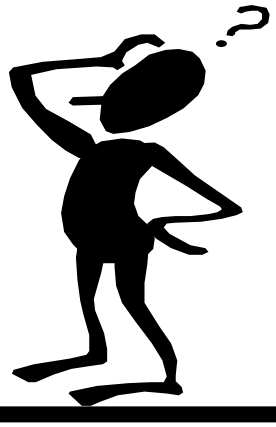

What should I take next year?

SCIENCE

9th Grade	10th Grade	11th Grade	12th Grade
Currently enrolled in Physics 9	Chemistry Regents	Biology	Any Science*
Completed Living Environment	Earth Science	Chemistry Regents/Honors*	Any AP Science* Or Science Elective*
	Chemistry	Physics Regents	Any AP Science* Or Science Elective*
	Chemistry	Any AP Science*	Any AP Science* Or Science Elective*

AP Sciences:

- Physics APB
- Physics APC
- Chemistry
- Environmental
- Biology

Science Electives:

- Science 12
- Science Research
- Robotics

*Subject to Departmental Approval

SCIENCE

Introduction

Great Neck North has a pupil population with a wide range of interests and abilities. In order to meet the needs of our students, we offer several levels of instruction in most areas of science.

Incoming freshmen will follow the general sequence shown below:

	9th grade	10th grade	11th grade	12th grade
Incoming Freshmen	Physics - 9 or Physics - 9 Honors	Chemistry or Chemistry Honors	Biology or AP Biology	Any AP or Science 12

Please note that a complete record of all required laboratory work must be submitted to the teacher before a student is eligible to take a New York State Regents examination in science.

Number of periods per cycle: All classes, with the exception of electives, meet for eight periods per 6 day cycle.

NINTH GRADE

PHYSICS - 9

Who Should Take Physics - 9?

Almost all ninth grade students are expected to enroll in PHYSICS-9. Exceptions are those recommended students who enroll in PHYSICS - 9 HONORS.

What Will We Be Studying In Physics-9?

Physics - 9 will follow an algebra-based physics curriculum appropriate for high school freshmen. This course covers all the traditional areas of a first course in Physics, with sections on: motion, forces, heat, energy, electricity, magnetism, waves, light, sound, electronics, nuclear physics, and radioactivity. Alongside the theoretical section of the course, there will be a strong practical aspect as well. Experimentation is a major part of the subject and will occur throughout the course. There is also an emphasis on improving number sense, a skill that is critical to success in all science classes and on programming, specifically using Arduino technology.

What Will Be Expected Of Me?

Students will be expected to regularly perform lab investigations and write lab reports. The course will be of an investigative nature, and students are often expected to work in groups. Students will also be expected to take notes and participate in class discussions. Students are required to have a scientific calculator, a ruler, and a protractor in addition to all of the usual classroom materials.

How Is The Course Taught?

A variety of methods will be employed, including the use of demonstrations, models, videos, charts, and a great deal of hands-on laboratory work. The class uses iPad technology to enhance many aspects of the course.

What Are The Completion Requirements?

Students will be required to take the school-based exit exam in June.

1 unit of credit

Prerequisites: Either Earth Science or Science 8

PHYSICS 9 - Honors

Who Should Take Physics - 9 Honors?

This opportunity for ninth graders to take a Physics Honors course is intended for those who rank at the very top of their honors science and math classes, and who are committed to making science their major academic area of pursuit. Students who opt for this extremely challenging program will be expected to follow a science sequence of Chemistry Honors or AP Chemistry (by teacher recommendation only) in 10th grade and AP Biology in 11th grade. Students may elect either AP Chemistry or AP Physics in 12th grade. Consider enrolling if your math skills are well above grade level (see What Will Be Expected of Me below), and if you have an intense interest in science.

What Will We Be Studying In Physics 9 - Honors?

Physics - 9 Honors is an intensive course covering all aspects of introductory physics, including mechanics, electromagnetic energy, sound, heat, and light. Emphasis will be placed on solid state electronics, modern physics, and relativity. Students will have the opportunity to explore selected projects in topics such as electronics and rocketry.

