

Reasoning and Problem Solving

Position and Direction – Year 5

About This Resource

This resource is aimed at Year 5 Expected and has been designed to give children the opportunity to consolidate the skills they have learned in Summer Block 3 Position and Direction.

The questions are based on a selection of the same ‘small steps’ that are addressed in the block, but are presented in a different way so children can work through the pack independently and demonstrate their understanding and skills.

Small Steps

Position in the first quadrant

Reflection

Reflection with coordinates

Translation

Translation with coordinates

National Curriculum Objectives

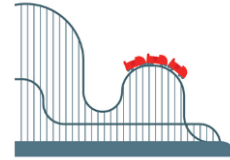
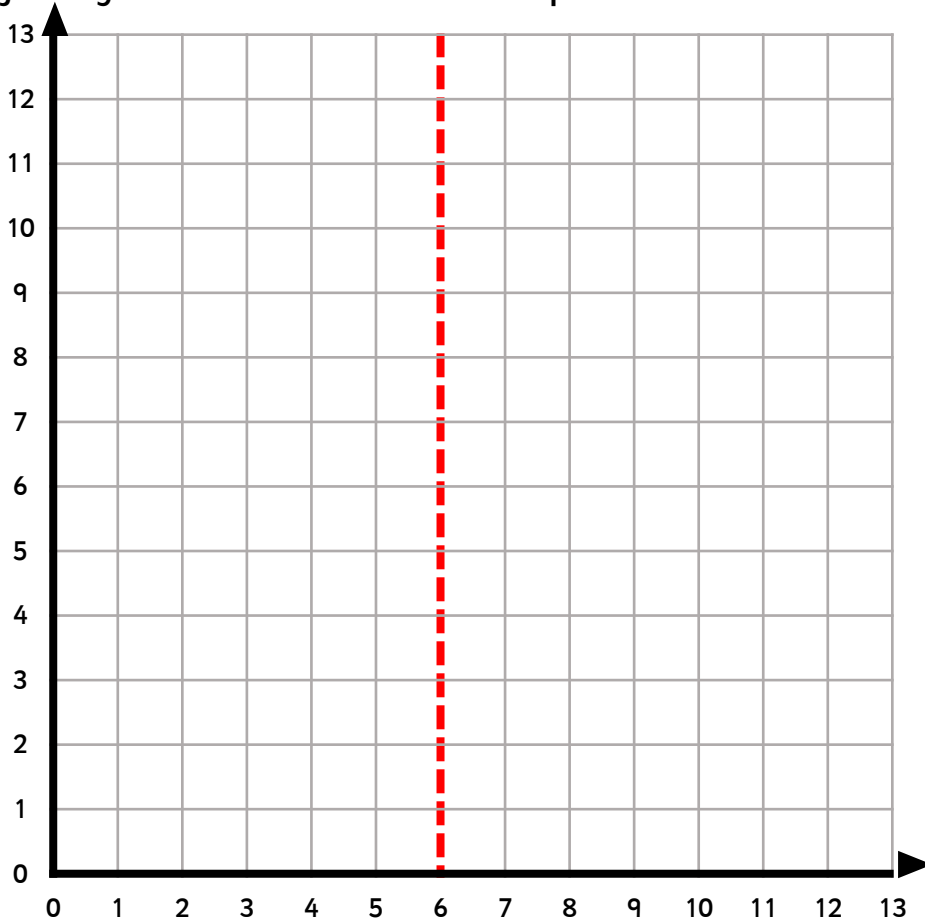
Mathematics Year 5: (5P2) [Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed](#)

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Reasoning and Problem Solving – Position and Direction – Year 5

Mr Moneybags of WonderWorld Theme Park is installing some new rides in his park and the building deadline is coming up fast. Help him make some important decisions before the inspector arrives at the end of the week – if the extension doesn't pass the inspection, the whole park will be torn down!

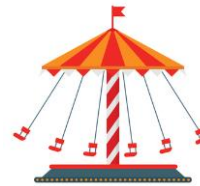
1. Mr Moneybags wants all these rides to be on the left side of the park. Plan how you will arrange the rides at the park by plotting each four pairs of coordinates and joining them to show how much space each ride will need.



