Science Department Course Enrollment Guide

What courses can I take and when?

Science Course Sequence Options

All students must have 3 science credits to graduate including Biology. Depending on your post-graduation goals, you may want to take more than 3 science courses. Below are sequence options to consider. **PLTW courses can be taken concurrently with any of the options below.

Option 1

First Course:

Physical Science and/or Principles of Biomedical Science

Second Course:

Biology or Honors Biology

Third (or more) Course:

AP Biology
AP Environmental Science
AP Physics A
Chemistry
Astronomy I and/or II
Environmental Science
Geoscience

Option 2

First Course:

Honors Biology
(can concurrently take) Principles of Biomedical Science

Second Course:

AP Biology
AP Environmental Science
AP Physics A
Physical Science
Chemistry
Astronomy I and/or II
Environmental Science
Geoscience

Third (or more) Course:

AP Chemistry
AP Physics B
Anatomy & Physiology
AP Environmental Science
Astronomy I or II
Environmental Science
Geoscience

9th –10th Grade Science Options

PLTW - Principles of Biomedical Sciences (PBS)

Topics Learned:

- ✗ Forensics
- ✗ Clinical Care
- ✗ Epidemiology
- ✗ Emergency Response

✘ ***Prerequisite:*** None

Physical Science

Topics Learned:

- ✗ Motion
- ✗ Forces & Momentum
- ✗ Energy & Waves
- ✗ Atoms & The periodic table
- ✗ Compounds
- ✗ Chemical reactions
- ✗ Nuclear science

✘ ***Prerequisite:*** None

9th–10th Grade Science Options

General Biology (EOC Tested)

Topics Learned:

- ✘ Ecology
- ✘ Evolution
- ✘ Genetics
- ✘ Cellular Energy
- ✘ Cell Cycle
- ✘ DNA and Protein Synthesis
- ✘ Experimental Design
- ✘ Scientific Reasoning/Argumentation

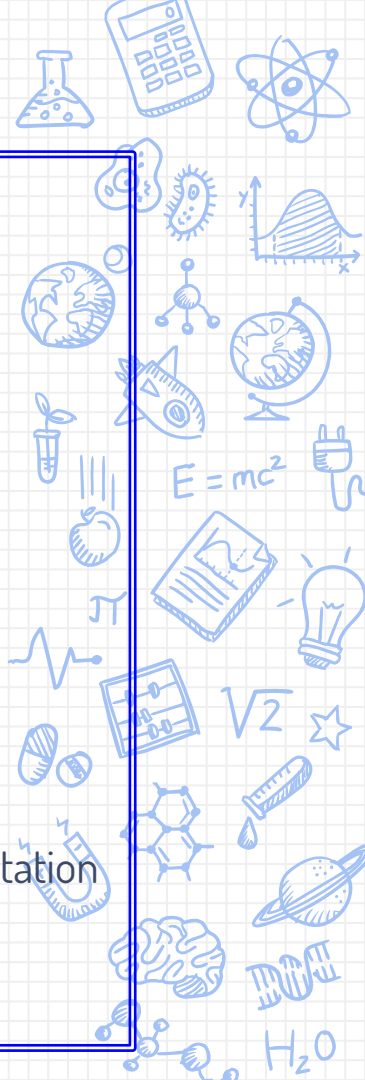
- ✘ Prerequisite: None

Honors Biology (EOC Tested)

Topics Learned:

- ✘ Ecology
- ✘ Evolution
- ✘ Genetics
- ✘ Cellular Energy
- ✘ Cell Cycle
- ✘ DNA and Protein Synthesis
- ✘ Experimental Design
- ✘ Scientific Reasoning/Argumentation

- ✘ Prerequisite: None



10th – 12th Grade Options: Chemistry

Chemistry

Topics Learned:

- ✗ Atomic Structure
- ✗ Bonding & Chemical Reactions
- ✗ Energy in Chemical Reactions
- ✗ Gas Laws

✗ ***Prerequisite:*** previous or concurrent enrollment in Geometry (Algebra II preferred)

AP Chemistry

Topics Learned:

- ✗ Properties of Elements & Compounds
- ✗ Intermolecular Forces
- ✗ Kinetics
- ✗ Thermodynamics
- ✗ Equilibrium
- ✗ Acid-Base Chemistry

