Mountain Lakes School District

Mathematics Program Update
January 2021

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Year in Review (2020)

- Provide a traditional middle school Math 6, Math 7, Math 8 option at Briarcliff.
- Provide 2-year and 1-year acceleration options at Briarcliff.
- All Grade 6-12 Math Curriculum rewritten and consistent across levels of rigor.
- All Grade K-5 Math Curriculum updated to reflect 2020 companion standards.
- Pilot of online Big Ideas Math Textbook for Math 6 - Algebra 1.
- Introduction of Honors Abstract and Linear Algebra elective at MLHS.

Remediation Plan for Remote Learning

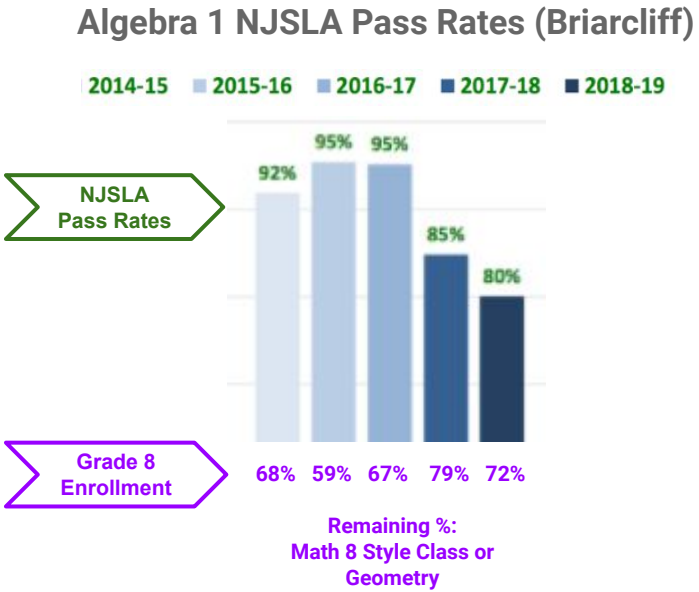
- Vertical Articulation Meetings and Topic Tracking.
- Adoption of the Achieve the Core Prioritization Recommendations.
- Horizontal Articulation Meetings for Algebra 1, Geometry, and Algebra 2.
- LinkIt! Benchmarking
- Consideration of a Change in Sequence for our High School Coursework.

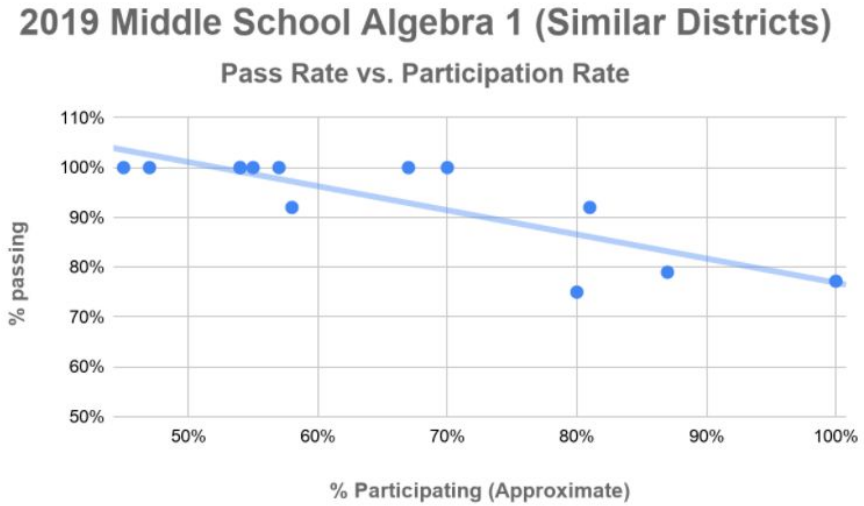
Program Goals

- Provide a strong foundation in the learning of mathematics.
- Accommodate variation in the rate of students' cognitive development.
- Promote self-efficacy in the learning of mathematics.
- Support the social-emotional health and wellness of our students.
- Provide pathways that culminate in the study of Calculus and/or Statistics.
- Position students for success on high-stakes assessments.

Challenges of Current Program

- Some students struggle to master algebraic concepts in Grade 8.

