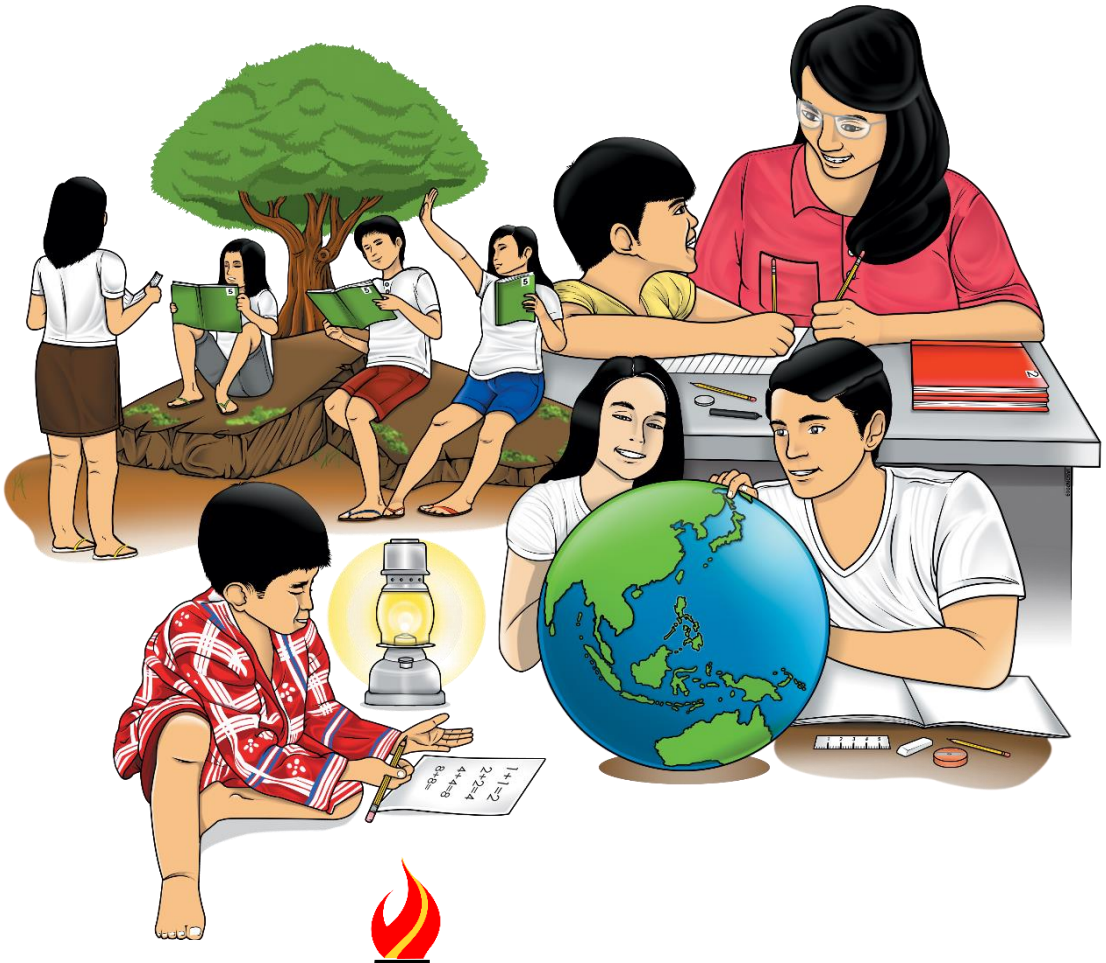
5

DepED
DEPARTMENT OF EDUCATION

Mathematics

Quarter 2 – Module 14: Visualizing the Ratio of Two Quantities



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode
Quarter 2 – Module 14: Visualizing the Ratio of Two Quantities
First Edition, 2020

Published by the Department of Education
Secretary: Leonor Magtolis Briones
Undersecretary: Diosdado M. San Antonio

Development Team of the Module

Writer: Rannie M. Castillo
Editors: Maria Niann L. Atis, Lido C. Manicane, Roel C. Tugas, Ramil R. Magdua
Reviewers: Renato S. Cagomoc, Rolando Lacbo, Joshua Sherwin T. Lim, Wilma L. Reyes, Arlene R. Restor
Illustrator: Louie Mercader**,** Jaime E. Sagayap Jr.
Layout Artist: Razle L. Jabelo
Management Team:
Ramir B. Uytico
Arnulfo R. Balane
Rosemarie M. Guino
Joy B. Bihag
Ryan R. Tiu
Sarah S. Cabaluna
Thelma Cabadsan-Quitalig
Elena S. De Luna
Renato S. Cagomoc
Noel E. Sagayap
Geraldine P. Sumbise
Joshua Sherwin T. Lim

Printed in the Philippines by

Department of Education – Region VIII
Office Address: DepEd Regional Office No. 8
Candahug, Palo, Leyte
E-mail Address: region8@deped.gov.ph

5

Mathematics

Quarter 2 – Module 14: Visualizing the Ratio of Two Quantities

DepED
DEPARTMENT OF EDUCATION

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests, and read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Good luck and happy learning!

