

# SASKATCHEWAN GRADE 7, 8 & 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**

<b>NUMBER STRAND OUTCOMES</b>		
<b>Grade 7 (2007)</b>	<b>Grade 8 (2008)</b>	<b>Grade 9 (2009)</b>
<b>WHOLE AND RATIONAL NUMBERS</b>		
<b>N7.1</b> Demonstrate an understanding of division through the development and application of divisibility strategies for 2, 3, 4, 5, 6, 8, 9, and 10, and through an analysis of division involving zero. <b>C CN ME R</b>	<b>N8.1</b> Demonstrate an 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>N7.2</b> Expand and demonstrate understanding of the addition, subtraction, multiplication, and division of decimals to greater numbers of decimal places, and the order of operations. <b>C CN ME PS R T</b>		
<b>N7.3</b> Demonstrate an understanding of the relationships between positive decimals, positive fractions (including mixed numbers, proper fractions and improper fractions), and whole numbers. <b>C CN ME R T</b>		
<b>N7.4</b> Expand and demonstrate understanding of percent to include fractional percents between 1% and 100%. <b>C PS R</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>N8.3</b> Demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically. <b>C CN PS R V</b>	
<b>N7.5</b> Develop and demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially and symbolically (limited to positive sums and differences). <b>C CN ME PS R V</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>N7.6</b> Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially and symbolically. <b>C CN PS R V</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>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. <b>C CN PS R V T</b></li> </ul>
<b>BASES AND EXPONENTS</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>

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### PATTERNS AND RELATIONS STRAND OUTCOMES

Grade 7 (2007)

Grade 8 (2008)

Grade 9 (2009)

#### TABLES OF VALUES, GRAPHS AND LINEAR RELATIONS

**P7.1** Demonstrate an understanding of the relationships between oral and written patterns, graphs and linear relations.  
**C CN R**

**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**

#### EXPRESSIONS, EQUATIONS AND POLYNOMIALS

**P7.2** Demonstrate an understanding of equations and expressions by:  

- distinguishing between equations and expressions
- evaluating expressions
- verifying solutions to equations.

**C CN ME**

**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**

#### LINEAR EQUATIONS AND INEQUALITIES

**P7.3** Demonstrate an understanding of one-step and two-step linear equations of the form  

$$\frac{ax}{b} + c = d$$
 (where  $a, b, c,$  and  $d$  are whole numbers,  $c \leq d$  and  $b \neq 0$ )  
 by modeling the solution of the equations concretely, pictorially, physically, and symbolically and explaining the solution in terms of the preservation of equality. **C CN PS R V**

**P8.2** Model and solve problems using linear equations of the form:  

- $ax = b$
- $\frac{x}{a} = b, a \neq 0$
- $ax + b = c$
- $\frac{x}{a} + b = c, a \neq 0$
- $a(x + b) = c$

 concretely, pictorially and symbolically, where  $a, b,$  and  $c$  are integers.  
**C CN PS V**

**P9.2** Model and solve situational questions using linear equations of the form:  

- $ax = b$
- $\frac{x}{a} = b, a \neq 0$
- $ax = b + cx$
- $\frac{x}{a} + b = c, a \neq 0$
- $ax + b = cx + d$
- $\frac{a}{x} = b, x \neq 0$
- $ax + b = c$
- $a(x + b) = c$
- $a(bx + c) = d(ex + f)$

 where  $a, b, c, d, e,$  and  $f$  are rational numbers.  
**C CN PS V**

**P7.4** Demonstrate an understanding of linear equations of the form  

$$x + a = b$$
 (where  $a$  and  $b$  are integers)  
 by modeling problems as a linear equation and solving the problems concretely, pictorially, and symbolically. **C CN PS R V**

**P9.3** Demonstrate understanding of single variable linear inequalities with rational coefficients including:  

- solving inequalities
- verifying
- comparing
- graphing. **C CN PS R V**

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STATISTICS AND PROBABILITY STRAND OUTCOMES		
Grade 7 (2007)	Grade 8 (2008)	Grade 9 (2009)
<b>CENTRAL TENDENCY</b>		
SP7.1 Demonstrate an understanding of the measures of central tendency and range for sets of data. C CN PS R T		
<b>DISPLAYING DATA</b>		
SP7.2 Demonstrate an understanding of circle graphs. C CN PS R V T	SP8.1 Analyze the modes of displaying data and the reasonableness of conclusions. C CN R	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</li> <li>• population or sample</li> </ul> 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
<b>PROBABILITY</b>		
SP7.3 Demonstrate an understanding of theoretical and experimental probabilities for two independent events where the combined sample space has 36 or fewer elements. C ME PS R T	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
<b>FIRST NATIONS AND METIS PERSPECTIVE</b>		
		SP9.4 Research and present how First Nations and Métis peoples, past and present, envision, represent, and make use of probability and statistics.

SHAPE AND SPACE STRAND OUTCOMES		
Grade 7 (2007)	Grade 8 (2008)	Grade 9 (2009)
<b>CIRCLES</b>		
SS7.1 Demonstrate an understanding of circles including circumference and central angles. C CN R V		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> C CN PS R V T

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### SHAPE AND SPACE STRAND OUTCOMES (continued)

**Grade 7 (2007)**

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#### AREA, SURFACE AREA AND VOLUME

**SS7.2** Develop and apply formulas for determining area of:  
 • triangles  
 • parallelograms  
 • circles.  
**CN PS R V**

**SS8.2** Demonstrate understanding of the surface area of 3-D objects limited to right prisms and cylinders (concretely, pictorially, and symbolically) by:  
 • analyzing views  
 • sketching and constructing 3-D objects, nets, and top, side, and front views  
 • generalizing strategies and formulae  
 • analyzing the effect of orientation  
 • solving problems.  
**C CN PS R V T**

**SS9.2** Extend understanding of area to surface area of right rectangular prisms, right cylinders, right triangular prisms, to composite 3-D objects.  
**C PS R V**

**SS8.3** Demonstrate understanding of volume limited to right prisms and cylinders (concretely, pictorially, and symbolically) by:  
 • relating volume to area  
 • generalizing strategies and formulae  
 • analyzing the effect of orientation  
 • solving problems.  
**CN PS R V**

#### PYTHAGOREAN THEOREM

**SS8.1** Demonstrate understanding of the Pythagorean Theorem concretely, pictorially and symbolically and by solving problems.  
**CN PS R V T**

#### 2-D SHAPES

**SS7.3** Demonstrate an understanding of 2-D relationships involving lines and angles.  
**CN R V T**

**SS9.3** Demonstrate understanding of similarity of 2-D shapes.  
**C CN PS R V**

#### CARTESIAN PLANE, TRANSFORMATIONS AND TESSELLATIONS

**SS7.4** Demonstrate an understanding of the Cartesian plane and ordered pairs with integral coordinates.  
**C CN V**

**SS7.5** Expand and demonstrate an understanding of transformations (translations, rotations, and reflections) of 2-D shapes in all four quadrants of the Cartesian plane.  
**CN PS V T**

**SS8.4** Demonstrate an understanding of tessellation by:  
 • explaining the properties of shapes that make tessellating possible  
 • creating tessellations  
 • identifying tessellations in the environment.  
**C CN PS V T**

**SS9.4** Demonstrate understanding of line and rotation symmetry.  
**C CN PS V**