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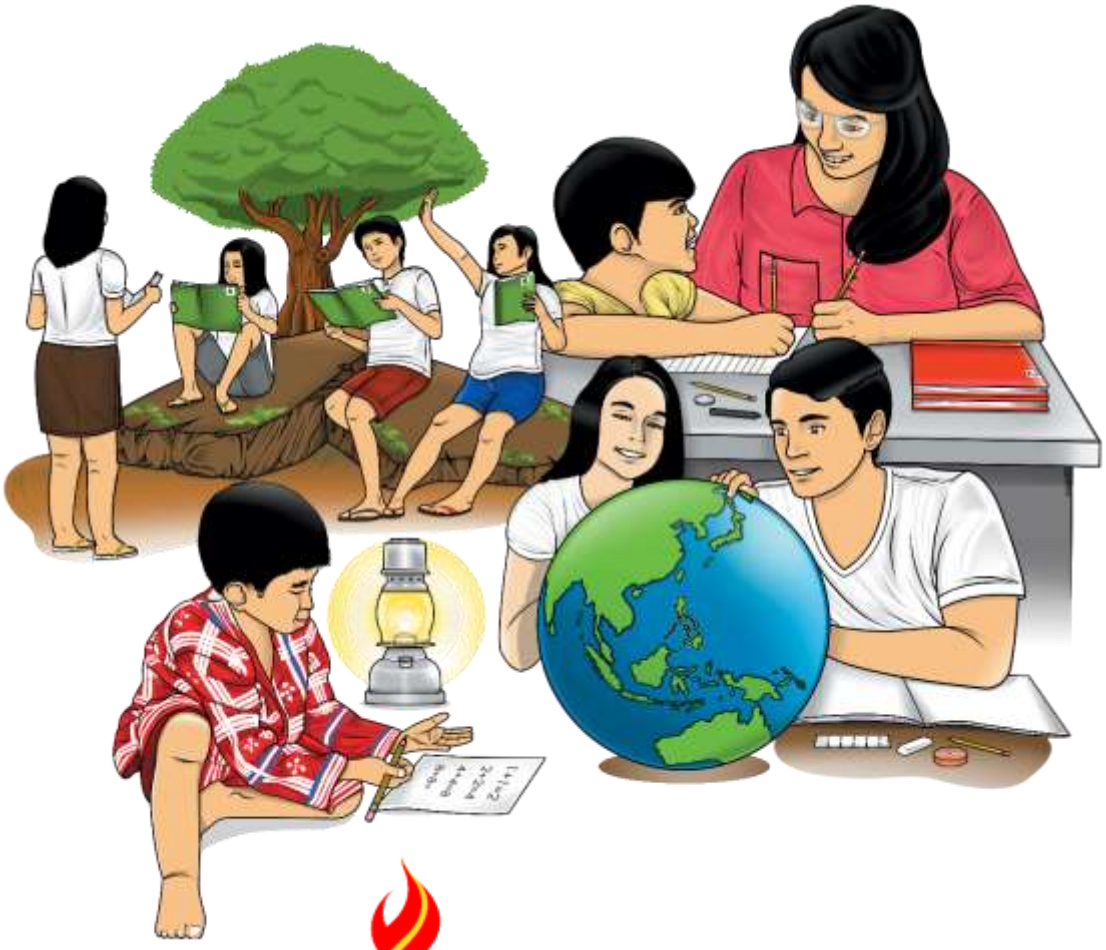
DepED
DEPARTMENT OF EDUCATION

Mathematics

Quarter 1 – Module 2: Divisibility Rules for 3, 6, and 9



ALTERNATIVE DELIVERY MODE
ADM

What I Need to Know

This module was designed to help you understand the divisibility rules for 3, 6 and 9 to find common factors of numbers. The activities and exercises are arranged to follow the standard sequence of a lesson.

After going through this module, you are expected to:

1. identify numbers that are divisible by 3, 6 and 9;
2. use divisibility rules for 3, 6 and 9 to find common factors of numbers; and
3. appreciate the use of divisibility rules to find common factors of numbers.

What I Know

Try to solve the test below. Find out if you still can recall previous lessons.

