

Science Department Curriculum Map – Grades 6-12 (Graduating Classes through 2019)

6th Science
7th Science
8th Science

9th Grade
Physical Science
Physical Science-Honors

10th Grade
Biology
Biology-Honors
Biology/Health-Honors

– Chemistry I
– Chemistry I-Honors

– Physics
– AP Physics-Honors
– Physics of Everyday Life-TC

– Human Anatomy/Physiology
– Human Anatomy/Physiology-Honors

– Earth & Space Science
– Earth & Space Science-Honors

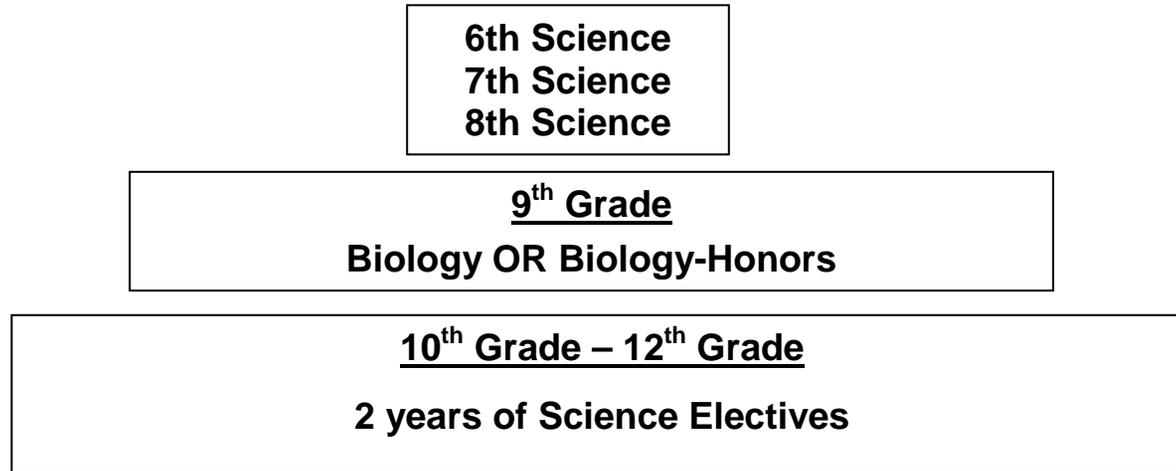
– AP Chemistry-Honors

– AP Biology-Honors

– AP Environmental
Science-Honors

- 3 years of science are required for graduation (Physical Science, Biology, Elective)
- 3 years of science are required for a 4-year college but 4 years are recommended.
- *Students highly interested in Science careers should consider pairing another science course with Biology during their Sophomore year.*

Science Department Curriculum Map – Grades 6-12 (Beginning with the Class of 2020)



- **3 years of science are required for graduation**
- **The typical course sequence is Biology, Chemistry, Physics, Elective**
- **Students highly interested in science careers should consider taking more than 4 science courses during high school.**

Science Course Sequence Recommendations

The chart on the next page summarizes the MFHS Science Department’s recommendations for students based on the kind of science background recommended for different post-high school plans. The content required for success on the ACT Science Reasoning section was also considered as most students take the ACT during their junior year in preparation for college applications. This is not meant to answer all questions about individual course sequences. Because all students differ in terms of strengths and interests, students should consult with their current science teacher.

Please note: courses in each category are listed alphabetically, not in order of importance.

Advanced STEM Track: Students who are planning on attending a 4-year college or university with a strong interest in a science-related major and/or future career.

STEM Track: Students who are planning on attending a 4-year college or university with an interest in a science-related major and/or future career.

Post-Secondary Track: Students who are planning on pursuing a trade or attending a 4-year or a 2-year college or university with a plan to pursue a non-science major.

Minimum: Students planning on graduating from MFHS as a minimum of three years of science is required

Science Course Sequence Recommendations

Advanced STEM Track

More than one science course most years

9th grade:

Honors Biology

10th grade:

Take two of the following:

Honors Anatomy

AP Biology

Honors Chemistry

Digital Electronics

Honors Earth Science

AP Environmental Science

AP Physics

Principles of Engineering

11th grade:

Take two of the following:

Honors Anatomy

AP Biology

AP Chemistry

Honors Chemistry

Digital Electronics

Honors Earth Science

AP Environmental Science

AP Physics

Principles of Engineering

12th grade:

Take two of the courses listed under 11th grade.

