

Math and Science Acceleration Pathways

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Program Origins



Established prior to the adoption of the Common Core State Standards (CCSS) and the Math-in-Focus curriculum.



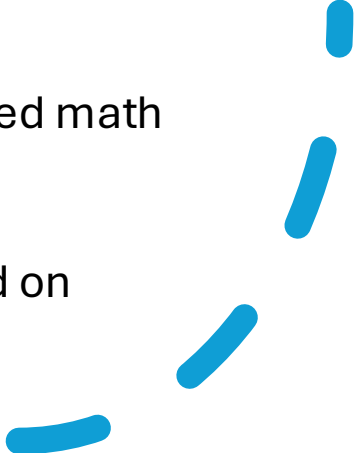
Designed for students who had such a strong knowledge base that they would have been disserved in a grade level classroom.



Skipping a grade allows students to finish high school with Multivariable Calculus, a more advanced class than AP Calculus.

Historical Context Continued

In 2020, the administration recommended moving the starting point of the double accelerated math pathway from grade 5 to grade 6 for the following reasons:

- Average attrition rate of 50%.
 - 89% of curriculum in grade 5 is brand new.
 - Enrichment practices were not available/effective for all students.
 - AIS instruction took the place of regular instruction.
 - Limited entry points to advanced math courses.
 - Tremendous stress was placed on students at a very young age.
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Emerging Concerns



Skipping content prioritizes speed over deep conceptual understanding, which may impact long-term math achievement and confidence.



Limited to a select group of students, the current structure raises questions about fairness & broader opportunities for enrichment.

What Changed in Grade 5 in 2020?

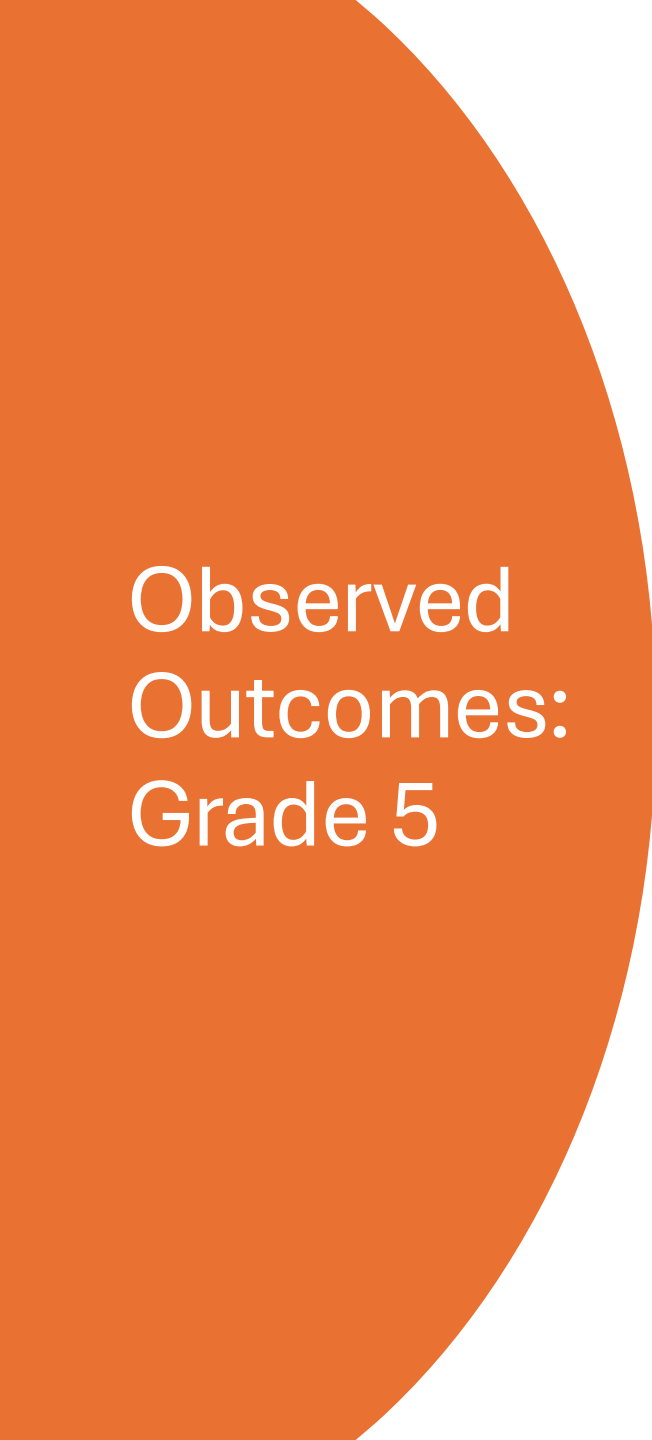
Grade 5 students were grouped heterogeneously.

