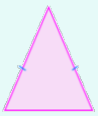
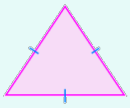
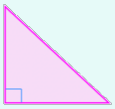
2D Shape – Polygons (n sides) Properties

Triangle (3 sides)

Scalene	Isosceles	Equilateral	Right
	 Two equal sides	 Three equal sides and all angles are 60°	 One of the angles is 90°

Quadrilateral (4 sides)

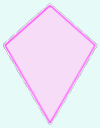
Parallelograms (2 pairs parallel sides)

Rectangle 

Square 

Rhombus 

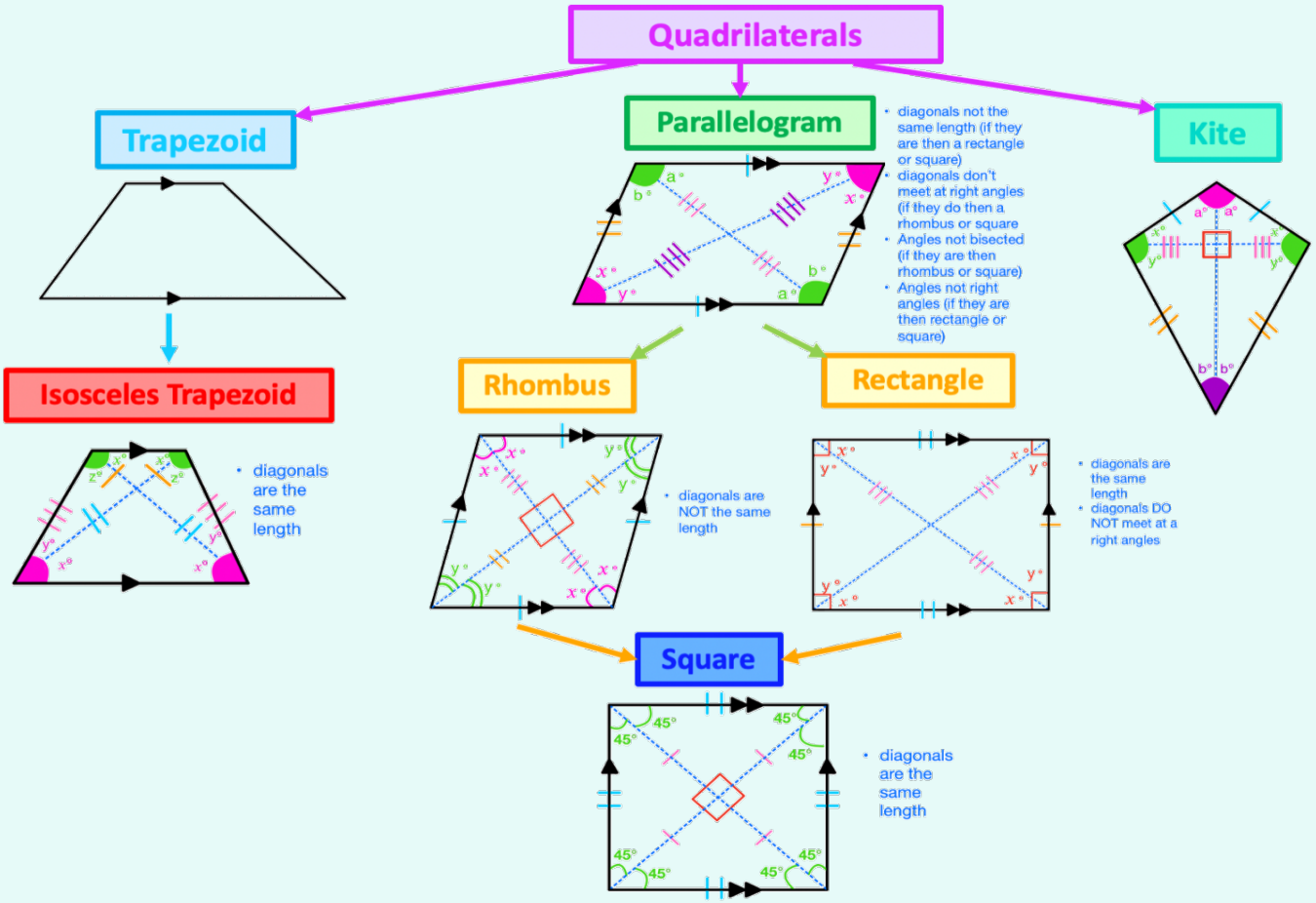
Non-Parallelogram (1 or no pairs parallel sides)

