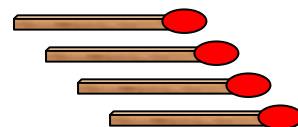
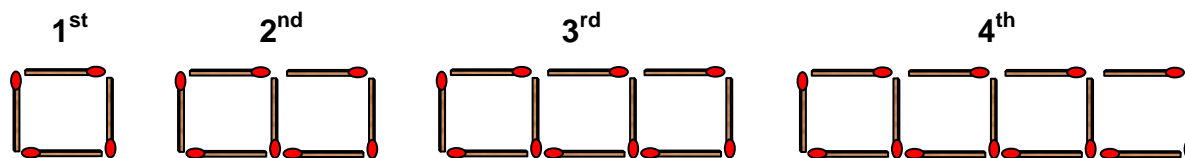


# Matchsticks and Marbles



## Task A Matchsticks



Look carefully at the matchstick pattern and answer the questions below.

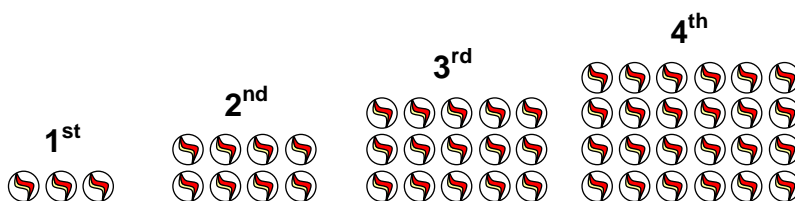
- How many matchsticks would there be in:
  - the 5th pattern?
  - the 6th pattern?
  - the 7th pattern?
- Copy and complete the table below.

Pattern Number	1	2	3	4	5	6	N
Number of Sticks	4	7					

- Use the Nth term to find out how many matchsticks there would be in:
  - the 10th pattern
  - the 20th pattern
  - the 100th pattern
- A particular matchstick pattern in the sequence above is made up of 46 matchsticks. Which number pattern would this be?
- Copy and complete the table below.

Pattern Number	18	31					
Number of Sticks	55	94	100	136	301	667	N

## Task B Marbles

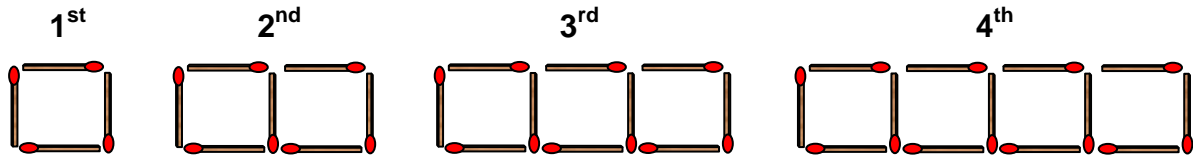


Look carefully at the marble pattern and answer the questions below.

- How many marbles are there in the 5<sup>th</sup> and 6<sup>th</sup> pattern?
- Write down an Nth term for this pattern.
- How many marbles in the 10<sup>th</sup> pattern and the 21<sup>st</sup> pattern?
- A particular marble pattern contains 168 marbles. What is its position in the sequence?
- Draw a graph with the x-axis going from 0 to 6 and the y-axis going from 0 to 25. Plot the sequences from Task A and Task B on the graph.

# Matchsticks and Marbles Answers

## Task A Matchsticks



Look carefully at the matchstick pattern and answer the questions below.

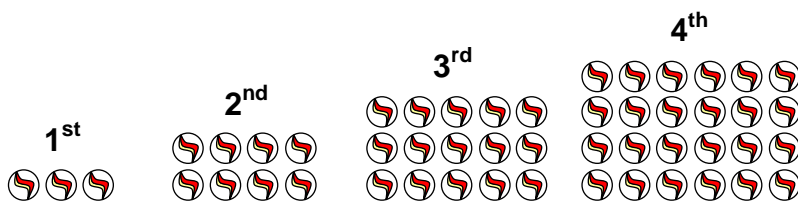
- How many matchsticks would there be in:
  - the 5th pattern? **16**
  - the 6th pattern? **19**
  - the 7th pattern? **22**
- Copy and complete the table below.

Pattern Number	1	2	3	4	5	6	N
Number of Sticks	4	7	<b>10</b>	<b>13</b>	<b>16</b>	<b>19</b>	<b>3N+1</b>

- Use the Nth term to find out how many matchsticks there would be in:
  - the 10th pattern **31**
  - the 20th pattern **61**
  - the 100th pattern **301**
- A particular matchstick pattern in the sequence above is made up of 46 matchsticks. Which number pattern would this be? **15**
- Copy and complete the table below.

Pattern Number	18	31	<b>33</b>	<b>45</b>	<b>100</b>	<b>222</b>	<b>(N-1)/3</b>
Number of Sticks	55	94	100	136	301	667	N

## Task B Marbles



Look carefully at the marble pattern and answer the questions below.

- How many marbles are there in the 5<sup>th</sup> and 6<sup>th</sup> pattern? **35 & 48**
- Write down an Nth term for this pattern.  **$N(N+2)$**
- How many marbles in the 10<sup>th</sup> pattern and the 21<sup>st</sup> pattern? **120 & 483**
- A particular marble pattern contains 168 marbles. What is its position in the sequence? **12**
- Draw a graph with the x-axis going from 0 to 6 and the y-axis going from 0 to 25. Plot the sequences from Task A and Task B on the graph.