



# Staples HS Science Transition Night

For students entering 9th grade

# **NINTH GRADE CORE SCIENCE COURSES**

Students have the option of taking one of two types of science classes in ninth grade

**Biology (3 academic levels)**

**or**

**Accelerated Science (A level)**

# Biology has THREE LEVELS

<b>Name</b>	<b>Independent Reading / Work</b>	<b>Independent Learning and Depth/Breadth Content</b>
<u><a href="#">Biology B</a></u> (College Prep)	Mostly in class	On-Level
<u><a href="#">Biology A</a></u> (Adv College Prep)	Blend of in class and at home	Above level
<u><a href="#">Biology Honors</a></u>	Mostly at home	Significantly above level

# **BIOLOGY versus ACCELERATED SCIENCE**

<b>Accelerated Science 1 and 2</b>	<b>Biology → Chemistry → Physics</b>
<p><b>An integrated science approach geared for students who learn by making connections across all science disciplines</b></p>	<p><b>Allows students to focus solely on one discipline for an entire year</b></p>
<p><b>Unleveled and taught at the “A” level</b></p>	<p><b>Leveled to allow for more structured differentiation</b></p>

# CLASS OF 2029 REQUIRES 9 CREDITS OF STEAM

<u>Subject Area</u>	<u>Minimum Credits Required</u>
<b>Humanities</b>	<b>9.0</b>
<ul style="list-style-type: none"> <li>• English 4.0                             <ul style="list-style-type: none"> <li>○ English 9 1.0</li> <li>○ English 10 1.0</li> <li>○ Additional courses in grades 11 and 12 2.0</li> </ul> </li> </ul> <i>Must be enrolled in an English course each semester all four years</i>	
<ul style="list-style-type: none"> <li>• Social Studies 3.0                             <ul style="list-style-type: none"> <li>○ Global Themes 1.0</li> <li>○ U.S. History 1.0</li> <li>○ Civics .5</li> <li>○ Area Study .5</li> </ul> </li> </ul>	
• Visual and Performing Arts 1.0	
• Open Humanities 1.0 <i>Additional course(s) in English, Social Studies, Visual and Performing Arts, or World Languages</i>	
<b>STEAM</b>	<b>9.0</b>
• Math 3.0	
• Science 3.0	
• Open STEAM 3.0 <i>Additional courses in Math, Science, Tech. Ed., Media, or other selected courses (see below)</i>	
<b>World Languages</b>	<b>2.0</b>
<i>Any one World Language in sequence</i>	
<b>Health and Physical Education</b>	<b>2.5</b>
• Health 1.0	
• Physical Education 1.5	
<b>Personal Financial Management and Financial Literacy</b>	<b>.5</b>
<i>Requirement satisfied by taking one of the following courses: Financial Algebra, Personal Financial Management, Consumer Math, Introduction to Economics, or AP Macro/Microeconomics</i>	
<b>Mastery-Based Diploma Assessment</b>	<b>1.0</b>
<b>Additional Credits</b>	<b>2.0</b>
<i>Credits earned in all subject areas beyond the minimum graduation requirement for that area</i>	
<b>Total Minimum Credits Required</b>	<b>26.0</b>

\* A vast majority of SHS students take more than 3 years of science

STEAM	9.0
• Math	3.0
• Science	3.0
• Open STEAM	3.0

*Additional courses in Math, Science, Tech. Ed., Media, or other selected courses*

# **NINTH GRADE ELECTIVE OPTIONS (all one semester courses)**

Science: [Solar System Astronomy](#)

Science: [Biotechnology](#)\* \*\*

Computer Science: [Intro to Programming](#) (math prerequisite: Algebra 1)

Computer Science: [Intro to Web Programming](#)

Engineering: [CATS \(Creative Tech. Solutions to Real-World Problems\)](#)

