# Irish Mathematics JI-Jnr Cert. National Curriculum Outcomes Addressed Within Numbers Up! 2 Baggin' the Dragon

| Age | Level | Curriculum Level | National Curriculum Objectives |
|---|---|---|---|
| 4-5 | 1 | JI | **Early mathematical activities**<br>Classifying<br>>classify objects on the basis of one attribute such as colour, shape, texture or size<br>>identify complements of a set (i.e. elements not in a set)<br>**Matching**<br>>match equivalent and non-equivalent sets using one-to-one correspondence<br>**Comparing**<br>>compare objects according to length, width, height, weight, quantity, thickness or size<br>>compare sets without counting<br>**Ordering**<br>>order objects according to length or height<br>>order sets without counting<br>**Algebra**<br>>identify, copy and extend patterns in colour, shape and size<br>**Spatial Awareness**<br>>explore, discuss, develop and use the vocabulary of spatial relations<br>**3-D shapes**<br>>sort 3-D shapes, regular and irregular<br>>solve tasks and problems involving shape<br>**2-D shapes**<br>>sort and name 2-D shapes: square, circle, triangle, rectangle<br>>solve problems involving shape<br>**Length**<br>>develop an understanding of the concept of length through exploration and the use of appropriate vocabulary<br>>compare and order objects according to length or height<br>**Weight**<br>>develop an understanding of the concept of weight through exploration and the use of appropriate vocabulary<br>>compare objects according to weight<br>**Capacity**<br>>develop an understanding of the concept of capacity through exploration and the use of appropriate vocabulary<br>>compare containers according to capacity<br>**Time**<br>>develop an understanding of the concept of time through the use of appropriate vocabulary<br>>sequence daily events or stages in a story<br>**Data**<br>>sort and classify sets of objects by one criterion<br>>match sets, equal and unequal<br>>represent and interpret a set of simple mathematical data using real objects, models and pictures |
| 6-7 | 2-3 | 1st & 2nd Class | **Algebra**<br>>recognise pattern, including odd and even numbers<br>>explore and use patterns in addition facts<br>>understand the use of a frame to show the presence of an unknown number<br>**Spatial Awareness**<br>>explore, discuss, develop and use the vocabulary of spatial relations |

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| | | | >give and follow simple directions within classroom and school settings<br>**2-D shapes**<br>>sort and name 2-D shapes: square, circle, semicircle, triangle, rectangle<br>>combine and partition 2-D shapes<br>>identify halves of 2-D shapes<br>>identify and discuss the use of 2-D shapes in the environment<br>**3-D shapes**<br>>describe, compare and name 3-D shapes, including cube, cuboid, cylinder and sphere<br>>discuss the use of 3-D shapes in the environment<br>>solve and complete practical tasks and problems involving shape<br>>explore the relationship between 2-D and 3-D shapes<br>**Symmetry**<br>>identify line symmetry in shapes and in the environment<br>**Angles**<br>>explore and recognise angles in the environment<br>**Length**<br>>estimate, compare, measure and record length using non-standard units<br>>select and use appropriate non-standard measuring units and instruments<br>>solve and complete practical tasks and problems involving length<br>**Area**<br>>estimate and measure area using non-standard units<br>**Weight**<br>> estimate, compare, measure and record weight using non-standard units<br>> select and use appropriate non-standard measuring units and instruments<br>>explore and discuss instances when objects or substances that weigh 1 kg vary greatly in size<br>**Capacity**<br>>estimate, compare, measure and record the capacity of a wide variety of containers using non-standard units<br>>select and use appropriate non-standard measuring units and instruments<br>>estimate, measure and record capacity using litre, half-litre and quarter-litre bottles, and solve simple problems<br>**Time**<br>>use the vocabulary of time to sequence events<br>>read and record time using simple devices<br>>read time in hours and half-hours on a 12-hour analogue clock<br>>read date, day and month using a calendar<br>**Data**<br>>sort and classify sets of objects by two and three criteria<br>>represent and interpret data in two, three or four row or columns using real objects, models and pictures<br>>represent, read and interpret simple tables and charts (pictograms)<br>>represent, read and interpret simple block graphs |
| 7-8 | 3 | Third class | **Algebra**<br>**Number patterns & sequences**<br>>explore, recognise and record patterns in number 0-999 |

