

Copy the outcome in your scribbler and then **read** the achievement indicators.

N3: Demonstrate an understanding of percent greater than or equal to 0%.

Achievement Indicators:

- Provide a context where a percent may be more than 100% or between 0% and 1%.
- Represent a given fractional percent using grid paper.
- Represent a given percent greater than 100 using grid paper.
- Determine the percent represented by a given shaded region on a grid, and record it in decimal, fractional and percent form.
- Express a given percent in decimal or fractional form.
- Express a given decimal in percent or fractional form.
- Express a given fraction in decimal or percent form.
- Solve a given problem involving percents.
- Solve a given problem involving combined percents.
- Solve a given problem that involves finding the percent of a percent, e.g., a population increased by 10% one year and then increased by 15% the next year. Explain why there was not a 25% increase in population over the two years.

Introduction: https://www.youtube.com/watch?v=rV0jZY_OvNw

Read:

Percents are ratios or fractions where the second term or denominator is 100. The term percent is simply another name for *hundredths*. Percents can be written as low as 0, but can go higher than 100. You've worked with percents between 1% to 100%. Now you will examine contexts where percents can be greater than 100% or less than 1% (**fractional percents**).

You use percents to calculate sales tax, price increases, and discounts.

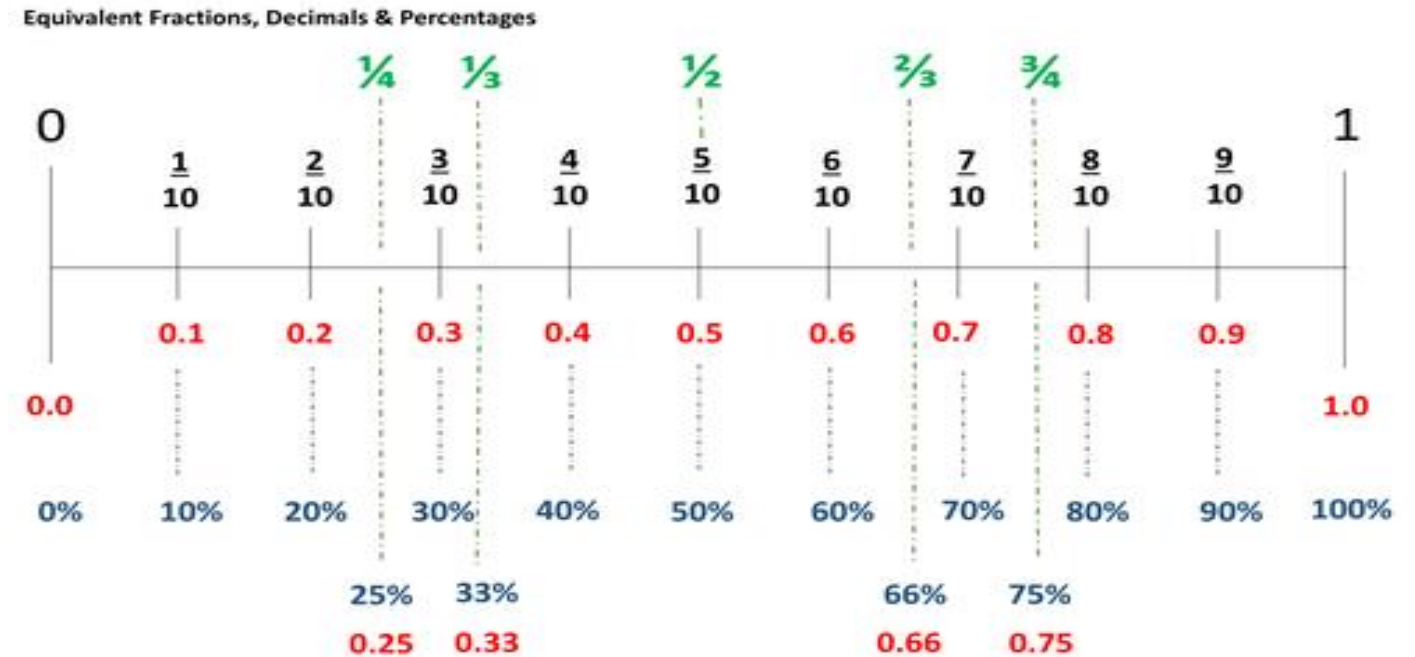


- Read and complete the investigate on p. 234.
- Read CONNECT on page 235 along with the examples on pages 236,237 and 238.

