

Key Concepts in the Curriculum

OVERVIEW OF MATHEMATICS K TO 12
AND
ENGLISH LANGUAGE ARTS K TO 12

Fall 2006



Ministry of
Education

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INTRODUCTION

The following are the Key Concepts derived from the current provincial curriculum for Mathematics K to 12 and English Language Arts K to 12. This information is provided as a quick overview for educators, and is designed to summarize the fundamental concepts for each of these courses and grade levels. This document is not a list of prescribed learning outcomes, but a framework of the key ideas that form the basis for these courses.

The Key Concepts resource can serve as a

- conceptual map for the current Mathematics and English Language Arts K to 12 Integrated Resource Packages
- tool to assist teachers in using the Mathematics and English Language Arts K to 12 Integrated Resource Packages
- guide to the current Mathematics and English Language Arts K to 12 curriculum for school administrators

The complete Integrated Resource Packages, including prescribed learning outcomes for these curricula are available at:

<http://www.bced.gov.bc.ca/irp/irp.htm>

Key Concepts in the Curriculum

OVERVIEW OF MATHEMATICS K TO 12



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KEY CONCEPTS: OVERVIEW OF MATHEMATICS K TO 12

	Kindergarten to Grade 1	Grades 2 to 3
NUMBER	<ul style="list-style-type: none"> • numbers from 0 to 100 • processes of addition and subtraction involving one-digit whole numbers 	<ul style="list-style-type: none"> • whole numbers from 0 to 1000 and common fractions to tenths • basic operations (+, -, x, ÷) on whole numbers • problems involving whole numbers
PATTERNS AND RELATIONS	<ul style="list-style-type: none"> • patterns that arise from daily and mathematical experiences 	<ul style="list-style-type: none"> • rules for numerical and non-numerical patterns that arise from daily and mathematical experiences
SHAPE AND SPACE	<ul style="list-style-type: none"> • measures involving whole numbers and non-standard units of measure • properties of 3-D objects • relative position of both 3-D objects and 2-D shapes 	<ul style="list-style-type: none"> • measures involving whole numbers and standard units of measure • properties of 3-D objects and 2-D shapes • positional language and relative positions of objects in one dimension
STATISTICS AND PROBABILITY	<ul style="list-style-type: none"> • first-hand information • chance and chance events involving ordinary vocabulary 	<ul style="list-style-type: none"> • first- and second-hand information • probability and chance experiments

Mathematics K to 7 Key Concepts are based on the Mathematics K to 7 Integrated Resource Package (1995) available at: <http://www.bced.gov.bc.ca/irp/mathk7.pdf>

KEY CONCEPTS: OVERVIEW OF MATHEMATICS K TO 12

	Grade 4	Grade 5	Grade 6	Grade 7
NUMBER	<ul style="list-style-type: none"> whole numbers from 0 to 10 000 and proper fractions arithmetic operations on whole numbers addition and subtraction of decimal fractions 	<ul style="list-style-type: none"> whole numbers, from 0 to 100 000, proper fractions and decimal fractions arithmetic operations on whole numbers and decimal fractions 	<ul style="list-style-type: none"> common fractions and whole numbers arithmetic operations on whole numbers and decimal fractions 	<ul style="list-style-type: none"> decimal fractions and integers arithmetic operations on decimal fractions and integers ratios, rates, and percentages
PATTERNS AND RELATIONS	<ul style="list-style-type: none"> numerical and non-numerical patterns 	<ul style="list-style-type: none"> patterns involving rules, charts, mental mathematics, and calculators 	<ul style="list-style-type: none"> extended patterns informal and concrete representations of equality 	<ul style="list-style-type: none"> patterns involving variables and expressions
SHAPE AND SPACE	<ul style="list-style-type: none"> decimal numbers and standard units of measure 3-D objects and 2-D shapes relative positions of objects in two dimensions 	<ul style="list-style-type: none"> measurement concepts and tools spatial relations involving 2-D shapes and 3-D objects transformations including slides, turns, and flips 	<ul style="list-style-type: none"> perimeter, area, surface area, volume, and angle measurement symmetry, translations, tessellations, and reflections 	<ul style="list-style-type: none"> properties of circles and parallel lines angles and time zones congruence, symmetry, translations, rotations, and reflections
STATISTICS AND PROBABILITY	<ul style="list-style-type: none"> graph first- and second-hand data simple probability experiments 	<ul style="list-style-type: none"> data sampling experiments involving the probability of single events 	<ul style="list-style-type: none"> data sampling and analysis probability of single events 	<ul style="list-style-type: none"> measures of variability and central tendency probability