Provided targeted enrichment blocks during the school day to provide more students with access to a deeper conceptual understanding of Mathematics.

Increased math time by 30 minutes two times per week during FLEX periods.


All 5th grade students receive either enrichment or AIS services during this time.

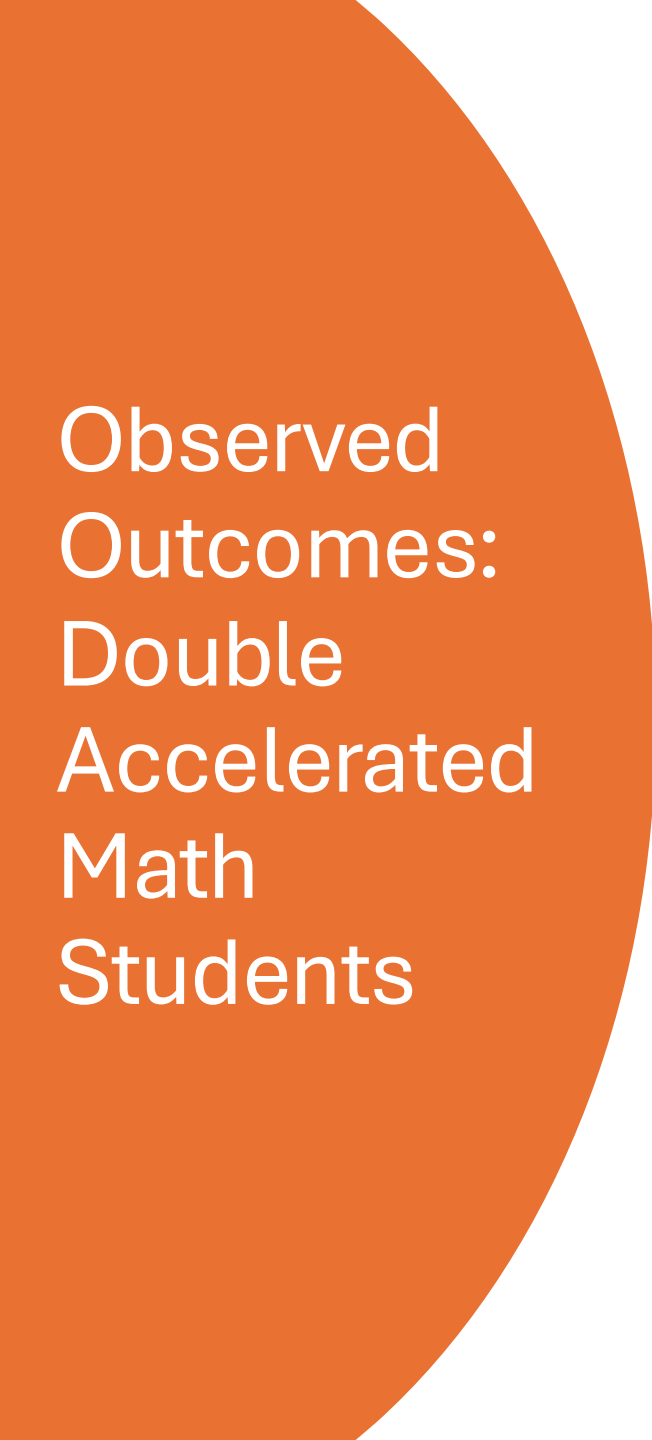
Changed the identification process for double acceleration to be more transparent.