STEM Track

At least one science course each year

9th grade:

Biology or Honors Biology

10th grade:

Take one or two of the following:

Anatomy or Honors Anatomy

AP Biology

Chemistry or Honors Chemistry

Digital Electronics

Earth Science or Honors Earth Sci.

AP Environmental Science

AP Physics

Principles of Engineering

11th grade:

Take one or two of the following:

Anatomy or Honors Anatomy

AP Biology

Chemistry or Honors Chemistry

AP Chemistry

Digital Electronics

Earth Science or Honors Earth Sci.

AP Environmental Science

AP Physics

Principles of Engineering

12th grade:

Take one or two of the courses listed under 11th grade.

Post-Secondary Track

One science course each year

9th grade:

Biology or Honors Biology

10th grade:

Take one of the following:

Chemistry or Honors Chemistry

Earth Science or Honors Earth Sci.

Principles of Engineering

11th grade:

Take one of the following:

Anatomy or Honors Anatomy

Chemistry or Honors Chemistry

Earth Science or Honors Earth Sci.

AP Environmental Science

Physics or AP Physics

12th grade:

Take one of the following:

Anatomy or Honors Anatomy

AP Biology

Chemistry or Honors Chemistry

AP Chemistry

Digital Electronics

Earth Science or Honors Earth Sci.

AP Environmental Science

Physics or AP Physics

Physics of Everyday Life

Proficient

Three years of science

9th grade:

Biology

10th grade:

Take one of the following:

Chemistry

Earth Science

Physics

Physics of Everyday Life

Principles of Engineering

11th grade:

Take one of the following:

Anatomy

Chemistry

Earth Science

Physics

Physics of Everyday Life

Principles of Engineering

12th grade:

Take a course in an area of interest

Science

Mission Statement:

The School District of Menomonee Falls Science Department is an active, continuing, and standards aligned curriculum that focuses on student’s application of scientific knowledge using an innovative and engaging inquiry based approach.

Course Title	Course Number	Length	Year Taken
Biology	SC179	Year	9
Biology-Honors	SC209	Year	9
Earth & Space Science	SC400/ SC410	Year	10-12
Earth & Space Science-Honors	SC420/ SC430	Year	10-12
Human Anatomy/Physiology	SC460/ SC470	Year	10-12
Human Anatomy/Physiology-Honors	SC500/ SC510	Year	10-12
Chemistry I	SC269	Year	10-12
Chemistry I Zero Hour	SC01Z	Year	10-12
Chemistry I-Honors	SC290/ SC300	Year	10-12
AP Biology-Honors	SC198/ SC199	Year	10-12
AP Environmental Science-Honors	SC131/ SC132	Year	10-12
AP Environmental Science-Honors Zero Hour	SC02Z/SC03Z	Year	10-12
AP Physics-Honors	SC616/ SC617	Year	10-12
Physics	SC570/ SC580	Year	10-12
Physics of Everyday Life-Honors TC	SC614/ SC615	Year	10-12
Principles of Engineering-Honors AS (PLTW)*	TE418/TE419	Year	10-12
AP Chemistry-Honors	SC371/ SC372	Year	11-12
Forensic Science I(Online)	SC512	Semester	10-12
Forensic Science II(Online)	SC513	Semester	10-12
Veterinary Science: The Care of Animals (Online)	SC670	Semester	10-12

*By request, this course may be used to complete credits toward the Science Graduation Requirement.

BIOLOGY

One Year Course

Grade 9

No Prerequisite

Course Number: SC179

This course has been designed to expose students to the apparent unity and diversity among living organisms. Laboratory exercises and demonstrations are used in presenting topics of biochemistry, cellular biology, plant and animal processes, and the ecology of water quality. Students completing two semesters of this course should have developed certain concepts about life that will enable them to better understand nature’s living realm. The basic course is not recommended for any student intending to pursue a college degree in the future.

