Reasoning and Problem Solving
Step 6: Parallel and Perpendicular

National Curriculum Objectives:

Mathematics Year 3: (3G2) Identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Complete a table showing the relationship between a set of vertical and horizontal lines, considering parallel and perpendicular.
Expected Complete a table showing the relationship between a set of vertical, horizontal or diagonal lines, considering parallel and perpendicular.
Greater Depth Complete a table showing the relationship between a set of more than 2 vertical, horizontal or diagonal lines, considering parallel and perpendicular.

Questions 2, 5 and 8 (Reasoning)
Developing Explain whether a statement is correct using knowledge of parallel and perpendicular. Shapes used include a rhombus and a rectangle in 'standard' orientation.
Expected Explain whether a statement is correct using knowledge of parallel and perpendicular. Regular shapes and irregular quadrilaterals used and may not be in 'standard' orientation.
Greater Depth Explain whether a statement is correct using knowledge of parallel and perpendicular. Irregular and compound shapes used and may not be in 'standard' orientation.

Questions 3, 6 and 9 (Problem Solving)
Developing Identify both sets of parallel or perpendicular lines that can be made by joining dots. Horizontal or vertical lines only.
Expected Identify all of the sets of parallel or perpendicular lines that can be made by joining dots. Most parallel or perpendicular lines are horizontal or vertical.
Greater Depth Identify all of the sets of 3 parallel or perpendicular lines that can be made by joining dots. Most parallel or perpendicular lines are diagonal.

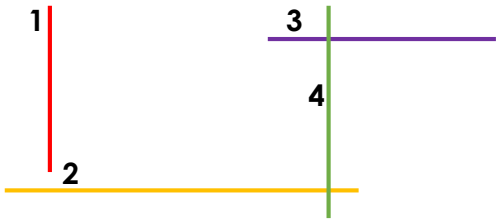
More Year 3 Properties of Shapes resources.

Did you like this resource? Don't forget to review it on our website.

Parallel and Perpendicular

1a. Complete the table considering parallel and perpendicular.

	Relationship	
Line 1		Line 4
Line 3		Line 4

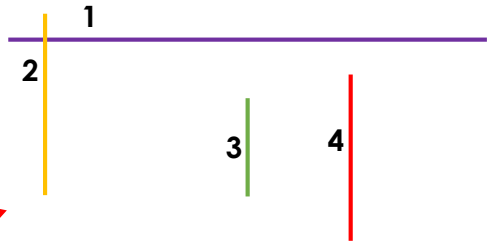


D

PS

1b. Complete the table considering parallel and perpendicular

	Relationship	
Line 2	Perpendicular	
	Parallel	Line 4



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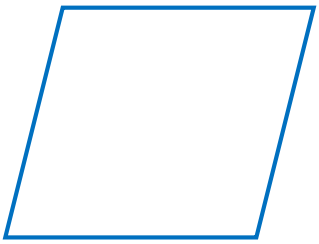
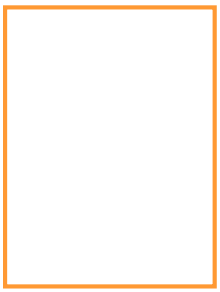
2a. Tilly thinks that the shape below has a set of perpendicular lines. Do you agree? Explain your answer.



D

R

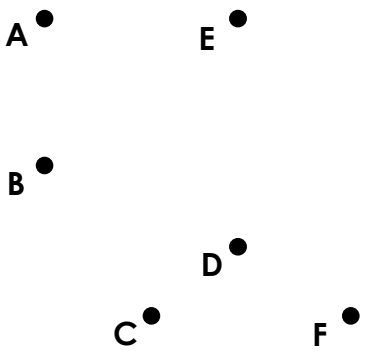
2b. Hannah thinks that this shape has 2 sets of parallel lines. Do you agree? Explain your answer.



D

R

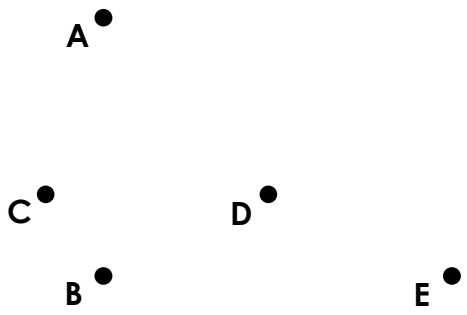
3a. Join the dots to work out how many different sets of parallel lines can be made.



D

PS

3b. Join the dots to work out how many different sets of perpendicular lines can be made.



D

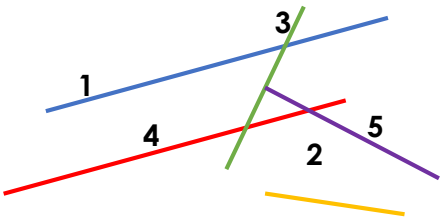
PS

Parallel and Perpendicular

Parallel and Perpendicular

4a. Complete the table considering parallel, perpendicular and neither.

