LESSON 3 Look for Pattern – Number Sequence

GUIDED ACTIVITY Sum of Consecutive numbers

GUIDED ACTIVITY **To find Sum of Consecutive numbers**

1. Consider the following diagram:

1st 2nd

How many black boxes are there in

a) the first row : ( )
the second row : ( )

b) Total number of black boxes = ( ) + ( )

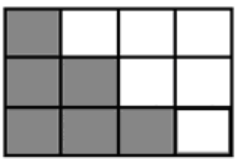
c) How many black boxes are there altogether?
(Note that exactly half of the squares are black)

Total number of black squares = ½ x ( ) x ( )

d) In conclusion: 1 + 2 = ½ x ( ) x ( )

2. Consider the following diagram:

1st 2nd 3rd



How many black boxes are there in

a) the first row : ( )
the second row : ( )
the third row : ( )

b) Total number of black boxes = ( ) + ( ) + ( )

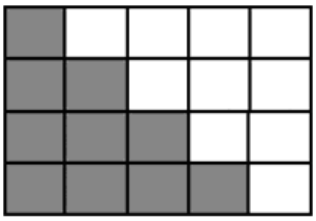
c) How many black boxes are there altogether?
(Note that exactly half of the squares are black)

Total number of black squares = ½ x ( ) x ( )

d) In conclusion: 1 + 2 + 3 = ½ x ( ) x ( )

3. Consider the following diagram:

1st 2nd 3rd 4th



How many black boxes are there in

a) the first row : ( )
the second row : ( )
the third row : ( )
the fourth row : ( )

b) Total number of black boxes
= ( ) + ( ) + ( ) + ( )

c) How many black boxes are there altogether?
(Note that exactly half of the squares are black)

Total number of black squares = ½ x ( ) x ( )

d) In conclusion:
1 + 2 + 3 + 4 = ½ x ( ) x ( )

4. Complete the following:

1 + 2	= ½ x ( ) x ( )
1 + 2 + 3	= ½ x ( ) x ( )
1 + 2 + 3 + 4	= ½ x ( ) x ( )
1 + 2 + 3 + 4 + 5	= ½ x ( ) x ( )
1 + 2 + 3 + 4 + 5 +.....100	= ½ x ( ) x ( )
1 + 2 + 3 + 4 + 5 +..... (last digit)	= ½ x ( ) x ( )

Important:

Sum of Consecutive number:
(starting with 1)

1 + 2 + 3 + ...(Last digit)

=

GUIDED EXAMPLE 1 **Sum of Consecutive numbers**

a) (Consecutive numbers starting with 1)

1 + 2 + 3 + 4 + 5 + …….400 =

b) (Even numbers)

2 + 4 + 6 + 8 + 10 + ……..400 =

c) (Odd numbers)

1 + 3 + 5 + 7 + ……..99 =

d) (Consecutive numbers not starting with 1)

80 + 81 + 82 + 83 + …….250 =

e) (Consecutive numbers of multiples)

i. 10 + 20 + 30 + 40 + ….. 1500

ii. 3 + 6 + 9 + 12 +…….. 450

GUIDED EXAMPLE 2 Sum of Consecutive numbers

Sequence Number	1	2	3	4
Number of dots	1	3	6	10

Find the number of dots in

a) 8^{th} diagram

b) 200^{th} diagram

GUIDED EXAMPLE 3

A series of the sums of odd numbers is shown below.

1	=	1	=	1x1
1+3	=	4	=	2x2
1+3+5	=	9	=	3x3
1+3+5+7	=	16	=	4x4
1+3+5+7+9	=	25	=	5x5

Find the sum of the odd numbers from 1 to 51 inclusive.

GUIDED EXAMPLE 4

A series of the sums of even numbers is shown below.

2	=	2	=	1x2
2+4	=	6	=	2 x3
2+4+6	=	12	=	3 x4
2+4+6+8	=	20	=	4x5
2+4+6+8+10	=	30	=	5x6

Find the sum of even numbers from 2 to 200 inclusive.