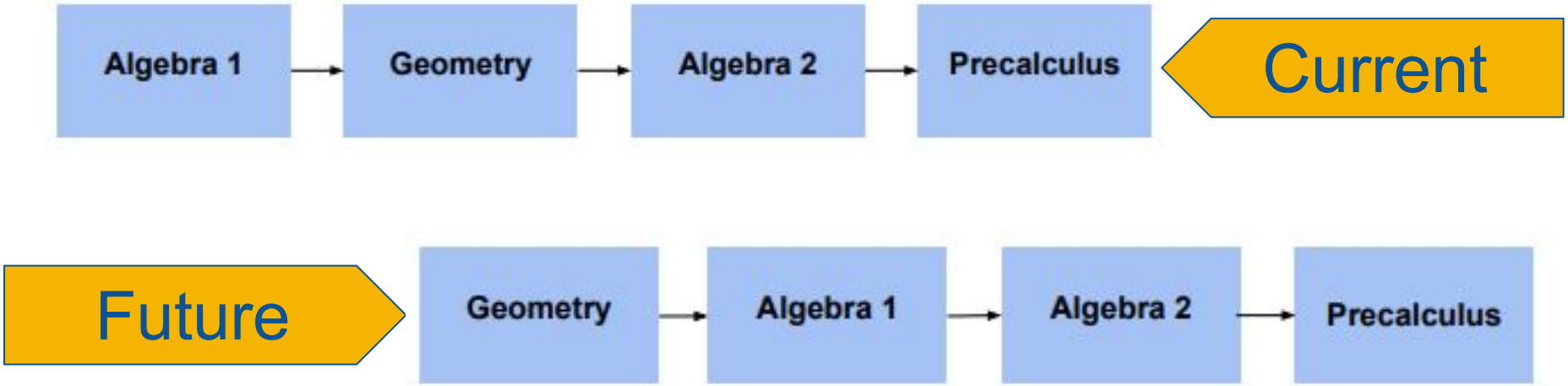




Negative Impact of Premature Study

- Mastery of algebra is crucial to the successful learning of mathematics.
- Attempting to master algebraical thought prematurely may lead to:
  - inadequate preparedness for future study.
  - false conclusions regarding mathematical ability.
    - Low self-efficacy in mathematics may discourage students from pursuing careers in STEM.
    - Struggling academically may have a negative impact on social-emotional health and wellness.

Recommendation for Change in Sequence



Small Change to Yield Many Benefits

- Another year of maturity and cognitive development before Algebra 1.
  - Dr. Jean Piaget's Stages of Cognitive Development
  - Drs. Dina and Pierre Van Hiele's Theory of Geometric Thought
- Additional year to remediate algebraic content learned in Math 6 and Math 7.
- No gap between Algebra 1 and Algebra 2.
- Increased precision in recommendations for level of rigor.
- Stronger foundation for success in future study of mathematics and science.

Frequently Asked Questions

Are any other school districts considering this sequence?

- National Council of Teachers of Mathematics (NCTM):
  - *Geometry First* section of the 2018 publication, *Catalyzing Change in High School Mathematics: Initiating Critical Conversations*
- Ridgewood Public Schools (Adopted in 2019-2020)
- Freehold Township High Schools (Adopted in 2020-2021)
  - Freehold High School
  - Freehold Township High School
  - Howell High School
  - Marlboro High School
  - Manalapan High School

Frequently Asked Questions

Do students need to know algebra to learn geometry?

