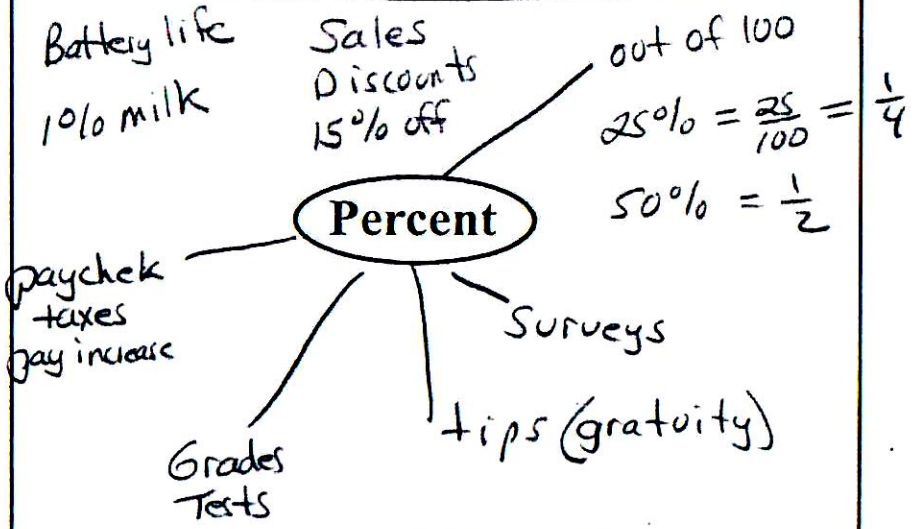
Fractions, Decimals, and Percents
Notes - Math 7
Intro to Chapter 2

A <u>percent</u> is a ratio that compares a number to 100.

<u>Ex</u>: 12 out of 24 students are boys
or
50% of the students are boys

Where is percent used in real life situations?



What percent/fraction relationships do we need to have MEMORIZED?

$\frac{1}{2} = 50\%$

$\frac{1}{3} = 33.\overline{3}\%$ $33\frac{1}{3}\%$

$\frac{2}{3} = 66.\overline{6}\%$ $66\frac{2}{3}\%$

$\frac{1}{4} = 25\%$

$\frac{2}{4} = \frac{1}{2}\ 50\%$

$\frac{3}{4} = 75\%$

$\frac{1}{5} = 20\%$

$\frac{2}{5} = 40\%$

$\frac{3}{5} = 60\%$

$\frac{4}{5} = 80\%$

$\frac{1}{6} = 16\frac{2}{3}\%$

$\frac{2}{6} = \frac{1}{3}\ 33\frac{1}{3}\%$

$\frac{3}{6} = \frac{1}{2}\ 50\%$

$\frac{4}{6} = \frac{2}{3}\ 66\frac{2}{3}\%$

$\frac{5}{6} = 83\frac{1}{3}\%$

$\frac{1}{8} = 12.5\%$

$\frac{2}{8} = \frac{1}{4}\ 25\%$

$\frac{3}{8} = 37.5\%$

$\frac{4}{8} = \frac{1}{2}\ 50\%$

$\frac{5}{8} = 62.5\%$

$\frac{6}{8} = \frac{3}{4} = 75\%$

$\frac{7}{8} = 87.5\%$

$\frac{1}{9} = 11.\overline{1}\%$ $11\frac{1}{9}\%$

$\frac{2}{9} = 22.\overline{2}\%$

$\frac{3}{9} = \frac{1}{3}\ 33.\overline{3}\%$

$\frac{4}{9} = 44.\overline{4}\%$

$\frac{5}{9} = 55.\overline{5}\%$

$\frac{6}{9} = \frac{2}{3}\ 66.\overline{6}\%$

$\frac{7}{9} = 77.\overline{7}\%$

$\frac{8}{9} = 88.\overline{8}\%$

$\frac{1}{10} = 10\%$

$\frac{2}{10} = 20\%$

$\frac{3}{10} = 30\%$

$\frac{4}{10} = 40\%$

$\frac{5}{10} = 50\%$

$\frac{6}{10} = 60\%$

$\frac{7}{10} = 70\%$

$\frac{8}{10} = 80\%$

$\frac{9}{10} = 90\%$

$1 = 100\%$

D → P

→ Percent

To write a decimal as a percent:

***Read decimal without using word "point"**
(Percent is number out of 100)

.37 $\frac{37}{100}$ → 37%

***Make sure decimal has at least two decimal places.** .6 → .60 $\frac{60}{100}$ 60%

.06 → $\frac{6}{100}$ 6%

*** Multipliy by 100 and attach the % sign**
(move decimal point two places right)

.125 12.5%

Examples:	
0.35 = 35%	**0.009 =** 0.9%
0.9 = .90 90%	**0.025 =** 2.5%
1.35 = 135% (100% 35%)	**0.09 =** $\frac{9}{100}$ 9%

To write a percent as a decimal:

*** Read the % sign as "hundredths"**

52% → $\frac{52}{100}$ .52

***divide by 100 and remove the percent symbol**

52%

.52

% → Decimal

Examples:	1% = .01
19% = .19	**1.5% =** .015
5% = .05 $\frac{5}{100}$ 0.05	**27% =** .27
450% = 4.5	**0.3% =** .003

.5 = 50%

To write a percent as a fraction, express the ratio as a fraction with a denominator of 100. Then simplify if possible.

Examples:

45% = $\frac{45}{100} \div \frac{5}{5} = \frac{9}{20}$

140% = $\frac{140}{100} = \frac{7}{5}$

0.4% = $\frac{0.4(10)}{100(10)} = \frac{4}{1000} = \frac{1}{250}$

8.5% = $\frac{8.5(10)}{100(10)} = \frac{85}{1000} = \frac{17}{200}$

More Examples:

$83\frac{1}{3}\% = \frac{83\frac{1}{3}}{100} =$

$83\frac{1}{3} \div 100$

$\frac{250}{3} \cdot \frac{1}{100} = \frac{5}{6}$

$4\frac{7}{12}\% = \frac{4\frac{7}{12}}{100} =$

$4\frac{7}{12} \div 100$

$\frac{55}{12} \cdot \frac{1}{100} = \frac{11}{240}$

To write a fraction as a percent, write an equivalent fraction with a denominator of 100.

Ask yourself:

* **Is it one I have memorized?**
* **Can I easily write it with a denominator of 100?**
* **Is it one I can simplify and then use other strategies?**
* **Can I write it as a decimal first? (may mean long ÷)**

Write these fractions as percents

$\frac{37}{100} =$ 37%

$\frac{7}{20} \times 5 = \frac{35}{100}$ 35%

$\frac{37}{50} \times 2 = \frac{74}{100}$ 74%

$\frac{7}{8} =$ 87.5%

$8\overline{)7.000}$ → .875, 64, 60, 56, 40

Write these fractions as percents

$\frac{7}{12}$ =

.583
12|7.000
60
100
96
40
36
4

$0.58\overline{3}$

$58.\overline{3}\%$

$\frac{37 \div 37}{370 \div 37}$ =

$\frac{1}{10}$

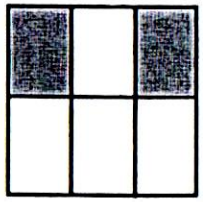
10%

$\frac{15}{20}$ = $\frac{3}{4}$

75%

* what fraction?

What percent of each of these is shaded?



$\frac{2}{6} = \frac{1}{3}$

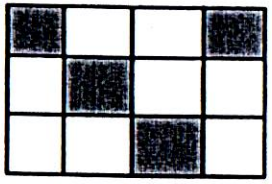
$33.\overline{3}\%$

or $33\frac{1}{3}\%$

$\frac{3}{8} = 37.5\%$

fraction first.