What I Need to Know

Hi, mathletes!

This module was designed to help you gain understanding and test your ability in visualizing the ratio of two given numbers using pictures. Ratios are a helpful tool for comparing things with each other in Mathematics and in real-life situations, so it is important to know what they mean and how they are used. Ratios occur frequently in daily life and help to simplify many of our interactions by putting numbers into perspective. Ratios allow us to measure and express quantities by making them easier to understand.

At the end of this module, you are expected to:

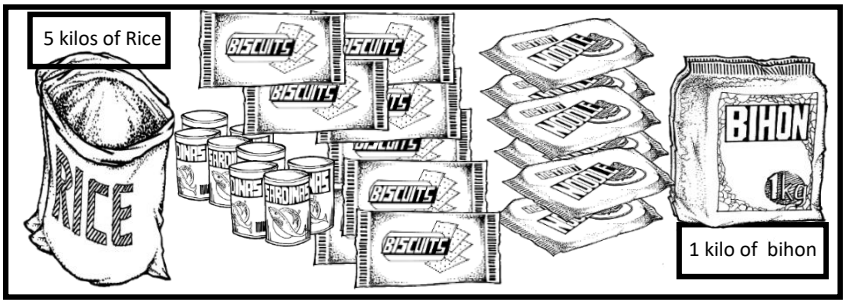
- visualize the ratio of two given numbers, and
- give importance to visualizing ratio of two given numbers.

What I Know

Before proceeding any further, try to answer the following.

Directions: Read and understand each situation carefully. Then write the corresponding ratio based on the pictures inside the box.

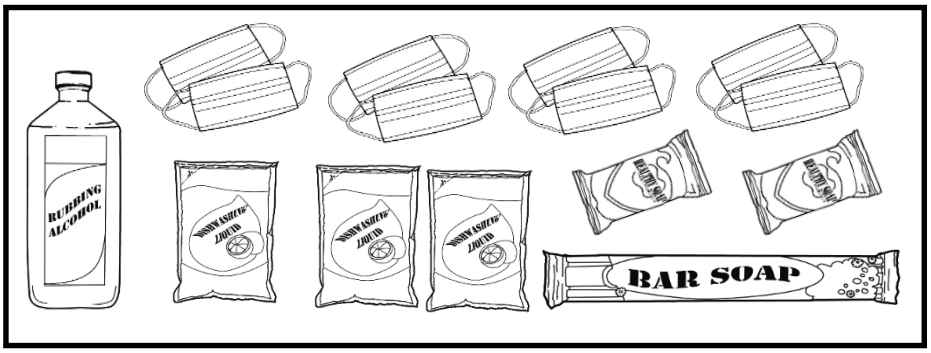
During the enhanced community quarantine, the local government units made sure that the residents of their barangays were provided with relief goods and other essential items to prevent people from getting sick with the coronavirus. Each family received the following items:



1) What is the ratio of rice to pancit bihon per kilo?
   A. 4:3 B. 4:8 C. 5:1 D. 5:5

2) What is the ratio of sardines to chicken noodles?
   A. 1:1 B. 4:8 C. 5:1 D. 5:5

3) What is the ratio of packs of biscuits to sardines?
   A. 4:3 B. 4:4 C. 4:8 D. 1:1



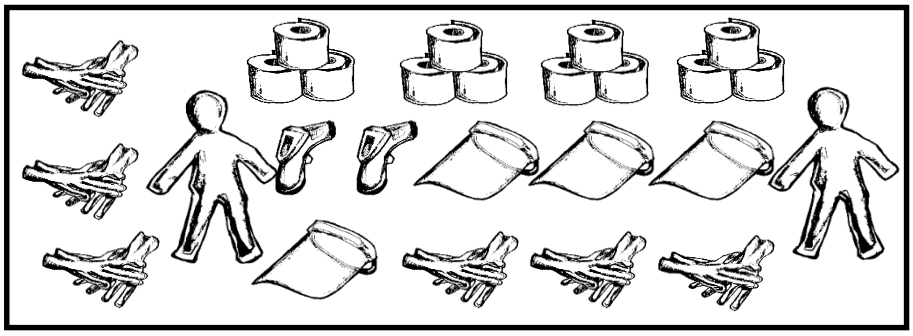
Note : To answer number 4-7, refer to the figure above.

4) What is the ratio of face masks to laundry soap?
   A. 8:1B. 7:5 C. 5:1 D. 4:4

5) What is the ratio of ethyl alcohol to bath soap?
   A. 4:3B. 3:4 C. 1:2 D. 1:1

6) What is the ratio of dishwashing liquid to face masks?
   A. 3:6B. 3:8 C. 4:6 D. 4:8

7) What is the ratio of laundry soap to bath soap?
   A. 1:2 B. 2:2 C. 3:2 D. 4:7



Note: To answer number 8-10, refer to the figure above.

