Study Guide

8th Grade Real World Applications Review
05/18/2016

**Appreciation**Appreciation is the amount an item has increased in value. Appreciation is generally thought of as being a "percent of increase."

Percent of increase tells what percent the original amount has increased. To determine the percent of increase we use the following formula:

 **percent of increase = (amount of increase ÷ original amount) x 100**

**Example 1:** Find the percent of increase if the original amount is $6 and the new amount is $9.

 (1) $9 - $6 = $3
 (2) $3 ÷ $6 = 0.50
 (3) 0.50 x 100 = 50%

Step 1: Determine the amount of increase by subtracting the original amount from the new amount ($9 - $6). The amount of increase is $3.
Step 2: Divide the amount of increase by the original amount to determine the percent of increase.
Step 3: Change 0.50 to a percent. This can be accomplished by multiplying 0.50 by 100. (Another way to convert a decimal number to a percent is to move the decimal point two places to the right.)

Answer: 50%

**Example 2:** Sally bought a printer for her computer last year for $200. This year the same printer costs $256.23. What is the percent of increase in the price of the printer? Round your answer to the nearest tenth.

 (1) $256.23 - $200 = $56.23
 (2) $56.23 ÷ $200 = 0.28115
 (3) 0.28115 = 28.115% ~ 28.1%

Step 1: Find the amount of increase.
Step 2: Divide the amount of increase by the original amount.
Step 3: Change 0.28115 into a percent. Round 28.115% to the nearest tenth.

Answer: 28.1%

**Depreciation**Depreciation is the amount an item has decreased in value. Depreciation is generally thought of a being a "percent of decrease."

Percent of decrease tells the percent the original amount has decreased. Often items are put on "sale" at a store, and the percent of decrease is called the rate of discount. To determine the percent of decrease we use the following formula:

 **percent of decrease = (amount of decrease ÷ original amount) x 100**

**Example 1:** Find the percent of decrease if the original amount is $20 and the new amount is $19.

 (1) $20 - $19 = $1
 (2) $1 ÷ $20 = 0.05
 (3) 0.05 x 100 = 5%

Step 1: Determine the amount of decrease by subtracting the original amount from the new amount. The amount of decrease is 20 - 19 = 1.
Step 2: Divide the amount of decrease by the original amount (1 ÷ 20 = 0.05).
Step 3: Change 0.05 to a percent. This can be accomplished by multiplying 0.05 by 100. The simple way to convert a decimal number to a percent is to move the decimal point two places to the right.

Answer: 5%

**Example 2:** T.J. bought a new shirt on sale for $14.50. The original price was $40. What was the rate of discount? Round your answer to the nearest tenth.

 (1) $40 - $14.50 = $25.50
 (2) $25.50 ÷ $40 = 0.6375
 (3) 0.6375 = 63.75% ~ 63.8%

Step 1: Determine the amount of decrease.
Step 2: Divide the amount of decrease by the original amount.
Step 3: Change 0.6375 to a percent. Round 63.75% to the nearest tenth.

Answer: 63.8%

**Credit**Credit is an agreement between a buyer and a seller which states that the buyer will receive the goods before full payment occurs. Generally there is a fee associated with buying an item with a credit plan, so it is usually more expensive to buy an item on credit than it is to buy an item with cash. Credit cards also charge a fee. This fee is called interest and it is in the form of a percentage rate.

**Which is Better, Credit or Cash Payment?:**

**Example 1:** A new kayak costs $625. You can pay with cash, or a credit plan with a $125 down payment and then 24 monthly installments of $25.00. How much more will you pay for the kayak if you choose the credit plan?

 (1) $25.00 x 24 = $600.00
 (2) $600.00 + $125.00 = $725.00
 (3) $725.00 - $625.00 = $100.00

Step 1: Determine the amount of money you will pay if you choose the credit plan. First multiply $25.00 by 24 to see how much money you will spend on the monthly installments. You will pay $600.00 in monthly installments.
Step 2: Add the $600.00 to the deposit ($125.00) to determine the amount you will pay for the kayak using the credit plan. With the credit plan, you will pay $725.00 for the kayak.
Step 3: To determine how much more you will pay with the credit plan, subtract the cash price of the kayak ($625.00) from the price you will pay using the credit plan ($725.00).

 Answer: If you choose the credit plan, you will pay $100.00 more for the kayak than you would if you paid cash.

**Credit Card Interest:**

Every credit card charges simple interest. Simple interest is interest charged to an account on a yearly basis.

**Example 2:** A credit card account has a balance of $1,234.00 and an annual interest rate of 17.25%. What is the simple interest that will be charged to the account in 1 year?

