

Anselmo - Merna Public Schools Science

MISSION STATEMENT

The mission of the Anselmo - Merna Schools is to provide a flexible education in a safe environment and to help students develop into lifelong learners who value and respect themselves and others.

Through the effort of the community school and families, and themselves, the students will become responsible and productive citizens.

Effort By All = Education For All

SCIENCE PHILOSOPHY

We believe that students need an appreciation for and understanding of the scientific method and that this method is applicable to everyday life.

We believe that students should be able to successfully use scientific equipment.

We believe that students should be able to intelligently communicate and question scientific and technological issues.

We believe that students should understand the key concepts and principles of science.

We believe that students should have opportunities to learn about scientific careers and the scientific contributions made by men and women from various cultures.

SCIENCE OUTCOMES / GOALS

1. The student will learn and apply the scientific method.
2. The student will learn to use scientific equipment in laboratory situations.
3. The student will be aware that scientific thought, and the technology that results therefrom, is not always the best for society as a whole--that there are positives and negatives to the application of scientific knowledge.
4. The student will learn the concepts and principles of science.
5. The student will learn that many cultures and societies have contributed to today's scientific knowledge.

SCIENCE EDUCATION STRANDS

1. Matter
2. Force and Motion
3. Universe
4. Diversity
5. Cells and Heredity
6. Interdependence

Anselmo-Merna Curriculum

Grade/Course: Advanced Biology

Program Goal	Strand	Curricular Objectives The students will:	Standard Number	Assessment
4	1	compare and contrast elements and compounds	12.3.2	Chapter test
4	1	explain the chemical properties of various substances due to their structure	12.3.2	Chapter test
1,2, 4	1	Compare and contrast the types of chemical bonds including covalent, ionic, hydrogen, and van der Waals interactions	12.3.2, 12.3.3	Chapter test
4	1	describe the structure of water including the polarity and how this allows for hydrogen bonding	12.3.2, 12.3.3	Chapter test
4	1	Identify and apply the four emergent properties of water	12.3.2, 12.3.3	Chapter test
1,2, 4	1	explain how water dissociates to form acids and bases and how this process is an important life function especially in buffers.	12.3.2, 12.3.3	Chapter test
1,2,4	1	compare and contrast the different organic molecules: carbohydrates, proteins, lipids, & nucleic acids	12.4.5.	Chapter test
1,2,4	1	Identify how carbon forms the backbone of all organic molecules and the functional groups that allow for this to occur.	12.4.5.	Chapter test
1,2,4	5	compare and contrast the two laws of mendelian inheritance	12.4.2	Chapter test
1,2, 4	5	apply the laws of probability to Mendelian inheritance	12.4.2	Chapter test
1,2, 4	5	Identify various complex inheritance patterns to include polygenic inheritance, incomplete dominance, codominance, pleiotropy, and epistasis	12.4.2	Chapter test
1,2, 4	5	Identify human mendelian genetic inheritance patterns and explain how they occur	12.4.2	Chapter test
1,2, 4	5	explain how mendelian inheritance patterns are controlled based on chromosome behavior	12.4.2	Chapter test
1,2, 4	5	use <i>drosophila melanogaster</i> (fruit flies) to explain various inheritance patterns based on chromosomes	12.4.2	Chapter test
1,2, 4	5	Explain and calculate linkage patterns of chromosomes	12.4.2	Chapter test
1,2, 4	5	Identify and explain how se-linked genes for different organisms cause unique expressions	12.4.2	Chapter test
1,2, 4	5	identify and explain various genetic disorders due to chromosomal abnormalities	12.4.2	Chapter test
1,2,3,4,5	5	describe and demonstrate how DNA cloning works and explain the positives and negative sides of this technological advancement	12.4.2/12.6.2/	Chapter test
1,2,3,4,5	5	describe and demonstrate how gel electrophoresis and southern blotting works and explain the positives and negative sides of this technological	12.4.2/12.6.2	Chapter test
1,2,3,4,5	5	Explain the process and procedure behind how entire genomes can be mapped	12.4.2/12.6.2	Chapter test
1,2,3,4,5	5	Explain the positive and negative sides to mapping entire genomes of organisms and what the future may hold	12.4.2/12.6.2/	Chapter test
1,2, 4	4,5,6	describe and explain how cell division, cell differentiation, and morphogenesis are important to the development of embryos	12.4.1	Chapter test
1,2, 4	4,5,6	identify how different cell types originate from differential gene expression in cells with the same DNA	12.4.1	Chapter test
1,2, 4	4,5,6	explain how animal and plant tissues and organs arise from similar genetic and cellular patterns and processes	12.4.1	Chapter test
1,2, 4	4,5,6	Explain the difference between the three basic plant organs: roots, stems & leaves	12.4.1	Chapter test
1,2, 4	4,5,6	Identify and describe the various components of a root	12.4.1	Chapter test
1,2, 4	4,5,6	Identify and describe the various components of a stem	12.4.1	Chapter test
1,2, 4	4,5,6	Identify and describe the various components of a leaf	12.4.1	Chapter test
1,2, 4	4,5,6	Explain the difference between the three tissue systems: dermal, vascular, & ground	12.4.1	Chapter test
1,2, 4	4,5,6	Identify the meristematic regions of a plant and the cells and organs that arise from these regions	12.4.1	Chapter test

