Algebra I A & B
Algebra I
Algebra II
Calculus AB AP
Calculus BC AP
Computer Science A AP
Finite Math
Fundamentals of Geometry
Geometry
Geometry/Trigonometry
Interdisciplinary Workshop
Intro to Algebra II/Finite
Math Builders
Pre-Calculus
Statistics AP
Trigonometry
Trig/Pre-Calculus
Summer Math Experience

Mathematics

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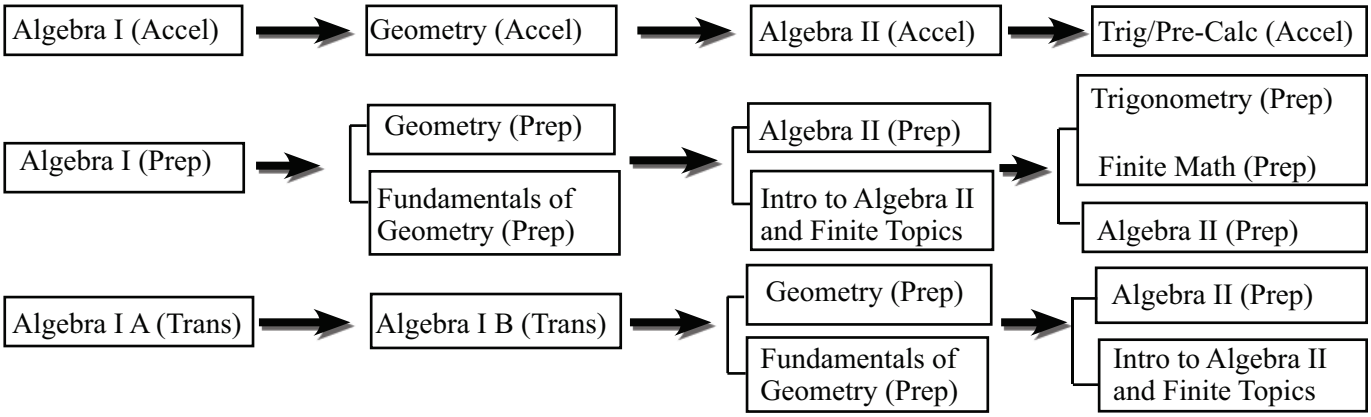
Mathematics Department Philosophy

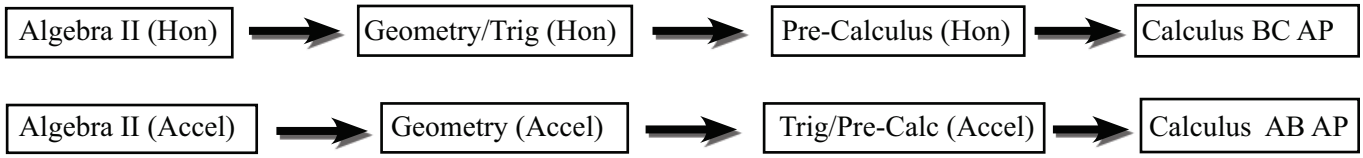
The mathematics curriculum has been developed to help students value mathematics, become confident in their abilities to do mathematics, become mathematical problem solvers, and to communicate and reason mathematically. Students, as a result of the high school mathematics experiences, should be able to model problems with the appropriate operations and equations, apply a variety of approaches and techniques to solve problems, understand the underlying mathematical features of problems, see the applicability of mathematical ideas to common and complex problems, use logical reasoning to present a cogent argument, and employ technology to explore mathematical ideas and solve problems.

Regular Sequence



Advanced Sequence

Students who successfully completed Algebra I in Grade 7 or 8 and received a satisfactory score on the semester finals will receive one unit of high school credit on a pass/fail basis and are eligible for one of the mathematics sequences as follows. The high school credit will be awarded after the successful completion of a year of mathematics at the high school.



Other Electives

South Campus 9-10

- Math Builders

North Campus 11-12

- Computer Science A AP
- Statistics AP
- Inter-Disciplinary Workshop (IDW) (Grade 11 only)

Mathematics Department Standards

The LTHS Mathematics Department has developed principles and standards for student learning which guide its academic programs and courses and challenge students. There are four principles and five general standards. In addition, each general standard contains specific mathematical standards that are available upon request. Finally, specific academic course standards have also been developed, and these are distributed to students at the beginning of each semester or annual course.

