

Geometry

Early Level 1 (Stage 1, 2 & 3) – After 1 Year at School

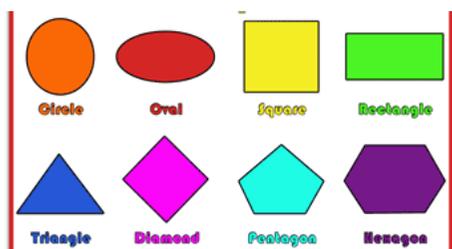
Shape Key Idea: Objects can be sorted by their appearance

Position and Orientation Key Idea: The position and movement of an object can be described

Transformation Key Idea: The position and appearance of an object can be changed by reflecting (flipping), translating (sliding) and rotating (turning) it

I am beginning to sort objects, show reflections and translations, and describe locations and give directions using everyday language

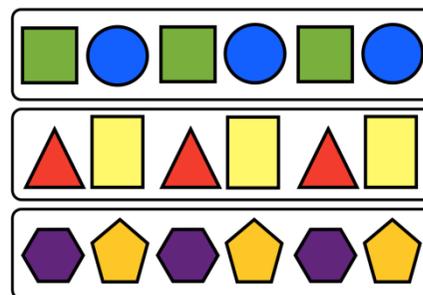
I am learning to identify and name these shapes



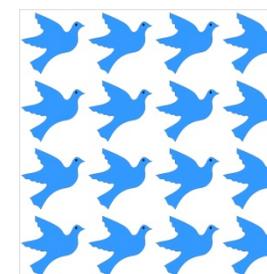
I am learning to sort objects by a single feature using everyday language

- “All of the big things”
- “All of the yellow things”
- “All of the round things”
- “All of the thick shapes”

I am learning to make a repeating pattern using shapes



I am learning to make objects that have been moved by translation (sliding) to make a pattern



I can find objects by following my teacher's directions using everyday language

e.g. on, over, beside, inside, behind, outside, in, under, in front of, underneath, near, above, middle, next to, on top, before, between

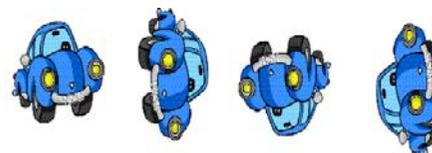


I am learning to move by following my teacher's directions using everyday language

e.g. forwards, backwards, sideways, away from, towards, whole turn



I am learning to make objects that have been flipped to make patterns



I am learning to find lines of symmetry in everyday objects



Geometry

Level 1 (Stage 4) – After 2 Years at School

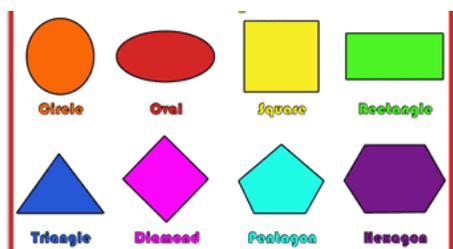
Shape Key Idea: Objects can be sorted by their appearance

Position and Orientation Key Idea: The position and movement of an object can be described

Transformation Key Idea: The position and appearance of an object can be changed by reflecting (flipping), translating (sliding) and rotating (turning) it

I am beginning to sort objects, show reflections and translations, and describe locations and give directions using mathematical language

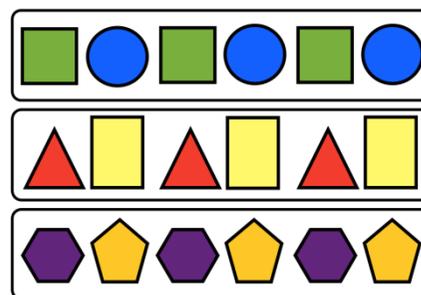
I can identify and name these shapes



I can sort objects by **different features** using **mathematical language**

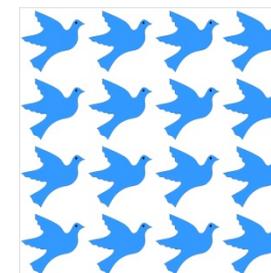
- “All these shapes have 4 sides and all the sides are the same length”
- “All the triangles with different sized sides”

