Danville Area School District
Course Overview and Scope and Sequence

Course Title: Anatomy and Physiology
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: This semester course examines human anatomy by exploring select body systems, tissues and anatomical directions and planes. This will be accomplished through lecture, audio-visual aids, demonstrations, and extensive laboratory activity, including, but not limited to, the dissection of fetal pigs and other mammals. Prerequisite: Successful completion of Keystone Biology or Honors Keystone Biology
ANCHOR STANDARDS: PA Biology standards 3.19-12B - Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
KEY COURSE TEXT AND MATERIALS: **Human Anatomy and Physiology** Eleventh Ed. *Elaine N. Marieb/Katja Hoehn-Pearson* ISBN: 9780124580999
KEY ASSESSMENTS: Diagnostic: Surveys Formative: Labs, Case Studies, Gizmos, Online/Class reviews Summative: Tests, Lab practicals and Quizzes

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Unit: 1 Introduction to anatomical concepts, terms and directions	Biology 3.19-12B		Body systems poster activity, Intro to dissection lab, Directional terms and systems quiz, test.	Google classroom, teacher created labs and materials, online platform: Biodigital.	10 class periods
Unit: 2 Cells and cell junctions	Biology 3.19-12B	Biology 3.19-19C 3.19-12J 3.19-19Q	Body cell research and poster project. Junctions 3D project, cells quiz.	Cells alive, gizmos, Google classroom, teacher created labs and materials, online platform: Biodigital.	6 class periods
Unit: 3 Tissues	Biology 3.19-12B	Biology 3.19-19C	Microscope tissues identification lab, Individual and class tissue concept maps. Tissues test and lab practical.	Google classroom, teacher created labs and materials, online platform: Biodigital.	12 class periods
Unit 4: Skeletal system	Biology 3.19-12B		Clay bone project, bone disorder research paper, Skull and vertebrae drag/drop tutorial, skeleton 3D labeling. Skeletal test.	Google classroom, teacher created labs and materials, online platform: Biodigital.	12 class periods
Unit 5: Muscular	Biology 3.19-12B	Biology 3.19-19C	Sarcomere unit 3D	Google classroom,	12 Class periods

system and introduction to dissection/external anatomy			model with pipecleaners, Muscle id lab, online tutorial of muscle action, test and quiz.	teacher created labs and materials, online platform: Biodigital.	
Unit 6: Digestive system	Biology 3.19-12B	Biology 3.19-19G 3.19-19J	Digestive case studies, Gizmo, paper alimentary tract activity, dissection, Test.	Google classroom, teacher created labs and materials, online platform: Biodigital.	12 Class periods
Unit 7: Circulatory/respiratory system	Biology 3.19-12B	Biology 3.19-19C	Blood pressure lab, heart dissection, blood vessel identification, Test.	Google classroom, teacher created labs and materials, online platform: Biodigital.	12 Class periods
Unit 8: Urogenital system (Excretory and reproductive systems)	Biology 3.19-12B	Biology 3.19-19C	Urology case study/diagnosis, nephron drawing and labeleing, reproductive system identification, hormone chart analysis. Final exam.	Google classroom, teacher created labs and materials, online platform: Biodigital.	12 Class periods

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Advanced Placement Biology
Content Area: Science
Grade Level: 10-12
Date Developed: 8/10/2023

COURSE OVERVIEW: AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes, energy and communication, genetics, information transfer, ecology, and interactions.

Science Practices

1. Explain biological concepts, processes, and models presented in written format.
2. Analyze visual representations of biological concepts and processes.
3. Determine scientific questions and methods.
4. Represent and describe data.
5. Perform statistical tests and mathematical calculations to analyze and interpret data.
6. Develop and justify scientific arguments using evidence.

ANCHOR STANDARDS:
BIG IDEA 1: EVOLUTION (EVO) The process of evolution drives the diversity and unity of life.
BIG IDEA 2: ENERGETICS (ENE) Biological systems use energy and molecular building blocks to grow, reproduce, and maintain dynamic homeostasis.
BIG IDEA 3: INFORMATION STORAGE AND TRANSMISSION (IST) Living systems store, retrieve, transmit, and respond to information essential to life processes.
BIG IDEA 4: SYSTEMS INTERACTIONS (SYI) Biological systems interact, and these systems and their interactions exhibit complex properties.

KEY COURSE TEXT AND MATERIALS: College Board Materials; Miller Levine AP Biology
KEY ASSESSMENTS: Diagnostic: Keystone Biology Exam Formative: Unit Quizzes and Exams Summative: AP Biology Exam

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Unit 1: Chemistry of Life	SYI-1 ENE-1 IST-1	2.A 1.A 6.E.b	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	5-7 Class Periods
Unit 2: Cell Structure and Function	SYI-1 ENE-1 ENE-2 EVO-1	1.A 6.A 2.D.a 5.A.d 2.A 3.D 5.D.b 3.E.b 6.E.b 4.A 1.B 6.E.a 6.B	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	11-13 Class Periods

Unit 3: Cellular Energetics	ENE-1 SYI-3	1.B 3.C.b 3.C.c 6.E.c 6.C 6.B 4.A 6.C	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	14-17 Class Periods
Unit 4: Cell Communication and Cell Cycle	IST-3 ENE-3 IST-1	1.B 1.A 6.C 6.E.b 4.B.b 5.A.e 6.E.a	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	9-11 Class Periods
Unit 5: Hereditary	IST-1 EVO-2 SYI-3	1.B 3.A 5.C 6.E.c 5.A.b 5.C 1.C 6.E.b	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	9-11 Class Periods
Unit 6: Gene Expression and Regulation	IST-1 IST-2 IST-4	1.C 2.B.b 2.D.b 6.E.a 6.A 6.B 2.C 3.D 6.D	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	18-21 Class Periods

Unit 7: Natural Selection	EVO-1 EVO-2 EVO-3 SYI-3	3.5.a 2.D.c 6.E.a 2.B.a 3.B 6.C	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	20-23 Class Periods
Unit 8: Ecology	ENE-3 IST-5 ENE-1 SYI-1 ENE-4 SYI-3 EVO-1 SYI-2	3.C.a 6.D 4.A 5.A.c 5.B 6.E.c 5.D.a 5.D.b	Personal Progress Check; Quizzes, Unit Exam; Lab	Text; College Board Materials; Teacher-Created Supplemental Materials	18-21 Class Periods

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Advanced Placement Chemistry
Content Area: Science
Grade Level: 11-12
Date Developed: 8/11/2023

COURSE OVERVIEW: The AP Chemistry course provides students with a college-level foundation to support future advanced coursework in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore content such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium.
Science Practices:

1. Describe models and representations, including across scales.
2. Determine scientific questions and methods.
3. Create representations or models of chemical phenomena.
4. Analyze and interpret models and representations on a single scale or across multiple scales.
5. Solve problems using mathematical relationships.
6. Develop an explanation or scientific argument.