Observed Outcomes: Grade 5


We have seen the following results:


- NYSED grade 5 math scores have increased by over 10% for all students.
 - NWEA math RIT scores have increased over 17%.
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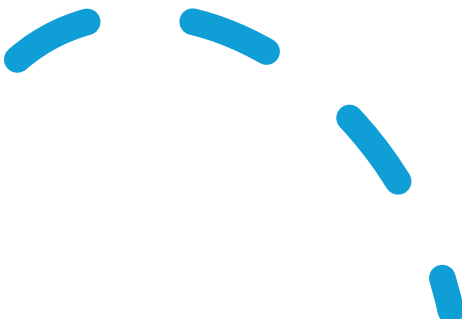
Observed
Outcomes:
Double
Accelerated
Math
Students

We have seen the following results:

- Attrition rates from 6th grade double accelerated math have dropped from 50% to 9% since 2020.
 - However, 45% of students in double accelerated math are performing below expectations.
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Identifying
Students
Accurately
Remains a
Challenge.



Percentage of potentially
successful students we have
been unable to capture,
regardless of carefully
reviewed and adjusted
screening measures:

? %

Why move acceleration to grade 7?

Ensure that no grade level content is skipped.

Greater flexibility in identifying students.

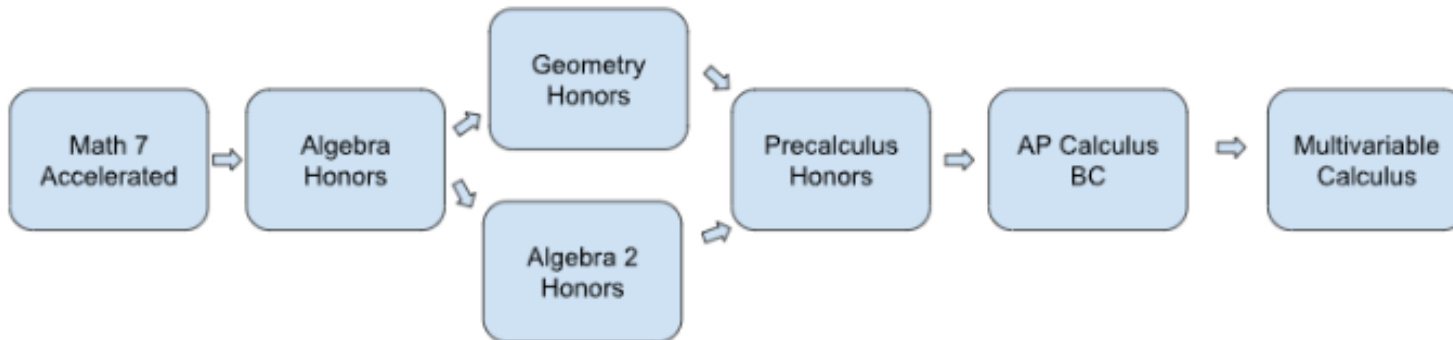
Students interested in taking Multivariable calculus can choose an additional math class, as one of their electives, in grade 9.

The pace of the curriculum remains accelerated for students interested in the mathematics pathway.

