

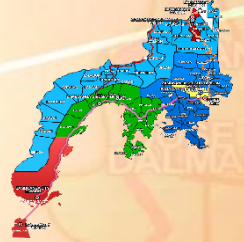


Republic of the Philippines  
**Department of Education**  
 Regional Office IX, Zamboanga Peninsula



- JANUARY**  
*Matuguhon*
- FEBRUARY**  
*Mahiguagmanon*
- MARCH**  
*Matinabangan*
- APRIL**  
*Matinahuron*
- MAY**  
*Makapsay og Malimpyo*
- JUNE**  
*Maablik og Masunod sa  
Dhasaklong Oras*
- JULY**  
*Maantigo og Maabilidad*
- AUGUST**  
*Maginhuhuhunon  
para sa Uban*
- SEPTEMBER**  
*Madaginaton*
- OCTOBER**  
*Matinud-anon*
- NOVEMBER**  
*Masaligan*
- DECEMBER**  
*Maalampon*

**5**



Zest for Progress  
 Zeal of Partnership

# Mathematics

Quarter 3 - Module 1

**Percent, Percentage and Its Relationship**



Name of Learner: \_\_\_\_\_

Grade & Section: \_\_\_\_\_

Name of School: \_\_\_\_\_



# What I Need to Know

This module contains one lesson:

## Lesson 1- Relationship Between Percent and Percentage


In this module, you will be able to:

1. Visualize percent and its relationship to fractions, ratios, and decimal numbers using models.
2. Define percentage, rate or percent and base.
3. Identify the base, percentage, and rate in the problem.



# What I Know

**Directions:** Encircle the letter of the correct answer.

1. Which is a fraction of 0.02?  
A.  $\frac{2}{10}$                       B.  $\frac{20}{10}$                       C.  $\frac{2}{100}$                       D.  $\frac{20}{100}$
2. 80% out of 100 mangoes were sold. How will you write 80% in fraction form?  
A.  $\frac{50}{100}$                       B.  $\frac{70}{100}$                       C.  $\frac{80}{100}$                       D.  $\frac{90}{100}$
3. Marie needs to get 80% of her test to get the reward promised by her mother. What is 80% in decimal form?  
A. 0.8                      B. 0.08                      C. 0.80                      D. 8
4. What percent is represented by the unshaded parts?  
A. 2%                      B. 20%                      C. 40%                      D. 50% 
5. The comparison of two quantities is called\_\_\_\_.  
A. Percent                      B. ratio                      C. factor                      D. fraction
6. The ratio of a number to 100 is called\_\_\_\_.  
A. Percent                      B. ratio                      C. factor                      D. fraction
7. What is twenty-five percent in 80?  
A. 10                      B. 20                      C. 30                      D. 40
8. If 68% of the campers are girls, how many percent are boys?  
A. 38%                      B. 32%                      C. 28%                      D. 22%
9. In a statement  $65\% \text{ of } 780 = N$ , 65% is called the rate. Why?  
A. 65 is the number with a symbol ( % ).  
B. It is the total of a whole.  
C. It is the part of a whole.  
D. It is the only given number smaller to the whole.
10. What is the base of this number statement? 15% of 60 is 9.  
A. 9                      B. 15                      C. 15%                      D. 60

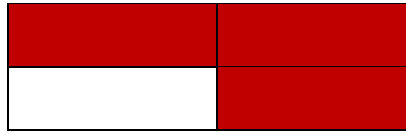


# What's In

## Activity 1: Help Me to Remember!

**Directions:** Answer the following question mentally.

1. What is 50% of 80?
2. Give the decimal form of 20%
3. What is the fraction form of 0.15?



4-5. What percent of a whole is the shaded part? And what is the decimal form of it?



# What's New

## Activity 2: Understand Me!

What do you do before you go to sleep? In the website [www.greatfacts.com](http://www.greatfacts.com), it says there that 44% of kids watch television before they go to sleep. If we are to follow this percentage, and for instance there are 25 kids in a certain area, how many of them watch television before they go to sleep?

