

Life Science

Course/Class Description: Required course for 7th graders. Discusses aspects of life at a multicellular level. Includes some of the basic building blocks for biology.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (Specific textbook chapters, website, videos, activities, novels, etc.)
Q1	8.3.1.a-c	<ul style="list-style-type: none"> -Use all tools in measuring situations -Create 'cell cities' representing cell organelles -lecture -Venn diagram (plant vs animal cell) -Group discussions 	<ul style="list-style-type: none"> Tool quiz Observation of tool use in lab Daily work Labs Quiz Tests PowerPoint (microorganism) 	<ul style="list-style-type: none"> "Beginning of the Year" binder-metric division Life Sci-Binder "Test 1" School website-->Academics-->Science Student references-->"Life Sci Test 1" Life Science book Ch. 3-4 Life Sci-Binder "Test 2" School website-->Academics-->Science Student references-->"Life Sci Test 2" Life Science book Ch. 5-7
Q2	8.3.1.e 8.3.2.b 8.3.3.c 8.3.3a-b, d-g	<ul style="list-style-type: none"> -View root, stem, leaf PowerPoints -Make posters -Dissect fruits -Create flower part model 	<ul style="list-style-type: none"> Quizzes Daily work Labs Project (flower model) Test Imaginary ecosystem 	<ul style="list-style-type: none"> Life Sci-Binder "Test 3" School website-->Academics-->Science Student references-->"Life Sci Test 3" Life Science book Ch. 8-9 Life Sci-Binder "Test 4"

Earth Science

Course/Class Description: Required class for 8th graders. Deals with nonliving components of Earth and Earth's history and development.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (Specific textbook chapters, website, videos, activities, novels, etc.)
Q1	<ul style="list-style-type: none"> ● 8.4.1.a-c ● 8.1.2.a-c ● 12.4.1.a-c 	<ul style="list-style-type: none"> ● Use all tools in measuring situations ● Classroom activities ● Lecture ● Debates ● Small and large group discussions 	<ul style="list-style-type: none"> ● Tool quiz ● Observation of tool use in lab ● Daily work ● Quiz ● Classroom activities ● Project (solar system model) 	<ul style="list-style-type: none"> ● "Beginning of the Year" binder-metric division ● Earth Sci-Binder "Test 1" ● School website-->Academics-->Science Student references-->"Earth Sci Test 1" ● Earth Science book Ch. 2 ● Earth Sci-Binder "Test 2" ● School website-->Academics-->Science Student references-->"Earth Sci Test 2" ● Earth Science book Ch. 3
Q2	<ul style="list-style-type: none"> ● 8.4.1.b-c ● 8.4.2.d ● 8.4.3.a-c ● 8.4.2.c, g ● 12.4.3.d 	<ul style="list-style-type: none"> ● Classroom activities ● Lecture ● Debates ● Small and large group discussions ● Research ● "Weatherman" presentation 	<ul style="list-style-type: none"> ● Quiz ● Test ● Daily work ● Classroom activities ● Weatherman presentation ● Quizzes 	<ul style="list-style-type: none"> ● Earth Sci-Binder "Test 3" ● School website-->Academics-->Science Student references-->"Earth Sci Test 3" ● Earth Science book Ch. 4, pg. 104-105 ● Earth Sci-Binder "Test 4"

