

SCIENCE

3006 Target STAAR – Science, 0.5 credit (local)

GPA Level 2

Grade Level(s): 9-12

Service ID: 84800300

Prerequisite(s): Counselor approval.

Notes: Recommended for students who scored below Satisfactory Standard the Biology STAAR EOC exam.

Target STAAR is a semester-long course recommended for students who did not meet the satisfactory standard on the Biology STAAR test at their previous grade level. This course will provide remediation within the school day for students who have not met the minimum score on a STAAR science test. Target STAAR can be taken concurrently with a student's science course.

Objectives will be the Biology STAAR EOC objectives. Strategies will be course-specific and will include such elements as test-taking strategies, problem solving, reading for meaning, and other content-specific strategies.

3011 Biology, 1 credit (state)

GPA Level 2

Grade Level(s): 9-12

Service ID: 03010200

Prerequisite(s): None

Notes: 3014 Biology: Sheltered (For English Language Learners); LPAC approval required; see page 178; students will be required to take the Biology STAAR EOC exam.

In Biology, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical-thinking and scientific problem solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; ecosystems; and plants and the environment.

3021 Biology (PreAP/GT), 1 credit (state)

GPA Level 1

Grade Level(s): 9-12

Service ID: 03010200

Prerequisite(s): None

Notes: 3024 Biology PreAP/GT: Sheltered (For English Language Learners); LPAC approval required; see page 178; students will be required to take the Biology STAAR EOC exam.

Biology (PreAP/GT) offers a more advanced level of experiences in the concepts of biology. Laboratory activities are presented as a combination of inquiry and confirmatory exercises, including animal dissection. Many of the concepts are the same as those in Biology except the presentation is more accelerated and in more detail. Animal dissection is a required part of the curriculum in this course.

3321 Biology (AP/GT), 1 credit (state)

GPA Level 1

Grade Level(s): 11-12

Service ID: A3010200

Prerequisite(s): Biology; Chemistry.

Notes: Prepares students for the College Board Advanced Placement Biology exam.

Advanced Placement Biology (AP/GT) offers students advanced study in the concepts of biology. Laboratory techniques are developed to further the student's ability to pursue a career in a biologically-related field. Advanced laboratory investigations of chemical reactions that occur in organisms (e.g., enzymes, Krebs cycle, protein synthesis, cell replication and specialization) are presented. Biological systems of plants and animals are investigated. Animal dissection is a required part of the curriculum in this course.

3111 Integrated Physics and Chemistry (IPC), 1 credit (state) GPA Level 2

Grade Level(s): 9-12 **Service ID:** 03060201

Prerequisite(s): Biology

Notes: **3114 Integrated Physics and Chemistry: Sheltered (For English Language Learners);** LPAC approval required; see page 178; not available to students on the RHSP or DAP who have previously earned high school credit in Chemistry or Physics; this course will not fulfill a science requirement for the DAP Graduation Plan.

In Integrated Physics and Chemistry, students conduct field and laboratory investigations using scientific methods during investigations, and make informed decisions using critical-thinking and scientific problem-solving. This course integrates the concepts of physics and chemistry using practical applications relating to the following topics: properties of matter, changes in matter, solution chemistry, motion waves and energy transformation.

3211 Chemistry, 1 credit (state) GPA Level 2

Grade Level(s): 9-12 **Service ID:** 03040000

Prerequisite(s): Biology; Algebra I.

Notes: **3214 Chemistry: Sheltered (For English Language Learners);** LPAC approval required; see page 178.

In Chemistry, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: characteristics of matter; energy transformations during physical and chemical changes; atomic structure; periodic table of elements; behavior of gases; bonding; nuclear fusion and nuclear fission; oxidation-reduction reactions; chemical equations; solutes; properties of solutions; acids and bases; and chemical reactions. Students will investigate how chemistry is an integral part of our daily lives.

3221 Chemistry (PreAP/GT), 1 credit (state) GPA Level 1

Grade Level(s): 9-12 **Service ID:** 03040000

Prerequisite(s): Biology; Algebra II or concurrent enrollment in Algebra II, attendance at summer tutorial program or completion of online program packet.