Mathematics Pathways

Grade 7 Grade 8 Grade 9 Grade 10 Grade 11 Grade 12

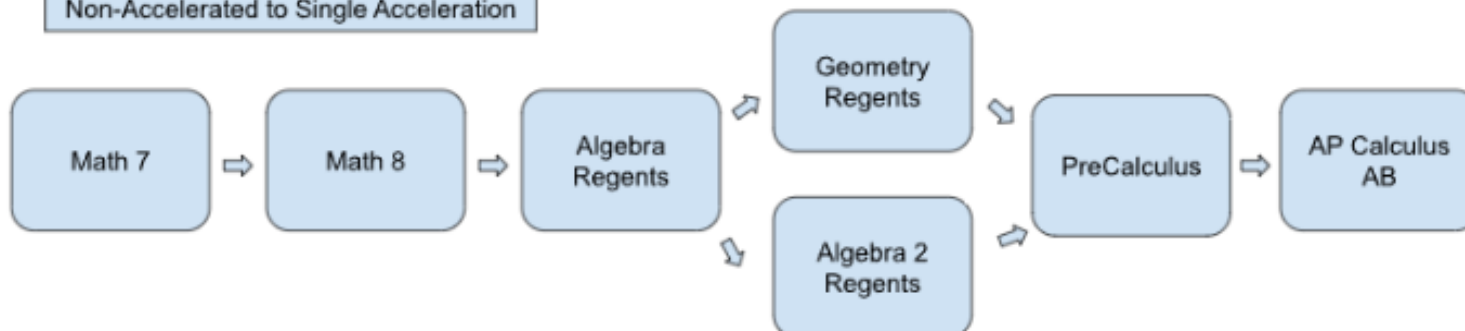
Double Acceleration



Single Acceleration



Non-Accelerated to Single Acceleration



Advantages of shifting the model



Expand and formalize enrichment in grade 6.



Increase the amount of time students spend learning mathematics by 60 minutes a week.



More students will have access to high-level enrichment.



Students have time to explore and determine their interests (e.g., Social Studies, English, Science, Math etc.) before committing to a pathway.

Identifying students for grade 7 Acceleration

Identification process
would mirror
Secondary model.

Identification will be
based on student
interest and
performance in grade
6.

Enrichment Time Explained



Opportunities for non-routine problem-solving



Interactive activities that go beyond grade-level standards



Emphasis placed on depth of curriculum (enrichment) rather than speeding through content (acceleration)

Skills vs. Enrichment

Evaluate $18 + 36 \div 3^2$

Using the digits 1 to 5 at most one time each, place a digit in each box to create an expression with the largest possible value.

$$\square + \square^{\square} \times \square$$

Skill vs. Enrichment

Write the correct comparison symbol ($>$, $<$, or $=$) in the box.

$$-\frac{8}{7} \quad \square \quad -2.14$$


Using the digits 1 to 9 at most once each, fill in the boxes to make a true statement.

$$-\frac{\square}{\square} < -0.\square\square < -\frac{\square}{\square} < -0.\square\square$$

Additional Enrichment Examples

- Spatial Reasoning Games
- Critical Thinking Games
- Data Talks
- Number Puzzles
- Logic Puzzles
- Interdisciplinary Projects





AP Intensive Science Pathway



Proposed Update



Current Science AP Intensive Pathway Selection Process

- Grade 6 students who participate in the double-acceleration math pathway are eligible to apply for the science AP pathway.
- Student science labs & tests, 6th grade math grades, and a secure science examination are factored using a rubric.

Findings:

- Attrition from the AP Intensive Pathway typically occurs at AP Chemistry (grade 10)
- Seven students not accepted to the AP Intensive Pathway as 7th graders opted to take AP Chemistry earning an average AP score of 4.
- The data suggests that students enrolled in single accelerated mathematics may have an equal opportunity for success in the AP Intensive Pathway.

2025 Science Recommendation:



Decouple the AP Intensive Science Pathway requirements from the Math Double-Acceleration requirement.