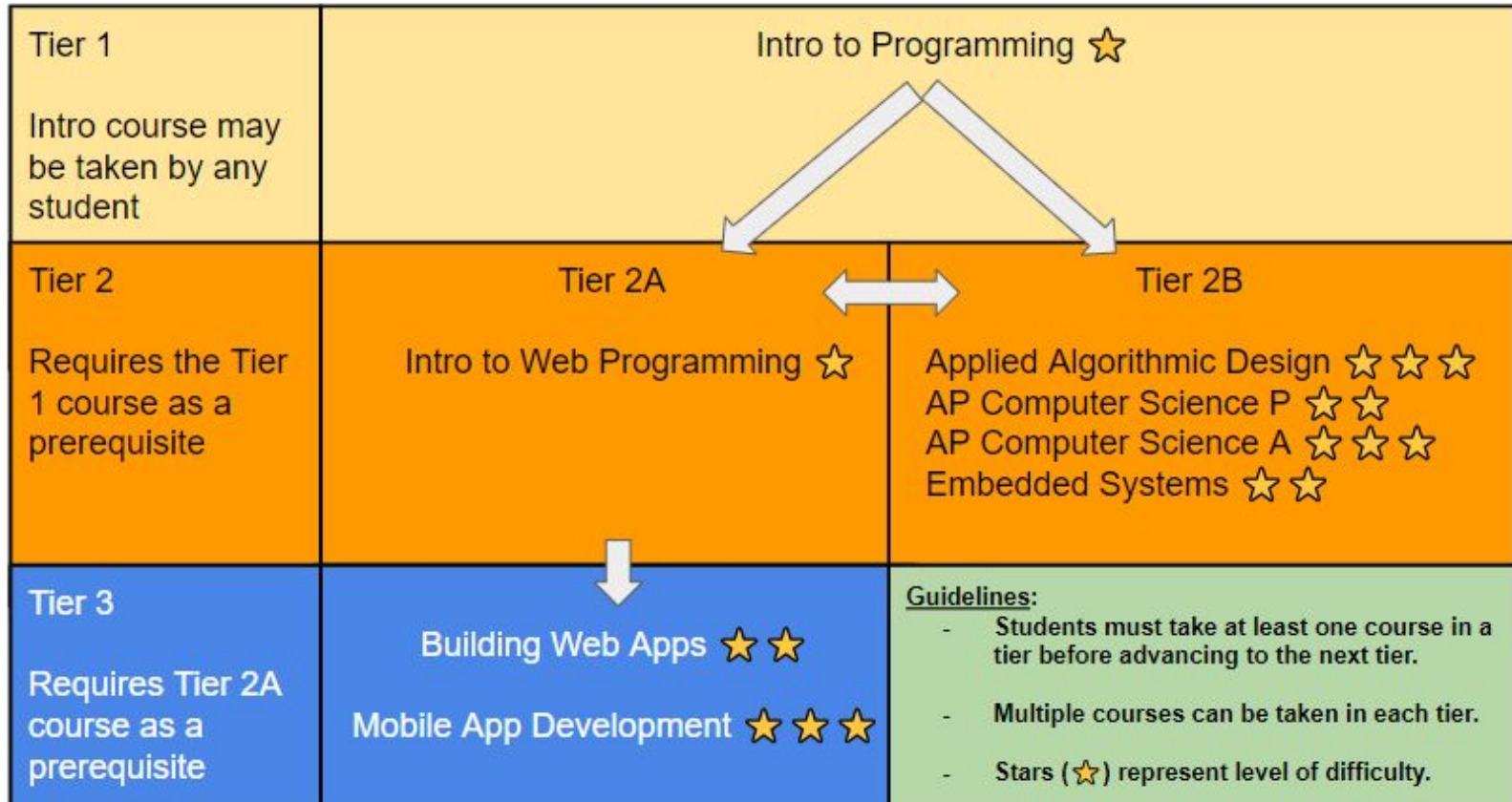
Engineering: [MAD \(Materials and Design\) Science](#)

Engineering: [3-D Engineering and Design](#) (math prerequisite: Geometry)

\*Requires 8th grade teacher recommendation

\*\*An excellent preparatory class for Scientific Research Honors

# COMPUTER SCIENCE PATHWAYS



# Typical Four Year Science Course Sequence

9th Grade	10th Grade	11th Grade	12th Grade
<b>Biology →</b>	<b>Chemistry &amp; Electives →</b>	<b>Physics &amp; Electives</b>	<b>Electives</b>
<b>Accelerated Science 1 →</b>	<b>Accelerated Science 2 →</b>	<b>Electives</b>	<b>Electives</b>

# Sample Student Science Pathways

PLEASE READ There are many successful pathways students can take when choosing science courses at Staples High School. The following slides provide nine example pathways that previous students have taken.

- These are NOT the only pathways that you can select from. They are provided to show you that there are many different course selections that you can choose to have a successful high school experience.
- Prerequisites, teacher and counselor recommendations, and your interests will help guide your selections.

## Student A

### 9th Grade

### 10th Grade

### 11th Grade

### 12 Grade

Biology A

Chemistry A

Physics A

AP Environmental  
Science

Elective: Intro to  
Programing

Elective: Forensics

## Student B

### 9th Grade

### 10th Grade

### 11th Grade

### 12 Grade

Accelerated  
Science 1

Accelerated  
Science 2

Anatomy &  
Physiology

AP Physics 1

Elective: Aerospace  
Engineering

## Student C

9th Grade	10th Grade	11th Grade	12 Grade
Biology B	Chemistry B  Elective: Intro to Prog // & Intro to Web Prog	Physics A  Elective: Embedded Systems & Building Web Apps	Marine Biology and Zoology

