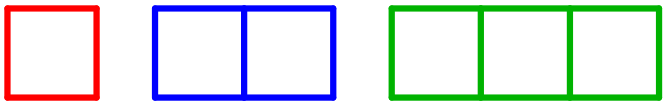
Sequences Starters

Starter 1

Q1. Matchstick Pattern



?

(a) Draw the 4th shape.
(b) How many matchsticks does it use?

Q2. Complete the Sequence

5, 10, 15, 20, __, __, __

Q3. Write the first 5 terms of the sequence with position-to-term rule: $2n$

_, _, _, _, __

Q4. Sam writes the 3 times table: $3, 6, 9, 12, 15 \ldots$
He then **adds 2** to every term. Write the first 5 terms of Sam's sequence.
What is the nth term rule?

Q5. Extending Q1

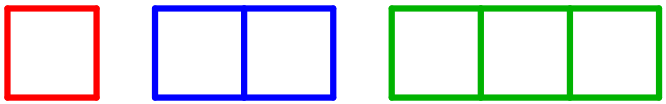
Using the matchstick pattern from Q1:
(a) How many matchsticks in the **10th** shape?
(b) Write a rule for the nth shape.

Q6. Challenge

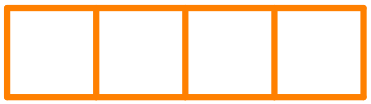
Is **100** a term in the sequence with nth term $3n + 1$?
Show how you know.

Starter 1

Q1. Matchstick Pattern

 ?

(a) Draw the 4th shape.
(b) How many matchsticks does it use?

(a) 
(b) 13 matchsticks

Q2. Complete the Sequence

5, 10, 15, 20, 25, 30, 35
(add 5 each time)

Q3. Write the first 5 terms of the sequence with position-to-term rule: $2n$

2, 4, 6, 8, 10

Q4.

Sam writes the 3 times table: $3, 6, 9, 12, 15 \ldots$
He then **adds 2** to every term. Write the first 5 terms of Sam's sequence.
What is the nth term rule?

Terms: $5,\ 8,\ 11,\ 14,\ 17.$ nth term: $\boldsymbol{3n+2}$

Q5. Extending Q1

Using the matchstick pattern from Q1:
(a) How many matchsticks in the **10th** shape?
(b) Write a rule for the nth shape.

(a) 31 matchsticks.
(b) position-to-term rule: $3n+1$

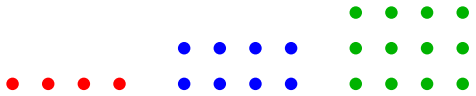
Q6. Challenge

Is **100** a term in the sequence with nth term $3n+1$?
Show how you know.

Yes, when $n = 33$,
$3 \times n + 1 = 3 \times 33 + 1 = 99 + 1 = 100$

Starter 2

Q1. Dot Pattern

 ?

(a) Draw the 4th picture.
(b) How many dots does it contain?

Q2. Complete the Sequence

4, 8, 12, 16, __, __, __

Q3. Write the first 5 terms of $3n + 1$

_, _, __, __, __

Q4. Alex writes the 5 times table: $5, 10, 15, 20, 25 \ldots$ He then **subtracts 1** from every term. Write the first 5 terms of Alex's sequence. What is the nth term rule?

Q5. Extend Q1

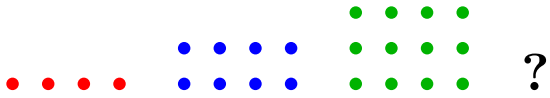
Using your dot pattern from Q1:
(a) How many dots in the **10th** picture?
(b) Write a rule for the nth picture.

Q6. Challenge

Sequence A has nth term $4n - 2$.
Sequence B has nth term $2n + 6$.
Do they share a term
at the same position?

Starter 2

Q1. Dot Pattern

 ?

(a) Draw the 4th picture.
(b) How many dots does it contain?

(a)  (b) 16 dots

Q2. Complete the Sequence

4, 8, 12, 16, 20, 24, 28
(add 4 each time)

Q3. Write the first 5 terms of $3n + 1$

4, 7, 10, 13, 16

Q4. Alex writes the 5 times table: $5, 10, 15, 20, 25 \ldots$ He then **subtracts 1** from every term. Write the first 5 terms of Alex's sequence. What is the nth term rule?