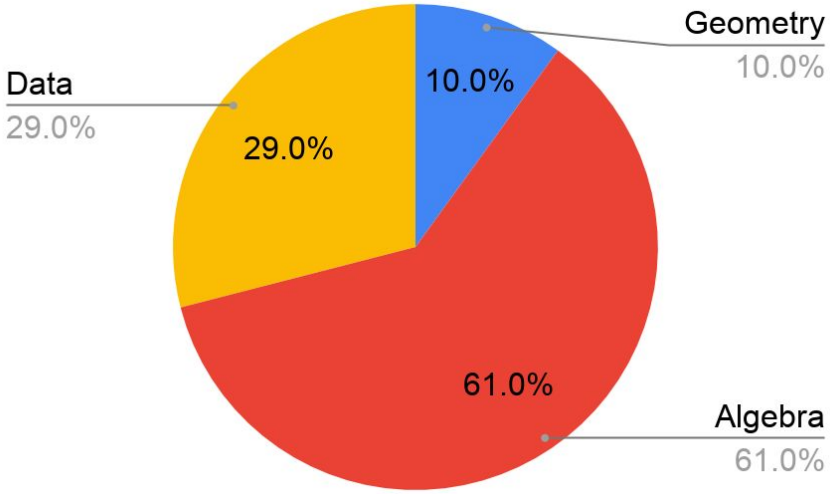
- The NJSLS provide flexibility in sequencing.
  "These standards do not mandate the sequence of high school courses...
  The standards themselves do not dictate curriculum, pedagogy, or delivery of content.
  In particular, states may handle the transition to high school in different ways (NJSLS for Mathematics: High School, pg 32)."
- The NJSLS for Geometry do not include any algebraic reasoning.
- Geometry NJSLA questions do not incorporate the NJSLS for High School Algebra.
- Historically, algebraic work has been integrated into our Geometry curriculum.
  - We intend to continue this practice with the exclusion of a few advanced topics.
  - Remediate algebraic skills learned during remote instruction in Math 6 and Math 7.
  - Continue to build a strong foundation for algebra in subsequent years.

Frequently Asked Questions

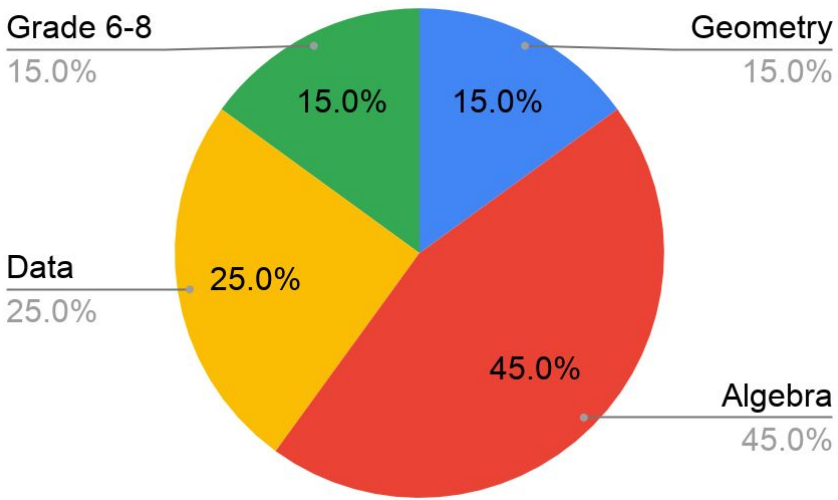
Will this affect performance on high-stakes assessments?

- The sequence of Geometry, Algebra 1, Algebra 2, will support academic success on high-stakes assessments.

SAT



ACT



Frequently Asked Questions

What about Rockaway Valley School?

