

Angles as Turns

All 11 questions from the CBSE CT Handbook, each with think time, a hint and an animated step-by-step solution

5

Algorithmic thinking

3

Logical reasoning

2

Abstraction

1

Pattern recognition

Ready-to-teach smartboard lessons, one click at a time.

How each question runs

1

Think

Students try alone for 60 seconds and write their answer in the handbook.

2

Hint

Show the hint. Give 1 more minute. Ask 2–3 children with different answers to explain.

3

Solve

Click once per step. Ask the class to predict each step before you click.

4

Discuss

Use the common mistake and extension in the notes.

The process of thinking matters more than the correct answer. Let children make mistakes, share strategies and explain their reasoning (CBSE Circular Acad-18/2026).

P and Q are standing in a playground. P took a right-angle turn in the clockwise direction and Q took a right-angle turn in the anti-clockwise direction, and now both of them face the same direction. If P is currently facing North, which direction was Q initially facing?

a) East

b) West

c) South

d) Cannot be determined

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

P and Q are standing in a playground. P took a right-angle turn in the clockwise direction and Q took a right-angle turn in the anti-clockwise direction, and now both of them face the same direction. If P is currently facing North, which direction was Q initially facing?

a) East

b) West

c) South

d) Cannot be determined

Hint: P and Q end up facing the same way. Which way is that? Now undo Q's turn.

Which way was Q facing at first?

a) East

b) West

c) South

d) Cannot be determined

Which way was Q facing at first?

a) East

b) West

c) South

d) Cannot be determined

1

P and Q now face the same direction, so Q is also facing North.

Which way was Q facing at first?

a) East

b) West

c) South

d) Cannot be determined

1

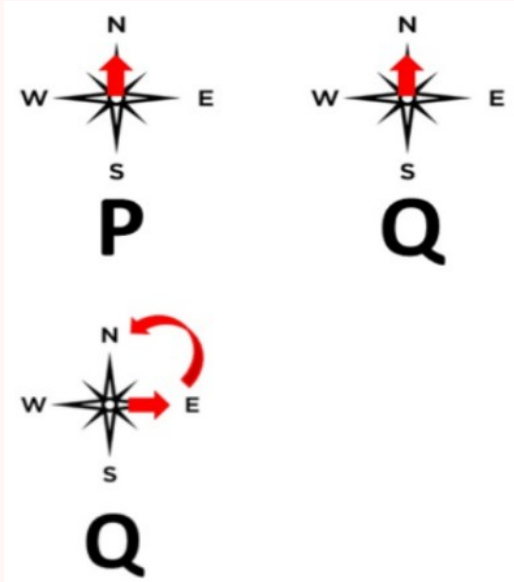
P and Q now face the same direction, so Q is also facing North.

2

Q made one right-angle anticlockwise turn to reach North.

Which way was Q facing at first?

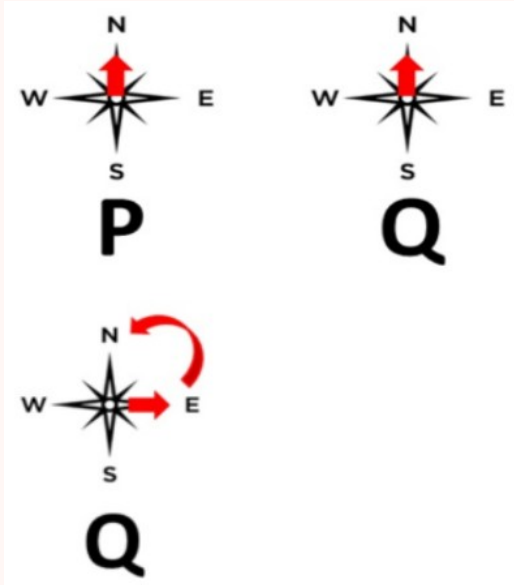
From the Teacher Handbook



- 1 P and Q now face the same direction, so Q is also facing North.
- 2 Q made one right-angle anticlockwise turn to reach North.
- 3 One anticlockwise right-angle turn from East gives North, so Q faced East: option a.

Which way was Q facing at first?

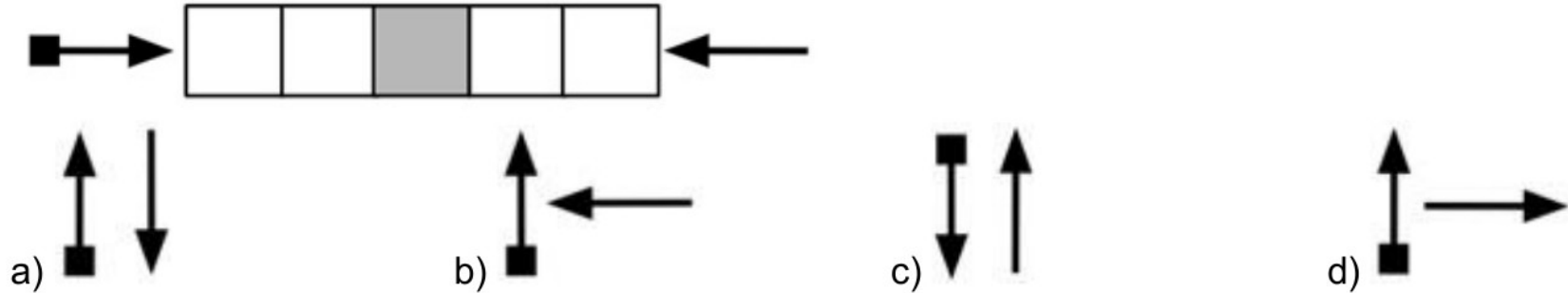
From the Teacher Handbook



- 1 P and Q now face the same direction, so Q is also facing North.
- 2 Q made one right-angle anticlockwise turn to reach North.
- 3 One anticlockwise right-angle turn from East gives North, so Q faced East: option a.