Mathematics K to 7 Key Concepts are based on the Mathematics K to 7 Integrated Resource Package (1995) available at: <http://www.bced.gov.bc.ca/irp/mathk7.pdf>

KEY CONCEPTS: OVERVIEW OF MATHEMATICS K TO 12

	Grade 8	Grade 9
NUMBER	<ul style="list-style-type: none"> rational numbers, including common fractions, integers, and whole numbers arithmetic operations on rational numbers problems involving ratio, rate, percent, and proportional reasoning 	<ul style="list-style-type: none"> powers with integral exponents powers with variable and rational bases problems involving rational numbers
PATTERNS AND RELATIONS	<ul style="list-style-type: none"> problems involving patterns, variables, expressions, and graphs one-step linear equations with rational number solutions 	<ul style="list-style-type: none"> linear equations in one variable arithmetic operations on polynomials
SHAPE AND SPACE	<ul style="list-style-type: none"> measurement patterns and procedures involving area and perimeter angle measures and properties of parallel lines as they relate to the properties of quadrilaterals design problems involving architectural drawings, properties of scaling, proportion, and networks 	<ul style="list-style-type: none"> trigonometric ratios involving right triangles geometric shapes conditions for triangle similarity or congruency
STATISTICS AND PROBABILITY	<ul style="list-style-type: none"> project plan for the collection, display, and analysis of data measures of central tendency and variability theoretical and experimental probability of independent events 	<ul style="list-style-type: none"> project plan for the collection, display, and analysis of data expressed in two variables role of probability in society

Mathematics 8 and 9 Key Concepts are based on the Mathematics 8 and 9 Integrated Resource Package (2001) available at: <http://www.bced.gov.bc.ca/irp/math89.pdf>

KEY CONCEPTS: OVERVIEW OF MATHEMATICS K TO 12

	Applications 10	Applications 11	Applications 12
NUMBER	<ul style="list-style-type: none"> • arithmetic operations on real numbers • arithmetic operations on tables 	<ul style="list-style-type: none"> • consumer problems including wages, property tax, exchange rates and unit prices • budgeting, investments and credit • simple and compound interest 	<ul style="list-style-type: none"> • operations on matrices • network problems • costs and benefits of renting, leasing or buying an asset • investment portfolio
PATTERNS AND RELATIONS	<ul style="list-style-type: none"> • nature of relations with an emphasis on linear functions • graphs of linear functions 	<ul style="list-style-type: none"> • systems of linear equations and linear inequalities • linear and nonlinear equations • quadratic and exponential functions 	<ul style="list-style-type: none"> • best fit equation for sinusoidal data
SHAPE AND SPACE	<ul style="list-style-type: none"> • triangle trigonometry • measuring devices using SI and Imperial measure • linear scale factors, areas, surface areas and volumes • geometry involving lines and line segments 	<ul style="list-style-type: none"> • maximum and minimum values using tolerances for lengths, areas and volumes • percentage error 	<ul style="list-style-type: none"> • cost and design problems • vectors in two and three dimensions
STATISTICS AND PROBABILITY	<ul style="list-style-type: none"> • lines of best fit • sampling procedures and inferences from collected data 	<ul style="list-style-type: none"> • discrete and continuous data and graphs • interpolation and extrapolation • best fit quadratic and exponential functions 	<ul style="list-style-type: none"> • independent and dependent events • fundamental counting principle • mutually exclusive and complementary events

Applications of Mathematics 10 to 12 Key Concepts are based on the *Applications of Mathematics 10 to 12 Integrated Resource Package* (2006) available at: <http://www.bced.gov.bc.ca/irp/apmath1012.pdf>

