

Literacy For All Groups



Noughts and Crosses with Connectives

if	although	while
because	as	before
since	when	after

Work with someone in your house to start with. In turn, select one of the connectives from the grid on the last page. Create a sentence about the photograph given using this word.

For example:

The mouse will only go for the cheese IF he is wearing his crash helmet.

As you go, write your sentences down in your jotter. The first person to achieve a diagonal, horizontal or vertical row of correct sentences will win the game.

Now there is a harder challenge. Try to come up with a really complex sentence, to go along with the picture which uses all three connectives in a row or column. It must make sense.

For example, if although, when and because were all in the same line, you could have

Although the mouse put on a crash helmet when approaching the cheese in the trap, it was still hurt because the helmet was faulty.

Try a few of these and write them in your jotter.

Group 1 Maths

Sequences

Obtain the rule for finding any number in a given number pattern

When asked to write the next three numbers in this pattern :-

1, 3, 5, 7, 9,

=> you would write 11, 13, 15.

A list of numbers which come in a definite order is called a **Sequence**.

The sequence 1, 3, 5, 7, 9, shown above is the sequence of **odd** numbers.

Rules :-

The **RULE "add on 2"** is used to allow you to move from one odd number to the next **consecutive** odd number.

In the same way the same **RULE "add on 2"** is used to allow you to move from one **even** number to the next.

=> the next **even** number after 54 is 56.

But... not all rules are simply "add on".

What about the sequence 3, 6, 12, 24,

Can you see here the **RULE** is "times by 2"?

=> the next term in the sequence is 48!

The rule for the pattern 2, 7, 12, 17, 22, ... is "start at 2 and go up by 5 each time"



Exercise 2

1. Describe the following pattern of numbers :- 6, 9, 12, 15, 18,

Copy :- this is the "...." times table, starting with the number "....".

2. Describe each of the following sequences using sentences like the one shown in question 1.

a 4, 8, 12, 16, 20, ...

b 6, 12, 18, 24, 30, ...

c 15, 20, 25, 30, 35, ...

d 30, 40, 50, 60, 70, ...

e 18, 27, 36, 45, ...

f 56, 48, 40, 32, 24, ...

3. a Look at the pattern in Question 2a :- 4, 8, 12, 16, 20.

Write down the next **3 terms** in this pattern.

b Write down the next 3 terms in the pattern shown in Question 2b.

c Write down the next 3 terms in the pattern shown in Question 2c.

d Write down the next 3 terms in the pattern shown in Question 2d.

e Write down the next 3 terms in the pattern shown in Question 2e.

f Write down the next 3 terms in the pattern shown in Question 2f.

4. Describe the following sequence of numbers :- 8, 11, 14, 17, 20, 23, ...

Copy :- "Begin at the number "...." and go up by "...." each time".

5. Describe each of the following sequences by saying :-

"Begin at the number "...." and go up (down) by "...." each time".

a 5, 7, 9, 11, 13, ...

b 4, 7, 10, 13, 16, ...

c 8, 12, 16, 20, 24, ...

d 7, 17, 27, 37, 47, ...

e 83, 88, 93, 98, 103, ...

f 2, 2.5, 3, 3.5, 4, ...

g 14, 15, ..., 17, 18, ..., 20, ...

h 52, 48, 44, 40, ...

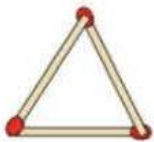
i 64, 55, 46, 37, ...

j 3700, 3600, 3500, 3400, ...

6. Write down the next 3 terms for each of the patterns in Question 5.

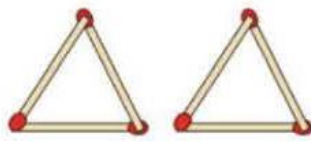
7. Look at this pattern made with matches.

1 triangle



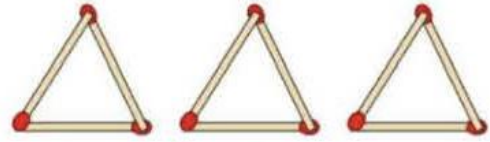
3 matches

2 triangles



6 matches

3 triangles



9 matches



a Draw the pattern showing the matches needed for 4 triangles.

b The pattern for the number of matches needed is 3, 6, 9, 12, ...
Copy this **sequence** and fill in the next 3 numbers.

c Copy the following and complete :-

"Start with 3 matches for 1 triangle and add on ... matches for each extra triangle".

d How many matches are needed for 10 triangles ?

