Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

The Irish Education System

An introduction to its structure, key features and mathematics curriculum

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Introductions

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Worked with Irish and international curriculum / assessment groups

Welcome to Ireland!

You?

Content

1. Overview of the system
2. Key general features
3. Mathematics curricula
4. State examinations ("workshop")
5. International tests of achievement
6. Conclusion

1. Overview of the system

Level	Year name	State exams. etc.	Curriculum
Post-primary			
Primary			

Age 18-19

Compulsory age 6 to ≈16

Age 4-5

Overview of the system – cont.

Level	Year name		State exams. etc.	Curriculum
Post-primary	Senior Cycle	Sixth Year		
		Fifth Year		
		Transition Year		
	Junior Cycle	Third Year		
		Second Year		
		First Year		
Primary	Sixth Class			
	Fifth Class			
	Fourth Class			
	Third Class			
	Second Class			
	First Class			
	Senior Infants			
	Junior Infants			

Age 18-19

Age 4-5

Overview of the system – cont.

Level	Year name		State exams. etc.	Curriculum
Post-primary	Senior Cycle	Sixth Year	Leaving Certificate (very high stakes)	
		Fifth Year		
		Transition Year		
	Junior Cycle	Third Year	Junior Cycle Profile of Achievement (formerly Junior Certificate)	
		Second Year		
		First Year		
Primary	Sixth Class		(Standardised tests)	
	Fifth Class			
	Fourth Class		(Standardised tests)	
	Third Class			
	Second Class		(Standardised tests)	
	First Class			
	Senior Infants			
	Junior Infants			

Age 18-19

Age 4-5

Overview of the system – cont.

Level	Year name		State exams. etc.	Curriculum
Post-primary	Senior Cycle	Sixth Year	Leaving Certificate (very high stakes)	Irish compulsory (unless exempt) (≈7 subjects)
		Fifth Year		
		Transition Year		
	Junior Cycle	Third Year	Junior Cycle Profile of Achievement (formerly Junior Certificate)	Irish, English, Maths & History compulsory (10-12 subjects)
		Second Year		
		First Year		
Primary	Sixth Class		(Standardised tests)	
	Fifth Class			
	Fourth Class		(Standardised tests)	
	Third Class			
	Second Class		(Standardised tests)	
	First Class			
	Senior Infants			
	Junior Infants			

Age 18-19

Age 4-5

2. Key general features

A state-aided rather than a state system

- Most primary schools, and a majority of post-primary schools, are owned or run by bodies other than the state
- However, the state pays
  - “Capitation” grants (per child / student)
  - Other grants
  - Teachers’ salaries (depending on teacher qualifications; the number of teachers is a function of the size of the school)

Not enough!
Not really free education!

- The system is *centralised* by **control of curriculum** rather than by school ownership
- See https://www.gov.ie/en/policy/655184-education/ for some more details

Key general features – cont.

Main kinds of primary school

- Parish schools or equivalent (under Roman Catholic, Church of Ireland [Anglican Communion], etc., patronage) – *the large majority*
  - Not restricted to children of the religious denomination of the patrons
- "Educate Together" schools – a growing number, *not* under religious patronage
- Gaelscoileanna – teaching through Irish

St Francis Xavier is a
Senior national school
3rd to 6th Class

Note

- There are many small schools
- Large schools may be divided into "Junior" and Senior"

Key general features – cont.

Main kinds of post-primary school

- (Voluntary) Secondary schools – typically under religious patronage – *the majority*
  - Not restricted to students of the religious denomination of the patrons
- Community Colleges – patrons are usually local “Education and Training Boards”
- Community Schools – from amalgamations of the above

Griffeen College

Note

- *Historically*, secondary schools provided academic education and Education and Training Board schools provided vocational education, with different curricula
- *Now* the curricula are similar (perhaps with different emphases)
  - Students may proceed to university from any school type

As in some countries now…

Key general features – cont.

