

# Aligning *Equals Math* with the Alberta Program of Studies

## Grade 9



Alberta Program of Studies	Related activities from <i>Equals Math</i> resources
<b>Number</b>	
<b>Representing</b>	
<p>N1. Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by:</p> <ul style="list-style-type: none"> <li>• representing repeated multiplication, using powers</li> <li>• using patterns to show that a power with an exponent of zero is equal to one</li> <li>• solving problems involving powers.</li> </ul>	<p><i>Emerging:</i>            8.B.1 estimate number to represent familiar sets up to 3-digits numbers (R)            8.C.1 demonstrate understanding of place value to 1000 (R)            8.C.2 identify 4-digit numerals (R)            8.C.6 identify 5- and 6-digit numerals(R)            8.C.8 compare large numbers up to 6-digits(R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>
<p>N3. Demonstrate an understanding of rational numbers by:</p> <ul style="list-style-type: none"> <li>• comparing and ordering rational numbers</li> <li>• solving problems that involve arithmetic operations on rational numbers.</li> </ul>	<p><i>Emerging:</i>            8.B.1 estimate number to represent familiar sets up to 3-digits numbers (R)            8.C.1 demonstrate understanding of place value to 1000 (R)            8.C.2 identify 4-digit numerals (R)            8.C.6 identify 5- and 6-digit numerals(R)            8.C.8 compare large numbers up to 6-digits(R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>
<b>Adding, Subtracting, Multiplying and Dividing</b>	
<p>N2. Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents:</p>	<p><i>Emerging:</i>            4.C.2 write addition and subtraction equations            7.B.5 choose correct operation to solve simple word problem            8.A.7 use a calculator to add and subtract 2- and 3-digit numbers            8.A.9 add and subtract 3-digit numbers, no re-grouping            8.B.7 add and subtract 3-digit numbers, with re-grouping            8.C.5 use a calculator to add and subtract 4-digit numbers</p> <p><i>Introductory:</i>            11.B.5 solve 2-digit multiplication problem with</p>

	<p>calculator (R)</p> <p>11.C.3 use manipulatives to solve division problems(R)</p> <p>11.C.5 use inverse relationship to solve division problems(R)</p> <p>11.D.3 use division to solve word problem with equal sets(R)</p> <p>11.D.6 choose multiplication and division to solve word problem(R)</p> <p><i>Basic:</i> No related activities identified.</p>
<p>N7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically.</p>	<p><i>Emerging:</i></p> <p>11.A.1 demonstrate multiplication with repeated sets</p> <p>11.A.2 use manipulatives to solve multiplication problems</p> <p>11.A.3 use 10:1 or 2:1 relationships to solve a multiplication problem</p> <p>11.A.4 skip count to solve multiplication problems</p> <p>11.B.4 use multiplication to solve word problem with repeated addition problem</p> <p>11.B.6 demonstrate commutative property of multiplication</p> <p>11.C.1 identify sets that can be divided into equal groups</p> <p>11.C.2 demonstrate division with array and grouping</p> <p><i>Introductory:</i></p> <p>11.B.5 solve 2-digit multiplication problem with calculator (R)</p> <p>11.C.3 use manipulatives to solve division problems(R)</p> <p>11.C.5 use inverse relationship to solve division problems(R)</p> <p>11.D.3 use division to solve word problem with equal sets(R)</p> <p>11.D.6 choose multiplication and division to solve word problem(R)</p> <p><i>Basic:</i> No related activities identified.</p>

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<b>Patterns and Relations</b>	
<b>Graphs and Tables</b>	
<p>PR1. Generalize a pattern arising from a problem-solving context, using a linear equation, and verify by substitution.</p>	<p><i>Emerging:</i>            10.C.5 extend number pattern with constant increment (R)            10.C.6 use a table representing constant rate of change (R)            10.C.7 describe number pattern in table with constant rate of change (R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>
<p>PR2. Graph a linear relation, analyze the graph, and interpolate or extrapolate to solve problems.</p>	<p><i>Emerging:</i>            10.C.5 extend number pattern with constant increment (R)            10.C.6 use a table representing constant rate of change (R)            10.C.7 describe number pattern in table with constant rate of change (R)</p> <p><i>Introductory:</i>            No related activities identified.</p> <p><i>Basic:</i>            No related activities identified.</p>
<b>Equations</b>	
<p>PR3. 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>x/a \square b, a \neq 0</math></li> <li>• <math>ax + b = c</math></li> <li>• <math>x/a + b \square 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>a/x = b, x \neq 0</math></li> </ul> <p>where <math>a, b, c, d, e</math> and <math>f</math> are rational numbers.</p>	<p><i>Emerging:</i>            10.C.1 use notation for equivalent expression (R)            10.C.2 complete problem solving with missing addend (R)            10.C.3 solve addition equation with a variable (R)            10.C.4 identify equal and equivalent sets(R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>
<p>PR4. Explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context.</p>	<p><i>Emerging:</i>            10.C.1 use notation for equivalent expression (R)            10.C.2 complete problem solving with missing addend (R)            10.C.3 solve addition equation with a variable (R)            10.C.4 identify equal and equivalent sets(R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>

