BC Draft Curriculum - Mathematics - Progressive Matrix

PROGRESSION IS HIGHLIGHTED IN THE FOLLOWING DOCUMENT VIA **BOLDED TEXT**.

Kindergarten	**Grade 1**
BIG IDEAS	**BIG IDEAS**
Numbers tell how much and how many and can be represented in many different forms.	Numbers tell how much and how many and can be represented in many different forms.
Patterns represented in various ways show repeated regularities.	Patterns represented in various ways show repeated regularities.
Objects and shapes can be described, measured, and compared in many ways.	Objects and shapes can be described, measured, and compared in many ways.
Information can be collected and represented by several methods.	Information can be collected and represented by several methods.
Curricular Competencies	**Curricular Competencies**
Students will be able to problem solve. **Analyzing a problem** • Use multiple strategies, including real-life concrete and pictorial contexts, to develop, construct, and apply mathematical understanding through play, inquiry, and problem solving • Estimate reasonably using whole-number benchmarks of 5 • Develop mental math strategies and abilities to make sense of quantities up to 10 **Reasoning and proof** • Use reasoning and logic to explore and make connections **Communicating** • Communicate in many ways (concretely, pictorially, symbolically, and using simple spoken or written language) to express, describe, explain, represent, and apply mathematical ideas **Connecting** • Visualize and describe mathematical concepts • Connect mathematical concepts to each other and make mathematical connections to the real world **Representing** • Develop mathematical understanding through concrete, pictorial, and symbolic representations • Use technology appropriately to explore mathematics, solve problems, record, communicate, and represent thinking	*Students will be able to problem solve.* **Analyzing a problem** • Use multiple strategies, including real-life concrete and pictorial contexts, to develop, construct, and apply mathematical understanding through play, inquiry, and problem solving • Estimate reasonably using whole-number benchmarks of **10 and personal referents (such as hands, arms, etc.)** • Develop mental math strategies and abilities to make sense of **sums and differences up to 20** **Reasoning and proof** • Use reasoning and logic to explore and make connections **Communicating** • Communicate in many ways (concretely, pictorially, symbolically, and using simple spoken or written language) to express, describe, explain, represent, and apply mathematical ideas **Connecting** • Visualize and describe mathematical concepts • Connect mathematical concepts to each other and make mathematical connections to the real world **Representing** • Develop mathematical understanding through concrete, pictorial, and symbolic representations • Use technology appropriately to explore mathematics, solve problems, record, communicate, and represent thinking
Concepts and Content	**Concepts and Content**
Students will know and understand the following concepts and content. • number concepts to 10 • partitioning numbers to 10 • repeating patterns with two or three elements • concrete relationship through change (ex. Show me how do I go from 4 to 6?) • equality as a balance and inequality as an imbalance • direct comparative measurement, based on one attribute • 3D objects, based on one attribute • positional language, such as beside, on top of, under, and in front of • the likelihood of familiar, real-life events	*Students will know and understand the following concepts and content.* • number concepts to **20** • **addition and subtraction to 20** • repeating patterns with **multiple** elements and attributes • **recognize and describe coins** • **verbal** relationship through change (ex. **Tell** me how do I go from **10** to **15**?) • **the meaning of** equality and inequality • daily events in a timeline • **in**direct comparative measurement, based on one attribute • measurement with non-standard units • comparing time using non-standard duration • 3D objects **and 2D shapes**, based on one attribute • **relative** positions, using positional language such as **up, down, in, and out** • concrete graphs using one-to-one correspondence • the likelihood of **less-**familiar, real-life events