LTHS Mathematics Principles

Mathematics students at LTHS will…

1. Use his/her body of mathematical knowledge to solve problems.

2. Communicate ideas and solutions orally and in writing.

3. Use technology, when appropriate, to solve problems.

4. Make connections among mathematical topics and between mathematics and other disciplines.

LTHS General Mathematics Standards

Mathematics students at LTHS will…

1. Demonstrate and apply a knowledge and sense of numbers including numerations and applications (addition, subtraction, multiplication, division), patterns, ratios, and proportions.

2. Estimate; make and use measurements of objects, quantities and relationships; and determine acceptable levels of accuracy in real life contexts.

3. Use algebraic and analytical methods to identify and describe patterns and relationships in data, in solving problems, and in predicting results.

4. Use geometric methods to analyze, categorize, and draw conclusions about points, lines, planes, and space.

5. Collect, organize, and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

6. Meet the standards for AP courses as determined by the College Board when they are enrolled in AP courses.

College Requirements

While a minimum of three years of high school mathematics is required for graduation, many students take four years of mathematics. The state requires each student to take an Algebra and a Geometry class for two of the three required credits. It is suggested that students desiring to attend a certain college study the specific requirements of that school. Most state universities in Illinois require three years of mathematics through advanced algebra for unconditional admission. Pre-calculus may also be required.

Placement

The Division Chair evaluates the performance of each incoming student. Placement is based upon an integrated analysis of the following performance indicators:

- information from the eighth grade teachers
- standardized test scores on the EXPLORE

After the initial recommended placement of incoming freshmen, associate school staff review the results and recommend further changes. Parents are then notified of the recommended placement.

Students who have completed Algebra I (Accel) in the seventh or eighth grade are given a two-part, two-day test. These tests are given by the middle school teacher as the final semester exams for the course. Until the final test in June, placement for these students will be "math to be assigned." Parents will be notified in June by letter regarding final placement. Students must achieve specific scores on the final exams and the Explore Test.

Students who are placed beyond Algebra I (Accel) will receive credit for Algebra I. This credit does not appear on the student's transcript until he/she has successfully completed Algebra II (Accel) or Algebra II (Hon). Please note that credit will not appear on the student's report card until the end of the first semester of the sophomore year. This credit will not apply to the three years of math credit required by the state of Illinois for high school graduation.

Due to the sequential nature of Mathematics courses, students who receive Fs for first semester grades may remain in class, have a level change, be dropped to a different course, or may enter a staggered semester course.

Calculator Requirements

All Math courses require a Texas Instruments TI84+graphing calculator.

- A letter to students and parents will be sent home in May to indicate calculator availability in area stores, through LTHS at freshman processing, and the LTHS Bookstore.
- Calculators will be provided to students on free and reduced lunch plans. Students and parents should contact the Division Chair in this instance.

Mathematics and Advanced Placement (AP)
A student may enroll in the following mathematics AP courses:

1. **Calculus AB AP** Students who have successfully completed Trig/Pre-Calculus (Accel) may enroll in Calculus AB AP. This two-semester course is especially designed for strong students with interest in mathematics and/or science. It qualifies them to take the Calculus AB AP Examination.
2. **Calculus BC AP** Students who have very successfully completed Pre-calculus (Hon) may enroll in Calculus BC AP. This two-semester course is especially designed for excellent students with high interest in mathematics and/or science. It qualifies them to take the Calculus BC AP examination.
3. **Computer Science A AP** College bound students who have completed Algebra II (Prep) or the equivalent may enroll in Computer Science A AP. This two semester course will cover topics that normally comprise six or more semester hours of college level work. The course requires familiarity with mathematical notation, problem solving skills, and competence in written communication. The programming language, JAVA, will be taught in the course but will comprise only about half the course content. Other subjects to be covered include data structures, algorithms, and computer applications. Completion of this course will prepare a student for the Computer Science A AP examination.
4. **Statistics AP** Students who have successfully completed Algebra II (Prep) or above may enroll in Statistics AP. This is an introductory, non-calculus based course in statistics. This course does not satisfy a college trigonometry requirement. This course qualifies students to take the Statistics AP examination.