GUIDED EXAMPLE 5

The number of coins was observed to increase in a pattern as shown in the table below.
Look for pattern and answer the following:

Week	1	2	3	4
Number of coins	5	10	20	40

a) How many coins will there be in week 6?

b) How many coins will there be in week 9?

c) In which week will there be 320 coins?

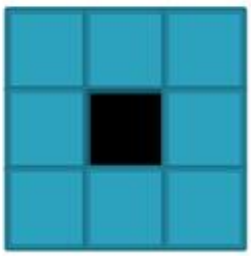
d) If the piggy bank is completed filled in week 15,
during which week is the piggy half filled with coins?

GUIDED EXAMPLE 6

1. Table 1 below consists of number 1 to 56. Alice and Lynn are given a plastic frame that covers exactly 9 squares of Table 1 with the centre square darken.

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

Table 1



frame

Alice puts the frame on 9 squares as shown below:

a) What is the average of the 8 numbers that can be seen on the frame?

b) Lynn puts the frame on some other 9 squares.
The sum of the 8 squares that can be seen in the frame is 272.
What is the largest number that can be seen in the frame?

BUILD YOUR UNDERSTANDING

1. Find the sum of the following:

a) 1 + 2 + 3 + 4 + 5 + …….150 =

b) 2 + 4 + 6 + 8 + …..+ 200

c) 1 + 3 + 5 + 7 +9 + …….99 =

d) 4 + 8 + 12 + 16 + 20 + …..+ 600

e) 50 + 51 + 52 + 53 + …….150 =

f) 1 + 2 + 3 + ……..98 + 99+ 99 + 98 + …….. + 2 + 1

g) 1 + 2 + 3 + ……..200 + 200+ 199 + 198 + …….. + 2 + 1

h) 1 + 2 + 3 + ……..98 + 99+ 98 + 97 + 96 …….. + 2 + 1

i) 1 + 2 + 3 + ……..200 + 199 + 198 + …….. + 2 + 1

2. How many different handshakes can be made in a party of;

a) 2 children?

b) 3 children?

c) 4 children?

d) 100 children?

e) Given that there a total of 1225 handshakes made in the party,
how many children are there in the party?
(Assume that each child shakes hands with every other child only once)

5.

Sequence Number	1	2	3	4
Number of dots	1	3	6	10

Find the number of dots in

a) 8^{th} diagram

b) 200^{th} diagram

6. Study the pattern below.

Row							
1				2	3	4	5
2	9	8	7	6			
3				10	11	12	13
4	17	16	15	14			
5				18	19	20	21
6	25	24	23	22			
7				26	27	28	29
8	33	32	31	30			
9				34	35	36	37
10	( )	( )	( )	( )			
……							
( )	57	56	55	54			
……				…….			
200	( )	( )	( )	( )			
……							
401				( )	( )	( )	( )

(a) Complete the pattern for Row 10 by filling up the four numbers in the above boxes.

(b) If the four numbers in a row are 57, 58, 59 and 60, what is the Row number?

(c) What are the four numbers in Row 200?

(d) What are the four numbers in Row 401?

7. The below shows the number pattern from 1 to 150.

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
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
.....	.....	.....	.....	.....	.....	.....	150

Find a 3 x 3 number block where the sum of the nine numbers add up to 837.

8. Consider the following sums:

Line 1	4 , 5	$\rightarrow$	6 , 7 , 8
Line 2	9 , 10 , 11	$\rightarrow$	12 , 13 , 14 , 15
Line 3	16 , 17 , 18 , 19	$\rightarrow$	20 , 21 , 22 , 23 , 24

a) Write down all the numbers in Line 4

b) If line 1, (that is 4 , 5 $\rightarrow$ 6 , 7 , 8) is said to have 5 numbers, and line 2 has 7 numbers, how many numbers does Line 60 have?

c) Which line has 151 numbers?