I am learning to make and **describe** a pattern using shapes



“I made my pattern by going square, circle, square circle and green, blue, green blue”

I am learning to make and **describe** objects that have been moved by translation (sliding) to make a pattern



“It is the same shape, size and colour and they are repeated”

I am learning to find objects by following and giving directions

e.g. on, over, beside, inside, behind, outside, in, under, in front of, underneath, near, above, middle, next to, on top, before, between



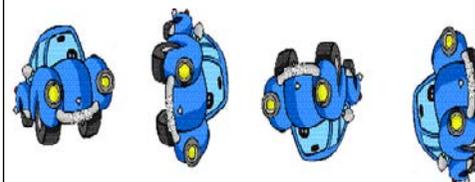
I can move by following directions and give my own directions using **steps, half and quarter turns**

e.g. *“Take 4 steps towards the whiteboard, make a half turn to the right then take 6 more steps.”*

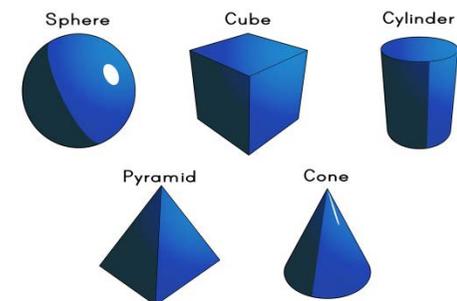


I am learning to make and **describe** objects that have been flipped to make patterns

e.g. *“The shape was rotated a quarter turn to the right, then a quarter turn again and then again”*



I can name some 3-Dimensional shapes



Geometry

Early Level 2 (Early Stage 5) – After 3 Years at School

Shape Key Idea: Objects can be sorted by their geometrical properties

Position and Orientation Key Idea: Position, direction and pathways can be shown on a map

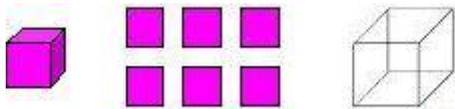
Transformation Key Idea: Some objects have symmetry and do not change position or appearance under some transformations

I can sort two and three dimensional shapes, create and describe reflections, translations and rotations, and give directions using whole number measures and half and quarter turns.

I am learning to make, name, sort and describe two and three dimensional shapes by their features

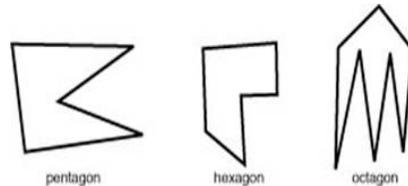
e.g. sides, corners, faces, edges, larger, smaller, round etc.

Cuboid 6 faces 12 edges



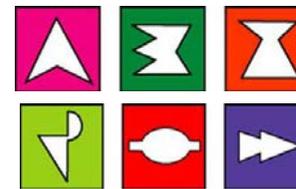
I am learning to name my groups of shapes

e.g. triangles, hexagons and quadrilaterals



I am learning to make shapes which have reflection symmetry by folding, tracing and cutting

e.g. How many of these shapes can you make by folding and cutting?

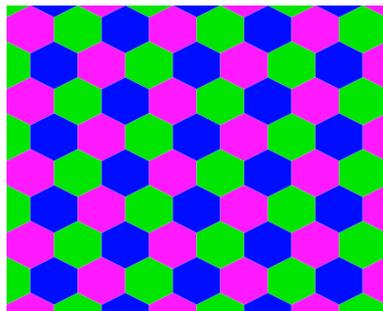


I am learning to describe the differences between movement and directions

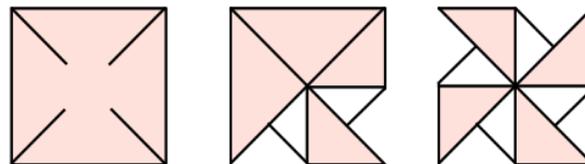
e.g. Movement = Forwards and Backwards
Directions = Left and Right



I am learning to fit shapes together to form a tessellation



I am learning to make patterns by rotating (turning) objects or shapes describing the pattern using words such as circle, turn and point.



I am learning to follow and give directions using **whole number measures** and half and quarter turns.

e.g. "Walk 20 metres then turn right. Walk another 10 metres then make a quarter turn to your left, you are now at school!"



