

4

Mathematics

Quarter 1 – Module 12: Estimating Quotients



Mathematics – Grade 4
Alternative Delivery Mode
Quarter 1 – Module 12: Estimating Quotients
First Edition, 2020

Republic Act 8293, section 176 states that: No copyright shall subsist in any work of the Government of the Philippines. However, prior approval of the government agency or office wherein the work is created shall be necessary for exploitation of such work for profit. Such agency or office may, among other things, impose as a condition the payment of royalties.

Borrowed materials (i.e., songs, stories, poems, pictures, photos, brand names, trademarks, etc.) included in this module are owned by their respective copyright holders. Every effort has been exerted to locate and seek permission to use these materials from their respective copyright owners. The publisher and authors do not represent nor claim ownership over them.

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

Development Team of the Module

Writers: Ireneo D. Dechavez

Reviewers: Elena D. Hubilla

Illustrator: Ireneo D. Dechavez

Layout Artist: Teresa Vissia B. Suñga

Management Team: Regional Director: Gilbert T. Sadsad

CLMD Chief: Francisco B. Bulalacao Jr.

Regional EPS In Charge of LRMS: Grace U. Rabelas

Regional ADM Coordinator: Ma. Leilani R. Lorico

CID Chief : Monserat D. Guemo

Division EPS In Charge of LRMS: Florena M. Deuna

Printed in the Philippines by _____

Department of Education – Region V

Office Address: Regional Center Site, Rawis, Legazpi City 4500

Telefax: 0917-178-1288

E-mail Address: region5@deped.gov.ph

4

Mathematics

Quarter 1 – Module 12:
Estimating Quotients

Introductory Message

For the facilitator:

Welcome to the Mathematics Grade 4 Alternative Delivery Mode (ADM) Module on Estimating Quotients!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:



Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Mathematics 4 Alternative Delivery Mode (ADM) Module on Estimating Quotients!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:



What I Need to Know

This will give you an idea of the skills or competencies you are expected to learn in the module.



What I Know

This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.



What's In

This is a brief drill or review to help you link the current lesson with the previous one.



What's New

In this portion, the new lesson will be introduced to you in various ways; a story, a song, a poem, a problem opener, an activity or a situation.



What is It

This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.



What's More

This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.



What I Have Learned

This includes questions or blank sentence/paragraph to be filled in to process what you learned from the lesson.



What I Can Do

This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.



Assessment

This is a task which aims to evaluate your level of mastery in achieving the learning competency.



Additional Activities

In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.



Answer Key

This contains answers to all activities in the module.

At the end of this module you will also find:

References

This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!



What I Need to Know

Good day learner! You learned in the previous module how to divide numbers and how to find the exact quotients. This time, you will find quotients which are not exact but close enough. This is called estimating quotients. Enjoy learning this module!

After going through this module, you are expected to:

- estimate the quotient of 3- to 4-digit dividends by 1- to 2-digit divisors with reasonable results.



What I Know

A. Estimate the quotients, then choose the most appropriate answer.

1. $13 \overline{)6\,347}$ a. 6 b. 60 c. 600 d. 6000
2. $75 \overline{)4\,224}$ a. 5 b. 50 c. 500 d. 5000
3. $38 \overline{)7\,342}$ a. 175 b. 157 c. 751 d. 517
4. $12 \overline{)8\,732}$ a. 9 b. 90 c. 900 d. 9000
5. $24 \overline{)375}$ a. 2 b. 20 c. 200 d. 2000
6. $18 \overline{)5\,236}$ a. 26 b. 260 c. 620 d. 255
7. $28 \overline{)5\,623}$ a. 20 b. 200 c. 300 d. 300

B. Read each problem, then solve.

8. If a kilogram of watermelon costs ₱35, about how many kilograms can you buy with ₱750?

9. Which is a better option if you want to save money: one box of 8 slices of egg pie at ₱247 or one slice of egg pie at ₱32? Assume that you need 8 slices of egg pie.
10. About how many 25s are there in 6 428?

