

Unit 6 - Percents

Name: _____

hour: _____

Learning Target I can...	Assignment	Practice assignment (teacher signs here)	Youtube.com video link for lessons:
6.1 I can find percents using proportional relationships.	P. 1-3		https://youtu.be/SSYmGEojYuk
6.2 I can solve multi-step problems involving proportional relationships (tax, tip, discount, markup)	P. 4-8		https://youtu.be/lrssdGPKeka
6.3 I can find the percent of change using proportional relationships.	P. 9-11		https://youtu.be/p0RWRXFe0Tk
6.4 I can use proportional reasoning to solve problems in various contexts. (Proportion word problems)	P. 12-15		no video for this
6.5 I can calculate simple interest	P. 16 -19		https://youtu.be/91qh3e4sUnM
6.6 I can calculate compound interest	P. 20 -21		https://youtu.be/WTZZ25uljhw
6.7 Percent Review	P. 22-23		No video for this
6.8 Percent Learning Assessment	P. 24-26		No video for this

Define:

Percent

A percent is a ratio whose denominator is 100.

Examples: $4\% = \frac{4}{100} = 0.04$

$25\% = \frac{25}{100} = 0.25$

Example 1:

Find the Percent

- 90 - 100: A
- 80 - 89: B
- 70 - 79: C
- 60 - 69: D
- ↓ 59 F

Math Test Score:

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

$$\frac{17}{29} = \underline{\hspace{2cm}} \%$$

Science Test Score:

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

$$\frac{58}{64} = \underline{\hspace{2cm}} \%$$

You Try!

Find the Percent

- 90 - 100: A
- 80 - 89: B
- 70 - 79: C
- 60 - 69: D
- ↓ 59 F

S.S. Test Score:

$$\frac{78}{100}$$

$$\underline{\hspace{2cm}} \%$$

ILA Test Score:

$$\frac{34}{48}$$

$$\underline{\hspace{2cm}} \%$$

Example 2:

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

What is 50% of 30?

40 is what percent of 44?

You Try

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

What is 70% of 80?

20 is what percent of 70?

Example 3:

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

John made 14 freethrows out of 22 attempts.

What percent of the freethrows did he make?

Example 4:

Amy's shooting percentage is 75 %.

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

If she made 15, how many did she shoot?

Example 5:

The Science Test was worth 50 points.

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

Laresa scored 90%, how many did she get correct?

Summary

Par
Whc

CW

 p. 33-34 # 1,5,9

P

 p. 33-34 (Finish)

Find the Percent

90 - 100: A
80 - 89: B
70 - 79: C
60 - 69: D
50 - 59: F

① Art Test Score:

$$\frac{72}{80} =$$

_____ %

② Tech Ed Test Score:

$$\frac{8}{18} =$$

_____ %

③ What is 25% of 90?

④ 12 is what percent of 15?

⑤ What is 90% of 40?

⑥ 66 is what percent of 75?

⑦ Aynsley made 23 out of 28 Freethrows.

What percent of the freethrows did he make?

- 8 Nathan attempted 40 Freethrows.
If he made 30, what percent of the
freethrows did he make?

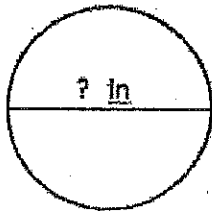
- 9 Landon's shooting percentage is 60 %.
If she made 15, how many did she shoot?

- 10 Matthew threw 75 pitches. Of these, 72% were strikes.
How many strikes did he throw?

"Remembering"

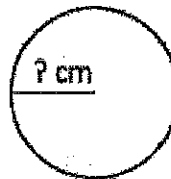
Find the missing measure (?) by working backwards.

11.



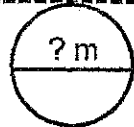
Circumference = 65.94 in

12.



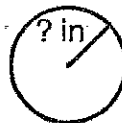
Circumference = 25.12 cm

13.



Area = 28.27 m²

14.



Area = 380.13 in²




15. **TIRE** The diameter of a bicycle tire is 26 inches.

a. Find the circumference of the tire. Use 3.14 for π .

b. How many rotations does the tire make to travel 95 feet? Explain your reasoning.

