of baseball cards. There are  $t$  cards in each pack. Karen has \_\_\_\_\_ cards in all. If she has 128 cards in all, how many cards are there in each pack?



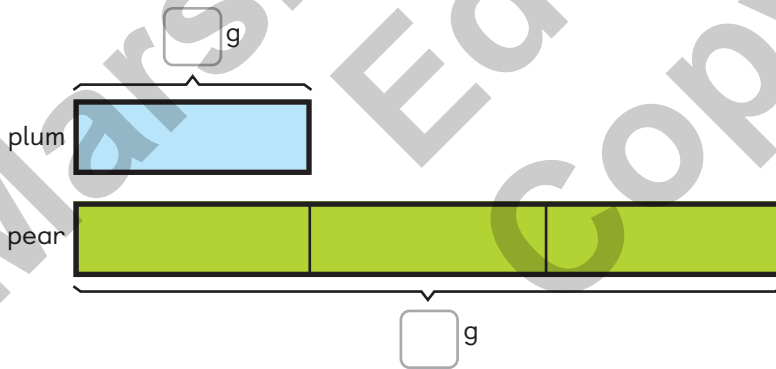
\_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_ ○ \_\_\_\_\_ = \_\_\_\_\_ ○ \_\_\_\_\_

\_\_\_\_\_ = \_\_\_\_\_

There are \_\_\_\_\_ cards in each pack.

2. A plum weighs  $p$  grams. A pear weighs 3 times as much as the plum. The pear weighs \_\_\_\_\_ grams. If the pear weighs 195 grams, how heavy is the plum?



\_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_ ○ \_\_\_\_\_ = \_\_\_\_\_ ○ \_\_\_\_\_

\_\_\_\_\_ = \_\_\_\_\_

The plum weighs \_\_\_\_\_ grams.