Geometry

Level 2 (Stage 5) – By the end of Year 4

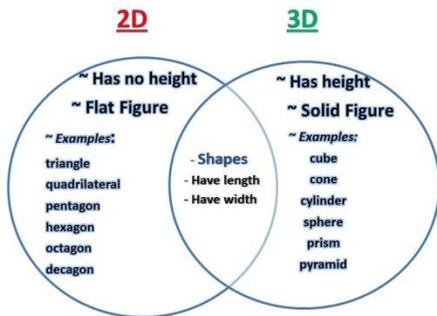
Shape Key Idea: Objects can be sorted by their geometrical properties

Position and Orientation Key Idea: Position, direction and pathways can be shown on a map

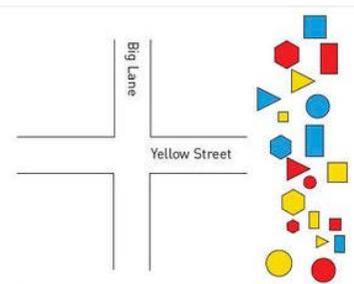
Transformation Key Idea: Some objects have symmetry and do not change position or appearance under some transformations

I can sort two and three dimensional shapes by two features at the same time, create nets for cubes, and give directions using simple maps

I can explain what's the same and what's different between two dimensional and three dimensional shapes



I am learning to sort two and three dimensional shapes by **two features** at the **same time**

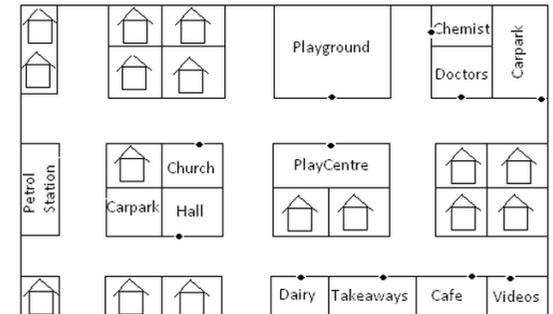


"I sorted the blocks by 2 features, size and colour so that I could put the big and yellow ones on the intersection."

I am learning to give and follow directions **using simple maps**

e.g. using symbols relative to other symbols and distances that are generalised "its twice as far"

If you started at the carpark, my house is twice as far from that.
Can you pick my house?



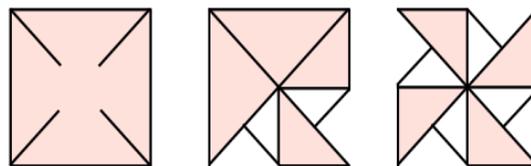
I can describe the two types of symmetry

e.g. Line and Rotational Symmetry

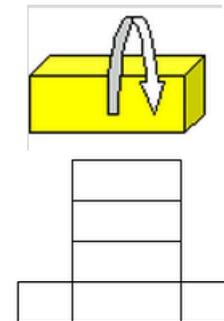


The letter C has one line of reflective symmetry
The letter S has half-turn rotational symmetry
The letter H has two lines of reflective symmetry
The letter R has neither reflective nor rotational
The letter Z has half turn symmetry

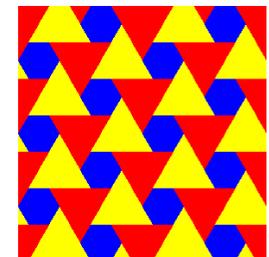
I can make patterns by rotating (turning) objects or shapes describing the pattern using words such as circle, turn and point.



