

Sequencing



1.1 Counting(all CIC)

Prior knowledge/Connections

1.2 Concepts of probability (CIC)

1.2 Concepts of probability

- use set theory to discuss experiments, outcomes, sample spaces

1.3 Outcomes of simple random processes

2.1

Synthetic Geometry
Lesson Ideas 3.1 -3.6 in synthetic geometry handbook

2.1

Synthetic Geometry
Lesson Ideas 3.7 -3.9 in synthetic geometry handbook

2.2

Transformation Geometry(CIC)
Introduction to central and axial symmetry by drawings.

2.2

Transformation Geometry
Lesson Ideas 2.9 -2.11 in synthetic geometry handbook

Prior knowledge/Connections

3.1

Number Systems (CIC)

3.1

Number Systems

3.2

Indices

3.3

Applied arithmetic

Prior knowledge/Connections

4.1

Generating arithmetic expressions from repeating patterns (all CIC)

4.2

Representing situations with tables, diagrams, graphs (CIC)

4.2

Representing situations with tables, diagrams, graphs

4.3

Finding Formulae

Prior knowledge/Connections

5.1

Functions

5.2

Graphing functions

Prior knowledge/Connections

Prior knowledge/Connections

Prior knowledge/Connections

Prior knowledge/Connections

Teacher Handbooks



TEACHER HANDBOOK

First Year

DRAFT



Senior Cycle HL

Senior Cycle OL

3rd Year

2nd Year

1st Year

Suggested Sequence of Topics - 1st Years

Section	Strand	Lesson Idea	Title	No of class periods	Cumulative total
Section 1	3.5	1.1	Sets	6	6
	3.1	1.2	Number System \mathbb{N}	6	12
	3.1	1.3	Number System \mathbb{Q}	10	22
	3.1	1.4	Ratio and Proportion	4	26
	3.1	1.5	Number System \mathbb{Z}	7	33
Section 2	1.4	1.6	Introduction to Statistics	3	36
	1.5	1.7	Formulating the question, collecting and organising data	4	40
	1.6	1.8	Representing data graphically and numerically	8	48
	1.1	1.9	Fundamental principle of counting	2	50

Section 4	2.2	1.19	Introduction to axial symmetry	2	71
		1.20	Introduction to central symmetry	2	73
Section 5	2.3	1.21	Introduction to coordinate geometry	4	77
Section 6	3.4	1.22	Applied measure	5	82
Section 7	4.1,4.2,4.3	1.23	Introduction to patterns	6	88
	4.6	1.24	Algebraic Expressions	5	93
	4.7	1.25	Simple Linear Equations	4	97
Section 8	2.1	1.26	Constructions 10 and 11 Congruent triangles 1	3	100
		1.27	Congruent triangles 2	2	102
		1.28	Theorem 2	2	104

Suggested Sequence of Topics – LCHL

Section number	Strand	Lesson Idea	Title of lesson idea	Suggested number of class periods	Cumulative totals
Section 1	3.1	LCHL.1	Number systems	4	4
	3.2	LCHL.2	Rules for indices and scientific notation	3	7
	3.2	LCHL.3	Logarithms	4	11
	3,4&5	LCHL.4	Relations approach to algebra - revision and extension of JC material	5	16
	3.1	LCHL.5	Arithmetic and geometric sequences and series	6	22

Section number	Strand	Lesson Idea	Title of lesson idea	Suggested number of class periods	Cumulative totals
	4.2	LCHL.10	Solving equations and the <i>Factor Theorem</i>	10	49
	4.3	LCHL.11	Inequalities - linear, quadratic, rational	5	54
	4.3	LCHL.12	Modulus inequalities	3	57
Section 4	3.4	LCHL.13	Nets, length, area and volume	5	62
Section 5	2.3	LCHL.14	Revision of JC trigonometry and radian measure	4	66
	2.3	LCHL.15	The unit circle and graphs of trigonometric functions	10	76
	2.3	LCHL.16	Area of a triangle, sine rule and cosine rule	6	82