✗ ***Prerequisite:*** successful completion (C- or better) of Chemistry and Algebra II

10th – 12th Grade Options: AP Physics (Dual Credit)

AP Physics A:

Topics Learned:

- ✗ Kinematics
- ✗ Dynamics
- ✗ Circular Motion & Gravitation
- ✗ Energy
- ✗ Momentum
- ✗ Torque & Rotational motion
- ✗ Simple Harmonic Motion

Prerequisite: *C- or better in Geometry*

AP Physics B:

Topics Learned:

- ✗ Fluid Mechanics
- ✗ Thermodynamics
- ✗ Electric Fields, Force, & Potential
- ✗ Circuits
- ✗ Magnetism & Electromagnetic Induction
- ✗ Optics
- ✗ Nuclear & Atomic Physics

Prerequisite: C- or better or better in AP Physics A

10th – 12th Grade Options: Astronomy

****NOTE - These DO NOT have to be taken in any sequence (2 does not require 1)!**

Astronomy 1

Topics Learned:

- ✗ Observational Astronomy
- ✗ Advancements in Astronomy
- ✗ Earth, Moon, & Sun
- ✗ Forces & Light in Space

✗ ***Prerequisites:*** None

Astronomy 2

Topics Learned:

- ✗ Solar System Formation
- ✗ Planets
- ✗ Stars
- ✗ Cosmology

✗ ***Prerequisites:*** None

10th – 12th Grade Options: Earth Sciences

Geoscience

Topics Learned:

- ✗ Rock and mineral identification
- ✗ Mineralogy
- ✗ Hydrology
- ✗ Seismology
- ✗ Volcanology

✘ ***Prerequisites:*** None

Environmental Science

Topics Learned:

- ✗ Population biology
- ✗ Terrestrial ecology
- ✗ Aquatic ecology
- ✗ Resource management
- ✗ Waste management.

✘ ***Prerequisites:*** None

10th – 12th Grade Options: Earth Sciences (cont'd)

AP Environmental Science (New for 23-24!)

Topics Learned:

- ✗ Energy Transfer
- ✗ Interactions between Earth systems
- ✗ Interactions between different species and the environment
- ✗ Sustainability

✘ ***Prerequisites:*** None

10th – 12th Grade Options: Life Sciences

AP Biology (Dual Enrollment)

Topics learned:

- ✘ DNA replication and protein synthesis
- ✘ Basic Biochemistry
- ✘ Cellular Energy processes
- ✘ Cell Cycle
- ✘ Evolution
- ✘ Ecology and animal behavior
- ✘ Lab techniques including: microscopy, DNA amplification, and gel electrophoresis.
- ✘ ***Prerequisite:*** Biology, Chemistry (you can be enrolled in AP Bio and Chem. at the same time.)

Anatomy and Physiology

Topics Learned:

- ✘ Laboratory intensive course
- ✘ Anatomy and physiology of human body systems
- ✘ Study skills necessary to learn complex terminology and concepts
- ✘ In-depth dissection of preserved organisms is required.
- ✘ ***Prerequisite:*** Chemistry

10th – 12th grade: Biomedical PLTW Courses

Human Body Systems

Topics Learned:

- ✘ Interactions of body systems
- ✘ Basic anatomy and physiology (through dissections and models)
- ✘ Use and application of modern biotechnology tools

✘ ***Prerequisite:*** none

Medical Interventions

Topics Learned:

- ✘ Molecular Biology
- ✘ Use and application of modern biotechnology tools
- ✘ Epidemiology
- ✘ Prosthetics
- ✘ Genetics

✘ ***Prerequisite:*** none

Biomedical Innovations

Topics Learned:

- ✘ Emergency Medicine
- ✘ Human Physiology
- ✘ Environmental health
- ✘ Public health
- ✘ Forensic science
- ✘ Epidemiology
- ✘ Biomedical engineering
- ✘ Student-driven independent project

✘ ***Prerequisite:*** Must be a senior; completion of MI

Students can earn 3 hours of undergraduate credit from Missouri S&T for EACH PLTW Biomedical course to potentially earn 12 credit hours!

What should I take if I want to go to college and *focus on science*?

You need to take *4 science credits at a minimum*, that should ideally include the following:

- ***Biology***
- ***Chemistry***
- ***AP Physics A***

PLEASE find your friendly neighborhood science teacher to answer any questions you may have!