Physical Science

Course/Class Description: Requirement for all freshmen. Teaches the basics of physics and chemistry. Includes a great deal of age appropriate math.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (Specific textbook chapters, website, videos, activities, novels, etc.)
Q1	<ul style="list-style-type: none"> • 12.2.1.b • 12.2.1.c • 12.2.1.f • 12.2.1.g • 12.2.1.h 	<ul style="list-style-type: none"> • Read safety packet • Safety skits • Safety scavenger hunt • Lecture • Labs • Classroom activities 	<ul style="list-style-type: none"> • Tool quiz • Observation of tool use in lab • Safety skits • Daily work • Labs • Quizzes • Tests 	<ul style="list-style-type: none"> • "Beginning of the Year" binder-metric division • Physical science-Binder "Safety" • Physical science-Binder "Test 1" • School website-->Academics-->Science • Student references-->"Physical science Test 1" • Physical science book Ch. 2 • Physical science-Binder "Test 2" • School website-->Academics-->Science • Student references-->"Physical science Test 2" • Physical science book Ch. 11-12
Q2	<ul style="list-style-type: none"> • 12.2.1.a • 12.2.1.d • 12.2.1.e • 12.2.1.g • 12.2.1.h • 12.2.3.k • 12.1.2.a-d 	<ul style="list-style-type: none"> • Classroom activities • Research (atomic theorist) • Lecture • Labs • Computer practice for new skills 	<ul style="list-style-type: none"> • Daily work (graded and ungraded) • Labs • Quizzes • Test • Classroom activities 	<ul style="list-style-type: none"> • Physical science-Binder "Test 3" • School website-->Academics-->Science • Student references-->"Physical science Test 3" • Physical science book Ch. 13-15

Biology

Course/Class Description: Required class for sophomores. Discusses life and processes at a cellular level. Also looks at interactions of life in ecosystems and evolution.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (Specific textbook chapters, website, videos, activities, novels, etc.)
Q1	<ul style="list-style-type: none"> 12.3.1.a-c 	<ul style="list-style-type: none"> Use all tools in measuring situations Classroom activities Macromolecule ID labs (carbohydrate, lipids, proteins, nucleic acids) Create the "Cellgive Review" newspaper Complete transport labs (osmosis, diffusion) Lecture Small and large group discussions 	<ul style="list-style-type: none"> Tool quiz Observation of tool use in lab Daily work (labs) Quizzes Test Project (mitosis model) 	<ul style="list-style-type: none"> "Beginning of the Year" binder-metric division Biology-Binder "Test 1" School website-->Academics-->Science Student references-->"Biology Test 1" Biology book Ch. 4-2, 3 Biology-Binder "Test 2" School website-->Academics-->Science Student references-->"Biology Test 2" Biology book Ch. 5
Q2	<ul style="list-style-type: none"> 12.3.1c 12.3.2.a-c 	<ul style="list-style-type: none"> Classroom activities Lecture Research Labs 	<ul style="list-style-type: none"> Daily work (labs) Quizzes Test Project (mitosis) 	<ul style="list-style-type: none"> Biology-Binder "Test 3" School website-->Academics-->Science Student references-->"Biology Test 3" Biology book Ch. 6

Chemistry

Course/Class Description: Elective only open to juniors and seniors. Will fulfill college "lab class" requirements.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (Specific textbook chapters, website, videos, activities, novels, etc.)	Ne Academic Standards (non-core areas)
Q1	12.2.1.f	<ul style="list-style-type: none"> • Use all tools in measuring situations (36 for chem) • Content related labs • Lecture • Practice on white boards/lg board • Read "extention articles" in class and discuss • Prepare for mole day 	<ul style="list-style-type: none"> • Tool quiz • Observation of tool use in lab • Daily work (labs) • Quizzes • Tests • Daily work • Lab books • Creative writing assignment 	<ul style="list-style-type: none"> • "Beginning of the Year" binder-metric division • "Beginning of the Year" binder-tools Chemistry-Binder "Ch. 1" • School website-->Academics-->Science • Student references-->"Chem Ch. 1" • "Modern Chemistry" Ch. 1 • Chemistry-Binder "Ch. 2" • School website-->Academics-->Science • Student references-->"Chem Ch. 2" • "Modern Chemistry" Ch. 2 • Chemistry-Binder "Ch. 3" • School website-->Academics-->Science • Student references-->"Chem Ch. 3" • "Modern Chemistry" Ch. 3 • Chemistry-Binder "Ch. 4" • School website-->Academics-->Science • Student references-->"Chem Ch. 4" • "Modern Chemistry" Ch. 4 • Chemistry-Binder "Labs" 	
Q2	12.2.1.a	<ul style="list-style-type: none"> • Content related labs 	<ul style="list-style-type: none"> • Quizzes 	<ul style="list-style-type: none"> • Chemistry-Binder "Ch. 5" 	

