High School Mathematics Pathways

How are pathways different than levels?

Levelled courses are developed for different academic abilities. "Pathways" of courses are designed to better meet your interests and needs for after high school.

What if I don't know what I want to do after I graduate? Can I switch pathways?

Yes. If you have started to take courses in one pathway, you can take courses in another one, as long as you complete the prerequisites. You will receive credit for all math courses you take.

Should I take more math courses, even if I don't need them to graduate?

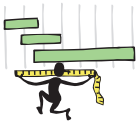
You may need specific courses for entrance to post-secondary programs. You will also increase your math skills and keep them current which will help you no matter what you decide to do after high school.

For more information, contact the Guidance Counsellor at your school or go to: www.careercruising.com (login information available from Guidance Dept.)

An understanding of math is essential in today's competitive, technological world. Starting in 2008, the K-12 mathematics curriculum in New Brunswick has been changing to help students be better prepared for whatever they choose to do after high school. The new curriculum is focused on providing students with the skills and knowledge to confidently solve problems and contribute to society.

The high school mathematics program has changed significantly. There are new courses for Grades 9 to 12 and the Grades 11 and 12 courses are organized into three "pathways". These pathways and the courses included in each are explained in more detail on the next page.

- **Financial and Workplace Mathematics**



- **Foundations of Mathematics**

- **Pre-Calculus**

Each pathway is designed to provide students with the mathematical competencies and critical-thinking skills that will be needed after high school. Students should select courses in the pathway that best fits their interests and plans for after high school, similar to selecting science and other elective courses. Each pathway provides students with a different focus of math concepts and skills. Students may choose to take additional courses beyond what they need to graduate to better prepare them for what they want to do after high school.

REQUIRED COURSES

What math courses do I need to graduate?

- Mathematics 9
- Geometry, Measurement, and Finance 10
- Number, Relations, and Functions 10
- **Plus:** one of the following Grade 11 courses
  - Financial and Workplace 11

  OR
  - Foundations of Mathematics 11 (pre- or co-requisite for the Pre-Calculus pathway)

GRADE 9: *MATHEMATICS 9*

Length: Full year

Prerequisite: Grade 8 mathematics

Topics: exponents and bases, linear relations and equations, polynomials, circle properties, surface area, scale diagrams, data collection and displays, histograms, probability

GRADE 10: *Geometry, Measurement, and Finance 10*

Length: 1 semester

Prerequisite: Grade 9 mathematics

Topics: Pythagorean Theorem, polygons, angles, trigonometric ratios, metric and Imperial systems of measurement, surface area and volume, unit pricing, currency exchange, income (gross & net pay), credit cards, loans, interest

AND

GRADE 10: *Number, Relations, and Functions 10*

Length: 1 semester

Prerequisite: Grade 9 mathematics

Topics: prime factors, common factors, square and cube roots, irrational numbers, integral and rational exponents, polynomial expressions, trinomial factoring, linear relations and functions, slope, distance formula, midpoint formula

High School Math Pathways: Which one is best for you?

FINANCIAL AND WORKPLACE MATHEMATICS

This pathway is designed for students who plan to take post-secondary programs that require applied mathematics or who plan to enter the workforce directly after high school.

FOUNDATIONS OF MATHEMATICS

This pathway is designed for students who plan to take post-secondary academic programs that do not require calculus.

PRE-CALCULUS

This pathway is designed for students who plan to take post-secondary programs that require calculus.

GRADE 11 COURSES

Financial and Workplace Mathematics 110

Length: 1 semester

Pre-requisite: *Geometry, Measurement, and Finance 10*

Topics: right triangles, trigonometry, scale models & drawings, numerical reasoning, renting & buying, investment portfolios, personal budgets, application of formulas, slope, proportional reasoning.

Opens doors to programs such as:

College diplomas: Early Childhood Education, Firefighting, Drafting, Welding, Plumbing, Carpentry;

Bachelor degrees: Arts and Fine Arts

Foundations of Mathematics 110

Length: 1 semester

Pre-requisites: *Number, Relations, and Functions 10* and *Geometry, Measurement, and Finance 10*

Topics: numerical & logical reasoning, angles & triangles, sine & cosine law, systems of linear inequalities, quadratic functions, renting & buying, investment portfolios

Opens doors to programs such as:

College diplomas: Medical Technology, Business Administration, Practical Nursing;

Bachelor degrees: Arts and Fine Arts

Pre-Calculus 110

Length: 1 semester

Pre- or Co-requisite: *Foundations of Mathematics 110*

Topics: absolute value functions, radical expressions & equations, rational expressions & equations, angles & trigonometric ratios (0°-360°), polynomial factoring, systems of equations, quadratic functions & equations, linear & quadratic inequalities.

Opens doors to programs such as:

College diplomas: Engineering and Environmental technology;

Bachelor degrees: Nursing

GRADE 12 COURSES

Financial and Workplace Mathematics 120

Length: 1 semester

Pre-requisite: *Financial and Workplace Mathematics 110* OR *Foundations of Mathematics 110*

Topics: measuring, sine & cosine laws, properties of polygons, transformations of 2-D & 3-D shapes, small business finance, linear relationships, data interpretation, probability.

Not currently required for any specific program, but would support:

College diplomas: Art and Design, Forest Technology, Business

Foundations of Mathematics 120

Length: 1 semester

Pre-requisite: *Foundations of Mathematics 110*

Topics: normal distribution, standard deviation, confidence intervals, set theory, conditional statements, probability, binomial theorem, polynomial, exponential, logarithmic & sinusoidal functions.

Opens doors to programs such as:

College diplomas: Engineering Technology, Computer Technician, Pharmacy Technology; Bachelor degrees: Nursing, Kinesiology, Business Administration, Economics, Psychology

Pre-Calculus A 120

Length: 1 semester

Pre-requisite: *Pre-Calculus 110*

Topics: graphs of functions & related equations, exponential & logarithmic functions & equations, angles in standard position, degrees & radians, unit circle, trigonometric functions & equations, trigonometric identities.

****Most programs that require Pre-Calculus A 120, also require Pre-Calculus B 120**

Please confirm the entrance requirements for specific programs offered by post-secondary institutions.

Pre-Calculus B 120

Length: 1 semester

Pre- or Co-requisite: *Pre-Calculus A 120*

Topics: arithmetic & geometric sequences & series, polynomial factoring & functions, radical, reciprocal & rational functions, function toolkit, permutations, combinations & binomial theorem, limits & continuity of functions.

Opens doors to programs such as:

Bachelor degrees: Science, Computer Science, Engineering, Mathematics

Calculus 120

Length: 1 semester

Pre-requisites: *Pre-Calculus A 120* and *Pre-Calculus B 120*

Topics: rates of change, derivatives of functions, derivative rules, inverse trig functions, optimization problems, definite integrals, antiderivatives, application of integrals.

Supports: Bachelor degrees: Science, Computer Science, Engineering, Mathematics