Students

- High retention rate through to Leaving Certificate
  - Different levels and types of Leaving Certificate to accommodate different student needs
- High proportion (>60%) proceed to third-level education…
  - … in some cases, whether it suits them or not; strong social pressure
- Less focus on progress to trades and apprenticeships (but improving)

Note

- Still many single-sex post-primary (and a few primary) schools

Key general features – cont.

Teachers

- **Teacher education – traditional** routes
  - **Primary teaching –** three-year (now four-year) B.Ed.
  - **Post-primary teaching –** bachelor's degree in a school subject (e.g. Mathematics) plus one-year "Higher Diploma" (now two-year Professional Masters)
    - Gives accreditation to teach a specific subject / specific subjects
    - *No* special qualification for teaching Senior Cycle
- **Teacher education – variations**, e.g.
  - Post-graduate diploma courses for **primary teaching**
  - Specialised concurrent courses for **post-primary teaching**
    - Include ones for mathematics / science

Key general features – cont.

Teacher shortage!

– A new feature…

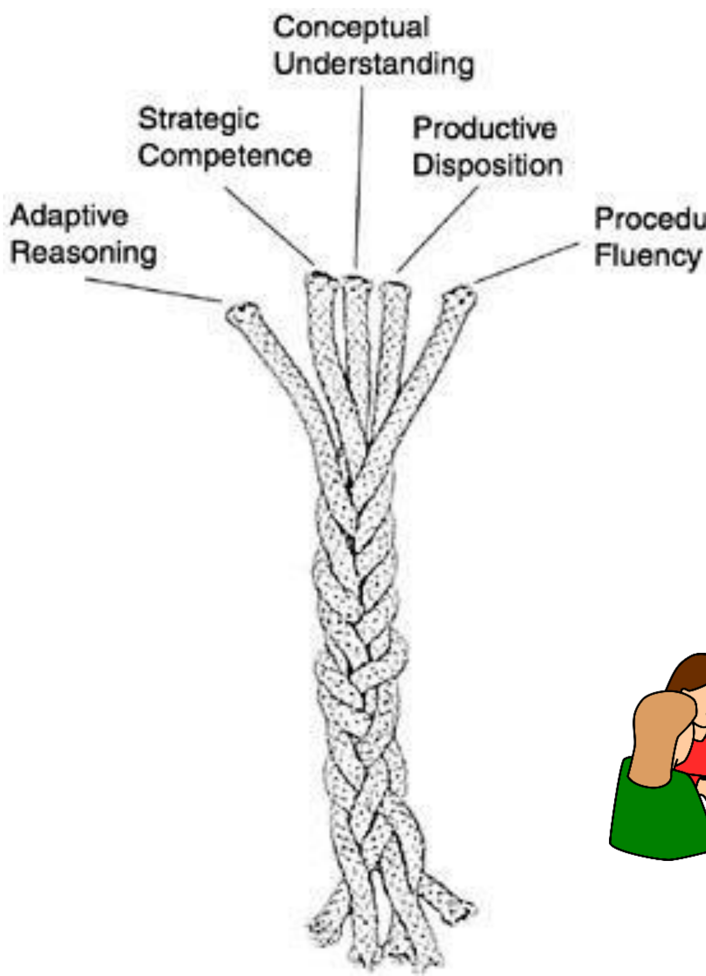
– For many years we had more applicants than places, even for mathematics
  - However, many teaching mathematics did not have qualifications in mathematics

… but still a highly-regarded profession drawing strong academic students

3. Mathematics curricula

Overall goal at all levels

- Develop **mathematical proficiency**, made up of five (intertwined) strands
  - **Conceptual understanding**
  - **Procedural fluency**
  - **Strategic competence** (for problem solving)
  - **Adaptive reasoning** (for logical thought and explanation)
  - **Productive disposition** (seeing mathematics as making sense and as worth while)
- *Due to NRC / Kilpatrick et al., 2001*



Mathematics curricula – cont.

