MLSD Mathematics

Review of Current Programs, Enrollment, and Success
January 2019
Honors Mathematics - Marking Period 1 at MLHS

Student Success in ML Honors/AP Math (MP1)

- A+ (30.0%)
- A (20.0%)
- A (11.2%)
- B+ (10.0%)
- B (9.0%)
- B (8.0%)
- C+ (7.0%)
- C (5.0%)
- C (4.0%)
- Dropped (5.0%)

Student Success in ML Honors/AP Math (MP1)

- A range (59.2%)
- B range (28.2%)
- C range (7.5%)
- Dropped (5.0%)
- Other (5.0%)
Placement into Honors Mathematics at MLHS

- Teacher Recommendation
- Course Placement Applications (CPAs):
  - Students may apply for admittance to an Honors/AP course.
  - These students must earn a grade of B– or higher on a diagnostic test.
- 2018–2019 School Year:
  - 108 CPAs
  - 90 Admitted
Honors Mathematics Students Earning C+ or Below

40 Honors students with Grades C+ or Below

- 18 students admitted due to a CPA.
- 3 students were recommended, but taking Honors or AP math for the first time.
- 13 students attended a middle school other than Briarcliff.
- 6 were students who were recommended for the course and have a background in Honors level math.
Gender Distribution in Honors Math Courses

- **Algebra 1AB**: 40.0% Female, 60.0% Male
- **Geometry Hon**: 50.0% Female, 50.0% Male
- **Algebra 2 Hon**: 44.0% Female, 56.0% Male
- **Precalculus Hon**: 33.0% Male
- **AP Calculus AB**: 42.0% Female, 58.0% Male
- **AP Calculus BC**: 34.0% Female, 66.0% Male
- **Hon Multi-Var Calc**: 50.0% Male
- **AP Statistics**: 44.0% Female, 56.0% Male
- **AP CS Principles**: 28.0% Female, 72.0% Male
- **AP Comp Sci A**: 43.0% Female, 57.0% Male
Gender: Mountain Lakes vs. Nation

Mountain Lakes vs. Nation

ML  Nation

% Female

AP Calc AB  AP Calc BC  AP Stat  AP CS
Gender Trends in AP Computer Science
STEAM Opportunities at MLSD

Wildwood Elementary School
- IAC Science Bee
- STEAM Challenges & Enrichment Lessons
- Cartoonist Workshop
- Math Marathon
- Math Olympiads Contests
- Destination Imagination

Briarcliff Middle School
- IAC Science Bee
- Robotics
- Art Class
- Workshop on the Arts
- Teen Arts Festival
- Math Contests: AMC 8, Math Counts, Math League, Math Olympiads
- Maker Space at ML Public Library
- Destination Imagination

Mountain Lakes High School
- Academy for Biotechnology
- Engineering/Architectural Drafting and Design Course
- Graphic Design, Web Design, Computer Science Courses
- Contests: AMC 10/12, Math League
- Destination Imagination
Questions
What about our Briarcliff Middle School Students?

● Middle School Programs Differ from High School Programs
  ○ Cognitive Development and Readiness
  ○ Acquisition of Learning Strategies
  ○ Comfort with Productive Struggle
  ○ Development of Grit
  ○ Emphasis on Social–Emotional Health and Well–Being
Jean Piaget - Stages of Development

- Sensorimotor Stage (Birth to 2 Years Old)
- Pre-Operational Stage (Ages 2-4)
- Concrete Operations (Ages 7-11)
- Formal Operations (Ages 11-15)
  - Cognition reaches final form.
  - No longer requires concrete objects to make rational judgements.
  - Capable of deductive and hypothetical reasoning.
  - Ability for abstract thinking is very similar to an adult.
Cognitive Development vs. Physical Development

- Do we expect children to all be the same height at age 12?
- How tall should a 12-year old be?

[https://study.com/academy/answer/how-tall-should-a-12-year-old-be.html](https://study.com/academy/answer/how-tall-should-a-12-year-old-be.html)

- Boys and girls experience growth spurts around 10-13 years old.
- Boys generally grow in height until they are around 16 years old.
- Girls generally stop growing in height around 15 years old.
- A 12 year old boy should be between 4 1/2 and 5 1/4 feet tall.
- A 12 year old girl should be between 4 1/2 and 5 1/3 feet tall.
Each student operates within a range of ability.

Learning is best facilitated by presenting challenges without overwhelming students.

If the work is too difficult the student will not have the intellectual tools necessary to learn anything from attempting the work.

Learning takes place when children are working within their zone of proximal development.

The zone of proximal development describes tasks that a child has not yet learned but is capable of learning at a given time.
Option 2: External Coursework at MLHS

- Option 2 Program Application (School Counseling Office)
- Option 2 Committee Review of Curriculum → Approve or Deny
- Student Must Earn A- or Above in Course
- Student Must Earn B- or above on MLHS Assessment of Material
Is Calculus the Goal?