Anselmo-Merna Curriculum

Grade/Course: Biology 10th grade

Program Goal	Strand	Curricular Objectives	Standard Number	Assessment
4	1,4	define biology as the study of life	12.1.1/12.8.3/	12.2.1
4	1,4	identify that organisms require energy to do biological work	12.1.1/12.8.3/	12.2.1
4	1,4	differentiate between growth and development	12.1.1/12.8.3/	12.2.1
4	1,4	define and explain homeostasis	12.1.1/12.8.3/	12.2.1
4	1,4	describe how life is a continuous process	12.1.1/12.8.3/	12.2.1
4	1,4	identify and explain that organization is the result of energy use	12.1.1/12.8.3/	12.2.1
4	1,4	give examples of levels of biological organization	12.4.1 C	
4	1,4	explain adaptations as methods of survival	12.1.1/12.8.3/	12.2.1
1,2,3,4,5	1,4	compare the quality and quantity of early science to modern science	12.1.1/12.6.1/	12.2.1
1,2,3,4,5	1,4	compare and contrast science and technology	12.1.1/12.6.1/	12.2.1
1,4	1,4	list the processes of science	12.1.1/12.6.1/	12.2.1
1,2	1,4	understand the term "hypothesis"	12.1.1/12.6.1/	12.2.1
1,2,	1,4	differentiate between hypothesis and conclusion	12.1.1/12.6.1/	12.2.1
1,2	1,4	differentiate between control group and experimental group	12.1.1/12.6.1/	12.2.1
1,2	1,4	differentiate between hypothesis and theory	12.1.1/12.6.1/	12.2.1
1,2,4	5	distinguish between magnification power and resolving power	12.4.1	12.2.1
1,2,3,4,5	4	identify taxonomy as the science of classification of organisms	12.4.3 B/C/D;	12.4.3
1,2,3,4,5	4	explain why a common classification system is necessary	12.4.3 B/C/D;	12.4.3
3,4,5	4	compare and contrast Aristotle's and Linnaeus's system of	12.4.3 B/C/D;	12.4.3
3,4,5	4	describe the binomial nomenclature system of classification	12.4.3 B/C/D;	12.4.3
3,4,5	4	list and explain factors that are used in classifying organisms	12.4.3 B/C/D;	12.4.3
4	4	list the classification categories	12.4.3 B/C/D;	12.4.3
1,3,4,5	4	understand that more closely related organisms have more similar genetic makeups	12.4.3 B/C/D;	12.4.3
4	4	explain why we use a six kingdom classification system	12.4.3 B/C/D;	12.4.3
1,3	1	learn that a knowledge of matter is necessary to understand life	12.4.5 a/12.7.1	12.4.5
4	1	illustrate the structure of an atom	12.4.5 a/12.7.1	12.4.5
4	1	explain that the number of protons and electrons distinguishes an atom	12.4.5 a/12.7.1	12.4.5
4	1	identify organic compounds	12.4.5 a/12.7.1	12.4.5
1,2,3,4,5	1	compare and contrast the biological uses of carbohydrates, lipids, proteins, and nucleic acids	12.4.5 a/12.7.1	12.4.5
4	1	compare and contrast the processes of hydrolysis and condensation	12.4.5 a/12.7.1	12.4.5

