Unit 4, Lesson 10

Tax and Tip

Let's learn about sales tax and tips.

10.1 Notice and Wonder: The Price of Sunglasses

You are on vacation and want to buy a pair of sunglasses for $10 or less. You find a pair with a price tag of $10. The cashier says the total cost will be $10.45.

What do you notice? What do you wonder?

CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

10.2 Shopping in Two Different Cities

Different cities have different sales tax rates. Here are the sales tax charges on the same items in two different cities. Complete the tables.

City 1

item	price ($)	sales tax ($)	total ($)
paper towels	8.00	0.48	8.48
lamp	25.00	1.50	
toothbrush	1.00		
laundry soap	12.00		
	x		

City 2

item	price ($)	sales tax ($)	total ($)
paper towels	8.00	0.64	8.64
lamp	25.00	2.00	
toothbrush	1.00		
laundry soap	12.00		
	x		

CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

10.3 Shopping in a Third City

Here is the sales tax on the same items in City 3.

item	price ($)	sales tax ($)
paper towels	8.00	0.58
lamp	25.00	1.83
toothbrush	1.00	0.07
laundry soap	12.00	

1. What is the tax rate in this city?

2. For the sales tax on the laundry soap, Kiran says it should be $0.84. Lin says it should be $0.87. Do you agree with either of them? Explain your reasoning.

10.4 Dining at a Restaurant

1. Jada has a meal in a restaurant. She adds up the prices listed on the menu for everything they ordered and gets a subtotal of $42.00.

Date: Sep. 12th
Time: 6:55 PM
Server: # 27

Bread Stix	9.50
Chicken Parm	15.50
Chef Salad	12.00
Lemon Soda	2.00
Tea	3.00
Subtotal	42.00
Sales Tax	3.99
Total	45.99

a. When the check comes, it says they also need to pay $3.99 in sales tax. What percentage of the subtotal is the sales tax?

b. After tax, the total is $45.99. What percentage of the subtotal is the total?

c. They actually pay $52.99. The additional $7 is a tip for the server. What percentage of the subtotal is the tip?

CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

2. The tax rate at this restaurant is 9.5%.

Date: Sep 12th	
Time: 6:04 PM	
Server: # 27	
Bread Stix	9.50
Ravioli Bites	10.50
Cheesecake	4.95
Subtotal	24.95
Sales Tax	_____
Total	_____

Another person's subtotal is $24.95. How much will their sales tax be?

Date: Sep 12th	
Time: 7:12 PM	
Server: # 27	
Garden Salad	_____
Broccoli Bites	_____
Subtotal	_____
Sales Tax	1.61
Total	_____

Some other person's sales tax is $1.61. How much was their subtotal?

Are you ready for more?

Elena's cousins went to a restaurant. The part of the entire cost of the meal that was tax and tip together was 25% of the cost of the food alone. What could the tax rate and tip rate be?

CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

Lesson 10 Summary

Many places have *sales tax*. A sales tax is an amount of money that a government agency collects on the sale of certain items. For example, a state might charge a tax on all cars purchased in the state. Often, the tax rate is given as a percentage of the cost. For example, a state's tax rate on car sales might be 2%, which means that for every car sold in that state, the buyer has to pay a tax that is 2% of the sales price of the car.

Fractional percentages often arise when a state or city charges a sales tax on a purchase. For example, the sales tax in Arizona is 7.5%. This means that when someone buys something, they have to add 0.075 times the amount on the price tag to determine the total cost of the item.

For example, if the price tag on a T-shirt in Arizona says \$11.50, then the sales tax is $(0.075) \cdot 11.5 = 0.8625$, which rounds to 86 cents. The customer pays $11.50 + 0.86$, or \$12.36 for the shirt.

The total cost to the customer is the item price plus the sales tax. We can think of this as a percent increase. For example, in Arizona, the total cost to a customer is 107.5% of the price listed on the tag.

A *tip* is an amount of money that a person gives someone who provides a service. It is customary in many restaurants to give a tip to the server that is between 10% and 20% of the cost of the meal. If a person plans to leave a 15% tip on a meal, then the total cost will be 115% of the cost of the meal.

CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.