Common Introductory Course for Junior Cycle Mathematics

The common course is intended to be covered by all students. The general learning outcomes reflect those listed in the draft syllabus strands documents. Depending on the progress being made by the class group, teachers may extend the learning sub-topics or explore the ones listed to a greater depth. The order in which topics are taught is left to the discretion of the teacher.

Strand /Topic Title	**Learning outcomes** *students should be able to*
Strand 1: 1.2 Sample design and data collection	– to pose a question and reflect on the question in the light of data collected' – plan an investigation involving statistics – select a sample and appreciate the importance of representativeness so as to avoid biased samples – design a plan to collect data on the basis of above knowledge – collect the data according to the plan
Strand 1: 1.3 Descriptive statistics	– select appropriate graphical or numerical methods to describe the sample (univariate data only) – use stem and leaf plots, line plots and bar charts to display data
Strand 1: 1.6 Concepts of probability It is expected that experiments (including simulations), both individually and in groups, will form the primary vehicle through which the knowledge, understanding and skills in probability are developed.	– decide whether an everyday event is likely or unlikely to happen – appreciate that probability is a quantity that gives a measure on a scale of 0 - 1 of how likely an event is to occur – connect with set theory; discuss experiments, outcomes, sample spaces – use the fundamental principle of counting
Strand 2: 2.1 Synthetic Geometry (see Appendix 1) The geometrical results should be first encountered through discovery and investigation.	– convince themselves through investigation that theorems 1-6 are true – Complete the following constructions: – the bisector of a given angle, using only compass and straight edge – the perpendicular bisector of a segment, using only compass and straight edge – a line perpendicular to a given line l, passing through a given point on l – a line parallel to a given line l, through a given point – divide a line segment into 2, 3 equal segments, without measuring it – a line segment of given length on a given ray

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Strand 2: 2.2 Transformation geometry	– use drawings to show central symmetry and axial symmetry
Strand 2 : 2.3 Co-ordinate geometry	– coordinate the plane – locate points on the plane using coordinates
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Strand 3: 3.5 Sets Students learn the concept of a set as being a collection of well-defined objects or *elements*. They are introduced to the concept of the universal set, null set, sub-set; the union and intersection operators and to Venn diagrams: simple closed bounded curves that contain the elements of a set. They investigate the properties of arithmetic as related to sets and solve problems involving sets.	– list elements of a set – describe the rule that defines a set – consolidate the idea that equality is a relationship in which two equal sets have the same elements – use the cardinal number terminology when referring to set membership – perform the operations of intersection, union (for two sets) – investigate the commutative property for intersection and union – illustrate sets using Venn diagrams
Strand 3 : 3.1 Number systems Students explore the operations of addition, subtraction, multiplication and division and the relationships between these operations – in the first instance to whole numbers and integers. They explore some of the laws governing these operations and use mathematical models to reinforce the algorithms they commonly use. Later, they revisit these operations in the context of rational numbers and refine and revise their ideas.	– revisit models such as decomposition, skip counting, arranging items in arrays and accumulating groups of equal size to make sense of the operations of addition, subtraction, multiplication, and division in **N** where the answer is in **N** – investigate the commutative, associative and distributive properties of number operations and the relationships between operations, including inverse operation – perform the operations in their order, including brackets – investigate models such as the number line to illustrate the operations of addition, subtraction, multiplication and division in **Z** – generalise observations of arithmetic operations – investigate models to help think about the operations of addition, subtraction, multiplication and division of rational numbers

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Students devise strategies for computation that can be applied to any number. Implicit in such computational methods are generalisations about numerical relationships with the operations being used. Students will articulate the generalisation that underlies their strategy, firstly in common language and then in symbolic language.	– consolidate the idea that equality is a relationship in which two mathematical expressions have the same value – analyse solution strategies to problems – begin to look at the idea of mathematical proof – calculate percentages – use the equivalence of fractions, decimals and percentages to compare proportions – consolidate their understanding of factors, multiples, prime numbers in N – consolidate their understanding of the relationship between ratio and proportion – check a result by considering whether it is of the right order of magnitude and by working the problem backwards – make and justify estimates and approximations of calculations
Strand 4: 4.1 Generating arithmetic expressions from repeating patterns Students examine patterns and the rules that govern them and so construct an understanding of a relationship as that which involves a set of inputs, a set of outputs and a correspondence from each input to each output.	– use tables to represent a repeating-pattern situation – generalise and explain patterns and relationships in words and numbers – write arithmetic expressions for particular terms in a sequence – use simple graphs as a tool for analysing relations – develop and use their own mathematical strategies and ideas and consider those of others – present and interpret solutions, explaining and justifying methods, inferences and reasoning
4.2 Representing situations with tables diagrams and graphs Students examine relations derived from some kind of context – familiar, everyday situations, imaginary contexts or arrangements of tiles or blocks.They look at various patterns and make predictions about what comes next.	–