KEY CONCEPTS: OVERVIEW OF MATHEMATICS K TO 12

	Essentials 10	Essentials 11	Essentials 12
NUMBER	<ul style="list-style-type: none"> • spreadsheets • bank forms such as cheques, deposit slips, and reconciliation statements • wages (gross and net) salaries, expenses and budget 	<ul style="list-style-type: none"> • personal income and debt • single person tax forms • vehicle ownership and operation • business plan 	<ul style="list-style-type: none"> • insurance, mortgages and loans • financial investments • federal, provincial, and municipal government income and expenditures
PATTERNS AND RELATIONS	<ul style="list-style-type: none"> • consumer decisions • rate, ratio and proportion 	<ul style="list-style-type: none"> • linear relations • interpolation and extrapolation 	<ul style="list-style-type: none"> • direct variation, partial variation, and inverse variation • formula substitution and manipulation
SHAPE AND SPACE	<ul style="list-style-type: none"> • basic trigonometry • SI and Imperial measurement • perspective drawing and construction of 2-D shapes and 3-D objects • scaling of dimensioned objects • geometry project 	<ul style="list-style-type: none"> • SI and Imperial measurement • Vernier callipers and micrometers 	<ul style="list-style-type: none"> • “exploded” format for objects • cost of materials to build objects • design of objects within a budget
STATISTICS AND PROBABILITY	<ul style="list-style-type: none"> • measures of central tendency • sample and population • data presentation and conclusions 	<ul style="list-style-type: none"> • line plots, bar graphs, and circle graphs • characteristics of data sets • data manipulation to stress a particular point of view 	

Essentials of Mathematics 10 to 12 Key Concepts are based on the *Essentials of Mathematics 10 to 12 Integrated Resource Package* (2006) available at: <http://www.bced.gov.bc.ca/irp/emath1012.pdf>

KEY CONCEPTS: OVERVIEW OF MATHEMATICS K TO 12

	Principles 10	Principles 11	Principles 12
NUMBER	<ul style="list-style-type: none"> • real number system • arithmetic operations on real numbers • exact values, arithmetic operations, and algebraic operations on real numbers 		
PATTERNS AND RELATIONS	<ul style="list-style-type: none"> • arithmetic number patterns • operations on polynomials including rational expressions • nature of relations with an emphasis on linear functions • linear function models 	<ul style="list-style-type: none"> • systems of linear equations and linear inequalities • nonlinear equations and inequalities • factors of polynomials • quadratic, polynomial, and rational functions 	<ul style="list-style-type: none"> • geometric number patterns • exponential, logarithmic, and trigonometric equations, functions, and identities • primary trigonometric functions
SHAPE AND SPACE	<ul style="list-style-type: none"> • basic triangle trigonometry • coordinate geometry involving points, lines, and line segments 	<ul style="list-style-type: none"> • coordinate geometry involving points, lines, and line segments • geometric properties of circles 	<ul style="list-style-type: none"> • transformations of functions • absolute and inverse functions
STATISTICS AND PROBABILITY			<ul style="list-style-type: none"> • fundamental counting principle • permutations, combinations • mutually exclusive and complementary events • conditional probability

Principles of Mathematics 10 to 12 Key Concepts are based on the Principles of Mathematics 10 to 12 Integrated Resource Package (2006) available at: <http://www.bced.gov.bc.ca/irp/prmath1012.pdf>

Key Concepts in the Curriculum

OVERVIEW OF ENGLISH LANGUAGE ARTS K TO 12



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KEY CONCEPTS: OVERVIEW OF ENGLISH LANGUAGE ARTS K TO 12

	Kindergarten	Grade 1	Grade 2	Grade 3
<p>ORAL LANGUAGE</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<p><i>Pre-K learning experiences plus...</i></p> <ul style="list-style-type: none"> speaking and listening to express and inquire developing vocabulary making connections and asking questions using meaningful syntax beginning to demonstrate phonological awareness 	<p><i>Kindergarten plus...</i></p> <ul style="list-style-type: none"> speaking and listening to recall and retell acquiring and expressing ideas and information accessing prior knowledge and organizing thinking using words correctly developing phonological awareness 	<p><i>K and 1 plus...</i></p> <ul style="list-style-type: none"> staying on topic and sustaining concentration making and sharing connections comparing and contrasting recognizing language patterns 	<p><i>K to 2 plus...</i></p> <ul style="list-style-type: none"> generating ideas sharing ideas and opinions recalling and summarizing in logical sequence recognizing and using language features
<p>READING AND VIEWING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> engaging in reading or reading-like behaviour connecting with prior knowledge developing printing concepts developing familiarity with the alphabet, alphabetic sounds and common words 	<ul style="list-style-type: none"> choosing and reading books developing word-decoding strategies making connections to texts identifying story elements 	<ul style="list-style-type: none"> reading with comprehension and fluency predicting and summarizing to construct and confirm meaning making connections between texts acquiring and using vocabulary relating to texts 	<ul style="list-style-type: none"> self-monitoring and self-correcting during reading developing explanations making connections among texts locating information using text features
<p>WRITING AND REPRESENTING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> creating messages (e.g., using pictures, symbols, letters and words) using invented spelling and word copying printing most letters and simple words 	<ul style="list-style-type: none"> writing short passages (e.g., journal entries, lists, poems) using basic punctuation and simple sentence construction printing legible letters and words 	<ul style="list-style-type: none"> writing, following models presented expressing personal responses to text material beginning to use criteria to improve writing using basic punctuation and constructing simple and compound sentences 	<ul style="list-style-type: none"> writing for a purpose and audience accessing reference materials using criteria to improve writing using conventional spelling, sentence variation and new vocabulary