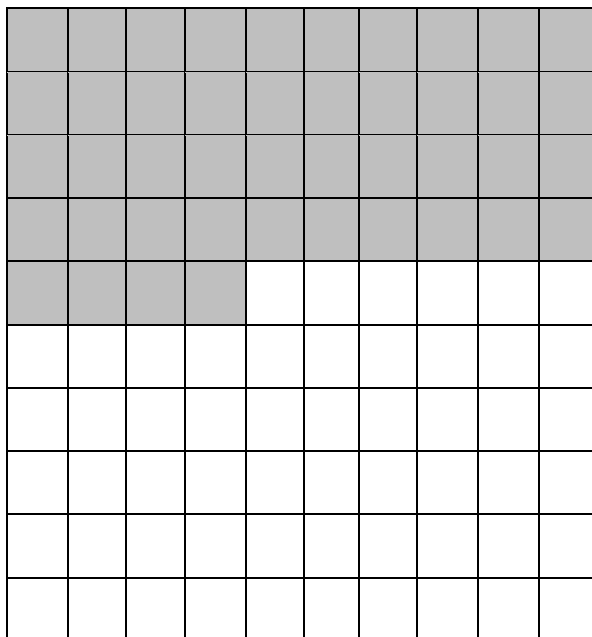
Comprehension Check:

1. How many percent of kids watched television before going to sleep?
2. What is 44% in fraction form?
3. How is 44% be written as decimal?



# What is it

## Visualizing Percent and its Relationship to Fractions, Ratios and Decimal numbers using model



Applying what we have learned from Lesson 6, we know that 44% is 44 out of 100.

Hence, we have the shaded portion in the figure on the left.

In fraction form, this is  $\frac{44}{100}$

Simplifying the fraction, this is  $\frac{11}{25}$ .

Therefore, 11 out of 25 kids watch television before they go to sleep.

In ratio form 44:100 or 11: 25.

## Percent to Fraction

To change percent to a fraction, remove the percent symbol ( % ) and write as numerator, then the denominator 100. This is from definition that percent means for every hundred. Remember to always reduce the fraction to lowest terms.

*Example 1*

Write the given percent as a fraction in simplest form.

Percent	Fraction	Simplest Form
1. 23%	$\frac{23}{100}$	$\frac{23}{100}$
2. 50%	$\frac{50}{100}$	$\frac{1}{2}$
3. 36%	$\frac{36}{100}$	$\frac{9}{25}$

## Percent to Decimal

To change percent to decimal, write the percent as a fraction, then divide the numerator by the denominator. A shorter method is to remove the % symbol, then move two decimal places to the left.

*Example 2:* Write the percent as a fraction, then divide the numerator by the denominator.

Percent	Fraction	Decimals
1. 23%	$\frac{23}{100}$	$23 \div 100 = 0.23$
2. 50%	$\frac{50}{100}$	$50 \div 100 = 0.50$
3. 36%	$\frac{36}{100}$	$36 \div 100 = 0.36$

*Example 3:* Remove the percent symbol ( % ) then move the decimal point two places to the left. This is because every percent is a ratio of a number is 100.

Percent	Decimal Form
1. 18%	0.18
2. 23.5%	0.235
3. 100.0167%	1.000167

## Decimal to Percent

To change decimal to percent, multiply the decimal number to 100, then affix the % symbol. A shortcut would be moving the decimal point two places to the right, then affix the % symbol.

*Example 4:* Multiply the decimal number by 100, then affix the % symbol.

Decimal	x 100	Percent
1. 0.01	$0.01 \times 100$	1%
2. 0.45	$0.45 \times 100$	45%
3. 2.24	$2.24 \times 100$	224%

*Example 5:* Move the decimal point two places to the right and affix the % symbol.

Decimal	Percent
1. 0.04	4%
2. 0.95	95%
3. 11.1	1110%

## Fraction to Percent

To change a fraction to percent, change into decimal first by dividing the numerator by the denominator. Then move the decimal point two places to the RIGHT and affix the % symbol.

Fraction	Decimal	Percent
$\frac{23}{100}$	$23 \div 100 = 0.23$	23%
$\frac{1}{2}$	$1 \div 2 = 0.5$	50%
$\frac{9}{25}$	$9 \div 25 = 0.36$	36%

## Defining and Identifying Percentage, Rate or Percent and Base

*Percentage* is a part of a whole. That whole or total is the *base*, while the number with the percent ( % ) symbol is the *rate*.