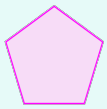
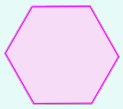
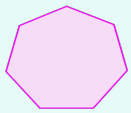
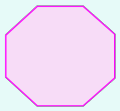
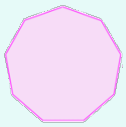
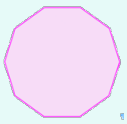
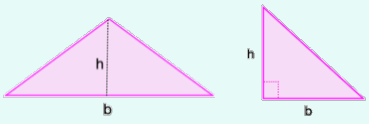
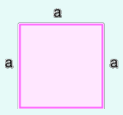
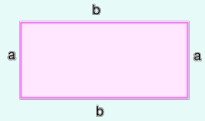
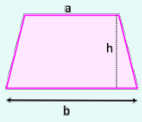
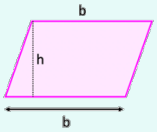
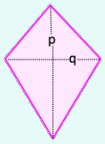
Kite 

Trapezium (UK)
Trapezoid (US) 

Quadrilateral Properties

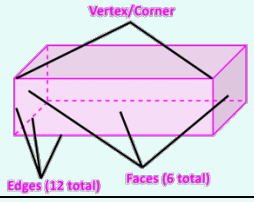
	Parallelogram	Rectangle	Rhombus	Square	Trapezium	Isosceles trapezium	Kite
All sides equal			✓	✓			
Opposite sides equal	✓	✓	✓	✓		One pair	2 disjoint pairs of consecutive sides are equal
Opposite sides parallel	✓	✓	✓	✓	One pair	One pair	
Opp. Angles equal	✓	✓	✓	✓		Base angles add to 180°	Only one pair of opposite angles are equal (larger pairs of angles)
4 right angles		✓		✓			
Consecutive angles add to 180°	✓	✓	✓	✓	Non base angles add to 180°	Non base angles add to 180°	
Diagonals equal		✓		✓		✓	
Diagonals are perpendicular			✓	✓			✓
Diagonals bisect each other	✓	✓	✓	✓			✓



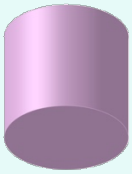
Pentagon (5 sides)	 0 lines of symmetry and order 5 rotational symmetry (if regular)
Hexagon (6 sides)	 6 lines of symmetry and order 6 rotational symmetry (if regular)
Heptagon (7 sides)	 7 lines of symmetry and order 7 rotational symmetry
Octagon (8 sides)	 8 lines of symmetry and order 8 rotational symmetry (if regular)
Nonagon (9 sides)	 9 lines of symmetry and order 9 rotational symmetry (if regular)
Decagon (10 sides)	 10 lines of symmetry and order 10 rotational symmetry (if regular)
2D Shape Areas	
Triangle	 Area= $\frac{1}{2}bh$
Square	 Area= a^2
Rectangle	 Area= ab
Trapezium/Trapezoid	 Area = $\frac{1}{2}(a+b)\times h$
Parallelogram	 Area= bh
Kite	 Area= $\frac{1}{2}pq$
Circle	 Area= πr^2

3D shape - Curved Faces/Edges Properties

we now look at faces, vertices and edges rather than sides

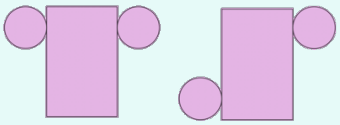


Cylinder



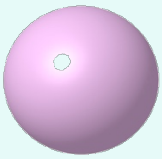
Area= $2\pi rh + 2\pi r^2$
Volume= $\pi r^2 h$

Net:



2 curved edges, 3 faces (1 curved and 2 flat circles), 0 vertices

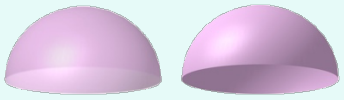
Sphere



Area= $4\pi r^2$
Volume= $\frac{4}{3}\pi r^3$

0 edges, 1 curved face, 0 vertices

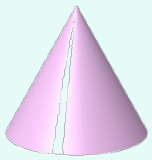
Hemisphere



Area= $3\pi r^2$
Volume= $\frac{4}{3}\pi r^3$

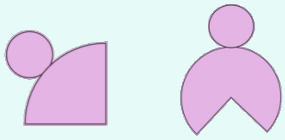
1 curved edge, 2 faces (1 curved and one flat circle), 0 vertices

