CHINO VALLEY UNIFIED SCHOOL DISTRICT
INSTRUCTIONAL GUIDE
HUMAN ANATOMY AND PHYSIOLOGY HONORS

Course Number	5929
Department	Science
Prerequisite	"B" or better in Biology or Biology Honors
Length of Course	Two (2) semesters/One (1) Year
Grade Level	11-12
Credit	5 units per semester/10 total credits-life science
Repeatable	Not repeatable for credit
UC/CSU	Meets "d" laboratory requirement as advanced biology
Board Approved	April 3, 2008

Description of Course - Human Anatomy and Physiology is a second year, advanced course for the student who wishes to acquire a greater breadth and depth of knowledge of the principles of advanced biology with an emphasis of anatomy and physiology. This course is designed for students who may be interested in a career in the health related fields. Homework and laboratory work are an important part of the curriculum.

Rationale for Course - This course provides students a laboratory class that fulfills the state and district graduation requirement for life science and fulfills an entrance requirement for the UC/CSU level schools.

Objective 1 - Have a working knowledge of the basic language and general anatomical concepts of the human body.

1.1 Performance Indicator: Students will be able to list the branches and divisions of anatomy.

1.2 Performance Indicator: Students will be able to explain the levels of structural organization.

1.3 Performance Indicator: Students will be able to explain homeostatic mechanisms, including negative and positive feedback.

1.4 Performance Indicator: Students will be able to describe and demonstrate anatomical position.

1.5 Performance Indicator: Students will be able to use directional terminology based on anatomical position.

1.6 Performance Indicator: Students will be able to identify and locate specific body regions.

1.7 Performance Indicator: Students will be able to describe and identify the major body planes.

1.8 Performance Indicator: Students will be able to identify the location of body cavities and membranes.

1.9 Performance Indicator: Students will be able to identify and name the nine abdominal subdivisions and their quadrants.

1.10 Performance Indicator: Students will be able to identify the major organ systems and explain their major structures and functions.

1.11 Performance Indicator: Students will be able to use prefixes and suffixes relevant to medical terminology.

Objective 2 - Be able to identify the four major tissue categories: epithelial, connective, nervous, and muscular.

2.1 Epithelial tissue

2.1.1 Performance Indicator: Students will be able to identify epithelial tissue and explain its special characteristics.

2.1.2 Performance Indicator: Students will be able to classify all epithelial tissue types.

2.1.3 Performance Indicator: Students will be able to identify the location and function of epithelial tissue types.

2.1.4 Performance Indicator: Students will be able to describe the epithelial tissue types.

2.2 Connective tissue

2.2.1 Performance Indicator: Students will be able to identify connective tissue and explain its special characteristics.

2.2.2 Performance Indicator: Students will be able to classify all connective tissue types.

2.2.3 Performance Indicator: Students will be able to identify the location and function of connective tissue types.

2.2.4 Performance Indicator: Students will be able to describe the connective tissue types.

2.3 Muscle tissue

2.3.1 Performance Indicator: Students will be able to identify muscle tissue and explain its special characteristics.

2.3.2 Performance Indicator: Students will be able to classify all muscle tissue types.

2.3.3 Performance Indicator: Students will be able to identify the location and function of muscle tissue types.

2.3.4 Performance Indicator: Students will be able to describe the muscle tissue types.

2.4 Nervous tissue

2.4.1 Performance Indicator: Students will be able to identify nervous tissue and explain its special characteristics.

2.4.2 Performance Indicator: Students will be able to classify nervous tissue.

2.4.3 Performance Indicator: Students will be able to describe the steps of tissue repair.

2.4.4 Performance Indicator: Students will be able to explain the developmental aspects of tissues.

2.4.5 Performance Indicator: Students will be able to identify tissue types through microscope use during lab experiences; assessment will occur in the form of a microscope laboratory practical.

Objective 3 - Have a working knowledge of the structure and function of the integumentary system.

3.1 Performance Indicator: Students will be able to name the tissue types composing the epidermis and the dermis.

3.2 Performance Indicator: Students will be able to list the layers of the epidermis and describe the functions of each layer.

3.3 Performance Indicator: Students will be able to describe the factors that normally contribute to skin color.

3.4 Performance Indicator: Students will be able to compare the structure, function and location of sweat and oil glands.

3.5 Performance Indicator: Students will be able to compare eccrine and apicrine glands.

3.6 Performance Indicator: Students will be able to list the parts of a hair follicle and the functional relationship of the arrector pili muscle.

