

Correlation Between

EdAlive's Baggin' the Dragon V2

And

MATHEMATICS SYLLABUSES 2007 (PRIMARY AND SECONDARY)

Curriculum Planning and Development Division,
Ministry of Education, Singapore

Table of Contents

Table of Contents	2
Introduction	3
Curriculum Overview	4
Curriculum Correlation.....	6
Primary 1	6
Primary 2	8
Primary 3	10
Primary 4	12
Primary 5	15
Primary 6	18
Secondary 1	21
Secondary 2	24

Introduction

This document provides a correlation between the content contained in EdAlive's Baggin' the Dragon V2 software, and the PRIMARY & SECONDARY MATHEMATICS SYLLABUSES developed by the Ministry of Education, Singapore.

Baggin' the Dragon V2 is based on the multi award-winning original title (Numbers Up! 2 Baggin' the Dragon), and contains over 3000 hands-on activities covering Shape, Space, Measurement, Geometry, Data, Statistics, Graphs, Probability, Patterns and Algebra. Baggin' the Dragon V2 uses a carefully crafted progression of activities that begins with basic knowledge and introduces new concepts gradually, extending students from ages 5 – 15 at their own pace. The content within Baggin' the Dragon V2 covers a significant portion of the Concepts, Skills, Processes, Attitudes and Metacognition described in the Mathematics Curriculum Framework.

The correlation between Baggin' the Dragon V2 and the PRIMARY & SECONDARY MATHEMATICS SYLLABUSES is provided below. A correlation matrix is also provided to give a brief overview of the curriculum content covered by Baggin' the Dragon V2.

Curriculum Overview

<u>Curriculum Topic</u>	<u>Covered by VP2</u>
Whole Numbers	
Fractions	
Decimals	
Percentage	
Ratio	Y
Speed	Y
Measurement	Y
Geometry	Y
Data Analysis	Y
Algebra	Y

Main Curriculum Topics address by Baggin' the Dragon V2

	Main Topics in the Singapore Curriculum									
	Whole Numbers	Fractions	Decimals	Percentage	Ratio	Speed	Measurement	Geometry	Data Analysis	Algebra
<u>Primary 1</u>	BC						BC	BC	BC	B
<u>Primary 2</u>	BC	BC					BC	BC	BC	B
<u>Primary 3</u>	BC	BC	B				BC	BC	BC	B
<u>Primary 4</u>	BC	BC	BC	B			BC	BC	BC	B
<u>Primary 5</u>	BC	BC	BC	BC	C	B	BC	BC	BC	B
<u>Primary 6</u>	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC
<u>Secondary 1</u>	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC
<u>Secondary 2</u>	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC

*In line with the latest MOE Mathematics Syllabuses
Ages 5 -15+: Kindergarten 1&2, Primary 1 – 6, Secondary 1&2*

C = Topic covered by Singapore Curriculum
B = Topic covered by Baggin' the Dragon V2

Curriculum Correlation

Primary 1

Baggin' the Dragon V2 covers the following content from Primary 1.

WHOLE NUMBERS	Numbers up to 100	<ul style="list-style-type: none"> counting to tell the number of objects in a given set, number notation and place values (tens, ones), reading numbers in numerals and in words, comparing and ordering numbers, number patterns.
	Addition and subtraction	<ul style="list-style-type: none"> concepts of addition and subtraction, use of the addition symbol (+) or subtraction symbol (−) to write a mathematical statement for a given situation, recognising the relationship between addition and subtraction, solving 1-step word problems involving addition and subtraction within 20, addition of more than two 1-digit numbers, addition and subtraction within 100 addition and subtraction using formal algorithms.
	Mental calculation	<ul style="list-style-type: none"> addition and subtraction within 20, addition and subtraction involving <ul style="list-style-type: none"> a 2-digit number and ones without renaming, a 2-digit number and tens.
	Multiplication and division	<ul style="list-style-type: none"> multiplication as repeated addition (within 40), use of the multiplication symbol (×) to write a mathematical statement for a given situation, division of a quantity into equal sets: <ul style="list-style-type: none"> given the number of objects in each set, solving 1-step word problems with pictorial representation.
MEASUREMENT	Length and mass	<ul style="list-style-type: none"> measurement and comparison of the lengths/masses of two or more objects in non-standard units, use of the following terms: <ul style="list-style-type: none"> long, longer, longest short, shorter, shortest tall, taller high, highest heavy, heavier, heaviest light, lightest