Answer: **a) East**

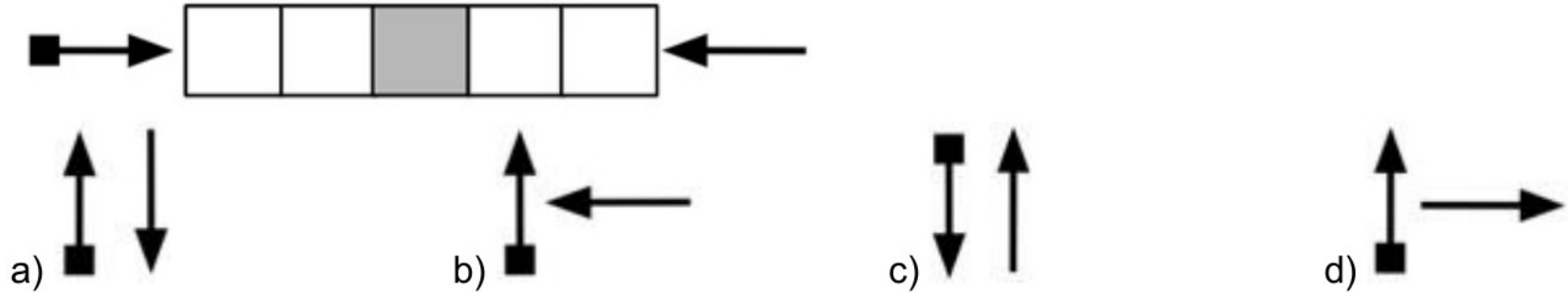
Two arrows must pass through five blocks to reach the opposite side, making a right-angle clockwise turn each time they enter a block. Which of the following options shows the correct positions of these arrows when they are present in the shaded block?



60s

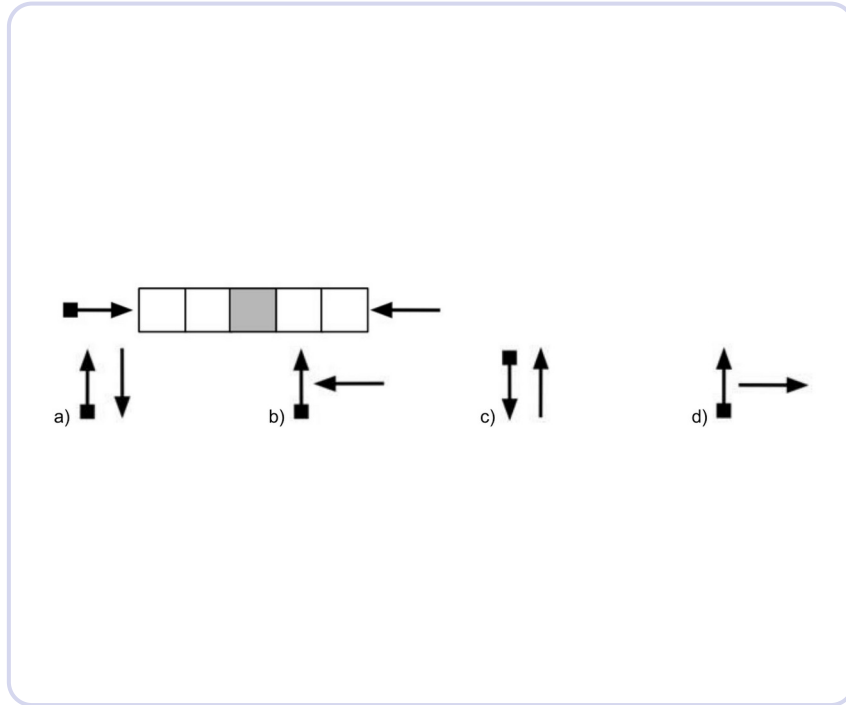
Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

Two arrows must pass through five blocks to reach the opposite side, making a right-angle clockwise turn each time they enter a block. Which of the following options shows the correct positions of these arrows when they are present in the shaded block?

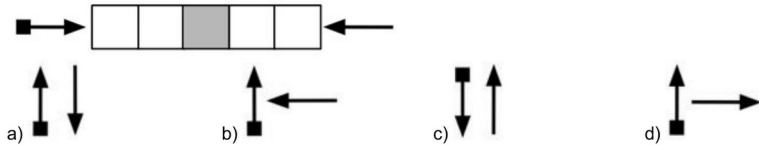


Hint: Each time an arrow enters a block it turns a right angle clockwise. Follow each arrow block by block.

Arrows turning inside the blocks



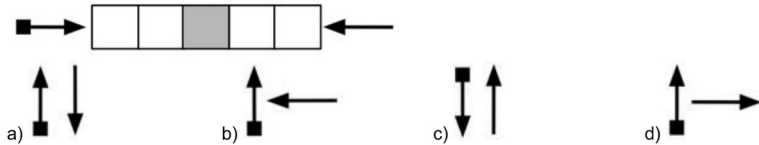
Arrows turning inside the blocks



1

Left arrow (points right): block 1 points down, block 2 points left, block 3 points up.

Arrows turning inside the blocks



1

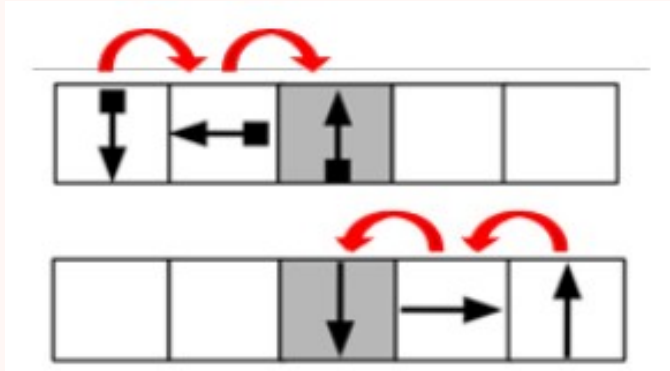
Left arrow (points right): block 1 points down, block 2 points left, block 3 points up.

2

Right arrow (points left): block 5 points up, block 4 points right, block 3 points down.

Arrows turning inside the blocks

From the Teacher Handbook



1

Left arrow (points right): block 1 points down, block 2 points left, block 3 points up.

2

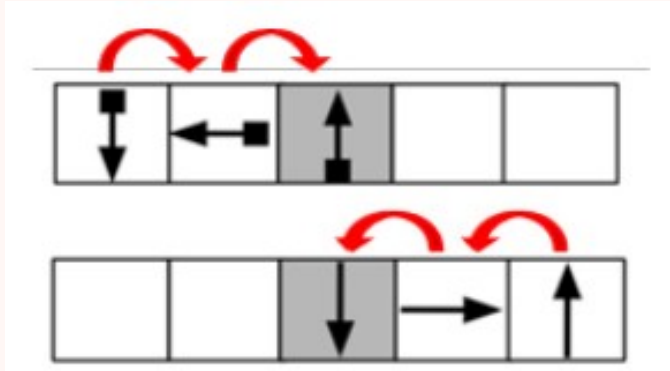
Right arrow (points left): block 5 points up, block 4 points right, block 3 points down.

