

Mathematics Grade 9 Shape and Space (SS)				
Outcome	1 - Beginning The student is having difficulty demonstrating an understanding of the concept.	2 – Approaching The student is developing an understanding of the concept.	3 – Meeting The student consistently demonstrates an understanding of the concept or has achieved the concept.	4- Exemplary The student independently demonstrates an in-depth understanding of the concept, and consistently applies this knowledge to new situations.
<p>SS9.1 I can demonstrate understanding of circle properties including:</p> <ul style="list-style-type: none"> ○ perpendicular line segments from the centre of a circle to a chord bisect the chord ○ inscribed angles subtended by the same arc have the same measure ○ the measure of a central angle is twice the measure of an inscribed angle subtending the same arc ○ tangents to a circle are perpendicular to the radius ending at the point of tangency. <p>[C, CN, PS, R, T, V]</p>	<ul style="list-style-type: none"> • With help, I can identify perpendicular line segments from the centre of a circle through a chord. 	<ul style="list-style-type: none"> • I can identify perpendicular line segments from the centre of a circle through a chord. 	<ul style="list-style-type: none"> • I can explain what a perpendicular bisector is in relation to a radius of a circle and a chord. 	<ul style="list-style-type: none"> • I can use perpendicular bisectors and radii to determine measurements of line segments within a circle.
	<ul style="list-style-type: none"> • I can identify two inscribed angles subtended by the same arc AND an inscribed angle and a central angle subtended by the same arc. 	<ul style="list-style-type: none"> • I can determine the measure of an inscribed angle given the measure of another inscribed angle or central angle on the same arc. 	<ul style="list-style-type: none"> • Given two inscribed angles subtended by the same arc, AND an inscribed angle and a central angle that are subtended by the same arc, I can determine the measure of those angles in comparison to each other. 	<ul style="list-style-type: none"> • Given two inscribed angles subtended by the same arc, AND an inscribed angle and a central angle that are subtended by the same arc, I can determine the measure of those angles in comparison to each other, and justify my response.
	<ul style="list-style-type: none"> • With help, I can identify a point of tangency and a line of tangency. 	<ul style="list-style-type: none"> • I can identify a point of tangency and a line of tangency. 	<ul style="list-style-type: none"> • I can identify a point of tangency and describe the relationship between a line of tangency and a radius. 	<ul style="list-style-type: none"> • I can construct a tangent to a circle using my knowledge of tangents and circles.
	<ul style="list-style-type: none"> • With help, I can solve situational questions and problems involving ONE circle property, including: <ul style="list-style-type: none"> ○ perpendicular line segments from the centre bisecting a chord ○ inscribed angles ○ central angles ○ OR ○ tangents. 	<ul style="list-style-type: none"> • I can solve situational questions and problems involving ONE circle property, including: <ul style="list-style-type: none"> ○ perpendicular line segments from the centre bisecting a chord ○ inscribed angles ○ central angles ○ OR ○ tangents. 	<ul style="list-style-type: none"> • I can solve situational questions and problems involving more than one circle property, including: <ul style="list-style-type: none"> ○ perpendicular line segments from the centre bisecting a chord ○ inscribed angles ○ central angles ○ OR ○ tangents. 	<ul style="list-style-type: none"> • I can solve situational questions and problems involving ALL circle properties, including: <ul style="list-style-type: none"> ○ perpendicular line segments from the centre bisecting a chord ○ inscribed angles ○ central angles ○ AND ○ tangents ○ AND explain my reasoning.
Comments				

