



## Correlation of the Saskatchewan Mathematics Program of Study with Mathology Grade 9 (Number)

Curriculum Outcomes	Grade 9 Mathology.ca	Pearson Canada Grades 4–9 Mathematics Learning Progression
<b>Outcomes</b>		
<p>N9.1 Demonstrate (concretely, pictorially, and symbolically) understanding of powers with integral bases (excluding base 0) and whole number exponents including:</p> <ul style="list-style-type: none"> <li>• representing using powers</li> <li>• evaluating powers</li> <li>• powers with an exponent of zero</li> <li>• solving situational questions.</li> </ul>	<p><b>Number Unit 3: Powers and Exponents</b> 6: Exploring Whole Number Exponents 10: Exploring Exponent Laws</p>	<p><b>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</b> <b>Investigating Number and Arithmetic Properties</b></p> <ul style="list-style-type: none"> <li>- Distinguishes between and investigates properties of prime and composite numbers (e.g., prime factorization).</li> <li>- Extends exponent notation to any repeated multiplication (e.g., <math>2 \times 2 \times 2 \times 2 = 2^4</math>) and evaluates expressions using exponents (e.g., <math>3^4 = 3 \times 3 \times 3 \times 3 = 81</math>).</li> </ul>
<p>N9.2 Demonstrate understanding of rational numbers including:</p> <ul style="list-style-type: none"> <li>• comparing and ordering</li> <li>• relating to other types of numbers</li> <li>• solving situational questions.</li> </ul>	<p><b>Number Unit 4: Fluency with Rational Numbers</b> 11: Comparing and Ordering Rational Numbers 12: Operations with Positive and Negative Fractions and Decimals 13: Order of Operations with Rational Numbers</p>	<p><b>Big Idea: The set of real numbers is infinite.</b> <b>Extending Whole Number Understanding to the Set of Real Numbers</b></p> <ul style="list-style-type: none"> <li>- Extends decimal and fraction understanding to positive and negative rational numbers.</li> </ul> <p><b>Big Idea: Numbers are related in many ways.</b> <b>Comparing and Ordering Quantities (Multitude and Magnitude)</b></p> <ul style="list-style-type: none"> <li>- Compares, orders, and locates positive and negative rational numbers.</li> </ul> <p><b>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</b> <b>Developing Fluency of Operations</b></p> <ul style="list-style-type: none"> <li>- Uses reasoning, estimation, efficient strategies, and algorithms to operate on positive and negative rational numbers.</li> </ul> <p><b>Investigating Number and Arithmetic Properties</b></p> <ul style="list-style-type: none"> <li>- Applies order of operations to equations involving exponents to evaluate expressions.</li> </ul>

<p>N9.3 Extend understanding of square roots to include the square root of positive rational numbers.</p>	<p><b>Number Unit 2:</b>  <b>Squares and Square Roots</b>  4: Calculating Square Roots of Perfect Squares  5: Estimating Square Roots of Non-Perfect Squares</p>	<p><b>Big Idea: The set of real numbers is infinite.</b>  <b>Extending Whole Number Understanding to the Set of Real Numbers</b></p> <ul style="list-style-type: none"> <li>- Distinguishes between numbers that do and do not have whole number square roots.</li> </ul> <p><b>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</b>  <b>Developing Conceptual Meaning of Operations</b></p> <ul style="list-style-type: none"> <li>- Models and demonstrates an understanding of squares and square roots.</li> </ul> <p><b>Big Idea: Numbers are related in many ways.</b>  <b>Estimating Quantities and Numbers</b></p> <ul style="list-style-type: none"> <li>- Estimates square roots of numbers that are imperfect squares (e.g., <math>\sqrt{28}</math> is between 5 and 6, and closer to 5).</li> </ul>
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## Correlation of the Saskatchewan Mathematics Program of Study with Mathology Grade 8 (Patterns and Relations)

Curriculum Outcomes	Grade 9 Mathology.ca	Pearson Canada Grades 4–9 Mathematics Learning Progression
<b>Outcomes</b>		
<p>P9.1 Demonstrate understanding of linear relations including:</p> <ul style="list-style-type: none"> <li>• graphing</li> <li>• analyzing</li> <li>• interpolating and extrapolating</li> <li>• solving situational questions.</li> </ul>	<p><b>Algebra Unit 2: Linear Relations</b></p> <p>6: Investigating Linear Relations 7: Graphing and Analyzing Linear Relations</p>	<p><b>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.</b></p> <p><b>Representing Patterns, Relations, and Functions</b></p> <ul style="list-style-type: none"> <li>- Represents a mathematical context or problem with expressions and equations using variables to represent unknowns.</li> <li>- Models problems and solves linear relations with rational coefficients, variables, and constants in different forms.</li> </ul> <p><b>Generalizing and Analyzing Patterns, Relations, and Functions</b></p> <ul style="list-style-type: none"> <li>- Predicts the value of a given element in a numeric or shape pattern using pattern rules.</li> <li>- Approximates linear relation values between and beyond data through interpolation and extrapolation.</li> </ul>
<p>P9.2 Model and solve problems, using linear equations of the form:</p> <ul style="list-style-type: none"> <li>• <math>ax = b</math></li> <li>• <math>\frac{x}{a} = b, a \neq 0</math></li> <li>• <math>ax + b = c</math></li> <li>• <math>\frac{x}{a} + b = c, a \neq 0</math></li> <li>• <math>ax = b + cx</math></li> <li>• <math>a(x + b) = c</math></li> <li>• <math>ax + b = cx + d</math></li> <li>• <math>a(bx + c) = d(ex + f)</math></li> <li>• <math>\frac{a}{x} = b, x \neq 0</math></li> </ul> <p>where a, b, c, d, e and f are rational numbers</p>	<p><b>Algebra Unit 5: Modelling and Solving Equations</b></p> <p>14: Modelling and Solving Linear Equations 15: Solving More Complex Linear Equations 16: Solving Linear Equations in Different Forms</p>	<p><b>Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.</b></p> <p><b>Understanding Equality and Inequality, Building on Generalized Properties of Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>- Solves linear relations with rational coefficients, constants, and solutions (e.g., <math>\frac{2}{3}m - 2 = -7/6</math>).</li> </ul>