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Grade 2	Grade 3
BIG IDEAS	**BIG IDEAS**
Numbers tell how much and how many and can be represented in many different forms.	Numbers **have values and can be described**, represented, **and calculated** in many different **ways**.
Patterns represented in various ways show repeated regularities.	Patterns represent **identified** regularities **and can be used to solve problems**.
Objects and shapes can be described, measured, and compared in many ways.	Objects and shapes can be described **using attributes**, and can be measured, **constructed**, compared, **and sorted** in many ways
Information can be collected and represented by several methods.	Information can be collected and represented **in various forms that allow us to make interpretations**.
	Units of measure can be used to compare and determine the measurable values of objects and shapes.
	Algebraic symbols can be used to represent, model, and analyze scenarios.
Curricular Competencies	**Curricular Competencies**
Students will be able to problem solve. **Analyzing a problem** • Use multiple strategies, including real-life concrete and pictorial contexts, to develop, construct, and apply mathematical understanding through problem solving • Estimate reasonably using whole-number benchmarks of **25, 50, and 100** and personal referents • Develop mental math strategies and abilities to make sense of sums and differences up to **100** **Reasoning and proof** • Use reasoning and logic to explore and make connections **Communicating** • Communicate in many ways (concretely, pictorially, symbolically, and using simple spoken or written language) to express, describe, explain, represent, and apply mathematical ideas **Connecting** • Visualize and describe mathematical concepts • Connect mathematical concepts to each other and make mathematical connections to the real world **Representing** • Develop mathematical understanding through concrete, pictorial, and symbolic representations • Use technology appropriately to explore mathematics, solve problems, record, communicate, and represent thinking	*Students will be able to problem solve.* **Analyzing a problem** • Use **an increasing variety of** strategies to develop, construct, and apply mathematical understanding through problem solving • Estimate **quantities** reasonably, using **large** whole-number **and fraction** benchmarks, and **the reasonableness of large whole-number calculations** • Develop **and apply** mental math strategies **for all operations to deepen understanding and develop computational fluency** **Reasoning and proof** • Reason and use logic to explore, make connections, **analyze observations, make generalizations from patterns, and test these generalizations** **Communicating** • Communicate in many ways (concretely, pictorially, symbolically, and using spoken and written language) to express, describe, explain, represent, **clarify**, **modify**, **reinforce**, and apply mathematical ideas **Connecting** • Visualize and describe mathematical concepts • Connect mathematical concepts to each other, and make mathematical connections to the real world **Representing** • Develop mathematical understanding through concrete, pictorial, and symbolic representations • Use technology appropriately to explore mathematics, solve problems, record, communicate, and represent thinking
Concepts and Content	**Concepts and Content**
Students will know and understand the following concepts and content. • number concepts to **100** • addition and subtraction to **100** • repeating **and increasing** patterns • **values of** coins • **symbolic** relationship through change **using numbers and/or symbols** • **symbolic representation** of equality and inequality • measure **by using single and multiple copies of a** non-standard unit • comparing time using non-standard duration • 3D objects and 2D shapes, based on **multiple** attribute**s** • relative positions, **including distance** • **pictorial representation of** concrete graphs • the likelihood of **contrived** events	*Students will know and understand the following concepts and content.* • number concepts to **1000** • addition and subtraction to **1000** • **one-step** addition and subtraction **equations with an unknown number** • **fractions** • **multiplication and division of single-digit numbers** • increasing and **decreasing** patterns • **monetary denominations**, using coins **and bills** • measurement using **standard** units • **standard units of** time • 2D shapes and 3D objects, based on **faces, edges, and vertices** • **preservation of** shape **(ex. Rotating will not change properties)** • **one-to-one correspondence using pictographs, charts, and tables** • likelihood of **two or more outcomes**

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Grade 4	Grade 5
BIG IDEAS	**BIG IDEAS**
Number **relationships are the foundation of mathematical communication**.	Numbers **represent** values **that can be used in calculations and expressed** in many ways.
	Attributes of objects and shapes can be **used to predict spatial relationships**.
Data can be collected, **organized, and displayed in many different ways**.	
Units of measure can be used to compare and determine the measurable values of objects and shapes.	
Algebraic symbols can be used to represent, model, and analyze scenarios.	**Patterns can be expressed with** algebraic **variables and symbols** to represent **problems and solutions**.
Time is arranged into measurable segments that can help us organize our daily lives.	Time is arranged into **predictable units that allow for planning and problem solving**.
	Chance and uncertainty are used to inform decisions in everyday life
Curricular Competencies	**Curricular Competencies**
Students will be able to problem solve. **Analyzing a problem** • Use multiple strategies to develop, construct, and apply mathematical understanding through problem solving • Estimate quantities reasonably using large whole-number, **decimal**, and fraction benchmarks, and the reasonableness of large whole number **and decimal** calculations • Develop and apply mental math strategies for all operations to deepen understanding and develop fluency **in making computations** **Reasoning and proof** • Reason and use logic to explore and make connections, analyze observations, make generalizations from patterns, and test these generalizations **Communicating** • Communicate in many ways (concretely, pictorially, symbolically, and using spoken and written language) to express, describe, explain, represent, clarify, modify, reinforce, and apply mathematical ideas **Connecting** • Visualize and describe mathematical concepts • Connect mathematical concepts to each other and make mathematical connections to the real world **Representing** • Develop mathematical understanding through concrete, pictorial, and symbolic representations • Use technology appropriately to explore mathematics, solve problems, record, communicate and represent thinking	*Students will be able to problem solve.* **Analyzing a problem** **Reasoning and proof** **Communicating** **Connecting** **Representing**
Concepts and Content	**Concepts and Content**
Students will know and understand the following concepts and content. • number concepts to **10 000** • addition and subtraction to **10 000** • **decimals to hundredths**, including addition and subtraction • one-step equations with an unknown number • **ordering and comparing** fractions • multiplication and division of **two- or three**-digit numbers **by one-digit numbers** • increasing and decreasing patterns, **including use of charts, graphs, and tables** • pattern **rules with words and numbers** • monetary **calculations, purchasing and change** • **perimeter of simple regular and irregular** shapes • **how to tell time with analogue and digital clocks, using 12- and 24-hour clocks** • **polygons** • **line symmetry** • one-to-one correspondence **and many-to-one correspondence, using bar graphs**, pictographs, charts, and tables • **simple probability experiments**	*Students will know and understand the following concepts and content.*

