SCHENECTADY CITY SCHOOL DISTRICT

ACADEMIC EXPECTATIONS
SCIENCE GRADES 9 - 12

SCIENCE

In order to graduate with a Regents or Local Diploma, students must successfully complete 22 units of credit and must pass four Regents examinations with a 65 or higher, or department-approved alternatives and one of the six Pathways requirements (Arts Pathway, World Languages Pathway, Career and Technical Education (CTE) Pathway, Career Development Pathway and Occupational Studies (CDOS) Pathway, Humanities Pathway or STEM Pathway.

The following New York State Regens Examinations are offered:

- Physical Setting: Earth Science
- Physical Science: Chemistry
- Physical Science: Physics
- Living Environment: Biology

Schenectady City School District students may also take periodic benchmark assessments to measure their progress toward science standards.

Students who wish to earn a Regents Diploma with Advanced designation must pass two additional math assessments and one additional science assessment.

In order to graduate, students must earn a total of 22 course credits, including three credits in science at the commencement-level; one course must be from the Physical Setting (Regents Earth Science, Chemistry or Physics) and one course must be from the Living environment *Regents Biology). The third course may be a life science, physical science, r an elective. While additional courses are not a requirement, they are strongly recommended. Please see your school counselor for specific information regarding course offerings, including International Baccalaureate (IB) courses.

Students who take Regents commencement-level science courses must successfully complete the State-mandates laboratory requirement to prepare students for the corresponding Regents examination in science. This includes 1200 minutes of hands-on laboratory experience with satisfactory laboratory reports.

Students who do not successfully complete courses may be asked to participate in credit recovery programs to make up credits. Depending on the course the student needs to make up, credit recovery may be offered online, during summer school, or scheduled during the school year.

In all science courses, students will

- use mathematical analysis, scientific inquiry, and engineering design to pose questions, seeks answers, and develop solutions
- represents and organize observations (e.g., diagrams, tables, matrices, charts) and interpret the organized data to compare the predicted result in the hypothesis and the actual result; conclude whether there is support for the explanation on which the prediction was based
- understand, apply scientific concepts, principles, and theories about the physical setting and living environment, and recognize the historical development of ideas in science

BIOLOGY (LIVING ENVIRONMENT) (1 course credit)

A Regents exam is offered at the end of this course. In biology, students will

- understand that living things are similar/different from each other and from nonliving things
- learn that organisms inherit genetic information in ways that result in continuity of structure and function between parents & offspring
- explore how individual organisms and species change over time
- analyze continuity of life sustained through reproduction & development
- understand that organisms maintain dynamic equilibrium that sustains life
- investigate dependence of plants & animals on each other & the environment
- make observations related to the profound impact human activity has on the

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TIPS FOR PARENTS

Teenagers benefit from a regular sleep schedule.

Set aside a designated homework space. Your child should do schoolwork each night, even if work isn't due right away. They can review notes taken during class or read a textbook.

Monitor and expect your child to catch up on missing work if they've been absent. Do they have a classmate they can reach out to? Will they make an appointment with their teacher(s)? Have they made up any required lab minutes they may have missed?

Don't leave your daughter out of the equation: Encourage both boys and girls to explore careers in science, technology, and engineering. Read about famous male and female scientists.

Monitor your student's grades and attendance through the IC Parent Portal.

Make sure students are organized. Whether they take notes online or in a notebook, they need a system.

Remember that science involves trial and error. As Thomas Edison once said, "I have not failed 10,000 times. ... I have succeeded in proving that those 10,000 ways will not work."

EARTH SCIENCE (1 credit)

A Regents exam is offered at the end of this course. In earth science, students will

- understand that the Earth and celestial phenomena can be described by principles of relative motion and perspective
- demonstrate that many of the phenomena that we observe on Earth involve interactions among components of air, water, and land
- observe that matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity
- conduct experiments related to meteorology, weather, geology, astronomy

CHEMISTRY (1 credit)

A Regents exam is offered at the end of this course. In chemistry, students will

- demonstrate existence of energy forms; when forms change, energy is conserved
- analyze how energy, matter interact through forces resulting in motion change
- understand concepts through experimentation about atomic concepts, the Periodic Table, moles/stoichiometry, chemical bonding, physical behavior of matter, kinetics/equilibrium, organic chemistry, oxidation-reduction, acids, bases, salts, nuclear chemistry

PHYSICS (1 credit)

A Regents exam is offered at the end of this course. In physics, students will

- observe and describe transmission of various forms of energy
- explain variations in wavelength and frequency in terms of the source of the vibrations that produce them, e.g., molecules, electrons, and nuclear particles
- explain and predict different patterns of motion of objects (e.g., linear and uniform circular motion, velocity and acceleration, momentum and inertia)
- compare energy relationships in an atom's nucleus to those outside the nucleus
- understand the relationships and common themes of systems thinking, models, magnitude and scale, equilibrium and stability, patterns of change, optimization
- analyze situations and solve problems using the process skills associated with energy, electricity and magnetism, waves, modern physics, and mechanics

ENVIRONMENTAL SCIENCE (1 credit)

In environmental science, students will

- learn that the environment is a complex web of relationships connecting humans with the world
- explore the topic of environmental science as an interdisciplinary science
- study human impact on the environment & how populations consume resources
- review the scientific method and explain how scientists use statistics and models to explain observations of natural phenomena
- use a decision-making model; apply to hypothetical and real-world scenarios

ANATOMY AND PHYSIOLOGY (1 CREDIT)

In anatomy and physiology, students will

- learn basic concepts of anatomy and physiology, including how the body is organized from the chemical to the organism level
- describe and explain the structures and functions of the human body at different organizational levels
- learn anatomical terms to describe body regions, sections, anatomical positions
- study histology, the study of microscopic tissue appearance, organization, and function, the human skeletal, muscular, and nervous system interactions

ADDITIONAL SCIENCE COURSES

SPORTS EXERCISE AND HEALTH, FIRST AND SPORTS MEDICINE, FORENSICS, PRE-IB CHEMISTRY, BIOLOGY IB HL 1, BIOLOGY IB HL 2, PHYSICS IB SL, SPORTS EXERCISE AND HEALTH IB SL