BENCHMARKS IN PERCENTS % (to copy)

YOU SHOULD KNOW THESE BENCHMARKS WHEN WORKING %

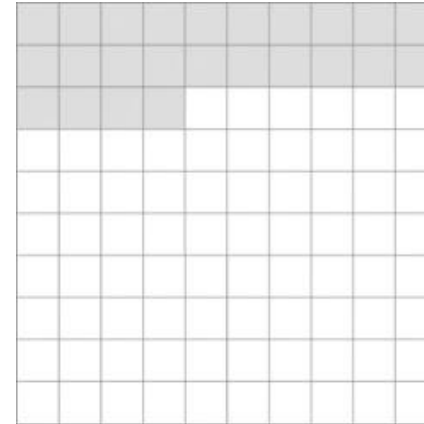
- $\frac{1}{5}$ = 20%
- $\frac{1}{4}$ = 25%
- $\frac{1}{3}$ = 33%
- $\frac{1}{2}$ = 50%
- $\frac{3}{4}$ = 75%



Relating Fractions, Decimals, and Percents

Quick Review

This hundred chart represents one whole, or 1.
The shaded part of this chart can be described three ways.



(to copy)

As a fraction: $\frac{24}{100}$

As a percent: **24%**

As a decimal: **0.24**

Each way above can be written in any of the other two ways.

Example 1 **(to copy)**

a) Write 8% as a decimal.

b) Write 0.48 as a percent.

c) Write $\frac{2}{5}$ as a decimal.

Solution

a) $8\% = 0.08$

b) $0.48 = 48\%$

c) $\frac{2}{5} = \frac{4}{10} = \frac{40}{100} = 0.4$

5.1 Relating Fractions, Decimals and Percents

1. **View** the video on percentages.

<https://www.youtube.com/watch?v=JeVSmq1Nrpw>

2. **Complete** questions # 6, 7, 8, 9 & 10 on page 239.

You will need grid paper divided in 100%.

- **3. Worksheet 5.1** – Relating Fractions, Decimals and Percents (pages 102-104 in the Practice and Homework Book)

Journal Question N3#1

And what if it is smaller than 1%?

Fill in this grid

- 100% of 24 is _____
- 50% of 24 is _____
- 25% of 24 is _____
- 10% of 24 is _____
- 5% of 24 is _____
- 1% of 24 is _____
- 0.5% of 24 is _____
- 0.1% of 24 is _____

To find 0.1% Which % helped?

100% of 24 is _____
_____% of 24 is _____
_____% of 24 is _____
_____% of 24 is _____

Find 0.5% of 50.

100% of 50 is _____

_____ of 50 is _____

_____ of 50 is _____

_____ of 50 is _____

_____ of 50 is _____

- $0.5 = \frac{1}{2}$... 0.5% is $\frac{1}{2}\%$ so 0.5% is half of 1%

if 1% of 50 is _____, half of that: 0.5% of 50 = _____

And what if it is greater than 100%?

Fill in this grid

- 100% of 12 is _____
- 200% of 12 is _____
- 250% of 12 is _____
- 300% of 12 is _____
- 375% of 12 is _____
- 400% of 12 is _____
- 425% of 12 is _____
- 500% of 12 is _____

Replace each _____ with $<$, $>$, or $=$ to make each statement true.

a) 3.21 _____ 321%

b) $1\frac{5}{8}$ _____ 158%

c) 0.76 _____ 7.6%

d) 0.9% _____ 0.9

e) $0.333\dots\%$ _____ $\frac{1}{3}\%$

f) 125% _____ $1\frac{1}{4}$

5.2 Calculating Percents

1) **Read** the Connect section and Examples on pages 243-245.

2) **Watch** the following the videos:

<https://www.youtube.com/watch?v=vh8HJITCCBE>

<https://www.youtube.com/watch?v=XDphZ5uzl18>

<https://www.youtube.com/watch?v=Co-iyqlcTI0>

- 3) **Worksheet 5.2** – Calculating Percents (pages 105-106 in the Practice and Homework Book)

Journal Question N3#2

Example: (to copy)

The cost price of a baseball cap is \$9. The sale price of the cap is 30% of the cost price.