BC Draft Curriculum - Mathematics - Progressive Matrix

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Grade 6	Grade 7
BIG IDEAS	**BIG IDEAS**
Numbers tell us how many or how much **of both very large and very small quantities**.	**Parts of** wholes can be represented in many ways **that have important connections**.
Understanding whole-number operations helps us make sense of and use operations with decimal number.	Understanding whole-number operations helps us make sense of and **do these operations with fractions and integers.**
Shapes can be described and **classified by many properties, including their angles**.	**Circles of all sizes contain and share important relationships.**
Transformations describe meaningful spatial relationships.	**Linear** relations can be represented in many ways that have important connections.
	Different measures and **uses of** data **help us** compare and interpret information
Relationships in patterns **can be** represent**ed in many ways, and these** represent**ations have important connections.**	
Curricular Competencies	**Curricular Competencies**
Students will be able to problem solve. **Analyzing a problem** **Reasoning and proof** **Communicating** **Connecting** **Representing**	*Students will be able to problem solve.* **Analyzing a problem** **Reasoning and proof** **Communicating** **Connecting** **Representing**
Concepts and Content	**Concepts and Content**
Students will know and understand the following concepts and content.	*Students will know and understand the following concepts and content.*

BC Draft Curriculum - Mathematics - Progressive Matrix

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Grade 8	Grade 9
BIG IDEAS	**BIG IDEAS**
Proportional reasoning helps us make sense of how quantities are related in real-life contexts.	
Understanding whole-number **multiplication and division** helps us make sense of and do these operations with fractions and integers.	
We can make sense of 3D objects through different perspectives.	
Linear relations can be represented in many ways that have important connections.	Linear relations can be represented in many ways that have important connections.
Data collection and representation **help us communicate with others**.	
	Through inquiry, we explore mathematics flexibly, creatively, and reflectively.
	People can solve problems and express their mathematical thinking in a range of forms.
	Topics in mathematics are interconnected and interrelated.
Curricular Competencies	**Curricular Competencies**
Students will be able to problem solve. **Analyzing a problem**	*Students will be able to problem solve.* **Analyzing a problem** • Engage in multiple strategies to solve problems in both abstract and real-life situations • Estimate and determine the reasonableness of values • Develop and apply mental math strategies to determine decimal and fraction calculations, deepen understanding, and reinforce whole number computational fluency
Reasoning and proof	**Reasoning and proof** • Inductively and deductively reason and use logic to explore, make connections, predict, analyze, generalize, and make conclusions
Communicating	**Communicating** • Communicate concretely, pictorially, symbolically, and using spoken and written language to express, describe, explain, represent, clarify, modify, reinforce, apply, defend, and extend mathematical ideas
Connecting	**Connecting** • Visualize and describe mathematical concepts • Connect mathematical concepts to each other and make mathematical connections to the real world • Explore, demonstrate, apply, and connect mathematical concepts incorporated in other disciplines
Representing	**Representing** • Describe, create, and interpret relationships through concrete, pictorial, and symbolic representations • Use technology appropriately to explore, illustrate, examine relationships, test conjectures, solve problems, record, communicate and represent thinking
Concepts and Content	**Concepts and Content**
Students will know and understand the following concepts and content.	*Students will know and understand the following concepts and content.*
	• numerical and spatial reasoning, logic, and patterns to solve puzzles and games • exponents
	• personal budgets
	• factors, prime factors, and numerical radicals • rational and irrational • multiplication and division of decimals, fractions, mixed numbers, and integers • two-variable linear relations, including graphs, rates of change, functions, and relations • operations with polynomials, of degree less than or equal to two • one- and two-step equations with rational coefficients and solutions • multi-step one-variable linear equations and inequalities • equations involving distribution
	• surface area and volume of composite solids • volume of prisms, pyramids, cones, and spheres • primary trigonometric ratios • Pythagorean theorem • scale diagrams of 2D shapes • data collection, display, and analysis, including population and sample data • probability in society