16. The center of a circular garden is at the end of a deck as
shown. How much area do you have to plant flowers?



<p>What is Sales Tax?</p>	<p>A <u>tax</u> levied on the retail (store) price of merchandise and collected by the retailer (store)</p>
<p>Example Tax</p>	<p>You purchase a new skateboard for \$80. The tax rate in the State of MN is 6.88 %.</p> <p>(a) What do you pay in tax? _____</p> <p>(b) What is the total amount that you owe? _____</p> 
<p>What is Tip?</p>	<p>A gratuity (tip) is a sum of money in <u>addition</u> to the basic price for a service.</p> <p>* You get to decide what percent, but it is recommended that you leave ~15%.</p>
<p>Example Tip</p>	<p>You eat dinner at the Olive Garden. Your total bill is \$54.25. You leave a 20% tip.</p> <p>(a) How much do you leave in tip? _____</p> <p>(b) What is the total amount that you leave? _____</p>
<p>What is Discount?</p>	<p>A discount is a <u>decrease</u> in the original price of the item.</p>
<p>What is Sale Price?</p>	<p>The price you pay <u>AFTER</u> the discount.</p>
<p>Example Discount</p>	 <p>The original price of the shorts is \$50.00. What is the Sale Price after a 25% discount?</p>
<p>What is a Markup?</p>	<p>An <u>increase</u> for profit for a store to make money on an item.</p>
<p>Example Markup?</p>	 <p>A store pays \$70 for a bike. The percent markup is 30%. What is the selling price?</p>

1. You bought the following items.
You need to pay 6.88% in sales tax.
What is the total cost?

	<u>Tax</u>	<u>Total</u>
Watch \$23.00		Sub-Total _____
Glove \$42.00		+
Soccer Ball \$ 6.00		Tax _____
Sub-Total <input type="text"/>		=
		Total _____

2. At the ballgame you buy:
You pay 6.88% in tax.
How much do you owe?

	<u>Tax</u>	<u>Total</u>
Nacho's \$2.50		Sub-Total _____
Hot Dog \$1.75		+
Large Coke \$2.00		Tax _____
Ice Cream \$2.50		=
Sub-Total <input type="text"/>		Total _____

3. At the pizza palace you order the items listed below. You pay 6.88% tax, and you leave a 15% tip to the waiter. How much do you owe?

	<u>Tax</u>	<u>Tip</u>	<u>Total</u>
Pizza \$14.50			
Wings \$ 4.25			
Bread \$1.95			
Sub-Total <input type="text"/>			Sub-Total _____
			+ _____
			Tax _____
			+ _____
			Tip _____
			= _____
			Total _____

4. You order hamburgers, basket of fries, and chocolate malts. You pay 6.88% in tax, and a 20% tip. What do you owe?

<u>Menu:</u>	<u>Tax</u>	<u>Tip</u>	<u>Total</u>
1 Hamb. \$ 2.25 _____			
1 Fries \$ 3.50 _____			
1 Malt \$ 3.25 _____			
Sub-Total <input type="text"/>			Sub-Total _____
			+ _____
			Tax _____
			+ _____
			Tip _____
			= _____
			Total _____

Tax, Tip, Discount CW
 5. Shoe Store (Take 30% off)

No TAX on Shoes!

	<u>Discount</u>	<u>Total</u>
<u>You Buy:</u>		
Sandels \$9.00		Sub-Total _____
Tennis Shoes \$70.00		-
Ball Cleats \$42.00		Discount _____
Sub-Total <input style="width: 100px; height: 20px;" type="text"/>		=
		Total _____

6. You went shopping at Best Buy last weekend.

You purchased the following items:

**** TAKE 15% OFF****

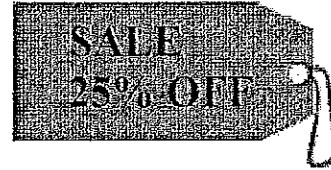
**** Don't forget Minnesota's 6.88 % sales tax.**

	<u>Discount</u>	<u>Tax</u>	<u>Total</u>
<u>You Buy:</u>			Sub-Total _____
TV \$179.99			-
DVD \$14.99			Discount _____
Video Game \$22.00			+
Sub-Total <input style="width: 100px; height: 20px;" type="text"/>			Tax _____
			=
			Total _____

Summary

Disc
 Tax,

1. You buy jeans that cost \$42.00 (price before the sale). How much will you pay with the sale?



2. You go out for dinner. The meal costs \$73.28. You leave a 15% tip. How much money do you need?

3. Which store should you buy the stereo?

Price of Stereo

Store	Regular Price	Discount
A	\$182	70%
B	\$155	30%
C	\$160	25%

4. Which price is the cheapest?

a. Regular Price: \$45

b. Regular Price: \$49

c. Regular Price: \$39



5. Challenge (optional) 2 ACTIVITY: Finding the Original Price

Work with a partner. You buy a shirt that is on sale for 30% off. You pay \$22.40. Your friend wants to know the original price of the shirt. How can your friend find the original price?