One Year On

Year Group	Strands	Date of Exam	Papers Changed
6 th Year	1 & 2	2012	Paper 2*
5 th Year	1, 2, 3 & 4	2013	Paper 1* Paper 2
2 nd Year	1 & 2	2013	Paper 2*
1 st Years	1, 2, 3 & 4	2014	Paper 1* Paper 2

* Full papers not changed except LCHL Paper 2 2012

Syllabus and Resources DRAFT

Leaving Certificate Strands 1 - 4

The learning outcomes in the syllabus have been matched to resources which are all available on the Project Maths web site www.projectmaths.ie.

Most Teaching & Learning Plans are available by clicking on this icon on the home page.



The Teaching & Learning Plans denoted by * are available under "Material Created by Teachers".



All Teaching & Learning Plans are also available under Teachers, Strand X, Senior Cycle

Patterns: A Relations Approach to Algebra is available by clicking on this icon on the home page.



Teacher Handbooks are available by clicking on this icon on the home page.



The Data Handling Cycle and other documents referred to in Strand 1 are available under Teachers, Strand 1, Senior Cycle, Supplementary Material.

There are activities on the Student's CD referring to the learning outcomes underlined or circled in blue. Some of these are in the Junior Certificate section.

There are hyperlinks to most of the resources referred to in the body of this document.

Strand 1: Statistics and Probability

Handbook

Students learn about	Students working at FL should be able to	In addition, students working at OL should be able to	In addition, students working at HL should be able to
1.1 Counting T & L Intro to Fundamental Principles of Counting *	- list outcomes of an experiment - apply the fundamental principle of counting	- count the arrangements of n distinct objects ($n!$) - count the number of ways of arranging r objects from n distinct objects	- count the number of ways of selecting r objects from n distinct objects 2 T & Ls Permutations, Combinations and Probability & Permutations leading to Combinations *
1.2 Concepts of probability	- decide whether an everyday event is likely or unlikely to occur - recognise that probability is a measure on a scale of 0-1 of how likely an event is to occur - use set theory, discuss experiments, outcomes, sample spaces - use the language of probability to discuss events, including those with equally likely outcomes - estimate probabilities from experimental data - recognise that, if an experiment is repeated, there will be different outcomes and that increasing the number of times an experiment is repeated generally leads to better estimates of probability - associate the probability of an event with its long run relative frequency	- discuss basic rules of probability (AND/OR, mutually exclusive) through the use of Venn diagrams - calculate expected value and understand that this does not need to be one of the outcomes - recognise the role of expected value in decision making and explore the issue of fair games	- extend their understanding of the basic rules of probability (AND/OR, mutually exclusive) through the use of formulae • Addition Rule: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ • Multiplication Rule (Independent Events): $P(A \cap B) = P(A) \times P(B)$ • Multiplication Rule (General Case): $P(A \cap B) = P(A) \times P(B A)$ - solve problems involving conditional probability in a systematic way - appreciate that in general $P(A B) \neq P(B A)$ - examine the implications of $P(A B) \neq P(B A)$ in context
1.3 Outcomes of random processes	- construct sample spaces for two independent events - apply the principle that in the case of equally likely outcomes the probability is given by the number of outcomes of interest divided by the total number of outcomes (examples using coins, dice, spinners, urns with coloured objects, playing cards, etc.)	- find the probability that two independent events both occur - apply an understanding of Bernoulli trials* - solve problems involving up to 3 Bernoulli trials - calculate the probability that the 1st success occurs on the n^{th} Bernoulli trial where n is specified	- solve problems involving calculating the probability of k successes in n repeated (Bernoulli trials (normal approximation not required)) - calculate the probability that the k^{th} success occurs on the n^{th} Bernoulli trial - use simulations to explore the variability of sample statistics from a known population and to construct sampling distributions - solve problems involving reading probabilities from the normal distribution tables T & L 1, 2, 3, 4 & 5 Student's CD T & L Binomial Distribution *

*A Bernoulli trial is an experiment whose outcome is random and can be either of two possibilities, "success" or "failure".

