

# ST. AGNES JUNIOR SCHOOL

## P.6 Mathematics

### TOPIC / UNIT 4: PATTERNS AND SEQUENCES:

#### Lesson one

**Subtopic:** Consecutive numbers / natural numbers / integers

**Content:** Find the consecutive counting numbers

**Example:** The sum of 3 consecutive whole numbers is 36. What are these numbers  
Let the 1<sup>st</sup> number be n.

$$2^{\text{nd}} \text{ number} = n + 1$$

$$3^{\text{rd}} \text{ number} = n + 2$$

$$\text{But: } n + (n + 1) + (n + 2) = 36$$

$$n + n + 1 + n + 2 = 36$$

$$n + n + n + 1 + 2 = 36$$

$$3n + 3 = 36$$

$$3n + 3 - 3 = 36 - 3$$

$$\underline{3n} = \underline{33}$$

$$3 = 3$$

$$\underline{\therefore n = 11}$$

$$\begin{array}{l|l|l} 1^{\text{st}} \text{ number} = n & 2^{\text{nd}} \text{ number} (n + 1) & 3^{\text{rd}} \text{ number is } (n + 2) \\ \text{and } n = 11 & = 11 + 1 & = 11 + 2 \\ & = 12 & = 13 \end{array}$$

#### Activity

Find the consecutive counting numbers whose sum is;

a) 27

b) 33

c) 45

d) 54

e) 69

f) 93

#### Lesson two

**Subtopic:** Consecutive numbers

**Content:** Find the consecutive EVEN numbers

**Note:** Even numbers increase in intervals of 2

**Example:** The sum of three consecutive Even numbers is 24. List down the 3 numbers

Let the 1<sup>st</sup> number by (x)

2<sup>nd</sup> number is (x + 2)

3<sup>rd</sup> number is (x + 4)

$$x + (x + 2) + (x + 4) = 24$$

$$x + x + 2 + x + 4 = 24$$

$$x + x + x + 2 + 4 = 24$$

$$3x + 6 = 24$$

$$3x + 6 - 6 = 24 - 6$$

$$\underline{3x} = \underline{18}$$

$$3 = 3$$

$$\underline{\mathbf{X}} = \underline{\mathbf{6}}$$

These EVEN Numbers are:

1 <sup>st</sup> is n,	2 <sup>nd</sup>	3 <sup>rd</sup>
= 6	X + 2	x + 4
	= 6 + 2	= 6 + 4
	= 8	= 10

### Activity

List down the consecutive even whose sum;

- a) 36
- b) 48
- c) 54
- d) 72
- e) 84
- f) 96

### Lesson three

**Subtopic:** Consecutive numbers

**Content:** Find the consecutive ODD numbers

**Note:** Odd numbers also increase in intervals of 2

**Example:** The sum of three consecutive Odd numbers is 39. List down the 3 numbers

Let the 1<sup>st</sup> number by (x)

2<sup>nd</sup> number is (x + 2)

3<sup>rd</sup> number is (x + 4)

$$\begin{aligned}x + (x + 2) + (x + 4) &= 39 \\x + x + 2 + x + 4 &= 39 \\x + x + x + 2 + 4 &= 39 \\3x + 6 &= 39 \\3x + 6 - 6 &= 39 - 6 \\ \underline{3x} &= \underline{33} \\ \underline{3} & \quad \underline{3} \\ \underline{\mathbf{X}} &= \underline{\mathbf{11}}\end{aligned}$$

These Odd Numbers are:

1 <sup>st</sup> is n,	2 <sup>nd</sup>	3 <sup>rd</sup>
= 11	X + 2	x + 4
	= 11 + 2	= 11 + 4
	= 13	= 15

### Activity

List down the consecutive even whose sum;

- a) 21
- b) 33
- c) 45
- d) 63
- e) 81
- f) 99

## Lesson four

**Subtopic:** Factors

**Content:**

- Listing factors
- The common factors (CF)
- The HCF / GCF
- The LCF

**NOTE:**

1. A factor is a number that divides another number completely. i.e. without leaving a remainder.
2. Factors are numbers multiplied to get multiples

**NB:** The smallest factor of every number is **1** while the biggest factor of every number is the number its self.

**Examples:** (i) How many factors do 18 have?

$$F_{18} = \{1, 2, 3, 6, 9, 18\}$$

$\therefore$  18 has 6 factors

(ii) Work out the sum of all the  $F_{20}$

$$F_{20} = \{1, 2, 4, 5, 10, 20\}$$

$$\begin{aligned} \text{Sum} &= 1 + 2 + 4 + 5 + 10 + 20 \\ &= 42 \end{aligned}$$

(iii) Work out the GCF of 12 and 18

$$F_{12} = \{1, 2, 3, 4, 6, 12\}$$

$$F_{18} = \{1, 2, 3, 6, 9, 18\}$$

$$CF = \{1, 2, 3, 6\}$$

$$GCF = 6$$

N.B The LCF is always 1

### Activity

1. List down all the factors of 24
2. How many factors do 14 have?
3. Find the GCF of the following numbers.
  - a) 10 and 20
  - b) 14 and 21
  - c) 12 and 24
  - d) 8 and 16

## Lesson five

**Subtopic:** Prime factorisation

**Content:** - Using (a) Multiplication  
(b) Subscript method  
(c) Powers/ exponents  
- Find number prime factorised.

**NOTE:**

1. Prime factorising is dividing a given number completely using only prime factors
2. Prime factor are the numbers with only two factor i.e 1 and the number its self.

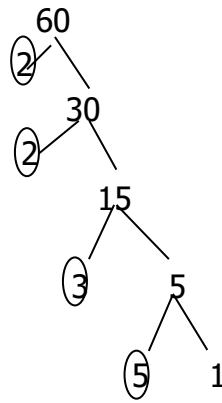
**Prime factors include:** {2, 3, 5, 7, 11, 13, 17, 19, 23, 29 ...}

**Examples:** (i) Find the prime factors of 60.

(a) **By ladder**

$$\begin{array}{r|l} 2 & 60 \\ 2 & 30 \\ 3 & 15 \\ 5 & 5 \\ \hline & 1 \end{array}$$

(b) **by factors tree**



Pf 60 are (a)  $2 \times 2 \times 3 \times 5$  in multiplication form

(b)  $\{2_1, 2_2, 3_1, 5_1\}$  in set notation or subscript form

(c)  $2^2 \times 3^1 \times 5^1$  in multiplication or power form

**NB.** Subscripts are like position i.e 1<sup>st</sup> **2**, 2<sup>nd</sup> **2**, 1<sup>st</sup> **3** and 1<sup>st</sup> **5**

### Activity

Prime factorise the following numbers and express your answers as instructed in the brackets

- a) 12 (in multiplication form)
- b) 18 (in multiplication form)
- c) 24 (in subscript form)
- d) 30 (in set notation)
- e) 40 (in power form)
- f) 64 (in power form)