Parent-Pupil

# MATHS

## Information File 3

*Shape & Space*

*for SEAG Entrance Assessment*



PMP Publications

**Other titles available from PMP Publications**
*for SEAG Entrance Assessment preparation*

- Parent-Pupil English Information File 1: *Punctuation, Grammar and Spelling*
- Parent-Pupil English Information File 2: *Comprehension and Vocabulary*
- English Punctuation, Grammar and Spelling Test Pack 1 (*39 check-up exercises*)
- English Punctuation, Grammar and Spelling Test Pack 2 (*27 check-up exercises*)
- English Comprehension Test Pack 1 (*16 tests*)
- English Comprehension Test Pack 2 (*16 tests*)

- Parent-Pupil Maths Information File 1: *Number*
- Parent-Pupil Maths Information File 2: *Measures*
- Parent-Pupil Maths Information File 3: *Shape and Space*
- Parent-Pupil Maths Information File 4: *Handling Data*
- Maths Question Test Pack (*6 tests*)

- Practice Tests Series 1 (*3 complete tests*)
- Practice Tests Series 2 (*3 complete tests*)
- Practice Tests Series 3 (*3 complete tests*)

# Contents

# Introduction

This Information File is a comprehensive revision package in Maths covering all aspects of the **Shape and Space** attainment target as required for the SEAG Entrance Assessment. The 4 books in the series provide a comprehensive revision guide for parents, and also covers the mathematics requirements of The Northern Ireland Curriculum for the end of Key Stage 2.

It should be understood, however, when using the book that mathematical processes can often be performed in more than one prescribed way and for some children the methods outlined within the book might not always 'unlock the door' to understanding.

We recommend that when a child is experiencing difficulty in grasping a specific mathematical process that parents meet with their child's class teacher to discuss the nature of the problem and possible solutions to it.

The Information File comprises:

- A comprehensive reference file detailing information that children should know for the **Shape and Space** attainment target of the mathematics element of the SEAG Entrance Assessment and at the end of Key Stage 2. The content which should be learnt, is outlined briefly in a number of ***NEED TO KNOW*** boxes.

NEED TO KNOW

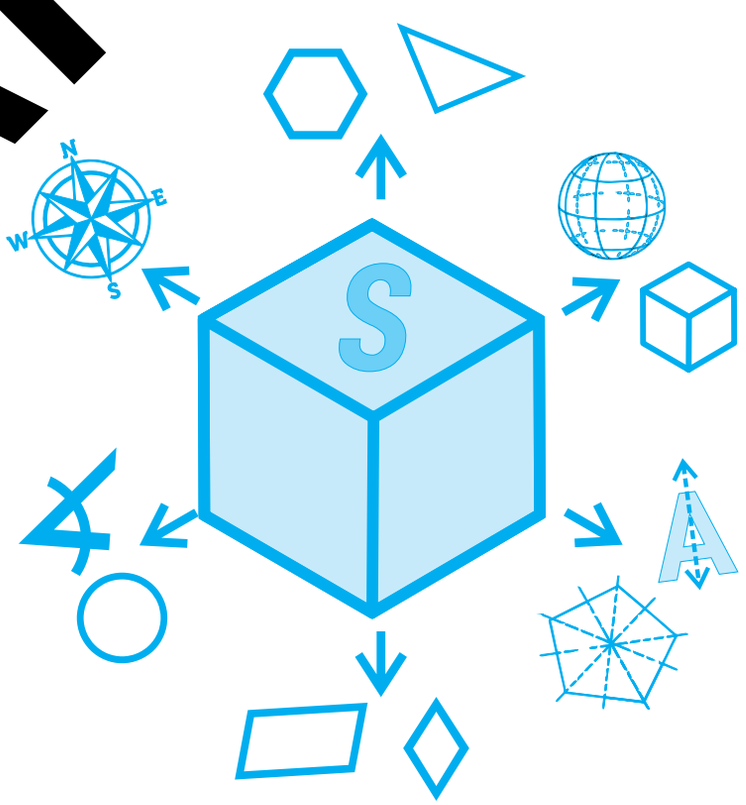
- A variety of example questions, with annotated step by step procedures illustrating how answers can be calculated.

Step 1
Step 2
Step 3

-  Occasional tips on how to work out problems.
- 3 practice tests that mirror the format of the maths element of the SEAG Entrance Assessment.