Are you done answering?
If yes, time to check. Please go to page 10 for the **Answer Key**.



What's In

Before we proceed with our new lesson, let us have a review in rounding off and dividing numbers.

A. Round the following numbers to the highest place value.

1. 4 672 2. 832 3. 5 821 4. 9 462 5. 7 732

B. Find the quotients.

6. $3\,639 \div 3$ 9. $1\,052 \div 4$
7. $4\,900 \div 7$ 10. $378 \div 9$
8. $568 \div 8$

If you are done answering the activity, please go to the **Answer Key** on page 10 and check if your answers are correct.



Notes to the Teacher

Supplemental lessons and activity sheets on the review topics should be given to learners who lack the required prerequisite skills.

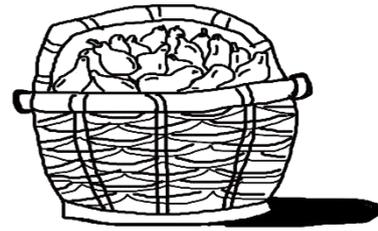


What's New

What is your favorite fruit? Do you like avocados? Avocado is a super fruit rich in essential nutrients that our body needs.

Read the problem.

Mr. Enriquez harvested 1 675 avocados in his orchard. He plans to place 23 avocados in a basket. About how many baskets will he need?



How will you find the answer to this problem?



What is It

You can answer the question by estimating the quotient of 1 675 and 23.

Let us see if we have the same answer.

The phrase “about how many” does not ask for an actual answer but an estimate. That is, you will estimate the quotient in solving the problem.

Consider the two methods below and try to find out which method is closer to the actual answer.

- A. **Rounding Method:** Rounding the dividend and divisor to the highest or greatest place value.
- B. **Compatible Number Method:** Using numbers (dividend and divisor) which can be divided compatibly.

Rounding Method	Compatible Number Method	Actual Answer
$\begin{array}{r} 23 \overline{)1675} \\ \downarrow \quad \downarrow \\ 20 \overline{)2000} \end{array}$	$\begin{array}{r} 23 \overline{)1675} \\ \downarrow \quad \downarrow \\ 20 \overline{)1600} \end{array}$	$\begin{array}{r} 72 \text{ r.}19 \\ 23 \overline{)1675} \\ - \underline{161} \\ 65 \\ - \underline{46} \\ 19 \end{array}$
$\begin{array}{r} 100 \\ 20 \overline{)2000} \\ - \underline{20} \\ 0 \\ - \underline{0} \\ 0 \\ - \underline{0} \\ 0 \end{array}$	$\begin{array}{r} 80 \\ 20 \overline{)1600} \\ - \underline{16} \\ 0 \\ - \underline{0} \\ 0 \\ - \underline{0} \\ 0 \end{array}$	

Actual Answer: He needs 72 baskets with 23 avocados each and there will be remaining 19 avocados.

If the rounding method is used, he needs about **100** baskets.

If compatible number method is used, he needs about **80** baskets.

Which of the two estimates is closer to the actual answer?

The estimate using Compatible Number Method provides the closer estimate with about 80 baskets.

Therefore, Mr. Enriquez needs about 80 baskets.

The use of estimating is to get close to real answers as quick as possible. **Rounding Method** is used if the numbers rounded to its highest place value are easy to divide. However, if the rounded numbers do not go in easily or exact, **Compatible Number Method** is used. Compatible numbers are numbers that are easy to compute mentally.

Example: $4\,923 \div 7$

If we use Rounding Method:

$$7 \overline{)4923} \longrightarrow 7 \overline{)5000}$$

Notice that 50 cannot be divided exactly by 7.
So, we use Compatible Number Method.

Are 7 and 49 compatible numbers?

Yes! 49 is a multiple of 7 (7, 14, 21, 28, 35, 42, **49**...).

$$7 \overline{)4923} \longrightarrow 7 \overline{)4900} = 700$$

Therefore, in this problem, Compatible Number Method is the best method to use.