8. Mrs Martin makes sponge cakes which she decorates with cherries.



1 sponge cake
(6 cherries)



2 sponge cakes
(12 cherries)



3 sponge cakes
(18 cherries)

a How many cherries are needed for 4 sponge cakes ?

b Copy the pattern 6, 12, 18 and write down the next 3 terms.

c Copy the following and complete :-

"Start with "...." cherries for 1 sponge cake and add on "...." cherries for each extra sponge cake.



8. d How many cherries are needed for 9 sponge cakes ?
 e If an extra 3 cherries were placed in the middle of each cake, how many cherries would now be needed for :-
 (i) 2 sponge cakes (ii) 3 sponge cakes
 (iii) 6 sponge cakes (iv) 10 sponge cakes ?

9. A special pattern - **The Fibonacci Sequence.**

Look at this sequence :- **1, 1, 2, 3, 5, 8,**

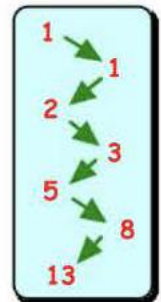
The pattern can be described as follows :-

- "Start with any 2 numbers (1 and 1 in the above example).
- "the 3rd number is formed by adding the 1st and 2nd numbers (2 = 1 + 1).
- "the 4th number is formed by adding the 2nd and 3rd numbers (3 = 1 + 2).
- "the 5th number is formed by adding the 3rd and 4th numbers (5 = 2 + 3).

- a Find the 6th number = 4th number + 5th number.
- b Find the 7th number = 5th number + 6th number.
- c What is the 8th Fibonacci number ?
- d Continue the pattern and find the first 12 Fibonacci numbers.



Fibonacci



10. Find the first 10 numbers in these Fibonacci sequences :-
 a 3, 4, 7, 11, b 2, 5, 7,
11. Form your own Fibonacci sequence.
 a Start with any 2 numbers.
 b Carry on with your pattern to produce the first 10 terms in your sequence.

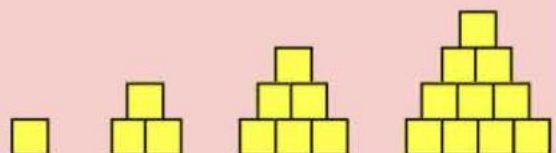
12. **A new pattern.**

Look at this set of numbers :- 3, 8, 15, 24, 35, 48,

- a It is difficult to see what the next number is. Can you ?
- b Can you see that **3 = (1 × 3)**, **8 = (2 × 4)**, **15 = (3 × 5)**.
 Write :- **24 = (4 × ...)**, **35 = (5 × ...)**, **48 = (... × ...)**.
- c Find the 7th number in the pattern.
- d Find the first 10 numbers in the sequence.

13. A boy was creating a pattern using building blocks.

- a Draw the 4 patterns of blocks neatly and draw the next 2 patterns (**5 and 6**).
- b Look at this pattern in the table :- 1, 3, 6, 10,



Can you see the connection ?
 Write down the next pattern in the same way.

$$1 = 1$$

$$3 = 1 + 2$$

$$6 = 1 + 2 + 3$$

$$10 = 1 + 2 + 3 + 4$$

- c Write down the 6th, 7th and **10th** patterns in a similar way.

Chapter 13

Patterns

Describing Number Patterns

To describe a **number pattern** :-

- write the **starting number**, then say
- by how much the numbers are **going up** or **coming down**.

Example

Describe the pattern 2, 7, 12, 17, 22,

Start at 2 and go up by 5 each time.

Be able to describe a pattern of numbers.



2, 7, 12, 17, 22, ...