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| | | | >explore, extend and describe (explain rule for) sequences<br>>use patterns as an aid in the memorisation of number facts<br>**Number sentences**<br>>translate an addition or subtraction number sentence with a frame into a word problem (frame not in initial position)<br>>solve one-step number sentences<br>**2-D shapes**<br>>identify, describe and classify 2-D shapes: square, rectangle, triangle, hexagon, circle, semicircle, oval and irregular shapes<br>>explore, describe and compare the properties (sides, angles, parallel and non-parallel lines) of 2-D shapes<br>>identify the use of 2-D shapes in the environment<br>>solve and complete practical tasks and problems involving 2-D shapes<br>**3-D shapes**<br>>identify, describe and classify 3-D shapes, including cube, cuboid, cylinder, cone, sphere, triangular prism, pyramid<br>>explore, describe and compare the properties of 3-D shapes<br>>explore the relationship of 3-D shapes with constituent 2-D shapes<br>>solve and complete practical tasks and problems involving 2-D and 3-D shapes<br>**Symmetry**<br>>identify line symmetry in the environment<br>>identify and draw lines of symmetry in two-dimensional shapes<br>**Lines and angles**<br>>identify, describe and classify vertical, horizontal and parallel lines<br>>recognise an angle in terms of a rotation<br>>classify angles as greater than, less than or equal to a right angle<br>>solve problems involving lines and angles<br>**Length**<br>>estimate, compare, measure and record lengths of a wide variety of objects using appropriate metric units<br>>rename units of length in m and cm<br>>solve and complete practical tasks and problems involving the addition and subtraction of units of length (m, cm)<br>**Area**<br>>estimate, compare and measure the area of regular and irregular shapes<br>**Weight**<br>> estimate, compare, measure and record the weight of a wide variety of objects using appropriate metric units (kg g)<br>> solve and complete practical tasks and problems involving the addition and subtraction of units of weight (kg and g)<br>**Capacity**<br>>estimate, compare, measure and record the capacity of a wide variety of containers using appropriate metric units (L, mL)<br>>solve and complete practical tasks and problems involving the addition and subtraction of units of capacity (L, mL)<br>**Time**<br>>consolidate and develop a further sense of time passing<br>>read time in five-minute intervals on analogue and digital clocks (12-hour)<br>>record time in analogue and digital forms<br>>read and interpret simple timetables |

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| | | | >rename minutes as hours and hours as minutes<br>>read dates from calendars and express weeks as days and vice versa<br>>solve and complete practical tasks and problems involving times and dates<br>**Data**<br>**Representing and interpreting data**<br>>collect, organise and represent data using pictograms, block graphs and bar charts<br>>represent and interpret data in two, three or four row or columns using real objects, models and pictures<br>>read and interpret tables, pictograms, block graphs and bar charts<br>>use data sets to solve and complete practical tasks and problems<br>**Chance**<br>>identify and record outcomes of simple random processes |
| 8-10 | 4-5 | 4th class | **Algebra**<br>**Number patterns & sequences**<br>>explore, recognise and record patterns in number 0-999<br>>explore, extend and describe (explain rule for) sequences<br>>use patterns as an aid in the memorisation of number facts<br>**Number sentences**<br>>translate an addition, subtraction, multiplication or division number sentence with a frame into a word problem (frame not in initial position)<br>>translate a one-step word problem into a number sentence<br>>solve one-step number sentences<br>**2-D shapes**<br>>identify, describe and classify 2-D shapes: equilateral, isosceles and scalene triangle, parallelogram, rhombus, pentagon, octagon<br>>explore, describe and compare the properties (sides, angles, parallel and non-parallel lines) of 2-D shapes<br>>identify the use of 2-D shapes in the environment<br>>solve and complete practical tasks and problems involving 2-D shapes<br>**3-D shapes**<br>>identify, describe and classify 3-D shapes, including cube, cuboid, cylinder, cone, sphere, triangular prism, pyramid<br>>establish and appreciate that when prisms are sliced through (in the same direction) each face is equal in shape and size<br>>explore, describe and compare the properties of 3-D shapes<br>>explore the relationship of 3-D shapes with constituent 2-D shapes<br>>solve and complete practical tasks and problems involving 2-D and 3-D shapes<br>**Symmetry**<br>>identify line symmetry in the environment<br>>identify lines of symmetry as horizontal, vertical or diagonal<br>>use understanding of line symmetry to complete missing half of a shape, picture or pattern<br>**Lines and angles**<br>>identify, describe and classify oblique and perpendicular lines<br>>discuss and describe intersecting lines and their angles<br>>classify angles as greater than, less than or equal to a right angle<br>>solve problems involving lines and angles<br>**Length** |

