

11+ Maths Practice Paper

Year 6 · Advanced

Lesson 5.2: Spatial and non-verbal sequences

Read this with your child:

1. This paper has **27 questions** in two parts. Work through them in order. The questions get harder as you go.
2. **Part 1** is multiple choice. Choose **one** answer, A, B, C, D or E, and mark it on the separate answer sheet by drawing a firm line through the box next to its letter. If you change your mind, rub the line out completely and mark your new answer.
3. **Part 2** asks you to write your answer. Write it in the boxes on the answer sheet, **one digit in each box**, starting from the left.
4. If a question is hard, leave it and come back to it at the end.
5. You may use rough paper for working out. You may **not** use a calculator.
6. Suggested time: **35 minutes**.

The answer sheet is after the questions. The answers, with a short explanation of each, are at the back for a parent to mark with.

These are original practice questions written by Elite Learners in the style of 11+ entrance tests. They are not produced by, or connected with, GL Assessment or Cambridge University Press & Assessment (CEM).

Example

Here are some patterns made of matchsticks.

How many matchsticks will Pattern 20 have?



Pattern 1



Pattern 2



Pattern 3

A 101

B 100

C 120

D 96

E 106

Answer: A 1 matchstick on the left, then 5 for each hexagon: $5 \times 20 = 100$, and $100 + 1 = 101$.

The answer, A, has already been marked on your answer sheet.

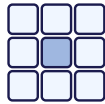
Now turn over and start Part 1.

Part 1: Multiple choice

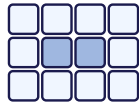
1

A garden path has grey tiles in a row, with white tiles all round.

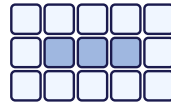
Which rule gives the number of white tiles in any pattern?



Pattern 1



Pattern 2



Pattern 3

- A 6 times the pattern number, then add 2
- B 8 times the pattern number
- C 2 times the pattern number, then add 8
- D add 2 each time
- E 2 times the pattern number, then add 6

2

The arrow turns an eighth of a turn anticlockwise each time.

Which arrow is missing?



- A
- B
- C
- D
- E

3

Here are some patterns made of matchsticks.

How many matchsticks will Pattern 50 have?



Pattern 1



Pattern 2



Pattern 3

- A 152
- B 200
- C 151
- D 154
- E 150

4

Here are some rectangles made of tiles.

How many tiles will Pattern 10 have?

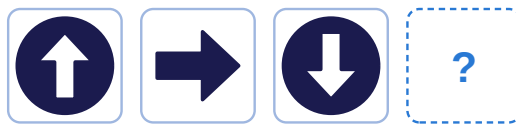


- A** 90 **B** 120 **C** 20 **D** 110 **E** 100

5

Two things change in this pattern.

Which picture comes next?



- A** **B** **C** **D** **E**

6

Here are some patterns made of matchsticks.

Which pattern uses exactly 61 matchsticks?



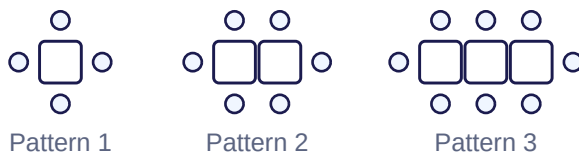
- A** Pattern 29 **B** Pattern 31 **C** Pattern 60 **D** Pattern 20 **E** Pattern 30

7

Square tables are pushed together in a row. Chairs go all the way round.

50 people need a chair each.

What is the smallest number of tables needed?



- A** 25 **B** 48 **C** 12 **D** 24 **E** 13

8

Here are some squares made of tiles.

How many more tiles does Pattern 8 have than Pattern 7?



A 8

B 15

C 14

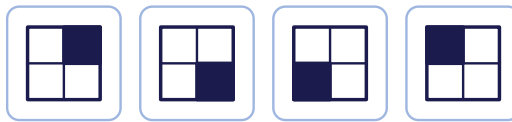
D 16

E 13

9

The shaded part keeps moving round the square in the same way.

Which picture is the 23rd?

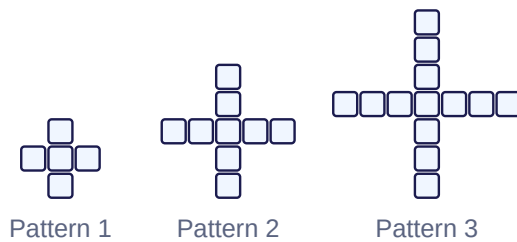


10

Here are some patterns made of tiles.

Kim has 100 tiles.

What is the biggest pattern Kim can make?



A Pattern 24

B Pattern 20

C Pattern 25

D Pattern 33

E Pattern 23

11

Here are some triangles made of dots.

How many dots will Pattern 8 have?



- A** 28 **B** 64 **C** 45 **D** 32 **E** 36

12

Two things change in this pattern.

Which shape comes next?



- A**  **B**  **C**  **D**  **E** 

13

Here are some patterns made of matchsticks.

Which pattern uses exactly 76 matchsticks?

