

Yearly Plan - Mathematics 9

In September 2021, teachers will be working hard to create a space that is safe and welcoming for all learners no matter the location of their “classroom”. The first weeks will still be a time to establish a sense of community, engage learners in rich interactive experiences to promote critical thinking and create opportunities for collaboration and discussion. This is an opportune time to develop a culture and a climate for mathematics learning, conducive to collaboration, risk taking and inquiry.

The following is a yearly plan for Mathematics 9, which provides an overview of the nine units. It is a reference tool to support teachers with the pacing of yearlong learning. Teachers are encouraged to use their professional judgement and consider the needs of their students when planning for instruction. **For the purposes of planning your mathematics lessons, refer to the [Mathematics 9 curriculum document](#) and [Foundational Outcomes](#) that provides essential background information and describes learning opportunities and assessment tasks for each of the outcomes in the unit.**

The Year at a Glance	
Unit # and Title	Unit Outcomes
Develop a Culture and Climate for Mathematics Learning	Nova Scotia's Inclusive Education Policy
Unit 1 Powers and Exponent Laws	N01, N04, N02
Unit 2 Rational Numbers	N03, N04
Unit 3 Square Roots and Surface Area	N05, N06, G01
Unit 4 Linear Relations	PR01, PR02
Unit 5 Polynomials	PR05, PR06, PR07
Unit 6 Linear Equations and Inequalities	PR03, PR04
Unit 7 Similarity and Transformations	G03, G02, GO4
Unit 8 Circle Geometry	M01
Unit 9 Probability and Statistics	SP04, SP01, SP02, SP03

Unit 1 Powers and Exponent Laws (21 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
	Introductory Lesson	2 hours	Course Outline/Formalizing Norms etc. Textbook walk through	Develop classroom norms <ul style="list-style-type: none"> Set tone for problem solving Develop various strategies/approaches for critical thinking and problem solving
Sept emb er - Octo ber	Unit 1: Powers and Exponent Laws Number: Students will be expected to develop number sense N01 Students will be expected to demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents. [C, CN, PS, R] N02 Students will be expected to demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents. [C, CN, PS, R, T] N04 Students will be expected to explain and apply the order of operations, including exponents, with and without technology. [PS, T]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document N01, N02, N04 ProGuide: Launch
		2 hours	What is a Power?	Curriculum Document: N01 ProGuide/Student Text: section 2.1
		2 hours	Powers of Ten and the Zero Exponent	Curriculum Document: N01 ProGuide/Student Text: section 2.2
		3 hours	Order of Operations with Powers	Curriculum Document: N04 ProGuide/Student Text: section 2.3 Student Text: Start Where You Are: What Strategy Could I try? pp.70 Student Text: Game Operation Target Practice p.72
		1 hour	Review and Assessment	Curriculum Document Mid-Unit Review: Student Text: p. 69
		3 hours	Exponent Laws 1	Curriculum Document: N02 ProGuide/Student Text: section 2.4
		3 hours	Exponent Laws 2	Curriculum Document: N02 Student Text: section 2.5
		4hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review p. 86–89 Student Text: Practice Test p.90 ProGuide: Unit Test CD: Extra Practice & Test Generator Student Text: Unit Problem: How Thick is a Pile of Paper p. 91



Unit 2 Rational Numbers (21 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
October — November	Unit 2: Rational Numbers Number: Students will be expected to develop number sense N03 Students will be expected to demonstrate an understanding of rational numbers by comparing and ordering rational numbers and solving problems that involve arithmetic operations on rational numbers. [C, CN, PS, R, T, V] N04 Students will be expected to explain and apply the order of operations, including exponents, with and without technology. [PS, T]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: N03, N04 ProGuide: Launch Student Text: Start Where You Are: How Can I Learn From Others? pp. 104–105
		2 hours	What Is a Rational Number?	Curriculum Document: N03 ProGuide/Student Text: section 3.1
		2 hours	Adding Rational Numbers	Curriculum Document: N03 ProGuide/Student Text: section 3.2
		2 hours	Subtracting Rational Numbers	Curriculum Document: N03 ProGuide/Student Text: section 3.3
		1 hour	Review and Assessment	Curriculum Document Student Text: Game: Closest to Zero p. 122 Mid-Unit Review: Student Text: p. 121
		2 hour	Multiplying Rational Numbers	Curriculum Document: N03 ProGuide/Student Text: section 3.4
		2 hours	Dividing Rational Numbers	Curriculum Document: N03 ProGuide/Student Text: section 3.5
		3 hours	Order of Operations with Rational Numbers	Curriculum Document: N04 ProGuide/Student Text: section 3.6
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review p.1443–145 Student Text: Practice Test p.146 ProGuide: Unit Test CD: Extra Practice & Test Generator ProGuide/Student Text: Unit Problem: Investigating Temperature Data – Student Text: p. 147; ProGuide: p. 57
		2 hours	Cumulative Review	

