

**Calculate discounts = Choose a level of accuracy appropriate to limitations on measurement when reporting quantities**

**Program Task:** Calculate sales discounts, employee discounts, shipping discounts and early payment discounts.

**Program Associated Vocabulary:**  
SALES DISCOUNTS, RATES OF DISCOUNTS, PERCENTAGES, EMPLOYEE DISCOUNTS

**Program Formulas and Procedures:**  
Price (Discount %) = Dollar Amount of Discount  
(Price) – (Dollar Amount of Discount) = Dollar Amount Owed

**Example:**  
A local general store is advertising a special sale for the holiday weekend. If customers bring in a coupon from the local newspaper, they will get an additional 15% discount on all of the purchases in the store. Carlee has picked out the following items to purchase at the general store:

Product	Price	Discount Amount
Ipod@ Clock Radio	\$69.99	25%
Toaster Oven	\$49.99	15%
Holiday Decoration Pack	\$29.99	35%

**Solution:**  
Ipod Clock Radio  
 $\$69.99 \times 0.25 = \$17.50 \rightarrow \$69.99 - \$17.50 = \$52.49$   
Toaster Oven  
 $\$49.99 \times 0.15 = \$7.50 \rightarrow \$49.99 - \$7.50 = \$42.49$   
Holiday Decoration Pack  
 $\$29.99 \times 0.35 = \$10.50 \rightarrow \$29.99 - \$10.50 = \$19.49$

Product	Price	Discount Amount	Dollar Discount	Amount Owed
Ipod@ Clock Radio	\$69.99	25%	\$17.50	\$52.49
Toaster Oven	\$49.99	15%	\$7.50	\$42.49
Holiday Decoration Pack	\$29.99	35%	\$10.50	\$19.49

Carlee brought the coupon from the newspaper for an additional 15% off her purchase. Calculate the amount Carlee owes for her purchase:  
 $\$52.49 + \$42.49 + \$19.49 = \$114.47$  (total purchases w/discounts)  
 $(\$114.47)(0.15) = \$17.17$  (Total 15% discount)  
 $\$114.47$  (total purchases) –  $\$17.17$  (extra discount) =  $\$97.30$

Carlee owes \$97.30 after all discounts were applied to her purchases.

**PA Core Standard:** CC.2.1.HS.F.5

**Description:** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

**Math Associated Vocabulary:**  
ROUNDING, PLACE VALUE, MENTAL MATH, AVERAGE

**Formulas and Procedures:**  
It is often more practical to use estimation to solve problems, using mental math, so that a calculator is not necessary. Usually the situations presented require you to either round to the nearest whole number, tens, hundreds, or thousands, or require you to take an average of the range of numbers given. The two examples below demonstrate specific situations where rounding and averaging are useful.

**Rounding:**  
Henry just purchased a cell phone plan that will cost him \$38.99 per month. His friend, Elizabeth, just purchased a cell phone plan that will cost her \$59.99 per month. Estimate how much more money Elizabeth will spend on her cell phone plan in one year.

- To estimate, round to the nearest tens. Henry will spend about \$40/mo. and Elizabeth will spend \$60/mo.
- Take the difference between the two:  $\$60 - \$40 = \$20$  to determine how much more Elizabeth will spend in one month.
- Multiply by 12.  $\$20 \times 12 = \$240$  more per year.

**Averaging:**  
Billy notices that 4-6 cars pass by his house each hour. Estimate the number of cars that will pass by his house in 8 hours.

- Find the average of 4 and 6. Average =  $(4 + 6) \div 2 = 5$
- Multiply this by 8 hours:  $5 \times 8 = 40$   
Approximately 40 cars should pass by his house.

### Instructor's Script – Comparing and Contrasting

The common core standard includes both rates and percents. A 10% discount means \$10 off for every \$100. Another method to calculating percentages is to use the part versus whole formula as shown below.

Example: What is 40% percent of \$60?

$$\frac{\%}{100} = \frac{\text{part}}{\text{whole}} \rightarrow \frac{40}{100} = \frac{x}{60} \rightarrow 100x = 2400 \rightarrow \frac{100x}{100} = \frac{2400}{100} \rightarrow x = 24$$

### Common Mistakes Made By Students

Students need to understand the limitations of estimating. For instance, if the cost per color copy is \$0.74/copy and 8,000 copies are made, rounding the price to an even dollar will yield an unreasonable answer. In this case, the estimate would produce a price of \$8,000 even though the actual price is only \$5,920.

### CTE Instructor's Extended Discussion

Discounts are utilized in many business establishments. It is important for a person in the field of Marketing and Business to have a strong understanding of the different forms of discounts. Calculating discounts is also an important skill for everyone to be able to use in their daily lives. Companies use discounts as an incentive to pay bills early, to make discounted purchases and as a benefit for employees in most retail firms.

Occasionally retailers offer discounts on a customer's total bill to encourage customers to purchase more products and "save money". This can be confusing for many shoppers to calculate. It is important for sales associates, managers, and cashiers to be able to calculate the different applications of discounts to sales in the stores where they are employed.