ANCHOR STANDARDS:
BIG IDEA 1: SCALE, PROPORTION, AND QUANTITY (SPQ) Quantities in chemistry are expressed at both the macroscopic and atomic scale. Explanations, predictions, and other forms of argumentation in chemistry require understanding the meaning of these quantities, and the relationship between quantities at the same scale and across scales.
BIG IDEA 2: STRUCTURE AND PROPERTIES (SAP) Properties of substances observable at the macroscopic scale emerge from the structures of atoms and molecules and the interactions between them. Chemical reasoning moves in both directions across these scales. Properties are predicted from known aspects of the structures and interactions at the atomic scale. Observed properties are used to infer aspects of the structures and interactions.
BIG IDEA 3: TRANSFORMATIONS (TRA) At its heart, chemistry is about the rearrangement of matter. Understanding the details

of these transformations requires reasoning at many levels as one must quantify what is occurring both macroscopically and at the atomic level during the process. This reasoning can be as simple as monitoring amounts of products made or as complex as visualizing the intermolecular forces among the species in a mixture. The rate of a transformation is also of interest, as particles must move and collide to initiate reaction events. BIG IDEA 4: ENERGY (ENE) Energy has two important roles in characterizing and controlling chemical systems. The first is accounting for the distribution of energy among the components of a system and the ways that heat exchanges, chemical reactions, and phase transitions redistribute this energy. The second is in considering the enthalpic and entropic driving forces for a chemical process. These are closely related to the dynamic equilibrium present in many chemical systems and the ways in which changes in experimental conditions alter the positions of these equilibria.
KEY COURSE TEXT AND MATERIALS: College Board Materials; Teacher Created Supplemental Materials
KEY ASSESSMENTS: Diagnostic: Keystone Biology Formative: Quizzes, Labs, Unit Exams, Personal Progress Checks Summative: AP Chemistry Exam

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Atomic Structure and Properties	SPQ-1 SPQ-2 SAP-1 SAP-2	5.B 5.D 2.A 5.A 1.A 4.B 4.A 4.C	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	9-10 Class Periods

Molecular and Ionic Compound Structure and Properties	SAP-3 SAP-4	6.A 3.A 4.C 3.B 6.C	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	12-13 Class Periods
Intermolecular Forces and Properties	SAP-5 SAP-6 SAP-7 SPQ-3 SAP-8	4.D 4.C 3.C 5.C 4.A 6.E 5.F 3.C 2.C 4.D	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	14-15 Class Periods
Chemical Reactions	TRA-1 SPQ-4 TRA-2	2.B 5.E 3.B 6.B 5.C 3.A 1.B	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	14-15 Class Periods
Kinetics	TRA-3 TRA-4 TRA-5 ENE-1	6.E 5.C 5.B 5.E 3.B 1.B	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	13-14 Class Periods
Thermodynamics	ENE-2 ENE-3	6.D 3.A 6.E 2.D	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	10-11 Class Periods

		1.B 5.F 5.A			
Equilibrium	TRA-6 TRA-7 TRA-8 SPQ-5	6.D 4.D 3.A 5.C 5.A 3.C 6.F 5.F 5.B 2.F 2.D	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	14-16 Class Periods
Acids and Bases	SAP-9 SAP-10	5.B 5.C 5.F 5.D 6.C 2.D 6.D 6.G	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	14-15 Class Periods
Applications of Thermodynamics	ENE-4 ENE-5 ENE-6	6.C 5.F 6.E 6.D 4.D 2.F 5.F 5.B	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	10-13 Class Periods

Danville Area School District
Course Overview and Scope and Sequence

Course Title: AP Physics C: Mechanics
Content Area: Science
Grade Level: 11-12
Date Developed: 8/11/2023

COURSE OVERVIEW: AP Physics C: Mechanics is a calculus-based, college-level physics course. It covers kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; oscillations; and gravitation. 1. Visual Representations 2. Question and Method 3. Representing Data and Phenomena 4. Data Analysis 5. Theoretical Relationships 6. Mathematical Routines 7. Argumentation
ANCHOR STANDARDS: BIG IDEA 1: CHANGE (CHA) Interactions produce changes in motion. BIG IDEA 2: FORCE INTERACTIONS (INT) Forces characterize interactions between objects or systems. BIG IDEA 3: FIELDS (FLD) Fields predict and describe interactions. BIG IDEA 4: CONSERVATION (CON) Conservation laws constrain interactions.
KEY COURSE TEXT AND MATERIALS: College Board Materials; Teacher Created Supplemental Materials
KEY ASSESSMENTS: Quizzes, Labs, Unit Exams, Personal Progress Checks Diagnostic: None

Formative: Quizzes, Labs, Unit Exams, Personal Progress Checks
Summative: AP Physics C: Mechanics Exam

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Kinematics	CHA-1 CHA-2	1.A 1.B 3.A 4.A 4.C 5.A 7.A	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	11-22 Class Periods
Newton's Laws of Motion	INT-1 INT-2 INT-3	1.A 2.D 3.B 4.B 5.A 7.A 7.B	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	12-24 Class Periods
Work, Energy, and Power	INT-4 CON-1 CON-2 CON-3	2.A 7.C 1.D 4.B 6.A 2.E 4.D	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	10-20 Class Periods

		5.C 6.C 7.E 5.D			
Systems of Particles and Linear Momentum	CHA-3 INT-5 CON-4	6.B 1.C 2.C 5.D 1.E 5.E 7.D 7.E 7.F	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	10-20 Class Periods
Rotation	INT-6 CHA-4 INT-7 CON-5	2.D 3.B 2.B 5.B 6.C 1.E 3.C 4.D 5.D 5.E 6.D 7.D	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	10-20 Class Periods
Oscillations	INT-8	1.E 2.B 2.F 4.C 4.E 5.E 7.F	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	5-10 Class Periods

Gravitation	FLD-1 CON-6	3.D 4.E 5.E 3.C 5.D 6.C 7.F	Labs; Personal Progress Check; Quizzes, Unit Exam	Supplemental Text; Teacher Created Materials; College Board Materials	5-10 Class Periods