8) What is the ratio of face shields to surgical gloves?
   A. 1:2 B. 2:3 C. 4:2 D. 4:5

9) What is the ratio of protective clothing to thermometer scanner?
   A. 1:1 B. 3:2 C. 5:5 D. 5:6

10) What is the ratio of tissue rolls to surgical gloves?
   A. 1:1 B. 2:1 C. 3:2 D. 4:6

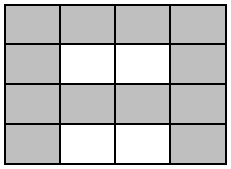
Lesson 1 Visualizing the Ratio of Two Quantities

To visualize ratios of two quantities, you need to master the skills on fractions because this will help you gain understanding of the concept of the lesson. In this module, you will be able to define the term "ratio" and give examples on your own about comparing two quantities in ratio form. So, let's start visualizing.

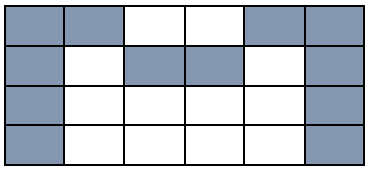
What's In

Tests consist of a huge part of fractions. Even in real-life, you use fraction, like when dividing a pizza or meal into squares or when you want to divide a space. Fractions are important because they tell you what portion of a whole you need, have, or want. It is also used in baking to tell how much of the ingredients to use. Fractions are also used in telling time; even each minute is a fraction of the hour. You have studied fractions before. Recall your knowledge about them and answer the following by telling the fractional part of the shaded/colored portion in comparison to the whole figure below.

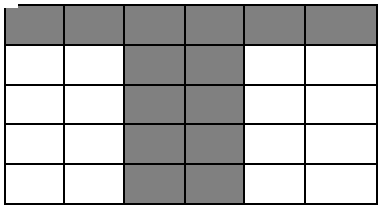
1)



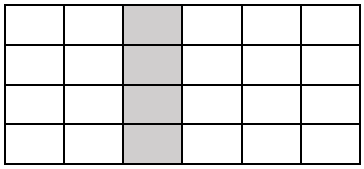
2)



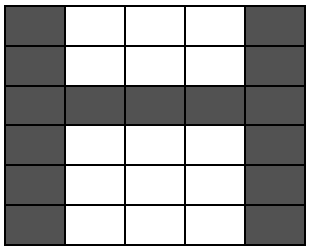
3)



4)



5)



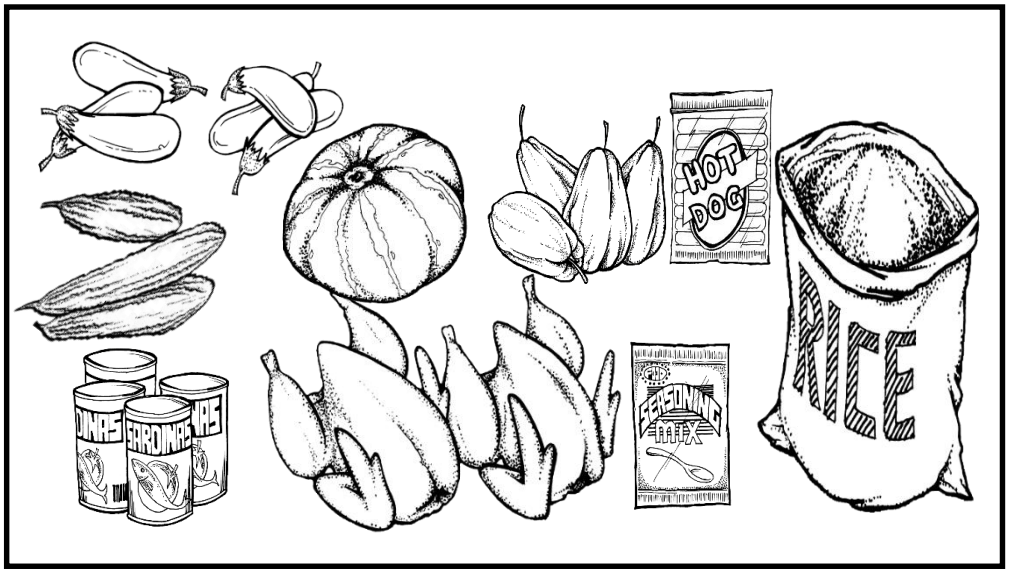
What's New

In the previous lessons, you were taught how to determine fractions. In this lesson, you will deal with visualizing ratios of two quantities being compared.