A) What is the sale price of the baseball cap without the tax?

$$30\% = 0.3 \qquad 0.3 \times \$9.00 = \$2.70 \qquad \$9.00 - \$2.70 = \underline{\underline{\$6.30}}$$

B) What is the price of the baseball cap with the NB tax of 15%

$$15\% = 0.15 \qquad \$6.30 \times 1.15 = \$7.245 \text{ (round to two places: } \underline{\underline{\$7.25}})$$

* use 1.15 to get the total cost instead of finding the tax amount and having to add it to the original price

Find the price of these objects by adding the NB sale tax of 15%.



\$89.25



\$180



\$52.99



\$149.49



\$260



\$13.95

SALE !

Calculate price then add tax of 15%.

-25%



\$89.25



\$180



\$52.99

-25%

-25%



\$13.95



\$149.49



\$260

Solving Percent Problems

- 1) **Read** the Connect section and Examples on pages 249-252. Take notes as needed.
- 2) **Watch** the following video: <https://www.youtube.com/watch?v=jAcDJDjQk2g>
- 3) **Read** through the information on this webpage and **attempt** the practice questions in the *Exercises* section at the bottom of the page.

<https://www.mathgoodies.com/lessons/percent/change>

Calculating Percent Increase

Calculate the percent increase:

60 ← Initial Value

90 ← Final Value

STEP 1: Find the difference

$$90 - 60 = 30$$

STEP 2: Divide by the initial value.

$$30 \div 60 = 0.50$$

STEP 3: Multiply by 100

$$0.50 \times 100 = 50\% \text{ increase}$$

Example: (to read)

The cost price of a winter coat is \$80. This is the price the merchant pays for the coat. Since the store needs to make a profit, the selling price of the coat is 150% of the cost price.

- What is the selling price of the coat?

$$150\% = \frac{150}{100} = 1.5$$

$$\begin{aligned} \text{Then } 150\% \text{ of } \$80 &= 1.5 \times \$80 \\ &= \underline{\underline{\$120}} \end{aligned}$$

could also use

$$100\% \text{ of } \$80 = \$80$$

$$+ \underline{50\% \text{ of } \$80 = \$40}$$

$$\text{so ... } 150\% \text{ of } \$80 = \underline{\underline{\$120}}$$

What if you added the 15% sale tax ? $\$120 \times 0.15 = \underline{\underline{\$18.00}}$

How much would that be? $\$120 + \$18 = \underline{\underline{\$138}}$

Percent increase: to calculate a percent increase, divide the increase by the original amount then write the quotient as a percent.

(To copy)

$$\text{Percent increase (\%)} = \frac{\text{increase}}{\text{original amount}} \times 100$$

Example: A pair of socks went from \$5.00 to \$6.00, what is the percentage change?

Increase \longrightarrow $\$6.00 - \$5.00 = \$1.00$

Percent increase \longrightarrow $\frac{\$1.00}{\$5.00} \times 100 = 0.2 \times 100 = \underline{20\%}$ increase

Percent decrease: to calculate a percent decrease, divide the decrease by the original amount then write the quotient as a percent.

(To copy)

$$\text{Percent decrease (\%)} = \frac{\text{decrease}}{\text{original amount}} \times 100$$

Example:

Joe is considering changing jobs. He works for a company making \$22.50 per hour. He has been offered a position closer to home that pays \$20.50 per hour. To find the percentage decrease in pay:

$$\text{decrease} \longrightarrow \$22.50 - \$20.50 = \$2.00$$

$$\text{percent decrease} \longrightarrow \frac{\$2.00}{\$22.50} \times 100 = 0.8888 \times 100 = \underline{\underline{8.89\%}} \text{ (rounded) decrease in pay}$$

Practice

1) **Worksheet 5.3** – Calculating Percent Problems (pages 107-109 in the Practice and Homework Book)

2) **Worksheet 5.4** – Sales Tax and Discount (pages 110-111 in the Practice and Homework Book)

*Remember to read the review section at the beginning of the worksheet.

Journal Question N3#3