What percent of each of these is shaded?



$\frac{4}{12} = \frac{1}{3}$

$33.\overline{3}\%$

$\frac{4}{6} = \frac{2}{3}$

$66.\overline{6}\%$

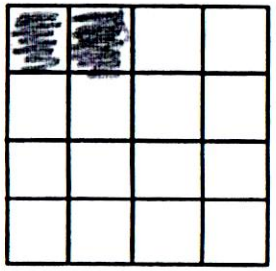
Shade in 40% of this figure.

$\frac{4}{10} = \frac{2}{5}$

Shade in 12.5% of this figure.

$\frac{1}{8} \times 2 = \frac{?}{16}$

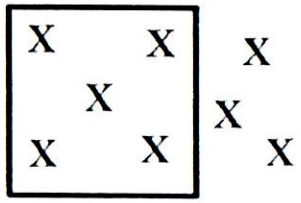
shade 2



whole part

What percent of the X's are outside the box ?

part / whole



outside / all 3/8

37.5%

Ben's soccer team won 11 games, lost 2 games and tied 7 games.

What percent of his games did he win?

wins / all 11/20 ×5

55/100 55%

What percent of his games did he lose?

lose / all 2/20 = 1/10

10%

What percent of his games did he tie?

tie / all 7/20 ×5

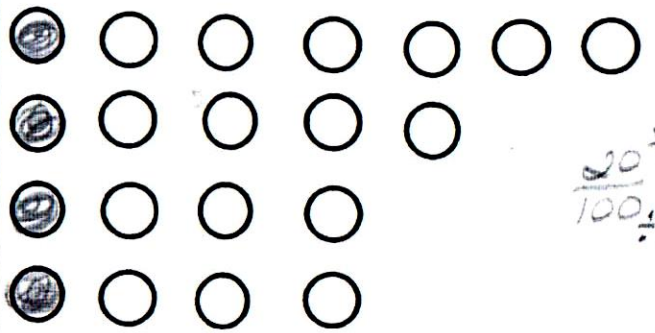
35/100 35%

Norma paid $15 tax on an item that cost $300. What percent of the item's cost did she pay in tax?

fraction tax / cost 15/300 ÷3 = 5/100

5% tax

Shade in 20% of these circles.

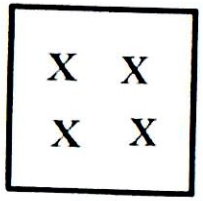


20/100 ÷5 = ?/20

2/10 = 1/5 ×4 = ?/20

shade 4

What percent of the X's are inside the box?



X $\frac{\text{inside X's}}{\text{all X's}}$ $\frac{4}{5}$

80%

Write 2.5 as a percent.

2.5 = 250%

Write 7% as decimal.

$\frac{7}{100}$

0.07

Write 0.8 as percent.

0.80

80%

Write 30% as fraction in lowest terms.

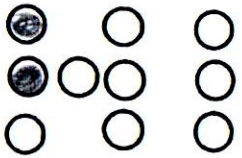
$\frac{30}{100} = \frac{3}{10}$

There are 8 girls and 4 boys in a class. What percent of the class is boys?

$\frac{\text{boys}}{\text{all}}$ $\frac{4}{12} = \frac{1}{3}$

$33.\overline{3}\%$

Shade in 20% of these circles. $\frac{1}{5} = \frac{2}{10}$



Write 60% as a fraction in lowest terms.

$\frac{60}{100} \rightarrow \frac{3}{5}$

Write 1.25 as a percent.

125%

Warm-up - Discuss this question with a partner.

Tammy gave the answer 2.5 for the decimal for 2.5% on her quiz. Her teacher marked it wrong. How could you convince Tammy that her answer does not make sense. Try to think of more than one way to explain it. What should she have given as an answer?

1 100%

2 200%

2.5 250% ≠ 2.5%

1% = .01

2% = .02

2.5% = .025