Anselmo-Merna Curriculum

Grade/Course: Physics

Program Goal	Strand	Curricular Objectives The students will:	Standard Number	Assessment
1,4	2	review basic physics skills to include scientific notation, significant figures, and conversions	12.2.1	chapter test
1,4	2	Identify, explain and apply linear motion, to include distance, displacement, speed, velocity, average speed, instantaneous speed, and average velocity	12.3.4	chapter test
1,4	2	identify, explain, and apply the linear motion of acceleration	12.3.4	chapter test
1,4	2	Identify and describe the linear motion of objects using diagrams including, ticker tapes, vector diagrams, and motion graphs	12.3.4	chapter test
1,4	2	Identify, describe, and apply the motion of objects in free-fall	12.3.4/12.6.1	chapter test
1,4	2	Identify and describe the major types of forces	12.3.4	chapter test
1,4	2	Identify and describe the term force	12.3.4	chapter test
1,4	2	Explain the difference between mass and weight of an object	12.3.4	chapter test
1,4	2	Identify and create force body diagrams for given on an object, and then apply these to determine the net force upon the object	12.3.4	chapter test
1,4	2	Identify, describe and apply Newton's 1st Law of Motion: The law of inertia	12.3.4/12.8.1/	chapter test
1,4	2	Identify, describe and apply Newton's 2nd law of motion	12.3.4/12.8.1/	chapter test
1,4	2	Apply Newton's 2nd law of motion to Free-Fall and Air Resistance	12.3.4/12.8.1/	chapter test
1,4	2	Identify, describe and apply Newton's 3rd law of motion: equal and opposite reaction forces	12.3.4/12.8.1/	chapter test
1,4	2	identify and create vector diagrams and apply them by adding vectors together to determine the resultant vector of an object	12.3.4	chapter test
1,4	2	Identify and describe projectile motion and use the equations to solve for the various velocities, accelerations, heights, distances, times, and forces of	12.3.4	chapter test
1,4	2	Analyze and apply force body diagrams in two-dimensions, this includes motion on inclined planes, as well as statics	12.3.4	chapter test
1,4	2	Identify, describe and apply momentum and impulse in the motion of objects	12.3.4	chapter test
1,4	2	Describe and apply the law of conservation of momentum in an object's motion and the effects of this law on the motion of other objects during	12.3.4	chapter test
1,4	2	Identify, describe and apply the concepts of work and power	12.3.4	chapter test
1,4	2	Identify, describe, and apply the concepts of kinetic energy and potential energy	12.3.5	chapter test
1,4	2	Analyze and apply the work-energy theorem	12.3.5	chapter test
1,4	2	Identify and characterize the motions of objects in circular paths	12.3.4	chapter test
1,4	2	Identify and apply the forces on objects in circular paths through free-body diagrams	12.3.4	chapter test
1,4	2	Apply Newton's 2nd law of motion to objects in circular motion	12.3.4	chapter test
1,4	2	Identify, explain, and apply the effect of gravity on circular motion	12.3.4	chapter test
1,4	2	Identify and describe the effects of gravity from circular motion to that of planetary and satellite motion	12.3.4/12.6.2	chapter test
1,4	2	Identify and describe waves, their motion, characteristics, and properties	12.3.6	chapter test
1,4	2	Identify, and describe wave behavior at boundaries to include reflection, refraction, and diffraction, as well as interference of waves--constructive and	12.3.6	chapter test
1,4	2	identify, explain, and describe the doppler effect	12.3.6	chapter test
1,4	2	compare and contrast standing versus traveling waves	12.3.6	chapter test
1,4	2	identify and describe the formation of standing waves	12.3.6	chapter test