Note that you will be able to write a ratio in three forms, using the word "**to**", using a colon form "**:**" and in **fraction form**. You can also use the **phrase form.**

Situation:

As the COVID-19 cases continue to rise, the local government officials and other government agencies are still doing their best to protect the residents of their own communities from any health risk. This situation still hinders the people to go back to work to earn a living. That is why the relief operations and donation drives are still being provided and done especially to the high-risk areas. The following items are just few of the many distributed goods to **every household**.



What Is It

In visualizing ratios of two quantities, you need to know that a “part” is a piece of something or one thing in a particular group, and that a “whole” represents all the combined pieces of something or all the items belonging to a particular group. You can represent a ratio in three forms, using the word "**is to**", using a colon form “**:**" and in **fraction form**. If necessary, you can also use the **phrase form.**

For example:

2 is to 3,

2:3, $\frac{2}{3}$ and "for every two girls in the class there are three boys."

Please note that we use the phrases "**for every**," "**per**," and "**for each**" to express the relationship in ratios.

Using the pictures from the given **situation**, let’s process the concept of the lesson applying the ways in writing a ratio.

1) whole dressed chickens to eggplants
   - word form: 2 is to 6
   - colon form: 2:6
   - fraction form: $\frac{2}{6}$

   phrase form: for every two whole dressed chickens, there are six eggplants

2) packed powder seasoning to cans of sardines
   - word form: 1 is to 4
   - colon form: 1:4
   - fraction form: $\frac{1}{4}$

   phrase form: per one pack of powder seasoning, there are four cans of sardines

3) squash to chayote
   - word form: 1 is to 4
   - colon form: 1:4
   - fraction form: $\frac{1}{4}$

   phrase form: for each one piece of squash, there are four pieces of chayote

4) sausages to bitter gourds
   - word form: 1 is to 3
   - colon form: 1:3
   - fraction form: $\frac{1}{3}$
   - phrase form

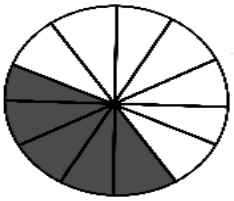
   phrase form: for everyone pack of sausages, there are three bitter gourds

5) sausages to rice
   - word form: 1 is to 1
   - colon form: 1:1
   - fraction form: $\frac{1}{1}$

   phrase form: per one pack of sausages, there is one sack of rice

Activity 1:

Look at the graph to the right. Notice the shaded or colored parts and the whole figure. There are 5 shaded parts, 7 unshaded parts, and the whole figure is divided into 12 parts.



In the previous figure, the ratio of the shaded parts to the whole figure is 5 is to 12 or 5:12 or $\frac{5}{12}$.

1. word form: 5 is to 12
2. colon form: 5:12
3. fraction form: $\frac{5}{12}$

The ratio of the unshaded parts to the whole figure is 7 is to 12, 7:12, or $\frac{7}{12}$.

Then the ratio of the whole figure to the shaded parts is 12:5, 12:5, or $\frac{5}{12}$.

Also considering the ratio of the whole figure to the unshaded parts, we have 12 is to 7, 12:7, or $\frac{7}{12}$.

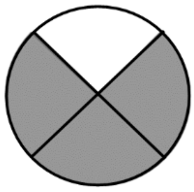
The expressions **5:12, 7:12, 12:5 or 12:7** are examples of ratio. A **ratio** is a comparison of two quantities. As we said earlier, we have three or four ways (at times if needed) in writing ratio. We have the "is to" form, colon form, fraction form and 'phrase form' if needed. For the colon form, we use the colon **(:)** read as **"is to"** or **"to"** and/or for the fraction form, we use the fraction bar **(/)** to separate two terms. In the ratio ***a:b, a*** and ***b*** are the **terms**, ***a*** is the first term or ***antecedent*** and ***b*** is the second term or ***consequent***. In the example **5:12, 5** is the first term or what we call ***antecedent***, and ***12*** is the second term or what we call ***consequent***.

Consider this:

Data	Ratio	Antecedent	Consequent
7 apples,12 grapes	7:12 or $\frac{7}{12}$	7	12

Now, let us consider another example.

Study the graph at the right. Write the corresponding ratio based on what is being asked below. Use only the colon form in your answers.