Roller Coaster
(1,7) (1,9)
(6,9) (6,7)



Ferris Wheel
(1,10) (1,12)
(5,12) (5,10)



Tilt-a-Whirl
(4,0) (4,3)
(6,3) (6,0)



Carousel
(1,2) (1,4)
(3,4) (3,2)

Which ride will take up the most space?

Which ride will take up the least space?

As the crew prepare to install the rides, Mr Moneybags cries, “I have changed my mind! Left is wrong, and right is right! Put the rides on the other side!” The crew scrambles to follow his order.

2. Reflect the rides over the red line on the graph above. Draw their new locations.

“Ah, splendid! I’ll have new plans drawn up for you post-haste!” says Mr Moneybags.

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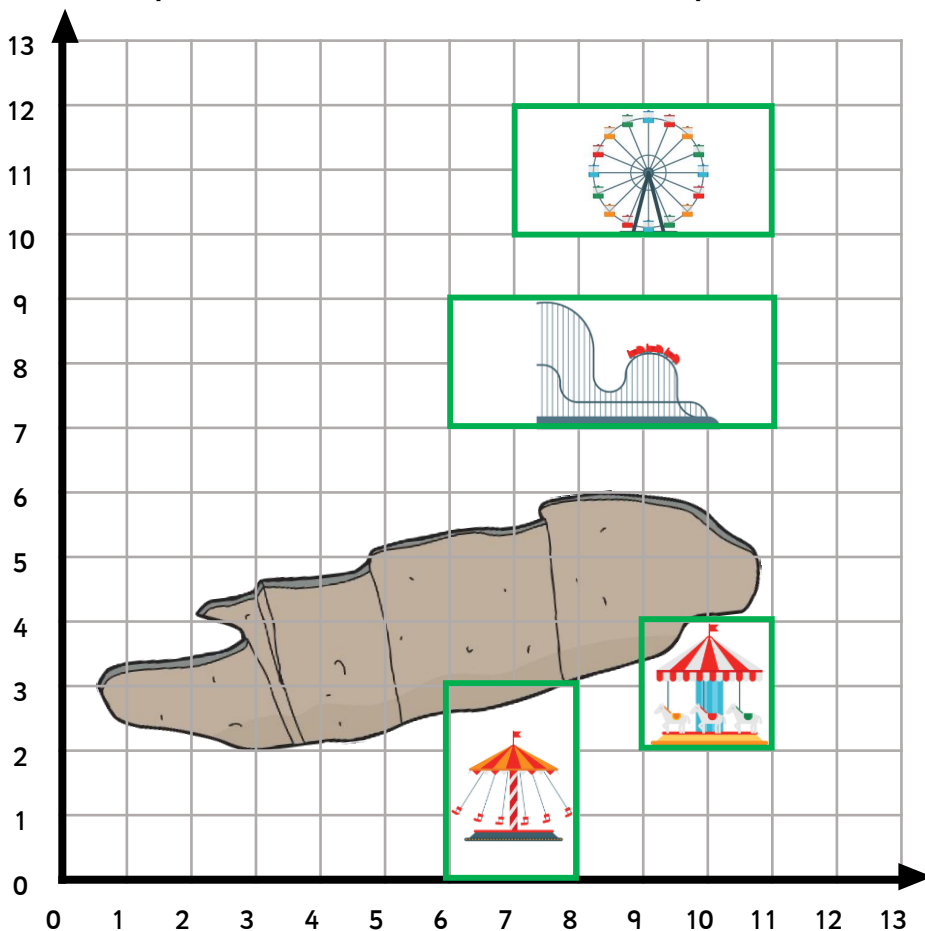
3. Write the old and new coordinates of each ride so the construction crew can get started.

Ride	Old coordinates	New coordinates after reflection
Ferris Wheel		
Roller Coaster		
Tilt-a-Whirl		
Carousel		

After working all night, the new attractions were finally up and running. Mr Moneybags arrived early to see them.

“I cannot believe this!” he cried. “A giant sinkhole has appeared in the middle of my park! What kind of terrible luck is this?! The inspector will be here in two days!”

