Lesson 24 Wintroduction Time and Money





Use What You Know

You have learned how to convert measurements to solve multi-step problems. Now you will solve multi-step problems involving time and money conversions. Take a look at this problem.

Last week, Shing did chores for 3 hours and 15 minutes on Monday, 35 minutes on Wednesday, and 20 minutes on Saturday. What was the total number of minutes Shing did chores?

- a. What do you need to do to solve the problem?
- **b.** Are all the times given in minutes only? Explain.
- c. How can you convert 3 hours to minutes?
- d. For the time that Shing did chores on Monday, convert hours to minutes and add the remaining minutes. How many minutes did Shing do chores on Monday? Show your work.
- e. Show how to find the total number of minutes Shing did chores last week.

> Find Out More

Math problems sometimes have multiple steps, like the problem with Shing's chores. If measurements are given in two different units, one of the steps is to convert units so the units are all the same.

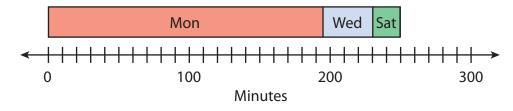
Shing did chores for 3 hours and 15 minutes, 35 minutes, and 20 minutes. To find the total number of minutes, convert 3 hours to minutes before adding.

Hours	Minutes
1	60
2	120
3	180

Now you can add to find the total number of minutes Shing did chores.

$$(180 + 15) + 35 + 20 = 250$$
 minutes

You solve real-life problems involving multiple steps and conversions in other ways. One way is to use a visual model like a number line. Below shows how you can use a number line to show Shing's times together to find the total.



Reflect

1 Explain why you need to know how to convert measurements in order to solve real-world measurement problems.

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Learn About Solving Problems About Time

Read the problem below. Then explore different ways to solve time problems.

Lucy has 2 hours to run errands. She has spent 15 minutes going to the post office and 45 minutes going to the grocery store. She has also spent 40 minutes going to get a haircut. How much time does Lucy have left to get her car washed?

Model It You can use a bar model to solve time problems.

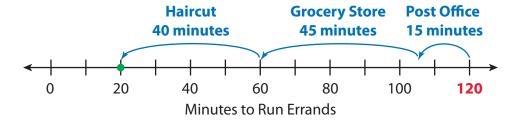
Since the errand times are in minutes, convert 2 hours to minutes.

 $2 \times 60 \text{ minutes} = 120 \text{ minutes}$

2 hours = 120 minutes				
15 minutes	45 minutes	40 minutes	? minutes	
Post Office	Grocery Store	Haircut	Car Wash	

Model It You can use a number line to represent the problem.

You can count backward from the total amount of time Lucy has to run all her errands. First, convert 2 hours to minutes: 2×60 minutes = 120 minutes.



Connect It Now you will solve the problem on the previous page using time conversions and equations.

- 2 How much time, in minutes, does Lucy have to do all her errands?
- 3 How can you find the total amount of time Lucy spent going to the post office, grocery store, and hair salon?

 Write an equation to show this amount.
- 4 Write and solve an equation with an unknown to find the amount of time Lucy has left to get her car washed.
- 5 How do you subtract 42 minutes from 1 hour 25 minutes? Explain what to do and why you do it.
- **Try It** Use what you just learned to solve these problems. Show your work on a separate piece of paper.
- 6 Chen spent 7 hours at school on Friday. He spent 30 minutes at lunch, 50 minutes at a school assembly, and the rest of the time in class. How much time did Chen spend in class?
- 7 Katrina took 3 minutes to get to her classroom after the bell rang. The table shows what she did along the way. How much time did she spend getting books from her locker? _____

Activity	Time	
walk to locker	48 seconds	
get books from locker	?	
walk from locker to classroom	35 seconds	

Learn About Solving Problems About Money

Read the problem below. Then explore different ways to solve money problems.

Prim bought 3 muffins at the school bake sale. Each muffin cost \$0.75. She also bought a cookie for \$0.50. Prim gave Mr. Hall a \$5.00 bill. How much change did she get?

Picture It You can use bills and coins to help solve money problems.

Show the amount Prim spent using quarters. 1 quarter = \$0.25



Show the amount Prim gave Mr. Hall in bills and quarters. There are 4 quarters in 1 dollar. Prim spent 11 quarters.



The amount that is not crossed out is the change that Prim got.

Connect It Now you will solve the problem on the previous page using money conversions and equations.

- 8 The money Prim used to pay is in dollars. The prices are in cents. Which is the larger unit? _____
- 9 Explain how you can convert \$5.00 to cents.

How many cents are in \$5.00?

Each muffin cost \$0.75, or 75 cents. The cookie cost \$0.50, or 50 cents. Fill in the blanks to find how many cents Prim spent on 3 muffins and 1 cookie.

