Percent Formula

	Rate	*	Base	=	Part	
	↓	↓	↓	↓	↓	
	%	of	Something	is	Something	

Examples:

	Tax Rate	*	Price of Item	=	Tax Paid	
Rate < 100%	5.00%	*	$10.00	=	$0.50	Part < Base
	% Score on Quiz	*	Possible Points on Quiz	=	Your Score on Quiz	
Rate = 100%	100.00%	*	30	=	30	Part = Base
	% of Company Last Year's Sales	*	Last Year's Sales	=	This Year's Sales	
Rate > 100%	110.00%	*	$100,000.00	=	$110,000.00	Part > Base

Define:

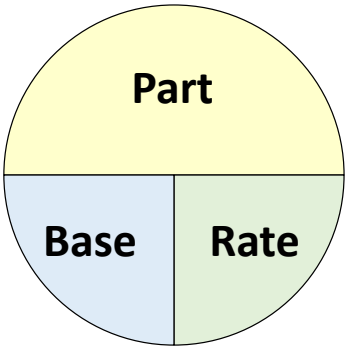
Rate =	***Percent*** or ***Decimal*** or ***Fraction*** or ***Rate*** or ***Ratio*** or ***How many parts for every 100*** or ***What you need to multiply Base by to get Part*** Rate can be smaller than, equal to or bigger than 100%
Base	***Whole*** or ***Total*** or ***Starting Point*** or ***Begin*** or ***That to which something is being compared***
Part	***Part of the Base*** or ***Ending Point*** or ***End*** . Part can be smaller than, equal to or bigger than the Base

Note: Sometimes people communicate the value of this year's company sales by saying: "**This year's sales are 110% of last year's sales**"
It means that for every $1 last year, the company made $1.10 this year.

"This year's sales are 110% of last year's sales: **looks like this:**

Part	=	Rate	*	Base
Something	is	%	of	Something
This year's sales	are	110%	of	last year's sales
↓	↓	↓	↓	↓
$110,000.00	=	110%	*	$100,000.00

Percent Formula is REALLY 3 Formulas



$$\text{Part} = \text{Rate} * \text{Base}$$

$$\text{Rate} = \frac{\text{Part}}{\text{Base}}$$

$$\text{Base} = \frac{\text{Part}}{\text{Rate}}$$

Examples:

With the following Facts, show that all three formulas are TRUE:

Formula Inputs:

Rate	=	Tax Rate	=	5.00%	= 0.05
Base	=	Price of Item	=	$10.00	
Part	=	Tax Paid	=	$0.50	

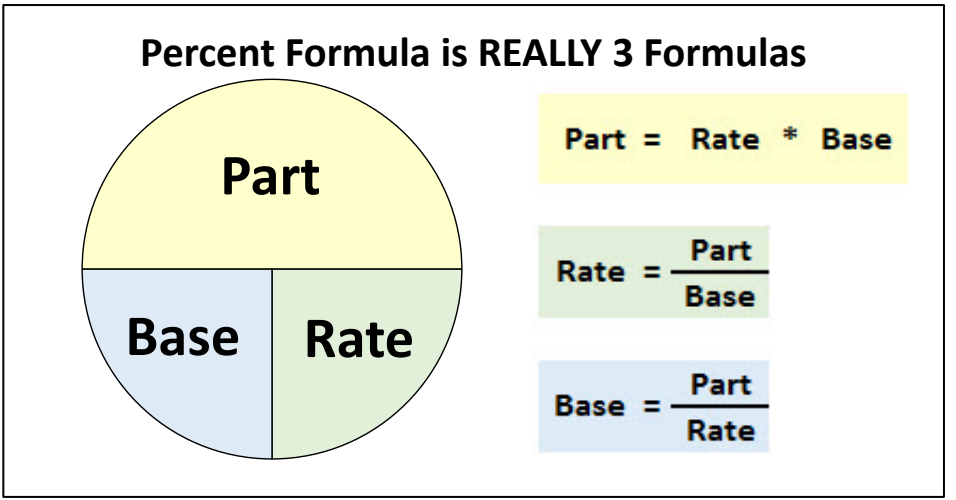
Part	=	Rate	*	Base
$0.50	=	0.05	*	$10.00

Rate	=	Part	/	Base
0.05	=	$0.50	/	$10.00

Base	=	Part	/	Rate
$10.00	=	$0.50	/	0.05

Or simply:

Part	$0.50	=Rate*Base =0.05*10
Rate	0.05	=Part/Base = 0.5/10
Base	$10.00	=Part/Rate = .5/.05



With these three formulas, you can solve for any one of the missing parts.