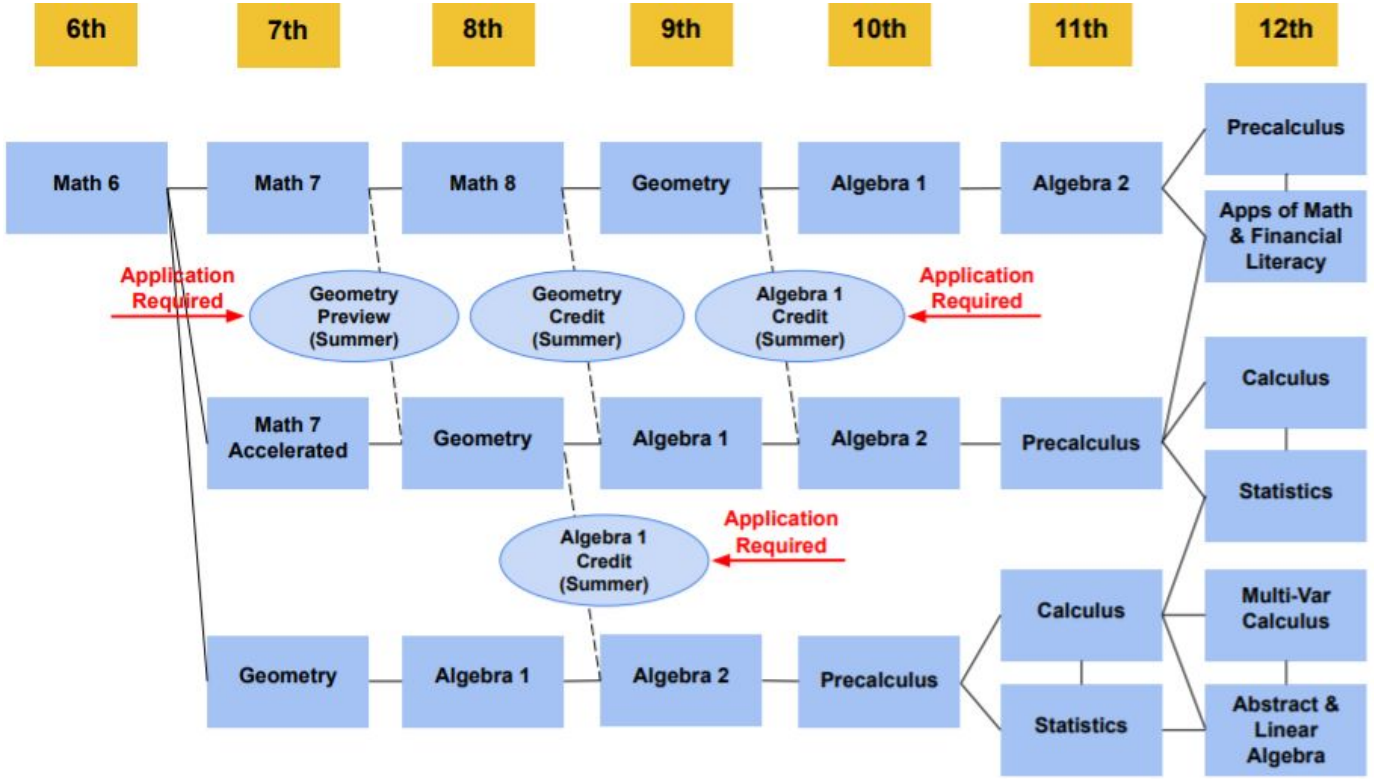
- The MLHS Program of Studies will allow for flexibility in sequencing.
- Students who have completed Algebra 1 will be enrolled in Geometry.
    - These students will proceed to Algebra 2.
    - Students may choose to retake Algebra 1 after Geometry and before Algebra 2.
- Students who have completed Geometry will be enrolled in Algebra 1.
    - These students will proceed to Algebra 2.
- Students entering MLHS from Math 8 will be enrolled in Geometry.
    - These students will proceed to Algebra 1 and then Algebra 2.

Frequently Asked Questions

Will this impact the identification process for Grade 7 placement?

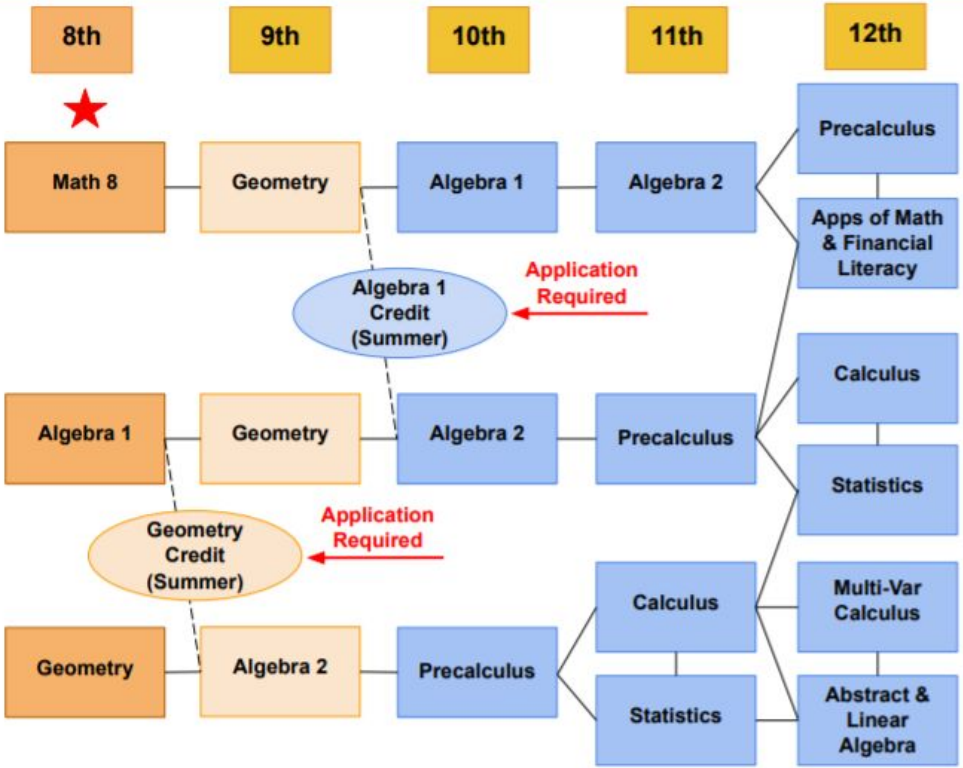
- The identification process for Grade 7 placement will not change.
  - Quarterly Summative Assessments (Grade 6 NJSLS)
  - Grade 6 LinkIt! Form C Benchmark (Grade 6 NJSLS)
  - Grade 7 LinkIt! Form C Benchmark (Grade 7 NJSLS)