 $3 \times \underline{\hspace{1cm}}$ cents $+ \underline{\hspace{1cm}}$ cents $= \underline{\hspace{1cm}}$ cents

- 11 Show how to find how many cents Prim got for change. _____
- 12 You have found Prim's change in cents. Explain how to find this amount in dollars and cents.

Try It Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

- One pound of nuts costs \$2.80. Aaron bought 2 pounds of nuts. He gave the clerk a \$10.00 bill. How much change did he get?
- 14 Keisha bought 4 books and 2 bookmarks at the library book sale. Each book cost \$2.50. Each bookmark cost \$1.95. Keisha paid with a \$20.00 bill. How much change did she get? _____

Practice Solving Time and Money Problems

Study the example below. Then solve problems 15–17.

Example

Marcel bought 4 DVDs. Each DVD cost \$19.50, including tax. He has a coupon for \$5.00 off the total cost. Marcel gave the clerk a \$100.00 bill. How much change will he get?

Look at how you could show your work using words and numbers.

amount spent on DVDs: $4 \times $19.50 = 78.00

amount spent after using coupon: \$78.00 - \$5.00 = \$73.00

amount received in change: \$100.00 - \$73.00 = \$27.00

Solution Marcel will get \$27.00.



What operation did the student use to represent the coupon for \$5.00 off the total cost?



Pair/Share

How could you work backward to solve this problem?

15 It took Otis 6 hours to travel to the Grand Canyon. Along the way he took 18 minutes to get gasoline and 53 minutes to eat. How much time did Otis spend driving?

Show your work.



How many minutes are in one hour?



Pair/Share

How could you use a number line to solve this problem?

Solution

Ronald and Kaili ran a 400-meter race. Ronald's time was 1 minute 51 seconds and Kaili's time was 2 minutes 34 seconds. How much faster was Ronald's time than Kaili's?





How many seconds are in one minute?

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Pair/Share

What operations do you need to use to solve this problem?

Solution

- 17 Victoria has two \$20 bills in her wallet. She spends \$12.25 on a gift and \$5.25 on wrapping paper. How much money does Victoria have left? Circle the letter of the correct answer.
 - **A** \$2.50
 - **B** \$17.50
 - **C** \$22.50
 - **D** \$27.75

Amir chose **A** as the correct answer. How did he get that answer?



How much does Victoria have in her wallet before she buys the gift and wrapping paper?



Pair/Share

How can you estimate to see if Amir's answer is reasonable?

Practice Solving Time and Money Problems

Solve the problems.

- 1 Sierra listened to her playlist for 10 minutes. She listened to 3 songs. The first song lasted 192 seconds, and the second song lasted 231 seconds. How long was the third song?
 - A 39 seconds
 - **B** 177 seconds
 - C 423 seconds
 - **D** 777 seconds
- 2 Bena bought a bottle of water for \$1.29 and a pack of gum for \$1.79. How much did Bena give the clerk if she got \$6.92 in change?
 - **A** \$5.00
 - **B** \$9.00
 - **C** \$10.00
 - **D** \$20.00
- 3 Tu went to the movies. He bought 2 tickets for \$9.50 each, popcorn for \$5.00, and 2 drinks for \$4.25 each. He gave the clerk two \$20.00 bills. Which expression(s) can be used to find the amount of change Tu got? Circle the letter for all that apply.
 - **A** \$40.00 \$9.50 \$4.25 \$5.00
 - **B** \$40.00 \$9.50 \$9.50 \$5.00 \$4.25 \$4.25
 - **C** $(2 \times \$9.50) + \$5.00 + (2 \times \$4.25) (2 \times \$20.00)$
 - **D** $$40.00 (2 \times $9.50) (2 \times $4.25) 5.00
 - **E** $(2 \times \$20.00) (2 \times \$9.50) (2 \times \$4.25) \5.00

4	4 r	A movie on TV is 2 hours long with commercials. There are 6 commercial breaks, each 4 minutes long. How long is the movie without the commercials? Circle the letter for all that apply.				
	A	36 minutes				
	В	96 minutes				
	C	144 minutes				
	D	1 hour, 24 minutes				
	E	1 hour, 36 minutes				
	and a loaf of bread costs \$2.25, including tax. Carter gives the clerk a \$20.00 bill. What will he get in change? List two different ways Carter could receive change. Show your work.					
	An	nswer bills:	coins:	or		
		bills:	coins:			
6	Monique has 2 hours to complete 3 homework assignments. She wants to spend the same amount of time on each assignment. How many minutes does she have for each assignment? Show your work.					
✓			tes to complete each assignment. can check off on the Self Check on pa	ige 265.		