# Shape and Space





# Solid Shapes — 3-Dimensional

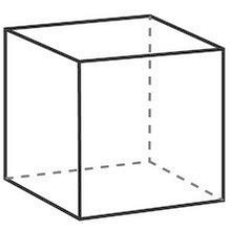
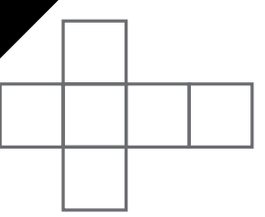
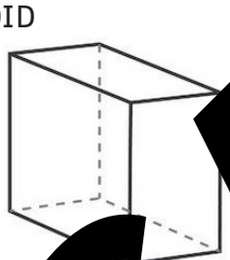
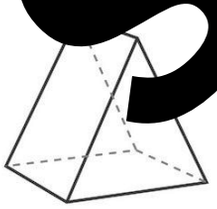
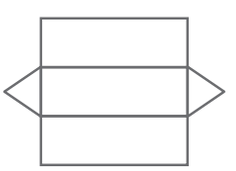
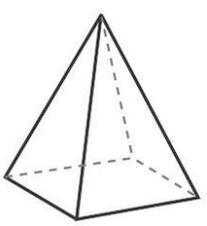
Solid shapes are called 3-Dimensional or 3-D shapes because they have 3 dimensions: length, width and height.

The following are 3-D shapes and their properties.

## NEED TO KNOW

Children should know the properties of all the 3-D shapes illustrated, e.g. the number of faces, edges and vertices (corners). Children should also be able to recognise the nets of 3-D shapes, describing and understanding their make-up or construction, e.g. the net of the triangular prism has 3 rectangles and 2 triangles.



| Shape | Properties | Net |
|---|---|---|
| CUBE  | ✳ 6 faces (all [illegible])<br>✳ 8 vertices (*or* corners)<br>✳ 12 edges |  |
| CUBOID  | [illegible] (6 rectangles *or* [illegible]rectangles + 2 squares)<br>✳ 8 [illegible]tices<br>✳ 12 edges |  |
| TRIANGULAR PRISM  | ✳ 5 faces (2 triangles, 3 rectangles)<br>✳ 6 vertices<br>✳ 9 edges |  |
| SQUARE BASED PYRAMID  | ✳ 5 faces<br>✳ 5 vertices (*or* corners)<br>✳ 8 edges |  |

# Lines

## NEED TO KNOW

Children should know the meanings of the terms explained below and identify these lines in a variety of contexts.

**HORIZONTAL**

a line straight across (parallel to the Earth's horizon)

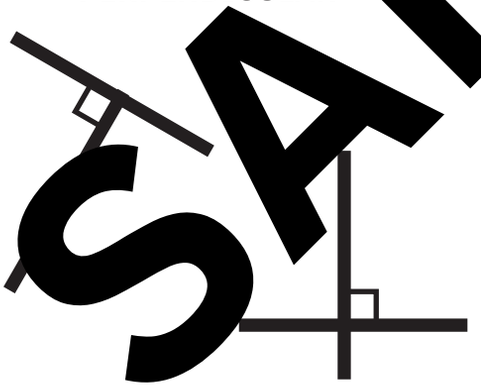
**VERTICAL**

a line straight 'up and down' (at right angles to the Earth's horizontal)

**DIAGONAL**

a line joining opposite corners in a shape

**PERPENDICULAR**



lines which meet or cross at right angles to each other

**PARALLEL**

lines which always remain the same distance apart and therefore never meet

# Triangles

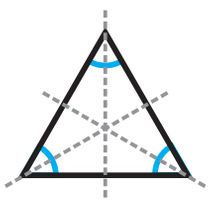
## NEED TO KNOW

Children should know the properties of each of the 4 triangles below, and be able to use these facts in a variety of problem-solving situations.

**FACTS:**

- A flat shape with THREE sides.
- The angles in all triangles add up to 180°.

### EQUILATERAL



- all 3 sides are equal
- all angles are 60°
- 3 lines of symmetry

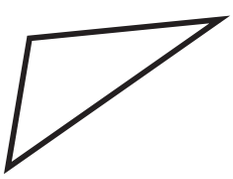
### ISOSCELES

- sides equal in length
- equal angles
- lines of symmetry

### RIGHT-ANGLED

- contains a right angle (90°)

### SCALENE



- all 3 sides are different lengths
- no equal angles
- no lines of symmetry



Answers to example questions on page 23:
1. A = Right-angled triangle, B =Isosceles triangle, C = Scalene triangle, D = Equilateral triangle;
2. A = Equilateral triangle, B = Isosceles triangle, C = Right-angled triangle, D = Scalene triangle

# Reflective Symmetry

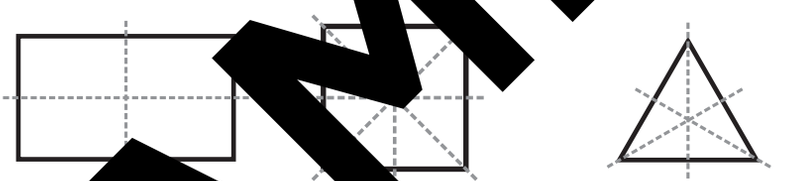
## NEED TO KNOW

Children should know the number of lines of symmetry in a variety of 2-D shapes and be able to reflect shapes using a mirror.

