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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics 5

Quarter 2
Lesson
6

Lesson Exemplar for Mathematics Grade 5
Quarter 2: Lesson 6 (Week 6)
SY 2024-2025

Development Team

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MATHEMATICS/QUARTER 2/ GRADE 5

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. **Content Standards**	Divisibility Rules
B. Performance Standards	Use divisibility rules.
C. Learning Competencies and Objectives	***Learning Competency*** ***1.*** *Use divisibility rules to find common factors of numbers:* ***a.*** *divisibility rules for 2, 5, and 10,* ***b.*** *divisibility rules for 3, 6, and 9, and* ***c.*** *divisibility rules for 4, 8, 11, and 12.*
D. Content	1. Apply divisibility rules to determine if a number is divisible by 2, 5, and 10 by observing the number's last digit. 2. Apply divisibility rules to determine if a number is divisible by 3 and 9 by observing the sum of the digits of a number.
E. Integration	21st Century Skill: Critical Thinking and Collaboration

II. LEARNING RESOURCES

De Gracia, M. M. B., Gromio, E. G., Gureng, P. T., Jimenez, E. P., & Perez, R. M. (2022). *REALISTIC MATH: Basic, Beyond, Breakthroughs 5.* Phoenix Publishing House, Inc., ISBN: 978-971-06-5561-8

DepEd TV Official (2020, October 4). *Grade 5 Math Q1 Ep1: Divisibility Rules for 2, 5, and 10* [Video File]. Youtube. https://www.youtube.com/watch?v=kOIwjTRL90Y

Doria, S. (2022, August 30). *Divisibility Rules for 2, 5, & 10 / Grade 5* [Video File]. Youtube. https://www.youtube.com/watch?v=2pOe6q6Zpfo

Laforteza, R. A. & Santiago, J. P. (2015). *Exploring Math Possibilities 5.* Don Bosco Press, Inc. ISBN: 978-971-9978-81-7

Sacao, J. R. (2022). *Math World 4* (2nd ed.). C & E Publishing, Inc. ISBN: 978-971-98-1716-1

Suarez, J. V. (2019). *Math Beyond Time 5.* JO-ES Publishing House, Inc. ISBN: 978-971-655-611-7

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. **Activating Prior Knowledge**	**DAY 1 - 2** **1. Short Review** Perform the indicated operation: a. 452÷2 b. 612÷3 c. 1065÷5 d. 972÷9 e. 2150÷10 **2. Feedback (Optional)**	The teacher will provide a short review on performing long division. The teacher may choose to make this as a group activity where the class is divided into groups and each group will compete to get the correct answer. The group with the highest score will be the winner.
B. Establishing Lesson Purpose	**1. Lesson Purpose** In our review, we performed a long division to get the answer. Now, let us go back to our examples: a. 452÷2 b. 612÷3 c. 1065÷5 d. 972÷9 e. 2150÷10 After performing the operation, we can notice that the quotient leaves no remainder. Do you think there is an easier way to determine whether the given examples can be exactly divided by their corresponding divisors without performing the long division process? The usual way to determine if a number is divisible by another is to perform the operation. However, mathematicians have established some **divisibility rules** that can help us determine whether a number can be exactly divided by another number. **2. Unlocking Content Vocabulary** Since the quotient leaves no remainder, we can say that the dividend is **divisible** by the divisor. In example number 1, since 2 divides 452 without leaving any remainder, we can say that 452 is **divisible** by 2.	In this part of the lesson, the teacher may utilize a guided question in order to gather the observation of the students with regards to the quotient of each example. The teacher may end this part by asking the students if it is possible to determine if a number is divisible by another number without undergoing the long division process. In this part of the lesson, the teacher will introduce the related terminologies that are commonly used in applying divisibility rules. The teacher may use the other examples on

	A number is a **factor** of another number if it divides that number without leaving a remainder. Since 2 divides 452 without leaving any remainder, we can say that 2 is a **factor** of 452. A number is a **common factor** of two (or more) numbers if it divides the numbers without leaving a remainder. On the other hand, if a number is divisible by another number, then it is a **multiple** of that number. Going back to example number 1, since 452 is divisible by 2, then we can say that 452 is a **multiple** of 2.	the review to clarify the concepts.
C. Developing and Deepening Understanding	**SUB-TOPIC 1: Applying divisibility rules to determine if a number is divisible by 2, 5, and 10 by observing the number's last digit.** **1. Explicitation**  We have 4 packs of candies. The first pack contains 10 candies, the second pack contains 15 candies, the third pack contains 12 candies, and the last pack contains 20 candies. We are going to divide the candies inside each pack and see if it will be divided equally into these two jars or if there will be any excess. 	In this part of the lesson, the teacher will lead the students to discover the divisibility rule for 2, 5, and 10 by direct observation. The activity can be done by the teacher as a group activity or as a teacher-led demonstration. The number of packs, candies or objects, and the materials for the activity may be localized or contextualized by the teacher using the available resources in the locality.