Notes: **3224 Chemistry PreAP: Sheltered (For English Language Learners);** LPAC approval required; see page 178; two summer sessions of PreAP Chemistry Prep Workshop for PreAP Chemistry will be offered, with registration information provided by each school; an online tutorial covering the same topics will also be offered.

Chemistry (PreAP/GT) offers a more advanced level of experience in the concepts of chemistry. Laboratory activities presented are a combination of inquiry and confirmatory exercises. Many of the activities are the same as those in Chemistry except the presentation is more accelerated and in more detail.

3521 Chemistry (AP/GT), 1 credit (state) GPA Level 1

Grade Level(s): 11-12 **Service ID:** A3040000

Prerequisite(s): Chemistry

Notes: This course prepares students for the College Board Advanced Placement Chemistry exam.

Advanced Placement Chemistry (AP/GT) offers students advanced study in the concepts of chemistry. Laboratory techniques are developed to further the student's ability to pursue a career in an engineering or chemical-related field. Advanced laboratory investigations of atomic theory, properties of matter, chemical reactions, kinetics, and equilibrium are presented.

3611 Physics, 1 credit (state) GPA Level 2

Grade Level(s): 10-12 **Service ID:** 03050000

Prerequisite(s): Algebra I; Biology.

Notes: **3614 Physics: Sheltered (For English Language Learners);** LPAC approval required; see page 178.

In Physics, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: laws of motion; changes within physical systems, and conservation of energy and momentum; force; thermodynamics; characteristics and behavior of waves; and quantum physics. This course provides students with a conceptual framework, factual knowledge, and analytical and scientific skills.

3631 Physics 1 (AP/GT), 1 credit (state)**GPA Level 1****Grade Level(s):** 10-11**Service ID:** A3050001**Prerequisite(s):** Algebra II or concurrent enrollment in PreAP Algebra II; Biology; and Chemistry.**Notes:** This course prepares students for the College Board Advanced Placement Physics 1: Algebra-Based exam.

Advanced Placement Physics 1 (AP/GT) offers advanced study in the concepts of physics and is the equivalent to a first-semester college course in algebra-based physics, taught over a full year. Laboratory techniques are developed to further the student's ability to pursue a career in a science field. Advanced laboratory investigations of Newtonian mechanics; work, energy, and power; mechanical waves and sound; and electrical circuits are presented.

3641 Physics 2 (AP/GT), 1 credit (state)**GPA Level 1****Grade Level(s):** 11-12**Service ID:****Prerequisite(s):** Algebra II; Physics 1 AP or concurrent enrollment in Algebra II PreAP and Physics 1 AP.**Notes:** This course prepares students for the College Board Advanced Placement Physics 2 exam.

Advanced Placement Physics 2 (AP/GT) offers advanced study in the concepts of physics and is equivalent to a second-semester college course in algebra-based physics taught over a full year. The course covers fluid mechanics; thermodynamics; electricity and magnetism; optics; atomic and nuclear physics.

3723 Physics C: Mechanics, Electricity and Magnetism (AP/GT), 1 credit (state)**GPA Level 1****Grade Level(s):** 11-12**Service ID:** A3050002**Prerequisite(s):** Physics; Calculus or concurrent enrollment.**Notes:** This course prepares students for the College Board Advanced Placement Physics C: Electricity Magnetism exam and the Physics C: Mechanics exam; summer assignment required.

The Advanced Placement Physics C (AP/GT) course is the first part of the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. An equal emphasis in the course is on mechanics and on electricity and magnetism, with the AP test separated for administration and grading into those two areas. Strong emphasis is placed on solving challenging problems, some requiring calculus.

3801 Earth and Space Science, 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 03060200**Prerequisite(s):** 3 units of science (1 may be concurrent) and 3 units of math (1 may be concurrent).**Notes:** None

Earth and Space Science (ESS) is a capstone course that builds on prior scientific knowledge and skills to provide high school students an understanding of the Earth system and cycles in space and time. The course focuses on three major science concepts: Earth in space and time, solid Earth and fluid Earth. Students will conduct classroom, laboratory, and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving.