4. Translate any rides that are too close to the sinkhole so they are somewhere safe. Draw them in their new positions so that the size of their plot does not change.

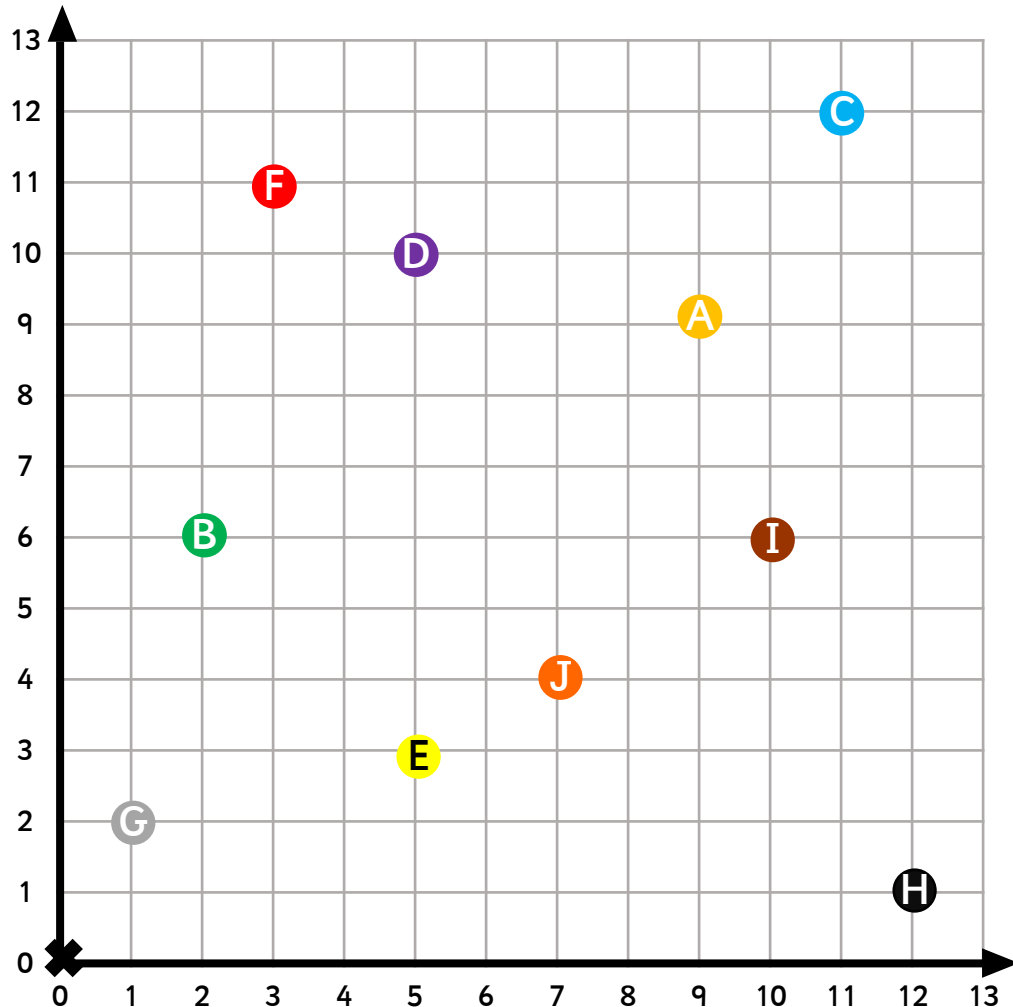


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The crew works through the night to move the rides and fill in the sinkhole. The inspector arrives at the park the next morning. He has given you a list of attractions he wishes to inspect, starting at the ticket office at the entrance of the park, which has been marked with a cross at (0,0).

5. Write the directions he will have to take to move around the park and visit the rides in the following order, starting from (0,0). The first one has been done for you.