What Will Be Expected Of Me?

You will be expected to regularly take notes, perform lab investigations, write lab reports, and work challenging mathematical problems in physics. This course requires a good deal of independent thinking, problem solving, and engineering. You must be prepared to keep up with the work in physics while learning the math required on your own. Enrichment and special projects will be expected of students.

How Is The Course Taught?

The course is taught through a combination of lecture format and laboratory work.

What Are The Completion Requirements?

Students will be required to take the physics Regents exit exam in June. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored in order to sit for the Regents examination.

1 unit of credit

Prerequisite: Earth Science (8th grade), Algebra I, Geometry.
Entry is by department selection.

TENTH GRADE

CHEMISTRY - Regents

Who Should Take Chemistry Regents?

Any student who has successfully completed Physics 9 should enroll in Chemistry Regents. Students should have average or above average reading skills and should be able to solve basic algebraic problems.

What Will We Be Studying In Regents Chemistry?

Chemistry Regents follows a course of study prescribed by the NYS Board of Regents. Topics covered include: matter and energy, atomic structure, bonding, the periodic table, the mathematics of chemistry, kinetics and equilibrium, acids and bases, oxidation-reduction reactions and electrochemistry, organic chemistry, and nuclear chemistry.

What Will Be Expected Of Me?

You will be expected to take notes regularly, to perform lab investigations, to write lab reports, interpret graphical information, and to work mathematical problems in chemistry. You may expect that to adequately complete homework and lab assignments you will need to spend a minimum of two hours per week on preparation outside the classroom.

How Is The Course Taught?

Lectures, group work, videos, and labs.

What Are The Completion Requirements?

Students will be required to take the NYS Regents examination in Chemistry in June. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored at school in order to sit for the Regents examination.

1 unit of credit

Prerequisite: Physics 9, Physics 9 honors, or recommendation by a guidance councilor for new incoming students.

CHEMISTRY - Honors

Who Should Take Chemistry Honors?

Honors Chemistry is an SAT II Chemistry level science course for those students who feel they would like to be challenged. Students currently enrolled and in excellent academic standing in Physics-9 Honors and Geometry or equivalent should consider this course.

What Will We Be Studying In Chemistry Honors?

The Honors Chemistry course will prepare students to sit for the SAT II Chemisty exam as well as the Chemistry Regents Exam. It is an enriched and more mathematical course than the standard Regents Chemistry curriculum. Emphasis is placed on an in-depth study of chemical concepts as well as certain topics beyond those required by the NYS Regents Syllabus; i.e., extensive presentation of the Gas Laws, Electronic Structure, Bonding, Thermodynamics, Acids and Bases, Kinetics, and Oxidation-Reduction reactions.

What Will Be Expected Of Me?

Students will be required to complete 1200 minutes of laboratory work and to submit laboratory reports that demonstrate conceptual understanding of the topic or principle. The mathematical relationships used are rigorous and integral to the problem-solving techniques required for in-depth understanding. Students may expect that to adequately complete homework and lab assignments they will need to spend a minimum of four hours per week on preparation outside the classroom.

How Is The Course Taught?

A variety of methods will be employed. Lessons will include the use of demonstrations, models, videos, charts, and hands-on laboratory work.

What Are The Completion Requirements?

Students will be required to take the NYS Regents Examination in Chemistry in June. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored at school in order to sit for the Regents examination.

1 unit of credit

Prerequisite: Physics 9 honors or a recommendation from the student's 9th grade teacher

ELEVENTH & TWELFTH GRADES

BIOLOGY - Regents

Who Should Take Biology Regents?

Any student who has successfully completed Physics 9 and Chemistry should enroll in Biology Regents. Students should have average or above average reading skills and should have a solid knowledge of chemistry. Vocabulary is an important part of the Biology curriculum.

What Will We Be Studying In Biology Regents?