Suppose, we are going to increase the number of jars to 5. Let us see if the candies contained in each pack can be divided equally among the 5 jars or if there will be an excess.

Now, let us increase our number of jars to 10. Again, let us try to divide the number of candies from each pack and see if it will be divided equally among the 10 jars or if there will be an excess.

From the activity, we can generate the following summary:

No. of Jars	Number of Candies that can be equally divided	Number of Candies that have an excess.
2	10, 12, 20	15
5	10, 15, 20	12
10	10, 20	12, 15

In this part of the lesson, the teacher will build the summary table together with the help of the student's observation through guided questions.

By observing the last digits of the numbers that can be divided 2, 5, and 10, we can generate the following divisibility rules:

a. Divisibility Rule for 2

A number is divisible by 2 if it is even or if the last digit ends with 0, 2, 4, 6, or 8.

In this part of the lesson, the teacher can ask the students to provide any number that they can think of that can be divided by 2, 5, and 10 based on their divisibility rules. For more details and ideas for modeling the divisibility rule for 2, 5, and

	In the activity, since the last digit of 10 is zero (0), then it is divisible by 2. We can notice that the last digit of 15 is 5, which is not an even number. Therefore, 15 is not divisible by 2. Since 10, 12, and 20 can be divided by 2, then 2 is a **common factor** of 10, 12, and 20. Examples: 54<u>0</u>, 86<u>2</u>, 1,53<u>4</u>, 5,46<u>8</u> **b. Divisibility Rules for 5** A number is divisible by 5 if the last digit of the number is 5 or 0. In the activity, since the last digit of 15 is 5, then it is divisible by 5. We can see that 12 is not divisible by 5 since its last digit is neither 5 nor 0. Since 10, 15, and 20 can be divided by 5, then 5 is a **common factor** of 10, 15, and 20. Examples: 64<u>5</u>, 78<u>0</u>, 1,43<u>5</u>, 3,92<u>0</u> **c. Divisibility Rules for 10** A number is divisible by 10 if the last digit of the number is 0. In the activity, since the last digit of 20 is 0, then it is divisible by 10. We can observe that 15 is not divisible by 10 since its last digit is not 0. Since the last digit of 15 is 5, and not zero, then it is not divisible by 10. Since 10 and 20 can be divided by 10, then 10 is a **common factor** of 10 and 20. Examples: 67<u>0</u>, 94<u>0</u>, 3,00<u>0</u>, 652<u>0</u> **2. Worked Example** Determine whether the following numbers are divisible by 2, 5, or 10 using their divisibility rules. More than one rule may apply. 1. 462 **Solution:** 462 ends in 2, which is even, then 462 is divisible by 2.	10, the teacher may watch this video: https://www.youtube.com/watch?v=2pOe6q6Zpfo In this part of the lesson, the teacher may conduct this as a

	2. 580 **Solution:** 580 ends in 0, which is even, then 580 is divisible by 2, 5, and 10 3. 898 **Solution:** 898 ends in 8, which is even, then 898 is divisible by 2. 4. 1,205 **Solution:** 1,205 ends in 5, then 1,205 is divisible by 5 only 5. 11,300 **Solution:** 11,300 ends in 9, then 11,300 is divisible by 2,5,10 **3. Lesson Activity** **(Refer to Worksheet 1)** *Key answer:* *(the students may put any of the following numbers for each item)* 1. 0, 2, 4, 6, or 8 2. 5 3. 0, or 5 4. 0, 2, 4, 6, or 8 5. 0 **Activity 1.1** Identify the common factors of the given numbers using the divisibility rules for 2, 5, and 10. 1. 262 and 358 2. 870 and 2,565 3.1,450 and 3,210 4. 1,540 and 7,256 5. 9,600 and 12,340 **DAY 3 - 4** **SUB-TOPIC 2: Applying divisibility rules to determine if a number is divisible by 3 and 9 by observing the sum of the digits of a number.**	group activity or individually through flashcards. The teacher may add other items. *Key Answer:* 1. 2 only 2. 2, 5, and 10 3. 2 only 4. 5 only 5. 2, 5, 10 This lesson activity is suggested to be conducted on the 2nd day. This can be answered individually or in pairs. *Key Answer: Activity 1.1* 1. 2 2. 5 3. 2, 5, 10 4. 2 5. 2, 5, 10 In this lesson, the class will be playing “The Boat is Sinking”. The teacher shall adjust the number of the class into random numbers that are

1. Explicitation

From our game, we can generate the following summary:

Grouped by	Number of Students that can be equally divided	Number of Students that have an excess.
3	33, 27, 30, 18	32
9	27, 18,	33, 30, 32

From our previous discussion, we have generated a divisibility rule by observing the last digit of our given numbers. Now, let us try to observe the sum of the digits of each number.