Terms: $4,\ 9,\ 14,\ 19,\ 24$. nth term: $\boldsymbol{5n - 1}$

Q5. Extend Q1

Using your dot pattern from Q1:
(a) How many dots in the **10th** picture?
(b) Write a rule for the nth picture.

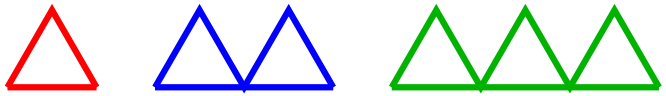
(a) 40 dots. (b) Rule: $4n$

Q6. Challenge

Sequence A has nth term $4n - 2$.
Sequence B has nth term $2n + 6$.
Do they share a term
at the same position?
$4n - 2 = 2n + 6 \ \Rightarrow \ n = 4$. Both equal **14** at position $n = 4$.

Starter 3

Q1. Matchstick Triangles

 ?

(a) Draw the 4th shape.
(b) How many matchsticks does it use?

Q2. Complete the Sequence

7, 14, 21, 28, __, __, __

Q3. Write the first 5 terms of $5n - 2$

_, _, __, __, __

Q4. A sequence **starts at 5** and **increases by 3** each time. Write the first 5 terms. What is the nth term rule?

Q5. Extending Q1

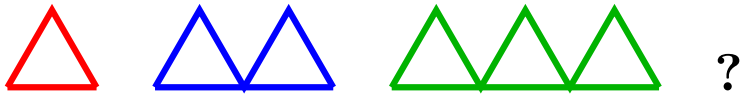
Using your triangle pattern from Q1:
(a) Write a rule for the nth shape.
(b) How many matchsticks in the **20th** shape?

Q6. Challenge

The nth term of a sequence is $4n + 3$.
Which term is the **first to exceed 75**?
Show your working clearly.

Starter 3

Q1. Matchstick Triangles

 ?

(a) Draw the 4th shape.
(b) How many matchsticks does it use?

(a)  (b) 12 matchsticks

Q2. Complete the Sequence

7, 14, 21, 28, 35, 42, 49
(add 7 each time — the 7× table)

Q3. Write the first 5 terms of $5n - 2$

3, 8, 13, 18, 23

Q4. A sequence **starts at 5** and **increases by 3** each time. Write the first 5 terms. What is the nth term rule?

Terms: $5,\ 8,\ 11,\ 14,\ 17.$ nth term: $\boldsymbol{3n + 2}$

Q5. Extending Q1

Using your triangle pattern from Q1:
(a) Write a rule for the nth shape.
(b) How many matchsticks in the **20th** shape?

(a) Rule: $3n$. (b) 60 matchsticks.

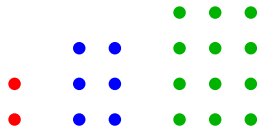
Q6. Challenge

The nth term of a sequence is $4n + 3$.
Which term is the **first to exceed 75**?
Show your working clearly.

$4n + 3 > 75 \Rightarrow n > 18.$ 19th term: $4(19) + 3 = \mathbf{79}$.

Starter 4

Q1. Dots



?

(a) Draw the 4th pattern.
(b) How many dots does it contain?

Q2. Complete the Sequence

1, 5, 9, 13, __, __, __

Q3. Write the first 5 terms of $10 - 2n$

_, _, _, _, _

Q4. Mia writes the 6 times table: $6, 12, 18, 24, 30 \ldots$ She then **subtracts 4** from every term. Write the first 5 terms, find the nth term, and find the 50th term.

Q5. Find the nth Term

$1,\ 5,\ 9,\ 13,\ 17,\ \ldots$

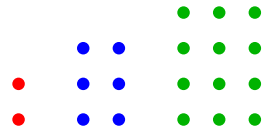
What is the nth term rule?

Q6. Challenge

The nth term of a sequence is $10 - 2n$.
Which is the **last positive term**?
What is the **first negative term**?