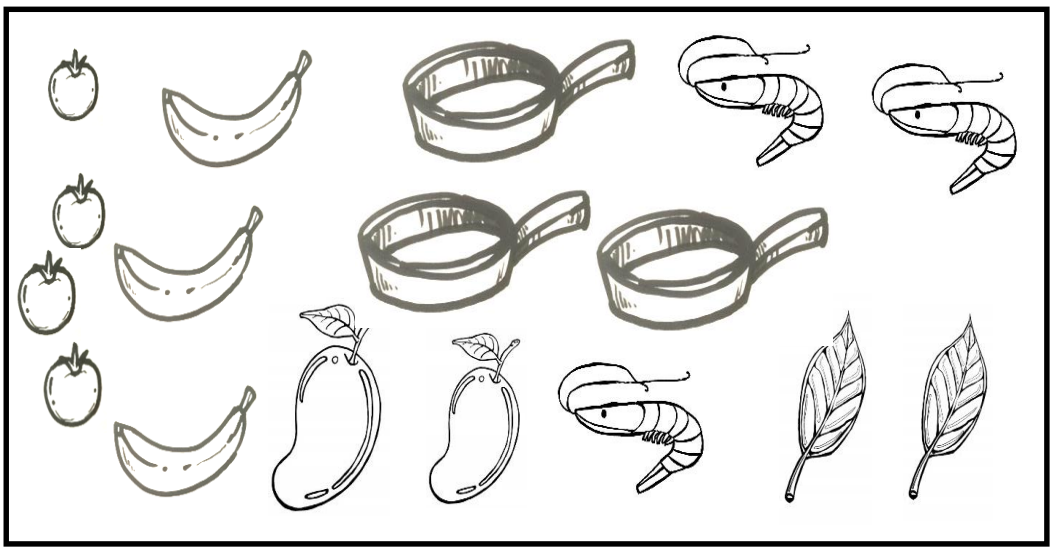


1) What is the ratio of the shaded parts to the unshaded part?
2) What is the ratio of the shaded parts to the whole pie chart?
3) What is the ratio of the unshaded part to the whole pie chart?
4) What is the ratio of the whole pie to the shaded parts?
5) What is the ratio of the unshaded part to the shaded parts?

What's More

Activity 1: Now try this activity.

Directions: Look at the picture. Write the corresponding ratio of the phrases based on the picture.



Example: shrimps to tomatoes

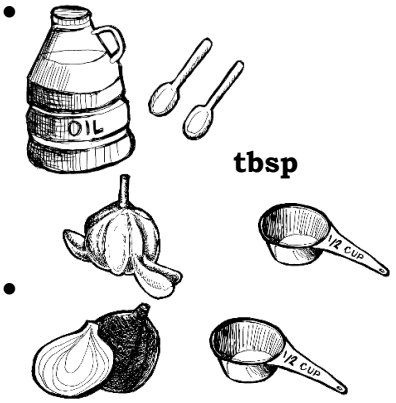
Answer: 3:4 or $\frac{3}{4}$

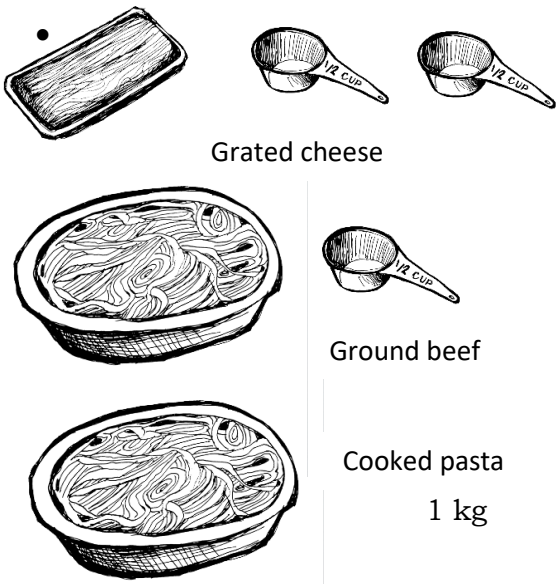
1) frying pans to shrimps
2) bananas to mangoes
3) leaves to tomatoes
4) bananas to shrimps
5) tomatoes to mangoes

Activity 2:

Directions: Recall your lessons in TLE about Home Economics. Read the recipe below and then write the corresponding ratio based on the given ingredients and their quantity.

The following are the ingredients of Pinoy Sweet-Style Spaghetti Recipe.





Use this diagram for your reference →

Tablespoon Conversions

¼ cup = 4 tablespoons
1/3 cup = 5 tablespoons + 1 teaspoon
3/8 cup = 6 tablespoons
½ cup = 8 tablespoons
2/3 cup = 10 tablespoons + 2 teaspoons
1 cup = 16 tablespoons

1) What is the ratio of cooking oil to onions in tablespoons?
2) What is the ratio of spaghetti sauce to cooked pasta in kilos?
3) What is the ratio of grated cheese to garlic in tablespoons?
4) What is the ratio of ground beef to grated cheese in cups?
5) What is the ratio of ground beef to the cooking oil in tablespoons?

Activity 3:

Directions: On your answer sheet, write **T** if the paired number is a ratio and **F** if it is not.

_____1) 26:29
_____2) 17478
_____3) $\frac{532}{629}$
_____4) 7587
_____5) 642:746

What I Have Learned

You have learned that 1) _____is a comparison of two quantities. There are three ways in writing ratio. They are:
2) _____, 3) _____, and 4) _____. In the ratio ***a:b, a*** and ***b*** are the 5) _____, ***a*** is the first term or ***antecedent*** and b is the second term of ***consequent***.
What is the other form of writing a ratio, that is used when needed? _____
How do we write 8 is to 15 in colon form? _____
Is understanding ratio essential to our daily life? Why? _____
_____
_____.

