

**Spring 2: Week 2.**

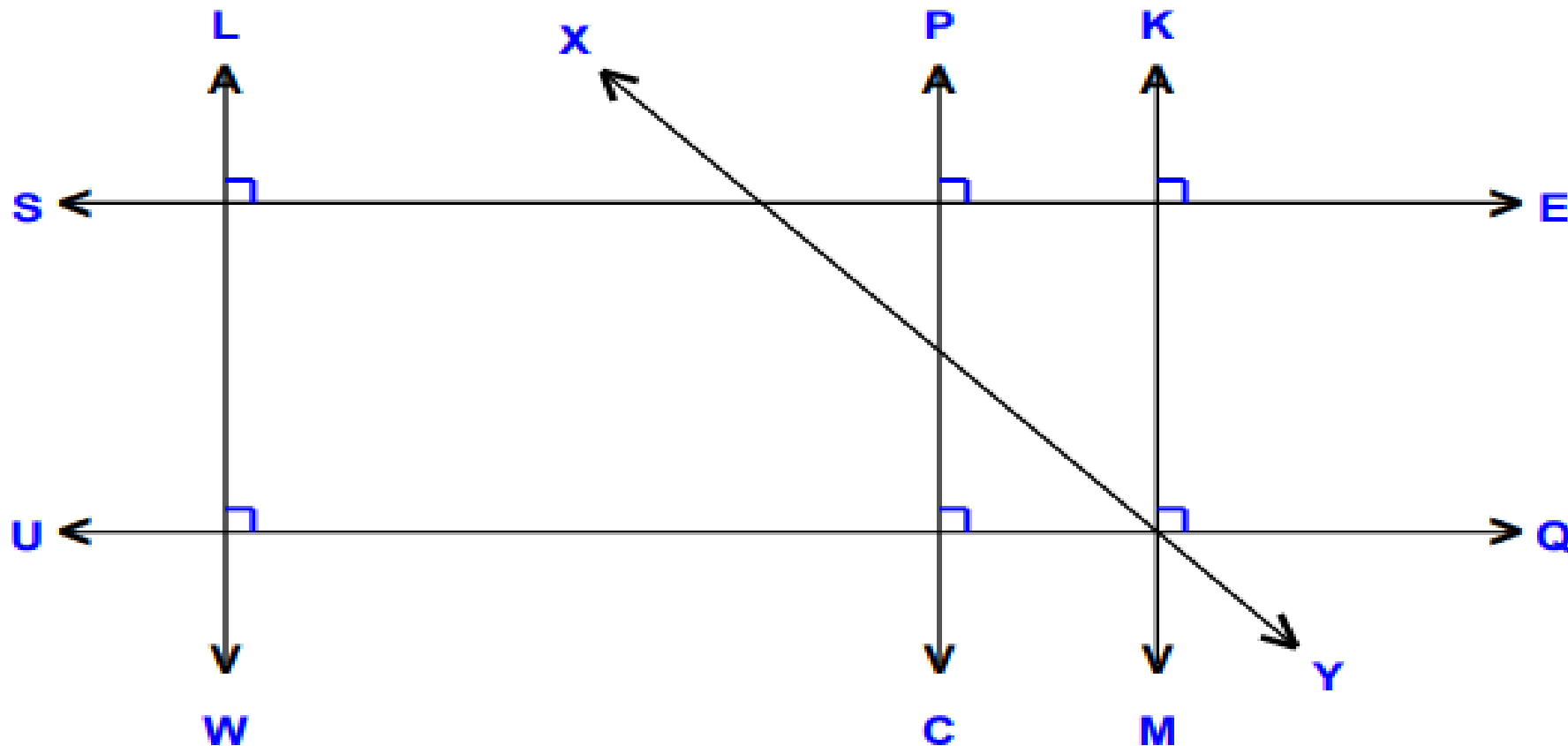
**Mrs Brown's Group: Wednesday  
Properties of shape.**

You do ...



