Starter

1) Multiply out the brackets and simplify:

a) 3(p - 2) $3p - 6$

b) 3h(2 + g) $6h + 3gh$

c) 3f(f - 1) $3f^2 - 3f$

2) Factorise the following expressions using a common factor:

a) 3j - 9 $3(j - 3)$

b) $3m^2 - m$ $m(3m - 1)$

c) $10x^2 + 15xy$

d) 5g + 10 m - 20 $= 5(g + 2m - 4)$

e) $2m^3 + 3m^2$ $m^2(2m + 3)$

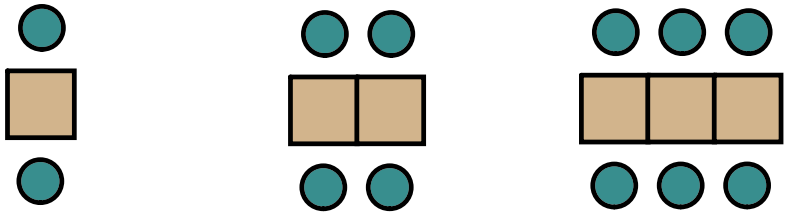
f) - 6g - 10f $-2(3g + 5f)$

$10x^2 + 15xy$
$= 5(2x^2 + 3xy)$
$= 5x(2x + 3y)$

Today's Learning:

To revise what we know about patterns and sequences.

Continue the patterns...



Tables	1	2	3	4	5	6
Chairs	2	4	6	8	10	12

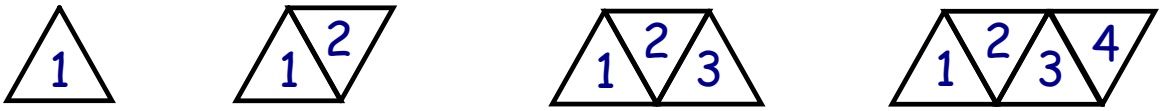
2T: 2 4 6 8

C=2T

Continue the pattern...

No. of papers	1	2	3	4	5	6
Cost	20p	40p	60p	80p	£1	£1.20

Continue the pattern...



No. of triangles	1	2	3	4	5	6
No. of lines	3	5	7	9	11	13

n: 1 2 3 4 5

2, 4, 6, 8, 10, ...

+2 +2 +2

2n: 2 4 6 8 10

1000th

2×1000

2000

2n

n: 1 2 3 4 5

10, 20, 30, 40, 50, ...

10n: 10 20 30 40 50

10n

n: 1 2 3 4 5

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

2n: 2 4 6 8 10

2n + 4

100th term

2 × 100 + 4

Starter

1) Solve the equation 3(y - 5) = -12

$3y - 15 = -12$
$+15 \quad +15$
$3y = 3$
$y = 1$

2) Evaluate $m^4 \times m^2$ $= m^6$

3) Simplify $\sqrt{32}$ $= \sqrt{4 \times 8}$
$= 2\sqrt{8}$
$= 2\sqrt{4 \times 2}$
$= 2 \times 2\sqrt{2} = 4\sqrt{2}$

4) Factorise $x^2 - 2x - 35$

$(x - 2)$

35
7, 5

$(x - 7)(x + 5)$

n: 1 2 3 4 5

1, 3, 5, 7, 9, ...

+2

2n: 2 4 6 8 10

2n - 1

Finding the nth Term

- Label the terms with n numbers, starting with 1.
- The amount being added from term to term is the multiplier.
- Compare with the actual terms and + or - an amount.

n: 1 2 3 4

e.g. 1) 4, 8, 12, 16, ... +4

4n: 4 8 12 16 $4n$

n: 1 2 3 4 5

2) 6, 11, 16, 21, 26, ... +5

5n: 5 10 15 20 25

$5n+1$

n: 1 2 3 4 5

3) 5, 6, 7, 8, 9, ... +1

In: 1 2 3 4 5 $n+4$

Find an expression for the nth term, then use this to find the 100th term in the sequence:

		100th term
1) 3, 6, 9, 12, 15, ...	$3n$	$3\times100=300$
2) 11, 21, 31, 41, ...	$10n+1$	$10\times100\times1=1001$
3) 13, 16, 19, 22, ...	$3n+10$	$3\times100+10=310$
4) 4, 5, 6, 7, 8, ...	$n+3$	
5) 20, 40, 60, 80, ...	$20n$	
6) -5, -10, -15, -20, ...	$-5n$	
7) 6, 5, 4, 3, ...	$-n+7$	
n -1 -2 -3 -4 8) 80.5, 80, 79.5, 79, 78.5, ...	$-0.5n+81$	

Today's Learning:

To find the formula connecting two variables.

R	1	2	3	4	5
t	8	10	12	14	16
2R	2	4	6	8	10

1) Find a formula for t in terms of R.

$t = 2R + 6$

2) Find t when R is 12

$t = 2 \times 12 + 6 = 24 + 6 = 30$

3) Find R when t is 30

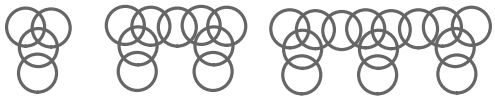
$30 = 2R + 6$

$-6 \qquad -6$

$24 = 2R$

$12 = R$

1) Samira is designing a chain belt. Each section of the belt is made from metal rings as shown below.



1 section
4 rings

2 sections
9 rings

3 sections
14 rings

a) Complete the table.

Number of sections (s)	1	2	3	4	5	11
Number of rings (r)	4	9	14	19	24	54

5s 5 10 15 20 25

b) Write down a formula for calculating the number of rings (r), when you know the number of sections (s).

$r = 5s - 1$

c) Samira uses 79 rings to make her belt. How many sections must she have?

$79 = 5s - 1$

$+1 \quad +1$

$80 = 5s$

$16 = s$