3831 Aquatic Science, 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 03030000**Prerequisite(s):** Biology; IPC, Chemistry or Physics.**Notes:** **3834 Aquatic Science: Sheltered (For English Language Learners);** LPAC approval required; see page 178.

In Aquatic Science students study a variety of topics that include: components of an aquatic ecosystem; relationships among aquatic habitats and ecosystems; roles of cycles within an aquatic environment; adaptations of aquatic organisms; changes within aquatic environments; geological phenomena and fluid dynamics effects; and origin and use of water in a watershed. Students conduct field and laboratory investigations, use scientific methods during investigations (including animal dissections), and make informed decisions using critical thinking and scientific problem solving. Animal dissection is a required part of the curriculum in this course.

3811 Environmental Systems (Ecology), 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 03020000**Prerequisite(s):** Biology; IPC or Chemistry.**Notes:** 3814 Environmental Systems (Ecology): Sheltered (For English Language Learners); LPAC approval required; see page 178.

In Environmental Systems, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: biotic and abiotic factors in habitats; ecosystems and biomes; interrelationships among resources and an environmental system; sources and flow of energy through an environmental system; relationship between carrying capacity and changes in populations and ecosystems; and changes in environments.

3821 Environmental Science (AP/GT), 1 credit (state)**GPA Level 1****Grade Level(s):** 11-12**Service ID:** A3020000**Prerequisite(s):** Biology; Chemistry.**Notes:** This course prepares students for the College Board Advanced Placement Environmental Science exam.

Advanced Placement Environmental Science (AP/ GT), unlike many other introductory courses, is offered from a wide variety of science disciplines including geology, biology, environmental systems, chemistry, and geography. The course provides the student with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, and to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them.

7550 Anatomy and Physiology, 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 13020600**Prerequisite(s):** Biology; Chemistry.**Notes:** None

In this course, students conduct laboratory investigations and fieldwork, use scientific methods during investigations, and make informed decisions using critical thinking and problem solving. Topics will be presented through an integration of biology, chemistry, and physics. Students will study structures and functions of the human body and body systems and will investigate the body's responses to forces, maintenance of homeostasis, electrical interactions, transport systems, and energy systems. Animal dissection is a required part of the curriculum in this course.

7551 Anatomy and Physiology (Adv Acad/GT), 1 credit (state)**GPA Level 1****Grade Level(s):** 11-12**Service ID:** 13020600**Prerequisite(s):** Biology; Chemistry.**Notes:** None

Anatomy and Physiology (Adv Acad/GT) offers a more advanced level of experiences for students planning to enter the medical profession. Students will conduct laboratory investigations using appropriate scientific tools and procedures. Topics will be presented through an integration of biology, chemistry, and physics. Students will study in detail the structures and functions of the human body and body systems and will investigate the body's responses to forces, maintenance of homeostasis, electrical interactions, transport systems, and energy systems. Extensive labs, including formal write-ups, are required. Animal dissection is a required part of the curriculum of this course.

3851 Astronomy, 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 03060100**Prerequisite(s):** Biology; IPC or Physics.**Notes:** None

In Astronomy, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Student study the following topics: information about the universe; scientific theories of the evolution of the universe; characteristics and the life cycle of stars; exploration of the universe; role of the Sun in our solar system; planets; and the orientation and placement of the Earth.

7930 Engineering Design and Problem Solving, 1 credit (state) GPA Level 2

Grade Level(s): 11-12 **Service ID:** 13037300

Prerequisite(s): Biology and 1 additional science credit.

Notes: None

Creative problem solving will take students into uncharted territory and the ideas of their peers will expose them to different ways of thinking. Students will have their talents stretched in ways they've never expected. In the Engineering Design and Development course, students work in teams to research, create, design and construct unique and original solutions to real-world engineering problems. The student's final project/solutions will be presented to and evaluated by a panel of community engineers and school personnel.