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Astronomy
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: Astronomy is presented on a general level with texts, computer simulations, and supplemental materials aimed at both making things clearer and enriching the subject matter. There is an emphasis placed on naked-eye astronomy to encourage students to routinely look at the night sky and broaden their knowledge of what they can see. There is also an emphasis placed on equipping students to find and use any number of good online astronomy sources. Topics include the historical development of astronomy, observational astronomy, the science of astronomy, classification of stars, the Milky Way and galaxies, and cosmology.
ANCHOR STANDARDS: 1. The Universe and Its Stars 2. Earth and the Solar System 3. Electromagnetic Radiation 4. Nature and Characteristics of Technology and Engineering 5. Applying, Maintaining, and Assessing Technological Products and Systems
KEY COURSE TEXT AND MATERIALS: None
KEY ASSESSMENTS: Diagnostic: None Formative: POGILS, labs, gizmos and class discussions Summative: Projects

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. Introduction to Astronomy	3.3.9-12B	3.2.9-12.P 3.2.9-12.V 3.2.9-12.W	Starry night simulation, OpenStax Video discussions, labs, Cosmic Survey, Discovery News article, APOD	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
2. Observational Astronomy	3.3.9-12D	3.2.9-12.V 3.5.9-12H 3.5.9-12GG 3.5.9-12JJ	Starry night simulation, OpenStax Video discussions, Messier and Constellation project, APOD	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
3. Astronomy as a Science	3.3.9-12D	3.2.9-12.V 3.2.9-12.W 3.2.9-12.X 3.5.9-12JJ 3.5.9-12NN	Starry night simulation, OpenStax Video discussions, planetary orbits project, spectroscopy lab and PhET Sims, OWN Microobservatory Telescope project, APOD	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
4. The Sun as a	3.3.9-12A	3.2.9-12.H	Starry night	Content is teacher	10 days

Star		3.2.9-12.V 3.2.9-12.W	simulation, OpenStax Video discussions, The Sun Hyperdoc and NOVA/Sun lab, The Sun Discussion Board, APOD	created. In addition to lab/project supplies, materials are posted in Google Classroom.	
5. Stars	3.3.9-12C	3.2.9-12.H 3.2.9-12.V 3.2.9-12.W	Starry night simulation, OpenStax Video discussions, HR Table Top Discussion, Star Infographic, APOD	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12
6. Galaxies and Beyond	3.3.9-12B	3.2.9-12.V 3.2.9-12.W	Starry night simulation, OpenStax Video, discussions and project, Galaxy Zoo Citizen Science project	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10
7. Life Beyond Earth	3.1.9-12I 3.1.9-12M	3.2.9-12.V 3.3.9-12.C 3.1.6-8.I	Starry night simulation, OpenStax Video, discussions and project, Packing for Mars table top	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	5

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Chemistry
Content Area: Science
Grade Level: 10th and/or 11th
Date Developed: June 2023

COURSE OVERVIEW: This course is intended for students pursuing a non-science major at the post-secondary level. Chemistry covers the same topics and concepts as Honors Chemistry with more emphasis placed on hands-on concepts and everyday applications of scientific principles. This course may be taken concurrently with Physics.
ANCHOR STANDARDS: 1. Structure and Properties of Matter 2. Chemical Reactions 3. Nuclear Processors 4. Forces and Motion 5. Types of Interactions
KEY COURSE TEXT AND MATERIALS: Pearson Chemistry Foundation Edition 2012
KEY ASSESSMENTS: Diagnostic: None Formative: POGIL, gizmo, labs, quizlet, classroom discussions, forms for bell ringer/exit ticket Summative: Quizzes and tests; Lab Final and Written Final

SCOPE AND SEQUENCE

Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. The Science of Chemistry	3.2.9-12.G	3.2.6-8.C 3.2.6-8.D 3.2.6-8.E 3.2.6-8.F 3.2.9-12.A 3.2.9-12.G	FLINN measurements, discovering density, test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom. FLINN scientific	15
2. Matter and Change	3.2.9-12.A	3.2.6-8.A 3.2.6-8.B 3.2.9-12.A 3.2.9-12.G	POGIL, FLINN scientific labs, Quizlet, test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15
3. Atomic Structure	3.2.9-12.A	3.2.6-8.A 3.2.9-12.A	Quizlet, POGIL isotopes, FLINN lab, test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	16
4. Electrons and the Periodic Table	3.2.9-12.A 3.2.9-12.V	3.2.6-8.A 3.2.6-8.I 3.2.6-8.Q 3.2.9-12.A	Quizlet, Bohr models of atoms, Flame test labs, Card game, Test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	16
5. Chemical Bonding	3.2.9-12.A 3.2.9-12.B 3.2.9-12.N	3.2.6-8.E 3.2.9-12.A 3.2.9-12.G	Quizlet, Flinn ChemTopics Labs: Properties of Solids, Model Kits,	Content is teacher created. In addition to lab/project supplies, materials	15

			POGILs, test	are posted in Google Classroom.	
6. Describing Chemical Reactions	3.2.9-12.C 3.2.9-12.G	3.2.6-8.D 3.2.6-8.E 3.2.6-8.F 3.2.9-12.A 3.2.9-12.G	Quizlet, Demos, Pogils, FLINN labs, modeling percent composition through chewing gum, analyzing solubility rules, test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	18
7. Stoichiometry and Reaction Kinetics	3.2.9-12.D 3.2.9-12.E 3.2.9-12.G	3.2.9-12.A 3.2.9-12.G	POGILS, quizlets, S'mores lab, Stoichiometry challenge, construction of rockets, test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15
8. KMT and Gas Laws	3.2.9-12.B 3.2.9-12.N	3.2.6-8.B 3.2.6-8.K 3.2.6-8.N 3.2.6-8.O 3.2.9-12.A	Gizmos, modeling gas law stations, PhET simulations, test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15
9. Solutions	3.2.9-12.E	3.2.9-12.A	Gizmos, modeling, Kool-Aid lab	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15
10. Acid-Base Chemistry	3.2.9-12.E	3.2.9-12.A 3.2.9-12.G	Gizmos, modeling, Properties of Acids and Bases lab, Titration lab	Content is teacher created. In addition to lab/project supplies, materials	15

				are posted in Google Classroom.	

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Entomology
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: This course explores the world of insects from a practical and scientific perspective. Topics covered include methods of insect collection and identification, insect ecology and taxonomy, insect anatomy, and the economic and environmental impacts of insects. Students will utilize various insect sampling methods and study the samples collected throughout the course. This course is recommended for students with an interest in environmental science, wildlife biology, biodiversity, or insect surveying used in agricultural applications.