Unit 3: Square Roots and Surface Area (19 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
Nov emb er - Dec emb er	Unit 3: Square Roots and Surface Area Number: Students will be expected to develop number sense Geometry: 3-D Objects and 2-D Shapes: Students will be expected to describe the characteristics of 3-D objects and 2-D shapes and analyze the relationships among them. N05 Students will be expected to determine the exact square root of positive rational numbers. [C, CN, PS, R, T] N06 Students will be expected to determine an approximate square root of positive rational numbers. [C, CN, PS, R, T] G01 Students will be expected to determine the surface area of composite 3-D objects to solve problems. [C, CN, PS, R, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: N05, N06, G01 ProGuide: Launch Student Text: Start Where You Are: How Can I Begin? pp. 22–23 Student Text: Project: Making Squares into Cubes p.2
		3 hours	Square Roots of Perfect Squares	Curriculum Document: N05 ProGuide/Student Text: section 1.1
		3 hours	Squares Roots of Non-Perfect Squares	Curriculum Document: N06 ProGuide/Student Text: section 1.2
		1 hour	Review and Assessment	Curriculum Document Mid-Unit Review: Student Text: p. 21
		3 hours	Surface Areas of Objects Made from Right Rectangular Prisms	Curriculum Document: G01 ProGuide/Student Text: section 1.3
		4 hours	Surface Areas of Other Composite Objects	ProGuide/Student Text: section1.4
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review p. 44–47 Student Text: Practice Test p.48 Student Text: Unit Test CD: Extra Practice & Test Generator ProGuide/Student Text: Unit Problem: Design a Play Structure – Student Text: p. 49; ProGuide: p. 47

Unit 4: Linear Relations (21 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
Dec emb er— Janu ary	Unit 4: Linear Relations Patterns: Students will be expected to use patterns to describe the world and solve problems. Variables and Equations: Students will be expected to represent algebraic expressions in multiple ways. PR01 Students will be expected to generalize a pattern arising from a problem-solving context using a linear equation and verify by substitution. [C, CN, PS, R, V] PR02 Students will be expected to graph a linear relation, analyze the graph, and interpolate or extrapolate to solve problems. [C, CN, PS, R, T, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: PR01, PR02 ProGuide: Launch ProGuide DVD: Master 4.28 Student Text: Start Where You Are: How Can I Explain My Thinking? pp. 152–153
		3 hours	Writing Equations to Describe Patterns	Curriculum Document: PR01 ProGuide/Student Text: section 4.1 Student Text: Technology: Table of Values and Graphing p. 163
		3 hours	Linear Relations	Curriculum Document: PR02 ProGuide/Student Text: section 4.2 Student Text: Game: What's My Point? p. 182
		3 hours	Another Form of the Equation for a Linear Relation	Curriculum Document: PR02 ProGuide/Student Text: section 4.3
		1 hours	Review and Assessment	Curriculum Document Mid-Unit Review: Student Text: p. 181
		3 hours	Matching Equations and Graphs	Curriculum Document: PR02 ProGuide/Student Text: section 4.4
		3 hours	Using Graphs to Estimate Values	Curriculum Document: PR02 ProGuide/Student Text: section 4.5 Student Text: Technology: Interpolating and Extrapolating p. 199
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review pp. 200–203 Student Text: Practice Test pg. 204 ProGuide: Unit Test CD: Extra Practice & Test Generator

				ProGuide/Student Text: Unit Problem: Predicting Music Trends – Student Text: p. 205; ProGuide: p. 57