A&P

Course/Class Description: Limited to juniors and seniors, primarily those entering the health care field. Uses a systematic approach to discuss the anatomy and physiology of body systems.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (specific textbook chapters, website, videos, activities, novels, etc.)
Q1	12.3.1.a-d 12.3.2.a, c	<ul style="list-style-type: none"> Classroom activities Research Lecture Group discussions Videos Labs Research/present disorders 	<ul style="list-style-type: none"> Daily work Labs Quiz ID quizzes Tests Research/pre sentation of disorders 	<ul style="list-style-type: none"> A&P-Folder "Test 1," "Test 2," "Test 3," "Test 4" School website-->Academics-->Science Student references-->"A&P Test 1," "A&P Test 2," "A&P Test 3," "A&P Test 4" A&P book Ch. 1, 2, 3, 4
Q2	12.3.1.d 12.3.2.a, c	<ul style="list-style-type: none"> Classroom activities Research Lecture Group discussions Videos Labs Research/present disorders 	<ul style="list-style-type: none"> Daily work Labs Quiz Tests Research/pre sentation of disorders 	<ul style="list-style-type: none"> A&P-Folder "Test 5," "Test 6," "Test 7," "" School website-->Academics-->Science Student references-->"A&P Test 5," "A&P Test 6," "A&P Test 7" A&P book Ch. 5, 6, 7
Q3	12.3.1.d 12.3.2.a, c	<ul style="list-style-type: none"> Classroom activities Research 	<ul style="list-style-type: none"> Daily work Labs 	<ul style="list-style-type: none"> A&P-Folder "Test 8," "Test 9," "Test 10," ""

Environmental Science

Course/Class Description: Mainly for juniors and seniors. Study the interaction of the environment and humans. Primarily lab/project-based. Much of the curriculum and methods are decided by students.

	NE State Standard/Benchmark (all standards and "sub-standards"/indicators must be accounted for) Bold all standards assessed on NeSA	Learning Activities	Evaluation Techniques	Resources (Specific textbook chapters, website, videos, activities, novels, etc.)
Q1	12.3.1.d 12.3.3.a 12.3.3.b	<ul style="list-style-type: none"> • Create graphs of GreenFiber recycling totals • Research worm care and monitor worm health (red wiggler worms) • Modify and monitor recycling program as needed • Class choice 	<ul style="list-style-type: none"> • GreenFiber graphs • Successful worm farm • Labs • Class observation • Recycling program successfully implemented 	<ul style="list-style-type: none"> • Environmental Science-Binder "Worms" • School website-->Academics-->Science Student references-->"Environmental Science Recycling" • Environmental Science-Binder "Recycling" • School website-->Academics-->Science Student references-->"Environmental Science Worms" • Other binders with various topics students might choose
Q2	12.3.1.d 12.3.3.a 12.3.3.c 12.3.3.d	<ul style="list-style-type: none"> • ID nearby trees • ID examples brought in by students and teacher • Complete stream tests at Cedar Creek • Monitor recycling program 	<ul style="list-style-type: none"> • ID test (tree) • Evaluation of stream • Prezi • Class observation • Recycling program successfully implemented 	<ul style="list-style-type: none"> • Environmental Science-Binder "Trees" • School website-->Academics-->Science Student references-->"Environmental Science Trees" • Book: "Fruit and twig key" • Book: "What tree is that?" tree ID guide • Book: "Tree identification manual"

Life Science

Test 1

8.3.1 Students will investigate and describe the structure and function of living organisms.

8.3.1a Recognize the levels of organization in living organisms (cells, tissues, organs, organ systems, organisms).