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SS9.2 I can extend understanding of area to surface area of right rectangular prisms, right cylinders, right triangular prisms, to composite 3-D objects. [CN, PS, R, V]	<ul style="list-style-type: none"> I can determine the area of simple 2-D shapes. 	<ul style="list-style-type: none"> I can determine the surface area of simple 3-D objects (right rectangular prisms, right cylinders, and right triangular prisms). 	<ul style="list-style-type: none"> I can determine the surface area of composite 3-D objects. 	<ul style="list-style-type: none"> I can determine the surface area of composite 3-D objects, including those with cut-outs and/or more complex shapes (ie: hexagons).
	<ul style="list-style-type: none"> I can solve situational questions involving simple 2-D shapes. 	<ul style="list-style-type: none"> I can solve situational questions involving simple 3-D objects. 	<ul style="list-style-type: none"> I can solve situational questions involving the surface area of composite 3-D objects. 	<ul style="list-style-type: none"> I can solve situational questions involving more complex composite 3-D objects.
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SS9.3 I can demonstrate understanding of similarity of 2-D shapes. [C, CN, PS, R, V]	Similar polygons	<ul style="list-style-type: none"> I can explain the difference between similarity and equality. With help, I can draw a polygon similar to a given polygon. With help, I can take steps to solve a basic situational question involving the similarity of polygons 	<ul style="list-style-type: none"> I can identify whether or not two polygons are similar. I can draw a polygon similar to a given polygon. I can take steps to solve a basic situational question involving the similarity of polygons. 	<ul style="list-style-type: none"> I can prove whether or not two polygons are similar. I can draw a polygon similar to a given polygon and explain the strategy I used. I can solve situational questions involving the similarity of polygons. 	<ul style="list-style-type: none"> I can identify and prove whether two polygons that are reflected, translated, and transformed in the Cartesian plane are similar. I can create two similar polygons and explain the strategy I used. I can solve a situational problem involving the use of surface area as well as similarity.
	Scale diagrams	<ul style="list-style-type: none"> I can identify and describe situations relevant to me, my family, or my community that involve scale diagrams, and explain the meaning of the scale factor involved. With help, I can confirm whether or not a given diagram is a scale diagram of a 2-D shape. With help, I can solve simple situational questions involving scale diagrams OR scale factors. 	<ul style="list-style-type: none"> *I can determine scale factor for a given 2-D shape and an enlargement or reduction of the shape. I can confirm whether or not a given diagram is a scale diagram of a 2-D shape. I can solve situational questions involving scale diagrams OR scale factors. 	<ul style="list-style-type: none"> *I can draw a diagram to scale that represents an enlargement or reduction of a given 2-D shape and explain the strategy used. I can confirm whether or not a given diagram is a scale diagram of a 2-D shape and, if it is, identify the scale factor for the diagram. I can solve situational questions involving scale diagrams AND scale factors. 	<ul style="list-style-type: none"> I can create a scale diagram of a given space, and choose an appropriate scale factor for this diagram. I can confirm whether or not a given diagram is a scale diagram of a 2-D shape, and if it is, identify the fractional scale factor for the diagram. I can solve situational questions involving fractional scale factors without the use of technology.
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SS9.4 Demonstrate understanding of line and rotation symmetry. [C, CN, PS, V]	Line Symmetry	<ul style="list-style-type: none"> • With help, I can determine if a given 2-D shape or design has line symmetry. • With help, I can complete a simple 2-D shape or design given part of a shape or design and the line/lines of symmetry. • With help, I can identify a line of symmetry in a simple shape. • With help, determine whether two 2-D shapes on the Cartesian plane are related by line symmetry. 	<ul style="list-style-type: none"> • I can determine if a given 2-D shape or design has line symmetry. • I can complete a simple 2-D shape or design given part of a shape or design and the line/lines of symmetry. • I can identify a line of symmetry in a simple shape. • I can determine whether two 2-D shapes on the Cartesian plane are related by line symmetry. 	<ul style="list-style-type: none"> • I can classify 2-D shapes and designs according to the number of lines of symmetry. • I can complete a complex 2-D shape or design given part of a shape or design and the line/lines of symmetry. • I can identify a line of symmetry in a tessellation. • I can determine whether two 2-D shapes on the Cartesian plane are related by line symmetry and explain. 	<ul style="list-style-type: none"> • I can create a design that shows a specific number of lines of symmetry and explain the lines of symmetry used. • I can create a design given part of the design and the coordinates to create the lines of symmetry to be used. • I can identify a line of symmetry in a complex tessellation involving small differences. • I can determine whether two complex shapes on the Cartesian plane are related by line symmetry using a line other than the x and y axis as the line of reflection and explain.
	Rotation Symmetry	<ul style="list-style-type: none"> • With help, I can determine if a given 2-shape or design has rotation symmetry. • With help, I can determine whether two 2-D shapes on the Cartesian plane are related by rotation symmetry. 	<ul style="list-style-type: none"> • I can determine if a given 2-D shape or design has rotation symmetry. • I can determine whether two 2-D shapes on the Cartesian plane are related by rotation symmetry. 	<ul style="list-style-type: none"> • I can determine if a given 2-D shape or design has rotation symmetry and I can identify the order and angle of rotation in a 2-D shape or design. • I can determine whether two 2-D shapes on the Cartesian plane are related by rotation symmetry and explain. 	<ul style="list-style-type: none"> • I can create a design that shows rotation symmetry and that shows a specific order and angle of rotation. • I can create a design on the Cartesian plane given a simple 2-D shape and the order of rotation needed.

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