3

In the shaded block one arrow points up and one points down: option a.

Arrows turning inside the blocks

From the Teacher Handbook



1

Left arrow (points right): block 1 points down, block 2 points left, block 3 points up.

2

Right arrow (points left): block 5 points up, block 4 points right, block 3 points down.

3

In the shaded block one arrow points up and one points down: option a.

Answer: **a**

Prachi is facing North. She takes a right-angle turn in the clockwise direction. She then takes a right-angle turn again in the clockwise direction. What direction is she facing now?

a) North

b) East

c) West

d) South

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

Prachi is facing North. She takes a right-angle turn in the clockwise direction. She then takes a right-angle turn again in the clockwise direction. What direction is she facing now?

a) North

b) East

c) West

d) South

Hint: A clockwise right-angle turn from North takes you to East. Do it one more time.

Prachi's direction after two turns

a) North

b) East

c) West

d) South

Prachi's direction after two turns

a) North

b) East

c) West

d) South

1 Prachi starts facing North.

Prachi's direction after two turns

a) North

b) East

c) West

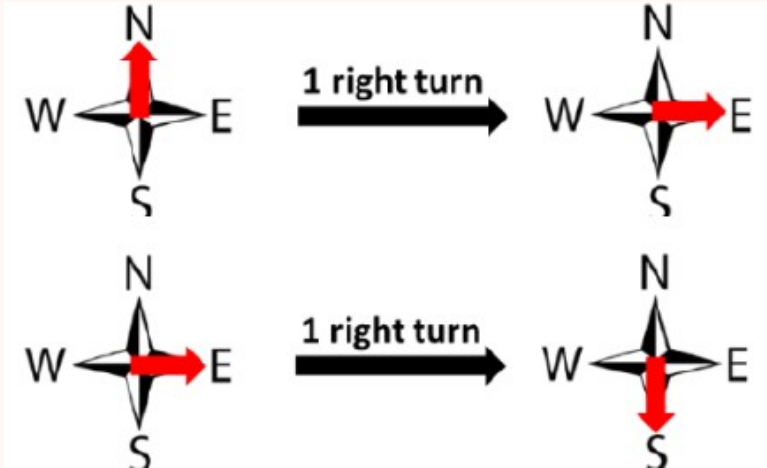
d) South

1 Prachi starts facing North.

2 First right-angle clockwise turn: she faces East.

Prachi's direction after two turns

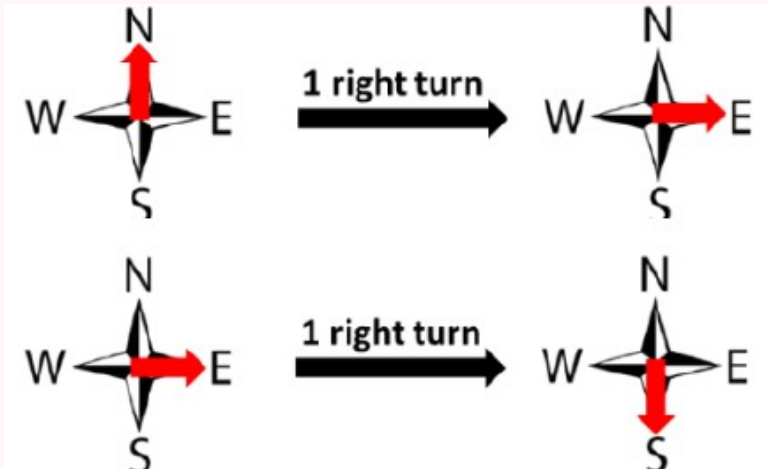
From the Teacher Handbook



- 1 Prachi starts facing North.
- 2 First right-angle clockwise turn: she faces East.
- 3 Second right-angle clockwise turn: she faces South, option d.

Prachi's direction after two turns

From the Teacher Handbook



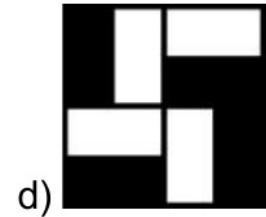
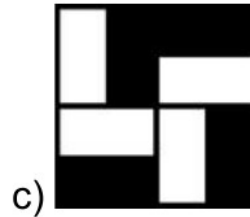
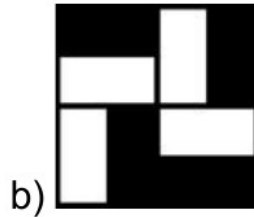
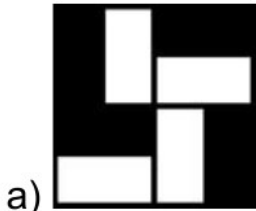
- 1 Prachi starts facing North.
- 2 First right-angle clockwise turn: she faces East.
- 3 Second right-angle clockwise turn: she faces South, option d.

Answer: d) South

The given question image could be rotated clockwise or anticlockwise multiple times. Which of the following options will you NOT get on rotating the given question image?



Question
Image



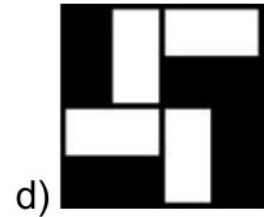
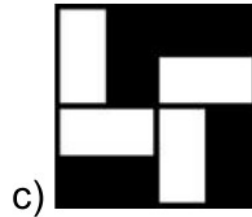
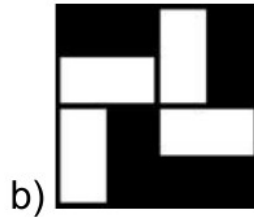
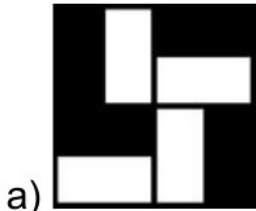
60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

The given question image could be rotated clockwise or anticlockwise multiple times. Which of the following options will you NOT get on rotating the given question image?

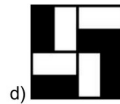
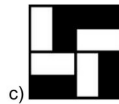
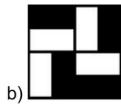
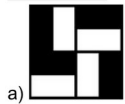


Question
Image



Hint: Turn the question image one right angle at a time. A turn can move the pattern round, but can it flip it?

