Rupert A. Nock Middle School

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NEWBURYPORT PUBLIC SCHOOLS

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Dear parents and guardians,

We are reaching out to parents and guardians of 7th and 8th grade students to share information on the math curriculum for grades 7-12. Three years ago, in order to align our courses with the Common Core Standards, the district adopted the Eureka Math program for grades K-8. Eureka is a rigorous curriculum that covers all the standards outlined in the Common Core and includes work in the areas of algebra, geometry, and basic calculations. We are finding that Eureka Math is helping our students build a firm foundation in preparation for high school math courses.

Some of our students are in need of an advanced math course by 8th grade. For this reason, the Nock offers a high school level course in Algebra I. Students qualify for this course by meeting criteria that are set by a team of professional educators including the district math coordinator, the 7-8 math team, and the Newburyport High School math department chair. The course is designed for students who have a high degree of math competence, can independently complete complex math, and are motivated to take a fast-paced math course. Students are placed in this course at the end of 7th grade. (See attached for Grade 8 Algebra I criteria and timeline.)

Most students benefit from a final year of Eureka math in 8th grade. In this year, students continue to build confidence in tackling complex problems through exploration of geometry, ratios and proportions, expressions and equations, statistics and probability, and functions concepts. Students who do not take Algebra I in middle school often continue on to an advanced honors or Advanced Placement (AP) path in high school. We have attached a complete description of the NHS math pathways in this letter.

It is important to note that students will have many opportunities for honors and AP courses in all subject areas at the high school. Not taking Algebra I in 8th grade will not affect a student's ability to take advanced math in high school. In fact, our data has shown that students who are placed in a math course that best matches the level identified by the criteria and teacher recommendation, have the most long-term success in math and tend to choose math elective courses as they proceed through high school.

In the early spring of 8th grade, students will receive placement recommendations for courses at NHS. There are honors, college preparatory, and basic levels in all the major content areas. Students are recommended for an honors course if they meet the criteria. The high school will be hosting a meeting for parents this fall where you will receive a full listing of all the courses and the criteria for honors placement. The date for this meeting will be communicated from us as soon as it is set.

Middle school students are growing intellectually, socially, and physically at very different rates. It is not uncommon for us to see a student who did not have a strong interest or skill in a subject like math

emerge as a top student in that area in high school. The pathway through the high school supports this growth and provides opportunities for all levels of learners to build a rigorous transcript and pursue competitive collegiate goals.

Sincerely,

Lisa Furlong
Principal

Elizabeth Kinzly
District STEM Coordinator

8th Grade Algebra I Placement Criteria and Process

1) Algebra I placement rubric:

Student only needs to see a concept once to understand the process and can extrapolate his/her understanding in order to solve more difficult problems while being able to handle new concepts almost every day.
Student demonstrates consistent homework preparation, shows all work, and uses resources to work towards a solution to unfamiliar or more challenging problems rather than leaving them blank.
Student works and takes notes independently, and keeps materials organized.
Student consistently earns A's on assessments before test corrections or retakes.
Student is highly motivated for success in math, is very responsive to suggestions/coaching when provided, and embrace mathematical challenges.

2) Algebra I scoring criteria:
   a. 95% or higher in 7th grade math class (at end of second trimester)
   b. 55 or higher on the Iowa Algebra Readiness Assessment
   c. 93% or higher on the Newburyport Basic Skills Assessment

Students who meet the above rubric and scoring criteria will be recommended for Algebra I in 8th grade. The placement process will take place in April of 2017. Parents and students will be notified of the placement recommendation by mail in mid-May.

9th Grade Math Placement Information

REQUIREMENT: Newburyport High School requires all students to complete 3 years of study in mathematics. We offer a variety of sequences to help students achieve their goals.
For acceptance into a four-year Massachusetts State College or University, it is advised that students take 4 years of high school math including Algebra I, Geometry, and Algebra II (at any level). Some students opt to take more than four math courses in order to satisfy their individual needs and/or strengths.

SEQUENCE: There are a variety of sequences of courses for students in the study of mathematics at Newburyport High School. The specific sequence taken can vary depending on a student's strengths or weaknesses in mathematics. The ability to understand abstract math is developmental. Some students are ready to tackle algebra in 7th or 8th grade while others might not be ready to 10th or 11th grade.

Math is a skills based subject and as such every math concept a student learns is built off of skills developed in previous grades or units. Having options and assuring appropriate placement is key to students being successful in high school math. Students should be challenged but not over whelmed. We have found that there is an adverse effect if students are placed into a course, which they are not quite ready for.