ANCHOR STANDARDS:

1. Structure and Function
2. Growth and Development of Organisms
3. Ecosystem Dynamics, Functioning, and Resilience
4. Social Interactions and Group Behavior
5. Evidence of Common Ancestry and Diversity
6. Natural Selection and Adaptation

KEY COURSE TEXT AND MATERIALS: None - all material is teacher generated

KEY ASSESSMENTS: Teacher-generated rubrics for project-based assessments, one per unit of study
Diagnostic: None

Formative: Labs, activities, identifications, dissections, class discussion/notes/journal reports
Summative: Projects

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Unit 1: Introduction to Entomology	3.1.9-12N 3.1.9-12V	3.1.9-12.I 3.1.9-12.O	Insect specimen examination	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
Unit 2: Insects 101	3.1.9-12B	3.1.9-12C 3.1.9-12M 3.1.9-12.I 3.1.9-12.O	Mimicry complex project and insect order identification lab practical	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
Unit 3: Insect Anatomy	3.1.9-12B	3.1.9-12.O	Insect senses project and grasshopper dissection lab practical	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
Unit 4: Insect Taxonomy and Evolution	3.1.9-12B 3.1.9-12S 3.1.9-12.X	3.1.9-12M 3.1.9-12U 3.1.9-12.I	Model insect evolution through timeline, taxonomy/evolution case study project	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days

Unit 5: Insect Ecology	3.1.9-12B 3.1.9-12.M	3.1.9-12A 3.1.9-12M 3.1.9-12O 3.1.9-12.S 3.1.9-12.T	Insect ecology journal article report	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
Unit 6: Insect Identification and Microscopy	3.1.9-12B	3.1.9-12.O 3.1.9-12.S	Insect identification and lab practical	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
Unit 7: Uses of Entomology in Society	3.1.9-12V	3.1.9-12.N	Cumulative project	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Environmental Science
Content Area: Science
Grade Level: 10th, 11th, and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: This is an introductory course designed for students who are interested in engaging with the world around them. This course will examine topics from basic ecological principles through human population and their impact on the environment. Students will acquire skills needed to continue their education in science and develop the ability to address environmental issues throughout their lives. This course will also emphasize hands-on, project based learning experience.
ANCHOR STANDARDS: 3.1 Unifying Themes of Science; 3.3 Biological Science
KEY COURSE TEXT AND MATERIALS: None
KEY ASSESSMENTS: Diagnostic: None Formative: Labs and activities, simulations and model construction, bell ringers, exit tickets, and class discussions Summative: Projects

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME

Unit 1: Basic Ecological Principles	3.3.9-12E	3.1.9-12H 3.1.9-12I 3.3.9-12.N	Model of an ecosystem (diorama) and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
Unit 2: Wildlife Management	3.1.9-12N 3.3.9-12.Q	3.1.9-12L 3.1.9-12M	Animal rights campaign, invasive species investigation, and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
Unit 3: Population Growth and Impact	3.3.9-12Q	3.1.9-12N	Modeling state demographic info for ecological purposes, analyzing/interpreting data, age/sex pyramids, population control vs. resource management debate, and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	11 days
Unit 4: Human Health Issues	3.1.9-12N		Modeling nutrient deficiencies and disease spread in dense populations, and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	8 days

Unit 5: Waste Management	3.3.9-12R	3.1.9-12N 3.3.9-12.R	Analyzing types of waste, landfill models, upcycling project, NIMBY reflection and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	14 days
Unit 6: Pollution	3.3.9-12P 3.3.9-12R	3.1.9-12N 3.3.9-12.R	Air and water quality sampling and analysis, technology for cleaning pollution model, oil spill simulation, and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	14 days
Unit 7: Energy and Urban Planning	3.3.9-12O 3.3.9-12P 3.3.9-12R	3.1.9-12N 3.3.9-12.P 3.3.9-12.R	Alternate energy models, eco-home designs, and class discussions	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 - 12 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Fundamentals of Engineering
Content Area: Science
Grade Level: 10th, 11th, and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: The course is for students who may have an interest in engineering. Exploring basic computer aided design and concepts in data collection analysis and modeling, students will learn and investigate engineering and engineering concepts. This course is an interactive, hands-on, project based course and will allow students to gain exposure to multiple engineering disciplines including Civil, Mechanical, Electrical and other Engineering fields. Topics and projects to be covered in this course may include: design software, hydroponics, strengths of materials, electrical systems, and renewable energy sources. Each student will have the opportunity to explore a topic of their choice for a final project.
ANCHOR STANDARDS: 3.5 Earth Sciences
KEY COURSE TEXT AND MATERIALS: Teacher Generated
KEY ASSESSMENTS: Diagnostic: 8th Grade PSSA Science Formative: Quizzes Summative: Unit Tests

SCOPE AND SEQUENCE

Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. **Fields of Engineering**	3.5.9-12.NN 3.5.9-12.JJ 3.5.9-12.G 3.5.9-12.E 3.5.9-12.Z 3.5.9-12.T	3.5.6-8.P 3.5.6-8.BB	Individual review of fields and careers in Engineering	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	5 days
2. The Engineering Process	3.5.9-12.OO 3.5.9-12.MM 3.5.9-12.I 3.5.9-12.B 3.5.9-12.F 3.5.9-12.CC 3.5.9-12.U 3.5.9-12.Q	3.5.6-8.Q 3.5.6-8.S	Reverse Engineering Project Presentation	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	6 days
3. Chemical and Environmental Engineering	3.5.9-12.QQ 3.5.9-12.C 3.5.9-12.D	3.5.6-8.FF	Hydroponic/Aquaponic Project Presentation	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
4. Engineering Design	3.5.9-12.PP 3.5.9-12.BB 3.5.9-12.X 3.5.9-12.Y 3.5.9-12.O 3.5.9-12.N	3.5.6-8.II	Demonstrate ability with Fusion360 and other design softwares, Print a simple object on the 3D Printer	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
5. Aeronautical and	3.5.9-12.J 3.5.9-12.DD	3.5.6-8.JJ	Model Rocket Improvement	Content is teacher created. In addition	12 days

Aerospace Engineering			Project	to lab/project supplies, materials are posted in Google Classroom.	
6. Mechanical and Civil Engineering	3.5.9-12.A 3.5.9-12.H 3.5.9-12.S 3.5.9-12.W	3.5.6-8.LL 3.5.6-8.KK	Egg Drop Activity, Structural Project Presentation	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	25 days
7. Electrical Engineering	3.5.9-12.KK 3.5.9-12.P	3.5.6-8.CC 3.5.6-8.DD	Circuit Activity	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
8. Independent Research	3.5.9-12.GG 3.5.9-12.II 3.5.9-12.FF 3.5.9-12.AA 3.5.6-8.W	3.5.6-8.DD	Final Presentation	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Honors Keystone Biology
Content Area: Science
Grade Level: Primarily 9th
Date Developed: June 2023

COURSE OVERVIEW: Honors Keystone Biology covers the same topics as Keystone Biology, but includes Ecology standards addressed in the Integrated Science course. This course is designed for students who are considering a major in science or health-care professions. Students should anticipate more independent reading, a deeper examination of topics, and a quicker pace than in Keystone Biology. This course will also emphasize a hands-on laboratory component. Students enrolled in Keystone Biology Honors will take the Keystone Biology Exam during the spring of the school year.