What I Can Do

Directions: Read the story carefully and give the corresponding ratio.

Teacher Amy is a Grade 5 adviser. Her students go to school by using different means of transportation. Five (5) children sail in a "bangka", 6 ride in a jeepney, 9 take the tricycle, 13 walk to school, and the rest take the bus. There are 38 children in Teacher Amy's class.

Question: What is the ratio of children who sail in a "bangka" to children who take the tricycle?

Answer: 5: 9 or $\frac{5}{9}$

Situation	Ratio
1) the ratio of children who ride the jeepney to children who walk to school.	
2) the ratio of children who ride the bus to children who ride the tricycle.	
3) the ratio of children who sail in a "bangka" to children who ride the bus.	
4) The ratio of children who ride the jeepney to children who ride the bus.	
5) the ratio of children who ride the tricycle to children who walk to school.	

Assessment

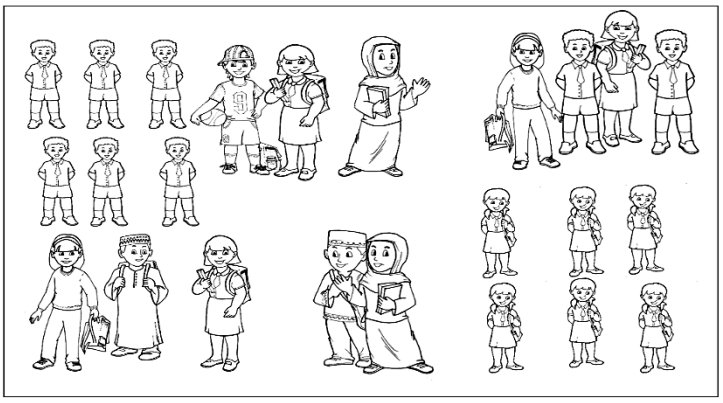
Directions: Read the information inside the box. Write the correct ratio required in the questions below. You may answer in colon form.

Aling Maria is a wholesale store owner. She asked her niece Alice to do an inventory of her supplies to check whether they are still enough, or she already needed to buy additional items in her next trip to the supermarket. The things listed below by Alice are the ones left in her store.

- 3 biscuits
- 5 cans of corned beef
- 8 bars of soap
- 23 pencils
- 12 notebooks
- 5 crayons
- 8 sachets of coffee
- 9 pads of paper
- 10 lollipops
- 25 chocolate candies
- 4 cans of sardines

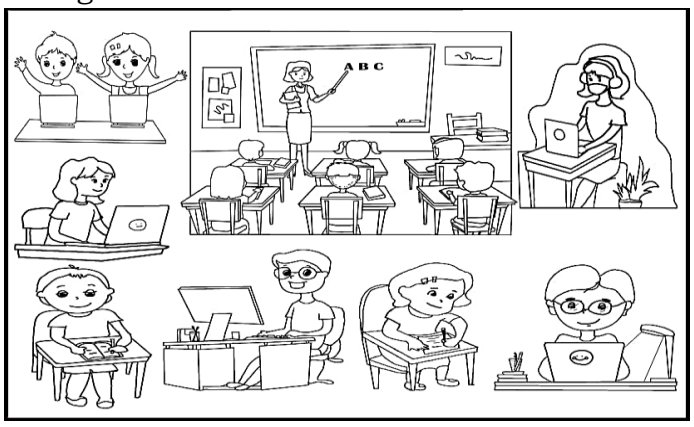
1) What is the ratio of pencils to bars of soap?
   A. 23:8 B. 10:25 C. 8:5 D. 4:12
2) What is the ratio of biscuits to corned beef?
   A. 8:1 B. 7:5 C. 3:5 D. 2:1
3) What is the ratio of lollipops to chocolate candies?
   A. 2:5 B. 12:8 C. 23:8 D. 25:5
4) What is the ratio of pencils to pads of paper?
   A. 10:4 B. 15:5 C. 23:8 D. 23:9

On the first day of school, the students came in different clothing. Carefully observe each one of them.



5) What is the ratio of boys in uniform to girls in casual wear?
   A. 10:4 B. 2:1 C. 3:8 D. 2:5
6) What is the ratio of students in Muslim outfit to boys in casual wear?
   A. 6:4 B. 4:3 C. 2:6 D. 1:2
7) What is the ratio of girls in uniform to students in casual wear?
   A. 9:7 B. 8:3 C. 6:6 D. 4:2

Due to the pandemic, the Department of Education designed and offered different ways of learning modalities enable learners to continue studying in any means they are capable of. We have the modular (with the use of modules having lessons and activities to answer at home); online/virtual (with the use of Internet connectivity and computers, cellphones, and other gadgets); and face-to-face (classroom set-up with social distancing).