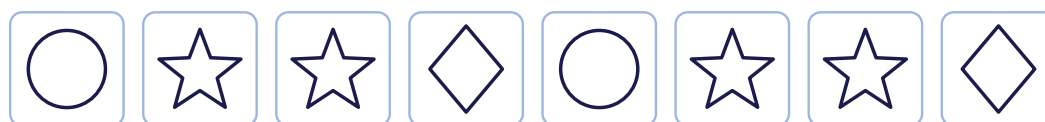


- A** Pattern 14 **B** Pattern 12 **C** Pattern 15 **D** Pattern 16 **E** Pattern 19

14

This pattern keeps repeating.

How many stars are there in the first 50 shapes?



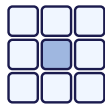
- A** 13 **B** 25 **C** 24 **D** 26 **E** 12

15

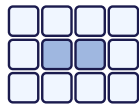
A garden path has grey tiles in a row, with white tiles all round.

A path uses 70 white tiles.

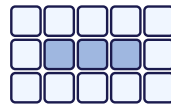
How many grey tiles does it have?



Pattern 1



Pattern 2



Pattern 3

A 32

B 64

C 38

D 33

E 35

16

Here are some patterns made of matchsticks.

How many more matchsticks does Pattern 30 have than Pattern 20?



Pattern 1



Pattern 2



Pattern 3

A 10

B 31

C 29

D 30

E 60

17

Here are some rectangles made of tiles.

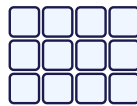
Which pattern has exactly 56 tiles?



Pattern 1



Pattern 2



Pattern 3

A Pattern 8

B Pattern 14

C Pattern 28

D Pattern 6

E Pattern 7

18

The arrow turns an eighth of a turn clockwise each time, and keeps going.

Which way does the 20th arrow point?



A



B



C



D



E



19

Here are some squares made of tiles.

How many more tiles does Pattern 12 have than Pattern 10?



A 21

B 44

C 40

D 4

E 24

20

Here are some patterns made of matchsticks.

Sam has 100 matchsticks and makes Pattern 30.

How many matchsticks are left over?



A 1

B 70

C 10

D 19

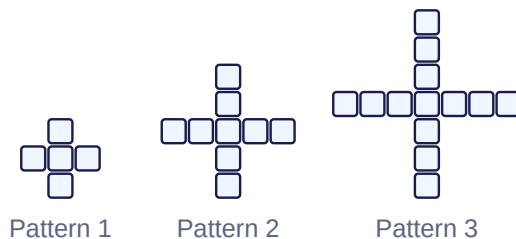
E 9

Part 2: Write your answer

21

Here are some patterns made of tiles.

How many tiles will Pattern 25 have?



Write your answer in the boxes on the answer sheet, one digit in each box.

22

Here are some patterns made of matchsticks.

How many matchsticks will Pattern 100 have?



Write your answer in the boxes on the answer sheet, one digit in each box.

23

Here are some squares made of tiles.

Which pattern uses exactly 225 tiles? Write the pattern number.



Write your answer in the boxes on the answer sheet, one digit in each box.

24

This pattern keeps repeating.

In what position is the 10th circle? (For example, write 6 for the 6th shape.)

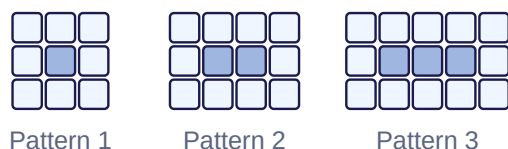


Write your answer in the boxes on the answer sheet, one digit in each box.

25

A garden path has grey tiles in a row, with white tiles all round.

How many white tiles will Pattern 45 have?



Write your answer in the boxes on the answer sheet, one digit in each box.

26

Here are some triangles made of dots.

How many dots will Pattern 10 have?



Write your answer in the boxes on the answer sheet, one digit in each box.

27

Here are some patterns made of matchsticks.

Ben has 200 matchsticks.

What is the biggest pattern Ben can make? Write the pattern number.



Pattern 1



Pattern 2



Pattern 3

Write your answer in the boxes on the answer sheet, one digit in each box.

Answer sheet

11+ Maths Practice Paper · Year 6 · Lesson 5.2: Spatial and non-verbal sequences

Name

Draw a firm line through the box next to your answer, like the example.

Part 1: Multiple choice

Ex	A	☒	B	☐	C	☐	D	☐	E	☐
1	A	☐	B	☐	C	☐	D	☐	E	☐
2	A	☐	B	☐	C	☐	D	☐	E	☐
3	A	☐	B	☐	C	☐	D	☐	E	☐
4	A	☐	B	☐	C	☐	D	☐	E	☐
5	A	☐	B	☐	C	☐	D	☐	E	☐
6	A	☐	B	☐	C	☐	D	☐	E	☐
7	A	☐	B	☐	C	☐	D	☐	E	☐
8	A	☐	B	☐	C	☐	D	☐	E	☐
9	A	☐	B	☐	C	☐	D	☐	E	☐
10	A	☐	B	☐	C	☐	D	☐	E	☐
11	A	☐	B	☐	C	☐	D	☐	E	☐
12	A	☐	B	☐	C	☐	D	☐	E	☐
13	A	☐	B	☐	C	☐	D	☐	E	☐
14	A	☐	B	☐	C	☐	D	☐	E	☐
15	A	☐	B	☐	C	☐	D	☐	E	☐
16	A	☐	B	☐	C	☐	D	☐	E	☐
17	A	☐	B	☐	C	☐	D	☐	E	☐
18	A	☐	B	☐	C	☐	D	☐	E	☐
19	A	☐	B	☐	C	☐	D	☐	E	☐
20	A	☐	B	☐	C	☐	D	☐	E	☐