<p>P9.3 Demonstrate understanding of single variable linear inequalities with rational coefficients including:</p> <ul style="list-style-type: none"> <li>• solving inequalities</li> <li>• verifying</li> <li>• comparing</li> <li>• graphing.</li> </ul>	<p><b>Algebra Unit 6: Inequalities</b>  17: Introducing Inequalities  18: Solving Linear Inequalities and Graphing Solutions</p>	<p><b>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.</b>  <b>Representing Patterns, Relations, and Functions</b></p> <ul style="list-style-type: none"> <li>- Models and solves linear inequalities graphically and symbolically (<math>a + 5 &lt; 9</math>).</li> </ul>
<p>P9.4 Demonstrate understanding of polynomials (limited to polynomials of degree less than or equal to 2) including:</p> <ul style="list-style-type: none"> <li>• modeling</li> <li>• generalizing strategies for addition, subtraction, multiplication, and division</li> <li>• analyzing</li> <li>• relating to context</li> <li>• comparing for equivalency.</li> </ul>	<p><b>Algebra Unit 1:  Algebraic Expressions</b>  1: Representing and Evaluating Polynomials  3: Adding and Subtracting Polynomial Expressions  4: Multiplying and Dividing Polynomial Expressions</p>	<p><b>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.</b>  <b>Representing Patterns, Relations, and Functions</b></p> <ul style="list-style-type: none"> <li>- Represents a mathematical context or problem with expressions and equations using variables to represent unknowns.</li> </ul> <p><b>Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.</b>  <b>Using Variables, Algebraic Expressions, and Equations to Represent Mathematical Relations</b></p> <ul style="list-style-type: none"> <li>- Extends understanding of algebraic expressions to include writing and evaluating expressions with polynomials of degree two (e.g., <math>3x^2 - 7</math>).</li> <li>- Applies arithmetic properties to operate on polynomial expressions and solve problems (e.g., find area of rectangle with sides of <math>3x</math> and <math>4 + x</math>). (Limited to degrees of 2.)</li> </ul>



## Correlation of the Saskatchewan Mathematics Program of Study with Mathology Grade 8 (Shape and Space)

Curriculum Outcomes	Grade 9 Mathology.ca	Pearson Canada Grades 4–9 Mathematics Learning Progression
<b>Outcomes</b>		
SS9.1 Demonstrate understanding of circle properties including: <ul style="list-style-type: none"> <li>• perpendicular line segments from the centre of a circle to a chord bisect the chord</li> <li>• inscribed angles subtended by the same arc have the same measure</li> <li>• the measure of a central angle is twice the measure of an inscribed angle subtending the same arc</li> <li>• tangents to a circle are perpendicular to the radius ending at the point of tangency.</li> </ul>	<b>Geometry/ Measurement</b> <b>Unit 1: Geometry Around Us</b> 2: Investigating Circle Properties and Constructions	<b>Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.</b> <b>Understanding Relationships Among Measured Units</b> <ul style="list-style-type: none"> <li>- Uses circle properties to generalize and solve problems (e.g., central angle, inscribed angle, tangent-radius, triangle applications, chord bisector).</li> </ul> <b>Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes.</b> <b>Investigating Geometric Attributes and Properties of 2-D Shapes and 3-D Solids</b> <ul style="list-style-type: none"> <li>- Extends understanding of circle attributes to include arcs, sectors, chords, tangents, etc.</li> </ul>
SS9.2 Extend understanding of area to surface area of right rectangular prisms, right cylinders, right triangular prisms, to composite 3-D objects.	<b>Geometry/ Measurement</b> <b>Unit 3: Measurement of 3-D Objects</b> 8: Investigating Surface Area of Composite 3-D Objects	<b>Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.</b> <b>Understanding Relationships Among Measured Units</b> <ul style="list-style-type: none"> <li>- Determines volume and surface area of composite 3-D objects.</li> </ul> <b>Big Idea: Many things in our world (e.g., objects, spaces, events) have attributes that can be measured and compared.</b> <b>Understanding Attributes That Can Be Measured, Compared, and Ordered</b> <ul style="list-style-type: none"> <li>- Understands surface area as an attribute of 3-D objects that can be measured and compared.</li> </ul>