	Time	<ul style="list-style-type: none">• telling time to the hour/ half hour.
GEOMETRY	Basic shapes	<ul style="list-style-type: none">• identifying and naming basic 2-D and 3-D objects• classifying shapes.
	Patterns	<ul style="list-style-type: none">• making/completing patterns with 2-D cut-outs according to different attributes
DATA ANALYSIS	Picture graphs	<ul style="list-style-type: none">• collecting and organising data,• working with picture graphs,• use of a symbol/picture to represent one object,• reading and interpreting picture graphs in both horizontal and vertical forms.

Primary 2

Baggin' the Dragon V2 covers the following content from Primary 2.

WHOLE NUMBERS	Numbers up to 1000	<ul style="list-style-type: none"> counting in tens/ hundreds, reading numbers in numerals and in words, comparing and ordering numbers, number patterns.
	Addition and subtraction	<ul style="list-style-type: none"> addition and subtraction of numbers up to 3 digits, solving up to 2-step word problems involving addition and subtraction.
	Multiplication and division	<ul style="list-style-type: none"> recognising the relationship between multiplication and division, multiplication and division within the multiplication tables,
FRACTIONS	Fraction of a whole	<ul style="list-style-type: none"> interpretation of fraction as part of a whole, reading and writing fractions, comparing and ordering <ul style="list-style-type: none"> unit fractions, like fractions.
	Addition and subtraction	<ul style="list-style-type: none"> addition and subtraction of like fractions within one whole.
MEASUREMENT	Length, mass and volume	<ul style="list-style-type: none"> estimation and measurement of <ul style="list-style-type: none"> length in metres/ centimetres, mass in kilograms/ grams, volume of liquid in litres, identifying a straight line of given length, use of the appropriate measures and their abbreviations cm, m, g, kg, , comparing

		<ul style="list-style-type: none"> • lengths, • masses, • volumes, <ul style="list-style-type: none"> • solving word problems involving length/ mass/ volume.
	Time	<ul style="list-style-type: none"> • telling and writing time to 5 minutes, • use of 'a.m.' and 'p.m.', • using an analogue clock face to read time, • duration of one hour/ half hour from an o'clock time.
GEOMETRY	2-D and 3-D figures	<ul style="list-style-type: none"> • identifying the basic shapes that make up a given figure, • forming different 2-D figures with cut-outs of <ul style="list-style-type: none"> • rectangle • square • triangle • copying figures on dot grid or square grid.
	Patterns	<ul style="list-style-type: none"> • making/ completing patterns with 2-D cut-outs according to one or two of the following attributes <ul style="list-style-type: none"> • shape • size • orientation • colour
	Line, curve and surface	<ul style="list-style-type: none"> • identifying lines (straight lines) and curves, • identifying flat faces of a 3-D object.
DATA ANALYSIS	Picture graphs	<ul style="list-style-type: none"> • reading and interpreting picture graphs with scales, • solving problems using information presented in picture graphs.

Primary 3

Baggin' the Dragon V2 covers the following content from Primary 3.