Unit 5: Polynomials (22 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
January —February	Unit 5: Polynomials Patterns: Students will be expected to use patterns to describe the world and solve problems. Variables and Equations: Students will be expected to represent algebraic expressions in multiple ways. PR05 Students will be expected to demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to two). [C, CN, R, V] PR06 Students will be expected to model, record, and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially, and symbolically (limited to polynomials of degree less than or equal to two). [C, CN, PS, R, V] PR07 Students will be expected to model, record, and explain the operations of multiplication and division of polynomial expressions, concretely, pictorially, and symbolically (limited to polynomials of degree less than or equal to two). [C, CN, R, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: PR05, PR06, PR07 ProGuide: Launch
		2 hours	Modelling Polynomials	Curriculum Document: PR05 ProGuide/Student Text: section 5.1
		2 hours	Like Terms and Unlike Terms	Curriculum Document: PR06 ProGuide/Student Text: section 5.2
		3 hours	Adding Polynomials	Curriculum Document: PR05, PR06 ProGuide/Student Text: section 5.3
		3 hours	Subtracting Polynomials	Curriculum Document: PR05, PR06 ProGuide/Student Text: section 5.4
		1 hour	Review and Assessment	Curriculum Document Student Text: Start Where You Are: How Can I Summarize What I have Learned? pp. 238–239 Mid-Unit Review: Student Text: p. 237 Student Text: Game Investigating Polynomials that Generate Prime Numbers p. 240
		3 hours	Multiplying and Dividing a Polynomial by a Constant	Curriculum Document: PR07 ProGuide/Student Text: section 5.5
		3 hours	Multiplying and Dividing a Polynomial by a Monomial	Curriculum Document: PR07 ProGuide/Student Text: section 5.6
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review pp. 258–261 Student Text: Practice Test p.262 ProGuide: Unit Test CD: Extra Practice & Test Generator

				Student Text: Unit Problem: Algebra Patterns on a 100-Chart p. 263

Unit 6: Linear Equations and Inequalities (23 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
February —March	Unit 6: Linear Equations and Inequalities Patterns: Students will be expected to use patterns to describe the world and solve problems. Variables and Equations: Students will be expected to represent algebraic expressions in multiple ways. PR03 Students will be expected to model and solve problems, where a, b, c, d, e , and f are rational numbers, using linear equations. [C, CN, PS, V] PR04 Students will be expected to explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context. [C, CN, PS, R, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: PR03, PR04 ProGuide: Launch
		3 hours	Modelling Solving Equations by Using Inverse Operations	Curriculum Document: PR03 ProGuide/Student Text: section 6.1
		3 hours	Solving Equations by Using Balance Strategies	Curriculum Document: PR03 ProGuide/Student Text: section 6.2
		1 hour	Review and Assessment	Curriculum Document Student Text: Game: Equation Persuasion p.287 Mid-Unit Review: Student Text: p.286
		3 hours	Introduction to Linear Inequalities	Curriculum Document: PR04 ProGuide/Student Text: section 6.3
		3 hours	Solving Linear Inequalities by Using Addition and Subtraction	Curriculum Document: PR04 ProGuide/Student Text: section 6.4
		3 hours	Solving Linear Inequalities by Using Multiplication and Division	Curriculum Document: PR04 ProGuide/Student Text: section 6.5
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review pp. 307–309 Student Text: Practice Test p. 310 ProGuide: Unit Test CD: Extra Practice & Test Generator Student Text: Unit Problem: Raising Money for the Pep Club p. 311
		2 hours	Cumulative Review	

Unit 7 Similarity and Transformations (24 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
April – May	Unit 7: Similarity and Transformations 3-D Objects and 2-D Shapes: Students will be expected to describe the characteristics of 3-D objects and 2-D shapes and analyze the relationships among them. Transformations: Students will be expected to describe and analyze position and motion of objects and shapes G02 Students will be expected to demonstrate an understanding of similarity of polygons. [C, CN, PS, R, V] G03 Students will be expected to draw and interpret scale diagrams of 2-D shapes. [CN, R, T, V] G04 Students will be expected to demonstrate an understanding of line and rotation symmetry. [C,CN, PS, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: G02, G03, G04 ProGuide: Launch Student Text: Start Where You Are: What Should I Recall? pp. 316–317
		2 hours	Scale Diagrams and Enlargements	Curriculum Document: G03 ProGuide/Student Text: section 7.1
		3 hours	Scale Diagrams and Reductions	Curriculum Document: G03 ProGuide/Student Text: section 7.2 Student Text: Technology: Drawing Scale Diagrams pp. 332–333
		2 hours	Similar Polygons	Curriculum Document: G02 ProGuide/Student Text: section 7.3
		3 hours	Similar Triangles	Curriculum Document: G02 ProGuide/Student Text: section 7.4
		1 hour	Review and Assessment	Curriculum Document Mid-Unit Review: Student Text: p.352
		3 hours	Reflections and Line Symmetry	Curriculum Document: G04 Student Text: section 7.5
		3 hours	Rotations and Rotational Symmetry	Curriculum Document: G04 Student Text: section 7.6
		2 hours	Identifying Types of Symmetry on the Cartesian Plane	Curriculum Document: G04