Biology Regents follows a course of study that is built upon the NYS Living Environment curriculum. In addition to the syllabus of that course, the course involves biochemistry, molecular biology, and the anatomy and physiology of living organisms.

What Will Be Expected Of Me?

You will be expected to take notes regularly, to perform lab investigations, and to write lab reports. You may expect that to adequately complete homework and lab assignments you will need to spend a minimum of two hours per week on preparation outside the classroom.

How Is The Course Taught?

Lectures, group work, videos, and labs.

What Are The Completion Requirements?

Students will be required to take the NYS Living Environment Regents in June. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored at school in order to sit for the Regent examination.

1 unit of credit

Prerequisite: Physics-9 and Regents Chemistry or Physics 9 and Living Chemistry.

BIOLOGY - Advanced Placement

Who Should Take A. P. Biology?

The Advanced Placement course in Biology is a challenging college level course designed for students who have a firm mastery of the factual information and the concepts of high school biology and chemistry and who have demonstrated ability in critical thinking and in mathematical and laboratory skills.

Consider enrolling if you identify with all of the following predictors of success: grades of "A" in the Regents sciences, a "B" or better in other core academic studies, above grade level reading and writing skills, ease in working individually in laboratory investigations, and solid problem solving skills.

What Will We Be Studying In A. P. Biology?

The course is designed to be the equivalent of a full year of introductory college biology, usually taken during the first college year. Topics studied include biological chemistry, cells, energy transformations, molecular genetics, and ecology. Laboratory work is experimental and quantitative, rather than descriptive. Assigned reading includes a widely used college text, *Biology* by Campbell, as well as selected reprints from *Scientific American* and other journals and books. This is a vocabulary heavy course.

What Will Be Expected Of Me?

Major emphasis will be placed on understanding of biological concepts and the development of biological thought. You will be expected to demonstrate your understanding both orally and in expository essays. You must be prepared to spend a minimum of four-six hours per week on independent work outside of the classroom to adequately complete the reading and writing assignments (which include extensive written lab reports). In addition, you will be expected to complete after school any laboratory work which could not be completed during the allotted laboratory time. Grading is based upon mastery of the A.P. curriculum.

How Is The Course Taught?

Both lecture and laboratory formats will be used in this fast-paced class. Lecture will require aural concentration and attentiveness, note taking, and the ability to conceptualize and to formulate connections. Laboratories are an integral part of the course and will include experimental work which will sometimes extend beyond the double lab period. The weeks following the A. P. exam will be devoted to the completion of individual extended projects.

What Are The Completion Requirements?

Students will be required to prepare for and take the Advanced Placement examination in Biology in May and the Biology Regents in June if not previously completed. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored at school in order to sit for the Regents examination.

1 unit of credit

Prerequisites: Physics 9, Chemistry Regents, and Department recommendation.

Those not receiving the department recommendation will be required to meet with counselor, department head, and parents to ensure full awareness of the high level of commitment and skill required to succeed in AP Biology.

PHYSICS - Regents

Who Should Take Physics Regents?

Regents Physics is the standard high school physics course designed for those students who are following a college preparatory science sequence. Consider enrolling if you have successfully passed Regents level courses in Earth Science or Biology and have passed or are currently enrolled and doing satisfactory work in Regents Chemistry.

What Will We Be Studying In Physics Regents?

Regents Physics will take you through the basic science concepts of matter and energy, electricity and magnetism, light, sound, and heat.

What Will Be Expected Of Me?

You will be expected to regularly take notes, perform lab investigations, write lab reports, and work mathematical problems in physics. To adequately complete homework and lab assignments, students will need to spend a minimum of two hours of preparation per week outside of the classroom.

How Is The Course Taught?

The course is taught through a combination of lecture format and laboratory work.

What Are The Completion Requirements?

Students may be required to take the NYS Regents Examination in Physics in June. Students must complete 1200 minutes of laboratory requirements and master State-specified laboratory skills in order to qualify.

1 unit of credit

Prerequisite: Regents Chemistry and regents Biology; students should be in the twelfth grade and be recommended by their science teacher.