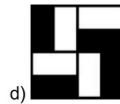
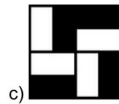
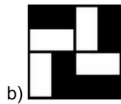
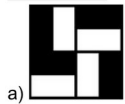
Which image is NOT a rotation?



Which image is NOT a rotation?

1

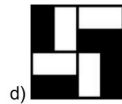
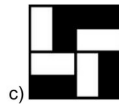
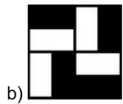
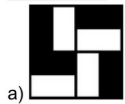
Turn the question image clockwise or anticlockwise and compare with each option.



Which image is NOT a rotation?



Question
Image



1

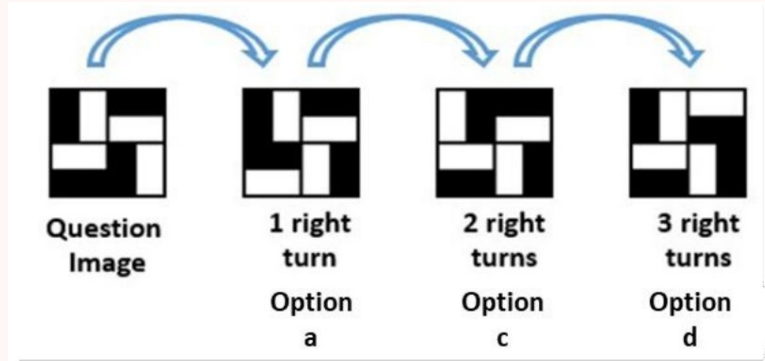
Turn the question image clockwise or anticlockwise and compare with each option.

2

Options a, c and d match a turned version of the question image.

Which image is NOT a rotation?

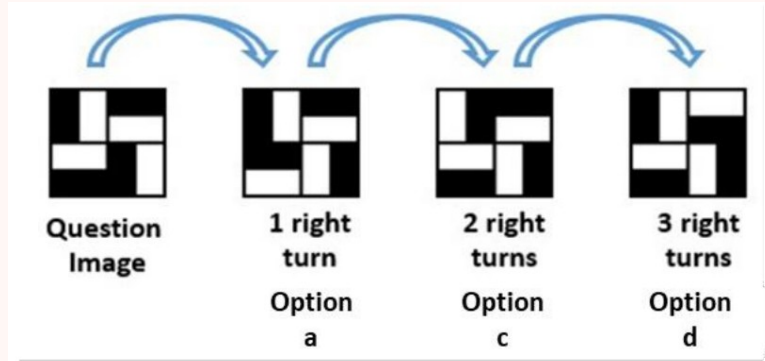
From the Teacher Handbook



- 1 Turn the question image clockwise or anticlockwise and compare with each option.
- 2 Options a, c and d match a turned version of the question image.
- 3 Option b is a flipped (mirror) version, which no turn can give: option b.

Which image is NOT a rotation?

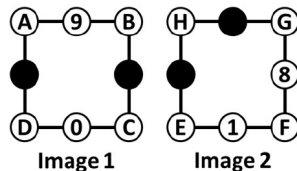
From the Teacher Handbook



- 1 Turn the question image clockwise or anticlockwise and compare with each option.
- 2 Options a, c and d match a turned version of the question image.
- 3 Option b is a flipped (mirror) version, which no turn can give: option b.

Answer: b

Sam rotates Image 2 by a right-angle clockwise turn. If Tom places the rotated Image 2 on Image 1, which of the following statements is NOT true?



a) A and E overlap with each other

b) 9 and 8 are opposite to each other

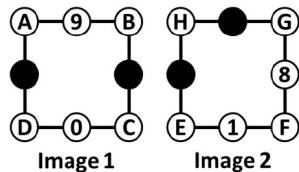
c) F and B are diagonal to each other

d) 9 and 1 overlap with each other

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

Sam rotates Image 2 by a right-angle clockwise turn. If Tom places the rotated Image 2 on Image 1, which of the following statements is NOT true?



a) A and E overlap with each other

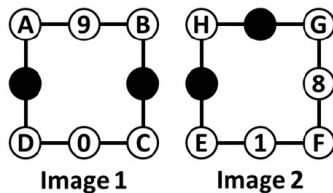
b) 9 and 8 are opposite to each other

c) F and B are diagonal to each other

d) 9 and 1 overlap with each other

Hint: Rotate Image 2 a right angle clockwise first: what sits at each corner and on each side now?

Rotate Image 2 and place it on Image 1



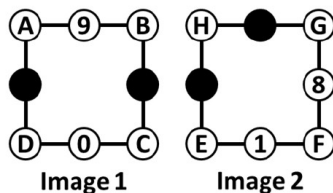
a) A and E overlap with each other

b) 9 and 8 are opposite to each other

c) F and B are diagonal to each other

d) 9 and 1 overlap with each other

Rotate Image 2 and place it on Image 1



1

After the turn: E top-left, H top-right, G bottom-right, F bottom-left; 1 on the left side, 8 at the bottom.

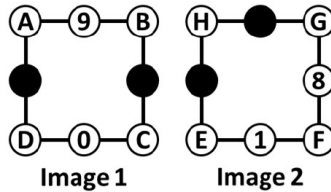
a) A and E overlap with each other

b) 9 and 8 are opposite to each other

c) F and B are diagonal to each other

d) 9 and 1 overlap with each other

Rotate Image 2 and place it on Image 1



a) A and E overlap with each other

b) 9 and 8 are opposite to each other

c) F and B are diagonal to each other

d) 9 and 1 overlap with each other

1

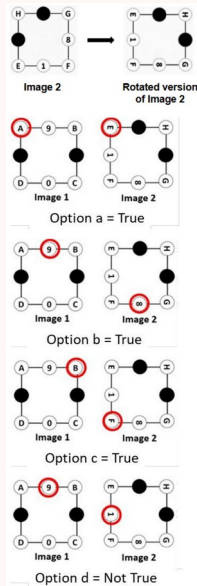
After the turn: E top-left, H top-right, G bottom-right, F bottom-left; 1 on the left side, 8 at the bottom.

2

Check: E is on A (a true), 8 is opposite 9 (b true), F is diagonal to B (c true).