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<b>Shape and Space</b>	
<b>Circles</b>	
<p>SS1. Solve problems and justify the solution strategy, using the following circle properties:</p> <ul style="list-style-type: none"> <li>• the perpendicular from the centre of a circle to a chord bisects the chord</li> <li>• the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc</li> <li>• the inscribed angles subtended by the same arc are congruent</li> <li>• a tangent to a circle is perpendicular to the radius at the point of tangency.</li> </ul>	<p><i>Emerging:</i> 9.C.1 identify right angle (R) 11.E.1 measure perimeter</p> <p><i>Introductory/Basic:</i> No related activities identified.</p>
<b>Surface Area</b>	
<p>SS2. Determine the surface area of composite 3-D objects to solve problems.</p>	<p><i>Emerging:</i> 9.A.4 identify length with lines and pictured ruler (R) 9.A.5 measure line in centimeters (R) 9.A.7 measure line in meters(R) 9.C.1 identify right angle(R) 9.D.4 count sides and vertices on two-dimensional net(R) 11.E.1 measure perimeter (R) 11.E.2 measure area (R) 11.E.4 determine the volume of a box (R)</p> <p><i>Introductory:</i> 9.D.6 sort polyhedral shapes from other shapes</p> <p><i>Basic:</i> No related activities identified.</p>
<b>3-D Objects</b>	
<p>SS3. Demonstrate an understanding of similarity of polygons.</p>	<p><i>Emerging:</i> 5.D.6 identify three-dimensional shapes 5.D.5 find and match three-dimensional shapes in the environment 9.A.4 identify length with lines and pictured ruler (R) 9.A.5 measure line in centimeters (R) 9.A.7 measure line in meters (R) 9.C.1 identify right angle (R) 9.D.1 identify three-dimensional faces, vertices, and edges 9.D.2 count three-dimensional faces, vertices, and angles 9.D.3 use a table to organize three-dimensional shapes 11.E.1 measure perimeter (R)</p>

	<p>11.E.2 measure area (R) 11.E.4 determine the volume of a box (R)</p> <p><i>Introductory:</i> 9.D.4 count sides and vertices on two-dimensional net (R) 9.D.5 build, identify, and compare three-dimensional shape to net (R)</p> <p><i>Basic:</i> No related activities identified.</p>
<b>Transformations</b>	
<p>SS4. Draw and interpret scale diagrams of 2-D shapes.</p>	<p><i>Emerging:</i> 9.B.3 predict and confirm results of transformations (R) 9.B.4 describe motion (s) to prove congruency (R)</p> <p><i>Introductory/Basic:</i> No related activities identified.</p>
<p>SS5. Demonstrate an understanding of line and rotation symmetry.</p>	<p><i>Emerging:</i> 9.B.3 predict and confirm results of transformations (R) 9.B.4 describe motion (s) to prove congruency (R)</p> <p><i>Introductory/Basic:</i> No related activities identified.</p>

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Alberta Program of Studies	Related Activities from Equals Math
<b>Statistics and Probability</b>	
<b>Collecting, Displaying and Analyzing Data</b>	
<p>SP3. Develop and implement a project plan for the collection, display and analysis of data by:</p> <ul style="list-style-type: none"> <li>• formulating a question for investigation</li> <li>• choosing a data collection method that includes social considerations</li> <li>• selecting a population or a sample</li> <li>• collecting the data</li> <li>• displaying the collected data in an appropriate manner</li> <li>• drawing conclusions to answer the question.</li> </ul>	<p><i>Emerging:</i>            3.D.6 interpret a bar graph by comparison            3.E.3 place data in simple bar graph with symbolic representation            3.E.4 compare amounts on bar graph with symbolic representation            3.E.5 use data from bar graph to solve simple problem            6.A.5 make a bar graph with categorical data            6.A.6 communicate conclusions drawn from bar graph (R)</p> <p><i>Introductory:</i>            No related activities identified.</p> <p><i>Basic:</i>            No related activities identified.</p>
<p>SP1. Describe the effect of:</p> <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> </ul> <p>on the collection of data.</p>	<p><i>Emerging:</i>            6.A.6 communicate conclusions drawn from bar graph (R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>
<p>SP2. Select and defend the choice of using either a population or a sample of a population to answer a question.</p>	<p><i>Emerging:</i>            6.A.6 communicate conclusions drawn from bar graph (R)</p> <p><i>Introductory/Basic:</i>            No related activities identified.</p>
<b>Probability</b>	
<p>SP4. Demonstrate an understanding of the role of probability in society.</p>	<p><i>Emerging:</i>            10.B.1 predict probability of outcomes            10.B.2 describe outcome of experiment            10.B.3 describe variable and result</p> <p><i>Introductory:</i>            10.B.6 predict probability regarding change over time (R)            10.B.7 collect data from experiment</p> <p><i>Basic:</i>            No related activities identified.</p>