ANCHOR STANDARDS:

1. Structure and Function
2. Growth and Development of Organisms
3. Organization for Matter and Energy Flow
4. Interdependent Relationships in Ecosystems
5. Cycles of Matter and Energy Transfer in Ecosystems
6. Ecosystem Dynamics, Functioning, and Resilience
7. Social Interactions and Group Behavior
8. Inheritance of Traits
9. Variation of Traits
10. Evidence of Common Ancestry and Diversity
11. Natural Selection
12. Adaptation

KEY COURSE TEXT AND MATERIALS: Miller and Levine: Biology 2019
KEY ASSESSMENTS: Diagnostic: CDT Formative: Oral quizzes, labs and activities, bell ringers, exit tickets, and class discussions Summative: Unit tests, keystone writing practices, projects; Keystone Exam

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Unit: 1 Introduction to biology-Characteristics of life and scientific method	3.1.9-12B 3.1.9-12C	3.1.6-8.C	Glow stick lab, graph interpretation, goldfish analysis, quizzes and tests	All content is teacher created. Materials are posted in Google Classroom.	15 days
Unit 2: Biological molecules	3.1.9-12F	3.1.6-8.G	Infographics, protein structure lab, enzyme lab, gizmo, class discussions, quizzes, and test	All content is teacher created. Materials are posted in Google Classroom.	12 days
Unit 3: Energy transfer in cells	3.1.9-12E 3.1.9-12G 3.1.9-12J	3.1.6-8.F 3.1.6-8.G	ATP simulation, photosynthesis and CR model, respiration lab, oral quizzes and tests,	All content is teacher created. Materials are posted in Google Classroom.	16 days
Unit 4: Cells and transport	3.1.9-12B 3.1.9-12C	3.1.6-8.A 3.1.6-8.B 3.1.6-8.D	Cell and organelle model, membrane model, homeostasis	All content is teacher created. Materials are	15 days

			mechanisms via osmosis and diffusion labs, quizzes and tests	posted in Google Classroom.	
Unit 5: Cell cycle and cell division	3.1.9-12D 3.1.9-12Q	3.1.6-8.D 3.1.6-8.N	Cell cycle model, Cell division diagrams, gizmo, quizzes and test	All content is teacher created. Materials are posted in Google Classroom.	15 days
Unit 6: Genetic information (DNA/RNA) structure and function	3.1.9-12A 3.1.9-12P 3.1.9-12Q	3.1.6-8.M 3.1.6-8.N	DNA model, codon game, diagrams of DNA processes, DNA extraction lab, flipcharts, genetic engineering simulations, oral quizzes, and test	All content is teacher created. Materials are posted in Google Classroom.	22 days
Unit 7: Genetics and inheritance	3.1.9-12R	3.1.6-8.E 3.1.6-8.R	Predicting and analyzing inheritance patterns, blood type lab, quizzes and test	All content is teacher created. Materials are posted in Google Classroom.	12 days
Unit 8: Evolution	3.1.9-12O 3.1.9-12R 3.1.9-12S 3.1.9-12T 3.1.9-12U 3.1.9-12W 3.1.9-12X	3.1.6-8.I 3.1.6-8.O 3.1.6-8.P 3.1.6-8.Q 3.1.6-8.S 3.1.6-8.T	Evidence lab, natural selection simulation, gizmo, cladogram/phylogenetic tree construction, oral quizzes and test	All content is teacher created. Materials are posted in Google Classroom.	20 days
Unit 9: Ecology	3.1.9-12H 3.1.9-12I	3.1.6-8.I 3.1.6-8.J	Biome diagram, model of energy flow in an	All content is teacher created.	25 days

	3.1.9-12K 3.1.9-12L 3.1.9-12M 3.1.9-12N 3.1.9-12V	3.1.6-8.K 3.1.6-8.L 3.1.6-8.U	ecosystem, scavenger hunt, limiting factor/carrying capacity lab, population growth models, quizzes and test	Materials are posted in Google Classroom.	

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Honors Chemistry
Content Area: Science
Grade Level: Primarily 10th
Date Developed: June 2023

COURSE OVERVIEW: Honors Chemistry is designed to provide students who are considering science majors in postsecondary education with a rigorous experience with chemical principles and laboratory procedures that will ensure their initial success in additional coursework at the university level. This course will maximize opportunities for the individual to polish mathematical skills and scientific skills. Students selecting Honors Chemistry should have above average grades in previous math and science courses, should be motivated and willing to work independently, and be willing to ask for extra assistance, when needed. This course may be taken concurrently with other science courses.
ANCHOR STANDARDS: 1. Structure and Properties of Matter 2. Chemical Reactions 3. Nuclear Processors 4. Forces and Motion
KEY COURSE TEXT AND MATERIALS: Pearson Chemistry Foundation Edition 2012
KEY ASSESSMENTS: unit tests, laboratory analysis assignments following each laboratory experiment Diagnostic: None Formative: POGIL, gizmo, labs, quizlet, classroom discussions, forms for bell ringer/exit ticket Summative: Quizzes and tests