Primary

- New Primary curriculum launched last year (September 2023)
  - Changes in focus rather than content…

Happens so often…

Old (1999)	New (2023)
Intended to emphasise problem solving / real-life applications	Fresh attempt, as the intentions were not always implemented
Perhaps a little earnest and functional	Emphasis on ***playfulness***
"The child will be enabled to…."	"Through **appropriately playful and engaging learning experiences**, children should be able to…."
From 4th Class for number operations: "… without and with a calculator"	Calculator not mentioned (but pictured in "toolkit")

Mathematics curricula – cont.

Primary content

- Five content strands: Algebra, Data and Chance, Measures, Number, Shape and Space
  - *Actual content a little elusive, specified via learning outcomes but rather hard to find?*
- From the **old version**, *by the end of 6th Class* – most advanced examples:
  - **Number**: divide a decimal number by a decimal, without and with a calculator; identify and explore square numbers
  - **Algebra**: know simple properties and rules about brackets and priority of operations; solve one-step number sentences and equations: $^{-}3 + {}^{+}6 = \square$; $^{-}4 + \square = {}^{+}1$; $x + 6 = 30$
  - **Shape and Space**: explore the sum of the angles in a quadrilateral
  - **Measures**: calculate area using acres and hectares
  - **Data [and Chance]**: read and interpret trend graphs and pie charts; construct and use frequency charts and tables

Mathematics curricula – cont.

Have you had major changes like this?

Post-primary

Revolution, not ***evolution***

- A major curriculum initiative from 2008, **Project Maths**, *aimed to change emphases* throughout the post-primary curriculum
  - Teaching for **conceptual understanding** (rather than *over-emphasising procedural fluency*)
  - More emphasis **on applying mathematics / problem solving in real-life contexts**

Always intended, not well implemented

New

- Implementation **supported** by
  - Increased professional development for teachers, focusing e.g. on promoting **active learning**, exploratory and group activities
  - **Examination papers** well aligned to the intentions

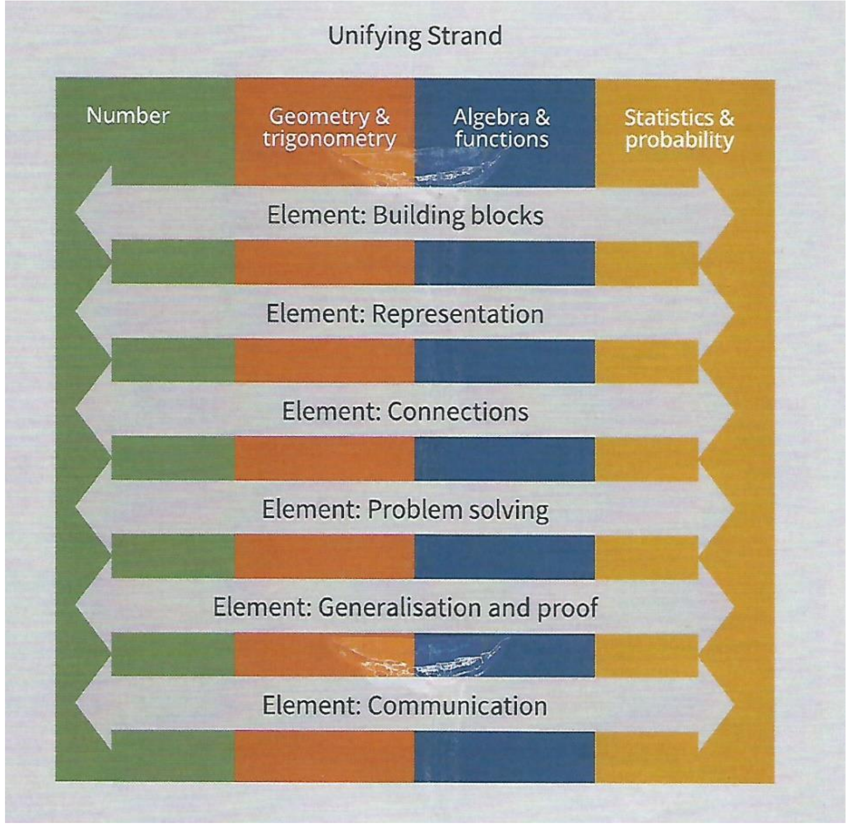
A change!

