



National Council for Curriculum and Assessment
An Chomhairle Náisiúnta Curaclaim agus Measúnachta

PACCS Conference 2009

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National Council for Curriculum and Assessment
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Project Maths

Developing post-primary
mathematics education

Summary

- The background – Why Project Maths?
- Curriculum development
- Project Maths – March 2009

Background

Concerns in relation to

- student uptake for FL, OL, HL
- low student achievement in tests and examinations
- lack of understanding and the ability to apply mathematics in other than familiar contexts
- emphasis on rote learning of procedures
- nature of assessment and its backwash effect on teaching and learning
- attitudes to mathematics

Developing the proposals

- Report on the consultation (April 2006)
- Outline proposal to NCCA Council (Dec. 2006)
- Strands and sequence proposed (March 2007)
- Final proposals (June 2007)
- Revised timescales (December 2007)
- DES approval and announcement (March 2008)
- Selection of 24 schools (May 2008)

Key skills

- While particular emphasis is placed in mathematics on the development and use of information processing, logical thinking and problem-solving skills, the new approach being adopted in the teaching and learning of mathematics will also give prominence to students being able to develop their skills in communicating and working with others. By adopting a variety of approaches and strategies for solving problems in mathematics, students will develop their self-confidence and personal effectiveness.

Aim of mathematics education

- Mathematics education should contribute to the personal development of the learners and to their development of logical reasoning and critical thinking skills. It should help to provide them with the mathematical knowledge, skills and understanding needed for continuing their education and for life and work, and enable them to appreciate the beauty and power of mathematics in their everyday lives.

Syllabus learning outcomes

As a result of their study of mathematics learners should

- be able to recall relevant mathematical facts
- demonstrate instrumental understanding ("knowing how") and necessary psychomotor skills (skills of physical co-ordination)
- possess relational understanding ("knowing why")
- be able to apply their mathematical knowledge and skills to solve problems in both familiar and unfamiliar contexts
- have developed analytical and creative powers in mathematics
- appreciate mathematics and its uses

Post-primary mathematics

- 2 syllabus levels at JC
 - bridging with primary curriculum; common 1st year course
 - 3 examination levels
- 3 syllabus and examination levels at LC
- Phased syllabus change – 5 strands, 3 phases
- Incremental change in examinations
- Increased emphasis on understanding; development of problem-solving skills

Teaching and learning

- In each strand, at every syllabus level, emphasis should be placed on appropriate contexts and applications of mathematics so that students can appreciate its relevance to their current and future lives. The focus should be on understanding the concepts involved, building from the to the abstract and from the informal to the formal.
- Lessons will be more active and learners will be 'doing' maths

Phasing of developments

- Phased syllabus changes at junior cycle and senior cycle – 5 **Strands** over 3 years (1+2, 3+4, 5)
 1. Statistics and probability
 2. Geometry and trigonometry
 3. Number
 4. Algebra
 5. Functions
- Initial group of 24 schools – balanced sample; teachers to use and evaluate classroom resources

	Initial school group (24)	All other schools
Sept 2008	Strands 1 + 2	
Sept 2009	Strands 3 + 4	
June 2010	Changes to paper 2 (S1+S2)	
Sept 2010	Strand 5	Strands 1 + 2
June 2011	Changes to paper 1 S3 + S4	No change in exams
Sept 2011	All strands in place	Strands 3 + 4 (*)
June 2012	Full changes to both papers 1 and 2	No change paper 1 Changes to paper 2 (S1+S2)
Sept 2012	Full new syllabuses in all schools	Full new syllabuses in all schools
June 2013	New exam paper 2	Changes to paper 1 (S3+S4)* New exam paper 2*
June 2014	New papers 1 + 2 in all schools	New papers 1 + 2 in all schools

Strand 1 – statistics and probability

Students should be able to

- recall basic facts related to data, data handling, and random processes...
- select appropriate formulae and techniques in order to process information presented in a variety of forms
- present information appropriately in tabular, graphical and pictorial form; read and interpret information presented in these forms
- analyse and process information, including information presented in cross-curricular and unfamiliar contexts
- apply their knowledge and skills to draw conclusions and to make predictions and decisions...