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. Intro to Chemistry and Scientific Measurements	3.2.9-12.A 3.2.9-12.G	3.2.6-8.C	FLINN measurements, discovering density,quizzes and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
2. Atomic Structure	3.2.9-12.A 3.2.9-12.T	3.2.6-8.A 3.2.6-8.I 3.2.6-8.Q 3.2.9-12.A 3.2.9-12.G	Radiation Lab, modeling nuclear decay, analyzing flame test data and emissions, quizzes and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
3. The Periodic Table and Bonding	3.2.9-12.A	3.2.6-8.A 3.2.9-12.A 3.2.9-12.G	POGIL, Card game, periodic trends lab, modeling electrons and bonding, diagraming Lewis structures, VSPER shape lab, quizzes and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	25 days
4. Nomenclature and Intro Moles	3.2.9-12.A 3.2.9-12.B 3.2.9-12.D	3.2.6-8.E 3.2.9-12.A 3.2.9-12.G	Hydrate lab, modeling moles, diagraming mole relationship with volume, KClOx lab, analyzing	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	25 days

			nomenclature, quizzes and test		
5. Chemical Reactions and Stoichiometry	3.2.9-12.C 3.2.9-12.G	3.2.6-8.D 3.2.6-8.E 3.2.6-8.F 3.2.9-12.A 3.2.9-12.G	Balancing chemical reactions, modeling reactions and solubility,	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	25 days
6. Kinetic Theory and Gas Laws	3.2.9-12.B 3.2.9-12.D 3.2.9-12.E	3.2.6-8.B 3.2.6-8.N 3.2.6-8.O 3.2.9-12.A 3.2.9-12.G	Phase lab, modeling gas laws lab, molar volume of hydrogen lab, quizzes and tests.	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
7. Solutions	3.2.9-12.E	3.2.9-12.A 3.2.9-12.G	Solubility curve lab, Colligative properties analysis, freezing point depression lab, quizzes and test.	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
8.Acid Base	3.2.9-12.E	A2.2.2 3.2.9-12.A 3.2.9-12.G	POGIL, modeling acids and bases lab, titrations lab, quizzes and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days

Understood standards: basic algebra, basic reading and comprehension

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Honors Physics
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: Honors Physics will explore topics such as mechanics, thermodynamics, electromagnetism, waves, and fluid mechanics, and learn how they are interconnected. This course is designed to delve into the fundamental principles and concepts of physics through hands-on experiments, interactive activities, and mathematical modeling. Honors Physics utilizes Trigonometry and Geometry extensively. This course is designed for students desiring a challenging curriculum, but who choose not to enroll in AP Physics. By the end of this course, you will have a solid foundation in the basic concepts and principles of physics and be able to apply them to solve complex problems. You will also have gained valuable skills in critical thinking, problem-solving, and teamwork.

ANCHOR STANDARDS:

1. Forces and Motion
2. Types of Interactions
3. Definitions of Energy
4. Relationship Between Energy and Forces

KEY COURSE TEXT AND MATERIALS: Physics: Giancoli 6th edition 2005
ISBN: 0-13-184661-2

KEY ASSESSMENTS:
Diagnostic: None

Formative: Labs, activities, bell ringers/exit tickets, class discussions, gizmo
Summative: quiz and test

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. Measurement	2.1.HS Mathematics Core Standards	2.5.6-8.O	Classroom discussions and measurement activities.	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	5 days
2. One dimensional motion - constant velocity	3.2.9-12I	3.2.3.A 2.2.HS Mathematics Core Standards	Velocity lab, graphing practice, lab practicum, quiz and unit test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
2x. One dimensional motion - constant acceleration	3.2.9-12I 3.2.9-12K	3.2.3.A 2.2.HS Mathematics Core Standards	Acceleration lab, lab extensions, ball toss lab, lab practicum, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
3. Two dimensional motion	3.2.9-12I	3.2.3.A 2.3.HS Mathematics Core Statndards	Vector Addition activity, vector investigations, projectile lab, Pirate lab, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days

4. Forces	3.2.9-12I 3.2.9-12K	3.2.6-8.H	Force diagram, Newton's law labs, Atwood's lab, Friction lab, inclined plane lab, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
5. Energy	3.2.9-12L	3.2.6-8.L 3.2.6-8.O 3.2.6-8.P	Gizmo, ball toss lab, model friction and energy lab, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
6. Momentum	3.2.9-12J 3.2.9-12K 3.2.9-12P 3.2.9-12Q	3.2.6-8.G	Momentum and collision lab, gizmo, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
7. Rotational Motion	3.2.9-12L 3.2.9-12M 3.2.9-12S	3.2.6-8.C	Gizmos, Constant acceleration modeling, diagram rotational lab, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
8. Waves and Sound	3.2.9-12T	3.2.6-8.Q 3.2.6-8.R	Gizmo, Wave Lab, Modelling Wave Behavior, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
9. Electricity and	3.2.9-12M	3.2.6-8.I	Gizmo, series and	Content is teacher	15 days

Magnetism	3.2.9-12S	3.2.6-8.K	parallel lab, home energy use investigation, modeling circuits, quiz	created. In addition to lab/project supplies, materials are posted in Google Classroom.	
10. Light and Optics	3.2.9-12V 3.2.9-12W	3.2.6-8.R	Optics Lab, Gizmo, Diffraction and Light Spectra Lab, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
11. Fluid Mechanics	3.2.9-12Q	3.2.6-8.P	Gizmo, Density lab, modeling buoyancy, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
12. Thermodynamics	3.2.9-12Q 3.2.9-12R	3.2.6-8.M 3.2.6-8.N 3.2.6-8.B	Heat Transfer Lab, Gizmo, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	5 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Integrated Science
Content Area: Science
Grade Level: 9th
Date Developed: June 2023

COURSE OVERVIEW: Integrated Science is an introductory course that will help prepare students for the Keystone Biology Exam by examining the key concepts of Ecology, scientific investigation, physical science, and levels of biochemical organization. This course leads directly into the Keystone Biology course in 10th grade.
ANCHOR STANDARDS: 1. The History of Planet Earth 2. Earth Materials and Systems 3. Plate Tectonics and Large-Scale System Interactions 4. The Roles of Water in Earth's Surface Processes 5. Weather and Climate 6. Biogeology 7. Natural Resources 8. Natural Hazards 9. Human Impact on Earth's Systems
KEY COURSE TEXT AND MATERIALS: Physical Earth and Space Science: An Integrated Approach
KEY ASSESSMENTS: Diagnostic: None

Formative: Oral quizzes, labs and activities, bell ringers, exit tickets, gizmo, end of section reviews and class discussions
Summative: Quizzes and Tests

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Unit 1: Measurement	3.1.10.A 3.1.10.B 3.1.10.D 3.2.10.A	CC.2.1.HS.F.4 CC.2.1.HS.F.5	Edulastic, Lab investigations - measurements, gizmo, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
Unit 2: The scientific Process	BIO.B.3.3 3.2.10.C	3.1.10.D 3.2.10.A	Edulastic, Lab investigations - variables, gizmo, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	17 days
Unit 3: Mapping Earth	3.1.10.E 3.5.10.A	MS-ESS3-2	Edulastic, Lab investigations - topography, gizmo, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
Unit 4: Earth's Atmosphere and Weather	3.5.10.C HS-ESS2-2 HS-ESS2-5	MS-ESS2-5 MS-ESS2-6 MS-ESS3-2	Edulastic, Lab investigations - specific heat and	All content is teacher created. In addition to	17 days