Rotate Image 2 and place it on Image 1

From the Teacher Handbook



1

After the turn: E top-left, H top-right, G bottom-right, F bottom-left; 1 on the left side, 8 at the bottom.

2

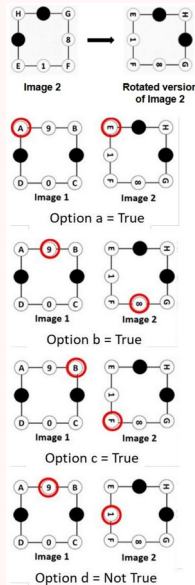
Check: E is on A (a true), 8 is opposite 9 (b true), F is diagonal to B (c true).

3

9 is on the top side but 1 is on the left side, so they do not overlap: option d.

Rotate Image 2 and place it on Image 1

From the Teacher Handbook



1

After the turn: E top-left, H top-right, G bottom-right, F bottom-left; 1 on the left side, 8 at the bottom.

2

Check: E is on A (a true), 8 is opposite 9 (b true), F is diagonal to B (c true).

3

9 is on the top side but 1 is on the left side, so they do not overlap: option d.

Answer: d) 9 and 1 overlap with each other

Pratik is facing north. He first makes a $\frac{1}{4}$ clockwise turn, followed by a $\frac{1}{2}$ anti-clockwise turn. In which direction was he facing at the end?

a) North

b) East

c) West

d) South

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

Pratik is facing north. He first makes a $\frac{1}{4}$ clockwise turn, followed by a $\frac{1}{2}$ anti-clockwise turn. In which direction was he facing at the end?

a) North

b) East

c) West

d) South

Hint: A $\frac{1}{4}$ turn is one right angle. A $\frac{1}{2}$ turn is two right angles.

Pratik's direction after two turns

a) North

b) East

c) West

d) South

Pratik's direction after two turns

a) North

b) East

c) West

d) South

1

Start facing North. A $\frac{1}{4}$ clockwise turn: he faces East.

Pratik's direction after two turns

a) North

b) East

c) West

d) South

1

Start facing North. A $\frac{1}{4}$ clockwise turn: he faces East.

2

A $\frac{1}{2}$ anticlockwise turn is two right angles: East to North, then North to West.

Pratik's direction after two turns

a) North

b) East

c) West

d) South

1

Start facing North. A $\frac{1}{4}$ clockwise turn: he faces East.

2

A $\frac{1}{2}$ anticlockwise turn is two right angles: East to North, then North to West.

3

He ends up facing West: option c.

Pratik's direction after two turns

a) North

b) East

c) West

d) South

1

Start facing North. A $\frac{1}{4}$ clockwise turn: he faces East.

2

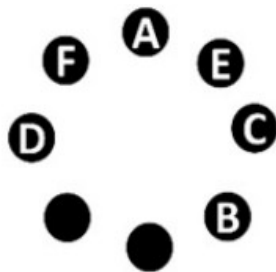
A $\frac{1}{2}$ anticlockwise turn is two right angles: East to North, then North to West.

3

He ends up facing West: option c.

Answer: **c) West**

A, B, C, D, E, and F are seated around a table, facing the centre, with two chairs left empty, as shown below. Two new members join the group. E, C, and B move one seat clockwise, while D and F move one seat anticlockwise. After these changes, the new members occupy the empty chairs. Who is sitting between the two new members?



a) A

b) B

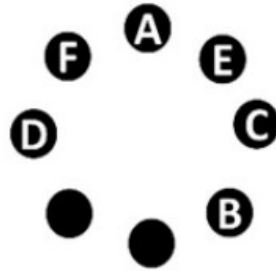
c) E

d) F

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

A, B, C, D, E, and F are seated around a table, facing the centre, with two chairs left empty, as shown below. Two new members join the group. E, C, and B move one seat clockwise, while D and F move one seat anticlockwise. After these changes, the new members occupy the empty chairs. Who is sitting between the two new members?



a) A

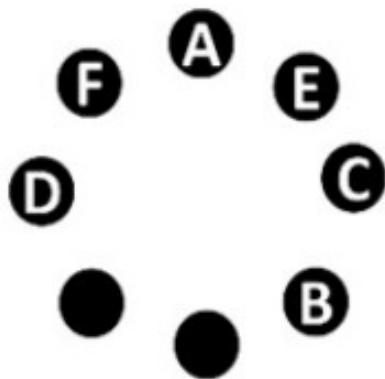
b) B

c) E

d) F

Hint: Move E, C and B one seat clockwise first. Then move D and F. Which chairs are empty now?

Who sits between the new members?



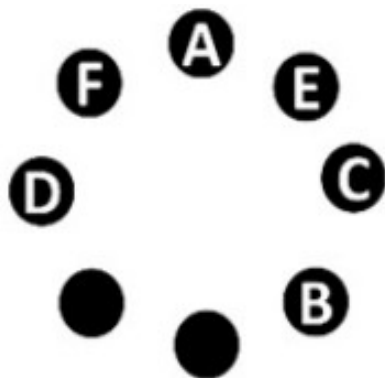
a) A

b) B

c) E

d) F

Who sits between the new members?



a) A

b) B

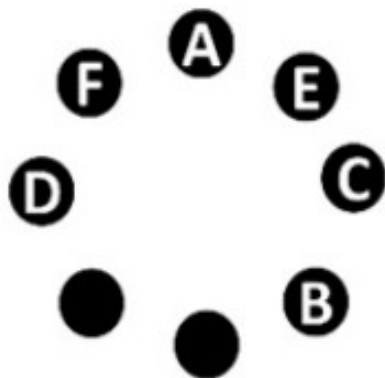
c) E

d) F

1

E, C and B each move one seat clockwise; B moves into an empty chair.