## Student D

9th Grade	10th Grade	11th Grade	12 Grade
Biology Honors  Elective: Solar System	Chemistry A  Elective: 3D Design & Engineering	AP Biology  Elective: Intro to Programming	Physics Honors  Elective: AP Computer Sci A

## Student E

9th Grade	10th Grade	11th Grade	12 Grade
Accelerated Science 1	Accelerated Science 2	AP Environmental Science	Horticulture and Animal Behavior

## Student F

9th Grade	10th Grade	11th Grade	12 Grade
Biology Honors	Chemistry A	AP Chemistry	Earth Science Electives: Forensics & Animal Behavior

## Student G

9th Grade	10th Grade	11th Grade	12 Grade
Biology A  Electives: Intro to Programing and Intro to Web Programing	Chemistry A  Electives: AP Computer Sci P	Physics A  Electives: Applied Algorithmic Design & Embedded Systems	Engineering & Applied Physics  Electives: Building Web Apps and Mobile App Development

## Student H

9th Grade	10th Grade	11th Grade	12 Grade
Biology A	Earth Science	Chemistry A	Physics A

## Student I

9th Grade	10th Grade	11th Grade	12 Grade
Biology A	Chemistry A	Physics Honors	AP Physics C
Biotechnology		Scientific Research Honors	Scientific Research Honors

## **Course Descriptions from Program of Study**

The following slides provide the course description of pertinent classes from the Staples High School [Program of Study Guide](#).

# Biology A

## BIOLOGY A

1.0 credit      Grade 9                      Full-Year

Prerequisite: Enrollment as a SHS student

Teacher recommendation required

Graduation Requirement Area: Science

Biology A is aligned with the Next Generation Science Standards. Major topics include Ecology, Cells, DNA, Genes and Heredity, Evolution, and Human Health. Students will be expected to participate in regular lab experimentation, develop critical thinking skills, and apply knowledge to a variety of scenarios. Evaluation is based on laboratory experiments and reports, tests, quizzes, homework, and projects.

# Biology Honors

## BIOLOGY HONORS

1.0 credit      Grade 9      Full-Year

Prerequisite: Concurrent enrollment in Geometry A or higher, enrollment as a SHS student

Teacher recommendation required

Graduation Requirement Area: Science

Biology Honors is aligned with the Next Generation Science Standards. Major topics include Ecology, Cells, DNA, Genes and Heredity, Evolution, and Human Health. The level of reading necessitates that students enrolling in this course have excellent reading and comprehension skills. Students will be expected to participate in regular lab experimentation, develop critical thinking skills, and apply knowledge to a variety of scenarios. Concepts studied in Biology Honors will be approached in greater depth and in a manner that requires more student independence. Evaluation is based on laboratory experiments and reports, tests, quizzes, homework, and projects.

# Accelerated Science 1 and 2

ACCELERATED SCIENCE 1

ACCELERATED SCIENCE 2

2.0 credits      Grade 9, 10

Two Years

Prerequisite for Accelerated Science 1: Enrollment as a SHS student

Prerequisite for Accelerated Science 2: Accelerated Science 1

Teacher recommendation required

Graduation Requirement Area: Science

This is a two-year science course designed to give students broad exposure to science concepts in Biology, Chemistry, Earth Science, and Physics within an integrated framework aligned to the new Connecticut Science Standards (CT-NGSS). Students study big ideas such as “What is it all made of?” and “How do humans influence the flow of energy and matter on Earth?” Students generate the questions they need answers to in order to build their understanding. Students collaborate and engage in argument from evidence, develop and revise models, and carry out investigations to come to an understanding of the world around them. This course is for students who like to look at the big picture. It compacts the curriculum of three years of traditional science into two, allowing students to take a broader range of science courses their junior and senior years.

# Solar System Astronomy

## SOLAR SYSTEM ASTRONOMY

.5 credit      Grades 9, 10, 11, 12      S1

Prerequisite: None

Graduation Requirement Areas: Science or Open STEAM

Solar System Astronomy is a tour of Earth's neighborhood in space that includes the Sun, planets, planets' moons and rings, asteroids and meteoroids, comets, Oort Cloud, and Kuiper Belt and its objects. It includes the evolution of our Solar System and the Earth-Moon system, as well as the search for other star systems that house planets similar to those we know. Students learn the history of solar system models and the important players that raised astronomy from a collection of myths to a modern science. We will also take an in-school field trip to our planetarium. Student assessment will include traditional tests, lab work, short-term activities, and oral presentations.