AP PHYSICS - 1

Who Should Take Advanced Placement Physics-1?

Advanced Placement Physics-1 is a college level course designed for those students willing and able to engage in a demanding mathematical treatment of the basic principles of physics. Consider enrolling if you earned a grade of “A” in both Regents Chemistry and Algebra II-Trigonometry, and if you are willing to devote the time necessary to master an array of sophisticated physics problems.

What Will We Be Studying In Advanced Placement Physics-1?

This course follows the Advanced Placement Physics-1 syllabus. This introductory treatment to physics is the equivalent to a first-semester college course in algebra-based physics. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; electrostatics and magnetism, and mechanical waves and sound. It will also introduce electric circuits.

What Will Be Expected Of Me?

Major emphasis will be placed upon problem solving involving steps in a chain of reasoning. Complex manipulation of mathematical principles is a focus. Students will be expected to apply the principles of physics learned in class to problems they have never seen before. Emphasis will also be placed upon qualitative reasoning and the ability to apply principles of physics to verbal explanations of everyday phenomena. To adequately complete homework and lab assignments students will need to spend a minimum of four to seven hours of preparation per week outside of the classroom.

How Is The Course Taught?

Lecture and laboratory formats are used. Additionally, students will spend a considerable amount of class time working on physics problems in groups.

What Are The Completion Requirements?

Students will be required to prepare for and take the Advanced Placement examination in Physics-1 in May, and typically the NYS Physics Regents examination in June. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored at school in order to sit for the Regents examination.

1 unit of credit

Prerequisite: Chemistry Regents, Biology Regents, Algebra II Trigonometry or equivalent. Department recommendation is required.

Those not receiving the department recommendation will be required to meet with counselor, department head, and parents to ensure full awareness of the high level of commitment and skill required to succeed in AP Physics -1.

PHYSICS C - Advanced Placement

Who Should Take A. P. Physics C?

The AP course in Physics C is a college level course that will be extremely helpful for students planning to major in the physical sciences or engineering. Consider enrolling if you identify with both of the following predictors of success: solid A grades in Physics and in Pre-calculus. A co-requirement for the course is AP Calculus, preferably the BC level.

What Will We Be Studying In A. P. Physics?

The AP Physics C course is designed to be the equivalent of a college physics course that utilizes calculus. The first half of the year is devoted to mechanics. The use of Calculus in problem solving and in derivations increases as the course progresses. In the second half of the year, the primary emphasis is on classical electricity and magnetism. Calculus is used freely in formulating principles and in solving problems. Fewer topics are covered in Physics C than in the first-year physics course, but they are covered in greater depth and with greater analytical and mathematical sophistication.

What Will Be Expected Of Me?

A major emphasis will be placed on acquiring competence in dealing with physical problems. You will be expected to apply physical principles to solve a variety of physical situations. This is a rigorous and demanding course that requires that you do a considerable amount of work in the classroom. It is very difficult to learn this material from the textbook alone, and therefore, active participation and complete concentration are extremely important if you are to succeed. Grading is based upon mastery of the AP curriculum.

How Is The Course Taught?

In this class, both lecture and problem solving sessions will be used. The class is designed to enable you to learn from both the teacher and from other students in the class. In turn, you will be expected to master the material to the extent that you can help teach other students.

What Are The Completion Requirements?

Students will be required to prepare for and take the Advanced Placement examination in Physics C in May.

1 unit of credit

Prerequisites: Biology Regents, Chemistry Regents, Physics Regents, AP Calculus (concurrent enrollment), and Department recommendation.

Those not receiving the department recommendation will be required to meet with counselor, department head, and parents to ensure full awareness of the high level of commitment and skill required to succeed in AP Physics C.

CHEMISTRY - Advanced Placement

Who Should Take A. P. Chemistry?