Examples on Next Page ==>>

	A	B	C	D	E	F
1	**Examples of Percent Formulas:**					
2	** For these examples we do not need to follow the Word Problem 5 steps,					
3	but of course we must always follow Excel's Golden Rule!					
4	**Example 1:**					
5	If the price for the phone was $400 and you were given a 25% discount,					
6	how much was the discount?					
7	Rate =	% Discount on Phone Price	25%			
8	Base =	Phone Price	$400			
9	**Part =**	**Discount is $?**	**$100**		**=C8*C7**	
10	Formula to use:	**Part = Rate * Base**				
11		Check: Rate = Part / Base	**0.25**		**=C9/C8**	**Check ☑**
12						
13	**Example 2:**					
14	If your points earned on the test were 90 and your percent score was 75%,					
15	what were the total possible points available on the test?					
16	Rate =	Your test percent score	75%			
17	**Base =**	**Total possible points on test?**	**120**		**=C18/C16**	
18	Part =	Your points earned on the test	90			
19	Formula to use:	**Base = Part / Rate**				
20		Check: Part = Rate * Base	**90**		**=C17*C16**	**Check ☑**
21						
22	**Example 3:**					
23	If you had $2000 in the bank for the month and you earned $10 in interest,					
24	What was the monthly Interest Rate that you earned?					
25	**Rate =**	**Monthly Interest Rate?**	**0.005**		**=C27/C26**	**0.50%**
26	Base =	Amount in the bank for month	$2,000.00			or
27	Part =	Interest Earned for Month	$10.00			**$1/$200**
28	Formula to use:	**Rate = Part / Base**				
29		Check: Rate = Part / Base	**0.005**		**=C27/C26**	**Check ☑**
30						
31	**Example 4:**					
32	If the super bowl stadium had 70,000 fans and 1/3 of the fans left after the					
33	3rd Quarter, how many fans left the stadium (after the 3rd quarter)?					
34	Rate =	Fraction of Fans who left	1/3			
35	Base =	Total Fans at Beginning	70,000			
36	**Part =**	**# fans left the stadium?**	**23,333.3**		**=C35*C34**	
37	Formula to use:	**Part = Rate * Base**				
38		Check: Base = Part / Rate	**70,000**		**=C36/C34**	**Check ☑**

Examples of Percent Formulas:

** For these examples we do not need to follow the Word Problem 5 steps,
but of course we must always follow Excel's Golden Rule!

Example 5:
The news report said that 2,000 people lost their homes in the mud slide,
and that that represented 1 in 5 of the total people in the city. Given that
information, what is the total number of people who live in the city?

Rate =	% of the Total # people who live in city	1/5	20.00%		
Base =	**Total number of people who live in city?**	**10,000**	**=C10/C8**		
Part =	# people lost their homes in the mud slide	2,000			
Formula to use:	**Base = Part / Rate**				
	Check: Part = Rate * Base	**2000**	**=C9*C8**	**Check ☑**	

Example 6:
Your Total Points Earned for the class are 455. The syllabus says that there are
510 Total Possible Points possible. What is your Decimal Grade rounded to thousandths?
What is your % Grade rounded to a tenth of a percent?