	HS-ESS3-1	MS-ESS3-3 MS-ESS3-4 MS-ESS3-5	convection, gizmo, class discussion, and test	lab/project supplies, materials are posted in Google Classroom.	
Unit 5: Chemical Cycles and Climate Change	3.3.9-12.L 3.3.9-12.M 3.3.9-12.S	3.3.6-8.J 3.3.6-8.O	Edulastic, Lab investigations - pH, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
Unit 6: Earth's History and Rocks	3.3.9-12.G	3.3.6-8.D	Edulastic, Lab investigations - tree ring dating, gizmo, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	19 days
Unit 7: Changing Earth	3.3.9-12.F 3.3.9-12.G 3.3.9-12.H 3.3.9-12.I	3.3.6-8.D 3.3.6-8.E 3.3.6-8.F	Edulastic, Lab investigations - plate boundaries, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	17 days
Unit 8: Earthquakes and Volcanoes	3.3.9-12.O	3.3.6-8.K	Edulastic, gizmo, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	16 days

Unit 9: Water Systems	3.3.9-12.K	3.3.6-8.H 3.3.6-8.I 3.3.6-8.K	Edulastic, Lab investigations - water tables, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	17 days
Unit 10: How Water Shapes the Land	3.3.9-12.J	3.3.6-8.G 3.3.6-8.K	Edulastic, Lab investigations - water tables, class discussion, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Keystone Biology
Content Area: Science
Grade Level: Primarily 10th
Date Developed: June 2023

COURSE OVERVIEW: Biology is the study of life! This course examines structure, function, energy use, behavior and relationships in the world around us. The emphasis will be on cellular, molecular, and environmental aspects of life. Students will acquire skills needed to continue their education in science and develop the ability to address biosocial issues throughout their lives. This course will also emphasize a hands-on laboratory component. Students enrolled in Keystone Biology will take the Keystone Biology Exam during the spring of the school year.

ANCHOR STANDARDS:

1. Structure and Function
2. Growth and Development of Organisms
3. Organization for Matter and Energy Flow
4. Interdependent Relationships in Ecosystems
5. Cycles of Matter and Energy Transfer in Ecosystems
6. Ecosystem Dynamics, Functioning, and Resilience
7. Social Interactions and Group Behavior
8. Inheritance of Traits
9. Variation of Traits
10. Evidence of Common Ancestry and Diversity
11. Natural Selection
12. Adaptation

KEY COURSE TEXT AND MATERIALS: Miller and Levine: Biology 2019
KEY ASSESSMENTS: Diagnostic: CDT Formative: Oral quizzes, labs and activities, bell ringers, exit tickets, and class discussions Summative: Unit tests, keystone writing practices, projects; Keystone Exam

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
Unit: 1 Introduction to Biology - Characteristics of life and scientific method	3.1.9-12B 3.1.9-12C	3.1.6-8.C	Glow stick lab, graph interpretation, goldfish analysis, quizzes and tests	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
Unit 2: Biological molecules	3.1.9-12F	3.1.6-8.G	Infographics, protein structure lab, enzyme lab, gizmo, class discussions, quizzes, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
Unit 3: Energy transfer in cells	3.1.9-12E 3.1.9-12G 3.1.9-12J	3.1.6-8.F 3.1.6-8.G	ATP simulation, photosynthesis and CR model, respiration lab, oral quizzes and tests,	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	16 days

Unit 4: Cells and transport	3.1.9-12B 3.1.9-12C	3.1.6-8.A 3.1.6-8.B 3.1.6-8.D	Cell and organelle model, membrane model, homeostasis mechanisms via osmosis and diffusion labs, quizzes and tests	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
Unit 5: Cell cycle and cell division	3.1.9-12D 3.1.9-12Q	3.1.6-8.D 3.1.6-8.N	Cell cycle model, Cell division diagrams, gizmo, quizzes and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
Unit 6: Genetic information (DNA/RNA) structure and function	3.1.9-12A 3.1.9-12P 3.1.9-12Q	3.1.6-8.M 3.1.6-8.N	DNA model, codon game, diagrams of DNA processes, DNA extraction lab, flipcharts, genetic engineering simulations, oral quizzes, and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	22 days
Unit 7: Genetics and inheritance	3.1.9-12R	3.1.6-8.E 3.1.6-8.R	Predicting and analyzing inheritance patterns, blood type lab, quizzes and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
Unit 8: Evolution	3.1.9-12O 3.1.9-12R 3.1.9-12S	3.1.6-8.I 3.1.6-8.O 3.1.6-8.P	Evidence lab, natural selection simulation, gizmo,	All content is teacher created. In addition to	20 days

	3.1.9-12T 3.1.9-12U 3.1.9-12W 3.1.9-12X	3.1.6-8.Q 3.1.6-8.S 3.1.6-8.T	cladogram/phylogenetic tree construction, oral quizzes and test	lab/project supplies, materials are posted in Google Classroom.	
Unit 9: Ecology	3.1.9-12H 3.1.9-12I 3.1.9-12K 3.1.9-12L 3.1.9-12M 3.1.9-12N 3.1.9-12V	3.1.6-8.I 3.1.6-8.J 3.1.6-8.K 3.1.6-8.L 3.1.6-8.U	Biome diagram, model of energy flow in an ecosystem, scavenger hunt, limiting factor/carrying capacity lab, population growth models, quizzes and test	All content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	25 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Honors Organic Chemistry
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: This course is designed for students who are considering the pursuit of a science major or students who plan to pursue health-care professions. The course will emphasize the identification, naming and drawing of organic molecules with the following functional groups: alkanes, alkenes, alcohol, carboxylic acids, aldehydes, ketones, amines, amides, ethers, and esters. Characteristic chemical reactions of these functional groups will be introduced. Common organic laboratory skills, techniques and equipment will also be used.
ANCHOR STANDARDS: 1. Organization for Matter and Energy Flow in Organisms 2. Structures and Properties of Matter 3. Chemical Reactions
KEY COURSE TEXT AND MATERIALS: None
KEY ASSESSMENTS: Diagnostic: None Formative: POGILS, Labs and discussions Summative: Tests