8) What is the ratio of learners who chose online learning to learners who chose modular learning based on the picture?
A. 2:4 B. 3:4 C. 3:1 D. 8:4

9) What is the ratio of learners who chose face-to-face to learners who chose online learning?
A. 4:2 B. 5:3 C. 5:6 D. 1:1

10) What is the ratio of learners who chose modular learning to learners who chose face-to-face learning?
A. 2:2 B. 1:3 C. 4:5 D. 7:4

Additional Activities

Directions: Study the table below. Using the given information, express the ratio of the number of harvested mangoes and bananas weekly in each of the indicated pair of weeks.

1. week 1 harvested mangoes to week 3 harvested bananas
2. week 4 harvested mangoes to week 2 harvested bananas
3. week 5 harvested mangoes to week 1 harvested bananas
4. week 2 harvested mangoes to week 4 harvested bananas
5. week 3 harvested mangoes to week 5 harvested bananas

Harvest of Mangoes & Bananas in Maximo's Farm Per Week	Harvested Number of Mangoes in Baskets	Harvested Number of Bananas in Crates
Week 1	230	310
Week 2	200	250
Week 3	130	95
Week 4	190	115
Week 5	150	205

Answer Key

What I Know

1. C
2. A
3. A
4. A
5. C
6. B
7. A
8. B
9. A
10. B

What's In

1. $\frac{3}{4}$
2. $\frac{1}{2}$
3. $\frac{9}{25}$
4. $\frac{1}{6}$
5. $\frac{1}{2}$

What I Have Learned

1. RATIO
2. WORD
3. COLON
4. FRACTION
5. TERMS

(Varied answers here)

What's More

Activity 1

1. 1:1
2. 3:2
3. 1:2
4. 1:1
5. 2:1

Activity 2

1:4
1:1
2:1
1:2
4:1

Activity 3

T
F
T
F
T

What I Can Do

1. 6:13
2. 5:9
3. 1:1
4. 6:5
5. 9:13

Assessment

1. A
2. C
3. A
4. D
5. B
6. B
7. A
8. C
9. D
10. B

What's Is It

1. 3:1
2. 3:4
3. 1:4
4. 4:3
5. 1:3

Additional Activities

1. 230:95 or 46:19
2. 190:250 or 19:25
3. 150:310 or 15:31
4. 200:115 or 40:23
5. 130:205 or 26:41

ADM MATH 5 MODULE 14 ANSWER KEY WITH EXPLANATION

WHAT I KNOW

1. C - a comparison of 5 kilos of rice to 1 kilo of pancit bihon, so the ratio is 5:1
2. A - a comparison of 4 sardines to 3 chicken noodles, so the ratio is 4:3
3. D – a comparison of 4 packs of biscuits to 4 sardines, so the ratio is 4:4. However, answer must be in simplest form. So, the final answer is 1:1 (Remember that a ratio is a fraction)
4. There are 8 facemasks and one bar of laundry soap. So, the ratio is 8:1
5. C – There is one bottle of ethyl alcohol and 2 bath soap. So, the ratio is 1:2
6. B – There are 3 packs of dishwashing liquid and 8 facemasks. So, the ratio is 3:8
7. A – There is one laundry soap and 2 bath soap. So, the ratio is 1:2
8. B – There are 4 face shields and 6 surgical gloves. So, the ratio is 4:6. In simplest form, the final answer is 2:3
9. A – There are 3 protective clothing and 2 thermometer scanners. So, the ratio is 2:2. In simplest form, the final answer is 1:1
10. B – There are 12 tissue rolls and 6 surgical gloves. So, the ratio is 12:6. In simplest form, the final answer is 2:1

What's In

1. There are 12 shaded parts and the whole figure is composed of 16 squares. So, the ratio is 12:16. In simplest form, the final answer is 3:4.
2. There are 12 shaded parts and the whole figure is composed of 24 squares. So, the ratio is 12:24. In simplest form, the final answer is 1:2
3. There are 9 shaded parts and the whole figure is composed of 25 squares. So, the ratio is 9:25
4. There are 4 shaded parts and the whole figure is composed of 24 squares. So, the ratio is 4:24. In simplest form, the final answer is 1:6
5. There are 15 shaded parts and the whole figure is composed of 30 squares. So, the ratio is 15:30.In simplest form, the final answer is 1:2

What is it

1. The ratio of the shaded parts to the unshaded part is 3:1.
2. The ratio of the shaded parts to the whole pie chart is 3:4.
3. The ratio of the unshaded part to the whole pie chart 1:4.
4. The ratio of the whole pie to the shaded parts is 4:3.
5. The ratio of the unshaded part to the shaded parts is 1:3.