The Big Picture



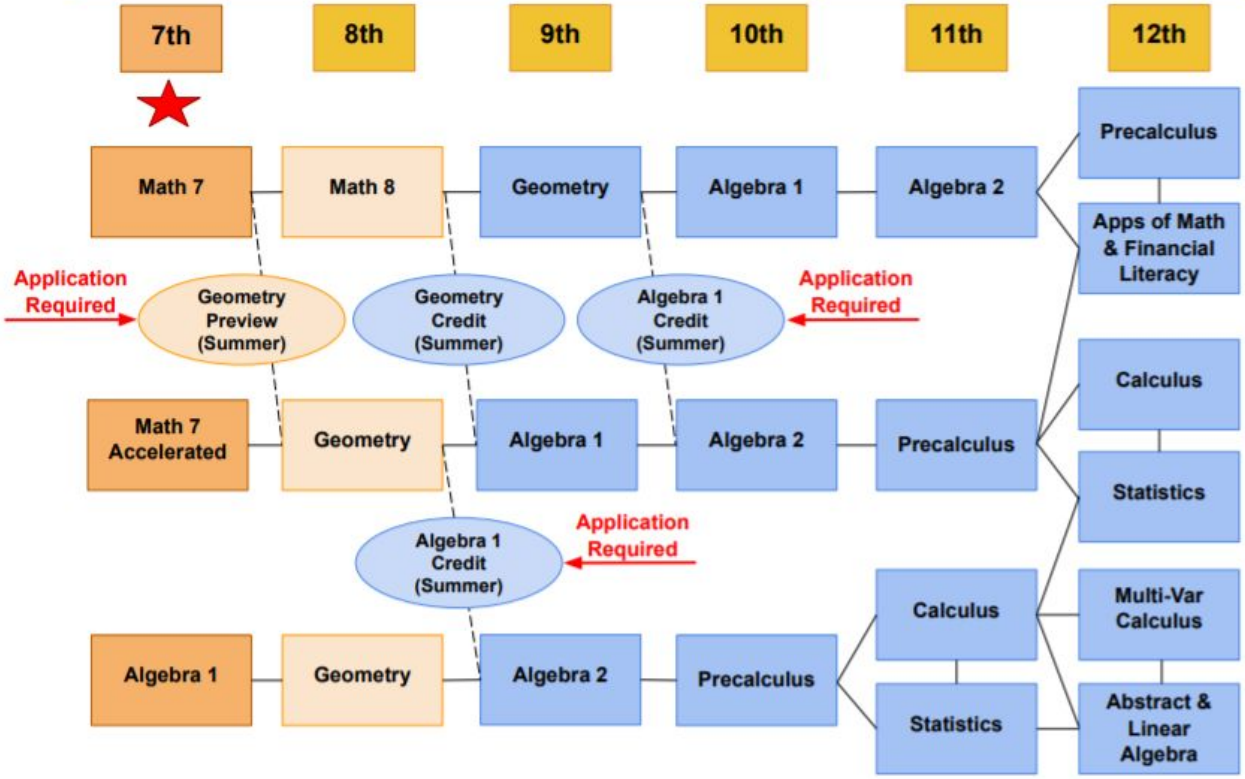
Enriched, Advanced, Honors, and Advanced Placement Were Omitted from this Diagram for Simplicity.