8.3.1b Recognize that all organisms are composed of one or many cells; that these cells must grow, divide, and use energy; and that all cells function similarly.

8.3.1c Recognize specialized cells perform specialized functions in multicellular organisms.

State the three basic concepts included in the cell theory.

Name some cell organelles and describe the function of each.

Recognize and describe the cellular process.

Describe the differences between animal and plant cells.

Explain the need and use of a biological classification system.

Explain the need and use of binomial nomenclature.

Parent Signature _____

Life Science

Test 2

Evaluate the impact of viruses, bacteria, protists and fungi on daily life.

Viruses:

Describe the appearance, characteristics, and locations of viruses.

Explain the life functions that viruses are and are not capable of performing.

List several harmful and beneficial applications of viruses.

Bacteria:

Describe the appearance, characteristics, and locations of bacteria.

Describe the methods by which bacteria obtain energy and reproduce.

List several harmful and beneficial applications of bacteria.

Protists:

Describe the appearance, characteristics, and locations of protists.

Describe the methods by which protists obtain energy and reproduce.

List several harmful and beneficial applications of protists.

Fungi:

Describe the appearance, characteristics, and locations of fungi.

Describe the food absorbing and reproductive structures common to most fungi.

List several harmful and beneficial applications of fungi.

Parent's signature: _____

Life Science

Test 3

8.3.1 Students will investigate and describe the structure and function of living organisms.

8.3.1.e Describe how plants and animals respond to environmental stimuli.

8.3.2 Students will investigate and describe the relationship between reproduction and heredity.

8.3.2.b Compare and contrast sexual and asexual reproduction.

8.3.3 Students will describe populations and ecosystems.

8.3.3.c Recognize that producers transform sunlight into chemical energy through photosynthesis.

- Compare the functions of roots, stems and leaves and how the vascular system allows for transport of water and nutrients throughout.

Test date: _____

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Life Science

Test 4

8.3.3 Students will describe populations and ecosystems.

- 8.3.3.a Diagram and explain the flow of energy through a simple food web.
- 8.3.3.b Compare the roles of producers, consumers, and decomposers in an ecosystem.
- 8.3.3.d Determine the biotic and abiotic factors that impact the number of organisms an ecosystem can support.
- 8.3.3.e Recognize a population is all the individuals of a species at a given place and time.
- 8.3.3.f Identify symbiotic relationships among organisms.
- 8.3.3.g Identify positive and negative effects of natural and human activity on an ecosystem.

Test date: _____

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Life Science

Test 5

8.3.2 Students will investigate and describe the relationship between reproduction and heredity.

8.3.2.a Recognize that hereditary information is contained in genes within the chromosomes of each cell.

- Define genetics.
- Explain the chromosome theory of heredity.
- Describe the use of selective breeding to improve characteristics in plants and animals.
- Name ways genetic engineering has contributed to medicine and agriculture.

8.3.2.b Compare and contrast sexual and asexual reproduction.

Test date: _____

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Life Science

Test 6

8.3.4 Students will identify characteristics of organisms that help them survive.

8.3.4.a Describe how an inherited characteristic enables an organism to improve its survival rate.

8.3.4.b Recognize the extinction of a species is caused by the inability to adapt to an environmental change.

8.3.4.c Use anatomical features of an organism to infer similarities among other organisms.

Test date: _____

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Life Science

Test 7

8.3.1 Students will investigate and describe the structure and function of living organisms.

8.3.1.d Identify the organs and functions of the major systems of the human body and describe ways that these systems interact with each other.

- Describe the primary components of and explain the role of the following systems in the human body:

- Skeletal
- Muscular
- Digestive
- Circulatory
- Respiratory
- Excretory
- Nervous
- Endocrine
- Reproductive

Test date: _____

Parent's signature: _____

Earth Science

Test 1

12.4 Students will investigate and describe the known universe.

12.4.1a Describe the formation of the universe using the Big Bang theory.

