

Unit 9

Applying Percents

Lesson	Topic	Standard
1	Introduction to applications (vocabulary) <ul style="list-style-type: none">• Commission, discount, tip, (real world)	7 RP3
2	Tax/tip (tax + tip)	7 RP3
3	Commission	7 RP3
4	Discount (discount + tax)	7 RP3
5	Review Sheet	
6	Review Review Sheet	
7	Test	
8	Performance Task/Review what you know	

Name: _____

Teacher: _____

Period: _____

Day 1 - Introduction To Applications

This lesson takes the basics of percent and applies them to everyday problems. You will review important topics as well as learn how to solve these practical applications of percent.

Most percent word problems can be solved using the proportion:

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

This important proportion will be adjusted for each of the problem types that follow.



~Neat Fact~

"Percent" comes from the Latin *Per Centum*.
The Latin word *Centum* means 100,
for example a Century is 100 years.



Vocabulary:

- ~ **Sales Tax:** An amount of money added to a total purchase determined by the county and state in which the purchase is made.
- ~ **Tip:** The amount of money earned by a person in the service industry for providing a particular service. Tips usually given to waiters, valet, caddies, drivers and bellboys.
- ~ **Commission:** The amount of money earned by a salesperson for selling a certain product.
- ~ **Discount:** An amount subtracted from the price of an item; a savings.

Match the term to the example:

- | | |
|--|---------------|
| _____ 1) Uncle Johnny gave his waiter \$20. | a) Sales Tax |
| _____ 2) Elvis got an extra \$45 in his paycheck from his sales this week. | b) Tip |
| _____ 3) Mike used a coupon and only spent \$13 instead of \$22. | c) Commission |
| _____ 4) Even though I bought \$10 worth of pencils, I had to pay \$10.88. | d) Discount |
| _____ 5) Kent carried my bags up to my hotel room so I gave him \$5. | |
| _____ 6) Joyce bought a sequin top for 20% off. | |
| _____ 7) Tommy made \$340 plus his salary because he rented out a lot of apartments this week. | |

- _____ 8) Porsche ordered three pairs of shoes for \$20 each and was charged \$65.25.
- _____ 9) Phil only pays 50% because he is an employee.
- _____ 10) Will got to take home 20% of the value of his table's check.

Find the following:

- 11) Sal spent \$6 out of \$12. What percent of his money did he spend? _____
- 12) Todd had \$44 in his wallet. He spent 30% of his money. How much money does he have left? _____
- 13) Peter spent 20% of his money. He has \$40 left in his pocket. How much did he go out with? _____

Day 1 – Homework

Match the term to the example:

- | | |
|--|---------------|
| _____ 1) Sal only pays 80% of the bill because he counts the money. | a) Sales Tax |
| _____ 2) Todd will bring your popcorn and drinks faster if you give him money. | b) Tip |
| _____ 3) Dave has to write a check to the State for the amount of money he collects over the subtotal. | c) Commission |
| _____ 4) Drew's boss gave him an extra \$200 for having the highest sales. | d) Discount |
| _____ 5) Wendy will let you stay at the hotel for 20% less if you say "sunshine" when you book. | |
| _____ 6) Justin makes 10% of the waiter's money because he bussed their tables and filled the ice. | |
| _____ 7) The couple left Lynda a penny on a \$300 bill because she was rude. | |
| _____ 8) Casey paid for a \$2 coffee at the store with a \$5 bill and got back \$2.84. | |

Solve for the missing number:

- 9) What is 42% of 87?
- 10) 22 is what percent of 88?
- 11) 17 is what percent of 51?
- 12) Ramon spent 60% of his \$437 paycheck on gifts for his friends. How much did he spend?
- 13) Jackie kept \$75 out of the \$80 she found on the streets of NYC. What percentage did she keep?
- 14) Hahn had \$25 left in her purse after shopping and spending 20% of her money.
How much did she leave to go shopping with?

Review:

15) $|4 - 6^2|$

16) $4x + 6 - 21x = 91$

17) Factor:
 $-12x - 16y$

18) Solve and Graph
 $3x - 7 \leq 29$



Tax – Add to the original price for the total cost.
Tip – Add to the original bill for the total cost.



Day 2 – Tax and Tip

Money is always two decimal places (*rounded to the nearest **hundredth***)

Example:

1) Suzy just bought the new laptop. It was \$459 plus 8% sales tax. How much was her total purchase?

There are two ways to solve this problem

Method 1:

Find out what is 8% of \$459

_____ = _____

Then add it to the original

Item price + *Tax* = *Grand total*

_____ + _____ =



Method 2:

The price of the item is 100%

AND tax is 8%

$$100\% + 8\% = 108\%$$

So,

2) A sweatshirt at Hollister costs \$60 and the rate of tax is 9%. How much is the tax?

3) After eating lunch at Applebee's, the cost of the two meals are \$35. If you want to leave the waiter a 20% tip, how much money should you leave as a tip?

3) A 65 inch 3D-HDTV costs \$1600. If the tax is 8.5%, what is the total?