Mathematics curricula – cont.

Junior Cycle

- The "**Project Maths**" course was provided at two levels, ***Higher*** and ***Ordinary*** – but examined at three, ***Higher***, ***Ordinary*** and ***Foundation***
- A **revision** in 2018 (as part of Junior cycle reform across all subjects) *abolished the Foundation level examination*
- The revised course has **four content-related strands** – Number, Geometry & Trigonometry, Algebra & Functions, Statistics & Probability – and a "**unifying strand**" focusing on connections, representation, problem solving, etc.

Oops?

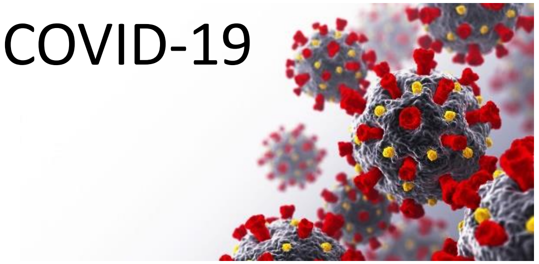


Mathematics curricula – cont.

Junior Cycle assessment

– In line with **other subjects**
  - **Only one** exam. paper per level, ***centrally*** set and marked, worth 90% of total marks
  - "**Classroom Based Assessments**" (**CBA**s: problem posing & solving / investigations) in 2nd and 3rd Year – contribute to ***school-based*** certification
  - "**Assessment task**" in 3rd Year – ***centrally*** set and marked, worth 10% of total marks

– Implementation **hindered** by COVID-19
  - Only one CBA required
  - No assessment task yet



– CBAs ***very unpopular*** with teachers!

Mathematics curricula – cont.

Senior Cycle

- **Leaving Certificate Mathematics** is not compulsory, but almost everyone takes it
  - Needed for many university and other courses
- The "**Project Maths**" course – still running – is provided and examined at three levels, ***Higher***, ***Ordinary*** and ***Foundation***
  - ***Around 36% of candidates take the Higher course*** *(risen from around* ***12%*** *forty years ago!) – many because there is now a bonus score for university entry*
- Five **content** strands: Statistics & Probability, Geometry & Trigonometry, Number, Algebra, Functions
  - **Functions** strand: *calculus* for Higher level and *differential calculus* for Ordinary level; **Statistics & Probability** strand: *hypothesis testing* for Higher level

Mathematics curricula – cont.

Leaving Certificate Mathematics assessment

– **Entirely by examinations**: two papers (one for Foundation), centrally set and marked, at the end of 6th Year …

  - … at present!!

– Course is being **revised**; **changes** being looked for (by Minister for Education)…. ***one paper per level, 40% coursework***…??

Other courses (small uptake)

– There is an **Applied Mathematics** course – taken in addition to Mathematics by strong candidates with a particular interest in mathematics

– A **Mathematical Applications** course caters for students not suited by academic / abstract work

4. State examinations

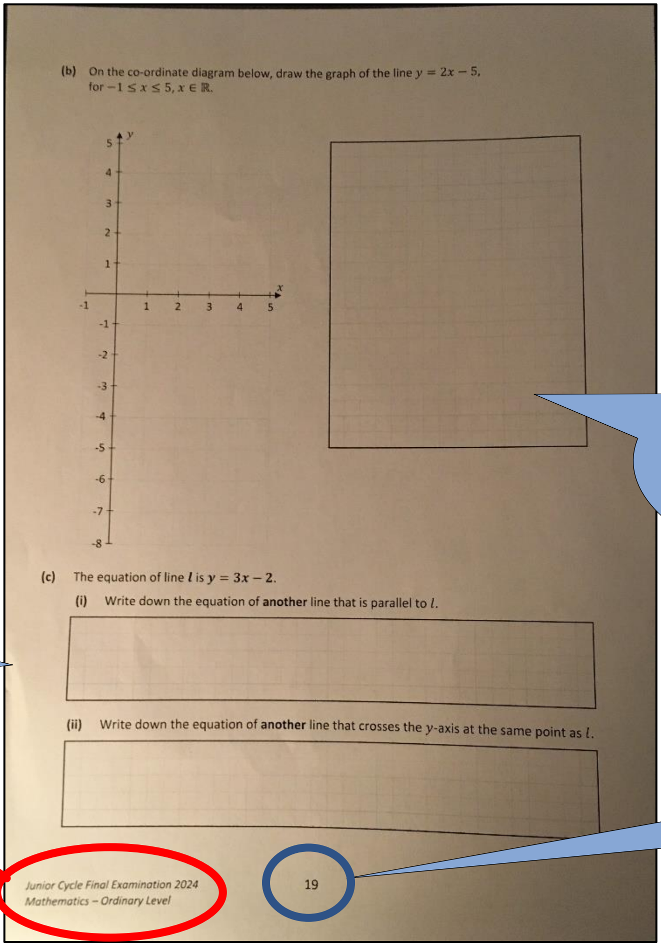
"Workshop"