Below are some other examples. Study them.

$$784 \div 5$$

$$\begin{array}{r} 5 \overline{)784} \\ \downarrow \\ \underline{160} \\ 5 \overline{)800} \\ - \underline{5} \\ \quad 30 \\ - \underline{30} \\ \quad \quad 0 \\ - \underline{0} \\ \quad \quad \quad 0 \end{array}$$

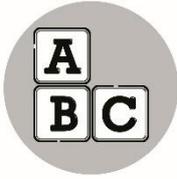
$$7562 \div 14$$

$$\begin{array}{r} 14 \overline{)7562} \\ \downarrow \\ \underline{750} \\ 10 \overline{)7500} \\ - \underline{70} \\ \quad \quad 50 \\ - \underline{50} \\ \quad \quad \quad 0 \\ - \underline{0} \\ \quad \quad \quad \quad 0 \end{array} \text{ OR } \begin{array}{r} \underline{800} \\ 10 \overline{)8000} \\ - \underline{80} \\ \quad \quad 0 \\ - \underline{0} \\ \quad \quad \quad 0 \\ - \underline{0} \\ \quad \quad \quad \quad 0 \end{array}$$

$$3294 \div 8$$

$$\begin{array}{r} 8 \overline{)3294} \\ \underline{400} \\ 8 \overline{)3200} \\ - \underline{32} \\ \quad \quad 0 \\ - \underline{0} \\ \quad \quad \quad 0 \\ - \underline{0} \\ \quad \quad \quad \quad 0 \end{array}$$

Now, you already learned how to estimate quotients.
This time you are now ready for the activities.
LET'S GO!!!



What's More

Activity 1

Estimate the following using the Rounding Method.

1. $4\,108 \div 82$

2. $573 \div 6$

3. $9\,234 \div 28$

4. $8\,501 \div 9$

5. $2\,124 \div 17$

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.

Assessment 1

Round the dividend and divisor, then estimate each quotient.

1. $3\,115 \div 63$

2. $6\,442 \div 49$

3. $1\,671 \div 41$

4. The 1 342 pupils and teachers of Pawa Elementary School will go on a field trip. Buses to be hired have 52 seats each. About how many buses will they hire?
5. The 2 672 chickens in a farm can consume 42 kilograms of feeds a day. About how many chickens can consume a kilogram of feeds a day?

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.

Activity 2

Estimate the following using the Compatible Number Method.

1. $3\,208 \div 18$

4. $4\,562 \div 94$

2. $3\,613 \div 56$

5. $8\,321 \div 24$

3. $9\,546 \div 16$

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.

Assessment 2

Use the Compatible Number Method to find the estimated quotient.

1. $645 \div 8$

2. $4\,732 \div 12$

3. $8\,752 \div 4$

4. The City Mayor received a donation of 6 393 kilograms of rice to be distributed to 8 barangays affected by COVID-19. About how many kilograms of rice will each barangay receive?
5. The Kids Heart Foundation donated 4 576 notebooks to 9 elementary schools. About how many notebooks did each school receive?

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.



What I Have Learned

How do we estimate the quotient of 3- to 4-digit dividends by 1- to 2-digit divisors with reasonable results?

- To estimate the quotients, use either of the two methods:
 - A. Rounding Method: Round the dividend and divisor to the highest place value and then divide.

- B. Compatible Number Method: Use numbers in the dividend and divisor that can be divided compatibly.



What I Can Do

- A. Estimate the quotients to answer the following:
1. About how many 52s are there in 1 324?
 2. About how many minutes are there in 3 568 seconds?
 3. About how many 26s are there in 5 867?
- B. Estimate each quotient. Then, compare the two estimated quotients by writing $>$, $<$ or $=$.
4. $3\ 672 \div 35$ $3\ 452 \div 32$
5. $645 \div 5$ $567 \div 6$
6. $6\ 543 \div 65$ $7\ 027 \div 67$

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.



