Reasoning and Problem Solving
Step 3: Count Vertices on 2D Shapes

National Curriculum Objectives:

Mathematics Year 2: (2G2a) Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Calculate and compare the amount of vertices on simple regular 2D shapes.
Expected Calculate and compare the amount of vertices on regular and some irregular 2D shapes.
Greater Depth Calculate and compare the amount of vertices on irregular 2D shapes.

Questions 2, 5 and 8 (Problem Solving)
Developing Sort simple, regular 2D shapes in a Venn diagram using knowledge of shape properties.
Expected Sort regular and irregular 2D shapes in a Venn diagram using knowledge of shape properties.
Greater Depth Sort irregular 2D shapes in a Venn diagram using knowledge of shape properties.

Questions 3, 6 and 9 (Reasoning)
Developing Prove or disprove a statement about vertices involving regular 2D shapes.
Expected Prove or disprove a statement about vertices involving regular and irregular 2D shapes.
Greater Depth Prove or disprove a statement about vertices involving irregular 2D shapes.

More Year 2 Properties of Shape resources.

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

Reasoning and Problem Solving – Count Vertices on 2D Shapes

1a. Sinead and Ben are comparing the amount of vertices their shapes have.

I have a triangle and a square.

Sinead

I have 3 triangles.

Ben

How many vertices does each child have in total? Who has the most?

D PS

1b. Hafsa and Cian are comparing the amount of vertices their shapes have.

I have a pentagon and a square.

Hafsa

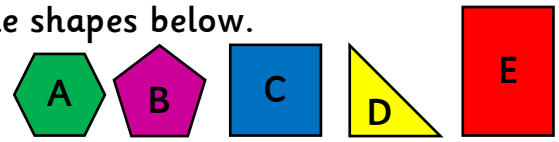
I have 3 rectangles.

Cian

How many vertices does each child have in total? Who has the least?

D PS

2a. Complete the Venn diagram using the shapes below.

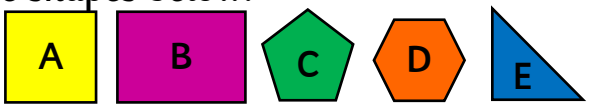


Irregular shapes

4 or more vertices

D PS

2b. Complete the Venn diagram using the shapes below.



Regular shapes

Less than 5 vertices

D PS

3a. Chuan says:

Two triangles have the same amount of vertices as a hexagon.

Chuan

Is he correct?

Explain how you know.

D R

3b. Josh says:

A square and a triangle have the same amount of vertices as a pentagon.

Josh

Is he correct?

Explain how you know.

D R

Reasoning and Problem Solving – Count Vertices on 2D Shapes

4a. Gabriel and Sean are comparing the amount of vertices their shapes have.

I have a pentagon and a kite.

Gabriel

I have 2 triangles and a square.

Sean

How many vertices does each child have in total? Who has the most?

E PS

4b. Lucy and Isabel are comparing the amount of vertices their shapes have.

I have an octagon and a pentagon.

Lucy

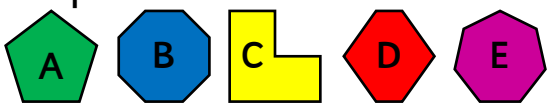
I have 2 rectangles and a triangle.

Isabel

How many vertices does each child have in total? Who has the least?

E PS

5a. Complete the Venn diagram using the shapes below.

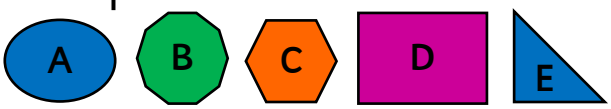


Regular shapes

More than 5 vertices

E PS

5b. Complete the Venn diagram using the shapes below.



Regular shapes

Less than 8 vertices

E PS

6a. Cian says:

A triangle and a pentagon have the same amount of vertices as an octagon.

Cian

Is he correct?

Explain how you know.

E R

6b. Ben says:

A square and a hexagon have the same amount of vertices as an nonagon.

Ben

Is he correct?

Explain how you know.

E R

Reasoning and Problem Solving – Count Vertices on 2D Shapes

7a. Alice and Lucy are comparing the amount of vertices their shapes have.

I have a hexagon and a decagon

Alice

I have 2 triangles and an octagon.

Lucy

How many vertices does each child have in total? Who has the most?

GD PS

7b. Kelly and Josh are comparing the amount of vertices their shapes have.

