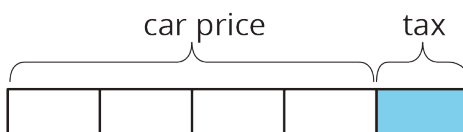


Lesson 8: Percentage Situations

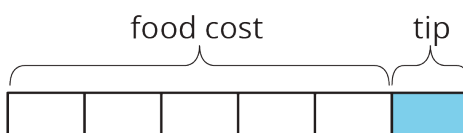
Let's find unknown percentages.

8.1: Tax, Tip, and Discount

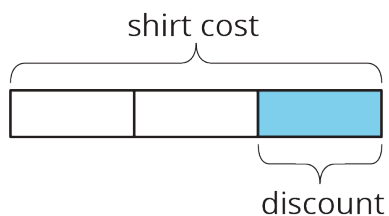
What percentage of the car price is the tax?



What percentage of the food cost is the tip?



What percentage of the shirt cost is the discount?



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

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?

8.4: Info Gap: Sporting Goods

Your teacher will give you either a *problem card* or a *data card*. Do not show or read your card to your partner.

If your teacher gives you the *problem card*:

1. Silently read your card and think about what information you need to be able to answer the question.
2. Ask your partner for the specific information that you need.
3. Explain how you are using the information to solve the problem.

Continue to ask questions until you have enough information to solve the problem.

4. Share the *problem card* and solve the problem independently.
5. Read the *data card* and discuss your reasoning.

If your teacher gives you the *data card*:

1. Silently read your card.
2. Ask your partner “*What specific information do you need?*” and wait for them to *ask* for information.

If your partner asks for information that is not on the card, do not do the calculations for them. Tell them you don’t have that information.

3. Before sharing the information, ask “*Why do you need that information?*” Listen to your partner’s reasoning and ask clarifying questions.
4. Read the *problem card* and solve the problem independently.
5. Share the *data card* and discuss your reasoning.

Pause here so your teacher can review your work. Ask your teacher for a new set of cards and repeat the activity, trading roles with your partner.

8.5: Card Sort: Percentage Situations

Your teacher will give you a set of cards. Take turns with your partner matching a situation with a descriptor. For each match, explain your reasoning to your partner. If you disagree, work to reach an agreement.

Lesson 8 Summary

There are many everyday situations in which 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
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, we can think of this as an 18% increase of the restaurant bill. If we know the initial amount and the final amount, we can also find the percent increase or percent decrease. For example, a plant was 12 inches tall and grew to be 15 inches tall. What percent increase is this? Here are two ways to solve this problem:

The plant grew 3 inches, because $15 - 12 = 3$. We can divide this growth by the original height, $3 \div 12 = 0.25$. So the height of the plant increased by 25%.

The plant's new height is 125% of the original height, because $15 \div 12 = 1.25$. This means the height increased by 25%, because $1.25 - 1 = 0.25$.

Here are two ways to solve the problem: A rope was 2.4 meters long. Someone cut it down to 1.9 meters. What percent decrease is this?

The rope is now $2.4 - 1.9$, or 0.5 meters shorter. We can divide this decrease by the original length, $0.5 \div 2.4 = 0.208\bar{3}$. So the length of the rope decreased by approximately 20.8%.

The rope's new length is about 79.2% of the original length, because $1.9 \div 2.4 = 0.791\bar{6}$. The length decreased by approximately 20.8%, because $1 - 0.792 = 0.208$.