- Possibility #1: Algebra 1 → Geometry → Algebra 2 → Precalculus → 12th Grade
- Possibility #2: Algebra 1 → Geometry → Algebra 2 → Precalculus → Calculus → 12th Grade
- Possibility #3: Geometry → Algebra 2 → Precalculus → Calculus → 12th Grade
- Possibility #4: Algebra 2 → Precalculus → Calculus → Elective → 12th Grade

* These are the most common pathways, but there are many possibilities!
Mathematics Electives

Advanced:

- AP Calculus AB
- AP Calculus BC
- AP Statistics
- Honors Multi-Variable Calculus
- Honors Abstract & Linear Algebra

College Preparatory:

- Probability & Statistics
- Applications of Algebra w/ Financial Literacy
Questions
Survey of Similar Districts

Bernards Township  Millburn
Berkeley Heights  Montgomery
Chatham  Mountain Lakes
Glen Rock  New Providence
Haddonfield  Princeton
Kinnelon  Ridgewood
Livingston  Summit
Madison  West Windsor–Plainsboro
Mendham Township  Westfield
Number of Course Offerings Per Grade

# Options Per Grade Level

- 1 Option
- 2 Options
- 3 Options
- 4 Options

# Similar Districts

<table>
<thead>
<tr>
<th>Grade</th>
<th>1 Option</th>
<th>2 Options</th>
<th>3 Options</th>
<th>4 Options</th>
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<tr>
<td>6th</td>
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<td>ML</td>
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<td>5</td>
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<td>8th</td>
<td>ML</td>
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How is advanced mathematical ability addressed in 6th Grade?

![Graph showing Grade 6 Leveling vs. Acceleration]

- Leveled: 6 districts
- Accelerated: 8 districts
- Neither: ML district
What percent of students are enrolled in a 7th-8th grade Algebra 1 to Geometry program?
What percent of students are enrolled in Prealgebra in 8th Grade?
How are Districts Determining Placement?

Commonly Used Placement Criteria

- In-House Test: 8
- MP Grades: 7
- PARCC: 6
- Teacher Rec: 5
- Benchmark Tests: 4
- MAP: 3
- Study Skills: 2
- IOWA: 1

*# Similar Districts*
Our Current 6th Grade End of Year Assessments

- OLSAT (G&T Identification)
- IOWA Algebra Readiness Assessment (Math Placement)
- Briarcliff Diagnostic Assessment (Math Placement)
- PARCC (Math) – State Requirement
- PARCC (ELA) – State Requirement
Avoid Overassessing our 11-year old Students

In an attempt to avoid over-assessing our students, we will:

● Eliminate the IOWA Algebra Readiness Assessment
● Administer the OLSAT to both 5th and 6th grade students in Spring 2019.
● In subsequent years, G&T Identification will take place at the end of 2nd grade and the end of 5th grade -- not 6th grade.
What Does this Mean for 7th-8th Grade Algebra 1 and Geometry Honors Math Placement?

The following criteria will be used within a 28-Point Rubric, on which a student must earn 20+ points to be eligible for this program:

- Benchmark Assessments (8 Points)
- 6th Grade PARCC Scores (10 points)
- Briarcliff Diagnostic Assessment of 7th Grade NJSLS (10 Points)
## Rubric: Benchmark Assessments (8 Points)

<table>
<thead>
<tr>
<th>Grade</th>
<th>95+%</th>
<th>90-94%</th>
<th>85-89%</th>
<th>80-84%</th>
<th>&lt;80%</th>
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<tbody>
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<td>MP1 Quarterly</td>
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<tr>
<td>MP4 Quarterly</td>
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# Rubric: 6th Grade PARCC Scores (10 Points)

<table>
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<tr>
<th>6th Grade PARCC</th>
<th>800+</th>
<th>795-799</th>
<th>790-794</th>
<th>785-789</th>
<th>780-784</th>
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<tbody>
<tr>
<td>Rubric Points</td>
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<td>9</td>
<td>8</td>
<td>7</td>
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<table>
<thead>
<tr>
<th>6th Grade PARCC</th>
<th>775-779</th>
<th>770-774</th>
<th>765-769</th>
<th>760-764</th>
<th>&lt;760</th>
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<tbody>
<tr>
<td>Rubric Points</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</table>
Rubric: Briarcliff Diagnostic Assessment of 7th Grade NJSLS (10 Points)

<table>
<thead>
<tr>
<th>BDA Score</th>
<th>90+%</th>
<th>85-89%</th>
<th>80-84%</th>
<th>75-79%</th>
<th>70-74%</th>
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</thead>
<tbody>
<tr>
<td>Rubric Points</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>BDA Score</td>
<td>65-69%</td>
<td>60-64%</td>
<td>55-59%</td>
<td>50-54%</td>
<td>0-49%</td>
</tr>
<tr>
<td>Rubric Points</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>0</td>
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More about the Briarcliff Diagnostic Assessment of 7th Grade NJSLS

- 7th Grade NJSLS are extensions of 6th Grade NJSLS.
- 7th Grade NJSLS are not explicitly taught in 6th Grade Math class.
- Exposure to 7th Grade NJSLS is available through challenge work.
- This assessment is meant to identify students far beyond typical academic growth.
- Extremely advanced students are expected to earn high scores.
- Less advanced students may not earn high scores.
- This is Okay! It is expected and completely normal!
What if my child wants to prepare?

- NJSLS for Mathematics: https://www.nj.gov/education/cccscs/2016/math/
- MLSD In-Class Access to 7th Grade NJSLS: Mrs. Lombardi’s “Finished Early” Board
- MLSD Online Resources for Mathematics (IXL): (Your child has an account) https://www.ixl.com/
- Free Online Support in Mathematics: https://www.khanacademy.org/math/
Briarcliff Library Math Curriculum Corner

Curriculum Binder:
- Curriculum Maps
- Grade Level NJSLS

Textbooks:
- 6th Grade Math
- Algebra 1
- Geometry Honors

Computer Stations:
- Links to Online Resources
Please remember....

- Admittance into our accelerated Algebra 1AB to Geometry Honors Program does not mean the student is required to enroll in these courses.
- The most important things to keep in mind in the learning of mathematics are cognitive development and readiness.
- Students who advance before they are cognitively ready may wind up falling behind or experiencing major struggles in their future mathematics coursework.
Thank you for listening!

Questions