I am learning to create nets for cubes



I am learning to predict whether a shape will tessellate because it has straight lines



Geometry

Early Level 3 (Early Stage 6) – By the end of Year 5

Shape Key Idea: Shapes can be defined by their geometrical properties

Position and Orientation Key Idea: Position, direction and pathways of objects can be described using coordinate systems

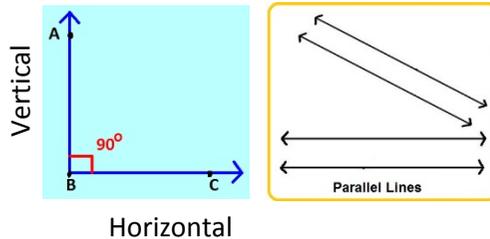
Transformation Key Idea: Specific items are needed to describe different transformations

I can sort considering the absence or presence of features and justify my decisions, represent and describe the results of position and orientation, draw and make objects from different views, and give directions using grid references and points of the compass

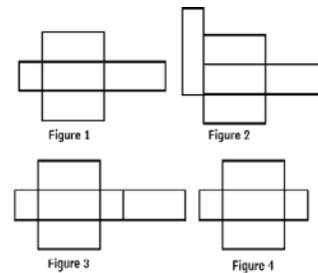
I am learning to define and sort two dimensional and three dimensional shapes using their geometric properties and justify my decision

e.g. number of sides, symmetry, parallel and perpendicular sides, right angles and, angles that are smaller or larger than right angles.

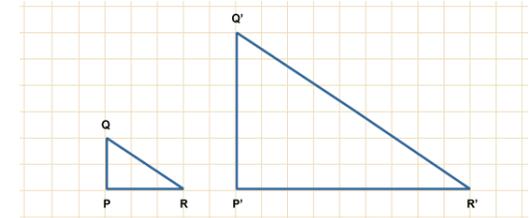
I am learning to recognise and identify right angles, horizontal, vertical and parallel lines



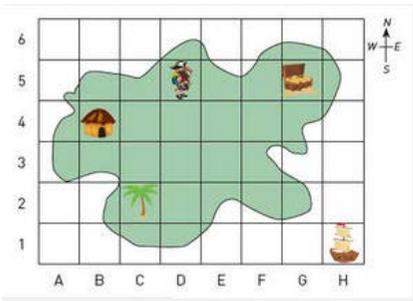
I am learning to create nets for rectangular prisms



I am learning to enlarge on grid paper simple shapes to a specified scale e.g. twice the size

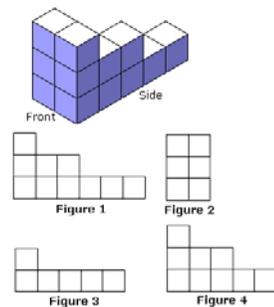


I am learning to follow and give directions using grid references and points of the compass.

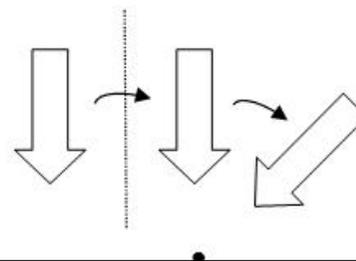


"I know the hut is at B4, the tree at C2 and the treasure is at G5. The pirate needs to travel south-east to get to his ship."

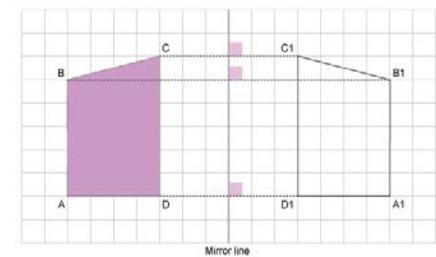
I can draw plan, front and side views of objects



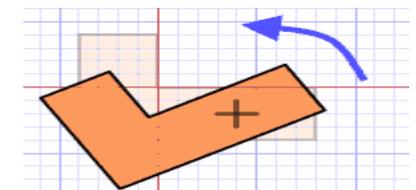
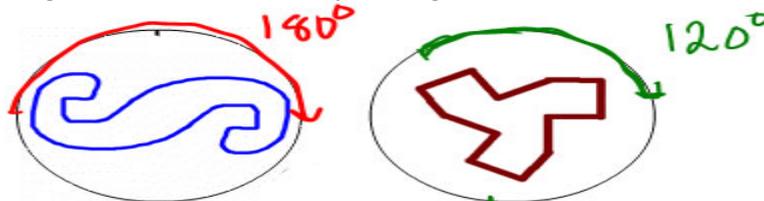
I am learning to describe translation as the distance and direction a shape is moved



I am learning to describe reflections as a "mirror image". The reflection is the same distance from the reflection line on the opposite side



I am learning to describe rotations by the angle of rotation and the location of the centre of rotation