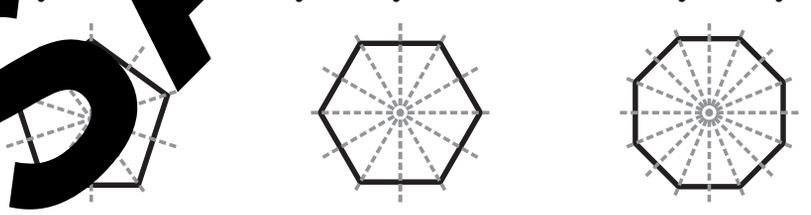
If a shape can be folded in the middle so that one half of the shape fits exactly over the other then the shape is said to be symmetrical. The line where the fold is made is s[illegible]to be the line of symmetry.

e.g. some letters can have lines of symmetry:


e.g. 2-D shapes have lines of symm[illegible]



- A **rec[illegible]gle** has 2 [illegible]s of symmet[illegible]
- A **square** has [illegible]nes of symmetry
- An **equilateral triangle** has 3 lines of symmetry



- A **regular pentagon** has 5 lines of symmetry and 5 equal sides
- A **regular hexagon** has 6 lines of symmetry and 6 equal sides
- A **regular octagon** has 8 lines of symmetry and 8 equal sides

**Regular shapes have the same number of lines of symmetry as they have sides.**

**All the angles in regular shapes are equal.**

Shape and Space

Mark: / 28

# Test 1

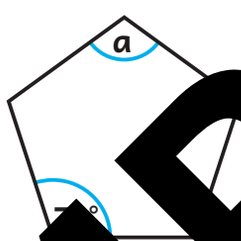
Children should have **30 minutes** to complete this test.

| DATE OF TEST | | | | | |
|---|---|---|---|---|---|
| Day | | Month | | Year | |
| | | | | | |

**Candidate's Name**

You should choose the **best** answer and mark the box beside or below its letter with a thin horizontal line like this ▭.

**1** **What is the size of angle *a*?**




**A** 60° ▭ **B** 70° ▭ **C** [illegible]° **D** 72° ▭ **E** 73° ▭

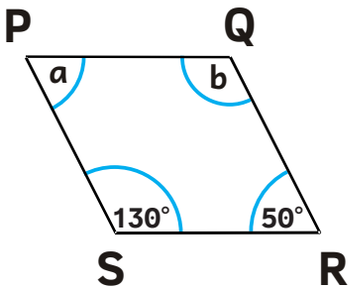
**2** **If I was facing West and turned 225° clockwise, in which direction would I be pointing?**

[illegible] **B** [illegible] **C** NE ▭ **D** NW ▭ **E** SE ▭

**3** **Which of these shapes do not tessellate?**

▭ **A** rhombus
▭ **B** square
▭ **C** regular hexagon
▭ **D** regular octagon
▭ **E** equilaterial triangle

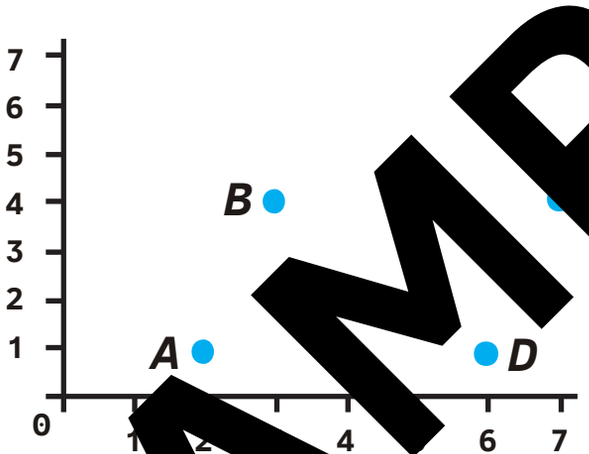
**27** What size are angles *a* and *b*?




*a* = _____ °

_____ °

**28** If you join point A to B to C and back to point A, what shape have you made?



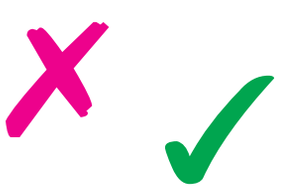

_____



## END OF TEST

# Answer Key





## Test 3

*see page 52*

1. D – It is a rhombus
2. C – 45°
3. C
4. D – 141°
5. D – 3
6. C – Apartment Block
7. D – 60°
8. C
9. B – 1
10. B – 20°
11. C – GB
12. C – 1 and 3
13. D
14. C – 180°
15. B – obtuse
16. B – NE
17. D – 6
18. D – (9, 4)
19. D – Square-based pyramid
20. C – 2
21. C – NW
22. E – 8
23. (8, 6)
24. *a* , *d*, *e*
25. [illegible]
26. [illegible]
27. [illegible]gular-based pyramid *or* tetrah[illegible]on
28. 210°