Class of 2025
(Current 8th Grade Students)



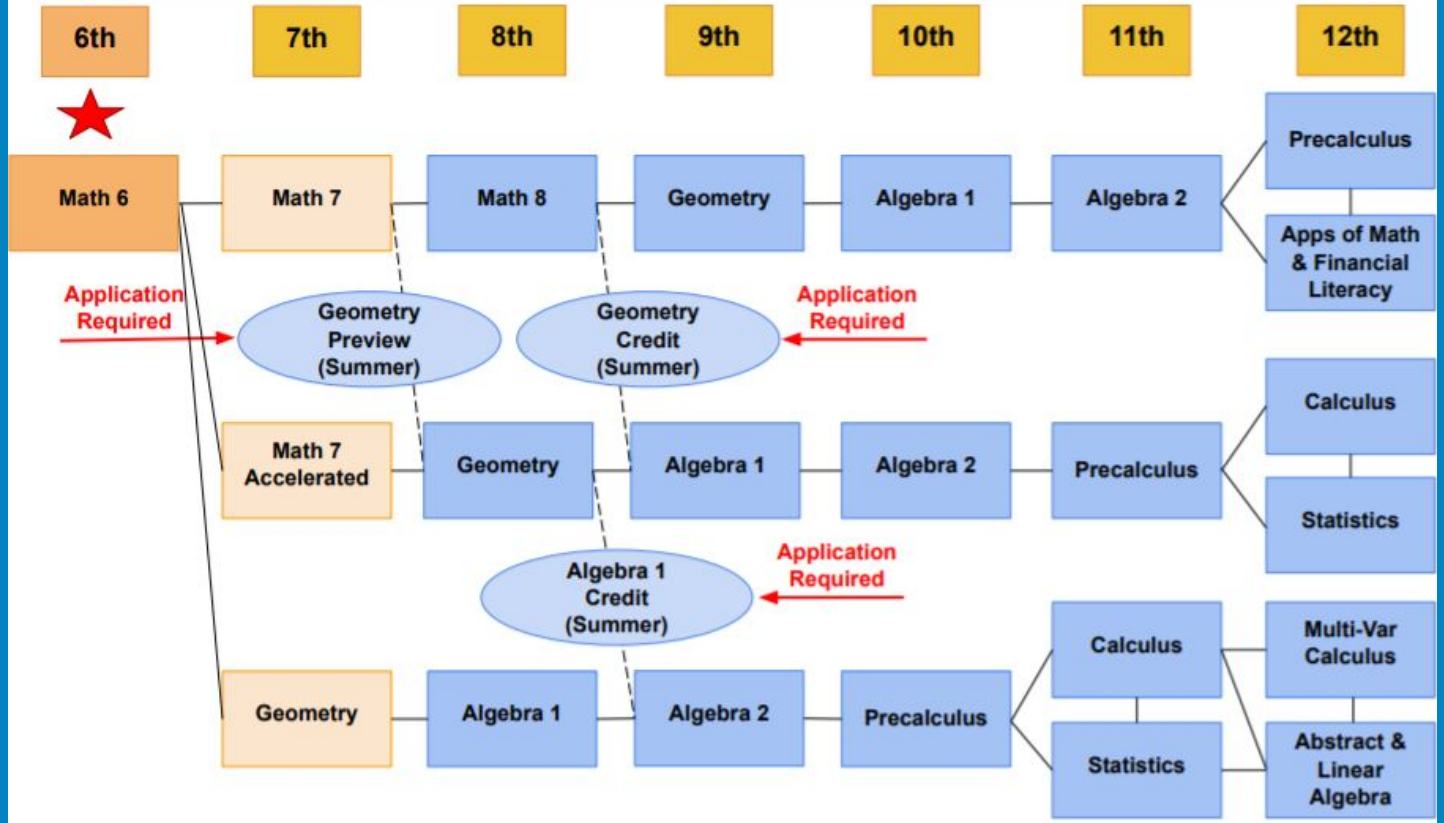
This diagram reflects the most common pathways; however, there are many more possibilities.

Class of 2026
(Current 7th Grade Students)



This diagram reflects the most common pathways; however, there are many more possibilities.

Class of 2027
(Current 6th Grade Students)



This diagram reflects the most common pathways; however, there are many more possibilities.

Thank You & Questions