Who sits between the new members?



a) A

b) B

c) E

d) F

1

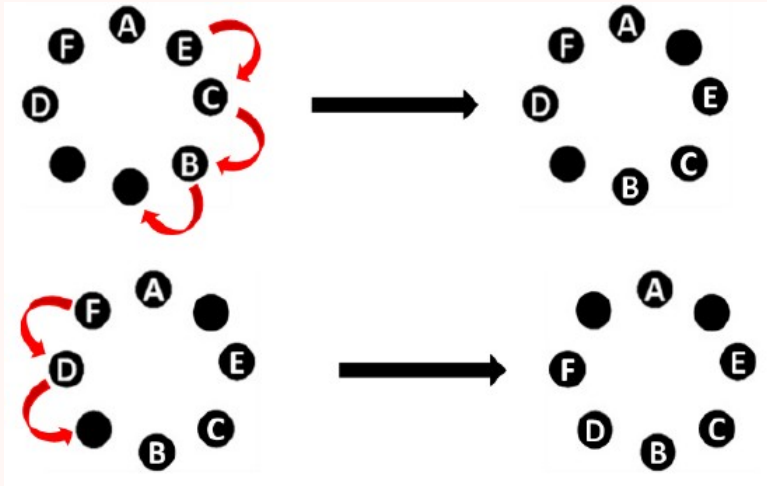
E, C and B each move one seat clockwise; B moves into an empty chair.

2

D and F each move one seat anticlockwise; D moves into the other empty chair.

Who sits between the new members?

From the Teacher Handbook



1

E, C and B each move one seat clockwise; B moves into an empty chair.

2

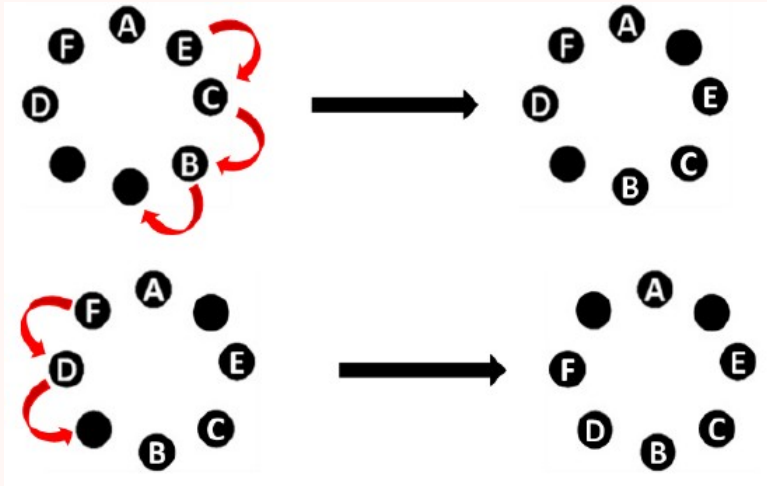
D and F each move one seat anticlockwise; D moves into the other empty chair.

3

The empty chairs are now on both sides of A, so A sits between the new members: option a.

Who sits between the new members?

From the Teacher Handbook



1 E, C and B each move one seat clockwise; B moves into an empty chair.

2 D and F each move one seat anticlockwise; D moves into the other empty chair.

3 The empty chairs are now on both sides of A, so A sits between the new members: option a.

Answer: a) A

Rohan and Kamini are facing East. Rohan takes 2 quarter turns in clockwise direction and Kamini takes 2 quarter turns in anti-clockwise direction and then Kamini takes 1 quarter turn in clockwise direction. Which of the following will lead Kamini and Rohan to face opposite directions?

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anti-clockwise direction

d) Both options a and b

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

Rohan and Kamini are facing East. Rohan takes 2 quarter turns in clockwise direction and Kamini takes 2 quarter turns in anti-clockwise direction and then Kamini takes 1 quarter turn in clockwise direction. Which of the following will lead Kamini and Rohan to face opposite directions?

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anti-clockwise direction

d) Both options a and b

Hint: Find where each person faces first. Then test each option.

Make Rohan and Kamini face opposite ways

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anti-clockwise direction

d) Both options a and b

Make Rohan and Kamini face opposite ways

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anti-clockwise direction

d) Both options a and b

1

Rohan: 2 quarter turns clockwise from East, so he faces West.

Make Rohan and Kamini face opposite ways

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anticlockwise direction

d) Both options a and b

1

Rohan: 2 quarter turns clockwise from East, so he faces West.

2

Kamini: 2 anticlockwise and 1 clockwise = 1 anticlockwise from East, so she faces North.

Make Rohan and Kamini face opposite ways

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anti-clockwise direction

d) Both options a and b

1

Rohan: 2 quarter turns clockwise from East, so he faces West.

2

Kamini: 2 anticlockwise and 1 clockwise = 1 anticlockwise from East, so she faces North.

3

One clockwise quarter turn for Kamini makes her face East, opposite Rohan: option b.

Make Rohan and Kamini face opposite ways

a) Rohan taking 1 quarter turn in a clockwise direction

b) Kamini taking 1 quarter turn in a clockwise direction

c) Rohan taking 2 quarter turns in an anti-clockwise direction

d) Both options a and b

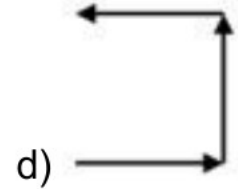
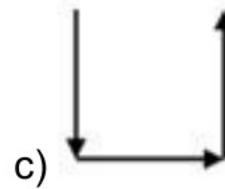
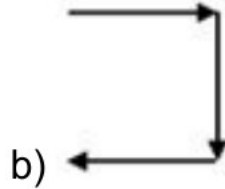
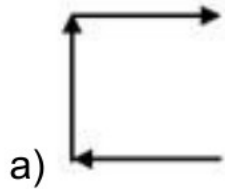
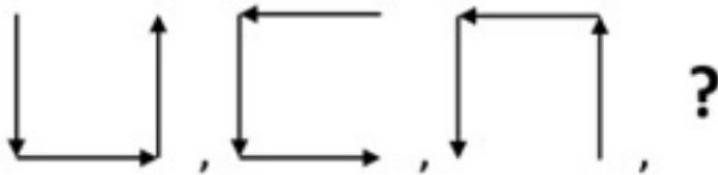
1 Rohan: 2 quarter turns clockwise from East, so he faces West.