7940 Engineering Design and Development (Adv Acad), 1 credit (state) GPA Level 1

Grade Level(s): 11-12 **Service ID:** 13037300

Prerequisite(s): 2 Project Lead the Way course credits; Biology and 1 additional science credit.

Notes: Project Lead the Way course.

This course builds on the knowledge and skills students learned in previous Project Lead the Way engineering courses. Instruction will emphasize advanced principles of engineering processes and the development of three-dimensional solid models. Students will work in teams to research, create, design and construct unique and original solutions to real-world engineering problems. The student's final project/solutions will be presented to and evaluated by a panel of community engineers and school personnel.

7963 Advanced Biotechnology (Adv Acad/GT), 1 credit (state) GPA Level 1

Grade Level(s): 10-12 **Service ID:** 13036400

Prerequisite(s): Biotechnology

Notes: None

Students in Advanced Biotechnology study a variety of topics that include structures and functions of cells, nucleic acids, proteins, and genetics. Topics include cell structure, proteins, genetic engineering, and the impact of immunological events in biotechnology. Students further study the increasingly important agricultural, environmental, economic, and political roles of bioenergy and biological remediation; the roles of nanoscience and nanotechnology in biotechnology medical research; and future trends in biological science and biotechnology.

7021 Advanced Animal Science, 1 credit (state) GPA Level 2

Grade Level(s): 11-12 **Service ID:** 13000700

Prerequisite(s): Biology and 1 additional science credit; and one of the following: Principles of Agriculture, Small Animal Management, Livestock Production, Equine Science, or Veterinary Medical Applications.

Notes: \$15 FFA dues recommended.

This course is developed to prepare students for careers in the field of animal science. The students will learn, reinforce, apply, and transfer their knowledge and skills in a variety of settings. This course examines the correspondence of human, scientific, and technological aspects of animal science through field and laboratory experience.

7620 Food Science, 1 credit (state) GPA Level 2

Grade Level(s): 11-12 **Service ID:** 13023000

Prerequisite(s): Biology; IPC or Chemistry.

Notes: \$20 class fee.

This class explores the nature and improvement of foods for consumers. Students study nutrition and wellness, food technology, world food supply, diet-related disorders, chemical and physical changes that affect food product quality, technologies used in food processing, and food safety. Investigation of the properties of food and how it affects the human body will also be covered.

7951 Forensic Science, 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 13029500**Prerequisite(s):** Biology; Chemistry.**Notes:** None

This course is a structured and scientific approach to the investigation of crimes of assault, abuse and neglect, domestic violence, accidental death, homicide, and the psychology of the criminally insane. Students will learn basic terminology and investigative procedures related to crime scene, question building, interviewing, criminal behavior characteristics, truth detection methodology, and scientific procedures used to solve crimes. Students will have the opportunity to collect and analyze evidence through case studies and mock crime scenes. Students will learn about the history, legal aspects of forensics, and career options available in the forensic field.

7530 Pathophysiology, 1 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 13020800**Prerequisite(s):** Biology and 1 additional science credit.**Notes:** None

This course studies disease processes and how human systems are affected. Emphasis is placed on prevention and treatment of diseases. The course begins with the basics of cellular biology, cancer, the infection process, and the immune system. A focus on specific body systems and common disorders will be covered. Students will differentiate between normal and abnormal physiology. The course will include at least 40% laboratory investigation and fieldwork using appropriate scientific inquiry.

7997 Scientific Research and Design, 1.0 credit (state)**GPA Level 2****Grade Level(s):** 11-12**Service ID:** 13037210**Prerequisite(s):** Biology and 1 additional science credit.**Notes:** None

This course provides students the opportunity to explore the world around them by researching and designing experiments. All aspects of the inquiry process, from background research, to asking a testable question, designing and performing experiments, and communicating conclusions based on evidence will be included in this class. Experiments will be drawn from all areas of science to provide students a broad science background.

7999 Independent Study: Scientific Research & Design (Adv Acad), 1.0 credit (state)**GPA Level 1****Grade Level(s):** 11-12**Service ID:** 13037210**Prerequisite(s):** Application required.**Notes:** A possible Distinguished Achievement Plan Advanced Measure.