BIOLOGY-HONORS

One Year Course

Grade 9

Prerequisite: Department Approval

Course Number: SC209

Honors Biology is an in depth, laboratory-centered survey of general biology for the college bound student. Equal emphasis is placed on biological inquiry and biological subject matter. Inquiry into biological subject matter is made possible by the frequent use of the laboratory, the considerations of biological history, and thorough student oriented activities and discussions. Quantitative techniques are employed to apply mathematical analysis to laboratory investigations. Biological topics are similar to those covered in regular biology but in much more depth and breadth with particular emphasis on the molecular basis.

EARTH & SPACE SCIENCE

One Year Course

Grades 10-12**No Prerequisite**

Course Numbers:

Semester 1: SC400

Semester 2: SC410

Earth and Space Science is the study of the Earth, its place in the Universe and the geologic processes that shape the surface of our planet. Earth Science is divided into three major units consisting of Astronomy, Geology and Meteorology. Students will study the composition of our solar system and universes while also studying processes that shape our planet such as plate tectonics, earthquakes and volcanoes. Students will also have an opportunity to investigate the science of Meteorology and weather phenomena such as hurricanes, tornadoes and thunderstorms. Lab activities and computer applications are integrated into this course. This course is designed to prepare students for collegiate level course work in the field of Earth Science.

EARTH & SPACE SCIENCE-HONORS

One Year Course

Grades 10-12**No Prerequisite**

Course Numbers:

Semester 1: SC420

Semester 2: SC430

Earth and Space Science is the study of the Earth, its place in the Universe and the geologic processes that shape the surface of our planet. Earth Science is divided into three major units consisting of Astronomy, Geology and Meteorology. Students will study the composition of our solar system and universes while also studying processes that shape our planet such as plate tectonics, earthquakes and volcanoes. Students will also have an opportunity to investigate the science of Meteorology and study weather phenomena such as hurricanes, tornadoes and thunderstorms. Lab activities and computer applications are integrated into this course. This course is designed to prepare students for collegiate level course work in the field of Earth Science.

HUMAN ANATOMY/PHYSIOLOGY

One Year Course

Grades 10-12**Prerequisite: Biology**

Course Numbers:

Semester 1: SC460

Semester 2: SC470

Human Anatomy and Physiology is an exciting course that examines the structures and functions of the various systems of the human body. Animal dissections will be used to help us better understand how the human body works. The course is especially important for those interested in pursuing a career in a health related field, but not mandatory. Students will be expected to purchase a cat dissection lab manual.

HUMAN ANATOMY/PHYSIOLOGY-HONORS

One Year Course

Grades 10-12**Prerequisite: Biology****Recommendation: Successful completion of Chemistry H or concurrent enrollment.**

Course Numbers:

Semester 1: SC500

Semester 2: SC510

Anatomy/Physiology deals with the study of cells, tissues and the various systems of the human body. Animal dissections will be used to help us better understand how the human body works. This course involves the etiology of words, making models and many projects. Anatomy also involves a great deal of memorizing. This course is strongly recommended for those students who are interested in medicine, nursing, medical technology, zoology, physical therapy, physical education or any health care related field. Students will be expected to purchase a cat dissection lab manual.

CHEMISTRY I

One Year Course

Grades 10-12***Prerequisite: Successful completion of Biology and Geometry***

Course Number: SC269

Zero Hour Course number: SC01Z****THIS COURSE OFFERED BEFORE SCHOOL
7:00 AM-7:45 AM (ZERO HOUR)***

This course is designed for students with strong reading ability who plan to attend a college or technical school but are not necessarily majoring in science. It is an excellent course for those curious about chemistry or those interested in a science-related vocation, i.e., medical or laboratory technicians, nurses, elementary teachers, etc. The course includes the study of atomic structure, the nature of chemical reactions, the writing of equations, problem solving and practical applications. These concepts are reinforced with lab work where appropriate.

Because Chemistry is a mathematics-based science course, students must have a strong background in Algebra I. They must be able to solve multistep arithmetic problems that involve planning or converting units of measures, and to manipulate algebraic expressions and equations by substituting values for unknown quantities.