English Language Arts K to 7 Key Concepts reflect both the 1996 and 2007 (pending) English Language Arts curricula for Grades K to 7, available at (<http://www.bced.gov.bc.ca/irp/>)

KEY CONCEPTS: OVERVIEW OF ENGLISH LANGUAGE ARTS K TO 12

	Grade 4	Grade 5	Grade 6	Grade 7
<p style="text-align: center;">ORAL LANGUAGE</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<p><i>K to 3 plus...</i></p> <ul style="list-style-type: none"> providing details and examples to enhance meaning summarizing and synthesizing comparing and analysing ideas expressing ideas clearly and fluently 	<p><i>K to 4 plus...</i></p> <ul style="list-style-type: none"> sharing and explaining ideas and viewpoints interpreting the speaker's message (verbal and non-verbal) considering audience when presenting recognizing literary devices 	<p><i>K to 5 plus...</i></p> <ul style="list-style-type: none"> resolving problems comparing ideas identifying purposes and perspectives using sequential organizers organizing information and practicing delivery 	<p><i>K to 6 plus...</i></p> <ul style="list-style-type: none"> negotiating to achieve consensus analysing and evaluating ideas analysing perspectives and considering alternatives incorporating non-verbal elements using techniques and aids to facilitate audience understanding
<p style="text-align: center;">READING AND VIEWING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> choosing texts and defending text choices making inferences and drawing conclusions during reading reading strategically, depending on purpose reading texts of different forms and genres 	<ul style="list-style-type: none"> making personal connections to texts comparing ideas and information in texts previewing texts and reading to locate information constructing meaning using genre and form 	<ul style="list-style-type: none"> describing personal connections to texts analysing ideas and information in texts determining importance of ideas and information constructing and confirming meaning of text, using structures and features 	<ul style="list-style-type: none"> reflecting on and responding to texts analysing, comparing, and synthesizing ideas in texts acknowledging and evaluating ideas and alternative viewpoints in texts constructing and confirming meaning of text, using types and features
<p style="text-align: center;">WRITING AND REPRESENTING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> writing in a variety of genres writing to express and extend thinking using criteria to revise and edit writing using conventional grammar, spelling and punctuation 	<ul style="list-style-type: none"> writing for a variety of audiences and purposes analysing thinking by expressing opinions and alternatives accessing and using multiple sources of information using variation in sentence construction 	<ul style="list-style-type: none"> writing a variety of well-developed texts writing to critique or defend positions selecting genre and form depending on purpose enhancing meaning and artistry in writing, using features and conventions of language 	<ul style="list-style-type: none"> writing a variety of well-developed texts writing to compare, analyse, generalize and speculate developing and applying criteria to improve writing enhancing meaning and artistry in writing, using features and conventions of language

English Language Arts K to 7 Key Concepts reflect both the 1996 and 2007 (pending) English Language Arts curricula for Grades K to 7, available at (<http://www.bced.gov.bc.ca/irp/>)