Grouped by	Number of Students that can be equally divided	Sum of Digits	Number of Students that have an excess.	Sum of Digits
3	33	3+3 = 6	32	3+2 = 5
	27	2+7 = 9		
	30	3+0 = 3		
	18	1+8 = 9		
9	27	2+7=9	33	3+3 = 6
	18	1+8=9	30	3+0 = 3
			32	3+2 = 5

By observing the sum of the digits of the numbers that can be divided by 3 and 9, we can generate the following divisibility rules:

a. Divisibility Rule for 3

A number is divisible by 3 if the sum of its digits is divisible by 3 or a multiple of 3.

From this rule, to determine if a number is divisible by 3:

First, take the sum of the digits of the given number.

Then, observe if the sum of the digits is a multiple of 3 or not.

divisible by 3 and 9 and not (for the purpose of observation). Excess students will have the role of observers. (the values in the explicitation are examples only). For an alternative activity, the teacher may refer to this video: https://www.youtube.com/watch?v=kOIwjTRL90Y

In this part of the lesson, the teacher can ask the students about their observations through guided questions.

In presenting each divisibility rule, the teacher can ask the students to provide any number that fits the rule.

From our game, the sum of the digits of 27 is 9. Since 9 is a multiple of 3 or can be divided by 3, then 27 is also divisible by 3. On the other hand, the sum of the digits of 32 is equal to 5 which is not divisible by 3. Therefore, 32 is not divisible by 3.

Examples:

Determine if the following numbers are divisible by 3.

1. 516
2. 913
3. 1,206

Answer:
1. 516
   First, take the sum of its digits.
   5 + 1 + 6 = 12
   Now, since 12 is a multiple of 3, then 516 is divisible by 3.

2. 823
   First, take the sum of its digits.
   8 + 2 + 3 = 13
   Now, since 13 is not a multiple of 3, then 823 is NOT divisible by 3.

3. 1,530
   First, take the sum of its digits.
   1 + 5 + 3 + 0 = 9
   Now, since 9 is a multiple of 3, then 1,530 is divisible by 3.

From the examples, since 516 and 1,530 are both divisible by 3, then we can say that 3 is one of their **common factors.**

b. Divisibility Rules for 9

A number is divisible by 9 if the sum of its digits is divisible by 9 or a multiple of 9.

	From this rule, to determine if a number is divisible by 9: **First,** take the sum of the digits of the given number. **Then,** observe if the sum of the digits is a multiple of 9 or not. From our game, the sum of the digits of 18 is 9. Since 9 is a multiple of 9 or can be divided by 9, then 18 is also divisible by 9. On the other hand, the sum of the digits of 33 is equal to 6 which is not divisible by 9. Hence, 33 is not divisible by 3. Examples: Determine if the following numbers are divisible by 9. 1. 516 3. 1,530 2. 823 Answer: 1. 516 First, take the sum of its digits. 5 + 1 + 6 = 12 Now, since 12 is not a multiple of 9, then 516 is NOT divisible by 9. 2. 823 First, take the sum of its digits. 8 + 2 + 3 = 13 Now, since 13 is not a multiple of 9, then 823 is NOT divisible by 9. 3. 1,530 First, take the sum of its digits. 1 + 5 + 3 + 0 = 9 Now, since 9 is a multiple of 9, then 1,530 is divisible by 9. Let us take 516 and 1,530 from our examples. As we can observe, these two numbers are both divisible by 3 but only 1,530 is divisible by 9. This gives us the idea that all numbers that are divisible by 9 are also divisible by 3 but not all numbers that are divisible by 3 are divisible by 9. **2. Worked Example**	The same examples will be used for the two rules. The teacher will use the examples for students to observe to arrive at a generalization.