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| | | | >estimate, compare, measure and record lengths of a wide variety of objects using appropriate metric units, and selecting suitable instruments of measurement<br>>rename units of length using decimal or fraction form<br>>understand, estimate and measure the perimeter of regular 2-D shapes<br>>solve and complete practical tasks and problems involving the addition and subtraction, multiplication and simple division of units of length (km, m, cm)<br>**Area**<br>>estimate, compare and measure the area of regular and irregular shapes<br>**Weight**<br>> estimate, compare, measure and record the weight of a wide variety of objects using appropriate metric units (kg, g) and selecting suitable instruments of measurement<br>> rename units of weight in kg and g<br>>rename units of weight using decimal or fraction form<br>>solve and complete practical tasks and problems involving the addition and subtraction, multiplication and division of simple units of weight (kg and g)<br>**Capacity**<br>>estimate, compare, measure and record the capacity of a wide variety of containers using appropriate metric units (L, mL) and selecting appropriate instruments of measure<br>>rename units of capacity using decimal and fraction form<br>>solve and complete practical tasks and problems involving the addition and subtraction, multiplication and simple division of units of capacity (L, mL)<br>**Time**<br>>consolidate and develop a further sense of time passing<br>>read time in five-minute intervals on analogue and digital clocks (12-hour)<br>>express digital time as analogue time and vice versa<br>>read and interpret simple timetables<br>>rename minutes as hours and hours as minutes<br>>read dates from calendars and express weeks as days and vice versa<br>>solve and complete practical tasks and problems involving times and dates and the addition and subtraction of hours and minutes<br>**Data**<br>**Representing and interpreting data**<br>>collect, organise and represent data using pictograms, block graphs and bar charts incorporating the scales 1:2, 1:5, 1:10 and 1:100<br>>represent and interpret data in two, three or four row or columns using real objects, models and pictures<br>>read and interpret bar-line graphs and simple pie charts<br>>use data sets to solve and complete practical tasks and problems<br>**Chance**<br>>identify and record outcomes of simple random processes |
| 10-11 | 6-7 | 5th class | **Algebra**<br>**Directed numbers**<br>>identify positive and negative numbers in context<br>**Rules and properties** |

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| | | | >explore and discuss simple properties and rules about brackets and priority of operation<br>>identify relationships and record verbal and simple symbolic rules for number patterns<br>**Equations**<br>>translate number sentences with a frame into word problems and vice versa<br>>solve one-step number sentences and equations<br>**2-D shapes**<br>>make informal deductions about 2-D shapes and their properties<br>>use angle and line properties to classify and describe triangles and quadrilaterals<br>>identify the properties of the circle<br>>classify 2-D shapes according to their lines of symmetry<br>>use 2-D shapes and properties to solve problems<br>**3-D shapes**<br>>identify and examine 3-D shapes and explore relationships, including tetrahedron (faces, edges and vertices)<br>>draw the nets of simple 3-D shapes<br>**Lines and angles**<br>>recognise, classify and describe angles and relate angles to shape and the environment<br>>recognise angles in terms of a rotation<br>>explore the sum of the angles in a triangle<br>**Length**<br>>estimate and measure the perimeter of regular and irregular shapes<br>**Area**<br>>discover that the area of a rectangle is length by breadth<br>>estimate and measure the area of regular and irregular 2-D shapes<br>>calculate area using square centimetres and square metres<br>**Weight**<br>> estimate and measure weight using appropriate metric units<br>**Capacity**<br>> estimate and measure capacity using appropriate metric units<br>**Time**<br>>read and interpret timetables and the 24-hour clock (digital and analogue)<br>>interpret and convert between times in 12-hour and 24-hour format<br>**Money**<br>>compare 'value for money' using unitary method<br>**Data**<br>**Representing and interpreting data**<br>>read and interpret pictograms, single and multiple bar charts and simple pie charts<br>>use simple data sets<br>>explore and calculate averages of simple data sets<br>>use data sets to solve problems<br>>read and interpret bar-line graphs and simple pie charts<br>>use data sets to solve and complete practical tasks and problems<br>**Chance**<br>>identify and list all possible outcomes of simple random processes<br>>construct and use frequency charts and tables |

