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P.5 MATHEMATICS CLASS WORK WEEK 3

LESSON ONE
TOPIC / UNIT 4: PATTERNS AND SEQUENCES:
SUBTOPIC: NUMBER SYSTEMS.

a) Natural numbers.
Natural numbers are also called counting numbers. These numbers are, 1, 2 , 3, 4, 5, 6, 7, 8 …..
Natural number numbers begin with 1

b) Whole numbers.
Whole numbers are the numbers which are not fractions in nature. The first whole number is 0.
They include; 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 ……….

c) Even numbers.
These are numbers which you divide by two and get no remainder. They are exactly divided by 2.
The first even number is 0. The sequence for even numbers is by adding 2. They include;
0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 ……….

d) Odd numbers.
Odd numbers are the numbers which you divide by two and get a remainder as one. The first odd
number is 1 and the sequence for odd numbers is by adding two. These numbers include;
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23 ………..

Activity.
1. Find the sum of the first four counting numbers
2. List all the even numbers less than ten
3. How many odd numbers are between 11 and 19?
4. Find the product of the 3rd and 5th whole number.
5. What is the difference of the 8th and the 2nd odd number?

LESSON TWO
TOPIC / UNIT 4: PATTERNS AND SEQUENCES:
SUBTOPIC: NUMBER SYSTEMS.

e) Prime numbers.
A prime number is a number which has only two factors. i.e., one and itself.
These numbers include; 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31 ….

How to get prime numbers from 1 to 100.

i) Cross out 1.
ii) Leave 2 and cross out all multiples of 2.
iii) Leave 3 and cross out all multiples of 3.
iv) Leave 5 and cross out all multiples of 5.
v) Leave 7 and cross out all the multiples of 7.

All the numbers that remain uncrossed are prime numbers.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

f) Composite numbers.
These are numbers which have more than two factors.
Note: All prime numbers, 0 and 1 are the only numbers which are not composite. These numbers include;

4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28 ……

Activity.
1. Find the sum of the first four prime numbers
2. List all the composite numbers less than ten
3. How many prime numbers are between 11 and 19?
4. Find the product of the 3rd and 5th composite number.
5. What is the difference of the 8th and the 2nd prime number?

LESSON THREE
TOPIC / UNIT 4: PATTERNS AND SEQUENCES:
SUBTOPIC: NUMBER SYSTEMS.

g) Square numbers.
Square numbers are the numbers we get after multiplying a number by itself.
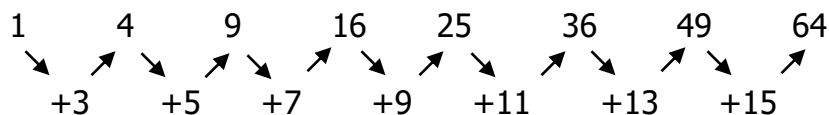$$1 = 1^2 = 1 \times 1 = 1$$
$$2 = 2^2 = 2 \times 2 = 4$$
$$3 = 3^2 = 3 \times 3 = 9$$

Note: Negative numbers as well as the unknown, have squares. E.g
$$-2 = -2^2 = -2 \times -2 = 4$$
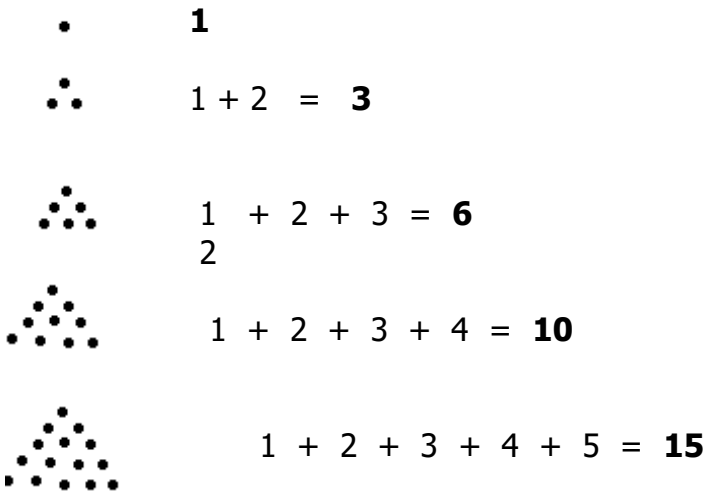$$-6 = -6^2 = -6 \times -6 = 36$$

The sequence for square numbers is by adding odd numbers from 3 in their order.