Do these in your book before you put the date:

Identify the given pair of lines as either parallel, perpendicular, or intersecting.



# You do ...



Do these in your book before you put the date:

1) Line UQ and Line KM are _____ lines.	6) Line XY and Line PC are _____ lines.
2) Line LW and Line PC are _____ lines.	7) Line LW and Line KM are _____ lines.
3) Line UQ and Line PC are _____ lines.	8) Line SE and Line LW are _____ lines.
4) Line UQ and Line LW are _____ lines.	9) Line SE and Line KM are _____ lines.
5) Line SE and Line PC are _____ lines.	10) Line KM and Line XY are _____ lines.

## Answers ...



Do these in your book before you put the date:

1) Line UQ and Line KM are <u>Perpendicular</u> lines.	6) Line XY and Line PC are <u>Intersecting</u> lines.
2) Line LW and Line PC are <u>Parallel</u> lines.	7) Line LW and Line KM are <u>Parallel</u> lines.
3) Line UQ and Line PC are <u>Perpendicular</u> lines.	8) Line SE and Line LW are <u>Perpendicular</u> lines.
4) Line UQ and Line LW are <u>Perpendicular</u> lines.	9) Line SE and Line KM are <u>Perpendicular</u> lines.
5) Line SE and Line PC are <u>Perpendicular</u> lines.	10) Line KM and Line XY are <u>Intersecting</u> lines.

Date: Week 2.

Title: **Properties of 3D shapes.**



Title: Properties of	2D Shapes
<b>Properties of 3D shapes.</b>	<ul style="list-style-type: none"><li>▪ Faces</li><li>▪ Perpendicular sides</li><li>▪ Parallel sides</li><li>▪ Opposite angles equal</li><li>▪ Angles total</li><li>▪ Vertices</li><li>▪ Symmetry</li></ul>

- **Key words/terminology:** Symmetry, angles, faces, vertices, parallel sides, opposite angles, perpendicular sides.

# **Shape**

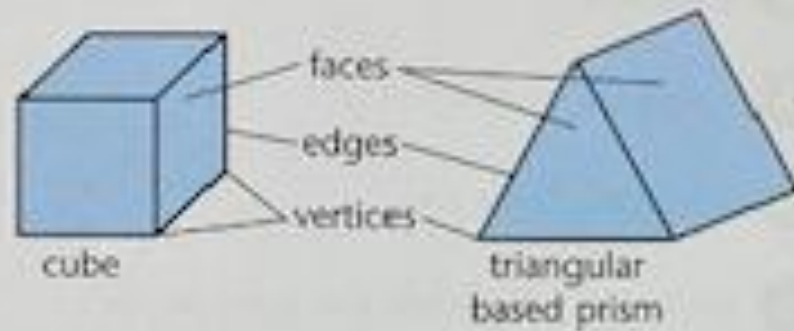
**To identify the properties of 2D shapes.**



## TARGET To describe the properties of 3-D shapes.

### POLYHEDRA

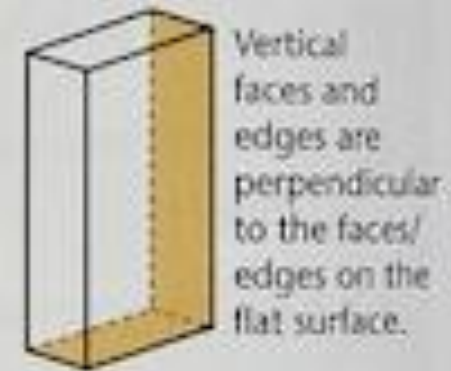
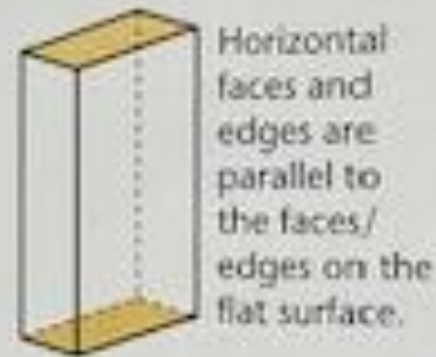
A polyhedron is a 3-D shape with straight edges.