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| 11-12 | 7-8 | 6th class | **Algebra**<br>**Directed numbers**<br>>identify positive and negative numbers on the number line<br>**Rules and properties**<br>>explore and discuss simple properties and rules about brackets and priority of operation<br>>identify relationships and symbolic rules for number patterns<br>>explore the concept of a variable in the context of simple patterns, tables and simple formulae and substitute values for variables<br>**Equations**<br>>translate word problems with a variable into number sentences<br>>solve one-step number sentences and equations<br>**2-D shapes**<br>>make informal deductions about 2-D shapes and their properties<br>>use angle and line properties to classify and describe triangles and quadrilaterals<br>>identify the properties of the circle<br>>plot simple co-ordinates and apply where appropriate<br>>use 2-D shapes and properties to solve problems<br>**3-D shapes**<br>>identify and examine 3-D shapes and explore relationships, including octahedron (faces, edges and vertices)<br>>draw the nets of simple 3-D shapes<br>**Lines and angles**<br>>recognise, classify and describe angles and relate angles to shape<br>>recognise angles in terms of a rotation<br>>explore the sum of the angles in a quadrilateral<br>**Length**<br>>rename measures of length<br>>use and interpret scales on maps and plans<br>**Area**<br>>recognise that the length of the perimeter of a rectangular shape does not determine the area of the shape<br>>calculate the area of regular and irregular 2-D shapes<br>>measure the surface area of specified 3-D shapes<br>>identify the relationship between square metres and square centimetres<br>>find the area of a room from a scale plan<br>**Weight**<br>> rename measures of weight<br>**Capacity**<br>>rename measures of capacity<br>>find the volume of a cuboid experimentally<br>**Time**<br>>explore international time zones<br>>explore the relationship between time, distance and average speed<br>**Money**<br>>explore 'value for money'<br>**Data**<br>**Representing and interpreting data**<br>>read and interpret pie charts and trend graphs<br>>use simple data sets<br>>explore and calculate averages of simple data sets |

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| | | | >use data sets to solve problems<br>>read and interpret bar-line graphs and simple pie charts<br>>use data sets to solve and complete practical tasks and problems<br>**Chance**<br>>identify and list all possible outcomes of simple random processes<br>>estimate the likelihood of occurrence of events; order on a scale from 0 to 100%, 0 to 1<br>>construct and use frequency charts and tables |
| 12-15 | 8-11 | Jnr Cert | **Applied arithmetic and measure**<br>2. SI units of length (m), area (sq m) volume (cu m) mass (kg) and time (s). Multiples and sub-multiples. Twenty-four hour clock, transport timetables. Relationship between average speed, distance and time.<br>3. Perimeter<br>Area: square, rectangle, triangle<br>Surface area and volume of rectangular solids<br>Length of circumference of circle/length of diameter = *pi*<br>Use of formulae for length of circumference of circle, for curved surface area and volume of cylinder, right circular cone and sphere<br>Application to problems, including use of the Theorem of Pythagoras<br>**Algebra**<br>1. Meaning of variable, constant, term, expression, coefficient<br>Evaluation of expressions<br>2. Addition and subtraction of simple algebraic expressions<br>Use of the associative and distributive property to simplify expressions<br>Multiplication and division of expressions<br>Rearrangement of formulae<br>3. Use of the distributive property in the factorisation of expressions<br>Factorisation of quadratic expressions<br>Difference of two squares<br>4. Formation and interpretation of number sentences leading to the solution of first degree equations in one variable<br>First degree equations in two variables. Problems and their solutions.<br>Quadratic equations – solutions using factors and/or the formula for real roots only.<br>**Statistics**<br>1. Collecting and recording data. Tabulating data. Drawing and interpreting bar-charts, pie-charts and trend graphs<br>2. Discrete array expressed as a frequency table. Drawing and interpreting histograms.<br>Mean and mode. Mean of a grouped frequency distribution<br>**Geometry**<br>1. Synthetic geometry:<br>Preliminary concepts:<br>The plane<br>Subsets of the plane: line *ab*, line segment, half line, collinear points<br>Angle; naming an angle with three letters. Straight angle.<br>Acute, right, obtuse and reflex angles<br>Parallel lines, perpendicular lines<br>Vertically opposite, alternate and corresponding angles<br>Triangle (scalene, isosceles, equilateral), quadrilateral (convex), rhombus, parallelogram, rectangle, square, circle |

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| | | | Concept of area in relation to these figures<br>All "Facts" and *Theorems* detailed in the Junior Certificate syllabus<br>2. Transformational geometry<br>Translation, central symmetry, axial symmetry. Translation and central symmetry map a line onto a parallel line. Axis and centre of symmetry. Rotation.<br>3. Co-ordinate geometry<br>Coordinates of images of points under translation, axial symmetry and central symmetry<br>Distance. Midpoint<br>Slope of a line. Parallel and perpendicular lines<br>Equation of a line in the form $y = mx + c$<br>Intersection of lines |