3.7 Performance Indicator: Students will be able to describe the structure of nails.

3.8 Performance Indicator: Students will be able to describe the major functions of the integumentary system.

3.9 Performance Indicator: Students will be able to identify pathologies, including skin cancers and burns of the integumentary system.

Objective 4 - Have a working knowledge of the structure and function of bones and the skeletal system.

4.1 Performance Indicator: Students will be able to classify types of bones.

4.2 Performance Indicator: Students will be able to identify the functions of bones.

4.3 Performance Indicator: Students will be able to label the anatomy of a long bone: macroscopic and microscopic.

4.4 Performance Indicator: Students will be able to discuss types of bone development including endochondral and intramembranous ossification.

4.5 Performance Indicator: Students will be able to list the stages of endochondral ossification in a long bone.

4.6 Performance Indicator: Students will be able to identify the various types of fractures.

4.7 Performance Indicator: Students will be able to discuss hormonal control of calcium storage.

4.8 Performance Indicator: Students will be able to discuss developmental aspects of bone development in newborns.

4.9 Performance Indicator: Students will be able to identify and discuss various types of pathology of the skeletal system.

4.10 Performance Indicator: Students will be able to compare axial and appendicular skeletons.

4.11 Performance Indicator: Students will be able to identify bones of the body, bone marking terminology, and landmarks on bones (honors will be required to know a greater number of bones).

4.12 Performance Indicator: Students will be able to classify bone joints based upon their structure and function.

4.13 Performance Indicator: Students will be able to identify the distinguishing features of synovial joints.

4.14 Performance Indicator: Students will be able to describe the movements allowed by synovial joints.

4.15 Performance Indicator: Students will be able to identify the types of synovial joints.

4.16 Performance Indicator: Students will be able to identify the factors that influence stability of synovial joints.

Objective 5 - Have a working knowledge of the structure and functions associated with muscular system.

5.1 Performance Indicator: Students will be able to compare the basic types of muscle tissue.

5.2 Performance Indicator: Students will be able to identify the functional characteristics of muscle tissue.

5.3 Performance Indicator: Students will be able to identify the general functions of muscle tissue.

5.4 Performance Indicator: Students will be able to explain the levels of gross skeletal muscle organization.

5.5 Performance Indicator: Students will be able to recognize the microscopic anatomy of a skeletal muscle fiber.

5.6 Performance Indicator: Students will be able to describe the sliding filament theory.

5.7 Performance Indicator: Students will be able to describe the physiology of skeletal muscle fibers when action potentials are generated across the neuromuscular junction.

5.8 Performance Indicator: Students will be able to identify the role of calcium in muscle contraction.

5.9 Performance Indicator: Students will be able to identify the role of the excitation-contraction coupling process.

5.10 Performance Indicator: Students will be able to identify and describe types of muscle contractions.

5.11 Performance Indicator: Students will be able to discuss energy requirements during muscle metabolism.

5.12 Performance Indicator: Students will be able to have a working knowledge of the relationship between oxygen debt, muscle fatigue and lactic acid fermentation.

5.13 Performance Indicator: Students will be able to explain the factors which affect the force of muscle contraction.

5.14 Performance Indicator: Students will be able to explain the effects of exercise on muscles.

5.15 Performance Indicator: Students will be able to explain the variables which control the velocity and duration of a muscle contraction.

5.16 Performance Indicator: Students will be able to have a working knowledge of hormonal influence on muscle growth and strength.

5.17 Performance Indicator: Students will be able to describe various pathologies in the muscular system.

5.18 Performance Indicator: Students will be able to explain the criteria for naming muscles.

5.19 Performance Indicator: Students will be able to describe the three classes of lever systems.

5.20 Performance Indicator: Students will be able to identify the major muscles by name, location and action.

5.21 Performance Indicator: Students will be able to identify origin and insertion locations for specific muscles.

Objective 6 - Have a working knowledge of the structure and function of the nervous system.

6.1 The General Nervous System—Neuron Anatomy and Function

6.1.1 Performance Indicator: Students will be able to identify the branches and organization of the nervous system.

6.1.2 Performance Indicator: Students will be able to identify the histology of the central and peripheral nervous systems.

6.1.3 Performance Indicator: Students will be able to label the basic anatomy and function of a neuron.

6.1.4 Performance Indicator: Students will be able to classify neurons by structure and function.

6.1.5 Performance Indicator: Students will be able to discuss the concepts of resting potential including the sodium-potassium pump.

6.1.6 Performance Indicator: Students will be able to explain the all-or-none principle.

6.1.7 Performance Indicator: Students will be able to discuss changes from resting to action potential.

6.1.8 Performance Indicator: Students will be able to discuss the propagation of a nerve impulse down a neuron.

6.1.9 Performance Indicator: Students will be able to explain the mechanism of a nerve impulse across the synaptic cleft.