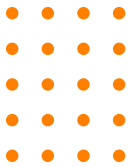
Starter 4

Q1. Dots



?

(a) Draw the 4th pattern.
(b) How many dots does it contain?



(a) (b) 20 dots

Q2. Complete the Sequence

1, 5, 9, 13, 17, 21, 25
(add 4 each time)

Q3. Write the first 5 terms of $10 - 2n$

8, 6, 4, 2, 0

Q4. Mia writes the 6 times table: $6, 12, 18, 24, 30 \ldots$ She then **subtracts 4** from every term. Write the first 5 terms, find the nth term, and find the 50th term.

Terms: $2,\ 8,\ 14,\ 20,\ 26$. nth term: $6n - 4$. 50th term: $\mathbf{296}$.

Q5. Find the nth Term

$1,\ 5,\ 9,\ 13,\ 17,\ \ldots$

What is the nth term rule?

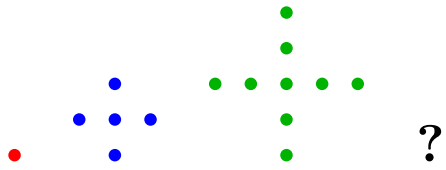
Differences: $+4$. First term: 1.
Rule: $\boldsymbol{4n - 3}$

Q6. Challenge

The nth term of a sequence is $10 - 2n$.
Which is the **last positive term**?
What is the **first negative term**?
$n = 4$: $+2$ (last positive).
$n = 5$: 0.
$n = 6$: -2 (first negative).

Starter 5

Q1. Dots



(a) Draw the 4th shape.
(b) How many dots in shape 5?

Q2. Complete the Sequence

1, 4, 9, 16, __, __, __

Q3. Write the first 5 terms of $2n + 5$

_, _, __, __, __

Q4. Find the nth Term

(a) $3,\ 5,\ 7,\ 9,\ 11,\ \ldots$

(b) $6,\ 10,\ 14,\ 18,\ 22,\ \ldots$

Q5.

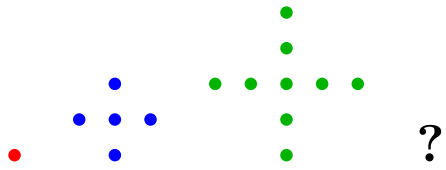
Jake says:
"I start at 3 and add 4 each time."
(a) Write his first 5 terms, (b) find the nth term rule, and (c) decide whether $\mathbf{59}$ is in his sequence. Show your reasoning.

Q6. Challenge

Mia's sequence has nth term $3n + 1$.
Jake's sequence has nth term $2n + 6$.
Find the **first three values** that appear in *both* sequences. What do you notice about them?

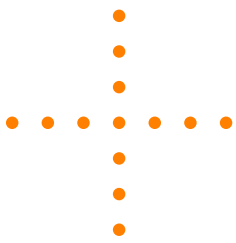
Starter 5

Q1. Dots



?

(a) Draw the 4th shape.
(b) How many dots in shape 5?



(a)
(b) Shape 5 has 17 dots

Q2. Complete the Sequence

1, 4, 9, 16, 25, 36, 49
(square numbers, n^2)

Q3. Write the first 5 terms of $2n + 5$

7, 9, 11, 13, 15

Q4. Find the nth Term

(a) $3,\ 5,\ 7,\ 9,\ 11,\ \ldots$ $2n + 1$

(b) $6,\ 10,\ 14,\ 18,\ 22,\ \ldots$ $4n + 2$

Q5. Jake says:

"I start at 3 and add 4 each time."
(a) Write his first 5 terms, (b) find the nth term rule, and (c) decide whether $\mathbf{59}$ is in his sequence. Show your reasoning.

(a) $3, 7, 11, 15, 19.$
(b) nth term: $4n - 1.$
(c) $4n - 1 = 59 \Rightarrow n = 15.$ **Yes!**
(15th term)

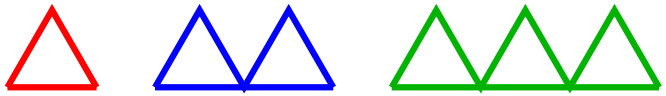
Q6. Challenge

Mia's sequence has nth term $3n + 1$.
Jake's sequence has nth term $2n + 6$.
Find the **first three values** that appear in *both* sequences. What do you notice about them?