Syllabus and Resources Draft

Junior Certificate Strands 1 - 4

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All Teaching & Learning Plans are also available under Teachers, Strand 1, Junior Cycle

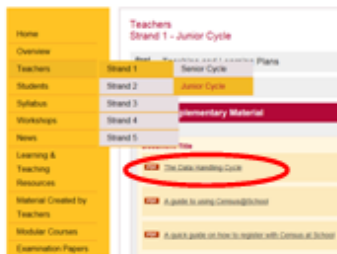
Patterns: A Relations Approach to Algebra is available by clicking on this icon on the home page.



Teacher Handbooks are available by clicking on this icon on the home page.



The Data Handling Cycle is available under Teachers, Strand 1, Junior Cycle, Supplementary Material.



There are activities on the Student's CD referring to the learning outcomes underlined or circled in blue.

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Appendix: Common Introductory Course for Junior Cycle Mathematics

Handbook

The Common Introductory Course is the minimum course to be covered by all learners at the start of junior cycle. It is intended that the experience of this course will lay the foundation for conceptual understanding which learners can build on subsequently. The order in which topics are introduced is left to the discretion of the teacher. The topics and strands should not be treated in isolation; where appropriate, connections should be made between them. Classroom strategies should be adopted which will encourage students to develop their synthesis and problem-solving skills.

Once the introductory course has been completed, teachers can decide which topics to extend or explore to a greater depth, depending on the progress being made by the class group.

The following table, when read in conjunction with the section on the Bridging Framework for Mathematics (see page 8), may help teachers to prepare teaching and learning plans for the Common Introductory Course in order to facilitate a smooth transition for learners from their mathematics education in the primary school.

Strand /Topic Title	Learning outcomes Students should be able to
Strand 1: 1.1 Counting	<ul style="list-style-type: none"> list all possible outcomes of an experiment <u>apply the fundamental principle of counting.</u>
Strand 1: 1.2 Concepts of probability It is expected that the conduct of experiments (including simulations), both individually and in groups, will form the primary vehicle through which the knowledge, understanding and skills in probability are developed.	<ul style="list-style-type: none"> decide whether an everyday event is likely or unlikely to occur recognise that probability is a measure on a scale of 0 - 1 of how likely an event is to occur
Strand 1: 1.5 Finding, collecting and organising data	<ul style="list-style-type: none"> explore different ways of collecting data plan an investigation involving statistics and conduct the investigation summarise data in diagrammatic form reflect on the question(s) posed in light of data collected
Strand 1: 1.6 Representing data graphically and numerically	<ul style="list-style-type: none"> 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 2: 2.1 Synthetic geometry (see <i>Geometry for Post-primary School Mathematics</i>) The geometrical results should be first encountered through discovery and investigation.	<ul style="list-style-type: none"> convince themselves through investigation that theorems 1-6 are true construct <ol style="list-style-type: none"> 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
Strand 2: 2.2 Transformation geometry	<ul style="list-style-type: none"> use drawings to show central symmetry and axial symmetry
Strand 2: 2.3 Co-ordinate geometry	<ul style="list-style-type: none"> coordinate the plane locate points on the plane using coordinates

T & L
Intro to
Fundamental
Principals of
Counting *

T & Ls
1, 2, 3, 4 & 5

Data
Handling
Cycle

Student's
CD

T & L
Co-ordinate
Plane *

Resources

Teaching & Learning



Teacher Handbooks



Students' CD



Algebra



Supplementary Material

Modular Courses

www.projectmaths.ie

Summary

- Strand 1 (Statistics & Probability)
- Strands 3 & 4 (Number Theory into Algebra)
- Sequencing
- Syllabus & Resources