# Sales, Distribution, and Marketing Operations (52.1801) T-Chart

<b>Problems</b>	<b>Career and Technical Math Concepts</b>	<b>Solutions</b>
1. Josie works at local clothing store which offers an employee discount of 25% on purchases. She is making her first purchase which totals \$185; calculate the discount amount and the total Josie will pay for her purchase.		
2. Deontae purchased a pair of sneakers that retailed for \$97.99. The clerk told him he could give him 20% off if he filled out a survey card. How much would Deontae pay for the sneakers if he filled out the card?		
3. Andi works at an amusement park during the summer; the job pays \$8.35/hour and she works 38 hours per week and the job is guaranteed for 18 weeks. Calculate her total summer earnings. If Andi reports on time for all of her shifts she will receive a 20% bonus at the end of the season. Calculate her bonus.		
<b>Problems</b>	<b>Related, Generic Math Concepts</b>	<b>Solutions</b>
4. A software support contract is quoted for one or two years. One year would cost \$795, but two years would cost \$1,495. Round each price to the nearest hundred dollars and estimate the savings for a two year commitment		
5. Students want to raise \$500 for a field trip. With fundraising, they collected \$127 on Monday, \$130 on Tuesday, \$84 on Wednesday, and \$90 on Thursday. Approximately how much money will they need to collect on Friday to reach their goal?		
6. A car can be rented for \$37.99/day plus \$0.39/mile. Which of the following is the best estimate for the cost of renting the car for 4 days if you are driving 100 miles? a) \$150 b) \$160 c) \$200 d) \$250		
<b>Problems</b>	<b>PA Core Math Look</b>	<b>Solutions</b>
7. A company is offering a salary of \$48,500 per year. If 20% is taken from taxes, how much will a person have made in 5 years after taxes?		
8. Every hour, the store sells between 40-50 items that range from \$1.99 - \$7.99. What would be a good estimate for the amount of money the store generates in a 10 hour day?		
9. Two friends went to dinner. Their bill came to \$37.79. If a fair tip is between 15 and 20 percent, what would be a fair tip to leave their waiter?		

# Sales, Distribution, and Marketing Operations (52.1801) T-Chart

Problems	Career and Technical Math Concepts	Solutions
1. Josie works at local clothing store which offers an employee discount of 25% on purchases. She is making her first purchase which totals \$185; calculate the discount amount and the total Josie will pay for her purchase.		$\$185(0.25) = x$ $x = \$46.25$ $\$185.00 - \$46.25 = \$138.75$
2. Deontae purchased a pair of sneakers that retailed for \$97.99. The clerk told him he could give him 20% off if he filled out a survey card. How much would Deontae pay for the sneakers if he filled out the card?		$\$97.99(0.2) = x$ $x = \$19.60$ $\$97.99 - \$19.60 = \$78.39$
3. Andy works at an amusement park during the summer; the job pays \$8.35/hour and she works 38 hours per week and the job is guaranteed for 18 weeks. Calculate her total summer earnings. If Andy reports on time for all of her shifts she will receive 20% bonus at the end of the season. Calculate her bonus.		$\$8.35(38) = \$317.30$ $\$317.30(18) = \$5711.40$ $\$5711.40(0.2) = \$1142.28$ Andi's bonus will be \$1142.28
Problems	Related, Generic Math Concepts	Solutions
4. A software support contract is quoted for one or two years. One year would cost \$795, but two years would cost \$1,495. Round each price to the nearest hundred dollars and estimate the savings for a two year commitment		Rounding: One year $\approx$ \$800, while two years $\approx$ \$1,500. $\$1,500/2 = \$750$ per year \$50 per year savings, or a \$100.00 savings for the two year commitment.
5. Students want to raise \$500 for a field trip. With fundraising, they collected \$127 on Monday, \$130 on Tuesday, \$84 on Wednesday, and \$90 on Thursday. Approximately how much money will they need to collect on Friday to reach their goal?		Rounding the amounts to the nearest ten, $130 + 130 + 80 + 90 = 430$ $500$ (their goal) $- 430$ (the approx. amt. collected) = \$70 is approximate amount they would need to collect on Friday
6. A car can be rented for \$37.99/day plus \$0.39/mile. Which of the following is the best estimate for the cost of renting the car for 4 days if you are driving 100 miles?  a) \$150 b) \$160 c) \$200 d) \$250		c) \$200 $C = \text{Total Cost}$ $x = \# \text{ of days}$ $y = \# \text{ of miles}$ Equation: $C = 37.99(x) + .39(y)$ Estimate Amounts: $C = 40x + .40x$ Substitute and Solve: $C = 40(4) + .40(100)$ $C = 160 + 40 = \$200$
Problems	PA Core Math Look	Solutions
7. A company is offering a salary of \$48,500 per year. If 20% is taken from taxes, how much will a person have made in 5 years after taxes?		$\$50,000$ salary estimate. 10% is \$5,000, so 20% is \$10,000. $5 \text{ years} \times \$10,000 \text{ tax/year} = \$50,000 \text{ taxes in 5 years.}$ $\$50,000 \text{ salary} \times 5 \text{ years} = \$250,000 \text{ estimated salary for 5 years}$ $\$250,000 \text{ (estimated salary)} - 50,000 \text{ (estimated taxes)} =$ $\$200,000 \text{ (estimated net, or after tax income for 5 years)}$
8. Every hour, the store sells between 40-50 items that range from \$1.99 - \$7.99. What would be a good estimate for the amount of money the store generates in a 10 hour day?		$45 = \text{Average of 40-50}$ $\$5 = \text{Average } \$1.99 \text{ and } \$7.99$ $45 \text{ items} \times \$5 = \$225 \text{ per hour}$ $\$225 \text{ per hour} \times 10 \text{ hours} = \$2,250.00 \text{ per day}$
9. Two friends went to dinner. Their bill came to \$37.79. If a fair tip is between 15 and 20 percent, what would be a fair tip to leave their waiter?		Estimate a \$40 bill. 10% is \$4. 20% is \$8 A fair tip would be any dollar amount between \$6 and \$8.