Mathematics and Careers
A student skilled in mathematics will find many career opportunities available. Some require a college education, some a post high school technical course, and others good mathematics' skills right after graduating from Lyons Township High School.

The number of careers requiring a college education with a strong background in mathematics increases every year. They include the occupations of teachers, accountants, systems analysts, actuaries, statisticians, computer programmers, engineers, pharmacists, architects, chemists, physicists, doctors, veterinarians, and other life scientists. For these careers, a student is expected to take four years of high school mathematics.

More and more careers that require a college degree but are not thought of as technical will require a strong mathematics background in the future. This is due to the increasing application of mathematics techniques in using technology to solve problems. For example, business students at the University of Illinois must now take a calculus course to prepare for a career in business.

Minimum requirements of high school mathematics for college admissions are continually being strengthened. All State universities in Illinois require three years of mathematics which must include advanced algebra, i.e., Algebra II or higher. Most four year colleges encourage students to complete four years of high school mathematics, including pre-calculus. Students interested in careers in business (economics, finance, management, or marketing) or social science (especially psychology, urban planning, political science, criminal science, or criminal justice) need to take four years of mathematics at Lyons Township High School.

Mathematics is an important component of success in life after high school. Thinking and problem solving skills developed in mathematics courses at all levels will benefit all students. In addition to the regular sequence of mathematics courses at LT, students have the opportunity to take Computer Science AP, a course that applies mathematics in solving problems by computer.

Did you know?

- **There is a continued shortage of qualified mathematics teachers particularly in inner city and rural schools.***
- **Employment in computer systems design and related services will grow by 54.6% by 2012.***

* U.S. Department of Labor, Labor Bureau of Statistics

- An asterisk (*) following "credit" indicates a course which is applied toward the Practical Arts graduation requirement.
- **Independent Study** Under specific conditions as outlined on p. 25 of the **Guide**, students may make application for Independent Study. In all cases, students must secure parent, teacher, counselor, divisional, and building administration approval. Independent Study may not be taken as an 8th semester/annual course.

Algebra I A (Trans)

Credit: 1 Level: II
Grade Offered: 9, 10 Annual 14115
11
Prerequisite: None

Algebra IA is designed to have students learn algebra concepts in realistic settings with the aid of technology. Problem solving and reasoning are emphasized. TI graphic calculators are used to provide multiple representations of algebraic situations: numeric, symbolic, tabular, and graphical. Topics include variables, functions, linear equations and inequalities, and quadratic equations and inequalities. Data collection and analysis is included. Reading and writing skills are emphasized throughout the course.

Algebra I B (Trans)

Credit: 1 Level: II
Grade Offered: 10 Annual 14125
11 Annual 14120
Prerequisite: Algebra IA

This curriculum will continue the program begun in Algebra IA. The emphasis is on communicating mathematically through writing, reading, and discussion. Critical thinking and reasoning are emphasized. Topics studied, with the use of technology include exponential functions, rational functions, systems of equations, equivalent equations, properties of equations, solving equations and inequalities, ratio and proportion, radicals, and factoring polynomials.

Algebra I (Prep)

Credit: 1 Level: III
Grade Offered: 9,10 Annual 15115
Prerequisite: None

In this beginning course in algebra, the language of algebra is studied intensively. Students begin their study of the real number system and its properties. The course is designed to convey an understanding of the meaning and use of variables, formulas, equations and inequalities, exponents, functions, and graphs. The fundamental processes with algebraic expressions are taught, including simple cases of factoring and work with algebraic fractions. The significance of problems and of problem solving is emphasized throughout the course.

Algebra I (Accel)

Credit: 1 Level: IV
Grade Offered: 9 Annual 17115
Prerequisite: None

Algebra I (Accel) develops the topic and skills listed in Algebra I (Prep) at a more advanced level and with less drill. More in depth problem solving and application problems are studied.