The relationship among the three is:  $R \times B = P$  or  $P = R \times B$

*Example 1*

We can write 70% of 40 = 30

We deal with the three elements: *rate*, *base* and *percentage*

70% of 40 = 30 where 70% is the rate, 40 is the base, and 30 is the percentage.

70 % is the rate. It is given as a percent.

It can be expressed as a ratio of fraction  $\frac{70}{100}$ .

40 is called the base. It is a whole number of which you take the percent.  
 30 is called the percentage. Meaning, it is a part of a whole. It is the resulting fractional part of the base.

When the percentage is unknown, remember to change the decimal form before we apply the formula.

Example 2: Find the percentage of 30% of 120.

Solution:

30% of 120

30% is the rate  
 120 is the base  
 The percentage is unknown

We should change the rate first to decimal before we apply the formula.

$$R = 30\% = 0.3 \qquad B = 120$$

Using the formula:

$$P = R \times B \\ = 0.3 \times 120$$

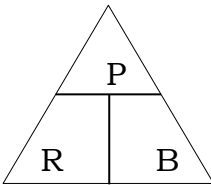
$$P = 36$$

Hence, 30% of 120 is 36

The percentage is 36.

What if the unknown value is the base or the rate? Are we going to use the same formula?

We may also use *Teehan's triangle* which is a strategy to remember the formula in solving problems involving percent.

	<p>Percentage, or part of a whole, is on top, meaning <math>P = R \times B</math>.                  Rate, or the number with % symbol beside it, is at the left because</p> $R = P \div B \times 100$ <p>Rate is percentage divided by base multiplied by 100. Base, or the whole or total, is at the right because</p> $B = P \div R$ <p>Base is percentage divided by rate.                  Remember to always change the rate to decimal form, before computing.</p>
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Example 3: Find the value of 30% of  $n = 12$

30% is the rate  
 n is the base  
 12 is the percentage

We should change the rate first to decimal before we apply the formula.

$$R = 30\% = 0.30$$

$$B = n$$

$$P = 12$$

Using the formula:

$$B = P \div R$$

$$n = 12 \div 0.3$$

$$n = 40$$

30% of 40 is 12, so the base is 40.

Example 4: 49 is  $n\%$  of 70

$n\%$  is the rate  
70 is the base  
49 is percentage

Here, the rate is unknown and what we will be able to solve is the rate in decimal form. Remember to change it to percent.

$$R = n \quad B = 70 \quad P = 49$$

Using the formula:

$$R = P \div B \times 100$$

$$n = 49 \div 70 \times 100$$

$$= (49 \div 70) \times 100$$

$$n = 0.7 \times 100$$

0.7 to percent is 70%

Hence, 49 is 70% of 70. The rate is 70%.

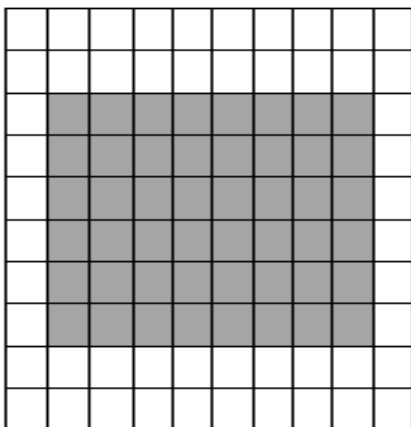


## What's More

### Activity 3: Try Me!

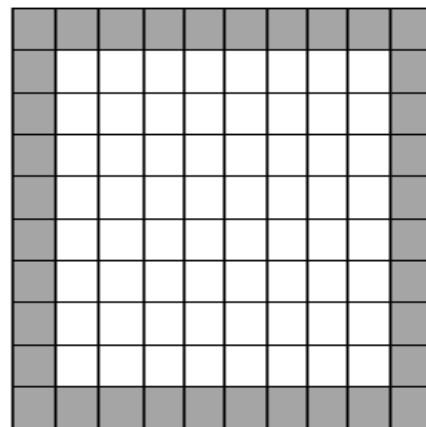
Directions: Write a fraction, decimal, and percent of the shaded parts.