- 4) At a discount store, Cole offered a salesperson \$600 for a couch. This offer includes the 8% sales tax. If the salesperson accepts the offer, what would be the price of the furniture, to the *nearest dollar*, before tax?
- 5) Tom's bill at a restaurant was \$29.15. He plans to leave a 15% tip for the waiter.
Explain how Tom can ESTIMATE the amount for the tip.
- 6) Mr. Messina goes on a jet skiing tour while on vacation. The company charges \$199 and 6.25% in tax. After the tour, he gives the instructor a 15% tip on his debit card. How much did the whole excursion cost?

Day 2 – Homework

*****Reminder: Find the tip based on the original bill*****

- 1) Patti works at a restaurant. She usually makes 15% tips on all the sales she makes for the night.
If she had \$784 in meals, **estimate** how much she could make in tips.
- 3) Terry wants to buy a Wii, but he is unsure if he has enough money. The Wii costs \$300 and there is a 9% sales tax on it. If he has \$325 does he have enough money?
- 4) Lowes charges \$1.80 for a 10-foot board, plus 5% for preparation cost.
a) If you need 50 boards, how much would the preparation cost be for all 50?
- b) What would the total cost be for all 50?
- 5) You and a friend go out for dinner and spend \$77.16. You want to leave a 15% tip. Your friend tells to leave \$20. Is he right? Explain. How would you do this problem in your head?
- 6) A new phone costs \$399.00, if tax is 7.5%, what is the total cost of the phone?
- 7) Bryce bought an aquarium priced at \$90.70. Shipping and handing cost him an additional 20%.
What was the total cost of the aquarium, including shipping and handing?

8) Lynda was a horrible waitress. She spilled a drink on you and she brought you the wrong food. The bill came to \$56.35 so you left her \$3. What was the percent of tip you left her?

9) Sancho and his friend went to dinner at Chili's. Their meal cost them \$27. Tax was 9% and they left an 18% tip. What was the grand total Sancho charged to his credit card?



Day 3 – Commission

**Commission – Add to the your base salary to get the total salary.
Think of commission as a tip from your job**



Deconstructing Percents:

The price of the item is 100% AND commission is 3%
 $100\% + 3\% = 103\%$ (*This is the grand total including commission*)

~~~~~  
1) Ms. Pickford works at Game Stop in her spare time. She earns an 8% commission for all sales. She sold \$1500 in the month of November.  
a) What was her commission?



b) If Ms. Pickford makes \$300 per week base **plus** commission, how much did she earn in November?

2) Mr. Urbancik sells 12 CD's on ebay for \$120. He gets a check for only \$84 after the commission has been taken out. Find the commission percent charged by the site?

3) Kent is a real estate agent. He gets 2.5% commission on each house he sells.  
a) Find the commission Kent gets if he sells a house for \$340,000.

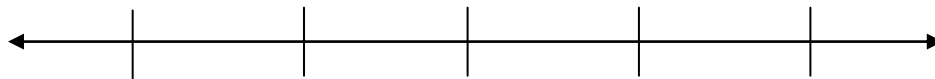


b) The day of the sale, Kent made a total of \$10,000. How much of his salary **did not** include the commission from selling the house?

### Try These:

- 1) Eric gets a 7% commission for each electronics item he sells. If he sells \$3000 worth of electronics, how much commission does he make?
  
- 2) Your Uncle is having a garage sale and asks you to come work it for him. You strike a deal for 3% of whatever you can sell. If you sold two TVs for \$60 each and a blow dryer for \$12, how much commission do you make? How much money does your uncle walk away with?
  
- 3) A real estate agent sells condos for \$90,000 each. She earns a 4% commission. In May, she sold 9 condos.
  - a) How much commission does she make on each condo?
  
  - b) How much in commission did she receive in May?
  
- 4) Mandy's monthly earning consist of a fixed salary of \$2800 and an 18% commission on all of her monthly sales. To cover her planned expenses, Mandy needs to earn an income of at least \$6400 this month.
  - a) Write an inequality, that when solved, will give the amount of sales Mandy needs to cover her planned expenses for the month.

- b) Graph the solution of the inequality on the number line below.



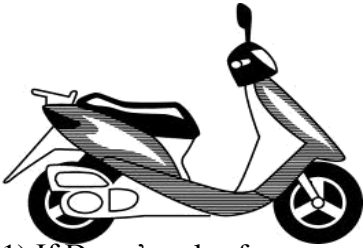
**A LOOK**  
*at the*  
**BUDGET**

### **Challenge**

- 5) While on vacation in Spain, a group can rent bicycles and scooter by the week. They get a reduced rental rate if they rent 5 bicycles for every 2 scooters rented. They reduced rate per bicycle is \$15.50 per week and the reduced rate per scooter is \$160 per week. The sales tax on **each** rental is 12%.
  - a) The group has \$1600 available to spend on bicycle and scooter rentals. What is the greatest number of bicycles and the greatest number of scooters the group can rent if the ratio of bicycles to scooters is 5:2?



b) If they do rent the greatest possible amount for each, they sales clerk will earn a 7% commission of the final price. What will the commission be?



### **Day 3 – Homework**

- 1) If Drew's sales for one week totaled \$ 1500, and his commission on those sales totaled \$82.50, then what is the percent of commission he received?
- 2) Dan is paid a 10% commission on his sales of \$2300. He also made an additional bonus of 2% this month on those same sales. How much combined commission was earned?
- 3) Renee works in the shoe department at Saks 5<sup>th</sup> Ave and has a salary that includes a base and a commission of 11% on all sales. If Renee makes \$200 per week plus commission, how much does she make if she sold \$6,500 worth of shoes? (Base + Commission : Total Salary)
- 4) Aaron, a car salesman at KIA, makes 4% commission on all sales. He sells 5 cars for \$15,000 each. What was his total commission on his sales?
- 5) What is the commission percentage paid on a \$450 diamond necklace if you make \$50?
- 6) Will is a real estate agent. When he sells a house he gets 3% and if they buyers are his customers too, then he gets another 3%. How much money will he receive, if he sells the house for \$345,000 to his customers?
- 7) Ken sells ovens at Lowes. He earns 5.6% commission on each oven sold. Today, he sold an oven for



\$1190. How much commission did he earn?

8) eBay charges a commission of 18% if the item sells for \$500 or less. If the item sells for more than \$500 it charges 18% for the first \$500 and 9% on the amount over \$500.

a) Find the commission for a \$400 sale

b) Find the commission on a \$650 sale.



## Day 4 – Discount

### Example:

You are buying a pair of sweats from Abercrombie & Fitch for \$50.  
They are on sale for 20% off.

### **Option 1:**

- 1) Find the discount, by setting up a proportion.
- 2) Subtract the discount from the original price, this will give you the SALES PRICE.
- 3) Find the tax if necessary, via a proportion.
- 4) Add the tax to the SALES PRICE, this will give you the final cost.

\_\_\_\_\_ = \_\_\_\_\_

Original Price

Discount: \_\_\_\_\_

Difference:

### **Option 2:**

*20% off means that you are paying 80% of the total cost.*  
 $100\% - 20\% = 80\%$

So, to find the sale price, you multiply the cost by the percentage you are paying

$$\$50 \cdot 80\% \rightarrow 50 \cdot .80 = 40$$

The sale price of the sweatpants is \$40.



1) A HD-DVD player has a list price of \$200 and is discounted 25%.

a) How much would the savings be? (discount)

b) What is the sales price?



c) If the tax is 8%, how much tax should they pay?

d) What is the total cost of the DVD player?



2) The new Batman DVD costs \$19.90. If you found it on sale at Kmart for 30% off the original price, how much does the DVD now cost?

3) American Eagle is having a sale on jeans. The original price was \$49.50. The sale price is \$33.00. What percent discount was taken? (percent of decrease)

4) A comforter at Bed Bath & Beyond is \$99 and you have a 20% off coupon. The same comforter is \$99 at JC Penny's but is on sale for 15% off. You also have a coupon for 5% off your total purchase at JC Penny's. Which is better deal?



5) A coat is currently \$139.99. It is going on sale for 30% off.

a) How much would you save?      b) What will the new cost of the coat be?

c) If 6% sales tax is now added, what is the final cost?

6) You find sneakers for \$79.95 at Modell's. In the paper, you see they will be on sale for \$63.96 next week.

a) What is the percent of discount that they will be offering?

b) If you wait and buy them next week, you will also have a coupon for an additional 15% off your purchase. How much will the shoes cost you?



7) Ryan buys a 3-D HDTV for his brother while it was on sale for 15% off. The TV originally cost \$2350. What is the sale price?

8) An XM radio player that lists for \$398 is on sale for 30% off the list price. How much money do you save?



9) A Skateboard is reduced 25% in price in a sale. The old price was \$120. Find the new price.

#### **Day 4 – Homework**

1) A Laptop is on sale for 20% off the regular price. The price was originally \$879.00. What is the sale price?

2) A washing machine is on sale for 15% off of the list price of \$620.

a) What would the cost be after the savings?

b) What would be the final cost of the machine after tax of 8.25% is applied?

3) This year the price of a gallon of gasoline dropped from \$4.25 a gallon to \$3.69 a gallon.  
Find the percent of discount to the nearest tenth?

4) A television on sale for 40% off saves you \$184. What is the original price of the television? What is the sale price (before tax)?

5) Last year there were 260 7th graders at Sequoya. This year the number of students decreased by 5%. How many less students are there? What is the new size of the 7th grade class?

6) Ben wants to buy a stereo. The regular price of the stereo is \$420. The sale Best Buy is having says you can

get \$25 off for every \$100 worth of merchandise purchased. He also has a coupon 25% off of the regular price.

a) What is the sale price of the stereo?

b) What is the price of the coupon if he used the coupon instead?

c) Ben must pay 7.25% sales tax in addition to the lower price of the stereo. What is the total amount Ben must pay for the stereo?