KEY CONCEPTS: OVERVIEW OF ENGLISH LANGUAGE ARTS K TO 12

	Grade 8	Grade 9
<p>ORAL LANGUAGE</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<p><i>K to 7 plus...</i></p> <ul style="list-style-type: none"> determining roles and assuming responsibilities narrating, exploring and recollecting responding to texts personally, critically and creatively demonstrating awareness of diversity conveying and deriving meaning through oral language features 	<p><i>K to 8 plus...</i></p> <ul style="list-style-type: none"> determining roles and assuming responsibilities describing, persuading and explaining responding to texts personally, critically and creatively acknowledging diversity conveying and deriving meaning through oral language features
<p>READING AND VIEWING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> examining and comparing ideas and elements among texts comprehending and responding to literary, informational and visual texts explaining and supporting personal connections to texts constructing meaning using text structures and features 	<ul style="list-style-type: none"> making and supporting judgments about texts analysing literary, informational and visual texts explaining and supporting personal connections to texts constructing meaning using text structures and features
<p>WRITING AND REPRESENTING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> creating a variety of personal, informational and imaginative texts creating thoughtful personal responses, comparing ideas, and synthesizing and extending thinking using elements of style and form appropriate to purpose and audience using conventions of language that enhance meaning and artistry 	<ul style="list-style-type: none"> creating a variety of personal, informational and imaginative texts creating thoughtful personal responses, comparing ideas, and synthesizing and extending thinking using elements of style and form appropriate to purpose and audience using conventions of language that enhance meaning and artistry

English Language Arts 8 to 10 Key Concepts reflect both the 1996 and 2007 (pending) English Language Arts curricula for Grades 8 to 12, available at (<http://www.bced.gov.bc.ca/irp/>)

KEY CONCEPTS: OVERVIEW OF ENGLISH LANGUAGE ARTS K TO 12

	Grade 10	Grade 11	Grade 12
<p style="text-align: center;">ORAL LANGUAGE</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<p><i>K to 9 plus...</i></p> <ul style="list-style-type: none"> • initiating and sharing responsibilities • explaining, arguing and entertaining • responding to texts personally, critically and creatively • demonstrating understanding of diversity • conveying and deriving meaning through oral language features 	<p><i>K to 10 plus...</i></p> <ul style="list-style-type: none"> • initiating and sharing responsibilities • explaining, arguing and entertaining • responding to texts personally, critically and creatively • demonstrating understanding of diversity • conveying and deriving meaning through oral language features 	<p><i>K to 11 plus...</i></p> <ul style="list-style-type: none"> • initiating and sharing responsibilities • explaining, arguing and entertaining • responding to texts personally, critically and creatively • demonstrating understanding of diversity • conveying and deriving meaning through oral language features
<p style="text-align: center;">READING AND VIEWING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> • identifying the influence of historical and cultural factors in texts and on texts • analysing and evaluating literary, informational and visual texts • explaining and supporting personal connections to texts • constructing meaning using text structures and features 	<ul style="list-style-type: none"> • identifying the influence of historical and social factors in texts and on texts • analysing and evaluating literary, informational and visual texts • explaining and supporting personal connections to texts • appreciating the writer's craft by analysing text structures and features 	<ul style="list-style-type: none"> • identifying and challenging bias, distortion and contradictions in texts • analysing and evaluating literary, informational and visual texts • explaining and supporting personal connections to texts • appreciating the writer's craft by analysing text structures and features
<p style="text-align: center;">WRITING AND REPRESENTING</p> <p><i>GRADE-BY-GRADE DISTINCTION IS FURTHER ARTICULATED THROUGH THE COMPLEXITY OF THE TEXT AND THE SITUATION</i></p>	<ul style="list-style-type: none"> • creating a variety of personal, informational and imaginative texts • creating thoughtful personal responses, evaluating ideas, and synthesizing and extending thinking • using elements of style and form appropriate to purpose and audience • using conventions of language that enhance meaning and artistry 	<ul style="list-style-type: none"> • creating a variety of personal, informational and imaginative texts • creating thoughtful personal responses, evaluating ideas, and synthesizing and extending thinking • using elements of style and form appropriate to purpose and audience • using conventions of language that enhance meaning and artistry 	<ul style="list-style-type: none"> • creating a variety of personal, informational and imaginative texts • creating thoughtful personal responses, evaluating ideas, and synthesizing and extending thinking • using elements of style and form appropriate to purpose and audience • using conventions of language that enhance meaning and artistry

English Language Arts 11 and 12 Key Concepts reflect both the 1996 and 2007 (pending) English Language Arts curricula for Grades 8 to 12, available at (<http://www.bced.gov.bc.ca/irp/>)



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