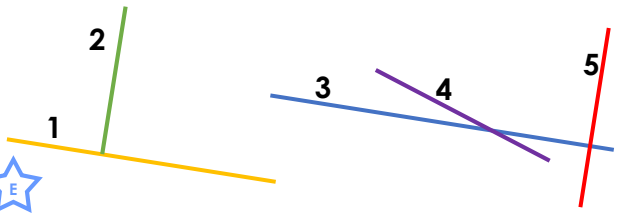
	Relationship	
Line 1		Line 4
	Perpendicular	Line 3
Line 2		Line 5



E PS

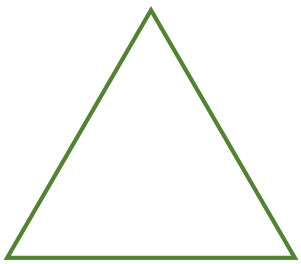
4b. Complete the table considering parallel, perpendicular and neither.

	Relationship	
Line 3		Line 5
Line 1		Line 3
Line 2	Parallel	



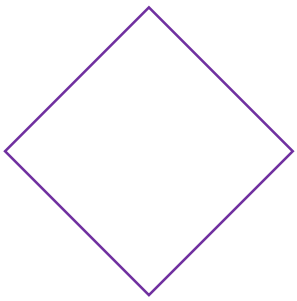
E PS

5a. Peter thinks that this shape has a set of parallel lines. Do you agree? Explain your answer.



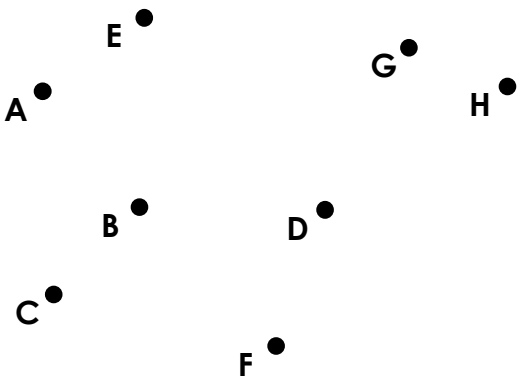
E R

5b. Miriam thinks that this shape has 2 sets of perpendicular lines. Do you agree? Explain your answer.



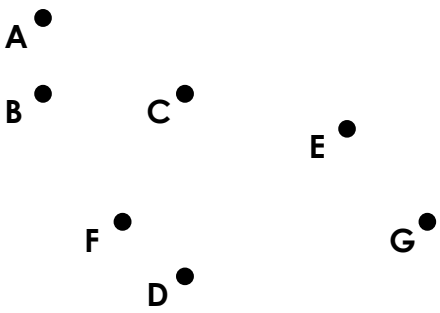
E R

6a. Join the dots to work out how many different sets of parallel lines can be made.



E PS

6b. Join the dots to work out how many different sets of perpendicular lines can be made.

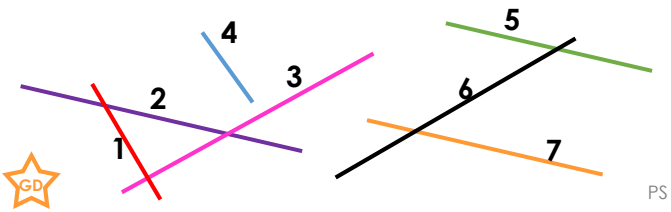


E PS

Parallel and Perpendicular

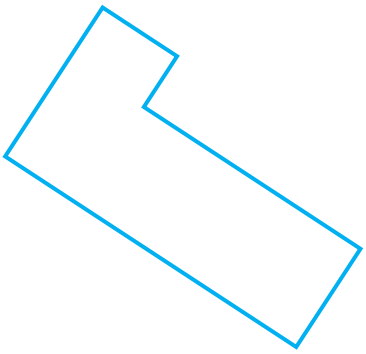
7a. Complete the table considering parallel, perpendicular or neither.

	Relationship		Relationship	
Line 5	Parallel		Parallel	
Line 3		Line 4	Perpendicular	
Line 1	Parallel			



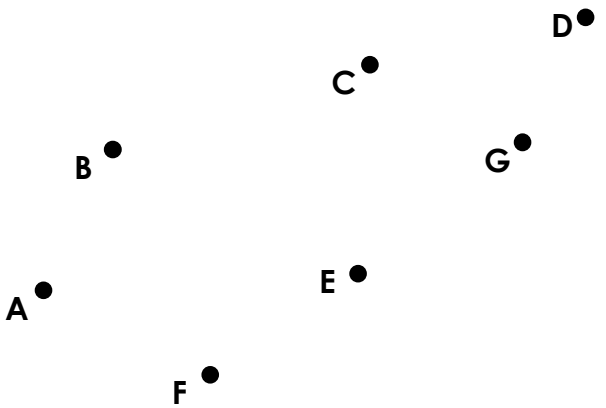
GD PS

8a. Hector thinks that this shape has a set of perpendicular lines and 2 sets of parallel lines. Do you agree? Explain your answer.