<p>SS9.3 Demonstrate understanding of similarity of 2-D shapes.</p>	<p><b>Geometry/ Measurement Unit 2: Measurement of 2-D Shapes and Scale Drawings</b>  4: Investigating Similar Triangles and Similar Polygons  5: Drawing and Interpreting Scale Drawings</p>	<p><b>Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes.</b>  <b>Investigating Geometric Attributes and Properties of 2-D Shapes and 3-D Solids</b></p> <ul style="list-style-type: none"> <li>- Uses interior angle properties of polygons to solve problems and determine similarity.</li> </ul> <p><b>Big Idea: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change.</b>  <b>Exploring 2-D shapes and 3-D solids by applying and visualizing transformations</b></p> <ul style="list-style-type: none"> <li>- Investigates dilation as a form of transformation and creates scale drawings using scale factors.</li> </ul>
<p>SS9.4 Demonstrate understanding of line and rotation symmetry.</p>	<p><b>Geometry/ Measurement Unit 1: Geometry Around Us</b>  1: Investigating Geometric Attributes including Line and Rotational Symmetry</p>	<p><b>Big Idea: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change.</b>  <b>Exploring Symmetry to Analyze 2-D Shapes and 3-D Solids</b></p> <ul style="list-style-type: none"> <li>- Draws, creates, and identifies shapes that have rotational symmetry, and identifies the centre of rotation and angle of rotation.</li> </ul>



**Correlation of the Saskatchewan Mathematics Program of Study  
with Mathology Grade 9 (Statistics and Probability)**

Curriculum Outcomes	Grade 9 Mathology.ca	Pearson Canada Grades 4–9 Mathematics Learning Progression
<b>Outcomes</b>		
SP9.1 Demonstrate understanding of the effect of: <ul style="list-style-type: none"> <li>• bias</li> <li>• use of language</li> <li>• ethics</li> <li>• cost</li> <li>• time and timing</li> <li>• privacy</li> <li>• cultural sensitivity and</li> <li>• population or sample on data collection.</li> </ul>	<b>Data Unit 1: Data Analysis</b> 1: Collecting Data 2: Factors Affecting Data Collection 5: Data and Probability in Decision Making	<b>Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.</b> <b>Collecting Data and Organizing It into Categories</b> <ul style="list-style-type: none"> <li>- Explores methods for collecting data from a population (e.g., census) and a representative sample of a population.</li> <li>- Critiques methods for selecting representative samples from a population (e.g., bias, ethics, cost, privacy).</li> </ul> <b>Drawing Conclusions by Making Inferences and Justifying Decisions Based on Data Collected</b> <ul style="list-style-type: none"> <li>- Identifies and describes trends in data presented over time, and predicts future results.</li> </ul>
SP9.2 Demonstrate an understanding of the collection, display, and analysis of data through a project.	<b>Data Unit 1: Data Analysis</b> 1: Collecting Data 3: Single-Variable Data Displays	<b>Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.</b> <b>Collecting Data and Organizing It into Categories</b> <ul style="list-style-type: none"> <li>- Explores methods for collecting data from a population (e.g., census) and a representative sample of a population.</li> </ul> <b>Creating Graphical Displays of Collected Data</b> <ul style="list-style-type: none"> <li>- Visually represents large-scale data (e.g., histograms, box plots).</li> </ul>

<p>SP9.3 Demonstrate an understanding of the role of probability in society.</p>	<p><b>Data Unit 1: Data Analysis</b> 5: Data and Probability in Decision Making</p>	<p><b>Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.</b></p> <p><b>Drawing Conclusions by Making Inferences and Justifying Decisions Based on Data Collected</b></p> <ul style="list-style-type: none"> <li>- Identifies and describes trends in data presented over time, and predicts future results.</li> </ul>
<p>SP9.4 Research and present how First Nations and Métis peoples, past and present, envision, represent, and make use of probability and statistics.</p>	<p><b>Data Unit 1: Data Analysis</b> 5: Data and Probability in Decision Making</p>	<p><b>Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.</b></p> <p><b>Drawing Conclusions by Making Inferences and Justifying Decisions Based on Data Collected</b></p> <ul style="list-style-type: none"> <li>- Identifies and describes trends in data presented over time, and predicts future results.</li> </ul>

The following lessons are not required, but recommended:

- Mathology 9 Algebra Unit 1: Algebraic Expressions, Lesson 2: Coding: Exploring Algebraic Expressions
- Mathology 9 Algebra Unit 1: Algebraic Expressions, Lesson 5: Mathematical Modelling: Top Ten
- Mathology 9 Data Management Unit 1: Data Analysis, Lesson 6: Mathematical Modelling: Oil Reserves
- Mathology 9 Financial Literacy Unit 1: Making Financial Decisions