

# SASKATCHEWAN GRADE 8 AND 9 MATHEMATICS AT A GLANCE

## Mathematical Processes

C = Communication  
PS = Problem Solving

CN = Connections  
R = Reasoning

ME = Mental Mathematics and Estimation  
V = Visualization

T = Technology

Grade 8 (2008)	NUMBER STRAND OUTCOMES	Grade 9 (2009)
<b>SQUARE ROOTS, BASES AND EXPONENTS</b>		
<b>N8.1</b> Demonstrate understanding of the square and principle square root of whole numbers concretely or pictorially and symbolically. <b>CN ME R V T</b>		<b>N9.3</b> Extend understanding of square roots to include the square root of positive rational numbers. <b>CN ME R V T</b>
		<b>N9.1</b> Demonstrate (concretely, pictorially, and symbolically) understanding of powers with integral bases (excluding base 0) and whole number exponents including: <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. <b>C CN PS R T</b></li> </ul>
<b>PERCENT</b>		
<b>N8.2</b> Expand and demonstrate understanding of percents greater than or equal to 0% (including fractional and decimal percents) concretely, pictorially and symbolically. <b>CN PS R V</b>		
<b>RATIO, RATE AND PROPORTIONAL REASONING</b>		
<b>N8.3</b> Demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically. <b>C CN PS R V</b>		
<b>FRACTIONS</b>		
<b>N8.4</b> Demonstrate understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially and symbolically. <b>C CN ME PS</b>		
<b>INTEGERS</b>		
<b>N8.5</b> Demonstrate understanding of multiplication and division of integers concretely, pictorially and symbolically. <b>C CN PS R V</b>		
<b>RATIONAL NUMBERS</b>		
		<b>N9.2</b> Demonstrate understanding of rational numbers including: <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> <b>C CN PS R V T</b>

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### Grade 8 (2008) STATISTICS AND PROBABILITY STRAND OUTCOMES Grade 9 (2009)

#### GRAPHING DATA

**SP8.1** Analyze the modes of displaying data and the reasonableness of conclusions.  
**C CN R**

**SP9.1** Demonstrate understanding of the effect of:

- bias
- use of language
- ethics
- cost
- time and timing
- privacy
- cultural sensitivity
- population or sample

on data collection. **C PS R T**

**SP9.2** Demonstrate an understanding of the collection, display, and analysis of data through a project. **C PS R V T**

#### PROBABILITY

**SP8.2** Demonstrate understanding of the probability of independent events concretely, pictorially, orally, and symbolically.  
**C CN PS T**

**SP9.3** Demonstrate an understanding of the role of probability in society.  
**C CN R T**

#### FIRST NATIONS AND METIS PERSPECTIVE

**SP9.4** Research and present how First Nations and Métis peoples, past and present, envision, represent, and make use of probability and statistics.

### Grade 8 (2008) PATTERNS AND RELATIONS STRAND OUTCOMES Grade 9 (2009)

#### LINEAR RELATIONS

**P8.1** Demonstrate understanding of linear relations concretely, pictorially (including graphs), physically, and symbolically.  
**CN ME PS R V T**

**P9.1** Demonstrate understanding of linear relations including:

- graphing
- analyzing
- interpolating and extrapolating
- solving situational questions. **C CN PS R V T**

#### POLYNOMIALS

**P9.4** Demonstrate understanding of polynomials (limited to polynomials of degree less than or equal to 2) including:

- modeling
- generalizing strategies for addition, subtraction, multiplication, and division
- analyzing
- relating to context
- comparing for equivalency. **C CN R V**

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Grade 8 (2008)	PATTERNS AND RELATIONS STRAND OUTCOMES	Grade 9 (2009)
<b>LINEAR EQUATIONS</b>		
<p><b>P8.2</b> 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>a(x + b) = c</math></li> </ul> <p>concretely, pictorially and symbolically, where <math>a, b,</math> and <math>c</math> are integers.</p> <p><b>C CN PS V</b></p>	<p><b>P9.2</b> Model and solve situational questions 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 = c, a \neq 0</math></li> <li>• <math>ax + b = cx + d</math></li> <li>• <math>ax + b = c</math></li> <li>• <math>a(bx + c) = d(ex + f)</math></li> </ul> <p>where <math>a, b, c, d, e</math> and <math>f</math> are rational numbers.</p> <p><b>C CN PS V</b></p>	<ul style="list-style-type: none"> <li>• <math>\frac{x}{a} = b, a \neq 0</math></li> <li>• <math>ax = b + cx</math></li> <li>• <math>\frac{a}{x} = b, x \neq 0</math></li> <li>• <math>a(x + b) = c</math></li> </ul>
	<p><b>P9.3</b> 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. <b>C CN PS R V</b></li> </ul>	

Grade 8 (2008)	SHAPE AND SPACE STRAND OUTCOMES	Grade 9 (2009)
<b>PYTHAGOREAN THEOREM</b>		
<p><b>SS8.1</b> Demonstrate understanding of the Pythagorean Theorem concretely, pictorially and symbolically and by solving problems.</p> <p><b>CN PS R V T</b></p>		
<b>CIRCLES</b>		
	<p><b>SS9.1</b> Demonstrate understanding of circle properties including:</p> <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. <b>C CN PS R V T</b></li> </ul>	

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Grade 8 (2008)	SHAPE AND SPACE STRAND OUTCOMES	Grade 9 (2009)
<b>AREA AND SURFACE AREA</b>		
<p><b>SS8.2</b> Demonstrate understanding of the surface area of 3-D objects limited to right prisms and cylinders (concretely, pictorially, and symbolically) by:</p> <ul style="list-style-type: none"> <li>analyzing views</li> <li>sketching and constructing 3-D objects, nets, and top, side, and front views</li> <li>generalizing strategies and formulae</li> <li>analyzing the effect of orientation</li> <li>solving problems.</li> </ul> <p><b>C CN PS R V T</b></p>		<p><b>SS9.2</b> Extend understanding of area to surface area of right rectangular prisms, right cylinders, right triangular prisms, to composite 3-D objects.</p> <p><b>CN PS R V</b></p>
<b>VOLUME</b>		
<p><b>SS8.3</b> Demonstrate understanding of volume limited to right prisms and cylinders (concretely, pictorially, and symbolically) by:</p> <ul style="list-style-type: none"> <li>relating volume to area</li> <li>generalizing strategies and formulae</li> <li>analyzing the effect of orientation</li> <li>solving problems.</li> </ul> <p><b>CN PS R V</b></p>		
<b>SIMILARITY</b>		
		<p><b>SS9.3</b> Demonstrate understanding of similarity of 2-D shapes.</p> <p><b>C CN PS R V</b></p>
<b>TRANSFORMATIONS AND TESSELLATIONS</b>		
<p><b>SS8.4</b> Demonstrate an understanding of tessellation by:</p> <ul style="list-style-type: none"> <li>explaining the properties of shapes that make tessellating possible</li> <li>creating tessellations</li> <li>identifying tessellations in the environment.</li> </ul> <p><b>C CN PS V T</b></p>		<p><b>SS9.4</b> Demonstrate understanding of line and rotation symmetry.</p> <p><b>C CN PS V</b></p>