PLACEMENT: Students entering Newburyport High School will receive recommendations from their eighth grade teachers. Recommendations are based on a variety of factors including but not limited to: grades, mastery of skills, consistency of work, ability to comprehend abstract ideas, self-motivation, and work ethic.

COURSES: The courses available for students entering NHS as 9th grader for the 2016/2017 school year are Algebra 1 CP2, Algebra I CP1, Algebra I Honors, and Geometry Honors.
Below is an overview of these four courses. For a complete listing of all Math courses please refer to the Program of Studies which can be found on the NHS website.

0419 Algebra 1 CP 2: Grades 9-12 Full Year 2.5 Credits/semester
This course is designed to provide students with a working foundation in Algebra 1. The curriculum was specifically designed for students who have not demonstrated a mastery of the material studied in Grade 8 Math and/or need additional support to be able to work with the abstractions presented in Algebra I. Topics will include: linear equations, systems of linear equations and inequalities, operations on polynomials, factoring, solving quadratic equations, introduction to function notation, families of functions, absolute value equations and inequalities, compound inequalities, measures of central tendency, graphs of data, as well as other topics presented by the Massachusetts Curriculum Frameworks.
This course followed by Geometry CP2 will address all topics needed to prepare students for the 10th grade math MCAS.

Algebra I Honors	***Geometry Honors***
• Demonstrate mastery of basic skills and number sense (times tables, adding signed numbers, place value, etc.)	• Demonstrate mastery of Algebra skills including but not limited to: systems of linear equations, factoring polynomials, solving quadratic equations by a variety of methods, graphing linear and quadratic functions, Laws of Exponents, Rational Expressions
• Can handle abstract ideas, translate ideas/relationships into symbols	• Can handle abstract ideas, translate ideas/relationships into symbols
• Able to articulate ideas, processes, mathematical reasoning, and problem-solving	• Able to articulate ideas, processes, mathematical reasoning, and problem-solving
• Can handle new concepts almost every day, with higher level of difficulty; will persist on a challenging problem	• Can handle new concepts almost every day, with higher level of difficulty; will persist on a challenging problem
• Only need to see it once to "get it" then can extrapolate their understanding in order to solve a variation of (or more difficult) problem	• Only need to see it once to "get it" then can extrapolate their understanding in order to solve a variation of (or more difficult) problem
• Consistent homework preparation; shows all work; uses resources to work towards a solution to an unfamiliar or more challenging problem rather than leave it blank	• Consistent homework preparation; shows all work; uses resources to work towards a solution to an unfamiliar or more challenging problem rather than leave it blank
• Have success on more rigorous assessments that include problem variation and challenge	• Have success on more rigorous assessments that include problem variation and challenge
• Embrace variation in environment and routines, including presentation of more challenging, complex problems	• Embrace variation in environment and routines, including presentation of more challenging, complex problems
• Work and take notes independently; keep materials organized	• Work and take notes independently; keep materials organized
• Earn mostly A's on assessments the first time	• Earn mostly A's on assessments the first time
• Highly motivated for success; very responsive to suggestions/coaching when provided; can handle challenges; can approach problems in different ways	• Highly motivated for success; very responsive to suggestions/coaching when provided; can handle challenges; can approach problems in different ways
• Ask higher order questions that show a deeper understanding and push the curriculum forward	• Ask higher order questions that show a deeper understanding and push the curriculum forward
• Able to consistently work successfully **without** the use of a calculator	• Able to consistently work successfully **without** the use of a calculator
	• Ability to transfer and apply Algebra concepts into other curriculum areas

Newburyport High School Mathematics Placement Rubric

Algebra I CP2	*Algebra I CP1*
• Have weaknesses in basic skills and number sense (times tables, adding signed numbers, place value, etc.)	• Demonstrate good basic skills and number sense (times tables, adding signed numbers, place value, etc.)
• Have lots of difficulty with abstract ideas and representations	• Can handle some abstractions including words to symbols representations
• Lots of difficulty articulating ideas, processes, and mathematical reasoning	• Some difficulty articulating ideas, processes and problem-solving but not overwhelmed by the expectation
• Need concepts presented in small chunks with lots of repetition; more likely to "give up" when faced with a challenging problem	• Can handle new concepts regularly, but not daily; may successfully approach a challenging problem with support, guidance, and practice
• Need many step-by-step examples, lots of practice, and regular spiraling for retention and concept building	• Like to see several examples and need regular practice
• Very inconsistent homework preparation; problems left blank if students don't immediately know how to approach it	• Generally consistent homework preparation (does the whole assignment, shows work, etc.)
• Ask lots of questions during assessments and/or need model problems or lots of cueing in order to complete an assessment	• Can complete assessments independently (without supports such as model problems and cueing)
• Need structured environment, routines, and presentations	• Can handle some variation in environment and routines
• Need support for note-taking, organizing materials and work	• Work and take notes independently; keep materials organized
• Need assessment re-takes and lots of support to get B's and C's in 8th grade	• Can earn A's, B's, and C's on assessments *without* regular re-takes
• Need continual motivational support	• Demonstrate some self-motivation for success but still need some direction and coaching on behaviors that bring success
• Ask basic questions; asking for "help" often means they want/need one-on-one step by step instruction	• Ask questions; generally able to proceed without step-by-step reminders