"Remembering"

6. At Skyview Middle School, 92% of the students eat hot lunch. If 815 students eat hot lunch, how many students are in the school?

What is Percent of Change?

Is the percent that a quantity changes from the original amount.

Formula

$$\text{Percent of Change} = \frac{\text{Amount of change}}{\text{Original Amount}} = \frac{X}{100}$$

Mrs. V

Trick

$$\text{Percent of Change} = \frac{\text{Big \#} - \text{Small \#}}{\text{Old}} = \frac{X}{100}$$

List Real Word:

Increases →

Decreases →

Example 1

When I started driving in 1993 the cost of gas was \$1.00 per gallon. Today the price of gas is change since. What is the percent of change since I have been driving?

$$\text{Percent of Change: } \frac{\text{(Big \# - Small \#)} \text{ Amount it changed}}{\text{Original Amount (Old \#)}} = \frac{X}{100}$$

Example 2

Skyview currently has 813 students. Next year our population is projected to be 776. What is the percent of change?

$$\text{Percent of Change: } \frac{\text{(Big \# - Small \#)} \text{ Amount it changed}}{\text{Original Amount (Old \#)}} = \frac{X}{100}$$

Example 3

My 8 passenger sports car was \$23,000 when I bought it in 2006. The value of the van is now is probably worth \$3000.

Find the Percent of Change:

$$\text{Percent of Change: } \frac{\text{Amount it changed}}{\text{Original Amount}} = \frac{X}{100}$$

Summary:

(Big #)

CW p.41-42 # 1,3,7

P p. 41-42 (Finish)

1. When Ms. Volkman's bought her White Bear Lake house in 2000 the cost was \$148,000. Ms. Volkman sold that house in 2008 for \$215,000. What is the Percent Of Change on that sale?

2. Hey...Remember that house Ms. Volkman sold in White Bear Lake....well, the bad news is....She wanted to sell the house for \$250,000 (that is what the for sale sign said), but she only got \$215,000. What is the Percent of Change?

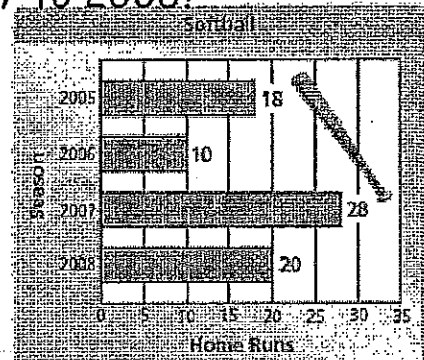
3. Skyview currently has 813 students. Last year our population was 846

What is the percent of change?

4. The table shows the number of hours you spent online last weekend. What is the percent of change in your online time from Saturday to Sunday?

Day	Hours Online
Saturday	2
Sunday	4.5

5. The bar graph shows a softball player's home run totals. What was the percent of change from 2007 to 2008?



6. Last week, you finished Level 2 of a video game in 32 minutes. Today, you finish Level 2 in 28 minutes. What is your percent of change?



7. What is the percent of change from 2000 to 2006?

Year	Population
2000	118,000
2006	138,000

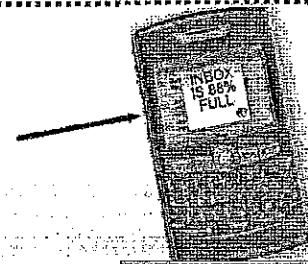
8. Challenge (optional)

A car loses 15% of its original value each year. After 1 year, a car has a value of \$13,600. What is the original value of the car?

1. A quarterback completed 68% of his passes in a game. He threw 25 passes. How many passes did the quarterback complete?

2. For a survey, a company decided to call 7 out of every 5000 people. How many people should be called in a town of 78,000 people?

3. You have 44 text messages in your inbox. How many messages can your cell phone hold?



4. At Paul Bunyon's logging camp, the cook scrambled 20 eggs for every 3 loggers, how many eggs did he need for the 288 loggers at the camp?

5. You answered 14 questions correctly on a 15-question quiz. What percent did you receive on the quiz?

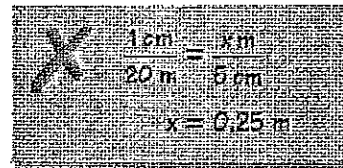
6. At a certain college, the ratio of men to women is 6 to 5. If there are 1,500 men, how many women are there?