Strand 1 – statistics

Topics

- Finding, collecting, and organising real data
- Representing data graphically
- Representing data numerically
- Analysing and interpreting data
- Random variables and their distribution
- Being a statistically aware consumer and citizen

Strand 1 – probability

Topics

- Fundamental principle of counting
- Outcomes of simple random processes
- Discrete probability
- Occurrence of events
- Expected values



Strand 2 – geometry and trigonometry

Students should be able to

- recall basic facts related to geometry and trigonometry so as to have information readily available to enhance understanding and aid application
- construct a variety of geometric shapes using standard equipment and modify or extend shapes to confirm or establish specific properties or characteristics
- solve geometrical problems and present logical proofs where required
- interpret information presented in graphical and pictorial form
- analyse and process information, including information presented in cross-curricular and unfamiliar contexts
- select appropriate formulae and techniques and apply their knowledge and skills to solve geometric and trigonometric problems.

Change in learning

- Learn by doing – 22 constructions for JCHL
- Working in groups
- Discovering their own mathematics
- Dynamic geometry software:
Geogebra – free; Census at Schools;
The Geometer's Sketchpad; Autograph

Supporting the change

- Teachers and pupils central to the change
 - school-based initiative; lesson development
 - feedback to curriculum development
 - immediate start-up and ongoing involvement
 - changing the mind-set; improving student confidence and competence

- System support for the change
 - DES, SEC, NCCA

Supporting the change (2)

- Teacher Education Section of DES to administer the project
 - Project Maths Development Office/Team
 - Funding
- NCCA responsible for directing:
 - curriculum and assessment development
 - teacher professional development
 - review and evaluation

Resource materials

- Post-primary geometry course
 - definitions, axioms, theorems, corollaries, propositions
- Commissioned resource materials to provide initial ideas and directions
- Maths Support Team
 - school-based support, regional workshops
 - development of additional resources

Project Maths – next steps

- Syllabus strands, sample resource materials will be available on the web
- Assessment
 - evidence of knowledge and skill development
- Examinations
 - draft questions for revised strands; consultation and refinement; assessment advice to SEC
 - sample paper from the SEC in October 2009 (LC paper 2)

Participation Levels – targets

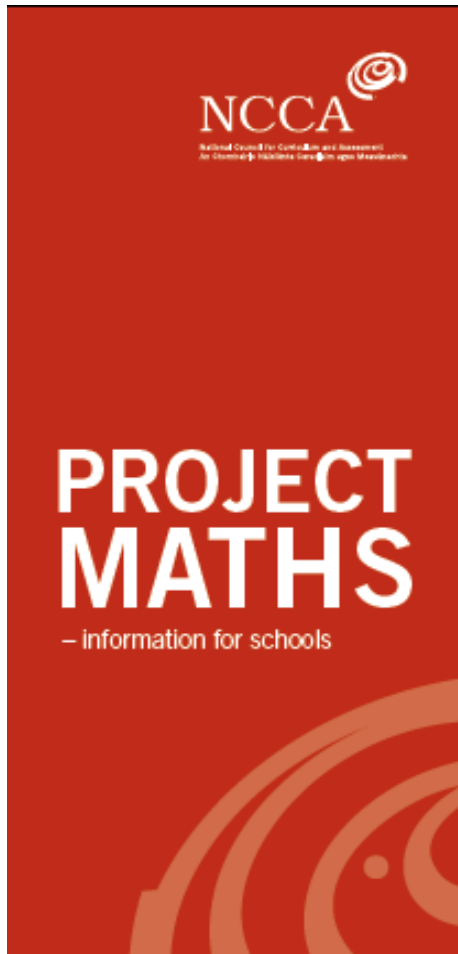
- Junior Certificate

60% of students to take Higher level

- Leaving Certificate

30% of students to take Higher level

Information on Project Maths



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Project Maths: Developing Post-Primary Mathematics Education

Draft syllabus documents
Working with schools
Schedule

A new initiative in maths got under way in September 2008, with the start-up of *Project Maths* in an initial group of 24 schools. The first two of five syllabus strands were introduced for first year and fifth year students in these schools.

This development sees much greater emphasis being placed on student understanding of mathematics concepts, with increased use of contexts and applications that will enable students to relate mathematics to everyday experience.

The initiative also focuses on developing students' problem-solving skills. In parallel with changes in curriculum, there will be changes in the way mathematics is assessed, to reflect the different emphasis on understanding and skills in the teaching and learning of mathematics.

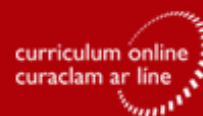
Draft syllabus documents

To download the revised syllabus strands in PDF please click on the links below.

[Junior Certificate Mathematics – draft syllabus strands 1 and 2 \(pdf\)](#)

[Appendix 1 – post-primary geometry course](#)

[Draft common mathematics course for First Year](#)



To view the Primary School Curriculum and the syllabuses for Junior Cycle and Senior Cycle please select from menu below.

Select option here »