Cones



Area= $\pi rl + \pi r^2$
Volume= $\frac{1}{3}\pi r^2 h$

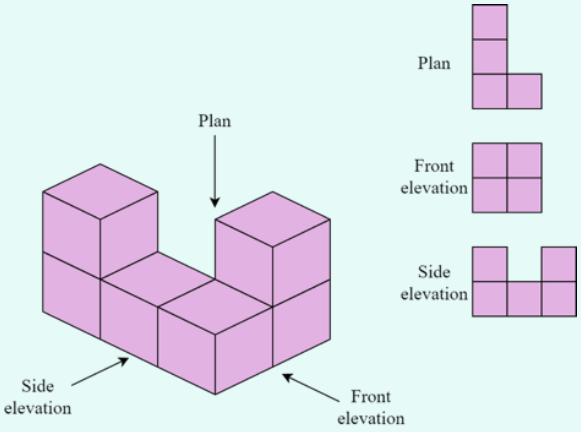
Net:



1 curved edge, 2 faces (1 curved and one flat circle), 1 vertex

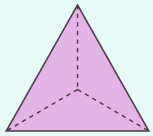
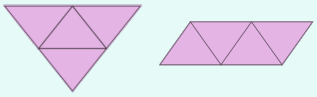
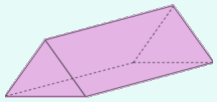
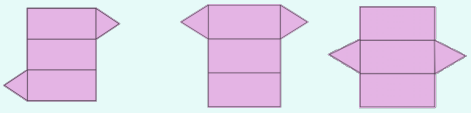
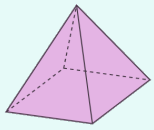
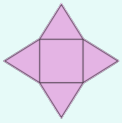
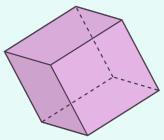
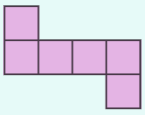
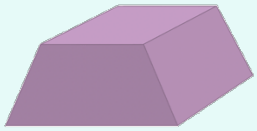
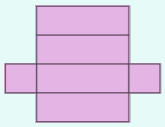
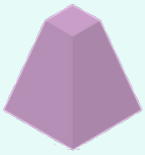
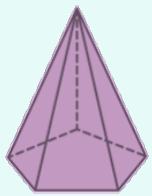
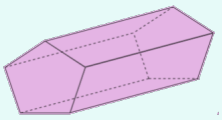
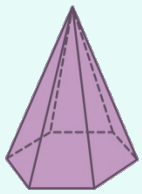
Plans and elevations

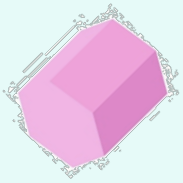
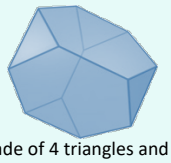
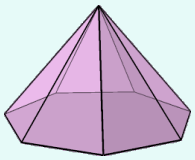
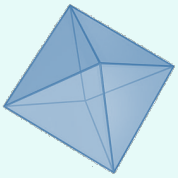
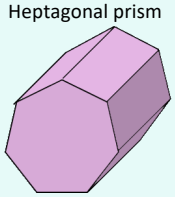
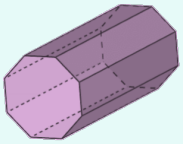
Plan: when looked at from above. Front elevation: When looked at from the front. Side elevation: When looked at from the side

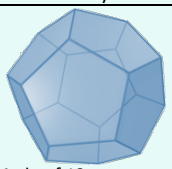
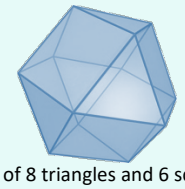
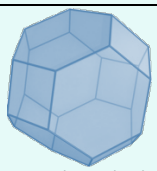
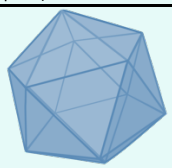
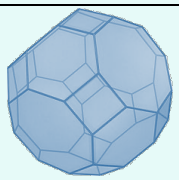
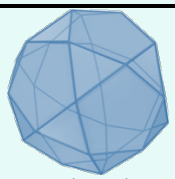
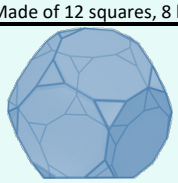
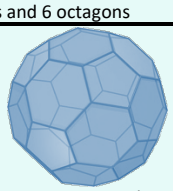