Shape Key Idea: Shapes can be defined by their geometrical properties

Position and Orientation Key Idea: Position, direction and pathways of objects can be described using coordinate systems

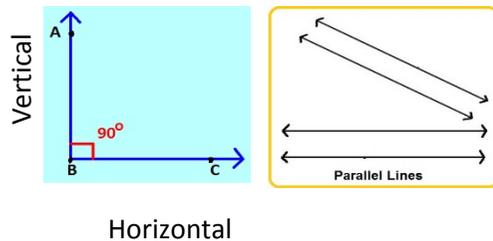
Transformation Key Idea: Specific items are needed to describe different transformations

I can sort shapes (including prisms) considering the absence or presence of features and justify my decisions, represent and describe the results of position and orientation, draw and make objects from different views, and give directions using grid references, turns and points of the compass

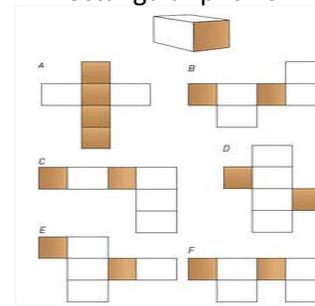
I am learning to define and sort two dimensional and three dimensional shapes **including prisms** using their geometric properties

e.g. number of sides, symmetry, parallel and perpendicular sides, right angles and, angles that are smaller or larger than right angles.

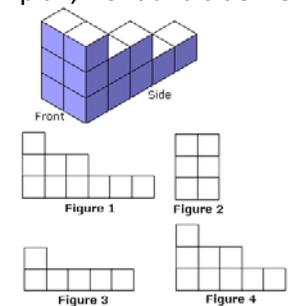
I can recognise and identify right angles, horizontal, vertical and parallel lines



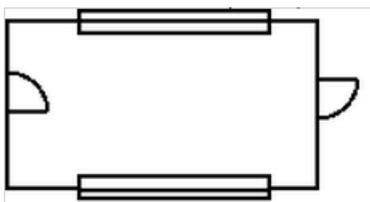
I can create and **identify** nets for rectangular prisms



I can draw **and make** objects given their plan, front and side views

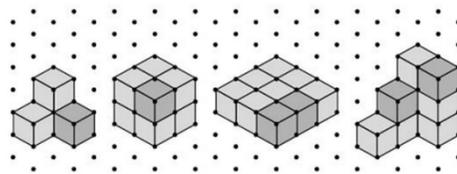


I am learning to show distances on a map using simple scales.

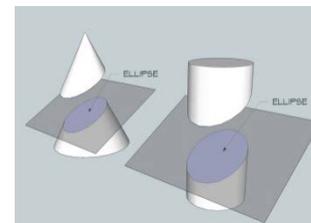


e.g The classroom scale is 10cm to 1m – so when the door measures 80cm wide it will be 8cm on my map.

I am learning to draw cube models using isometric dot paper and make a cube model from a dot paper drawing



I can solve problems involving cutting shapes and solids



I am learning to design and make patterns which involve translation, reflection and rotation



I can describe ALL the different transformations on shapes OR patterns

- Translation as the distance and direction a shape is moved
- Enlargement involves changes the size of the object using scale factors
- Reflection is a “mirror image”. The reflection has to be the same distance from the reflection line on the opposite side.
- Rotations by the angle of rotation and the location of the centre of rotation

Geometry

Early Level 4 (Early Stage 7) – By the end of Year 7

Shape Key Idea: Three Dimensional objects can be shown by a variety of Two Dimensional representations

Position and Orientation Key Idea: Position, direction and pathways can be operated on using coordinate systems and maps

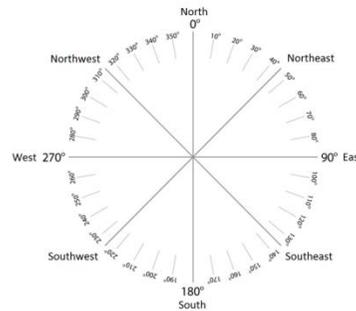
Transformation Key Idea: Some properties of objects do not change under different transformations

I can sort shapes into classes and justify my decisions, identify and describe the transformations that produce given shapes or patterns, create and identify nets for rectangular prisms, draw perspective views of objects, and give directions using simple scales.