Directions: Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1) Which of the following is NOT divisible by 3?
   A. 24 B. 42 C. 47 D. 78

2) One of the following numbers is divisible by 6. Which one is it?
   A. 72 B. 52 C. 37 D. 16

3) Which of the numbers below is divisible by 9?
   A.347 B. 346 C. 215 D. 153

4) 3 is a factor of ____.
   A. 136 B. 453 C. 541 D. 623

5) 6 is a factor of ____.
   A. 153 B. 244 C. 324 D. 531

6) Which of the following can be divided by both 3 and 6?
   A. 163 B. 516 C. 602 D. 700

7) ____ is a factor of 93.
   A. 3 B. 6 C. 9 D. both 3 and 6

8) Which of the following is both divisible by 3 and 9?
A. 75 B. 95 C. 135 D. 145

9) All the following are divisible by both 6 and 9 EXCEPT ____
A. 36 B. 216 C. 342 D. 536

10) The common factors of 18, 27, and 54 are _____
A. 3 and 6 B. 1, 3, and 9 C. 6 and 9 D. 3, 6, and 9

Lesson 2 Divisibility Rules for 3, 6, and 9 to Find Common Factors

As you have learned in the previous lesson, divisibility rules can help us determine whether a number can be divided by another number without any remainder. The divisibility rules for 3, 6, and 9 are grouped together because they all require computing the sum of the digits of a given number.

We can also use these rules to find more common factors of numbers.

What's In

Directions: Determine whether the first number is divisible by the second number. Write **Yes** if it is divisible, and **No** if it is not. Examples are given below. You may answer this in your activity notebook.

Examples:	12; 6	12 ÷ 6 = 2	Yes
	12; 5	12 ÷ 5 = 2.4	No

1. 41; 2 _____
2. 550; 5 _____
3. 1256; 10 _____
4. 8910; 10 _____
5. 348; 2 _____

What's New

Divisibility Rules for 3, 6, and 9

A number is divisible by another number if there is no remainder.

Study the table below. Find out why the given numbers are divisible by 3, 6 or 9.

Numbers Divisible by		
3	**6**	**9**
2133	5244	702
78	81120	3654
112311	774	25803

Knowing the divisibility rules for 3, 6 and 9 will help you find the factors of a number just by examining the sum of all its digits.

What is It

How do we know if a number is divisible by 3, 6 or 9?

Here is how:

❒ **Divisibility Rule for 3**

A number is divisible by 3 if the sum of all its digits is divisible by 3.

Example 1: 540 is divisible by 3 because 5 + 4 + 0 = 9, and 9 is divisible by 3. To check, 540 divided by 3 is 180.

❒ **Divisibility Rule for 6**

A number is divisible by 6 if the number is divisible by both 2 and 3.

Example 2: 822 is an even number, hence it is divisible by 2. Likewise, 822 is divisible by 3 because 8 + 2 + 2 = 12, and 12 is divisible by 3. Therefore, 822 is divisible by 6 since it is divisible by both 2 and 3.

❒ **Divisibility Rule for 9**

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

Example 3: 8253 is divisible by 9 because 8 + 2 + 5 + 3 = 18, and 18 is divisible or a multiple of 9.

Now, using the divisibility rules for 3, 6 and 9, let us find the common factors of 36 and 54.

STEP 1: Let us try if 36 and 54 are both divisible by 3, 6, and 9.

❒ **Divisible by 3**;

3 + 6 = 9 9 is a multiple of 3. Therefore, 36 is divisible by 3.

5 + 4 = 9 9 is a multiple of 3. Therefore, 54 is divisible by 3.

❒ **Divisible by 6**;

36 and 54 are even numbers. Therefore, 36 and 54 are both divisible by 2.

The sums of the digits of 36 and 54 are multiples of 3. So, both are divisible by 3. Therefore, 36 and 54 are both divisible by 6.

❒ **Divisible by 9**;

3 + 6 = 9 9 is a multiple of 9. Therefore, 36 is divisible by 9.

5 +4 = 9 9 is a multiple of 9. Therefore, 54 is divisible by 9.

STEP 2: Get the factors of 36 and 54.

To get the factors of 36, divide 36 by 3, 6, and 9. The divisor, quotient, 1, and the number itself are the factors.

36 ÷ 3 = 12

36 ÷ 6 = 6

36 ÷ 9 = 4

So, the factors of 36 are **1, 3, 4, 6, 9, 12, and 36**.

To get the factors of 54, divide 54 by 3, 6, and 9. The divisor, quotient, 1, and the number itself are the factors.

54 ÷ 3 = 18

54 ÷ 6 = 9

54 ÷ 9 = 6

So, the factors of 36 are **1, 3, 6, 9, 18, and 54**.

