Unit 4, Lesson 11

Percentage Contexts

Let's learn about more situations that involve percentages.

11.1 Leaving a Tip

Which of these expressions represent a 15% tip on a $20 meal? Which represent the total bill?

$15 \cdot 20$

$20 + 0.15 \cdot 20$

$1.15 \cdot 20$

$\frac{15}{100} \cdot 20$

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

11.2 Card Sort: Percentage Situations

1. Your teacher will give you a set of cards and a sorting mat. Take turns with your partner to match a situation to a category.
   a. For each match that you find, explain to your partner how you know it's a match.
   b. For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.

   Pause here so your teacher can review your work.

2. Choose one situation that involves a percent increase.
   a. Find the percentage that the increase is of the original amount.

   b. What does this percentage tell us about the situation?

3. Choose one situation that involves a percent decrease.
   a. Find the percentage that the decrease is of the original amount.

   b. What does this percentage tell us about the situation?

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

11.3 A Car Dealership

A car dealership pays a wholesale price of $12,000 to purchase a vehicle.

1. The car dealership wants to make a 32% profit.

   a. By how much will they mark up the price of the vehicle?

   b. After the markup, what is the retail price of the vehicle?

2. During a special sales event, the dealership offers a 10% discount off of the retail price.

   a. After the discount, how much will a customer pay for this vehicle?

   b. After the discount, what percent profit will the dealership make?

Are you ready for more?

This car dealership pays the salesperson a bonus for selling the car equal to 6.5% of the sale price. How much commission did the salesperson lose when they decided to offer a 10% discount on the price of the car?

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

Lesson 11 Summary

There are many everyday situations where a percentage of an amount of money is added to or subtracted from that amount in order to be paid to some other person or organization:

	goes to	how it works
sales tax	the government	added to the price of the item
gratuity (tip)	the server	added to the cost of the meal
interest	the lender (or account holder)	added to the balance of the loan, credit card, or bank account
markup	the seller	added to the price of an item so the seller can make a profit
markdown (discount)	the customer	subtracted from the price of an item to encourage the customer to buy it
depreciation	the buyer	subtracted from the price of an item as the item gets older
commission	the salesperson	subtracted from the payment that is collected

For example,

- If a restaurant bill is $34 and the customer pays $40, they left $6 dollars as a tip for the server. That is 18% of $34, so they left an 18% tip. From the customer's perspective, this can be thought of as an 18% increase of the restaurant bill.
- If a realtor helps a family sell their home for $200,000 and earns a 3% commission, then the realtor makes $6,000, because $(0.03) \cdot 200{,}000 = 6{,}000$, and the family gets $194,000, because $200{,}000 - 6{,}000 = 194{,}000$. From the family's perspective, this can be thought of as a 3% decrease on the sale price of the home.

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