12.4.1b Recognize that stars, like the Sun, transform matter into energy by nuclear reactions which leads to the formation of other elements.

12.4.1c Describe stellar evolution.

8.1.2a Recognize science is an ongoing process and the scientific community accepts and uses explanations until they encounter new experimental evidence not matching existing explanations.

Describe the characteristics of a galaxy.

Identify constellations and know their importance in history.

Discuss the current theories about black holes.

Parent Signature _____

Earth Science

Test 2

8.4 Students will investigate and describe Earth and the solar system.

Investigate the development of theories regarding space science and how they've progressed due to increasing technology.

8.4.1a Describe the components of the solar system (the Sun, planets, moons, asteroids, comets).

- Describe the nebular theory and explain how it accounts for the formation of our solar system.
- Explain why planets differ based on formation.
- Describe the motion of the planets and explain why they stay in orbit.

8.4.1c Describe the effects of gravity on Earth (tides) and the effect of gravity on objects in the solar system.

8.1.2a Recognize science is an ongoing process and the scientific community accepts and uses explanations until they encounter new experimental evidence not matching existing explanations.

8.1.2c Recognize scientists from various cultures have made many contributions to explain the natural world.

Explain the source and risks of space junk.

Parent's signature: _____

Earth Science

Test 3

8.4.1 Students will investigate and describe Earth and the solar system.

8.4.1b Describe the relationship between motion of objects in the solar system and the phenomena of *day, year, eclipses, phases of the Moon and seasons*.

8.4.1c Describe the effects of gravity on Earth (tides) and the effect of gravity on objects in the solar system.

8.4.2 Students will investigate and describe Earth's structure, systems, and processes.

8.4.1d Describe evidence of Earth's magnetic field.

Students will investigate the differences between the Earth and the moon.

List the main features of the moon – highlands, maria, rilles.

Explain the force that maintains an atmosphere on earth and identify the characteristics that currently deny the moon from maintaining an atmosphere.

Describe the atmosphere of the moon.

Discuss and evaluate theories of the origin of the moon.

Compare statistics about the diameter, gravity, and density of the earth and moon.

Test Date: _____

Parent's signature: _____

Earth Science

Test 4

8.4.2 Students will investigate and describe Earth's structure, systems, and processes.

- 8.4.2.c Describe the mixture of gasses in Earth's atmosphere and how the atmosphere's properties change at different elevations.
- Describe the four main layers of the atmosphere of earth and occurrences in each.
- 8.4.2.g Describe the water cycle (evaporation, condensation, precipitation).

8.4.3 Students will investigate and describe energy in Earth's systems.

- 8.4.3.b Identify factors that influence daily and seasonal changes on Earth (Tilt of the Earth, humidity, air pressure, air masses).
- 8.4.3.c Describe atmospheric movements that influence weather and climate (air masses, jet stream)

Test date: _____

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Earth Science

Test 5

8.4.2 Students will investigate and describe Earth's structure, systems, and processes.

8.4.2.a Describe the layers of Earth (core, mantle, crust, atmosphere)

8.4.2.b Describe the physical composition of soil.

8.4.2.e Compare and contrast constructive and destructive forces (deposition, erosion, weathering, plate motion causing uplift, volcanoes, earthquakes) that impact Earth's surface.

8.4.2.f Describe the rock cycle.

Test date: _____

Parent's signature: _____

Earth Science

Test 6

8.4.4 Students will use evidence to draw conclusions about changes in Earth.

- List common life forms found in each geologic era.
- List major geological events in each era.
- Contrast the early Earth with the planet we live on today.

8.4.4.a Recognize that Earth processes we see today are similar to those that occurred in the past (uniformity of processes).

- Explain how faults, extrusions and intrusions provide clues to earth's past.

8.4.4.b Describe how environmental conditions have changed through use of the fossil record.