WHOLE NUMBERS	Numbers up to 10 000	<ul style="list-style-type: none"> • reading numbers in numerals and in words, • comparing and ordering numbers, • odd and even numbers, • number patterns
	Addition and subtraction	<ul style="list-style-type: none"> • use of the terms 'sum' • solving up to 2-step word problems involving addition and subtraction.
	Multiplication	<ul style="list-style-type: none"> • use of the term 'product' • multiplication and division within the multiplication tables, • solving up to 2-step word problems involving the 4 operations.
FRACTIONS	Equivalent fractions	<ul style="list-style-type: none"> • recognising and naming equivalent fractions, • comparing fractions with respect to half • addition and subtraction of two related fractions within one whole.
MEASUREMENT	Length, mass and volume	<ul style="list-style-type: none"> • measurement of <ul style="list-style-type: none"> • length in kilometres (km), • volume of liquid in millilitres (ml), • measurement of length/ mass/ volume (of liquid) in compound units, • conversion of a measurement in compound units to the smaller unit, and vice versa, <ul style="list-style-type: none"> • kilometres and metres, • metres and centimetres, • kilograms and grams, • litres and millilitres. • solving word problems involving length/ mass/ volume/ capacity.

	Time	<ul style="list-style-type: none"> • reading and writing time to 5 minute intervals, • use of the terms 'past' and 'to', e.g. '10 minutes past 5' and '15 minutes to 12', • measurement of time in hours and minutes, • finding the duration of a time interval, • finding the starting time/ finishing time, • solving word problems involving addition and subtraction of time given in hours and minutes.
	Area and perimeter	<ul style="list-style-type: none"> • concepts of area and perimeter of a plane figure, • measurement of area in square units, • measurement of area in square centimetres (cm²) / square metres (m²), • use of formula to calculate the area of a rectangle/ square, • solving word problems involving the area/ perimeter of squares and rectangles.
GEOMETRY	Perpendicular and parallel lines	<ul style="list-style-type: none"> • identifying and naming perpendicular and parallel lines,
	Angles	<ul style="list-style-type: none"> • angle as an amount of turning, • identifying angles in 2-D figures, • identifying right angles, angles greater than/ smaller than a right angle.
DATA ANALYSIS	Bar graphs	<ul style="list-style-type: none"> • reading and interpreting bar graphs in both horizontal and vertical forms, • reading scales, • completing a bar graph from given data, • solving problems using information presented in bar graphs.

Primary 4

Baggin' the Dragon V2 covers the following content from Primary 4.

WHOLE NUMBERS	Numbers up to 100 000	<ul style="list-style-type: none"> • reading numbers in numerals and in words, • comparing and ordering numbers, • number patterns, • rounding off numbers
	Multiplication and division	<ul style="list-style-type: none"> • multiplication using at least one 3-digit or 4-digit number • solving up to 3-step word problems involving the 4 operations, • estimation of answers in calculations involving the 4 operations,
	Factors and multiples	<ul style="list-style-type: none"> • determining if a 1-digit number is a factor of a given number, • finding the common factors of two given numbers, • recognising the relationship between factor and multiple, • determining if a number is a multiple of a given 1-digit number
	Addition and subtraction	<ul style="list-style-type: none"> • addition and subtraction of <ul style="list-style-type: none"> • like fractions, • related fractions.
	Fraction of a set of objects	<ul style="list-style-type: none"> • interpretation of fraction as part of a set of objects.

	Multiplication	<ul style="list-style-type: none"> • multiplication of a proper/improper fraction and a whole number, • solving up to 2-step word problems involving addition, subtraction and multiplication, • using unitary method to find the whole given a fractional part.
DECIMALS	Decimals up to 3 decimal places	<ul style="list-style-type: none"> • notation and place values • identifying the values of the digits in a decimal, • comparing and ordering decimals, • conversion of a decimal to a fraction, • rounding off decimals
	Addition and subtraction	<ul style="list-style-type: none"> • addition and subtraction of decimals • estimation of answers in calculations, • checking reasonableness of answers.
	Multiplication and division	<ul style="list-style-type: none"> • division of a whole number by a whole number with answer in decimal form, • multiplication and division of decimals (up to 2 decimal places) by a 1-digit whole number, • solving up to 2-step word problems involving the 4 operations, • rounding off answers to a specified degree of accuracy, • estimation of answers in calculations,
MEASUREMENT	Time	<ul style="list-style-type: none"> • measurement of time in seconds (s), • 24-hour clock, • solving word problems involving time in 24-hour clock.
	Area and perimeter	<ul style="list-style-type: none"> • finding one dimension of a rectangle given the other dimension and its area/ perimeter, • solving word problems involving the area/ perimeter of squares and rectangles.