Algebra II (Prep)

Credit: 1 Level: III
Grade Offered: 11,12 Annual 15120
Prerequisite: Geometry (Prep)

The contents of this course include reviewing and extending the main topics of Algebra I. It contains an emphasis on a visual (graphing calculator) approach to learning the concept. It also includes the presentation of the following topics: exponents, logarithms, complex numbers, conic sections, quadratic functions, and systems of equations. The method of presentation is designed to meet the needs of students who desire a strong four year mathematical foundation for future study of mathematics and science or preparation for post-high school entrance requirements.

Algebra II (Accel)

Credit: 1 Level: IV
Grade Offered: 9, 10 Annual 17325
11 Annual 17320
Prerequisite: Geometry (Accel) or division chair approval

This course presents a more in depth treatment of those topics listed for Algebra II (Prep) and also includes the topics of polynomial functions, matrices, logarithmic functions, sequences, series, and probability.

Algebra II (Hon)

Credit: 1 Level: V
Grade Offered: 9,10 Annual 18325
Prerequisite: Division chair approval

This course presents the topics contained in Algebra II (Prep) and also includes the topics of polynomial functions, matrix equations, logarithmic functions, sequences, series, elementary probability, conic sections, and rational functions. Problem solving with the graphing calculator is a major emphasis in this course.

Calculus AB AP

Credit: 1 Level: V
Grade Offered: 11,12 Annual 18510
Prerequisite: Trig/Precalculus (Accel), Pre-Calculus (Hon), or division chair approval

Calculus AB AP is primarily concerned with developing the student's understanding of the concepts of calculus: functions, graphs and limits, derivatives, and integrals. The course emphasizes a multi-representational approach to calculus with concepts, results, and problems being expressed geometrically, numerically, and verbally. Technology is used regularly by students and teachers to reinforce different representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Calculus AB AP is the equivalent of a semester of college calculus. Students who take this course should plan to take the Calculus AB AP Exam.

Calculus BC AP

Credit: 1 Level: V
Grade Offered: 11, 12 Annual 18410
Prerequisite: Pre-Calculus (Hon) or division chair approval

Calculus BC AP is primarily concerned with developing the student's understanding of the concepts of calculus: functions, graphs and limits, derivatives and integrals, and slope fields and infinite series with its methods and applications. The course emphasizes a multi-representational approach to calculus with concepts, results, and problems being expressed geometrically, numerically, and verbally. Technology is used regularly by students and teachers to reinforce different representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Calculus BC AP is the equivalent of two semesters of college calculus. Students who take this course should plan to take the Calculus BC AP Exam.

Computer Science A AP

Credit: 1* Level: V
Grade Offered: 11,12 Annual 18710
Prerequisite: Algebra II (Prep) or equivalent

This course is designed to prepare students for the Computer Science A AP exam. Using the JAVA language, students will study syntax, programming methodology, algorithms, data structures, and recursion. These techniques will be applied in writing programs to solve problems, particularly the case study used on the AP Computer Science A exam.

Finite Math (Prep)

Credit: 1/2 Level: III
Grade Offered: 12 Spring 15822
Prerequisite: Algebra II (Prep)

This course is designed for the college preparatory student who may be planning to major in subjects such as psychology, business, economics, or liberal arts. The course includes topics such as matrices, systems of equations, linear programming, probability, finance, and statistics. Although Trigonometry (Prep) is not a prerequisite for this course, it would be beneficial to the student to have had a mathematics course during the first semester.

Geometry (Prep)

Credit: 1 Level: III
Grade Offered: 10 Annual 16015
11,12 Annual 16010
Prerequisite: Algebra IA/IB (Trans) with a C or better or Algebra I (Prep) with a C or better

Two primary purposes of the course are 1. to develop an understanding of inductive and deductive proof and the ability to apply it; and 2. to acquire geometric principles and facts and apply them to the solution of problems. These geometric principles are applied to figures in a plane and, to some extent, in space. The main topics of the course are triangles, quadrilaterals, circles, similar figures, parallelism, perpendicularity, right triangle trig, areas, and volumes. This course offers the student an opportunity to review and apply through practice his/her knowledge of algebra.