- Describe how scientists use index fossils to tell about earth's history.
- Describe how scientists use radioactive dating to tell how old fossils & rocks are.

Test date: _____

Parent's signature: _____

Earth Science

Test 7

8.4.2 Students will investigate and describe Earth's structure, systems, and processes.

8.4.2.h Classify Earth materials as renewable or nonrenewable.

- List pros and cons of renewable resources (wind, solar, geothermal, hydro, biofuel)
- List pros and cons of nonrenewable resources (natural gas, nuclear, petroleum, coal)
- Understand the importance of using balanced energy options
- Describe the importance of energy conservation and methods that they can use to conserve energy

Test date: _____

Parent's signature: _____

Physical Science

Safety Introduction

Demonstrate appropriate behaviors and techniques when working in a science lab.

- Recognize safety symbols.
- Explain the reasons for each laboratory rule.
- Demonstrate the use of important safety rules followed in the classroom laboratory.
- Describe how to respond to possible laboratory emergencies.

Parent Signature _____

Physical Science

Test 1

12.2 Students will investigate and describe matter in terms of its structure, composition and conservation.

12.2.1c Describe the three normal states of matter (solid, liquid, gas) in terms of energy, particle arrangement, particle motion, and strength of bond between molecules.

12.2.1b Describe the energy associated with phase changes between solids, liquids, and gasses.

Describe matter in terms of mass, weight, and volume.

Define density and compare the densities of various objects.

State the gas laws.

Distinguish between physical and chemical properties of matter and explain how each is useful in identifying substances.

Test Date _____

Parent Signature _____

Physical Science

Test 2

- 12.2 Students will investigate and describe matter in terms of its structure, composition and conservation.**
- 12.2.1f Recognize the charges and relative location of subatomic particles (neutrons, protons, electrons)
- 12.2.1g Describe properties of atoms, ion, and isotopes.
- 12.2.1h Describe the organization of the periodic table of elements with respect to patterns of physical and chemical properties.
- 12.1.2a Recognize that scientific explanations much be open to questions, possible modification, and must be based upon historical and current scientific knowledge.
- 12.1.2c Recognize tha the work of science results in incremental advances, almost always building on prior knowledge, in our understanding of the world.
- 12.1.2d Research and describe the difficulties experienced by scientific innovators who had to overcome commonly held beliefs of their times to reach conclusions that we now take for granted.
- (John Dalton, J.J. Thomson, Ernest Rutherford, and Neils Bohr)

Test Date: _____

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Physical Science

Test 3

Students will investigate and describe matter in terms of its structure, composition, and conservation.

12.2.1.a Recognize bonding occurs when outer electrons are transferred (ionic) or shared (covalent).

12.2.1.d Recognize a large number of chemical reactions involve the transfer of either electrons (oxidation/reduction) or hydrogen ions (acid/base) between reacting ions, molecules, or atoms.

12.2.1.e Identify factors affecting rates of chemical reactions (temperature, particle size, surface area).

12.2.1.g Describe properties of atoms, ions, and isotopes.

12.2.3.k Identify endothermic and exothermic reactions.

Describe that a chemical reaction is accompanied by a change in properties.

Explain how a chemical equation illustrates the law of conservation of mass. Balance to prove this.

Classify different types of chemical reactions.

Parent's signature: _____

Physical Science

Test 4

Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.

12.2.3.h Recognize that nuclear reactions (fission, fusion, radioactive decay) convert a fraction of the mass of interacting particles into energy, and this amount of energy is much greater than the energy in chemical interactions.

- Know the harmful effects of nuclear energy.
- Name ways we use nuclear energy

Parent's signature: _____

Physical Science

Test 5

12.2.3 Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.