2 Kamini: 2 anticlockwise and 1 clockwise = 1 anticlockwise from East, so she faces North.

3 One clockwise quarter turn for Kamini makes her face East, opposite Rohan: option b.

Answer: **b) Kamini taking 1 quarter turn in a clockwise direction**

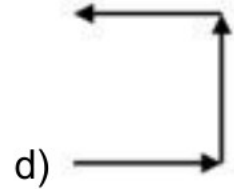
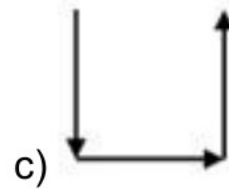
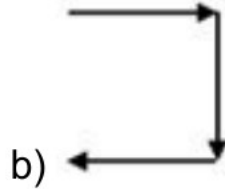
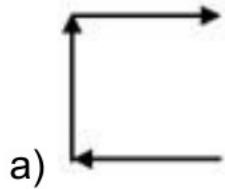
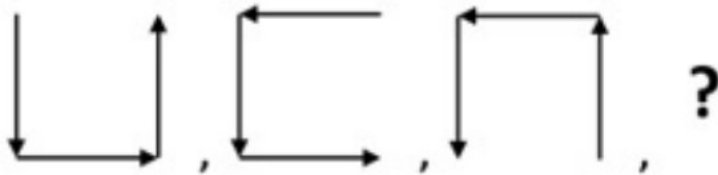
What will come in place of "?" in the given series?



60s

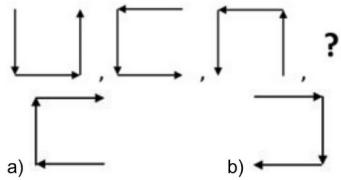
Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

What will come in place of "?" in the given series?



Hint: Compare term 1 and term 2. How has the shape turned? Check if term 3 follows the same turn.

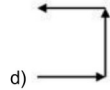
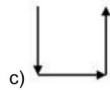
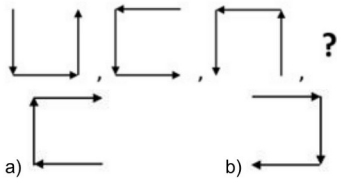
What comes next in the turning series?



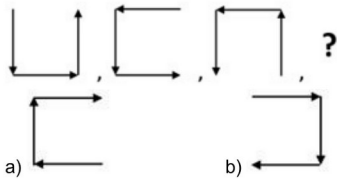
What comes next in the turning series?

1

Each term is the one before it turned by a right angle clockwise.



What comes next in the turning series?



1

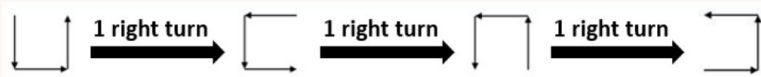
Each term is the one before it turned by a right angle clockwise.

2

Turn term 3 once more clockwise: the open side now faces left, with the arrows turning too.

What comes next in the turning series?

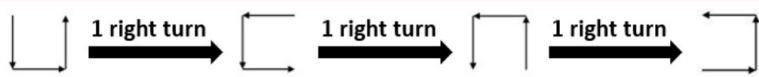
From the Teacher Handbook



- 1 Each term is the one before it turned by a right angle clockwise.
- 2 Turn term 3 once more clockwise: the open side now faces left, with the arrows turning too.
- 3 That matches option d.

What comes next in the turning series?

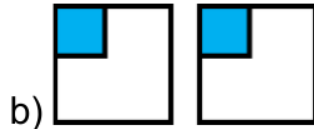
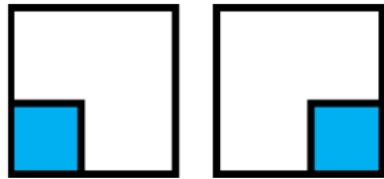
From the Teacher Handbook



- 1 Each term is the one before it turned by a right angle clockwise.
- 2 Turn term 3 once more clockwise: the open side now faces left, with the arrows turning too.
- 3 That matches option d.

Answer: **d**

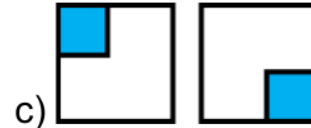
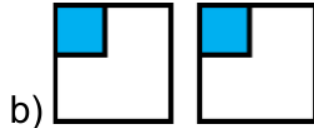
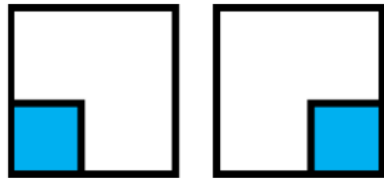
If both the blue boxes shift to the next corner in clockwise direction, how will the image look after the shift?



60s

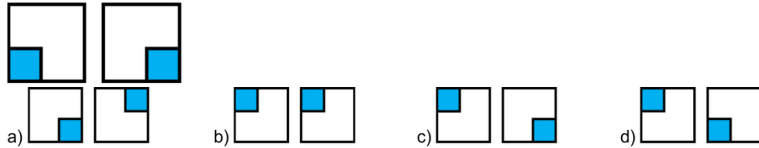
Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

If both the blue boxes shift to the next corner in clockwise direction, how will the image look after the shift?



Hint: Clockwise goes top-left, top-right, bottom-right, bottom-left, and back. Move each box one step.

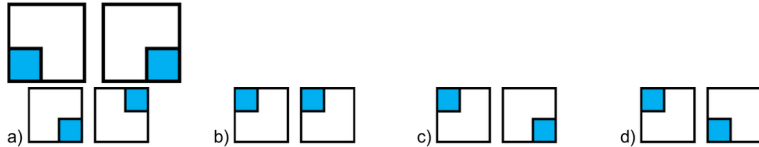
Blue boxes move one corner clockwise



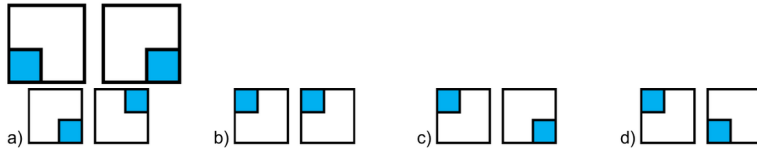
Blue boxes move one corner clockwise

1

The blue boxes are in the bottom-left and bottom-right corners.



Blue boxes move one corner clockwise



1

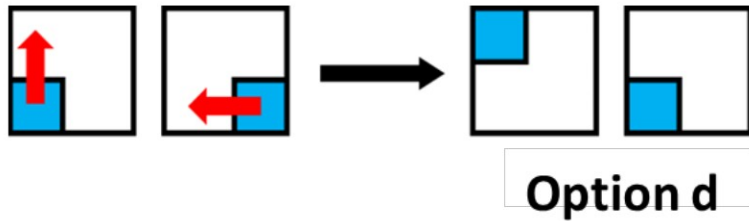
The blue boxes are in the bottom-left and bottom-right corners.

2

Moving clockwise: bottom-left goes to top-left; bottom-right goes to bottom-left.