7. Using $1 \text{ in} = 2.54 \text{ cm}$, How many inches in 8 cm?

8. A biggest loser contestant dropped from 185 pounds to 135 pounds.
What is the their percent of decrease?

9. A student in Mr. Boyle's class increased his push-ups from 14 to 22.
What is the percent of increase?

10. **ERROR ANALYSIS** A scale is 1 cm: 20 m. Describe and correct the error in finding the actual distance that corresponds to 5 cm.



~~$$\frac{1 \text{ cm}}{20 \text{ m}} = \frac{x \text{ m}}{5 \text{ cm}}$$
$$x = 0.25 \text{ m}$$~~

11. The ratio of orange juice to pineapple juice in Tropical Treat punch is 4 to 3. Bill has 64 oz of orange juice. How much pineapple juice does he need?

12. The number of riders on the bus last year was 52. The number of riders this year is 72. What is the percent of increase?

13. Using $1 \text{ mile} = 1.6 \text{ km}$. Mammoth Cave is the longest cave system in the world. So far, 365 miles of the cave have been explored.

What is this distance in kilometers?

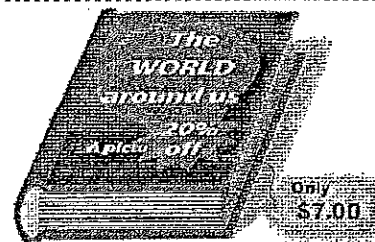
14. Jane had 121 hits out of 365 at bats. What percent of the time did she get a hit this season?


15. There are eight previews before a movie. Seventy-five percent of the previews are for comedies. How many previews are for comedies?

16. The cost of a text message increases from $\$0.10$ to $\$0.25$ per message. What is the percent of increase?

17. Challenge (optional). You buy a bike helmet for $\$22.26$, which already includes 6 % sales tax. The helmet is discount 30%. What is the original price?

18. Challenge (optional).
What is the original price of the book?



<p>What is Simple Interest?</p>	<p>Simple Interest is money <u>earned</u> or <u>paid</u> on the principle.</p> 
<p>What is the Simple Interest Formula?</p>	<p>Write the annual interest rate in decimal form.</p> <div style="display: flex; align-items: center; justify-content: center; gap: 10px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">Simple Interest (\$)</div> <div>=</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Principle Principle (\$)</div> <div>×</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Annual Interest Rate Rate (% per yr)</div> <div>×</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Time (Years)</div> </div> <p style="text-align: center; border: 1px solid black; border-radius: 15px; padding: 5px;">$I = Prt$</p>
<p>Example 1 \$100 10% 2 year</p>	<p style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;">$I = (P)(r)(t)$</p>
<p>Example 2</p>	<p>You put \$500 in a savings account. The account earns 3.5% Simple Interest per year.</p> <p>(a) What is the interest earned after 3 years?</p> <p>(b) What is the balance after 3 years?</p>
<p>Example 3</p>	<p>You put \$1000 in a savings account. The account earns \$100 simple interest in 4 years.</p> <p>What is the annual interest rate?</p>

Example:

You deposit \$300 in account that earns 7% interest.
 What is the balance of the account after 9 months?

CW p. #

P p. #

1. Define each variable.

I =

r =

p =

t =

2. In each situation, tell whether you would want a higher or lower interest rate. Explain your reasoning.

(a) You borrow money.

(b) You open a savings account.

3. An account earns 6% simple interest. You want to find the interest earned on \$200 after 8 months.

An account earns simple interest.

(a) Find the interest earned (b) Find the balance of the account.

4. \$600 at 5% for 2 years

5. \$1800 at 6.5% for 30 months

6. Describe and correct the error in finding the simple interest earned on \$500 at 6% for 18 months.

$$\begin{aligned} I &= (500)(0.06)(18) \\ &= \$540 \end{aligned}$$


7. Find the annual simple interest rate. $I = \$24$ $P = \$400$ $t = 2$ yrs

8. Find the annual simple interest rate.

$$I = \$160.67 \quad P = \$2000 \quad t = 8 \text{ mo}$$

9. Find the amount of time.

$$I = \$720 \quad P = \$1000 \quad r = 9\%$$

10.  (a) You borrow \$600 to buy a violin. The simple interest rate is 15%. You pay off the loan after 5 years. How much do you pay for the loan?

- (b) If you pay off the loan after 2 years. How much money do you save?