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. Bonding and Isomerism	3.1.9-12F	3.2.9-12A 3.2.9-12C	Science in motion, FLINN organic smells.	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	14
2. Introduction to Nomenclature and Alkanes	3.1.9-12F	3.2.9-12A 3.2.9-12C	Vernier distillation Science in motion	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	14
3. Alkenes and Alkynes	3.1.9-12F	3.2.9-12A 3.2.9-12C	FLINN isomerization Lab	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12
4. Stereoisomerism	3.1.9-12F	3.2.9-12A 3.2.9-12C	Bucknell table top lab	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	8
5. Organic Reactions	3.1.9-12F	3.2.9-12E 3.2.9-12F	FLINN soap making, Caffeine Extraction	Content is teacher created. In addition to lab/project	10

				supplies, materials are posted in Google Classroom.	
6. Functional Groups	3.1.9-12F	3.2.9-12A 3.2.9-12C	Science in Motion	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	14
7. Spectroscopy and Structure Determination	3.1.9-12F	3.2.9-12A 3.2.9-12C	Science in Motion, IR Spectroscopy, Field Trip to Wilkes U for NMR	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Physics
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: Physics is an exciting and fun introductory concepts-based physics course! This course is designed to introduce you to the fundamental principles and concepts of physics through hands-on experiments and interactive activities. You will explore topics such as mechanics, thermodynamics, electromagnetism, waves, and fluid mechanics, and learn how they are interconnected. Throughout the course, you will engage in a variety of activities that will challenge your understanding of physics and encourage you to think creatively. By the end of this course, you will have a solid foundation in the basic concepts and principles of physics and be able to apply them to solve problems. You will also have gained valuable skills in critical thinking, problem-solving, and teamwork.

ANCHOR STANDARDS:

1. Forces and Motion
2. Types of Interactions
3. Definitions of Energy
4. Relationship Between Energy and Forces

KEY COURSE TEXT AND MATERIALS: Holt Physics 2006
ISBN: 0-03-073548-3

KEY ASSESSMENTS: Unit Exams

Diagnostic: None
Formative: Labs, activities, bell ringers/exit tickets, class discussions, gizmo
Summative: quiz and test

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. Measurement	2.1.HS Mathematics core standards	3.5.6-8.O	Classroom discussions and measurement activities.	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	5 days
2. One dimensional motion - constant velocity	3.2.9-12I	3.2.3.A	Velocity lab, graphing practice, lab practicum, quiz and unit test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
2x. One dimensional motion - constant acceleration	3.2.9-12I 3.2.9-12K	3.2.3.A	Acceleration lab, ball toss lab, lab practicum, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
3. Two dimensional motion	3.2.9-12I	3.2.3.A	Dr. Evil activity, vector investigations, projectile lab, Pirate lab, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in	15 days

				Google Classroom.	
4. Forces	3.2.9-12I 3.2.9-12K	3.2.6-8.H	Force diagram, Newton's law labs, Atwood's lab, Friction lab, inclined plane lab, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
5. Energy	3.2.9-12L	3.2.6-8.L 3.2.6-8.O 3.2.6-8.P	Gizmo, ball toss lab, model friction and energy lab, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
6. Momentum	3.2.9-12J 3.2.9-12K 3.2.9-12P 3.2.9-12Q	3.2.6-8.G	Momentum and collision lab, gizmo, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	20 days
7. Rotational Motion	3.2.9-12L 3.2.9-12M 3.2.9-12S	3.2.6-8.C	Gizmos, Constant acceleration modeling, diagram rotational lab, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
8. Waves and Sound	3.2.9-12.T	3.2.6-8.Q 3.2.6-8.R	Gizmos, Wave Lab, Quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days

9. Electricity and Magnetism	3.2.9-12M 3.2.9-12S	3.2.6-8.I 3.2.6-8.K	Gizmo, series and parallel lab, home energy use investigation, modeling circuits, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	15 days
10. Light and Optics	3.2.9-12.V 3.2.9-12.W	3.2.6-8.R	Optics Lab, Gizmo, Diffraction and Light Spectra Lab, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
11. Fluid Mechanics	3.2.9-12Q	3.2.6-8.P	Gizmo, Density lab, modeling buoyancy, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	10 days
12. Thermodynamics	3.2.9-12.Q 3.2.9-12.R	3.2.6-8.M 3.2.6-8.N 3.2.6-8.B	Heat Transfer Lab, Gizmo, quiz	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	5 days

Danville Area School District
Course Overview and Scope and Sequence

Course Title: Zoology
Content Area: Science
Grade Level: 11th and/or 12th
Date Developed: June 2023

COURSE OVERVIEW: Zoology is a semester course that focuses on animal biology. It presents a survey of the animal kingdom with emphasis on diversity, evolutionary relationships, and functional adaptation. Students will be able to explain the position of a group in the animal kingdom, identify the characteristics that distinguish one group from another, discuss the shared properties of living systems within the animal kingdom, discuss the structural levels of organization of animal body plans, and compare anatomical and physiological function among various members of the animal kingdom. This will be accomplished through lecture, observation, laboratory exercises (including dissection), presentations, projects, and demonstrations.

ANCHOR STANDARDS:

1. Structure and Function
2. Growth and Development
3. Interdependent Relationships in Ecosystems
4. Ecosystem Dynamics, Functioning, and Resilience
5. Social Interactions and Group Behavior
6. Evidence of Common Ancestry and Diversity
7. Natural Selection and Adaptation

KEY COURSE TEXT AND MATERIALS: none - all materials are teacher generated

KEY ASSESSMENTS: 7 unit tests, 8 laboratory analysis assignments for animal dissections

Diagnostic: None
Formative: labs, dissections, class discussions, reading guides
Summative: tests and projects

SCOPE AND SEQUENCE					
Unit	PRIORITY STANDARDS	SUPPORTING STANDARDS	ASSESSMENT	MATERIALS	TIMEFRAME
1. Intro to Zoology	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Class discussions, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	12 days
2. Simple Animals	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Starfish dissection, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
3. Worms	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Class discussions, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days

4. Mollusks	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Squid dissection, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
5. Arthropods	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Crayfish dissection, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
6. Insects	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12O 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Anatomy of insects, grasshopper dissection, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days
7. Vertebrates	3.1.9-12B	3.1.9-12H 3.1.9-12I 3.1.9-12L 3.1.9-12M 3.1.9-12S 3.1.9-12T 3.1.9-12W 3.1.9-12X	Perch and dogfish dissection, quiz and test	Content is teacher created. In addition to lab/project supplies, materials are posted in Google Classroom.	13 days