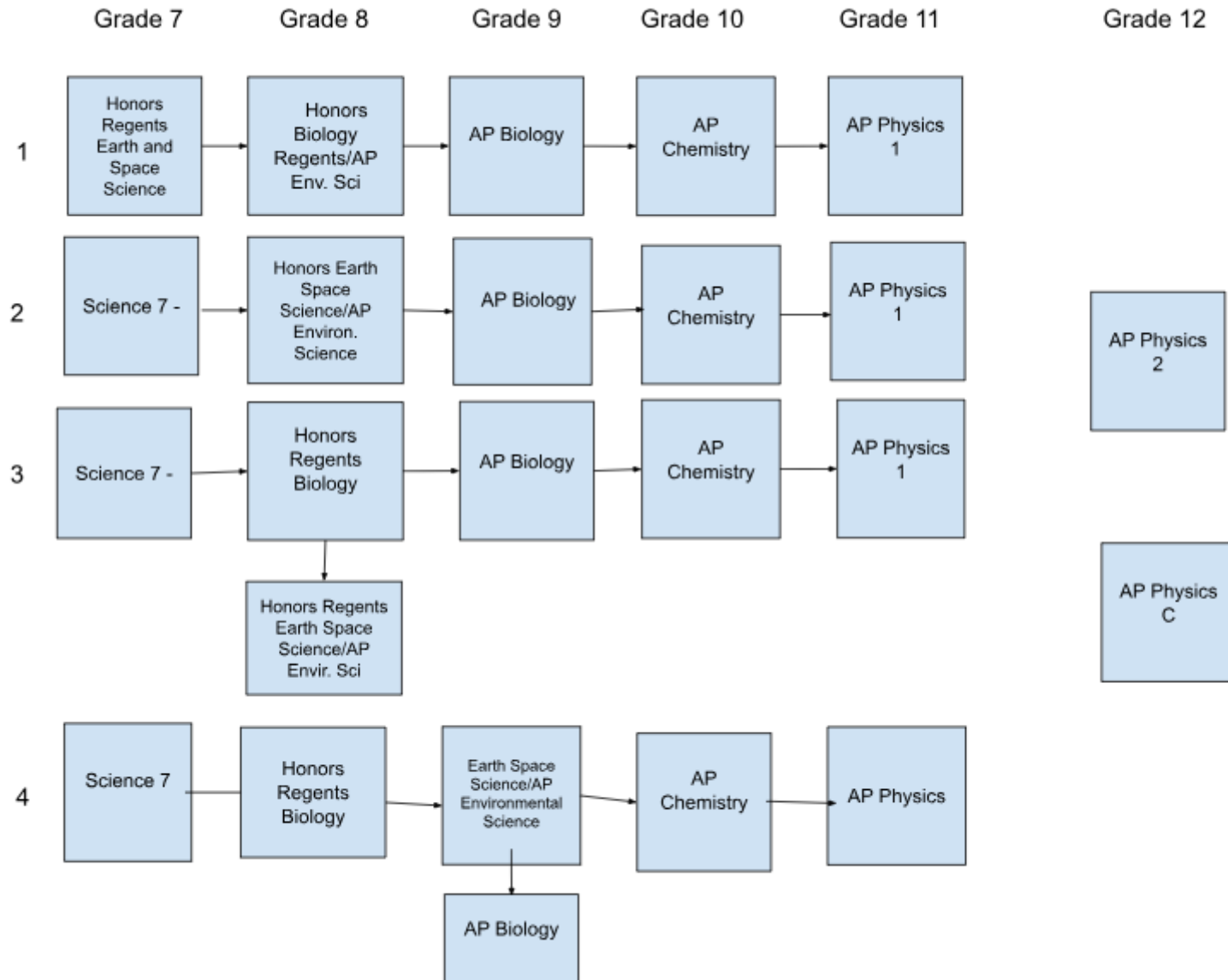


Students will no longer be required to be within the double-accelerated math pathway to be admitted.