	Determine whether the following numbers are divisible by 3 or 9 using their divisibility rules. More than one rule may apply. 1. 162 **Solution:** sum of the digits: 1+ 6+ 2 = 9, since 9 is a multiple of 3 and 9, then, 162 is divisible by 3 and 9 2. 354 **Solution:** sum of the digits: 3 + 5+ 4 = 12, since 12 is a multiple of 3 but not 9, then, 354 is divisible by 3 only 3. 1,107 **Solution:** sum of the digits: 1 + 1 +0 + 7 = 9, since 9 is a multiple of 3 and 9, then, 1,107 is divisible by 3 and 9 4. 2,235 **Solution:** sum of the digits: 2 + 2 + 3+ 5 = 12, , since 12 is a multiple of 3 but not 9, then, 2,235 is divisible by 3 only 5. 5,544 **Solution:** sum of the digits: 5+ 5 + 4 + 4 = 18, since 18 is a multiple of 3 and 9, then, 5,544 is divisible by 3 and 9	In this part of the lesson, the teacher may conduct this as a group activity or individually through flashcards. The teacher may add other items. *Key Answer:* 1. 3 and 9 2. 3 only 3. 3 and 9 4. 3 only 5. 3 and 9
	3. Lesson Activity **A.** Put a number on the line to make the given number divisible by the numbers inside the parenthesis. 1. 84__ (3 only) 2. 68__ (3 and 9) 3. 2,40__ (3 and 9) 4. 1,42__ (3 only) 5. 6,55__ (3 and 9) **B.** Identify the common factors of the given numbers using the divisibility rules for 3 and 9. 1. 123 and 969 2. 354 and 252 4. 3,126 and 2,508 5. 6,372 and 4,122	This lesson activity is suggested to be conducted on the 3rd day. It can be answered individually or in pairs.

<table>
<tr>
<td></td>
<td>3. 810 and 306

Refer to Activity Sheet 2
Key answer:
(the students may put any of the following numbers for each item)
1. 0, 3, 6, 9
2. 1,4,7
3. 3
4. 2, 5, 8
5. 2

Key Answer:
1. 3
2. 3
3. 3 and 9
4. 3
5. 3 and 9</td>
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<td>B. Making Generalizations</td>
<td>DAY 4
1. Learners' Takeaways
From the discussion for this week,
<table>
<tr><td colspan="5">When can we say that a number is divisible by ____?</td></tr>
<tr><td>2?</td><td>5?</td><td>10?</td><td>3?</td><td>9?</td></tr>
</table>
2. Reflection on Learning
a. In this lesson, we are taught to apply and observe some divisibility rules, do you think knowing and following these rules are important as a mathematics student? In real life, is it important to follow and observe rules (ex. School rules)?</td>
<td>In this part of the lesson, the teacher will guide the students in generalizing what they have learned by answering the given guide questions. The teacher can have it through oral recitation or a worksheet.

In this part of the lesson, the teacher will help the students realize the importance of the lesson as a math student and the application of the skills learned in the lesson in real life.</td>
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IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION	**NOTES TO TEACHERS**

A. Evaluating Learning

DAY 4

1. Formative Assessment

Activity 3

A. Complete the chart below. Write **D** in the appropriate space if the given number is divisible by the number in the top row. Write **N** if not. (1 point per correct answer)

	Numbers	**2**	**3**	**5**	**9**	**10**
Example	**456**	D	D	N	N	N
1.	**548**					
2.	**255**					
3.	**1,890**					
4.	**3,715**					
5.	**6,846**					

B. Identify the common factors of the given numbers using the divisibility rules for 3 and 9. ENCIRCLE all the numbers that apply on each row that corresponds to each item. (2 points per correct answer).

	Numbers	2	3	5	9	10	Common Factors
Ex.	78 and 162	2	3	5	9	10	2 and 3
1.	415 and 515	2	3	5	9	10	
2.	846 and 108	2	3	5	9	10	

3.	3,420 and 570	2	3	5	9	10	
4.	885 and 3,255	2	3	5	9	10	
5.	10,530 and 4,860	2	3	5	9	10	

2. Homework (Optional)

B. Teacher's Remarks	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**	Teachers are encouraged to record relevant observations or any critical teaching events that influence the attainment of the lesson objectives. Use or modify the provided template in recording the notable instructional areas or concerns. In addition, notes here can also be on tasks that will be continued the next day or additional activities needed.
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			
C. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *principles behind the teaching* *What principles and beliefs informed my lesson?* *Why did I teach the lesson the way I did?* ▪ *students* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *ways forward* *What could I have done differently?* *What can I explore in the next lesson?*			Entries on this section are the teacher's reflections about the implementation of the whole lesson, which will serve as inputs for the LAC sessions. Use or modify the provided guide questions in eliciting teacher's insights.