Fundamentals of Geometry (Prep)

Credit: 1 Level: III
Grade Offered: 10 Annual 16116, 16217
11, 12 Annual 16111, 16212
Prerequisite: C or below in Algebra IA/IB or C or below in Algebra I Prep

The two primary purposes of the course are: 1. to acquire geometric principles and facts and apply them to the solution of problems; and 2. to develop an understanding of logical reasoning and the ability to apply it. These geometric principles are applied to plane figures and those in space. The main topics of the course are triangles, quadrilaterals, circles, similar figures, parallelism, perpendicularity, right triangle trigonometry, area and volume. Unit projects will be given to enhance the material presented in class and incorporate real world type problems. Additionally, students will explore concepts through the use of computer software and manipulatives. This course will also offer students the opportunity to review and apply his/her knowledge of algebra.

Fundamentals of Geometry (staggered)

Credit: 1 Level: III
Grade Offered: 10 Spring Only: 16117
11, 12 Spring Only: 16112
Fall Only: 16211
Prerequisite: Failure of 1st semester Geometry Prep or Fundamentals of Geometry Prep

Geometry (Accel)

Credit: 1 Level: IV
Grade Offered: 9, 10 Annual 17515
Prerequisite: Algebra (Accel) or division chair approval

This course presents a more in depth treatment of those topics listed for Geometry (Prep) and more deductive proof and solid geometry. In addition, the relationships between lines and planes both in two and three dimensions and coordinate geometry are studied.

Geometry (Hon)/Trig

Credit: 1 Level: V
Grade Offered: 9, 10 Annual 18615
Prerequisite: Algebra II (Hon) or division chair approval

This course includes all the topics in Geometry (Accel) at a greater depth and faster pace. In addition, students study locus problems and constructions. The topics normally studied in a high school trigonometry course (trigonometry and circular functions) are incorporated into one quarter of the course.

Inter-Disciplinary Workshop (IDW)

Credit: 1 Level: III
Grade Offered: 11 Annual 00770

Prerequisite:
- Must be enrolled in at least two of the following: English III (Prep), U.S. History (Prep), American Studies (Prep), a mathematics course, a science course.
- Recommendation from previous year's English, math, science, and/or World History teachers.
- All applicants will be reviewed by the Student Achievement Team to affirm appropriateness of enrollment.

IDW is designed for students who need extra help in order to succeed in English III (Prep), U.S. History (Prep), American Studies (Prep), math, or science courses. It is a skills-building/reinforcing program. It is also a program for students who had success with academic support programs at South Campus, or for those who have academic challenges in core courses such as English, math, science, and social studies. Students in this class are expected to work independently on history, English, math, and/or science assignments; integrated assignments; and to seek help when needed. Weekly writing tutorials are also part of the curriculum. Students enrolled in IDW need to demonstrate a willingness to participate in the program and display a constant effort to achieve. An IDW contract must be signed by both students and their parents/guardians prior to participation in this course. IDW is taken as a general elective credit.

Introduction to Algebra II and Finite Topics (Prep)

Credit: 1 Level: III
Grade Offered: 11, 12 Annual 15220
Spring 15212
Prerequisite: Geometry Prep and teacher recommendation or division chair approval

This course will combine a review of Algebra I skills, introduction to Algebra II topics and a study of some finite math topics. Algebra topics included in the course will be a review of order of operations, use of sign numbers, solving linear equations and inequalities, graphing and writing linear equations, linear applications, solving systems of equations in two variables, polynomial operations, exponents and radicals, equations and graphs of circles, function notation and use of a variety of functions to solve application problems. The finite topics will include trigonometry, statistics, probability and finance.

Introduction to Algebra II and Finite Topics (staggered)

Credit: 1/2 Level: III
Grade Offered: 11, 12 Spring 15212
Prerequisite: Staggered Fundamentals of Geometry

This spring semester course will introduce students to Algebra II concepts in preparation for Algebra II Prep in the Fall.