GEOMETRY	Perpendicular and parallel	<ul style="list-style-type: none"> • use of the terms 'vertical' and 'horizontal'.
	Angles	<ul style="list-style-type: none"> • associating <ul style="list-style-type: none"> $\frac{1}{4}$ turn/ right angle with 90° $\frac{1}{2}$ turn with 180° $\frac{3}{4}$ turn with 270° • a complete turn with 360°
	Rectangle and square	<ul style="list-style-type: none"> • properties of rectangle and square,
	Symmetry	<ul style="list-style-type: none"> • identifying symmetric figures, • determining whether a straight line is a line of symmetry of a symmetric figure, • completing a symmetric figure with respect to a given horizontal/vertical line of symmetry,
DATA ANALYSIS	Tables	<ul style="list-style-type: none"> • completing a table from given data, • reading and interpreting tables, • solving problems using information presented in tables.
	Line graphs	<ul style="list-style-type: none"> • reading and interpreting line graphs, • solving problems using information presented in line graphs.

Primary 5

Baggin' the Dragon V2 covers the following content from Primary 5.

WHOLE NUMBERS	Four operation	<ul style="list-style-type: none"> • multiplication and division by tens, hundreds and thousands without using calculators, • solving word problems involving the 4 operations, • estimation of answers in calculations,
	Order of operations	<ul style="list-style-type: none"> • combined operations involving the 4 operations
FRACTIONS	Concept of fraction as division	<ul style="list-style-type: none"> • association of a fraction with division, • conversion between fractions and decimals.
DECIMALS	Four operations	<ul style="list-style-type: none"> • multiplication and division of decimals (up to 3 decimal places) by tens, hundreds and thousands without using calculators, • solving word problems involving the 4 operations, • rounding off answers to a specified degree of accuracy, • estimation of answers in calculations,
PERCENTAGE	Percentage	<ul style="list-style-type: none"> • expressing a part of a whole as a percentage, • use of the percentage symbol (%), • writing fractions and decimals as percentages, and vice versa, • finding a percentage part of a whole

RATIO	Ratio	<ul style="list-style-type: none"> • interpretation of $a : b$ where a and b are whole numbers • writing equivalent ratios, • expressing a ratio in its simplest form, • finding the ratio of two given quantities, • finding one quantity given the other quantity and their ratio, 	
	MEASUREMENT	Length, mass and volume	<ul style="list-style-type: none"> • conversion of a measurement from a smaller unit to a larger unit in decimal form, and vice versa, <ul style="list-style-type: none"> • kilometres and metres • metres and centimetres • kilograms and grams • litres and millilitres
		Area of triangle	<ul style="list-style-type: none"> • identifying the base of a triangle and its corresponding height, • use of formula to calculate the area of a triangle.
		Volume of cube and cuboid	<ul style="list-style-type: none"> • measurement of volume in cubic units, • drawing cubes and cuboids on an isometric grid, • measurement of volume in cubic centimetres (cm^3)/ cubic metres (m^3), • use of formula to calculate the volume of a cube/ cuboid, • finding the volume of liquid in a rectangular tank,
GEOMETRY	Angles	<ul style="list-style-type: none"> • use of the following properties to find unknown angles: <ul style="list-style-type: none"> • angles on a straight line, • angles at a point, • vertically opposite angles. 	
	Triangle	<ul style="list-style-type: none"> • identifying and naming the following types of triangles <ul style="list-style-type: none"> • isosceles triangle, • equilateral triangle, • right-angled triangle, • use of the property that the angle sum of a triangle is 180°, • finding unknown angles, 	

	Parallelogram, rhombus and trapezium	<ul style="list-style-type: none"> • identifying and naming parallelogram, rhombus and trapezium, • properties of parallelogram, rhombus and trapezium, • finding unknown angles
DATA ANALYSIS	Average of a set of data	<ul style="list-style-type: none"> • interpretation of average as "total amount \div number of items", • calculation of the average number/quantity, • finding the total amount given the average and the number of items, • solving word problems involving average.

