# High School Science Program

A high-quality science education means that students will develop an in-depth understanding of content and develop key skills—communication, collaboration, inquiry, problem solving, and flexibility—that will serve them throughout their educational and professional lives."

https://www.nextgenscience.org/

#### Portrait of a Learner

Vision of A Graduate: Competency based reimaging of mission statement

Student Learning practices maximize the impact of learning and dispositions necession to prepare amers for their future. Students are assured consister with their future and the opportunity to demonstrate their skills and knowledge in a variety of creative ways. Students actively participate in authentic learning experiences while practicing the skills and habits of mind to add take ownership of, their stills and solutions are assured to the skills and habits of mind to a state ownership of, their stills and the skills and the skills and habits of mind to a state ownership of, the skills and th Action Steps to Improve Science Achievement with High- Quality Instruction for all Students 1. Align the Science Curriculum with the Next Generation

Align the Science Curriculum with the Next Generation Science Standards and update course sequence.

#### Next Generation Science Standards

**Disciplinary Core Ideas:** Life Science, Earth Science, Physical Science, and Engineering, Technology, and the Application of Science

**Crosscutting Concepts:** Patterns, Cause & Effect, Scale, proportion & quantity, Systems & system models, Energy & matter, Structure & function, Stability & change

Science & Engineering Practices: Asking questions, Developing & using models, Planning & carrying out investigations, Analyzing & interpreting data, Using mathematics & computational thinking, Constructing explanations and designing solutions, Engaging in argument

#### Current Requirements & Sequence

Physical Science & Biology are graduation requirements & prerequisites for all other science courses

Students may double up sciences to take more electives/AP Courses. Some students would prefer to skip Physical Science in order to take additional higher level courses.

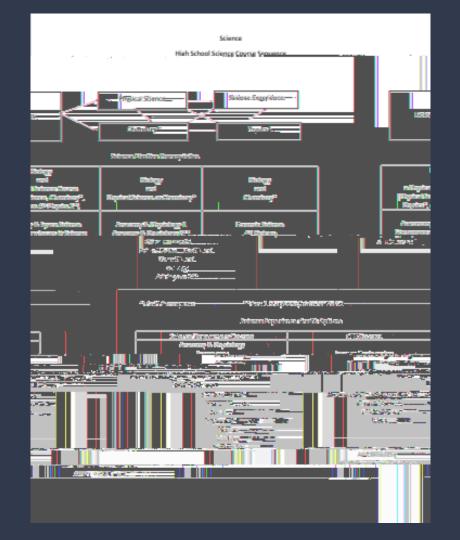
8th grade will have a greater emphasis on Physical Science standards moving forward. <u>https://docs.google.com/document/d/1hWSCJTAI</u> rQKFPWoI9Cylji9xRBrSWB2o4oQIIf3\_ehQ/edit

#### NGSS Model Course Maps

1. Conceptual Progressions Model: The grade-

#### NSD NGSS Proposed Course Sequence

9th Grade	10th & 11th Grades	12th Grades
Biology	Physical Science Elective Chemistry Physics	Electives & AP Courses
	Chemistry Physics	



#### Rationale for Course Sequence Changes

The proposed high school course sequence aligns with the new middle school progression.

Biology is a common experience for all students and meets the NH state requirement, while incorporating Earth Science standards.

Students have choice while meeting the NH state physical science requirement. This sequence allows students to choose physical science courses based on their interests.

All students will have access to all NGSS Performance Expectations. This is a pathway to implement the NGSS Modified Domain model, while giving student choice.

There will be more opportunities for students to take engaging and impactful science electives and increase Science and Engineering Practice proficiency.

## Increase required science credits for

#### Rationale for Additional Science Requirement

#### **Improving Science Proficiency:**

North SAS Testing Using TIDE

2017-2018 – 225 tested 43% proficient (NH 41% proficient)

2018-19 – 164 tested 41% proficient (NH 41% proficient)

2019-2020 - No testing COVID-19

Note: approximately 400 students should take the test each year, many have opted out

#### Next Generation Science Standards

Disciplinary Core Ideas Crosscutting Concepts Science & Engineering Practices: Asking questions, Developing & using models, Planning & carrying out investigations, Analyzing & interpreting data, Using mathematics & computational thinking, Constructing explanations and designing solutions, Engaging in argument from evidence, Obtaining, evaluating, & communicating information

#### RatioDa**ø**



2021 Graduates with 2 or 3+ Science Department Classes



Graduating Students in 2021 at Nashua High School South

3+ Science Classes: 28979.6%2 Science Classes: 74

289/363=

Graduating Students in 2021 at Nashua High School North

**3+ Science Classes: 242** 242/310= 78.1% **2 Science Classes: 68** 



### Proposed Science Graduation Requirements

- 1. Biological Science: Biology is required for graduation.
- 2. Physical Science: Physical Science, Chemistry, Physics or AP Physics meet the physical science requirement.
- 3. Science Experience: Students must have an additional science experience credit for graduation.

#### Proposed Science Experience Courses

#### Science Department Courses

Anatomy & Physiology Astronomy Chemistry **Contemporary Issues in Science** ELL Science **Environmental Science Forensic Science** Physical Science Physics Plant Science Zoology **AP** Biology AP Chemistry AP Environmental Šcience AP Physics 1 & 2

#### CTE Courses

Intro to Engineering Principles of Engineering Manufacturing, Eng., Design & Development Health Sciences Biotechnology & Biomedical Sciences Marine Robotics VEX Robotics CADD

### Next Steps

- 1. Change graduation requirements for the Class of 2027.
- 1. Update course sequence and appropriate course prerequisites to align with the new course progression for the 2023-24 Program of Studies.
- 1. Continue NGSS curriculum work and updating curriculum documents for Biology, Physical Science, Chemistry, and Physics. Update course descriptions to reflect curriculum changes..
- 1. Modify curriculum for elective science department courses to align with NGSS.
- 1. Create new science electives based on student interest, including broadening earth science opportunities.

Course Sequence Draft 2023

# Program of Studies Science Changes for 2023-24