- 12.2.3.a Describe mechanical wave properties (speed, wavelength, frequency, amplitude) and how waves travel through a medium.
- 12.2.3.b Recognize that the energy in waves can be changed into other forms of energy.
- 12.2.3.c Recognize that light can behave as a wave (diffraction and interference).
- 12.2.3.f Recognize that the production of electromagnetic waves is a result of changes in the motion of charges or by a changing magnetic field.
- 12.2.3.g Compare and contrast segments of the electromagnetic spectrum (radio, micro, infrared, visible, ultraviolet, x-rays, gamma) based on frequency and wavelength.

Test date: _____

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Physical Science

Test 6

12.2.3 Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.

12.2.3.b Recognize that the energy in waves can be changed into other forms of energy.

12.2.3.d Distinguish between temperature (a measure of the average kinetic energy of atomic or molecular motion) and heat (the quantity of thermal energy that transfers due to a change in temperature).

12.2.3.e Compare and contrast methods of heat transfer and the interaction of heat with matter via conduction, convection, and radiation.

12.2.3.i Interpret the law of conservation of energy to make predictions for the outcome of an event.

12.2.3.j Identify that all energy can be considered to be either kinetic, potential, or energy contained by a field (e.g. electromagnetic waves).

Test date: _____

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Physical Science

Test 7

Students will investigate and describe the nature of field forces and their interactions with matter.

12.2.2.a Describe motion with respect to displacement and acceleration.

12.2.2.b Describe how the law of inertia (Newton's 1st Law) is evident in a real-world event.

12.2.2.c Make predictions based on relationships among net force, mass, and acceleration (Newton's 2nd Law).

12.2.2.d Recognize that all forces occur in equal and opposite pairs (Newton's 3rd Law).

12.2.2.e Describe how Newton's 3rd Law of Motion is evident in a real-world event.

12.2.2.f Describe gravity as a force that each mass exerts on another mass, which is proportional to the masses and the distance between them.

12.2.2.g Recognize that an attractive or repulsive electric force exists between two charged particles and that this force is proportional to the magnitude of the charges and the distance between them.

Parent's signature: _____

Biology

Test 1

12.3 Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.

12.3.1a Identify the complex molecules (carbohydrates, lipids, proteins, nucleic acids) that make up living organisms.

- Discuss the general composition and importance of a macromolecule.
- Compare and contrast the structure of simple and complex carbohydrates.
- Give examples of carbohydrates and relate their function according to their types.
- Compare and contrast the structure of saturated and unsaturated fats.

12.3.1a Give examples of lipids and relate their function according to their types.

12.3.1a Describe the structure of proteins and explain the factors that affect their three-dimensional shape.

12.3.1a Give examples of proteins and relate their function according to their structure.

12.3.2a Compare and contrast the structure of DNA and RNA.

12.3.2b Describe the basic structure of DNA and its function in genetic inheritance.

Parent Signature _____

Biology

Test 2

12.3 **Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.**

12.3.1b Identify the form and function of sub-cellular structures that regulate cellular activities.

12.3.1c Describe the cellular functions of photosynthesis, respiration, cell division, protein synthesis, transport of materials, and energy capture/release.

Predict the interaction of molecules with the phospholipid bilayer on cell functions.

Diagram the three surface proteins and differentiate among their functions.

Describe and critique the theory of the origin of eukaryotic cells.

Parent's signature: _____

Biology

Test 3

12.3.1 **Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.**

12.3.1c Describe the cellular functions of photosynthesis, respiration, cell division, protein synthesis, transport of materials, and energy capture/release.

- Diagram how and tell why ATP is broken down to fuel a cell.

- Photosynthesis:
 - Outline and describe the three stages of photosynthesis.

- Cellular respiration:
 - Describe cellular respiration and its products.
 - Contrast fermentation and oxidative respiration.
 - Evaluate the reasons for use of oxidative respiration instead of fermentation in most living things.

Test date: _____

Parent's signature: _____

Biology

Test 4

12.3.1 Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.

12.3.1.c Describe the cellular functions of photosynthesis, respiration, *cell division*, protein synthesis, transport of materials, and energy capture/release.