Pre-Calculus (Hon)

Credit: 1 Level: V
Grade Offered: 10, 11 Annual 18850
Prerequisite: Algebra II (Hon) and Geometry (Hon)/Trig

This course is an extensive study of functions, advanced topics in trigonometry, matrices, combinatorics, statistics, and other topics in discrete mathematics. Calculator graphing technology is incorporated into the class in order to learn mathematics from a multifaceted approach.

Statistics AP

Credit: 1 Level: V
Grade Offered: 11, 12 Annual 18750
Prerequisite: Algebra II (Prep) or above

This is an introductory, non-calculus based course in statistics. It will introduce students to the concepts and tools for collecting, analyzing, and drawing conclusions from data. Four broad conceptual themes will be covered: 1. exploratory analysis of data; 2. planning a study; 3. probability; and 4. statistical inference. The graphing calculator (use of a TI-83+ is an expectation for the AP Test) and computer labs will be used throughout the course. Students who complete this course will be prepared for and should take the Statistics AP exam.

Trigonometry (Prep)

Credit: 1/2 Level: III
Grade Offered: 12 Fall 15851
Prerequisite: Algebra II (Prep)

This course is planned for the college preparatory student who is not planning to major in mathematics or science in college. This course includes the topics of a traditional trigonometry course such as trigonometric functions, Law of Sines, and Law of Cosines, phase shifts, and application problems. Attention is given to application of the topics. The student is encouraged to enroll in Finite Math (Prep) during the second semester.

Trig/Pre-Calculus (Accel)

Credit: 1 Level: IV
Grade Offered: 11,12 Annual 17350
Prerequisite: Algebra II (Accel) or Algebra II (Prep), and division chair approval

This course is an extensive study of functions including trigonometric, linear, quadratic, polynomial, rational, exponential, and logarithmic functions. In addition, the topics of complex numbers, vectors, parametrics, limits, and continuity are studied. Students who successfully complete this course with a grade of A or B should be prepared for calculus.

Math Builders (Prep)

Credit: 1/2 Level: III
Grade Offered: 9, 10 Spring 15127

Prerequisite: Failure in Algebra 1A, Algebra 1B or Algebra 1 Prep

Math Builders is a course for students who have struggled to succeed in a traditional math course. Math Builders is a project based course that focuses on activities, projects, and demonstrations to develop math skills and explain math concepts. The students will have guided choice in their projects and will gain confidence in math skills. Each project will have a rubric containing number sense, graphing skills, scale models, algebraic and geometric topics. The students will be prepared to return to the math sequence the following year.

Mathematics Classes

Freshman Courses
11005 Mathematics TBA
(for students in Algebra I in 8th grade)
11105 Mathematics No test
14115 Alg IA Trans
15115 Alg I Prep
17115 Alg I Accel
Spring Only
15127 Math Builders

Sophomore Courses
Annual
14115 Algebra I A Trans
14125 Algebra I B Trans
17115 Algebra I Accel
15115 Algebra I Prep
17325 Algebra II Accel
18325 Algebra II Honors
17515 Geometry Accel
18615 Geometry Hon / Trig
16015 Geometry Prep
16116, 16217 Fundamentals of Geometry
18850 Pre-Calculus Honors
17350 Trigonometry / Pre-Calc Accel
Spring Only
15127 Math Builders
16117 Fundamentals of Geometry

Staggered Semester
Spring only of current year
16117 Fundamentals of Geometry

Junior and Senior Courses
Annual
14115 Algebra I-A Trans.
14120 Algebra I-B Trans.
15115 Algebra I Prep
15220 Intro Alg II/Finite Topics
15120 Algebra II Prep
17320 Algebra II Accel
18510 Calculus AB AP
18410 Calculus BC AP
18710 Computer Science A AP
16111, 16212 Fundamentals of Geometry
16010 Geometry Prep
18850 Pre-Calculus Hon
17350 Trigonometry/Pre-Calculus Accel
18750 Statistics AP
Fall Only
15851 Trigonometry Prep

Spring Only
15822 Finite Math Prep
16112 Fundamentals of Geometry
15212 Intro to Algebra II & Finite

Staggered Semester
Spring only of current year
16112 Fundamentals of Geometry
15212 Intro to Algebra II & Finite
Fall only of following year
16211 Fundamentals of Geometry