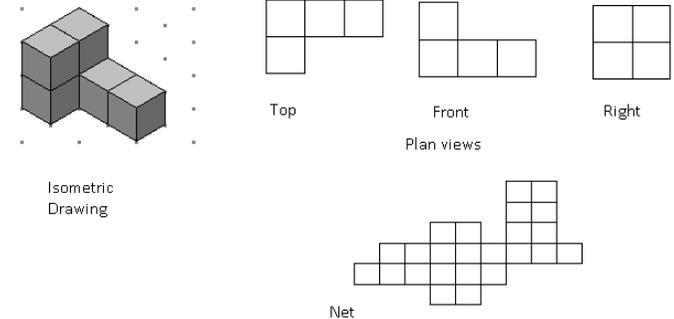
I am learning how different properties change under transformation

| Properties | Transformation | | | |
|---|----------------|------------|-------------|-------------|
| | Rotation | Reflection | Translation | Enlargement |
| Size (length of sides, area and volume) | | | | ✓ |
| Orientation | ✓ | ✓ | | ✓ |
| Position | ✓ | ✓ | ✓ | ✓ |
| Size of internal angles | | | | |

I am learning to create a map with directions plotted accurately by a clockwise measure

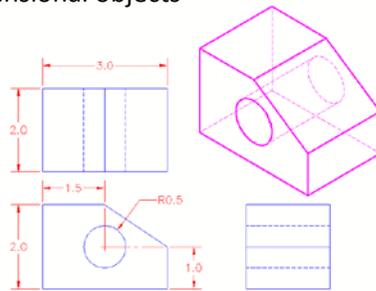


I can draw plan, front, side and perspective views of an object and create and identify nets for rectangular prisms and other simple solids



I can recognise and draw a two dimensional representation of three dimensional objects

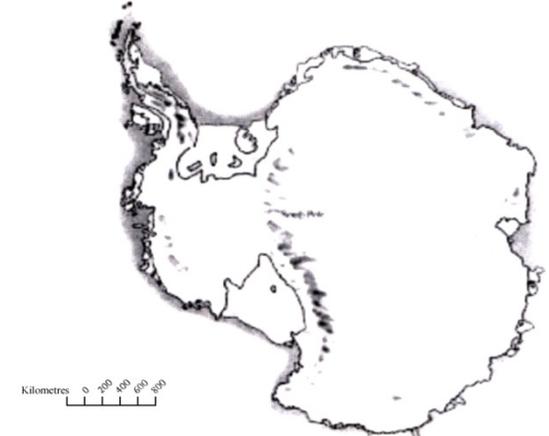
e.g. the shape of the faces, where and how the faces join and the relationship between faces, edges and corners.



I am learning to find the size of the interior and exterior angles in regular polygons and how this effects tessellation

| Polygon Name | No. of Sides | Sum of Interior Angles | Interior Angle | Tessellate - Yes or No |
|----------------------|--------------|------------------------|---------------------|------------------------|
| Equilateral triangle | 3 | 180 degrees | 60 degrees | Yes |
| Square | 4 | 360 degrees | 90 degrees | Yes |
| Pentagon | 5 | 540 degrees | 108 degrees | No |
| Hexagon | 6 | 720 degrees | 120 degrees | Yes |
| Heptagon | 7 | 900 degrees | 128.6 degrees (1dp) | No |
| Octagon | 8 | 1080 degrees | 135 degrees | No |
| Decagon | 10 | 1440 degrees | 144 degrees | No |
| Dodecagon | 12 | 1800 degrees | 150 degrees | No |

I am learning to show distances and interpret maps using scales. e.g. as a scale or as a ratio



Shape Key Idea: Three Dimensional objects can be shown by a variety of Two Dimensional representations

Position and Orientation Key Idea: Position, direction and pathways can be operated on using coordinate systems and maps

Transformation Key Idea: Some properties of objects do not change under different transformations