 (1) $1,234.00 x (17.25%)
 (2) $1,234.00x (0.1725) = 212.865
 (3) $212.87

Step 1: Multiply the balance of the account by the interest rate.
Step 2: Before multiplying by the interest rate, convert the percent into a decimal number. This involves moving the decimal point of the interest rate two places to the left.

 
Step 3: Round 212.865 to the nearest cent. This involves looking at the number in the hundredths place in 212.865. The 5 to the right of the number in the hundredths place tells us to round the 6 to 7. 212.865 rounds to $212.87.

Answer: You will pay $212.87 in interest in 1 year.

**Example 3:** The Gonzales' credit card currently has a balance of $5,256.78. The annual interest rate on their credit card is 16.9%. They received a credit card offer in the mail for a card with a 6.9% annual interest rate. How much money will the Gonzales' save in one year if they transfer the balance of their credit card to the credit card with the lower interest rate?

 (1) $5,256.78 x (0.169) = 888.39582 = $888.40 (interest old credit card)
 (2) $5,256.78 x (0.069 = 362.71782 = $362.72 (interest new credit card)
 (3) $888.40 - $362.72 = $525.68

Step 1: Determine the interest the Gonzales' would have paid with their current credit card. Multiply the current balance ($5,256.78) by the interest rate (16.9%). Remember to convert the percent into a decimal before multiplying. 16.9% = 0.169
Step 2: Determine the interest the Gonzales' will pay with the new credit card. Multiply the current balance ($5,256.78) by the new interest rate (6.9%). Remember to convert the percent into a decimal before multiplying. 6.9% = 0.069
Step 3: To determine the amount of money the Gonzales' will save, subtract the interest they would pay with the new credit card ($362.72) from the interest they would pay with the old credit card ($888.40).

Answer: The Gonzales' will save $525.68 in one year if they transfer their credit card balance to the new credit card.

**Spending**Many times there are items we wish to buy and we need to know how long we will have to save to buy these items, how much money we will have left after we purchase them, or how much money we will save by buying an item on sale. The following are examples of how to solve these types of problems.

**Example 1:** Carolyn wants to buy a new skateboard that costs $230.00. Her grandmother said she will help Carolyn by paying for one-half of the skateboard. If Carolyn already has $53.00 saved and she makes $23.00 per month babysitting, how many months will it take her to save the money to buy the skateboard?

 (1) $230.00 ÷ 2 = $115.00
 (2) $115.00 - $53.00 = $62.00
 (3) $62.00 ÷ $23.00 = 2.695652...
 (4) 3 months

Step 1: Since Carolyn only has to pay for half of the skateboard, divide the price of the skateboard ($230.00) by 2. Carolyn has to pay $115.00 for the skateboard.
Step 2: Carolyn already has $53.00 saved, so subtract $53.00 from $115.00 to determine the amount of money Carolyn still needs.
Step 3: Carolyn still needs $62.00 for the skateboard and she makes $23.00 per month. Dividing $62.00 by $23.00 will determine the number of months Carolyn will have to save in order to buy the skateboard.
Step 4: Since Carolyn will have to save for more than two months, it will be 3 months before she can buy the skateboard.

Answer: 3 months

**Example 2:** Colby went to a store where he bought a pair of tennis shoes that regularly cost $96.99 and were 45% off and a sweatshirt for $29.99 that was regularly $52.49. He also bought a pair of athletic socks for $5.99. (1) How much money did Colby spend? (2) How much money did Colby save?

Question #1:
 (1) $96.99 (45%) = Amount saved
 (2) $96.99 (0.45) = 43.6455
 (3) $43.65 = discount on shoes
 (4) $96.99 - $43.65 = $53.34
 (5) $53.34 + $29.99 + $5.99 = $89.32

Step 1: To figure the amount of money saved on the shoes, multiply the original price of the shoes by the percent of discount.
Step 2: To multiply by 45%, first convert 45% into a decimal number. This involves moving the decimal point two places to the left.

 
Multiply $96.99 by 0.45 to get 43.6455.
Step 3: Round 43.6455 to the nearest cent. This involves looking at the number in the hundredths place in 43.6455. The 5 to the right of the number in the hundredths place tells us to round the 4 up to 5. 43.6455 is rounded to $43.65. Colby will save $43.65 on the shoes.
Step 4: To determine the amount of money Colby will spend on the shoes, subtract $43.65 from the original price of the shoes ($96.99). Colby will pay $53.34 for the shoes.
Step 5: Add the amount Colby spent on the shoes ($53.34) to the amount he spent on the sweatshirt ($29.99) and the amount he spent on the socks ($5.99).

Answer: Colby spent a total of $89.32.