CHEMISTRY I-HONORS

One Year Course

Grades 10-12***Prerequisite: Successful completion of Biology and Geometry***

Course Numbers:

Semester 1: SC290

Semester 2: SC300

As with most sciences, our present understanding of chemistry is rooted in history. Through numerous laboratory experiments and investigations chemists have “discovered” the laws, theories, and concepts studied in this course. In order to understand chemistry, as well as the nature of science, in this course the student will be provided with opportunities to discover the laws of chemistry in much the same manner as the chemists of the past. Whenever possible, laboratory experiments are used as a lead-in, not a follow-up, to concepts discussed in this class. Honors Chemistry is a quantitative, in-depth course designed for college-bound students, especially those considering a science-related major. Chemistry topics covered are similar to those covered in Regular Chemistry, but in much more depth of theory and more strenuous mathematical expectations.

Because Honors Chemistry is a mathematics-based science course, students must have a strong background in Algebra I, and a sound understanding of problem-solving. They must be able to solve multistep arithmetic problems that involve planning or converting units of measures, and to manipulate algebraic expressions and equations by substituting values for unknown quantities.

AP BIOLOGY-HONORS

One Year Course

Grades 10-12***Prerequisite: Successful completion of Biology and Chemistry; Department Approval***

Course Numbers:

Semester 1: SC198

Semester 2: SC199

The AP Biology course is designed to enable the student to develop advanced inquiry and reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical routines, and connecting concepts in and across domains. The key concepts and related content that define the AP Biology course and exam are organized around a few underlying principles the College Board refers to as the Big Ideas. These encompass the core scientific principles, theories and processes governing living organisms and biological systems. The four Big Ideas include Evolution, Cellular Processes, Genetics and Information Transfer and Interactions.

This AP Biology course is equivalent to a two-semester college introductory biology course and has been endorsed enthusiastically by higher education officials. Upon successful completion of the AP Biology course, students are encouraged to take the AP exam to earn college credit.

Surveys of AP Biology exam scores indicate that the probability of achieving a score of 3 or higher is significantly greater for students who successfully complete a first course in high school biology. For this reason, Menomonee Falls High School students are required to successfully complete sophomore level Biology prior to enrolling in AP Biology.

Students may also receive department approval. Topics from Biology in which students will need to exhibit proficiency at the start of AP Biology include atomic theory and bonding, cell division and cell reproduction, organelles, and basic Mendelian genetics. There will be a summer assignment in which the students practice inquiry through a self directed laboratory.

AP ENVIROMENTAL SCIENCE-HONORS

One year Course

Grades 10-12***Prerequisite: Successful completion of Biology, Chemistry or concurrent Chemistry enrollment.***

Course Numbers:

Semester 1: SC131

Semester 2: SC132

***Zero Hour Course Numbers:**

SC02Z-Semester 1

SC03Z-Semester 2

AP Environmental Science is designed to be the equivalent of one semester introductory college course in Environmental Science and is specifically intended for those students who intend to take the College Board AP Environmental Exam in May. This course provides students with the scientific principles, concepts and methodologies required to understand the interrelationships of the natural world and to identify and analyze environmental issues both natural and man-made. Students will examine various environmental issues and discuss ways to solve or prevent them. Laboratory investigations are an essential component of the course.

****THIS COURSE OFFERED BEFORE SCHOOL******7:00 AM-7:45 AM (ZERO HOUR)***

AP PHYSICS-HONORS

One Year Course

Grades 10-12***Prerequisite: Successful completion of Algebra 2; Department Approval***

Course Numbers:

Semester 1: SC616

Semester 2: SC617

Content in Honors Physics includes Mechanics (kinematics, projectile motion, forces, energy, circular motion, momentum), as well as sound and basic circuits. Special projects include an egg-drop contest, building a water rocket, and a field trip to Great America. Students will also use computers for data analysis. This course emphasizes those skills and thought processes considered important for progress in science and technology. It is highly recommended for students who plan to major in science, engineering, mathematics or pre-med.

Because Honors Physics is a mathematics-based science course, students must have a strong background in algebra, trigonometry, geometry, and a sound understanding of problem-solving. They must be able to use the quadratic equation, solve multistep arithmetic problems that involve planning or converting units of measures, manipulate algebraic expressions and equations by substituting values for unknown quantities.