Therefore, we have:

Factors of 36: 1 3 4 6 9 12 36

Factors of 54: 1 3 6 9 18 54

The common Factors of 36 and 54 are **1, 3, 6, and 9.**

What's More

Get moving! Try to solve below.

Identify mentally whether or not each larger number is divisible by the smaller number. Write "Yes" if the number is divisible, and "No" if it is not. Write your answer on a separate sheet of paper.

1. Is 213 divisible by 3?
2. Is 519 divisible by 6?
3. Is 137 divisible by 3?
4. Is 504 divisible by 6?
5. Is 369 divisible by 3?
6. Is 918 divisible by 9?
7. Is 718 divisible by 6?
8. Is 849 divisible by 9?
9. Is 354 divisible by 6?
10. Is 9864 divisible by 9?

What I Have Learned

In finding the common factors of numbers divisible by 3, 6, and 9, we can use the following divisibility rules: Let us check.

a. A number is divisible by 3 if the sum of all the digits is divisible by ___.
b. A number is divisible by ___if the number is divisible by both 2 and 3.
c. A number is divisible by 9 if the _____ of all the digits is divisible or a multiple of 9.
d. The sums of 1+ 5+ 3 = ?, by what numbers is it divisible with? _____
e. What smallest 3-digit number is divisible by both 3 and 6? _____

What I Can Do

Directions: Use the divisibility rules for 3, 6, and 9 to help you solve the following problem.

1. Are all numbers divisible by 9 also divisible by 3?
2. The number of colored pencils in Ana's pencil case is divisible by 3, 6, and 9. She has more than 10 but less than 25. How many-colored pencils does Ana have?

Write your answer in the journal notebook.

Q1. When is a number divisible by 3, 6, and 9?

Assessment

Confident enough to take the test? If not, you may review first before answering the test.

Directions: Choose the letter of the correct answer. Write your answer on a separate sheet of paper.

1. Which of the following numbers is divisible by 3?
   A. 124 B. 342 C. 347 D. 671
2. Which of the numbers below is divisible by both 3 and 6?
   A. 28 B. 48 C. 67 D. 93
3. What is the common factor of 12 and 9?
   A. 3 B. 6 C. 9 D. 12
4. Which set is the common factor of 99 and 135?
   A. 3 and 6 B. 3 and 9 C. 6 and 9 D. 6 and 12
5. 3, 6, and 9 are factors of_____.
   A. 33 B. 42 C. 54 d. 64
6. One of the following is NOT divisible by 9. Which one is it?
   A. 342 B. 315 C. 264 D. 711
7. _____ is a common factor of 81 and 96.
   A. 3 B. 6 C. 8 D. 9

8. All the following are factors of 108 EXCEPT ____
   A. 3 B. 6 C. 8 D. 9
9. Both 3 and 6 are common factors of ____
   A. 486 and 267 B. 267 and 312
   C. 486 and 312 D. 267 and 311
10. Which of the following is NOT divisible by 3, 6, and 9?
   A. 711 B. 612 C. 810 D. 900

Additional Activities

More practice!

Directions: Identify the whole numbers between 1 and 100 that are divisible by 3, 6, and 9. Write your answers on the lines in the rows/boxes for 3, 6 and 9. Based on your answers above, how many whole numbers between 1 and 100 are divisible by 3, 6 and 9? Answer this in your activity notebook.

Divisible by 3:	____, ____ , ____, ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____, ____ How many are divisible by 3: _____
Divisible by 6:	____, ____ , ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____ How many are divisible by 6: _____
Divisible by 9:	____, ____ , ____, ____, ____, ____, ____, ____ , ____, ____, ____, ____ How many are divisible by 9: _____

Based on your answers above, how many whole numbers between 1 and 100 are divisible by 3, 6 and 9?

Answer Key

What I Know

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

What's In

1. 41;2 No
2. 550; 5 Yes
3. 1256; 10 No
4. 8910; 10 Yes
5. 348; 2 Yes

What's More

1. Yes
2. No
3. No
4. Yes
5. Yes
6. Yes
7. No
8. No
9. Yes
10. Yes

What I Can Do

1. No
2. 18 colored pencils

What I have learned

a. Three (3)
b. Six (6)
c. Sum
d. 3 and 9
e. 132

Assessment

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

Additional Activities

1. Divisible by:
   3 = 33
   6 = 16
   9 = 11