Shared values: $10,\ 16,\ 22,\ \ldots$ (they increase by 6 each time).

Starter 6

Q1. Matchstick Triangles

 ?

(a) Draw the 4th shape.
(b) How many matchsticks does it use?
(c) Which times tables does the sequence represent?

Q2. Complete the Sequence

4, 8, 12, 16, __, __, __

Q3. The 3 times table has nth term rule $3n$, what is the nth term rule for the 5 times table? __

Q4. Write the first 5 terms of $3n + 4$

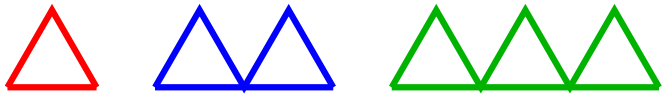
_, __, __, __, __

Q5. A sequence is made by taking the **3 times table** and **subtracting 2 from every term.**

(a) Write the first 5 terms.
(b) What is the nth term rule?
(c) Use your rule to find the **20th** term.
(d) Is 100 in the sequence? Show your working clearly.

Starter 6

Q1. Matchstick Triangles

 ?

(a) Draw the 4th shape.
(b) How many matchsticks does it use?
(c) Which times tables does the sequence represent?

(a) 
(b) 12 matchsticks
(c) The 3 times table

Q2. Complete the Sequence

4, 8, 12, 16, 20, 24, 28

Q3. The 3 times table has nth term rule $3n$, what is the nth term rule for the 5 times table?

5n

Q4. Write the first 5 terms of $3n + 4$

7, 10, 13, 16, 19

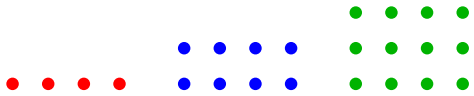
Q5. A sequence is made by taking the **3 times table** and **subtracting 2 from every term.**

(a) Write the first 5 terms.
(b) What is the nth term rule?
(c) Use your rule to find the **20th** term.
(d) Is $\mathbf{100}$ in the sequence? Show your working clearly.

(a) $1, 4, 7, 10, 13.$ (b) $\boldsymbol{3n - 2}.$ (c) $3 \times 20 - 2 = 58.$
(d) $3n - 2 = 100 \Rightarrow 3n = 102 \Rightarrow n = 31.$ **Yes**, 100 is the 31st term.

Starter 7

Q1. Dots

 ?

(a) Draw the 4th picture.
(b) How many dots does it contain?
(c) Which times table does the sequence represent?

Q2. Complete the Sequence

5, 10, 15, 20, __, __, __

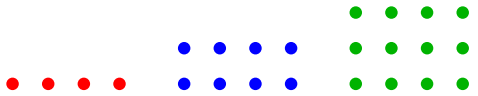
Q3. Write the first 5 terms of $4n - 3$

_, _, _, __, __

Q4. Start with the **5 times table** and **add 1** to every term.
(a) Write the first 5 terms.
(b) What is the nth term rule?
(c) Find the 20th term.
(d) Is $\mathbf{104}$ in the sequence? Explain how you know.

Starter 7

Q1. Dots

 ?

(a) Draw the 4th picture.
(b) How many dots does it contain?
(c) Which times table does the sequence represent?

(a)  (b) 16 dots
(c) The 4 times table

Q2. Complete the Sequence

5, 10, 15, 20, 25, 30, 35
(add 5 each time — the 5 times table)

Q3. Write the first 5 terms of $4n - 3$

1, 5, 9, 13, 17

Q4. Start with the **5 times table** and **add 1** to every term.

(a) Write the first 5 terms.
(b) What is the nth term rule?
(c) Find the 20th term.
(d) Is $\mathbf{104}$ in the sequence? Explain how you know.

(a) $6, 11, 16, 21, 26.$ (b) $\boldsymbol{5n+1}.$ (c) $5\times 20-1=99.$
(d) $5n-1=104 \Rightarrow 5n=105 \Rightarrow n=21.$ **Yes**, 101 is the 21st term.