

Technical Math for Allied Health
Class notes
Percent, Discounts, and Simple Interest (module 1)

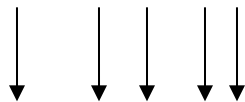
Knowing what
“percent” means will
help a lot.

“Percent” means “per 100” or “part of 100”

For example, 20% means “20 parts out of every 100 parts”. We could write 20% as $\frac{20}{100}$ or .20 (if we do that division).

Do you remember the
shortcut for turning
percents into decimals?

expl 1: What number is 16% of 70?



These problems can
usually be directly
translated.

Percent problems compare parts to the whole. Imagine you have a whole 70 dollars or meters or frogs or whatever. And, 16% of that 70 (or 11.2 dollars, meters, frogs, etc.) would be a **part of that whole**. The trick is to figure out what is the part and what is the whole in these problems.

$$\text{percent} = \frac{\text{part}}{\text{whole}}$$

or

$$\text{percent} \cdot \text{whole} = \text{part}$$

Alternatively,

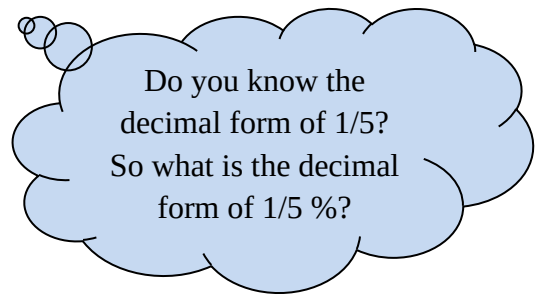
$$\frac{\text{percent number}}{100} = \frac{\text{part}}{\text{whole}}$$

expl 2: The number 45 is 25% of what number?

Identify the part and
the whole. Use x to
make an equation.

Check yourself! Does your answer make sense?

expl 3: One fifth percent (or $1/5\%$) of what number is 8.75?



Check yourself! Does your answer make sense?

expl 4: Andy won 75% of the 64 tennis matches she played. How many matches did she win? Include units.

expl 5: Gina spent \$14 on a game last week. This was 12.5% of her paycheck. How much was her paycheck? Include units.

Discounts: If you are told that a sale item is marked **35% off**, what percentage of the original price will you be paying?

Definitions: The **discount** is the amount of money taken off the original price. The **sales price** is the amount of money you pay for the item, after the discount is subtracted from the original price.

expl 6: A sterile supply technician orders supplies totaling \$1,234.56. She receives a 12% discount for payment within 30 days.

a.) If she pays within 30 days, how much of a discount will she receive? Round to the nearest cent. Include units.

b.) What is the final cost of the supplies? Include units.

expl 7: Solve. Round to the nearest cent. Include units.

A pharmacy is advertising a 25%-off sale. Find the sales price of a medication that sells regularly for \$12.56.

Make sure
you answer
the question.

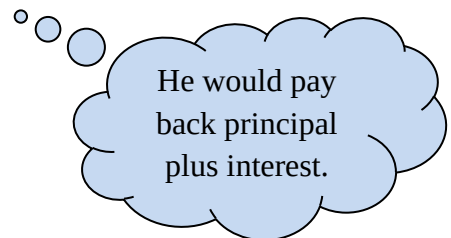
expl 8: Sarah purchased a set of art supplies for \$20.90 and a pair of jeans for \$18.95. She used a coupon to get 20% off of her entire purchase. How much change did Sarah receive from \$50? Include units.

Simple Interest: Do you remember the formula for simple interest? Try to write it below from memory. I have defined the variables involved.

Simple interest charged I after borrowing P dollars at an interest rate R (in decimal form) for time T (years)

Definitions: P is the **principal** (amount borrowed or invested), I is the **amount of interest**, R is the **interest rate**, and T is the **time**.

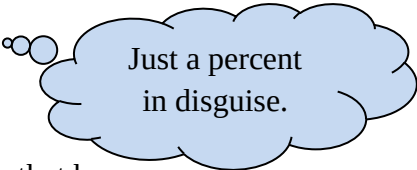
expl 9: A patient must finance \$10,000 for an elective surgery. If the annual interest rate is 7.5% and he is charged simple interest for 3 years, what amount will he owe at the end of the 3 years? Include units.



Problems about savings accounts are figured similarly.

Rates as a Given Amount of the Total:

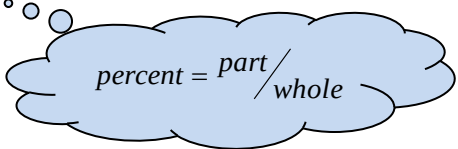
Sometimes information is *not* given as a percent but rather as a *number out of some part* of the greater whole. Often, they do that because the percent would be very small. We think of the information as a ratio and might need to multiply it by the total, much as a percentage is used.

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Just a percent
in disguise.

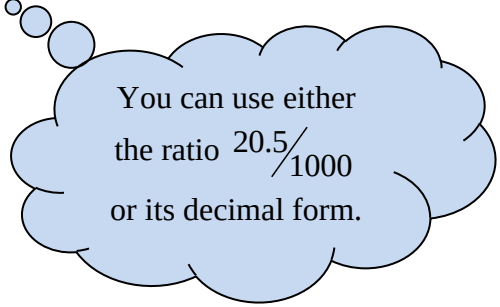
expl 10: The population of Malaysia in 2008 was 24,821,286 people. The birth rate in Malaysia at that time was 20.5 per 1000 people.

a.) Write this birth rate as a percentage. Practice both percent and decimal forms.

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percent = *part* / *whole*

b.) Approximately how many babies were born in Malaysia in 2008? Round to an appropriate place. Include units.

A light blue thought bubble with a black outline and three small circles leading to it from the top left. It contains the text "You can use either the ratio 20.5/1000 or its decimal form." in black, with "20.5/1000" in italics.

You can use either
the ratio *20.5/1000*
or its decimal form.