- A chance to browse through **examination papers**
  - Handout material
  - Papers online:
    - Archive: https://archive.maths.nuim.ie/staff/dmalone/StateExamPapers (*easy to navigate - scroll down to find the examination of interest*)
    - Official site (with marking schemes etc.): https://www.examinations.ie/exammaterialarchive/ (*harder to navigate)*
- If you prefer, look at **curricula**: https://www.curriculumonline.ie/ …
- … or **talk / ask questions** etc.

State examinations – cont.

“Handout” sample pages from

- Junior Cycle Ordinary level 2024
- Junior Cycle Higher level 2024
- Leaving Certificate Foundation level 2019
- Leaving Certificate Higher level 2019



Questions have many parts

Answers written on the exam. paper

Papers are LONG!!

Junior Cycle Final Examination 2024
Mathematics – Ordinary Level

State examinations – cont.

“Workshop”

5. International tests of achievement

TIMSS and PISA

- TIMSS (***Trends in International Mathematics and Science Study***)
  - (Mainly) Every 4 years from 1995; 4th grade and 8th grade
  - Based on **reasonably common topics** from participants' curricula
- PISA (***Programme for International Students Assessment***) – an OECD project
  - Every 3 years from 2000; 15-year-olds
  - Reading / mathematical / scientific "**literacy**" – preparedness for life

Note

- Studies are **problematic**; rank orders etc. need to be **interpreted carefully**
  - … but can provide very valuable data

International insights, nationally validated

International tests of achievement – cont.

Irish participation

– PISA – all cycles; TIMSS – 1995 and recent cycles

Main findings

Is Ireland doing well? Improving?

– PISA 2000
  - Irish **mean** score was around 500 (OECD mean); one of the smallest **standard deviations**
  - Mean not as good as hoped / expected **– *one reason for the Project Maths initiative***
– Recent rounds of PISA
  - **Mean** score still around 500, but the OECD mean has fallen, so ***rank*** *has improved…*
– TIMSS findings similar
– Overall: ***fairly satisfactory mean, small standard deviation, few high scorers***

International tests of achievement – cont.

Interpretations of small standard deviation

– Measure of **equity** in the education system?

“Good”?

- Similar curricula in all post-primary schools
- Everyone does some mathematics – but no-one does a great deal, no accelerated track

– Reflection of **teaching / learning styles**?

- Perhaps still rather too focused on procedures (despite the Project Maths reforms and professional development) – ***culture change is hard!***
- This helps with the easier / procedural items (so many get these correct), but few can do the hard, problem-solving items…

“Bad”?

Do tests match the curriculum?

– For Ireland, *perhaps* TIMSS (still) matches better than PISA …

- Effect is unclear

6. Conclusion

Some big questions

– For example….

At what grade levels should we differentiate curricula?

What forms of assessment can be used (as well as / instead of traditional examinations)?

How do we balance all strands of mathematical proficiency?

What mathematical content is important – at what stage?

How can we improve our teaching / learning approaches?

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Enjoy your time in Ireland!