Part 2: Write your answer, one digit in each box

21			
22			
23			
24			
25			
26			
27			

Answers

For a parent to mark with. One mark for each question: the paper is out of 27. Talk through any your child got wrong, using the explanation.

Q	Answer	How to get it
1	E 2 times the pattern number, then add 6	Each grey tile has a white tile above and below (2), and each end has 3 more (6). Check: Pattern 3 is $2 \times 3 + 6 = 12$.
2	B an arrow pointing down and left	Up, up and left, left: an eighth of a turn anticlockwise each time. After left comes down and left, then down.
3	C 151	1 matchstick on the left, then 3 for each square: $3 \times 50 = 150$, and $150 + 1 = 151$.
4	D 110	Pattern 3 is 3 rows of 4, so Pattern 10 is 10 rows of 11: $10 \times 11 = 110$.
5	A an arrow pointing left	The arrow turns a quarter turn clockwise each time, and the circle takes turns, dark then white. Next it points left, with no dark circle.
6	E Pattern 30	Take away the 1 extra: $61 - 1 = 60$. Each triangle needs 2: $60 \div 2 = 30$. It is Pattern 30.
7	D 24	Take away the 2 end chairs: $50 - 2 = 48$. Each table has 2 more: $48 \div 2 = 24$.
8	B 15	Pattern 8 has $8 \times 8 = 64$ and Pattern 7 has $7 \times 7 = 49$, so the difference is $64 - 49 = 15$. That is the L shape of new tiles: $8 + 7$.
9	C a square with the bottom left quarter shaded	It repeats every 4 pictures. $23 \div 4 = 5$ remainder 3, so the 23rd matches the 3rd picture: the bottom left quarter shaded.
10	A Pattern 24	$100 - 1 = 99$, and $99 \div 4 = 24$ remainder 3. Pattern 24 uses 97 tiles; Pattern 25 would need 101.
11	E 36	Add a row one dot longer each time: 1, 3, 6, 10, 15, 21, 28, then $28 + 8 = 36$.
12	D a square	Each shape has one side fewer, and the shapes take turns, white then dark. So next is a white shape with 4 sides: a square.
13	C Pattern 15	Take away the 1 extra: $76 - 1 = 75$. Each hexagon needs 5: $75 \div 5 = 15$. It is Pattern 15.
14	B 25	$50 \div 4 = 12$ remainder 2, so there are 12 whole blocks with $12 \times 2 = 24$ stars, and the last 2 shapes (circle, star) have 1 more: 25.
15	A 32	Take away the 6 end tiles: $70 - 6 = 64$. Each grey tile has 2 white tiles: $64 \div 2 = 32$.
16	D 30	Pattern 30 has 10 more squares than Pattern 20, and each square needs 3 more matchsticks: $10 \times 3 = 30$.
17	E Pattern 7	Each pattern has one row more than the last, and each row has one tile more than the number of rows. Pattern 7 is 7 rows of 8, and $7 \times 8 = 56$.
18	C an arrow pointing down and right	Eight eighth turns make a whole turn, so it repeats every 8 arrows. $20 \div 8 = 2$ remainder 4: it points the same way as the 4th arrow, down and right.

Q	Answer	How to get it
19	B 44	Pattern 12 has $12 \times 12 = 144$ and Pattern 10 has $10 \times 10 = 100$, so the difference is $144 - 100 = 44$.
20	E 9	Pattern 30 uses $3 \times 30 + 1 = 91$ matchsticks. $100 - 91 = 9$ are left over.
21	101	The middle tile, then 4 for each pattern number: $4 \times 25 = 100$, and $100 + 1 = 101$.
22	201	1 matchstick to start, then 2 for each triangle: $2 \times 100 = 200$, and $200 + 1 = 201$.
23	15	Each pattern is a square: Pattern 15 is 15 rows of 15, and $15 \times 15 = 225$.
24	38	The circles are in positions 2, 6, 10, ... : 4 apart. The 10th circle is 9 jumps of 4 after the 1st: $2 + 36 = 38$.
25	96	2 white tiles for each grey tile, and 6 at the ends: $2 \times 45 + 6 = 96$.
26	55	Add a row one dot longer each time: 1, 3, 6, 10, 15, 21, 28, 36, 45, then $45 + 10 = 55$.
27	39	$200 - 1 = 199$, and $199 \div 5 = 39$ remainder 4. Pattern 39 uses 196 matchsticks; Pattern 40 would need 201.

Score: out of 27