Exercise 1

1. Describe each of the following patterns by writing :-

"Start at and go up (or down) by each time".

a 2, 4, 6, 8, ...

b 3, 6, 9, 12, 15, ...

c 1, 6, 11, 16, 21, ...

d 70, 60, 50, 40, 30, ...

e 20, 17, 14, 11, ...

f 30, 38, 46, 54, ...

g 21, 19, 17, 15, ...

h 50, 100, 150, 200, ...

i 200, 180, 160, 140, ...

j 40, 100, 160, 220, ...

k 18, 25, 32, 39, ...

l 66, 55, 44, 33, ...

m 650, 540, 430, 320, ...

n 1, 13, 25, 37, ...

o £1.50, £2, £2.50, £3, ...

p £2.50, £5.50, £8.50, £11.50, ...

2. Write down the **next number** in each of the patterns in **question 1**.

3. Write down the **next number** in each pattern :-

a 9, 11, 13, 15, ...

b 40, 50, 60, 70, ...

c 6, 8, 10, 12, 14, ...

d 25, 30, 35, 40, 45, ...

e 4, 8, 12, 16, 20, ...

f 3, 7, 11, 15, 19, ...

g 5, 12, 19, 26, 33, ...

h 7, 15, 23, 31, 39, ...

i 36, 33, 30, 27, ...

j 50, 48, 46, 44, ...

k 50, 44, 38, 32, ...

l 80, 70, 60, 50, ...

m 60, 52, 44, 36, ...

n 2, 11, 20, 29, ...

o 34, 64, 94, 124, ...

p 230, 210, 190, 170, ...

4. **Copy** each number pattern and **fill in** all missing numbers :-

a 13, 15, ... 19, 21, ...

b 4, ... 10, 13, 16, ...

c 68, 58, 48, 38,

d 12, ... 22, ... 32, 37

e 77, 66, ... 44, 33, ...

f 3, 9, 27, 33, ...

g 18, 15, 12, ...

h ... 60, ... 50, 45, 40, ...

i ... 350, 300, ... 200, ...

j ... 40, ... 120, 160,

5. Write down the **next two numbers** for these patterns :-

a 32, 16, 8, 4, 2, ..., ...

b 4, 8, 16, 32, ..., ...

c 3, 4, 6, 9, 13, ..., ...

d 480, 240, 120, 60, ..., ...

e 676, 565, 454, 343, ...

f 1×3 , 2×4 , 3×5 , 4×6 , ...

g 1, 1, 2, 3, 5, 8, 13, ..., ...

Group 3 Maths

Patterns with Letters

Be able to recognise letter patterns and continue them.



As well as using shapes, **patterns** can also be made up of **letters**. Can you spot the patterns in these?

a b c d e f g The next letter in the pattern is **h**.

a c e g i k The next letter in the pattern is **m**.

F E D C B The next letter in the pattern is **A**.

Exercise 2

Worksheet 23·3

1. To help you with this exercise, write out all the **letters of the alphabet** in order.

2. Use your alphabet to help write the next **2 letters** in each pattern :-

a m n o p q r b C D E F G H

c L K J I H d b d f h j l

e r q p o n f E H K N Q

g ab cd ef gh ij h az by cx dw

3. **Copy** each list. **Put in** the missing letters.

a P Q S T b q o n m

c K M O d P R T V

4. Make up a **letter pattern** of your own and see if your neighbour and teacher can work out the next letter in your pattern. Make it hard!

Patterns with Numbers

Be able to recognise number patterns and continue them.

Patterns can also be made up using **numbers**.

1 3 5 7 9 11 The next number in the pattern is 13.

20 19 18 17 16 The next number in the pattern is 15.

5 10 15 20 25 The next number in the pattern is 30.

Exercise 3

Worksheet 23·4

1. In each of the number patterns below, write the next **2 numbers** :-

a 3 4 5 6 7

b 17 18 19 20 21

c 27 26 25 24

d 2 4 6 8 10

e 4 8 12 16 20

f 45 40 35 30 25

g 80 70 60 50

h 27 24 21 18 15

2. Copy these patterns and **put in** the missing numbers :-

a 10 15 25

b 5 9 11 13

c 90 60 50

d 12 15 18

e 28 20 16

f 33 44 66

g 31 27 21

h 42 47 57 62

i 12 34 45

j 0 50 150