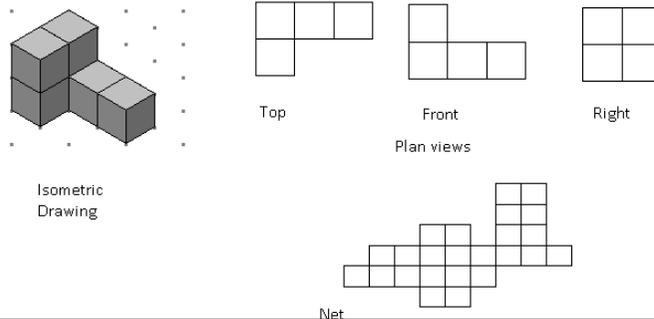
I can sort shapes into classes considering the relationships and justify my decisions, identify and describe the features that do or do not change under transformation, create and identify nets for rectangular prisms given particular requirements, draw perspective views of objects and give directions using bearings and coordinates.

I can identify and classify the common properties between two and three dimensional shapes considering the relationship between the classes and justify my decision

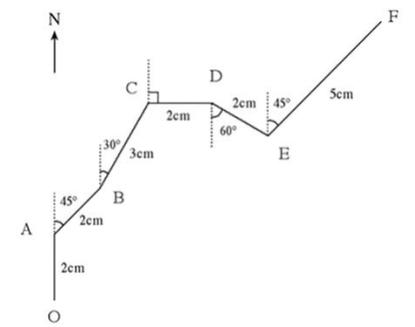
| Type | Example | Properties |
|--------------------|---------|---|
| Triangular prism | | <ul style="list-style-type: none"> 5 faces 2 triangular bases 3 rectangular faces 9 edges 6 vertices |
| Rectangular prism | | <ul style="list-style-type: none"> 6 faces 2 rectangular bases 4 rectangular faces 12 edges 8 vertices |
| Cube | | <ul style="list-style-type: none"> 6 faces 2 square bases 4 square faces 12 edges 8 vertices |
| Square pyramid | | <ul style="list-style-type: none"> 5 faces 1 square base 4 triangular faces 8 edges 5 vertices |
| Triangular pyramid | | <ul style="list-style-type: none"> 4 faces 1 triangular base 3 triangular faces 6 edges 4 vertices |

| TRIANGLES | QUADRILATERALS | REGULAR POLYGONS |
|--|--|--|
| Equilateral triangle All sides equal, interior angles 60° | Square All sides equal, all angles 90° | Equilateral triangle 3 sides, angle 60° |
| Isosceles triangle 2 sides equal, 2 congruent angles | Rectangle Opposite sides equal, all angles 90° | Square 4 sides, angle 90° |
| Scalene triangle No sides or angles equal | Rhombus All sides equal, 2 pairs of parallel lines, opposite angles equal | Regular Pentagon 5 sides, angle 108° |
| Right triangle 1 right angle | Parallelogram Opposite sides equal, 2 pairs of parallel lines | Regular Hexagon 6 sides, angle 120° |
| Acute triangle All angles acute | Kite Adjacent sides equal, 2 congruent angles | Regular Octagon 8 sides, angle 135° |
| Obtuse triangle 1 obtuse angle | Trapezoid 1 pair of parallel sides | Regular Decagon 10 sides, angle 144° |

I can draw or make plan, front, side and perspective views of an object and create and identify nets for rectangular prisms and other simple solids given particular requirements



I am learning to understand the relationship between the compass points and angles



I am learning that an objects size, internal angles, position and orientation may/may not change under some transformations

| Properties | Transformation | | | |
|---|----------------|------------|-------------|-------------|
| | Rotation | Reflection | Translation | Enlargement |
| Size (length of sides, area and volume) | | | | ✓ |
| Orientation | ✓ | ✓ | | ✓ |
| Position | ✓ | ✓ | ✓ | ✓ |
| Size of internal angles | | | | |

I am learning to create a map with directions plotted using bearings

“Draw the map of the Norwegian Ravine. Start at A = (0, 0); move North for 5 km to reach point B; go 8 km due East to reach the point C; D is the point 6 km due North of C; go due West for 4 km to reach E; F is 3 km due South of E; to get to G go 2 km West of F and then you are in open water. Grid references of the following points are A = (0, 0); B = C = D = F = G =”

I am learning to describe locations on a map using coordinates