The A. P. course in Chemistry is a college level course designed for those students (10^{th},11^{th} or 12th grade) who have firm mastery of the concepts of chemistry, and have demonstrated ability in critical thinking, and in mathematical and laboratory skills. It will be extremely helpful for students planning to major in the biological sciences or in pre-med. Consider enrolling if you identify with all of the following predictors of success: grades of "A" in Regents Chemistry, in the other Regents sciences, and in Mathematics; "B's" or better in other core academic studies; above grade level (12th grade) reading and writing skills, and ease in working individually and independently in laboratory investigations.

What Will We Be Studying In A. P. Chemistry?

The A.P. Chemistry course is designed to be the equivalent of the introductory chemistry course usually taken during the first college year. The college textbook used emphasizes chemical calculations, mathematical formulations of chemical principles, and in-depth laboratory investigations.

What Will Be Expected Of Me?

A major emphasis will be placed on acquiring competence in dealing with chemical problems. Students will be required to perform pre-laboratory readings and laboratory investigations, and to submit extensive written lab reports. You must be prepared to complete a minimum of five to seven hours of preparation per week outside of the classroom to adequately complete the assignments. Grading is based upon mastery of the A.P. curriculum.

How Is The Course Taught?

In this fast-paced class, lecture and laboratory formats will be used. Lecture will require listening and note taking skills and the ability to conceptualize and solve mathematical chemical problems. Laboratory investigations will require that each student individually set up equipment and record data.

What Are The Completion Requirements?

Students will be required to prepare for and take the Advanced Placement examination in Chemistry in May and the Chemistry regents in June if they are taking the course as a sophomore. Students must complete 1200 minutes of laboratory work, which must be submitted, graded, recorded, and stored at school in order to sit for the Regents examination.

1 unit of credit

Prerequisites: Physics - 9/Biology Regents, Chemistry Regents, Department recommendation.

Those not receiving department recommendation will be required to meet with counselor, department head, and parents to ensure full awareness of the high level of commitment and skill required to succeed in AP Chemistry.

ENVIRONMENTAL SCIENCE - Advanced Placement

Who Should Take A.P. Environmental Science?

The AP Environmental Science course is a college level course designed for seniors who have a firm mastery of the factual information and concepts of high school biology and chemistry and who have demonstrated ability in critical thinking, mathematics, and laboratory skills. Consider enrolling if you identify with all of the following predictors of success: grades of “A” in the Regents sciences, a “B” or better in other core academic courses, above grade level reading and writing skills, and ease in working both individually and in groups in the laboratory setting.

What Will We Be Studying In A.P. Environmental Science?

The course is designed to be the equivalent of a one-semester, introductory college course in environmental science. Topics studied include environmental issues, both aquatic and terrestrial ecosystems, ecology, weather and climate, population dynamics, geology and geological processes, and pollution. Laboratory work is in the form of field studies and other experimental and analytical studies. Assigned readings include current articles and excerpts from books.

What Will Be Expected Of Me?

Major emphasis will be providing students with scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. You will be expected to spend time outside of school to adequately complete the reading and writing assignments. This is a vocabulary heavy course. Grading is based upon mastery of the A.P. curriculum.

How Is The Course Taught?

Both lecture and laboratory formats are used. Lecture will require attentiveness and focus, so that the concepts can be fully understood and the connections successfully applied. Laboratory exercises will require initiative and independence, as well as creativity and organization.

What Are The Completion Requirements?
Students will be required to prepare for and take the Advanced Placement examination in Environmental Science in May.

1 unit of credit

Prerequisites: Regents Biology and Regents Chemistry, Department recommendation.

Those not receiving department recommendation will be required to meet with counselor, department head and parents to ensure full awareness of the high level of commitment and skill required to succeed in AP Environmental Science.

ELECTIVES

SCIENCE 12

This is a non-laboratory elective course which deals with issues of current concern to society. These include, but are not limited to: environmental issues, drug and alcohol abuse, human physiology and disease, and nutrition. Students will be expected to take notes using their iPads, complete projects both in groups and independently, perform independent research, complete class assignments, and prepare for and take traditional tests and quizzes. Students will also be required to read and report on current events pertaining to class material.