Blue boxes move one corner clockwise

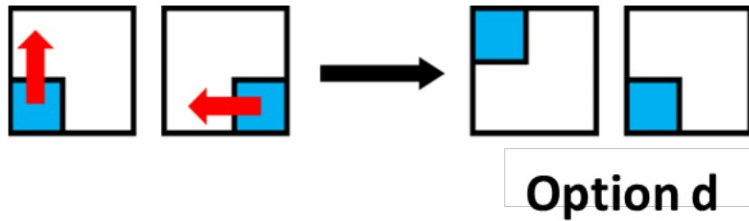
From the Teacher Handbook



- 1 The blue boxes are in the bottom-left and bottom-right corners.
- 2 Moving clockwise: bottom-left goes to top-left; bottom-right goes to bottom-left.
- 3 So the boxes are in the top-left and bottom-left corners: option d.

Blue boxes move one corner clockwise

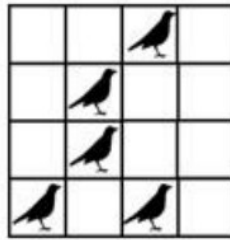
From the Teacher Handbook



- 1 The blue boxes are in the bottom-left and bottom-right corners.
- 2 Moving clockwise: bottom-left goes to top-left; bottom-right goes to bottom-left.
- 3 So the boxes are in the top-left and bottom-left corners: option d.

Answer: **d**

In the grid given below, colour some of the empty blocks such that each bird has exactly one coloured block adjacent to it. What is the MINIMUM number of blocks that need to be coloured? Note: For two blocks to be adjacent they MUST share one common side. Blocks having only a common corner are not adjacent



a) 2

b) 3

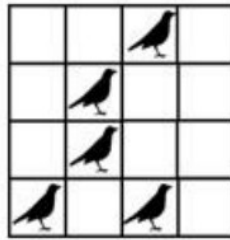
c) 4

d) 5

60s

Think on your own first. Write your answer in your handbook. Then tell your partner HOW you found it.

In the grid given below, colour some of the empty blocks such that each bird has exactly one coloured block adjacent to it. What is the MINIMUM number of blocks that need to be coloured? Note: For two blocks to be adjacent they MUST share one common side. Blocks having only a common corner are not adjacent



a) 2

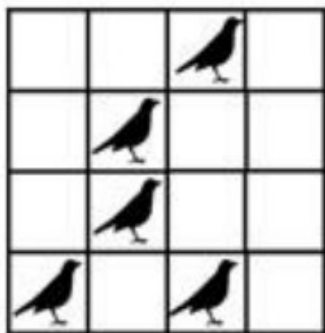
b) 3

c) 4

d) 5

Hint: Look for one empty block that touches as many birds as possible (sides only, not corners).

Fewest coloured blocks next to birds (Thinking Spot)



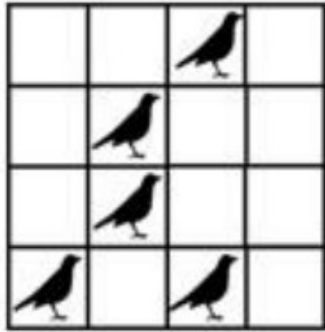
a) 2

b) 3

c) 4

d) 5

Fewest coloured blocks next to birds (Thinking Spot)



a) 2

b) 3

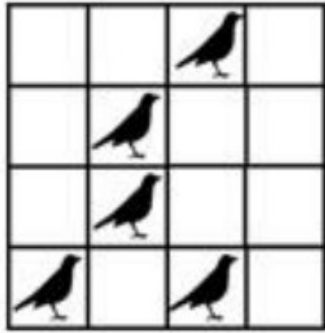
c) 4

d) 5

1

The empty block in the bottom row between two birds touches 3 birds: colour it.

Fewest coloured blocks next to birds (Thinking Spot)



a) 2

b) 3

c) 4

d) 5

1

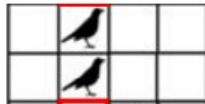
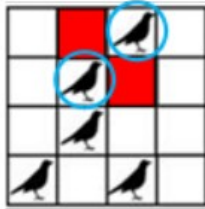
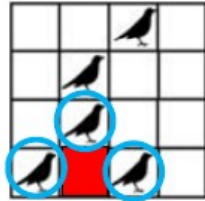
The empty block in the bottom row between two birds touches 3 birds: colour it.

2

The top two birds share two empty blocks next to both of them. Colour just one of those.

Fewest coloured blocks next to birds (Thinking Spot)

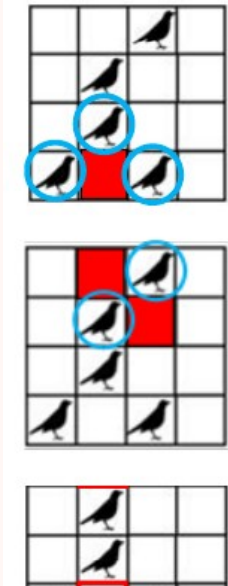
From the Teacher Handbook



- 1 The empty block in the bottom row between two birds touches 3 birds: colour it.
- 2 The top two birds share two empty blocks next to both of them. Colour just one of those.
- 3 Now every bird touches exactly one coloured block, using 2 blocks: option a.

Fewest coloured blocks next to birds (Thinking Spot)

From the Teacher Handbook



- 1 The empty block in the bottom row between two birds touches 3 birds: colour it.
- 2 The top two birds share two empty blocks next to both of them. Colour just one of those.
- 3 Now every bird touches exactly one coloured block, using 2 blocks: option a.

Answer: a) 2

Chapter 3 complete

Ask: Which question was the hardest? Which strategy helped you most: breaking it into parts, spotting a pattern, ignoring details, or going step by step?



Decomposition



Abstraction



Pattern recognition



Algorithmic
thinking

SlideLesson

Ready-to-teach smartboard lessons, one click at a time.

Licensed to: FREE SAMPLE (evaluation only) • Not for redistribution

FREE SAMPLE

Want every chapter like this?

-  **All CT chapters, Classes 3–8** Every handbook question with think time, a hint and a step-by-step solution
-  **Real click-by-click animation** The licensed version animates on your smartboard; this sample shows each click as a slide
-  **Teacher notes on every question** Facilitation tips, common mistakes and extension questions
-  **Licensed to your school** Watermarked with your school name, with yearly updates

Book a free demo for your school

slidelesson.in

WhatsApp 99949 59269