NHS Possible Math Course Sequences 2016/2017			
9th Grade	**10th Grade**	**11th Grade**	**12th Grade**
Algebra I CP2	Geometry CP2	Algebra II CP2	Financial Math
		Fundamentals of Algebra and Geometry	Financial Math
Algebra I CP1	Geometry CP1	Algebra II CP1	Pre-Calculus and/or Financial Math
Algebra I Honors	Geometry Honors	Algebra II Honors	Pre-Calculus Honors and/or AP Stats and/or Financial Math
	Geometry Honors and Algebra II Honors	Pre-Calculus Honors and/or AP Stats	AP Calculus (AB or BC) and/or AP Stats and/or Financial Math
Geometry Honors	Algebra II Honors	Pre-Calculus Honors and/or AP Stats	AP Calculus (AB or BC) and/or AP Stats and/or Financial Math

The chart above outlines the possible sequences for our high school math classes.

In addition to those courses listed above, the High School Special Education Department has courses and programs designed support students on Individual Education Plans to ensure their success in the study of mathematics. For more details please contact our Special Education Department.

0412 Algebra I CP 1: Grades 9-12 Full Year 2.5 Credits/semester
This course is designed to provide students with a solid foundation in Algebra. Topics will include: linear equations, systems of linear equations and inequalities, operations on polynomials, factoring, solving quadratic equations, introduction to function notation, families of functions, absolute value equations and inequalities, compound inequalities, measures of central tendency, graphs of data, as well as other topics presented by the Massachusetts Curriculum Frameworks
This course, followed by a Geometry course will address the topics needed to prepare students for the 10th grade math MCAS.

0416 Algebra I Honors: Grades 9-12 Full Year 2.5 Credits/semester
PREREQUISITE: Meets rubric criteria, A or better in 8th grade math, and teacher recommendation OR completion of 8th grade Algebra and teacher recommendation
This course is designed for ***highly*** motivated students who have excelled in previous math courses and who have demonstrated an ability to meet the demands of a faster paced and more in-depth study of Algebra I topics. Topics will include: linear equations, systems of linear equations and inequalities, operations on polynomials, factoring, solving quadratic equations by a variety of methods, function notation, families of functions, absolute value equations and inequalities, compound inequalities, measures of central tendency, graphs of data, as well as other topics presented by the Massachusetts Curriculum Frameworks. Due to faster pacing, additional topics will be included based on the strengths and needs of the students and will vary from year to year. This course followed by a Geometry course will address the topics for the Grade 10 MCAS

0423 Geometry Honors: Grades 9-12 Full Year 2.5 Credits/semester *
PREREQUISITE: Meets rubric criteria, A or better in 8th grade Algebra, and teacher recommendation

This course is designed for ***highly*** motivated students who have demonstrated a deep understanding of the concepts presented in Algebra I Honors and have the ability to meet the demands of a faster paced and more in- depth study of Geometry topics. Topics studied will include properties of triangles, quadrilaterals, and other polygons. As well as congruence, similarity, Right Triangles and the Pythagorean Theorem, area of polygons, surface area, volume, and other topics presented by the Massachusetts Curriculum Frameworks. Additionally, students will develop logical reasoning skills and transfer their geometry skills to applications of the concepts. Honors students will also complete some extension problems that will require more varied demonstrations, proofs, and applications. This course in conjunction with an Algebra I course will address the topics for the Grade 10 MCAS.

* Historically students coming out of 8th grade Algebra I who are not quite ready for the abstract concepts of Geometry Honors, are more successful in the long run if they take Honors Algebra I as a freshman. This allows them to really solidify the algebra skills needed in geometry honors and subsequently Algebra II Honors. The 8th grade Algebra I course is different from the 9th grade Algebra I Honors course in many aspects. The middle school must incorporate the Massachusetts 8th grade math standards into their Algebra curriculum. Likewise our Algebra I honors class will cover topics that the 8th will not be able to address.