- Mitosis:
 - Describe the structure of a chromosome.
 - Distinguish between diploid and haploid cells.
 - Examine a karyotype in order to study chromosomal pairs, including sex chromosomes.

- Meiosis:
 - Contrast a gamete with a somatic body cell.
 - Explain how the two stages of meiosis reduce the number of chromosomes in a cell by half.
 - Predict the effect crossing-over will have in creating genetic variation.
 - Give evidence to support the importance and function of meiosis and mitosis in given situations.

Test date: _____

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Biology

Test 5

12.2.1 Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.

12.3.1.c Describe the cellular functions of photosynthesis, respiration, cell division, *protein synthesis*, transport of materials, and energy capture/release.

- Explain the steps of DNA replication.
- Compare and contrast DNA and RNA.

12.3.2 Students will describe the molecular basis of reproduction and heredity.

12.3.2.b Describe the basic structure of DNA and its function in genetic inheritance.

12.3.2.c Recognize how mutations could help, harm, or have no effect on individual organisms.

12.1.2 Students will apply the nature of scientific knowledge to their own investigations and in the evaluation of scientific explanations.

12.1.2.a Recognize that scientific explanations must be open to questions, possible modifications, and must be based up on historical and current scientific knowledge.

12.1.2.b Describe how society influences the work of scientists and how science, technology, and current scientific discoveries influence and change society.

12.1.2.c Recognize that the word of science results in incremental advances, almost always building on prior knowledge, in our understanding of the world.

Test date: _____

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Biology

Test 6

12.3.2 Students will describe the molecular basis of reproduction and heredity.

12.3.2.a Identify that information passed from parents to offspring is coded in DNA molecules.

- Explain and apply complex patterns of inheritance to given situations.
- Demonstrate the use of the following terms: gene, allele, dominant, recessive, homozygous, heterozygous, genotype and phenotype.
- Relate Mendel's Law of Segregation and Law of Independent Assortment to the behavior of chromosomes during meiosis.

12.3.2.c Recognize how mutations could help, harm, or have no effect on individual organisms.

12.3.2.d Describe that sexual reproduction results in a largely predictable, variety of possible gene combinations in the offspring of any two parents.

- Summarize the garden-pea experiments performed by Gregor Mendel and explain why his use of mathematics resulted in successful conclusions.
- Evaluate and construct a pedigree.

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Biology

Test 7

12.3.4 Students will describe the theory of biological evolution.

12.3.1.d Describe how an organism senses changes in its internal or external environment and responds to ensure survival.

12.3.4.a Identify different types of adaptations necessary for survival (morphological, physiological, behavioral)

12.3.4.b Recognize that the concept of biological evolution is a theory which explains the consequence of the interactions of: (1) the potential for a species to increase its numbers, (2) the genetic variability of offspring due to mutation and recombination of genes, (3) a finite supply of the resources required for life, and (4) the ensuing selection by the environment of those offspring better able to survive and leave offspring.

12.3.4.c Explain how natural selection provides a scientific explanation of the fossil record and the molecular similarities among the diverse species of living organisms.

12.3.4.d Apply the theory of biological evolution to explain diversity of life over time.

- Use vestigial organs to prove divergent evolution.

Test date: _____

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Biology

Test 8

12.3.2 Students will describe, on a molecular level, the cycling of matter and the flow of energy between organisms and their environment.

12.3.3.a Explain how the stability of an ecosystem is increased by biological diversity.

12.3.3.b Recognize that atoms and molecules cycle among living and nonliving components of the biosphere.

12.3.3.c Explain how distribution and abundance of different organisms in ecosystems are limited by the availability of matter and energy and the ability of the ecosystem to recycle materials.

12.3.3.d Analyze factors which may influence environmental quality.

- Students will study the 7 ecosystems at Olsen Nature Preserve and compare their ability for growth, nutrient recharge, etc.

Test date: _____

Parent's signature: _____