- **A** Roller Coaster
- **B** Rocket Launch
- **C** Ferris Wheel
- **D** Tilt-a-Whirl
- **E** Haunted House
- **F** Carousel
- **G** Ice Cream Stand
- **H** Steam Train Trolley
- **I** Hot Air Balloons
- **J** Climbing Palace

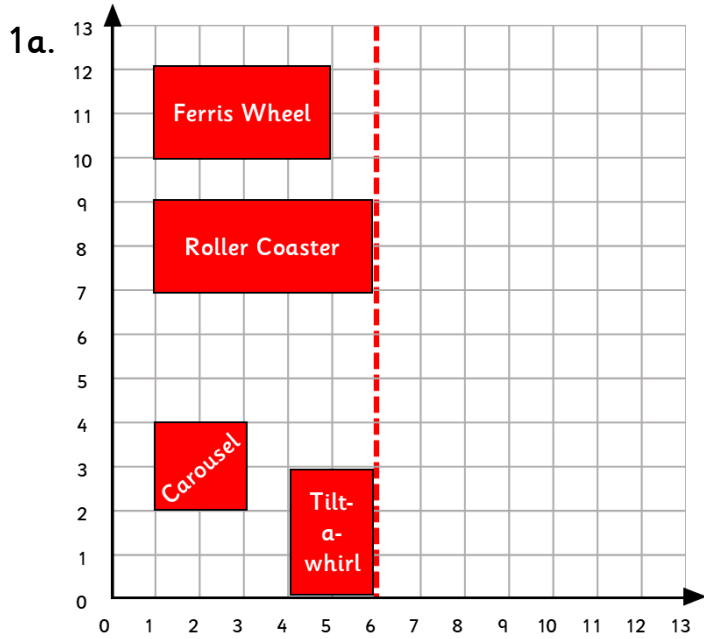


X to A	9 right, 9 up
A to B	
B to C	
C to D	
D to E	

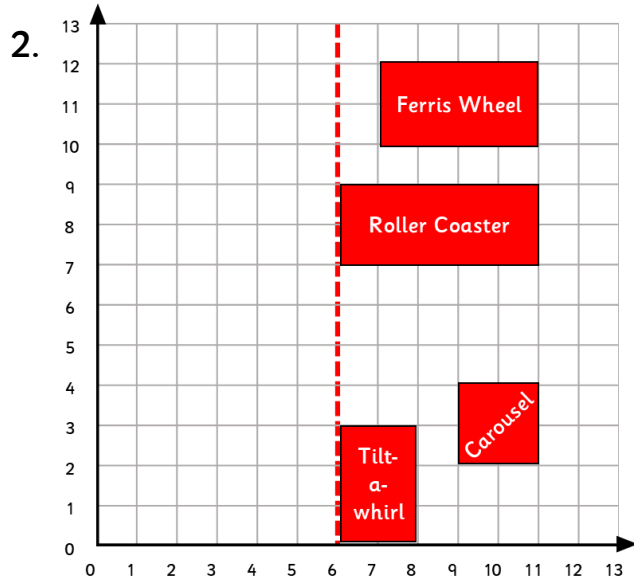
E to F	
F to G	
G to H	
H to I	
I to J	

All your hard work has paid off; the inspector is very happy with the park! Mr Moneybags is delighted with your contribution. See you at the Grand Opening!

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1b. **Most space: Roller coaster**
Least space: Carousel



3. Ride

Old coordinates

New coordinates after reflection

Ferris Wheel

(1,10) (1,12) (5,12) (5,10)

(7,10) (7,12) (11,12) (11,10)

Roller Coaster

(1,7) (1,9) (6,9) (6,7)

(6,7) (6,9) (11,9) (11,7)

Tilt-a-Whirl

(4,0) (4,3) (6,3) (6,0)

(6,0) (6,3) (8,3) (8,0)

Carousel

(1,2) (1,4) (3,4) (3,2)

(9,2) (9,4) (11,4) (11,2)

4. Several possible answers. The Carousel and Tilt-a-Whirl should both be translated to the upper-left of the quadrant. Alternatively, there is enough space for one of the rides in the bottom right of the quadrant.

5.

X to A	9 right, 9 up
A to B	7 left, 3 down
B to C	9 right, 6 up
C to D	6 left, 2 down
D to E	7 down

E to F	2 left, 8 up
F to G	2 left, 9 down
G to H	11 right, 1 down
H to I	2 left, 5 up
I to J	3 left, 2 down