A.



\_\_\_\_\_

B.



\_\_\_\_\_

Complete the table.

	Percent	Fraction	Decimal
1	34%		
2		$\frac{8}{25}$	
3			0.002
4			0.09
5			0.26

Identify the base, rate, and percentage

	Given	Base	Rate	Percentage
1	10% out of 80 is 8			
2	15% out of 90 is 13.50			
3	18% out of 100 is 18			
4	33 is 22% of 150			
5	117 is 65% of 180			



## What I Have Learned

### Activity 4 : Try Me More!

Directions: Write your answer on the space provided.

- \_\_\_\_\_ 1. What is 20% of 120?
- \_\_\_\_\_ 2. Give the percentage when the base is 60 and the rate is 12%.
- \_\_\_\_\_ 3. Give the fraction form of 83%.
- \_\_\_\_\_ 4. What is 17 in 85% of 20?
- \_\_\_\_\_ 5. The decimal form of 113% is\_\_\_\_\_.





# What I Can Do

## Activity 5 : **Apply Me!**

Neshielle got the final grades of her first quarter modular distance learning of the following subjects;

Filipino - 88%	Ar. Pan - 90%
English - 91%	TLE - 92%
Science - 90%	ESP - 92%
Mathematics - 89%	MAPEH - 91%

Directions: Create a single bar graph on Neshielle's grades in first quarter in decimal form. Write it in a short bond paper.

Rubrics in creating a graph.

10 points	7 points	4 points	1 point
Data in the graph is well organized, accurate and easy to read	Data in the graph is organized, accurate and easy to read	Data in the graph is accurate and easy to read	Data in the graph is not accurate and/or cannot be read

**Source:** <http://rubistar.4teachers.org>



# Assessment

Directions: Encircle the letter of the correct answer.

1. What is the fraction form of the shaded part?

- A.  $\frac{9}{9}$       B.  $\frac{9}{18}$       C.  $\frac{18}{1}$       D.  $\frac{18}{18}$

2. What percent of the whole is the unshaded part?

- A. 9%      B. 18%      C. 40%      D. 50

3. How do 18% converted to decimal in shorter way?

- A. By multiplying it to 100.  
B. By simply dividing the numerator by the denominator.  
C. By changing it to fraction and divide the numerator by the denominator  
D. By removing the percent symbol and move two places to the left.

4. If 70% is 70 out 100 in ratio, what is 70% written as decimal?

- A. 0.007      B. 0.07      C. 0.7      D. 70.00

5. Percent is always out of \_\_\_\_.

- A. 1      B. 10      C. 100      C.1 000

6. What is base?

- A. It is the whole from which you take the portion.  
B. It is a part or portion of the whole.  
C. It is term as percent.  
D. It is the other term of percentage.

Niejell spend 50% of his daytime answering his module. 25% for watching television and 10% for playing.

7. How many percent left to Niejell in his daytime activities?

- A. 5%      B. 15%      C. 20%      D. 25%

8. Troop Rizal ran  $\frac{3}{5}$  of the way around the oval before having formation.

What percent of the oval did the troop run?

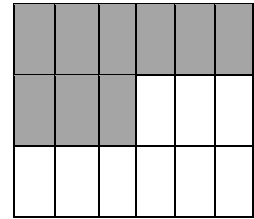
- A. 60%      B. 70%      C. 80%      D. 90%

9. Two of the 50 pieces of tomatoes in the basket are rotten. This is 4% of all the tomatoes in the basket. Which is the rate?

- A. 2      B. 4%      C. 4      D. 48

10. In a District Scouting, 8% of 125 campers are Twinklers. Which is the base?

- A. 8%      B. 117      C. 125      D. 133





## Additional Activities

### Activity 6: **Discuss With Me!**

Directions: Read and understand the problem. Show your solution and discuss your answer briefly.

1. Amber bought a rope of about 3.25 meters long. How could this be written in a fraction?
2. Athena is answering her homework in problem solving involving  $\frac{3}{8}$

How would she  $\frac{3}{8}$  as decimal in calculator?

## References

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