Shape and space (measurement)

1. Demonstrate an understanding of angles by:

• identifying examples of angles in the environment

• classifying angles according to their measure

• estimating the measure of angles, using 45°, 90° and 180° as reference angles

• determining angle measures in degrees

• drawing and labelling angles when the measure is specified.

* Provide examples of angles found in the environment.
* Classify a given set of angles according to their measure; e.g., acute, right, obtuse, straight, reflex.
* Sketch 45°, 90° and 180° angles without the use of a protractor, and describe the relationship among them.
* Estimate the measure of an angle, using 45°, 90° and 180° as reference angles.
* Measure, using a protractor, given angles in various orientations.
* Draw and label a specified angle in various orientations, using a protractor.

2. Demonstrate that the sum of interior angles is:

• 180° in a triangle

• 360° in a quadrilateral.

* Explain, using models, that the sum of the interior angles of a triangle is the same for all triangles.
* Explain, using models, that the sum of the interior angles of a quadrilateral is the same for all quadrilaterals.

3. Develop and apply a formula for determining the:

• perimeter of polygons

• area of rectangles

• volume of right rectangular prisms.

* Explain, using models, how the perimeter of any polygon can be determined.
* Generalize a rule (formula) for determining the perimeter of polygons, including rectangles and squares.
* Explain, using models, how the area of any rectangle can be determined.
* Generalize a rule (formula) for determining the area of rectangles.
* Explain, using models, how the volume of any right rectangular prism can be determined.
* Generalize a rule (formula) for determining the volume of right rectangular prisms.
* Solve a given problem involving the perimeter of polygons, the area of rectangles and/or the volume of right rectangular prisms.

Shape and Space (3-D Objects and 2-D Shapes)

4. Construct and compare triangles, including:

• scalene

• isosceles

• equilateral

• right

• obtuse

• acute in different orientations.

* Identify the characteristics of a given set of triangles according to their sides and/or their interior angles.
* Sort a given set of triangles, and explain the sorting rule.
* Identify a specified triangle from a given set of triangles; e.g., isosceles.
* Draw a specified triangle; e.g., scalene.
* Replicate a given triangle in a different orientation, and show that the two are congruent.

5. Describe and compare the sides and angles of regular and irregular polygons.

* Sort a given set of 2-D shapes into polygons and non-polygons, and explain the sorting rule.
* Demonstrate congruence (sides to sides and angles to angles) in a regular polygon by superimposing.
* Demonstrate congruence (sides to sides and angles to angles) in a regular polygon by measuring.
* Demonstrate that the sides of a given regular polygon are of the same length and that the angles of a regular polygon are of the same measure.
* Sort a given set of polygons as regular or irregular, and justify the sorting.
* Identify and describe regular and irregular polygons in the environment.

Shape and Space (Transformations)

1. Perform a combination of translations, rotations and/or reflections on a single 2-D shape, with and without technology, and draw and describe the image.

* Demonstrate that a 2-D shape and its transformation image are congruent.
* Model a given set of successive translations, successive rotations or successive reflections of a 2-D shape.
* Model a given combination of two different types of transformations of a 2-D shape.
* Draw and describe a 2-D shape and its image, given a combination of transformations.
* Describe the transformations performed on a 2-D shape to produce a given image.
* Model a given set of successive transformations (translations, rotations and/or reflections) of a 2-D shape.
* Perform and record one or more transformations of a 2-D shape that will result in a given image.

1. Perform a combination of successive transformations of 2-D shapes to create a design, and identify and describe the transformations.

* Analyze a given design created by transforming one or more 2-D shapes, and identify the original shape(s) and the transformations used to create the design.
* Create a design using one or more 2-D shapes, and describe the transformations used.

1. Identify and plot points in the first quadrant of a Cartesian plane, using whole number ordered pairs.

* Label the axes of the first quadrant of a Cartesian plane, and identify the origin.
* Plot a point in the first quadrant of a Cartesian plane, given its ordered pair.
* Match points in the first quadrant of a Cartesian plane with their corresponding ordered pair.
* Plot points in the first quadrant of a Cartesian plane with intervals of 1, 2, 5 or 10 on its axes given whole number ordered pairs.
* Draw shapes or designs, given ordered pairs, in the first quadrant of a Cartesian plane.
* Determine the distance between points along horizontal and vertical lines in the first quadrant of a Cartesian plane.
* Draw shapes or designs in the first quadrant of a Cartesian plane, and identify the points used to produce them.

1. Perform and describe single transformations of a 2-D shape in the first quadrant of a Cartesian plane (limited to whole number vertices).

* Identify the coordinates of the vertices of a given 2-D shape (limited to the first quadrant of a Cartesian plane).
* Perform a transformation on a given 2-D shape, and identify the coordinates of the vertices of the image (limited to the first quadrant).
* Describe the positional change of the vertices of a given 2-D shape to the corresponding vertices of its image as a result of a transformation (limited to the first quadrant).