A prism has two identical end faces and the same cross section throughout its length.

### PARALLEL AND PERPENDICULAR FACES/EDGES

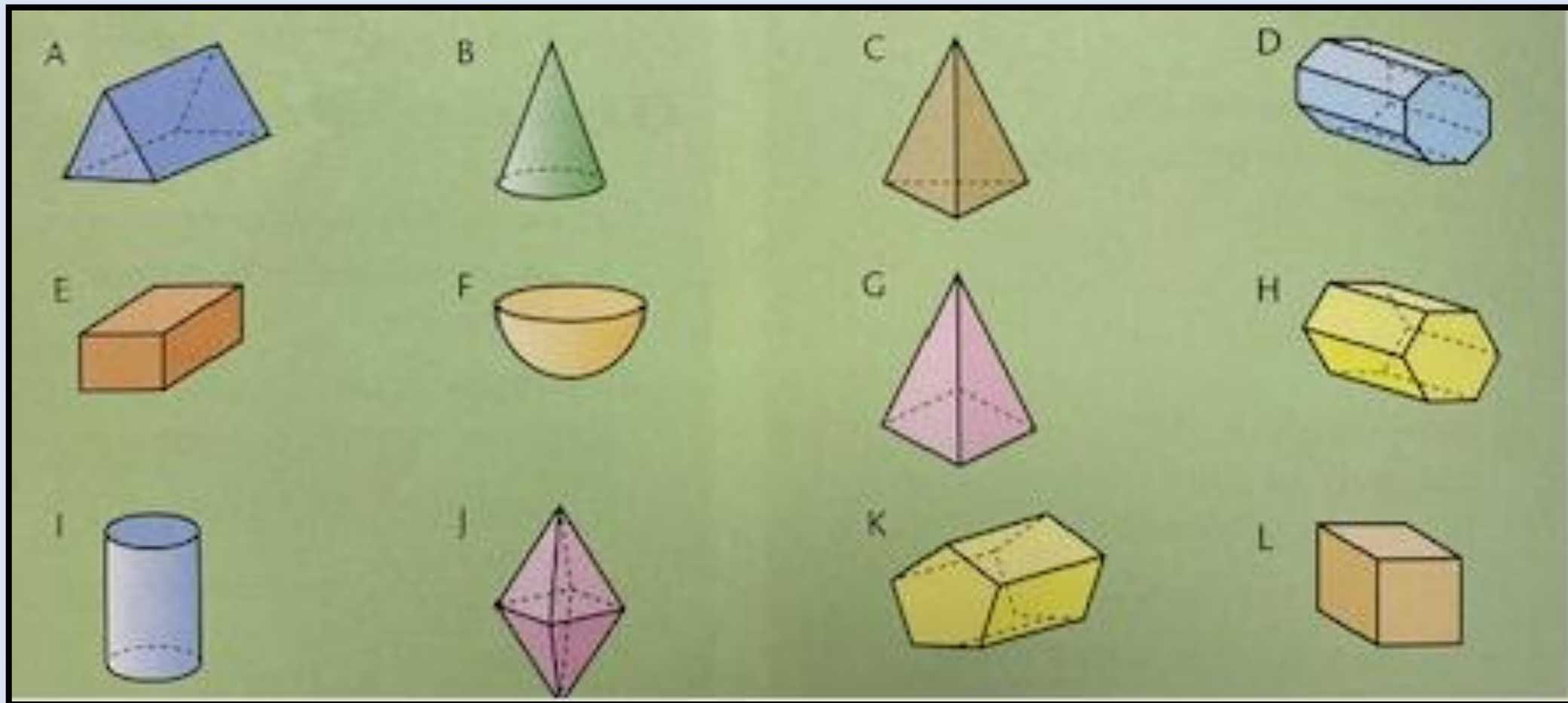
Parallel and perpendicular faces and edges can be identified by placing one face of a shape on a flat surface.