# Biotechnology

## BIOTECHNOLOGY

.5 credit                      Grades 9, 10, 11, 12                      S1, S2

Prerequisite: Completion of Biology or Accelerated Science 1, or taken concurrently with Biology or Accelerated Science 1 with teacher recommendation

Graduation Requirement Areas: Science or Open STEAM

**Note: Biotechnology is open to 9th graders with their 8th grade science teacher recommendation only.**

This course is designed for students interested in molecular genetics and biotechnology. Using the biochemistry of DNA, RNA, and proteins, students will learn the basic tools and techniques of biotechnology. CRISPR, Bacterial Transformation and Plasmid Purification, Protein Electrophoresis, Enzyme-linked Immunosorbent Assay, and Polymerase Chain Reaction will be the basis of laboratory experiments. Students will study human genetics as well as applications of biotechnology and ethical issues relating to this science.

# Intro to Programming

## INTRODUCTION TO PROGRAMMING

.5 credit      Grades 9, 10, 11, 12      S1, S2

Prerequisite: Algebra 1

Graduation Requirement Areas: Science or Open STEAM

Introduction to Programming acquaints students with the basic tools of modern programming. In this course, students will learn how to solve problems that can only be solved using the computational powers of a computer. These computational problems will be drawn from many fields of interest but will focus on graphic design of UIs, animation, and game development. The course utilizes Java as the programming language in the Processing environment. Focus is on the problem-solving process with an emphasis on the structure of solutions over the semantics of the language. The final exam will consist of a capstone project that demonstrates the abilities learned during the course.

# Intro to Web Programming

## INTRODUCTION TO WEB PROGRAMMING

.5 credit      Grades 9, 10, 11, 12      S1, S2

Prerequisite: Introduction to Programming

Graduation Requirement Areas: Science or Open STEAM

Introduction to Web programming acquaints future web developers with the tools of modern web programming. In this lab course, students will learn how to build a dynamic data driven website. The assignments in this course will be drawn from current web trends and technologies, but the focus of this course will be less on the artistic aspects of website design and more on the functional aspects of building a data driven website. The final exam will consist of a capstone project that demonstrates the abilities learned during the course.

# Biology B

## BIOLOGY B

1.0 credit      Grade 9      Full-Year

Prerequisite: Enrollment as a SHS student

Graduation Requirement Area: Science

Biology B is aligned with the Next Generation Science Standards. Major topics include Ecology, Cells, DNA, Genes and Heredity, Evolution, and Human Health. Students will be expected to participate in regular lab experimentation, develop critical thinking skills, and apply knowledge to a variety of scenarios. Evaluation is based on laboratory experiments and reports, assessments, homework, and projects. This course covers the same topics as Biology A, but with greater teacher support and direction. The reading level and assessments for this course are less demanding than Biology A.

# Creative Tech Solutions (CATS) to Real-World Problems

## CREATIVE TECHNOLOGICAL SOLUTIONS (CATS) TO REAL-WORLD PROBLEMS

.5 credit      Grades 9, 10, 11, 12      S1, S2

Prerequisite: Algebra 1

Graduation Requirement Areas: Science or Open STEAM

The CreAtive Technological Solutions (CATS) course is designed to help students develop skills in designing creative technological solutions to real-world problems. The key sections of this framework include creating designed artifacts and prototypes, connecting design to everyday life and global issues, finding creative technological solutions to problems having various levels of definition, analyzing solutions for their impact and effectiveness, and communicating thoughts and collaborating with peers and the larger design community.

\*Note: Not approved as an NCAA core course in Science

# MAD Science (Materials and Design)

## MATERIALS & DESIGN (MAD) SCIENCE

.5 credit      Grades 9, 10, 11, 12      S1, S2

Prerequisite: None

Graduation Requirement Areas: Science or Open STEAM

Material Science is a multidisciplinary subject that addresses the physical properties of materials and their applications in engineering and manufacturing. MAD Science will be a project-based introduction to this subject with an emphasis on solving small-scale real-world problems through knowledge of materials and original design. MAD Science will develop in students a working knowledge of the capabilities of modern and traditional materials as well as the ability to competently and safely work with examples. There will be a process of moving from observation, to imagination, to creation. Students will understand engineering decisions made in the products around them and will recognize and appreciate practical design philosophy and the ever-necessary compromises. The key sections of this framework include learning the nature of materials, understanding the reasoning behind their applications, imagining new solutions to solve real world problems, experimentation and data collection, communication and collaboration with peers, and creation of prototypes and testing.

\*Note: Not approved as an NCAA core course in Science

# 3-D Design & Engineering

## 3-D DESIGN & ENGINEERING

.5 credit      Grades 9, 10, 11, 12      S1, S2

Prerequisite: Geometry

Graduation Requirement Areas: Science or Open STEAM

The 3-D Design and Engineering course gives students the skills to develop design concepts and sustainable design through applying the 3D software Solidworks, which is used worldwide in Engineering projects. The key sections of this framework include: focus on creating design artifacts, connecting design to everyday life, abstracting problems to find solutions, analyzing both problems and solutions, communicating your thoughts, and collaborating with peers and the larger design community.

\*Note: Not approved as an NCAA core course in Science