Question #2:

 (6) $52.49 - $29.99 = $22.50
 (7) $43.65 + $22.50 = $66.15

Step 6: Determine the amount of money Colby saved on the sweatshirt. Subtract the amount Colby paid for the sweatshirt ($29.99) from the regular price of the sweatshirt ($52.49). Colby saved $22.50 on the sweatshirt.
Step 7: Determine the total amount of money saved. Add the amount of money Colby saved on the shoes ($43.65) to the amount of money Colby saved on the sweatshirt ($22.50).

Answer: Colby saved a total of $66.15.

**Example 3:** A sweater that costs $85.00 is on sale for 25% off. Katie has $69.00. If sales tax is 7.25%, how much money will Katie have left over after she buys the sweater?

 (1) $85.00 (0.25) = $21.25
 (2) $85.00 - $21.25 = $63.75
 (3) $63.75 (0.0725) = 4.621875 ~ $4.62
 (4) $63.75 + $4.62 = $68.37
 (5) $69.00 - $68.37 = $0.63

Step 1: Determine the amount of money saved on the sweater by multiplying $85.00 by 25%. Remember to change 25% into a decimal. Katie saves $21.25 on the sweater.
Step 2: Determine the amount Katie will pay for the sweater by subtracting the amount saved ($21.25) from the original price of the sweater ($85.00). Katie pays $63.75 for the sweater.
Step 3: Figure the sales tax on the purchase by multiplying the purchase price of the sweater ($63.75) by 7.25%. Remember to convert 7.25% into a decimal (0.0725). The sales tax will be $4.62. The ~ symbol means approximately.
Step 4: Add the purchase price of the sweater ($63.75) and the sales tax ($4.62). The total price of the sweater is $68.37.
Step 5: Katie has $69.00 and we want to know the amount of money she will have left over after she buys the sweater. Subtract $68.37 from $69.00.

Answer: Katie will have $0.63 left over after she buys the sweater.

**Example 5:** Tanner had $42.00. He spent 1/4 of his money on tickets to the dance and 3/5 of his money on a corsage for his date. How much money, if any, does Tanner have left?

 (1) $42.00 ÷ 4 = $10.50
 (2) $42.00 ÷ 5 = $8.40
 (3) $8.40 x 3 = $25.20
 (4) $10.50 + $25.20 = $35.70
 (5) $42.00 - $35.70 = $6.30

Step 1: Determine the amount of money Tanner spent on tickets to the dance. To figure one-fourth of a number, divide the number by 4. Tanner spent $10.50 on the tickets.
Step 2: Determine the amount of money Tanner spent on the corsage. To figure one-fifth of a number, divide the number by 5. One-fifth of $42.00 is $8.40.
Step 3: Tanner spent three-fifths of his money on the corsage, so we need to multiply $8.40 by 3. The corsage cost $25.20.
Step 4: Determine the total amount of money Tanner spent. Add the price of the tickets ($10.50) and the cost of the corsage ($25.20). Tanner spent $35.70.
Step 5: To determine the amount of money Tanner has left, subtract $35.70 from $42.00.

Answer: Tanner has $6.30 left over.

**Discount/Tax/Interest/Commission**Students must calculate discounts, simple interest, commissions, and sales tax.

The following formula is used to calculate simple interest:

 **Interest = Principal x Rate x Time**

"Principal" is the amount being borrowed.
"Rate" is the annual interest rate (given in the form of a percent).
"Time" refers to the amount of time the borrower has to pay back the loan.

**Example 1:** Barry needs to take out a loan from family members to buy a new bike. If the bike costs $100 and family members decide to loan him the money at an interest rate of 2% to be paid off in 5 years, how much interest will Barry be paying?

 (1) I = $100 x 0.02 x 5
 (2) I = $10

Step 1: Insert the known amounts into the formula (changing the 2% into the decimal 0.02).
Step 2: Perform the calculations.

Answer: Barry will pay $10 in interest.

Other formulas for calculating discounts and sales tax include:

 Discount = Original Price x Rate of Discount
 Sales Tax = Original Price x Rate of Sales Tax
 Commission = Original Price x Rate of Commission

**Example 2:** Find the sale price of a shirt if the original price is $50 and the rate of discount (the percent off the original price) is 10%.

 (1) Discount = Original Price x Rate of Discount
 (2) D = $50 x 0.10
 (3) D = $5
 (4) $50 - $5 = $45

Step 1: Write out the correct formula.
Step 2: Insert the known amounts into the formula (changing 10% to the decimal 0.10).
Step 3: Perform the calculations.
Step 4: Subtract the discount amount from the original price.

Answer: The sale price of the shirt is $45.