				Student Text: section 7.7
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review pp. 376–379 Student Text: Practice Test p.380 ProGuide: Unit Test CD: Extra Practice & Test Generator Student Text: Unit Problem: Designing a Flag p. 381

Unit 8 Circle Geometry (15 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
May	Unit 8: Circle Geometry Measurement: Students will be expected to use direct and indirect measurement to solve problems. M01 Students will be expected to solve problems and justify the solution strategy, using the following circle properties: <ul style="list-style-type: none"> – The perpendicular from the centre of a circle to a chord bisects the chord. – The measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc. – The inscribed angles subtended by the same arc are congruent. – A tangent to a circle is perpendicular to the radius at the point of tangency. [C, CN, PS, R, T, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: M01 ProGuide: Launch
		3 hours	Properties of Tangents to a Circle	Curriculum Document: M01 ProGuide/Student Text: section 8.1
		4 hours	Properties of Chords in a Circle	Curriculum Document: M01 ProGuide/Student Text: section 8.2 Student Text: Technology: Verifying the Tangent and Chord Properties pp. 400–401
		1 hour	Review and Assessment	Curriculum Document Mid-Unit Review: Student Text: p. 403
		3 hours	Properties of Angles in a Circle	Curriculum Document: M01 ProGuide/Student Text: section 8.3 Student Text: Technology: Verifying the Angle Properties pp. 413–414 Student Text: Game Seven Counters p.402

		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Chapter Review pp. 417–419 Student Text: Practice Test p.420 ProGuide: Unit Test CD: Extra Practice & Test Generator Student Text: Start Where You Are: How Do I Best Learn Math? pp. 415–416 Student Text: Unit Problem: Designing a Flag p. 421

Unit 9 Statistics and Probability (18 hours)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
June	Unit 9 Statistics and Probability Data Analysis: Students will be expected to collect, display, and analyze data to solve problems. Uncertainty: Students will be expected to use experimental or theoretical probabilities to represent and solve problems involving uncertainty. SP01 Students will be expected to describe the effect on the collection of data of bias, use of language, ethics, cost, time and timing, privacy, and cultural sensitivity. [C,CN, R,T] SP02 Students will be expected to select and defend the choice of using either a population or a sample of a population to answer a question. [C,CN, PS, R] SP03 Students will be expected to develop and implement a project plan for the collection, display, and analysis of data by formulating a question for investigation choosing a data collection method that includes social considerations selecting a population or a sample collecting the data displaying the collected data in an appropriate manner drawing conclusions to answer the question [C, PS, R, T, V]	1 hour	Assessing Prior Knowledge (ongoing throughout the unit)	Curriculum Document: SP01, SP02, SP03, SP04 ProGuide: Launch
		2 hours	Probability in Society	Curriculum Document: SP04 ProGuide/Student Text: section 9.1 Student Text: Game: Cube Master p.430
		2 hours	Potential Problems with Collecting Data	Curriculum Document: SP01 ProGuide/Student Text: section 9.2
		2 hours	Using Samples and Populations to Collect Data:	Curriculum Document: SP02 ProGuide/Student Text: section 9.3
		1 hour	Review and Assessment	Curriculum Document Student Text: Technology: Using Census at School pp. 442–443 Mid-Unit Review: Student Text: p. 444
		2 hours	Selecting a Sample	Curriculum Document: SP02 ProGuide/Student Text: section 9.4
		1 hour	Displaying Data	Student Text: Technology: Using Spreadsheets and Graphs to Display Data p. 450–451
		1 hour	Designing a Project Plan	Curriculum Document: SP03 ProGuide/Student Text: section 9.5
		4 hours	Reinforcement, Consolidation and Assessment	Curriculum Document Student Text: Study Guide and Review pp. 457–459 Student Text: Practice Test p. 460 CD: Extra Practice & Test Generator Student Text: Unit Problem: What Can You Discover about the World around You? p. 461
		2 hours	Cumulative Review	

Unit 9 Statistics and Probability (continued)

Timeline	GCO/SCOs	Suggested Time Allocation	Content / Assessment	Curriculum Document/ Supporting Resources
June	SP04 Students will be expected to demonstrate an understanding of the role of probability in society. [C, CN, R, T]			