Primary 6

Baggin' the Dragon V2 covers the following content from Primary 6.

FRACTIONS	Four operations	<ul style="list-style-type: none"> • division of a whole number/proper fraction by a proper fraction without using calculators.
PERCENTAGE	Percentage	<ul style="list-style-type: none"> • finding the whole given a part and the percentage, • finding percentage increase/decrease, • solving word problems involving percentage.
RATIO	Ratio	<ul style="list-style-type: none"> • expressing one quantity as a fraction of another, given their ratio, and vice versa, • finding how many times one quantity is as large as another, given their ratio, and vice versa, • expressing one quantity as a fraction of another given the two quantities, • finding the whole/ one part when a whole is divided into parts in a given ratio, • solving word problems involving 2 pairs of ratios.
SPEED	Distance, time and speed	<ul style="list-style-type: none"> • concepts of speed and average speed, • relationship between distance, time and speed <ul style="list-style-type: none"> • Distance = Speed \times Time, • Speed = Distance \div Time, • Time = Distance \div Speed, • calculation of speed, distance or time given the other two quantities

MEASUREMENT	Area and circumference of circle	<ul style="list-style-type: none"> • use of formulae to calculate the area and circumference of a circle, • finding the area and perimeter of circular shapes • solving word problems involving area and perimeter.
	Area and perimeter of	<ul style="list-style-type: none"> • finding the area and perimeter of a figure made up of several different shapes
	Volume of cube and cuboid	<ul style="list-style-type: none"> • finding one dimension of a cuboid given its volume and the other dimensions, • finding the length of one edge of a cube given its volume, • finding the height of a cuboid given its volume and base area, • finding the area of a face of a cuboid given its volume and one dimension, • solving word problems involving volume of a cube/ cuboid.
GEOMETRY	Geometrical figures	<ul style="list-style-type: none"> • finding unknown angles in geometrical figures involving square, rectangle, parallelogram, rhombus, trapezium and triangle.
	Nets	<ul style="list-style-type: none"> • 2-D representation of cube, cuboid, cone, cylinder, prism and pyramid, • identifying nets of the following solids <ul style="list-style-type: none"> • cube, • cuboid, • prism, • pyramid, • identifying the solid which can be formed by a given net,

DATA ANALYSIS	Pie charts	<ul style="list-style-type: none">• reading and interpreting pie charts,• solving 1-step problems using information presented in pie charts.
ALGEBRA	Algebraic expressions in one	<ul style="list-style-type: none">• representation of an unknown number using a letter,• simple algebraic expressions• simplification of algebraic expressions,• evaluation of simple algebraic expressions by substitution,• solving word problems involving algebraic expressions.

Secondary 1

Baggin' the Dragon V2 covers the following content from Secondary 1.

NUMBERS AND ALGEBRA	Numbers and the four operations	<ul style="list-style-type: none">• primes and prime factorisation• finding HCF and LCM, squares and square roots by prime factorisation• approximation and estimation
	Ratio, rate and proportion	<ul style="list-style-type: none">• ratios involving rational numbers• writing a ratio in its simplest form• average rate• problems involving ratio and rate
	Percentage	<ul style="list-style-type: none">• expressing one quantity as a percentage of another• comparing two quantities by percentage• increasing/decreasing a quantity by a given percentage• problems involving percentages
	Speed	<ul style="list-style-type: none">• concepts of speed and average speed• conversion of units of speed• problems involving speed and average speed