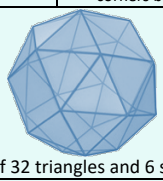
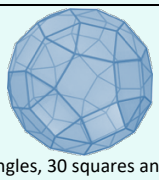
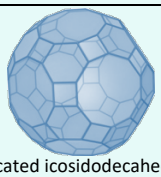
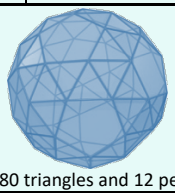
3D- Straight Edges Polyhedra (n faces) – Prisms or Pyramids

These are called Polyhedra rather than Polygons (the name for 2D shapes). For 3D shapes we count faces, unlike side lengths for 2D shapes.
We classify Polyhedra as either prisms (same face at each end) OR pyramids (triangular faces that join at a point)

	Prism (same face at each end)	Pyramids (triangular faces that join at a point)
Tetrahedron (4 faces)		Triangular pyramid  6 edges, 4 faces 4 vertices Net: Made of 4 triangles  There are 2 possible nets
Pentahedron (5 faces)	Triangular prism  9 edges, 5 faces 6 vertices Net: Made of 3 rectangle and 2 triangles  There are 9 possible nets	Square or rectangular pyramid  8 edges, 5 faces 5 vertices Net: Made of 1 square/rectangle and 4 triangles 
Hexahedron (6 faces)	Cube (aka square prism)  Net:  There are 11 possible nets Trapezoidal Prism  Cuboid (aka rectangular prism)  Net:  There are 54 possible nets Frustrum  12 edges, 6 faces 8 vertices	Pentagonal pyramid  10 edges, 6 faces 6 vertices
Heptahedron (7 faces)	Pentagonal prism  15 edges, 7 faces 10 vertices	Hexagonal pyramid  12 edges, 7 faces 7 vertices

Octahedron (8 faces)	Hexagonal prism  18 edges, 8 faces 12 vertices Truncated Tetrahedron (you don't need to know this)  Made of 4 triangles and 4 hexagons (truncate all 4 vertices of a regular tetrahedron at one third of the original edge length)	Heptagonal pyramid  4 edges, 8 faces, 8 vertices Double Pyramid (you don't need to know this)  Made of 8 triangles
Enneahedron (9 faces)	Heptagonal prism  21 edges, 9 faces 14 vertices	
Decahedron (10 faces)	Octagonal prism  24 edges, 10 faces 16 vertices	

You do not need to know the following, but some may find it interesting!			
Dodecahedron (12 faces)	 Made of 12 pentagons		
Cuboctahedron (14 faces)	 Made of 8 triangles and 6 squares	 Truncated Octahedron Made of 8 hexagons and 6 squares (remove 6 right square pyramids from each point)	 Truncated Cube Made of 8 triangles and 6 octagons (cut off the vertices of a cube so that every edge has the same length)
Icosahedron (20 faces)	 Made of 20 triangles		
Rhombicuboctahedron (26 faces)	 Small Made of 8 triangles and 18 squares	 Great Made of 12 squares, 8 hexagons and 6 octagons	
Icosidodecahedron (32 faces)	 made of 20 triangles and 12 pentagons	 Truncated dodecahedron Made of 20 triangles and 12 decagons (cut off the corners of the dodecahedron so the pentagon	  Truncated Icosahedron This is the FOOTBALL Made of 12 pentagons and 20 hexagons (cut the 12 vertices of a Icosahedron so that $\frac{1}{3}$ of each edge is cut off at each of both ends)

		faces become decagons and the corners become triangles)	
Snub Cube (38 faces)	 Made of 32 triangles and 6 squares		
Rhombicosidodecahedron (62 faces)	 Made of 20 triangles, 30 squares and 12 pentagons Note: There is also a Great Rhombicosidodecahedron consisting of 30 squares, 20 hexagons and 12 decagons	 Truncated icosidodecahedron Made of 30 squares, 20 hexagons, 12 decagons (cut off icosidodecahedron $\frac{1}{3}$ of the way into each side)	
Snub **Dodeca**hedron (92 faces)	 Made of 80 triangles and 12 pentagons		