SKILL : NUMBER AND NUMBER SENSE

KEEP IN MIND!

A. DIVISIBILITY

When is a number divisible by another number?

- A number is divisible by another number if it **CAN** be **DIVIDED EXACTLY** by a particular number.

Divisibility Rules

Divisibility by:	Rule
2	A number is divisible by 2 if its ones digit is 0, 2, 4, 6, or 8.
3	A number is divisible by 3 if the sum of its digits is divisible by 3.
4	A number is divisible by 4 if the number formed by its last two digits is divisible by 4 or both zeros.
5	A number is divisible by 5 if its ones digit is 0 or 5.
6	A number is divisible by 6 if it is divisible by 2 and 3.
7	A number is divisible by 7 if the difference between twice its units digit and the number formed by the remaining digits is divisible by 7.
8	A number is divisible by 8 if the number formed by its last three digits is divisible by 8.
9	A number is divisible by 9 if the sum of the digits is divisble by 9.
10	A number is divisible by 10 if its ones digit is 0.
11	A number is divisible by 11 if the last digit subtracted from the remining digits give a difference which is divisible by 11.
12	A number is divisible by 12 if it is divisible by both 3 and 4.

You Can Do This!

Tell if each number is divisible by 2, 3, 4, 5, 6, 8, 9, 10 or 12. List all possibilities.

1. 465 _____
2. 1 023 _____
3. 1 854 _____
4. 67 990 _____
5. 4 000 000 _____
6. 119 322 _____
7. 86 _____
8. 234 _____
9. 16 302 _____
10. 718 466 _____

Carry On !

What is the missing digit in:

1. 4 23___ to make it divisible by 5.
2. 1 25___ to make divisble by 3.
3. 67 99___to make it divisible by 2,5,10.
4. 2__7 to make it divisible by both 3 and 9.
5. 2 44__ to make it divisible by 11.

Take a Leap !

1. The number 25*a* where *a* is a digit is divisible by 6. What is the largest possible value of *a*?
2. I am a number that is less than 50. When I am divided by 5, I have a remainder of 3. When I am divided by 7, my remainder is 6. What number am I ?
3. What is the greatest 6-digit number that is divisible by all numbers from 2 to 12?
4. Chona Baked 10 to 20 ensaymadas. If she wraps up them up in fours, she would have 2 left over. If she wraps them up in fives, she would be short by 1. How many ensaymadas did Chona bake?
5. The number 25ab where a and b are digits is divisible by 6. What is the largest possible value of a + b?

B. PRIME AND COMPOSITE NUMBERS

PRIME NUMBER - a whole number greater than 1 **with only one pair of factors** (1 and itself).
COMPOSITE NUMBER - a whole number greater than 1 **with more than one pair of factors**.
FACTOR PAIR of a whole number – a pair of whole numbers whose product is the given number.
1 is a special number. It is neither prime nor composite number because it has only one factor,**itself**.
2 is the only even prime number because it has 2 factors only.
0 is not prime nor composite number since it is less than 1.

You Can Do This!

Write **P** for prime and **C** for composite.

1. 67 ____
2. 88 ____
3. 547 ____
4. 2 772 ____
5. 73 ____
6. 65 ____
7. 113 ____
8. 121 ____
9. 1 063 ____
10. 101 ____

Carry On !

List all the elements of each given set.

1. Prime numbers less than 29
2. Composite numbers between 50 and 100 that are divisible by 9
3. Even composite numbers 40 and 60
4. Prime numbers less than 109 but greater than 97
5. Odd composite numbers less than or equal to 33

Take a Leap !

1. Express 30 as the product of three prime numbers.
2. Which has more prime numbers, the numbers between 10 or 20 or between 110 and 120?
3. Find the least value for n such that $n^2 + n + 17$ is a composite.
4. Two-digit prime numbers less than 50, whose digits give an even number sum.
5. Prime numbers less than 100 with a 9 in the ones place.

C. PRIME FACTORIZATION

PRIME FACTORIZATION – is the process of finding the prime factors of a number.

WAYS TO FIND THE PRIME FACTORS

1. **FACTOR TREE Method**

2. **CONTINOUS DIVISION or UPSIDE-DOWN DIVISION**

- The prime factorization of a composite number is an expression showing the number as a product of its prime factors.
- You can find the prime factorization of a composite number by making a factor tree or by continous division.
- You may use exponents to write the prime factoriztion of a number.

You Can Do This!

Find the prime factorization of each number.Using any method.

1. 24
2. 48
3. 245
4. 32
5. 720
6. 642
7. 453
8. 28
9. 54
10. 63

Carry On !

Give the prime factorization of each number, using whichever method you prefer. Express your answer in exponential form,whenever possible.

1. 45
2. 148
3. 114
4. 32
5. 81

Take a Leap !

1. Express 3960 as a product of its prime factors..
2. Express 270 as a product of its prime factors in exponential form.
3. What is the greatest prime factor of 348?
4. Michelle is watching a reality show on TV, where 187 participants will be divided into several groups. The possible groupings are the prime factors of the number of participants. Give all possible groupings.
5. Express 13,860 as a product of prime factors using exponents.

D. GREATEST COMMON FACTOR and LEAST COMMON MULTIPLE

GREATEST COMMON FACTOR – the largest whole number that is a factor of each of two or more whole numbers.

1. Listing Method

18 ➡ **1** , **2** , **3** , **6** , 9 , 18
24 ➡ **1** , **2** , **3** , 4 , **6** , 8 , 12, 24
GCF (18, 24) = 6

2. Prime Factorization

18 ➡ **2** x **3** x **3**
24 ➡ **2** **x** **2** **x** **2** **x** **3**
GCF (18, 24) = 2 X 3 = 6

3. Euclidean Method

- When solving for the GCF of two or more numbers, you may use the listing method or the prime factorization method.
- You may use the Euclidean Method to find the GCF of two numbers.

LEAST COMMON FACTOR – the smallest nonzero whole number that is a multiple of each of two or more whole numbers

1. Listing Method

4 ➡ 4 , 8 , **12**
6 ➡ 6, **12**
LCM (4, 6)= 12

2. Prime Factorization

6 ➡ **2** x **3**
8 ➡ **2** **x** **2** **x** **2**
2 **x** **2** **x** **2** **x** **3** **= 24**

LCM (6,8) = 24

You Can Do This!

Find the GCF of each set of numbers using any method.

1. 12 and 48
2. 25 and 40
3. 27, 30, and 48
4. 18 and 42
5. 56 and 72

Find the LCM of each set of numbers using any method.

1. 6 and 14
2. 9 and 12
3. 14, 28, and 42
4. 120 and 125
5. 15 and 18

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Carry On !

Complete the table.

	LCM	GCF of the two LCM
1. 14 , 21, 30		
2. 16, 20, 30		

	GCF	LCM of the three GCF
3. 18 , 16, 20		
4. 12, 15, 21		
5. 24, 28, 32		

Take a Leap !

1. Which pair has a greater GCF, 18 and 54, or 15 and 40?
2. What two numbers less than 40 have a GCF of 18?
3. What is the product of the GCF of 12 and 22 and the GCF of 16 and 24?
4. In the office, Mr. Rodriguez gets coffee from the coffeemaker every 2 hours, while Mr. Torres gets coffee every 3 hours. If both men get coffee at 8:00 a.m, when will they get coffee at the same time again?
5. During the anniversary celebration of a grocery, every 12^{th} customer who enters the store wins a pen, while every 15^{th} customer wins a box of cookies. If the shoppers are numbered from 1^{st} onwards, which is the first customer that will win both a pen and a box of cookies?