	Algebraic representation and formulae	<ul style="list-style-type: none"> • using letters to represent numbers • interpreting various algebraic notations • evaluation of algebraic expressions and formulae • translation of simple real-world situations into algebraic expressions • recognising and representing number patterns
	Algebraic manipulation	<ul style="list-style-type: none"> • addition and subtraction of linear algebraic expressions • simplification of linear algebraic expressions
	Functions and graphs	<ul style="list-style-type: none"> • cartesian coordinates in two dimensions • graph of a set of ordered pairs • linear relationships between two variables • the gradient of a linear graph as the ratio of the vertical change to the horizontal change
GEOMETRY AND MEASUREMENT	Angles, triangles and polygons	<ul style="list-style-type: none"> • right, acute, obtuse and reflex angles, complementary and supplementary angles, vertically opposite angles, adjacent angles on a straight line, adjacent angles at a point, interior and exterior angles • angles formed by two parallel lines and a transversal: corresponding angles, alternate angles, interior angles • properties of triangles and special quadrilaterals • angle sum of interior and exterior angles of any convex polygon • properties of regular pentagon, hexagon, octagon and decagon • properties of perpendicular bisectors of line segments and angle bisectors
	Mensuration	<ul style="list-style-type: none"> • area of parallelogram and trapezium • problems involving perimeter and area of composite plane figures (including triangle and circle) • volume and surface area of cube, cuboid, prism and cylinder • conversion between cm^2 and m^2, and between cm^3 and m^3 • problems involving volume and surface area of composite solids

STATISTICS AND PROBABILITY	Data handling	<ul style="list-style-type: none">• data collection methods such as reading results of observations/outcomes of events• construction and interpretation of:<ul style="list-style-type: none">• tables• bar graphs• pictograms• line graphs• pie charts• drawing simple inference from statistical diagrams
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Secondary 2

Baggin' the Dragon V2 covers the following content from Secondary 2.

NUMBERS AND ALGEBRA	Ratio, rate and proportion	<ul style="list-style-type: none"> • map scales (distance and area) • direct and inverse proportion
	Algebraic manipulation	<ul style="list-style-type: none"> • expansion of the product of algebraic expressions • changing the subject of a formula • finding the value of an unknown quantity in a given formula • factorisation of algebraic expressions • multiplication and division of simple algebraic fractions • addition and subtraction of algebraic fractions
	Functions and graphs	<ul style="list-style-type: none"> • graphs of linear equations in two unknowns • graphs of quadratic functions and their properties
	Solutions of equations	<ul style="list-style-type: none"> • solving simultaneous linear equations in two unknowns • solving quadratic equations in one unknown by factorisation • formulating a pair of linear equations in two unknowns or a quadratic equation in one unknown to solve problems
GEOMETRY AND MEASUREMENT	Congruence and similarity	<ul style="list-style-type: none"> • congruent figures as figures that are identical in shape and size • matching sides and angles of two congruent polygons • similar figures as figures that have the same shape but different sizes • properties of similar polygons: <ul style="list-style-type: none"> • corresponding angles are equal • corresponding sides are proportional • scale drawings • solving simple problems involving similarity and congruence

	Pythagoras' theorem	<ul style="list-style-type: none"> • use of Pythagoras' theorem • determining whether a triangle is right-angled given the lengths of three sides
	Mensuration	<ul style="list-style-type: none"> • volume and surface area of pyramid, cone and sphere
STATISTICS AND PROBABILITY	Data analysis	<ul style="list-style-type: none"> • interpretation and analysis of stem-and-leaf diagrams • mean, mode and median as averages • purposes and use of mean, mode and median • calculation of the mean for grouped data
	Probability	<ul style="list-style-type: none"> • probability as a measure of chance • probability of single events (including listing all the possible outcomes in a simple chance situation to calculate the probability)