What's More

Activity 1

1) There are 3 frying pans and 3 shrimps. So, the ratio is 3:3. In simplest form, the final answer is 1:1
2) There are 3 bananas and 2 mangoes. So, the ratio is 3:2.
3) There are 2 leaves and 4 tomatoes. So, the ratio is 2:4. In simplest form, the final answer is 1:2
4) There are 3 bananas and 3 shrimps. So, the ratio is 3:3. In simplest form, the final answer is 1:1.
5) There are 4 tomatoes and 2 mangoes. So, the ratio is 4:2. In simplest form, the final answer is 2:1

Activity 2

1. The ratio of cooking oil to onions in tablespoons is 2:8. In simplest form, the final answer is 1:4.
2. The ratio of spaghetti sauce to cooked pasta in kilos is 1:1.
3. The ratio of grated cheese to garlic in tablespoons is 16:8. In simplest form, the final answer is 2:1.
4. The ratio of ground beef to grated cheese in cups is 1:2.
5. The ratio of ground beef to the cooking oil in tablespoons is 8:2. In simplest form, the final answer is 4:1.

Activity 3

1. 26:29 – It is a ratio. T
2. 17478- Not a ratio. F
3. $\frac{532}{629}$ It is a ratio. T
4. 7587 – Not a ratio. F
5. 642:746- It is a ratio. T

What I have Learned

1. RATIO
2. WORD
3. COLON
4. FRACTION
5. TERMS

Learners may have varied answers to the succeeding questions.

What I Can Do

1. The ratio of children who rode the jeepney to children who walked is 6:13 or 6/13.
2. The ratio of children who rode the bus to children who rode the tricycle is 5:9 or 5/9. (There are 38 children in the class. Adding the number of children who took different means of communication it would give 33. 38-33 = 5. So, there are 5 students who took the bus).
3. The ratio of children who sailed in "bangka" to children who rode the bus is 5:5. In simplest form, the final answer is 1:1.
4. The ratio of children who rode the jeepney to children who rode the bus is 6:5 or 6/5.
5. The ratio of children who rode the tricycle to children who walked is 9:13 or 9/13.

ASSESSMENT

1. The ratio of pencils to bar soaps is 23:8 or 23/8 (There are 23 pencils and 8 bar soaps). It is letter **A.**
2. The ratio of biscuits to corned beef is 3:5 or 3/5 (There are 3 biscuits and 5 corned beef). It is letter **C.**
3. The ratio of lollipops to chocolate candies is 10:25. In simplest form, the final answer is 2:5. (There are 10 lollipops and 25 chocolate candies). It is letter **A.**
4. The ratio of pencils to pads of paper is 23:9 or 23/9. (There are 23 pencils and 9 pads of paper). It is letter **D**.
5. The ratio of boys in uniform to girls in casual wear is 8:4. In simplest form, the final answer is 2:1. It is letter **B.**
6. The ratio of students in Muslim outfit to boys in casual wear is 4:3. (Two boys here are Muslims. So, the counting of boys will include them for the casual wear with one boy who is not a Muslim. All in all, there are 3 boys who are wearing casual wear that is why the ratio is 4:3). It is letter **B.**
7. The ratio of girls in uniform to students in casual wear is 9:7 or 9/7. It is letter **A.**
8. The ratio of learners who chose online learning to learners who chose modular learning is 6:2. In simplest form, the final answer is 3:1. It is letter **C.**
9. The ratio of learners who chose face-to-face to learners who chose online learning is 6:6. In simplest form, the final answer is 1:1. It is letter **D**.
10. The ratio of learners who chose modular learning to learners who chose face-to-face learning is 2:6. In simplest form, the final answer is 1:3. It is letter **B.**

Additional Activity

1. The ratio of harvested mangoes in week 1 & harvested bananas in week 3 is 230:95. In simplest form, the final answer is 46:19 or 46/19.
2. The ratio of harvested mangoes in week 4 & harvested bananas in week 2 is 190:250. In simplest form, the final answer is 19:25 or 19/25.
3. The ratio of harvested mangoes in week 5 & harvested bananas in week 1 is 150:310. In simplest form, the final answer is 15:13 or 15/13.
4. The ratio of harvested mangoes in week 2 & harvested bananas in week 4 is 200:115. In simplest form, the final answer is 40:23 or 40/23.
5. The ratio of harvested mangoes in week 3 & harvested bananas in week 5 is 130:205. In simplest form, the final answer is 26:41 or 26/41.

References

Gromio, E. G., De Gracia, M. B., Perez, R. M., & Gureng, P. T. (n.d.). *Realistic Math.* Quezon City: Sibs Publishing House, Inc.

Lumbre, A. P., Ursula, A. C., Placer, D. P., Burgos, J. R., & Sy, R. A. (2016). *21st Century Mathletes.* Philippines.

For inquiries or feedback, please write or call:

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex, Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: blr.lrqad@deped.gov.ph * blr.lrpd@deped.gov.ph