Rate =	**Decimal Grade?**	**0.89215686**	**=C22/C21**		
Rate =	**Decimal Grade rounded to thousandths?**	**0.892**	**=ROUND(C22/C21,3)**		
Rate =	**% Grade rounded to tenth of a percent?**	**89.2%**	**=ROUND(C22/C21,3)**		
Base =	Total Possible Points possible	510			
Part =	Your Total Points Earned	455			
Formula to use:	**Rate = Part / Base**				
	Check: Part = Rate (not rounded) * Base	**455**	**=C21*C18**	**Check ☑**	

Example 7:
A Highline Administrator said that this year's enrolment was 125% of last's years enrollment.
If last year's enrollment was 3,456 students, what was this year enrollment?

Rate =	% of Last's Year's Enrollment	125%			
Base =	Last year's enrollment	3,456			
Part =	**This year enrollment**	**4,320**	**=C30*C29**		
Formula to use:	**Part = Rate * Base**				
	Check: Rate = Part / Base	**1.25**	**=C31/C30**	**Check ☑**	

Example 8:
If the monthly interest rate for your CD bank account was 4/10% (compounded monthly),
and you earned $5.60 in interest paid for the month,
how much did you have did you have in the bank (same aount whole month)?

Rate =	Monthly interest rate	4/10%	0.400%		
Base =	**How much in the bank for month**	**1400**	**=C41/C39**		
Part =	Interest paid for the month	$5.60			
Formula to use:	**Base = Part / Rate**				
	Check: Part = Rate * Base	**5.6**	**=C40*C39**	**Check ☑**	

Handwritten notes on next 2 pages (Repeat of what is on First 2 pages).

Percent Formula

Rate	*	Base	=	Part
↓	↓	↓	↓	↓
%	of	something	is	something

Define:

Rate = "Percent" or "Decimal" or "Fraction" or "Rate" or "Ratio" or "How many parts for every 100" or "What you multiply by to get Part"

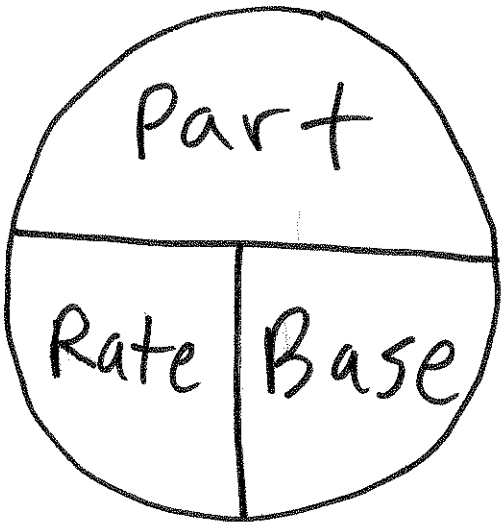
Base = "whole" or "Total" or "Begin" or "starting point" or "that to which something is being compared"

Part = Part of the Base. can be smaller, equal to, or bigger than Base.

Examples:

Rate	*	Base	=	Part
Tax Rate 5%	*	Price $10	=	Tax Paid $0.50
% score on Test 100%	*	possible Points 30	=	your score 30
% of company Last Year Sales 110%	*	Last Year Sales $100,000	=	This Year Sales $110,000

Percent Formula is REALLY 3 Formulas



① Part = Rate * Base

② Base = $\frac{\text{Part}}{\text{Rate}}$

③ Rate = $\frac{\text{Part}}{\text{Base}}$

Example:

with the following facts, show the the above 3 Formulas are TRUE.

Rate = Tax Rate = 5%

Base = Price of item = $10

Part = Tax Paid = $0,50

① Part = Rate * Base = $10 * 0.05 = $0.50 ✓

② Base = $\frac{\text{Part}}{\text{Rate}} = \frac{\$0.50}{0.05} = 5\overline{)50}^{10} = \$10$ ✓

③ Rate $\frac{\text{Part}}{\text{Base}} = \frac{\$0.50}{\$10.00} = 1000\overline{)50.00}^{0.05} = 0.05$ ✓

Prove Formulas TRUE: (8)

(1) $P = B * R$

$$\frac{P}{B} = \frac{B * R}{B}$$

Divide both sides by B and cancel

$$\frac{P}{B} = R$$

(2) $$\frac{P}{R} = \frac{B * R}{R}$$

Divide both sides by R and cancel

$$\frac{P}{R} = B$$