You do ...



Name each shape:





You do ...



Using the shapes on the previous slide:

1 Copy and complete this table showing the properties of nine different polyhedra.

Shape	Sides	Edges	Vertices
	7		
			4
cube		24	
		9	
			6
	8		
			8
		8	

- 2 For each of the shapes in the above table write down:
- how many pairs of parallel faces there are in the shape
  - how many pairs of perpendicular faces there are in the shape?

You do ...



Show your calculations in your book.

Copy and complete the following formulae where:

$S$  = number of sides of end face of prism

$F$  = number of faces of a prism

$E$  = number of edges of a prism

$V$  = number of vertices of a prism

1  $F = S + \square$

2  $E = \square S$

3  $V = \square S$

4  $E = F + V - \square$

Use your formulae to find:

- 5 the number of faces and edges of a prism with 24 vertices
- 6 the number of vertices and edges of a prism with 12 faces
- 7 the number of faces and vertices of a prism with 45 edges.



These questions relate to the first slide:

For each of the following shapes write down how many faces have:

- a) pairs of parallel edges
- b) pairs of perpendicular edges,

- 8** a heptagonal prism
- 9** a hexagonal pyramid
- 10** a 10 sided (decagonal) prism
- 11** a pentagonal pyramid
- 12** a 9 sided (nonagonal) prism
- 13** an octagonal pyramid

- 14** Look at the shapes in Section A.
  - a) Which shape has parallel edges in the shape but not in any face?
  - b) How many pairs of parallel faces does this shape have?
- 15** How many edges are there on the end face of a prism with:
  - a) 20 faces with parallel edges
  - b) 20 faces with perpendicular edges.



- 1 A triangular prism
- B cone
- C tetrahedron
- D octagonal prism
- E cuboid
- F hemisphere

- G square based pyramid
- H hexagonal prism
- I cylinder
- J octahedron
- K pentagonal prism
- L cube

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Shapes	Faces	Edges	Vertices
pentagonal prism	7	15	10
tetrahedron	4	6	4
octagonal prism	10	24	16
cube	6	12	8
triangular prism	5	9	6
octahedron	8	12	6
hexagonal prism	8	18	12
cuboid	6	12	8
square based pyramid	5	8	5

2 pentagonal prism

3 11

4 10



<b>2</b> pentagonal prism	<b>a)</b> 1 <sup>o</sup>	<b>b)</b> 10
tetrahedron	<b>a)</b> 0	<b>b)</b> 0
octagonal prism	<b>a)</b> 5	<b>b)</b> 16
cube	<b>a)</b> 3	<b>b)</b> 12
triangular prism	<b>a)</b> 1	<b>b)</b> 6
pentagonal based pyramid	<b>a)</b> 0	<b>b)</b> 0
octahedron	<b>a)</b> 4	<b>b)</b> 8
cuboid	<b>a)</b> 3	<b>b)</b> 12
square based pyramid	<b>a)</b> 0	<b>b)</b> 4

**C**

<b>1</b> $F = S + 2$	<b>5</b> Faces 14	Edges 36
<b>2</b> $E = 3S$	<b>6</b> Vertices 20	Edges 30
<b>3</b> $V = 2S$	<b>7</b> Faces 17	Vertices 30
<b>4</b> $E = F + V - 2$		
<b>8</b> <b>a)</b> 7	<b>b)</b> 7	<b>12</b> <b>a)</b> 9
<b>9</b> <b>a)</b> 1	<b>b)</b> 0	<b>b)</b> 9
<b>10</b> <b>a)</b> 12	<b>b)</b> 10	<b>13</b> <b>a)</b> 1
<b>11</b> <b>a)</b> 0	<b>b)</b> 0	<b>14</b> <b>a)</b> octahedron
		<b>b)</b> 4
		<b>15</b> <b>a)</b> 18
		<b>b)</b> 20

**The End !!!!!**

You do ...