1	4	9	16	25	36	49	64

+3   +5   +7   +9   +11   +13   +15

h) Triangular numbers.

These are numbers obtained by adding consecutive counting numbers. These numbers can be represented as a pattern.

$\bullet$ **1**

$\therefore$ $1 + 2 \;\; = \;\; \mathbf{3}$

   $1 + 2 + 3 = \mathbf{6}$

$1 + 2 + 3 + 4 = \mathbf{10}$

$1 + 2 + 3 + 4 + 5 = \mathbf{15}$

The list of these numbers is; 1, 3, 6, 10, 15, 21, 28, 36, 45, ...

i) Cube numbers

These are numbers which are obtained by multiplying the same number three times.

$1^3 = 1 \times 1 \times 1 = \mathbf{1}$
$2^3 = 2 \times 2 \times 2 = \mathbf{8}$
$3^3 = 3 \times 3 \times 3 = \mathbf{27}$
$4^3 = 4 \times 4 \times 4 = \mathbf{64}$
$5^3 = 5 \times 5 \times 5 = \mathbf{125}$
$6^3 = 6 \times 6 \times 6 = \mathbf{216}$

j) Rational numbers.

These are numbers which can be expressed in form of numerators and denominators. These numbers are simply the fractions. Examples of rational numbers are;

$\frac{1}{2}, \;\; \frac{3}{4}, \;\; \frac{1}{4}, \;\; \ldots\ldots\ldots$

Activity
1. What is the difference of the 3rd and the 5th square numbers?
2. Work out the sum of the first five triangular numbers
3. Find the 4th cube number.
4. Find the product of the 3rd and 2nd cube numbers.
5. What is the 6th triangular number?

LESSON FOUR
## TOPIC / UNIT 4: PATTERNS AND SEQUENCES:
SUBTOPIC: PRIME FACTORISATION OF NUMBERS.
1. When prime factorising a given number, only prime numbers are used as factors.
2. The prime numbers include; 2, 3, 5, 7, 11, 13, 17, …
3. The prime number chosen must divide the number exactly without giving a remainder.
4. There are two main ways of carrying out prime factorisation of numbers. These are:
    a) Prime factorising using a factor tree.
    b) Prime factorising using a ladder.
5. The answer is presented in two different ways;
    a) Multiplication form,
    b) Set notation (Subscript form)
6. In set notation form we write subscripts (small numbers) below prime factors when listing them.
7. Prime factorisation can be used to find the; LCM and Square roots of numbers.
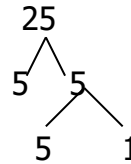
PRIME FACTORISING USING A FACTOR TREE

Example I   **Example II**

Prime Factorise 12.   Prime factorise 25.
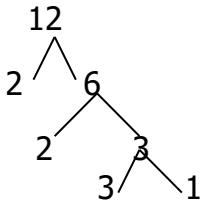
In multiplication form: **$PF_{12} = \{2 \times 2 \times 3\}$**   In multiplication form: **$PF_{25} = \{5 \times 5\}$**

In set notation form: **$PF_{12} = \{2_1, 2_2, 3_1\}$**   In subscript form: **$PF_{25} = \{5_1, 5_2\}$**

ACTIVITY
Prime factorise the following numbers using factor tree method and answer as instructed in the brackets.
1. 4 (set notation)   4. 50 (multiplication)
2. 10 (multiplication)   5. 14 (subscript)
3. 72 (subscript)   6. 56 (multiplication)

LESSON FIVE

TOPIC / UNIT 4: PATTERNS AND SEQUENCES:
SUBTOPIC: PRIME FACTORISATION USING A LADDER

Example I

Prime factorise 216

PF	NO.
2	216
2	108
2	54
3	27
3	9
3	3
	1

Example II

Prime factorise 6 using a ladder

PF	NO.
2	6
3	3
	1

In multiplication form 6 = 2 x 3

In subscript form 6 = {2_1, 3_1}

In multiplication form:

216 = 2 x 2 x 2 x 3 x 3 x 3

In subscript form 216 = {2_1, 2_2, 2_3, 3_1, 3_2, 3_3}

EXERCISE

Use a ladder to prime factorise and present your answer as instructed in the brackets.
1. 60 (Subscript)
2. 64 (multiplication)
3. 80 (subscript)
4. 128 (multiplication)
5. 58 (subscript)
6. 180 (multiplication)