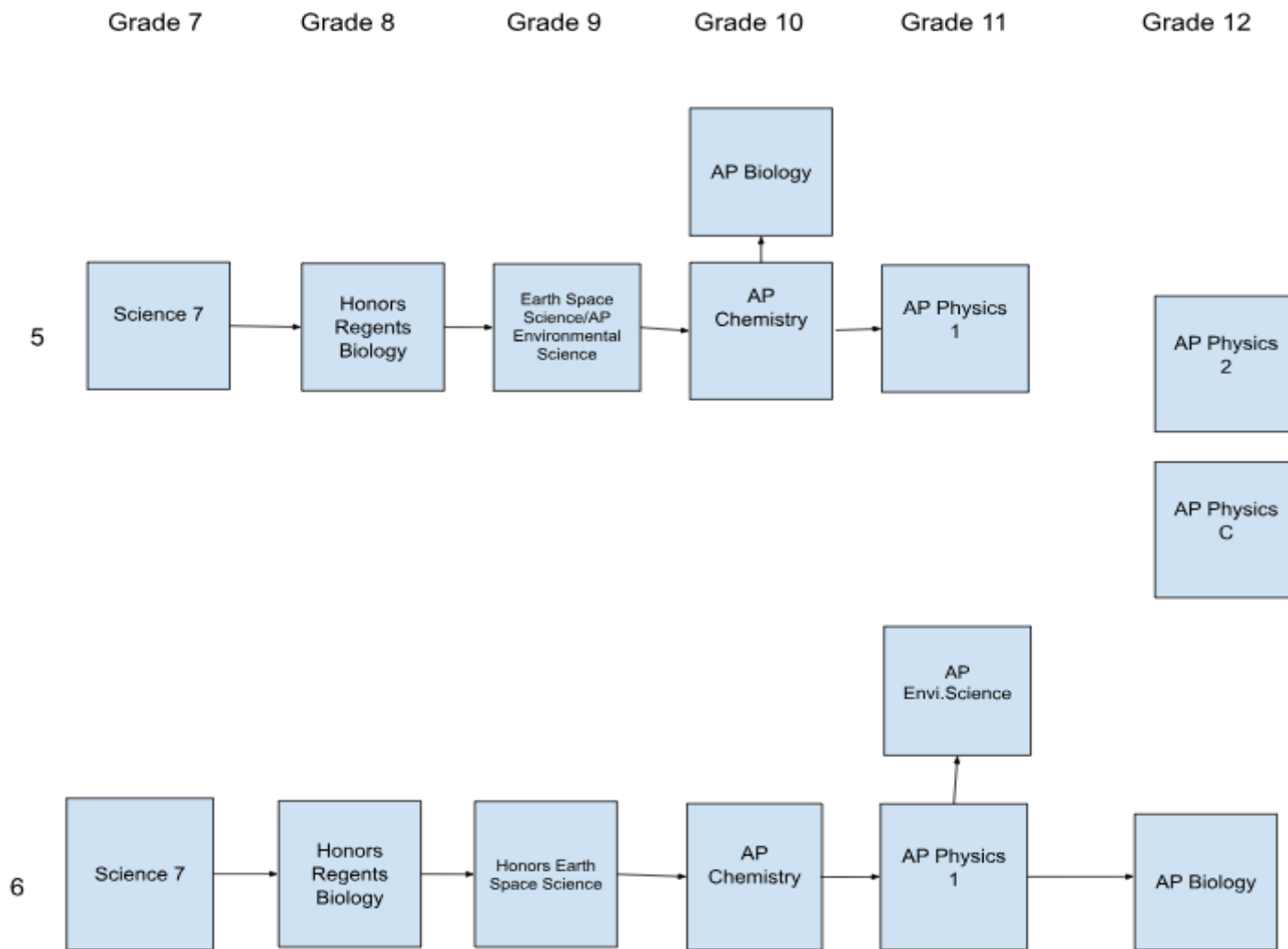


Identification will occur through using science test and lab averages, and a secure science exam.

We have identified on ramps in grades 8-12 allowing for students to participate in the AP Science Intensive Pathway.



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Summary:

- Entrance criteria was originally developed to ensure that students could handle skipped content.
- If content is not skipped, there is no need for these gates.
- It is impossible to capture student potential with 100% accuracy.
- The proposed structure will allow for developmental differences while still providing very high-level math instruction and access to the highest-level math & science courses.



Next Steps:

This presentation will be reprised on
January 28th ~ 9:30 AM
Shelter Rock Auditorium

2020-2024 Early Math Acceleration Identification Process Summary

Cognitive Abilities Test Screening: At least 98% national percentile on quantitative/non-verbal combined score

Secure exam: Assesses 6th grade learning standards & a deep understanding of prior grades' concepts.

Work Sample: universal samples spanning the full year

Teacher feedback: based on the math portion of the Renzulli-Hartman rating scale

Committee review of applicant data using a holistic rubric.