GD R

9a. Join the dots to work out how many different sets of 3 parallel lines can be made.

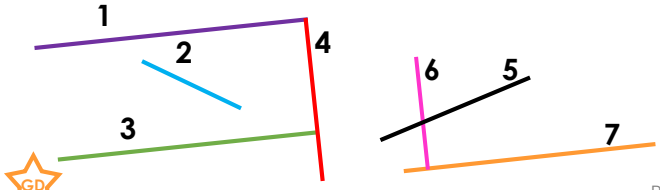


GD PS

Parallel and Perpendicular

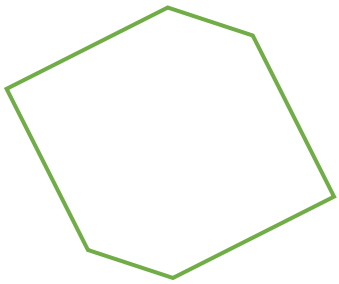
7b. Complete the table considering parallel, perpendicular or neither.

	Relationship		Relationship	
Line 1		Line 7	Parallel	
Line 4		Line 3		Line 7
Line 6	Perpendicular		Parallel	



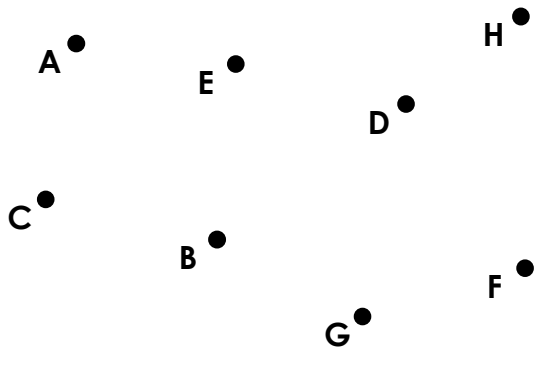
GD PS

8b. Khalid thinks that this shape has 2 sets of parallel lines and 1 set of perpendicular lines. Do you agree? Explain your answer.



GD R

9b. Join the dots to work out how many sets of perpendicular lines can be made.



GD PS

Reasoning and Problem Solving
Parallel and Perpendicular

Developing

1a.

	Relationship	
Line 1	Parallel	Line 4
Line 3	Perpendicular	Line 4

2a. Tilly is incorrect. A rhombus does not have any perpendicular lines as they do not meet at a right angle.

3a. There are 2 sets of parallel lines:
A – B and E – D
A – E and C – F

Expected

4a.

	Relationship	
Line 1	Parallel	Line 4
Line 5	Perpendicular	Line 3
Line 2	Neither	Line 5

5a. Peter is incorrect. A triangle does not have any parallel lines as all the lines join together.

6a. There are 2 sets of parallel lines:
A – H and B – D
A – B and E – D

Greater Depth

7a.

	Relationship		Relationship	
Line 5	Parallel	Line 7	Parallel	Line 2
Line 3	Neither	Line 4	Perpendicular	Line 1
Line 1	Parallel	Line 4		

8a. Hector is incorrect as the compound shape has 6 sets of perpendicular lines. He is correct that there are 2 sets of parallel lines (3 lines in each set).

9a. There are 2 sets of 3 parallel lines:
A – B and F – C and G – D
A – F and B – E and C – G

Reasoning and Problem Solving
Parallel and Perpendicular

Developing

1b.

	Relationship	
Line 2	Perpendicular	Line 1
Line 2 and 3	Parallel	Line 4

2b. Hannah is correct. A rectangle has 2 sets of parallel lines.

3b. There are 2 sets of perpendicular lines:
A – B and B – E
A – B and C – D

Expected

4b.

	Relationship	
Line 3	Perpendicular	Line 5
Line 1	Parallel	Line 3
Line 2	Parallel	Line 5

5b. Miriam is incorrect. A square has 4 sets of perpendicular lines as it has 4 right angles.

6b. There are 3 sets of perpendicular lines:
A – B and B – C
B – C and C – D
C – D and F – G

Greater Depth

7b.

	Relationship		Relationship	
Line 1	Parallel	Line 7	Parallel	Line 3
Line 4	Perpendicular	Line 3	Neither	Line 7
Line 6	Perpendicular	Line 7	parallel	Line 3 or 1

8b. Khalid is incorrect as the shape has 3 sets of parallel lines and 2 sets of perpendicular lines.

9b. There are 3 sets of perpendicular lines:
A – B and C – E
A – B and B – D
B – D and D – F
B – G and G – H