1 unit of credit

Prerequisite: Regents Biology

ROBOTICS

This course will provide an in-depth study of the field of robotics and the curriculum will focus on electronic, mathematical, and physics-based concepts. Programming and building robots requires the use of science, technology, engineering and math (STEM) applications. Students will also learn fundamental programming concepts and scientific method and inquiry techniques. The robotics industry will be explored and students may have the opportunity to participate in robotics competitions.

1 unit of credit

Prerequisite: None
Priority given to 11^{th} and 12^{th} graders

RESEARCH PROJECT - Seminar 9

Research Project Seminar 9 is devoted entirely to teaching 9^{th} grade students basic research skills. In teams, students will design and implement a psychology project by way of learning how to properly control scientific experiments, how to keep a detailed experimental notebook, how to search the professional literature, how to statistically analyze data,

and how to present findings to the public in the forms of a scientific paper, a Power Point talk, and a poster board display. All students compete as teams at the end of the year in the "Great Neck North Freshmen World Cup". Additionally, students will conduct several other investigations that exemplify various laboratory techniques and methods of statistical analysis. Incoming freshman from North Middle School will be invited to apply to Research Project Seminar 9.

1 unit of credit | Prerequisite: Departmental Approval

RESEARCH PROJECT SEMINAR

Who Should Take Research Project Seminar?

Research Project Seminar is a mentorship program designed for those students in 10th and 11th grade who wish to do independent and original research in science, engineering, and one of the social sciences such as psychology or economics. This course is also appropriate for students who wish to enter various science and engineering competitions at the state and national level. Students interested in taking this course must apply through the science department and will receive admission after being accepted by both the science department chairperson and the science research director. Selection is also based upon a student's grades in math and science classes, recommendations from the student's science teachers, and the quality of any research work completed by the student. Students must reapply for each subsequent year of science research.

What Will We Be Studying In Research Project Seminar?

Research Project Seminar will outline the process of developing an idea for science and/or engineering research, and will emphasize a stepwise approach by which that idea is brought to fruition in a completed project. Beyond this, you will be studying in depth the topics most directly concerned with your particular area of research.

What Will Be Expected Of Me?

You will be expected to meet in small groups with other students and the Research Coordinator on a daily basis. You will be expected to complete specific assignments given by the Research Coordinator. Although you will be highly encouraged to enter a science competition during the year, the minimum expectation is to produce (and display) a significant science and/or engineering project during the year. You will be expected to do most of the work for the Research Project Seminar independently. Students will also be required to present four unique PowerPoint presentations to their peers, complete a professional level scientific paper about their research, create a poster board for display, and present their research to the school during the in-house science competition.

How Is The Course Taught?

Students meet in small groups with the Research Coordinator to discuss their ongoing work and to discuss the process of developing and executing a research project. Group problem solving and brainstorming exercises are common.

What Are The Completion Requirements?

To complete the course, a student must submit and display two significant research project in science and/or engineering and meet all other course requirements.

1 unit of credit | Prerequisite: Department permission required. Enrollment is limited.

RESEARCH FOR SENIORS

Who Should Take Senior Research?

Qualified science students who have completed a significant science research project by September 1st of their senior year should register for this class.

What Will Be Expected Of Me?

You will be expected to meet a series of deadlines leading to the completion of The Regeneron Science Talent Search and Seimans research paper and application. In addition, you will be expected to enter your paper in several other science competitions including the Long Island Science & Engineering Fair and the WAC Lighting Invitational Science Fair.

How Is The Course Taught?

Students meet independently with the instructor to discuss their work.

What Are The Completion Requirements?

Students must complete the Seimans and Regeneron Science Talent Search applications, if qualified, as well as a formal research paper, by established deadlines. Additionally, students will submit their paper to other competitions as appropriate. Students are also required to create a PowerPoint presentation for their project, which will be presented at the Senior Science Symposium.

1 unit of credit Prerequisite: Department permission required**.**