PHYSICS**One Year Course****Grades 10-12*****Prerequisite: Successful completion of Algebra 2***

Course Numbers:

Semester 1: SC570

Semester 2: SC580

Content in Regular Physics includes Mechanics. Students will receive a good understanding of kinematics, projectile motion, forces, energy, and momentum. Special projects include building a mouse-trap car, an egg-drop contest, building a water rocket, and a field trip to Great America. Students will also use computers for data analysis. This course emphasizes those skills and thought processes considered important for progress in science and technology. It is highly recommended for students who plan to go on to higher education.

Because Physics is a mathematics-based science course, students must have a strong background in algebra, trigonometry, geometry, and a sound understanding of problem-solving. They must be able to use the quadratic equation, solve multistep arithmetic problems that involve planning or converting units of measures, manipulate algebraic expressions and equations by substituting values for unknown quantities.

PHYSICS OF EVERYDAY LIFE-HONORS TC

One Year Course

Grades 10-12***Prerequisite: Successful Completion of 1 year of high school Math***

Course Numbers:

Semester 1: SC614

Semester 2: SC615

Transcribed Credit

The Physics of Everyday Life is an elective designed for the specific purpose of applications in the world around us. ***Students will have the option to take the course for Transcribed Credit through WCTC.*** In this course students will be able to view nature more perceptively and to see the relationships that make up its rules. This is a less math intensive course that will stress conceptualization over computation. It is a survey course with topics covered that will include mechanics, materials, thermodynamics, waves and

PRINCIPLES OF ENGINEERING-HONORS AS

One year Course

Grades 10-12**No Prerequisite:*****Introduction to Engineering Design is recommended***

Course Numbers:

Semester 1:TE418

Semester 2:TE419

***Advanced Standing***

sound, electricity and magnetism, and optics. Specific topics will include projectile motion, the physics of lasers, rainbows, color mixing, musical instruments, microwave ovens, polarization, and circuit applications. Special projects will include building a mechanical wave generator as well as a field trip to Great America.

By request, this course is eligible to fulfill 2 credits of the Science Graduation Requirement. Please see your counselor for complete information.

See the course description in the Technology Education and Engineering Section on page 101.

AP CHEMISTRY-HONORS

One Year Course

Grades 11-12***Prerequisite: Successful completion of Chemistry I; Department Approval***

Course Numbers:

Semester 1: SC371

Semester 2: SC372

AP Chemistry is the equivalent of a two-semester introductory chemistry college course. AP Chemistry differs from Chemistry I with respect to the number and depth of topics covered, the emphasis on chemical calculations and the mathematical formulation of principles, and the kind of laboratory work done by students. This will require increased time and effort on the part of the students. Topics covered in AP Chemistry are determined by the College Board. Upon successful completion of the AP Chemistry course, students are expected to take the AP exam to earn college credit.

Surveys of AP Chemistry exam scores indicate that the probability of achieving a score of 3 or higher is significantly greater for students who successfully complete a first course in high school chemistry. For this reason, Menomonee Falls High School students are required to successfully complete Chemistry I prior to enrolling in AP Chemistry. Students must also receive department approval. AP Chemistry takes full advantage of students' first-year chemistry course. Topics from Chemistry I in which students will need to exhibit proficiency at the start of AP Chemistry include the history of atomic theory, electronic structure, nomenclature, balancing equations, the mole concept and stoichiometry, periodic trends, chemical bonds, intermolecular forces, and molecular geometry. There will be a summer assignment addressing many of these topics. Other topics will be addressed during

the course itself, but at a faster pace than their initial introduction in Chemistry I.

Because AP Chemistry is a mathematics-based science course, students must have a strong background in Algebra I and Algebra II, and a sound understanding of problem-solving. They must be able to solve multistep arithmetic problems that involve planning or converting units of measures, to manipulate algebraic expressions and equations by substituting values for unknown quantities, to solve quadratic equations, and exhibit knowledge of logarithms.

The following courses do not fulfill the science graduation requirements but may be options for elective credits for students with interest and skills in science.

Online Opportunities - see *Online Opportunities* section on page 38 for course descriptions.

- **Forensic Science I: Secrets of the Dead**
- **Forensic Science II: More Secrets of the Dead**
- **Veterinary Science: The Care of Animals**

Project Lead The Way (PLTW) Classes - (See course descriptions in the *Technology Education and Engineering* Section on page 101.)

- **Civil Engineering & Architecture**
- **Environmental Sustainability**
- **Introduction to Engineering Design-Honors AS**