

Grade 7

Complete Exit Tickets 1-8  
and Fun Review M3L1-4

(These are a review of  
what we have already  
studied.)

New

Lesson 9 (See Class Notes)

Name \_\_\_\_\_ Period \_\_\_\_\_

**Lesson 9: Using If-Then Moves in Solving Equations**

Learning Target: I can solve word problems algebraically.

**Classwork****Opening Exercise**

Heather practices soccer and piano. Each day she practices piano for 2 hours. After 5 days, she practiced both piano and soccer for a total of 20 hours. Assuming that she practiced soccer the same amount of time each day, how many hours per day,  $h$ , did Heather practice soccer?

Let  $h$  = # of hours practiced of soccer each day

$$\begin{array}{rcl} \text{piano} & & \text{soccer} \\ 5(2) + 5h & = & 20 \end{array}$$

$$\begin{array}{rcl} 10 + 5h & = & 20 \\ -10 & & -10 \\ \hline 5h & = & 10 \\ \frac{5}{5} & & \frac{5}{5} \\ h & = & 2 \end{array}$$

she practiced 2 hours of soccer each day.

Over 5 days, Jake practices piano for a total of 2 hours. Jake practices soccer for the same amount of time each day. If he practiced piano and soccer for a total of 20 hours, how many hours,  $h$ , per day did Jake practice soccer?

$$\begin{array}{rcl} 2 + 5h & = & 20 \\ -2 & & -2 \\ \hline 5h & = & 18 \end{array}$$

$$\begin{array}{rcl} 5h & = & 18 \\ \frac{5}{5} & & \frac{5}{5} \end{array}$$

$$h = 3\frac{3}{5}$$

$$\begin{array}{l} 3\frac{3}{5} \\ \downarrow \\ 3 \text{ hours and } \frac{3}{5} \text{ hour} \\ \downarrow \quad \frac{3}{5} \left( \frac{60 \text{ mins}}{1 \text{ hour}} \right) \\ \frac{180}{5} \\ 3 \text{ hours } 36 \text{ mins} \end{array}$$

He practiced 3.6 hours of soccer a day

Skip

## Example 1

Fred and Sam are a team in the local 138.2 mile bike-run-athon. Fred will compete in the bike race, and Sam will compete in the run. Fred bikes at an average speed of 8 miles per hour and Sam runs at an average speed of 4 miles per hour. The bike race begins at 6:00 a.m., followed by the run. Sam predicts he will finish the run at 2:33 a.m. the next morning.

- How many hours will it take them to complete the entire bike-run-athon?
- If  $t$  is how long it takes Fred to complete the bike race, in hours, write an expression to find Fred's total distance.
- Write an expression, in terms of  $t$  to express Sam's time.
- Write an expression, in terms of  $t$ , that represents Sam's total distance.
- Write and solve an equation using the total distance both Fred and Sam will travel.

f. How far will Fred bike, and how much time will it take him to complete his leg of the race?

g. How far will Sam run, and how much time will it take him to complete his leg of the race?

SKIP

Total Time (hours)	Fred's Time (hours)	Sam's Time (hours)
10	6	
15	12	
20	8	
18.35	8	
20.55	$t$	


### Example 2

Shelby is seven times as old as Bonnie. If in 5 years, the sum of Bonnie and Shelby's ages is 98, find Bonnie's present age. Use an algebraic approach.

	Present	Future
Bonnie	$B$	$B+5$
Shelby	$7B$	$7B+5$

$$(B+5) + (7B+5) = 98$$

$$8B + 10 = 98$$

$$\frac{8B}{8} = \frac{88}{8}$$

$$B = 11$$

Bonnie is 11 years old.

## Problem Set

Assignment : # 2, 4, 6, 7, 8, 9

Make sure to write an algebraic equation &amp; solve.

1. A company buys a digital scanner for \$12,000. The value of the scanner is  $12,000 \left(1 - \frac{n}{5}\right)$  after  $n$  years. The company has budgeted to replace the scanner when the trade-in value is \$2,400. After how many years should the company plan to replace the machine in order to receive this trade-in value?

2. Michael is 17 years older than John. In 4 years, the sum of their ages will be 49. Find Michael's present age.

3. Brady rode his bike 70 miles in 4 hours. He rode at an average speed of 17 mph for  $t$  hours and at an average rate of speed of 22 mph for the rest of the time. How long did Brady ride at the slower speed? Use the variable  $t$  to represent the time, in hours, Brady rode at 17 mph.

4. Caitlan went to the store to buy school clothes. She had a store credit from a previous return in the amount of \$39.58. If she bought 4 of the same style shirt in different colors and spent a total of \$52.22 after the store credit was taken off her total, what was the price of each shirt she bought? Write and solve an equation with integer coefficients.

5. A young boy is growing at a rate of 3.5 cm per month. He is currently 90 cm tall. At that rate, in how many months will the boy grow to a height of 132 cm?

6. The sum of a number,  $\frac{1}{6}$  of that number,  $2\frac{1}{2}$  of that number, and 7 is  $12\frac{1}{2}$ . Find the number.

7. The sum of two numbers is 33 and their difference is 2. Find the numbers.
8. Aiden refills three token machines in an arcade. He puts twice the number of tokens in machine A as in machine B, and in machine C, he puts  $\frac{3}{4}$  what he put in machine A. The three machines took a total of 18,324 tokens. How many did each machine take?
9. Paulie ordered 250 pens and 250 pencils to sell for a theatre club fundraiser. The pens cost 11 cents more than the pencils. If Paulie's total order costs \$42.50, find the cost of each pen and pencil.

Try these problems.

Module 3

Name \_\_\_\_\_

Period \_\_\_\_\_ Grade 7

## Lesson 9: Using If-Then Moves in Solving Equations

### Exit Ticket

1. Brand A scooter has a top speed that goes 2 miles per hour faster than Brand B. If after 3 hours, Brand A scooter traveled 24 miles at its top speed, at what rate did Brand B scooter travel at its top speed if it traveled the same distance? Write an equation to determine the solution. Identify the if-then moves used in your solution.
2. At each scooter's top speed, Brand A scooter goes 2 miles per hour faster than Brand B. If after traveling at its top speed for 3 hours, Brand A scooter traveled 40.2 miles, at what rate did Brand B scooter travel if it traveled the same distance as Brand A? Write an equation to determine the solution and then write an equivalent equation using only integers.