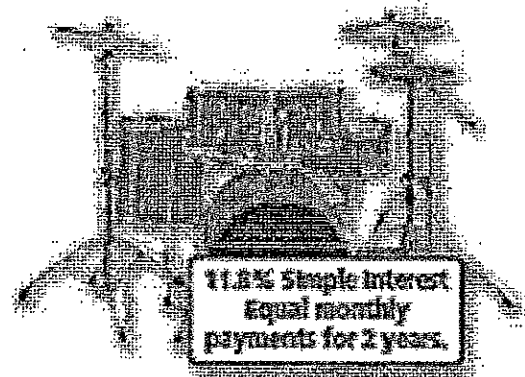
11. You put \$3000 in a CD (Certificate of Deposit) at a promotional rate. How long will it take to earn \$336 in interest?



12. A family charges a trip to the zoo on a credit card. The simple interest rate is 12%. The charges are paid after 3 months. What is the total amount paid for the trip?

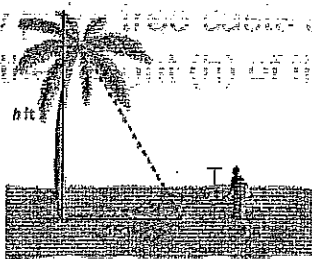
Zoo Trip	
Tickets	67.70
Food	62.54
Gas	45.50
Total Cost	?

13. A music company offers a loan to buy a drum set for \$1500. What is the monthly payments?

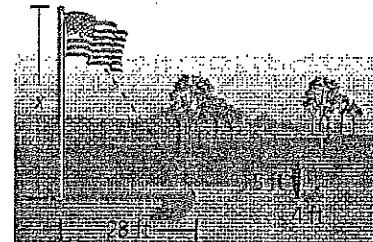


"Remembering"

14. A person that is 6 feet tall casts a 3-ft-long shadow. A nearby palm tree casts a 15-ft-long shadow. What is the height (h) of the palm tree?



15. What is the height (x) of the flagpole?



16. A store pays \$70 for a bicycle. The percent of markup is 20%. What is the selling price?



What is Compound Interest?

Compound Interest is interest that is calculated on principal AND previously earned interest.

What is the formula for Compound Interest?

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

A = amount of money after a certain time.

P = principle (amount you start with)

r = rate (decimal form)

t = time (in years)

n = number of times compounded in 1 year:

annually: n = 1

semi-annually: n = 2

quarterly: n = 4

monthly: n = 12

Example 1:

Suppose Karen has \$1000 that she invests in an account that pays 3.5 % interest compounded quarterly. How much money does Karen have at the end of 5 years?

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

A =
P =
r =
n =
t =

★ The \$1000
0.035. Th
for 5 year

★ So after
two dec
interest
be prese

Example 2:

Kelly plans to put her graduation money into an account and leave it there for 4 years while she goes to college. She receives \$750 in graduation money that she puts into an account that earns 4.25% interest compounded semi-annually. How much will be in Kelly's account at the end of four years?

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

A =

P =

r =

n =

t =

Example 3:

ABC Bank is offering to double your money! They say that if you invest with them at 6% interest compounded quarterly they will double your money. If you invest \$1500 in the account, how long will it take to double your money?

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

A =

P =

r =

n =

t =

1. 16% of 150 is what number?

3. 27 is what percent of 75?

2. 10 is 40% of what number?

4. What number is 35% of 56?

5. During the 2013 season, Joe Mauer struck out 22 times. In 2014, he struck out 35 times. What is the percent of change?

6. Last year Skyview had 308 kids attend the school dance. This year, 262 kids attended the dance. What is the percent of change?

7. The original price of the hat was \$15. You get a 5% discount. What is the sale price?

8. The cost of the Wild jersey is \$85. The Wild make the playoffs! The store marks up the price by 20%. What is the new price?

9. Your bill for Sgt Peppers is \$53.29. You pay 6.88% MN sales tax. Then, you leave a 15% tip (tip based on sub-total). What is the total amount that you owe?

10. You put \$450 into a savings account that earns 6%. You keep the money in the account for 8 years. What is the balance?

11. You borrow \$1550 so you can buy a used car. You earn \$116.25 in simple interest over 9 months. What is the rate?

12. You have \$2400 in your bank account that earns 3.8%. You earn \$45.60 in simple interest. How long have you had the money in the bank?

13. There are 5 choices for school lunch. 60% of the lunch choices are Italian food. How many are Italian?

14. You scored a 34 out of 40 on your math test. What percent did you get?

15. If you scored 80% on a test that was worth 50 points. How much did you earn?

16. A bag contains the following skittles: 7- yellow, 6 - green, 5 - red. What percent of the bag contains yellow or green skittles?