Assessment

- A. Estimate the quotients of the following. Choose the letter of the correct answer.
- | | | | | |
|---------------------|--------|--------|--------|--------|
| 1. $765 \div 7$ | a. 700 | b. 110 | c. 70 | d. 10 |
| 2. $843 \div 4$ | a. 210 | b. 201 | c. 120 | d. 102 |
| 3. $5\ 357 \div 25$ | a. 160 | b. 216 | c. 225 | d. 230 |
| 4. $8\ 345 \div 43$ | a. 400 | b. 250 | c. 200 | d. 20 |
| 5. $4\ 678 \div 37$ | a. 135 | b. 130 | c. 126 | d. 125 |

B. Find the estimated quotient.

6. $876 \div 5$

7. $1\,843 \div 16$

8. $6\,432 \div 83$

C. Solve each problem.

9. About how many dozens are there in 105 pieces?

10. There are 672 books to be distributed among 4 classes. About how many books will be given to each class?

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.



Additional Activities

A. Use estimation to tell whether the exact quotient is less than or greater than the given number.

1. $5 \overline{)3476}$ < 400 or > 400

2. $18 \overline{)4\,534}$ < 250 or > 250

3. $6 \overline{)1927}$ < 300 or > 300

B. Read and solve.

4. Which would you buy, one kilogram of fabric conditioner at ₱280 or 6 small packs of 54 grams each of the same fabric conditioner at ₱94 per pack? Why?

Are you done answering?

If yes, time to check. Please go to page 10 for the **Answer Key**.

**CONGRATULATIONS! You are doing very well.
See you in the next module.**



Answer Key

WHAT I KNOW (page 1 -2)

- | | |
|------|--|
| 1. C | 6. B |
| 2. B | 7. B |
| 3. A | 8. 20 kilograms |
| 4. C | 9. One box of 8 slices of egg pie at ₱247. |
| 5. B | 10. 200 |

WHAT'S IN (page 2)

- | | |
|----------|----------|
| 1. 5 000 | 6. 1 213 |
| 2. 800 | 7. 700 |
| 3. 6 000 | 8. 71 |
| 4. 9 000 | 9. 263 |
| 5. 8 000 | 10. 42 |

WHAT'S MORE (pages 5 - 7)

Activity 1

1. 50
2. 100
3. 300
4. 1 000
5. 100

Activity 2

1. 160
2. 60
3. 475
4. 50
5. 415

Assessment 1

1. 50
2. 120
3. 50
4. About 20 buses
5. About 75 chicken

Assessment 2

1. 80
2. 400
3. 2 200
4. About 800 kilograms
5. About 500 notebooks

WHAT CAN I DO (page 7-8)

1. 26 or 20
2. 60 minutes
3. 20
4. =
5. >
6. =

ADDITIONAL ACTIVITIES (page 9)

1. > 400
2. > 250
3. > 300
4. One kilogram of fabric conditioner at ₱280 because I can save more than ₱2.

ASSESSMENT (page 8)

1. B
2. A
3. B
4. C
5. D
6. 180
7. 90 or 100
8. 75 or 80
9. About 10 dozens
10. About 175 books

Score update:

- 5 WOW! GREAT JOB!
- 3-4 NICE!
- 0-2 OOOPPPS! Don't worry. Take time to go over the lesson again. Kindly approach your teacher or facilitator if you need help. Have fun!

Score update:

- 6 WOW! GREAT JOB!
- 5 VERY NICE!
- 3-4 NICE!
- 0-2 OOOPPPS! Don't worry. Take time to go over the lesson again. Kindly approach your teacher or facilitator if you need help. Have fun!

Score update:

- 10 WOW! GREAT JOB!
- 8-9 VERY NICE!
- 6-7 NICE!
- 0-5 Don't worry. Take time to study this module. Your teacher will be happy to help you. Have fun!

Score update:

- 4 WOW! EXCELLENT JOB!
- 3 NICE!
- 0-2 Do not worry. Your teacher will be happy to help you. Do not be shy to ask questions.

References

K to 12 Mathematics Curriculum Guide, August 2016.

Tabilang, A. et. al. (2015), Mathematics 4: Learner's Material, Pasig City, Lexicon Press.

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