I have a hexagon and a two kites.

Kelly

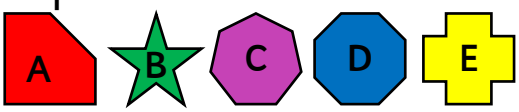
I have 2 pentagons and a triangle.

Josh

How many vertices does each child have in total? Who has the least?

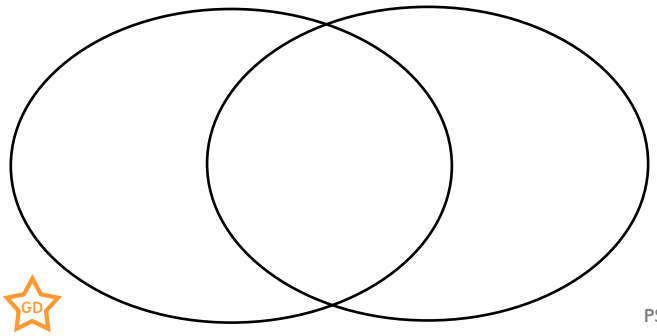
GD PS

8a. Complete the Venn diagram using the shapes below.



Irregular shapes

7 or more vertices

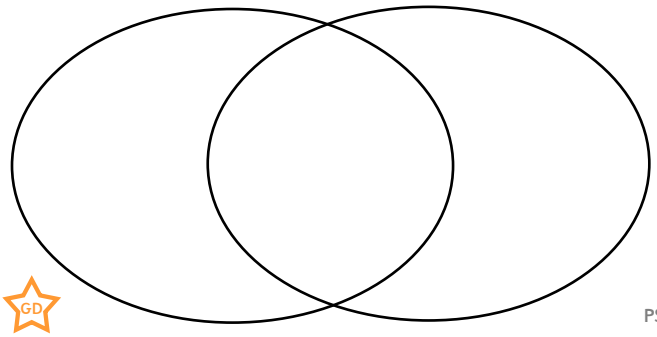


GD PS

8b. Complete the Venn diagram using the shapes below.

Regular shapes

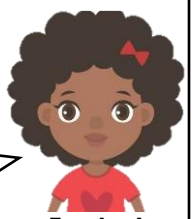
8 or less vertices



GD PS

9a. Isabel says:

Two pentagons and a star have less than 20 vertices altogether.



Isabel

Is she correct?

Explain how you know.

GD R

9b. Sean says:

A nonagon and a decagon have more than 15 vertices altogether.

Sean

Is he correct?

Explain how you know.

GD R

Reasoning and Problem Solving – Count Vertices on 2D Shapes

Developing

1a. Sinead has 7, Ben has 9. Ben has the most.
1b. Hafsa has 9, Cian has 12. Hafsa has the least.
2a. Irregular shapes: D. 4 or more vertices: A, B and C. Both: E.
2b. Regular shapes: C and D. Less than 5 vertices: B and E. Both: A.
3a. Chuan is correct. A triangle has 3 vertices so two triangles have 6 vertices, a hexagon also has 6 vertices.
3b. Josh is incorrect. A square has 4 vertices and a triangle has 3 vertices which is 7 vertices altogether, a pentagon has 5 vertices.

Expected

4a. Gabriel has 9, Sean has 10. Sean has the most.
4b. Lucy has 13, Isabel has 11. Isabel has the least.
5a. Regular shapes: A. More than 5 vertices: C and D. Both: B and E.
5b. Regular shapes: B. Less than 8 vertices: A, D, E. Both: C.
6a. Cian is correct. A triangle has 3 vertices and a pentagon has 5 vertices which is 8 vertices altogether, an octagon also has 8 vertices.
6b. Ben is incorrect. A square has 4 vertices and a hexagon has 6 vertices which is 10 vertices altogether, a nonagon has 9 vertices.

Greater Depth

7a. Alice has 16, Lucy has 14. Alice has the most.
7b. Kelly has 14, Josh has 13. Josh has the least.
8a. Irregular shapes: A. 7 or more vertices: C and D. Both: B and E.
8b. Regular shapes: D. 8 or less vertices: A, B, C and E.
9a. Isabel is incorrect. A pentagon has 5 vertices so 2 pentagons has 10 vertices, a star has 10 vertices, they have 20 vertices altogether.
9b. Sean is correct. A nonagon has 9 vertices and a decagon has 10 vertices which is 19 vertices altogether.