Unit 9, Lesson 14

Recalling Percent Change

Let's find the result of changing a number by a percentage.

14.1 Wheels

A scooter costs $160.

For each question, show your reasoning.

1. The cost of a pair of roller skates is 20% of the cost of the scooter. How much do the roller skates cost?

2. A bicycle costs 20% more than the scooter. How much does the bicycle cost?

3. A skateboard costs 25% less than the bicycle. How much does the skateboard cost?

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14.2 Taxes and Sales

1. You need to pay 8% tax on a car that costs $12,000. What will you end up paying in total? Show your reasoning.

2. Burritos are on sale for 30% off. Your favorite burrito normally costs $8.50. How much does it cost now? Show your reasoning.

3. A pair of shoes that originally cost $79 are on sale for 35% off. Does the expression $0.65(79)$ represent the sale price of the shoes (in dollars)? Explain your reasoning.

Are you ready for more?

Come up with some strategies for mentally adding 15% to the total cost of an item.

14.3 Expressing Percent Increase and Decrease

Complete the table so that each row has a description and two different expressions that answer the question asked in the description. The second expression should use only multiplication. Be prepared to explain how the two expressions are equivalent.

description and question	expression 1	expression 2 (using only multiplication)
A one-night stay at a hotel in Anaheim, CA, costs $160. Hotel room occupancy tax is 15%. What is the total cost of a one-night stay?	$160 + (0.15) \cdot 160$	
Teachers receive a 30% educators' discount at a museum. An adult ticket costs $24. How much would a teacher pay for admission into the museum?		$(0.7) \cdot 24$
The population of a city was 842,000 ten years ago. The city now has 2% more people than it had then. What is the population of the city now?		
After a major hurricane, 46% of the 90,500 households on an island lost their access to electricity. How many households still have electricity?		
	$754 - (0.21) \cdot 754$	
Two years ago, the number of students in a school was 150. Last year, the student population increased 8%. This year, it increased about 8% again. What is the number of students this year?		

Lesson 14 Summary

We can write different expressions to calculate percent increase and decrease.

Suppose a new phone costs \$360 and is on sale at 25% off the regular price. One way to calculate this is to first find 25% of 360, which is 90, and then subtract \$90 from \$360 to get the sale price of \$270. These calculations can be recorded in this way:

$$360 - (0.25) \cdot 360 = 270$$

Another way to represent this calculation is to notice that subtracting 25% of the cost is equivalent to finding 75% of the cost. Using the distributive property, we know that $360 - (0.25) \cdot 360$ can be rewritten as $(1 - 0.25) \cdot 360$, which is equal to $(0.75) \cdot 360$.