6.1.10 Performance Indicator: Students will be able to explain the differences between electrical and chemical synapses.

6.1.11 Performance Indicator: Students will be able to identify the variables that affect the speed, strength, and duration of a nerve impulse.

6.1.12 Performance Indicator: Students will be able to describe the function of a neurotransmitter.

6.1.13 Performance Indicator: Students will be able to compare excitatory and inhibitory synapses.

6.1.14 Performance Indicator: Students will be able to identify the various neurotransmitters and explain their function in neural transmission.

6.1.15 Performance Indicator: Students will be able to identify the components of a reflex arc.

6.2 The General Nervous System—Brain Anatomy and Function

6.2.1 Performance Indicator: Students will be able to identify the major structures and functions of the various parts of the brain.

6.2.2 Performance Indicator: Students will be able to identify the major cerebral lobes of the brain along with their functions.

6.2.3 Performance Indicator: Students will be able to identify the association areas with their connections to parts of the brain.

6.2.4 Performance Indicator: Students will be able to explain the components of the diencephalons with their functions.

6.2.5 Performance Indicator: Students will be able to identify the components of the brain stem with their functions.

6.2.6 Performance Indicator: Students will be able to identify the structure of the cerebellum with its function.

6.2.7 Performance Indicator: Students will be able to identify the structure of the limbic system with its function.

6.2.8 Performance Indicator: Students will be able to identify the components of an electroencephalogram, including types of brain waves.

6.2.9 Performance Indicator: Students will be able to discuss sleep-wake patterns.

6.2.10 Performance Indicator: Students will be able to discuss memory storage and retrieval.

6.2.11 Performance Indicator: Students will be able to discuss the structure of the meninges.

6.2.12 Performance Indicator: Students will be able to identify the flow of cerebrospinal fluid and its composition.

6.2.13 Performance Indicator: Students will be able to identify various pathologies of the nervous system.

6.2.14 Performance Indicator: Students will be able to identify the 12 pairs of cranial nerves.

6.2.15 Performance Indicator: Students will be able to identify cranial nerve locations and their functions.

6.2.16 Performance Indicator: Students will be able to identify the types of receptors with their location and function.

6.2.17 Performance Indicator: Students will be able to classify receptors by structure and function.

6.2.18 Performance Indicator: Students will be able to identify types of reflexes.

6.2.19 Performance Indicator: Students will be able to discuss the general features of spinal nerves.

6.2.20 Performance Indicator: Students will be able to discuss effects of the parasympathetic and sympathetic division on various organs.

6.2 Special Senses

6.2.1 Performance Indicator: Students will be able to describe the location, structure, and afferent pathways of taste and smell receptors.

6.2.2 Performance Indicator: Students will be able to be able to explain how these receptors are activated.

6.2.3 Performance Indicator: Students will be able to describe structure and function of accessory eye structures.

6.2.4 Performance Indicator: Students will be able to trace the pathway of light through the eye to the retina.

6.2.5 Performance Indicator: Students will be able to explain how light is focused for distant and close vision.

6.2.6 Performance Indicator: Students will be able to describe the events involved in the stimulation of photoreceptors by light.

6.2.7 Performance Indicator: Students will be able to compare and contrast the roles of rods and cones in vision.

6.2.7 Performance Indicator: Students will be able to compare and contrast light and dark adaptation.

6.2.8 Performance Indicator: Students will be able to discuss the major pathologies associated with the eye.

6.2.9 Performance Indicator: Students will be able to describe the structure and function of the outer, middle and inner ear.

6.2.10 Performance Indicator: Students will be able to describe the sound conduction pathway to the fluids of the inner ear and follow the auditory pathway from the Organ of Corti to the temporal cortex.

6.2.11 Performance Indicator: Students will be able to differentiate pitch and loudness and localize the source of sounds.

6.2.12 Performance Indicator: Students will be able to explain how the balance organs of the semicircular canals and the vestibule help maintain dynamic and static equilibrium.

6.2.13 Performance Indicator: Students will be able to describe the major pathologies associated with the ear.

Objective 7 - Have a working knowledge of the structure and function of the endocrine system.

7.1 Performance Indicator: Students will be able to indicate the important differences between hormonal and neural controls of body functioning.

7.2 Performance Indicator: Students will be able to list the major endocrine organs and describe their body locations.

7.3 Performance Indicator: Students will be able to describe the two major mechanisms by which hormones bring about their effects on their target tissues.

7.4 Performance Indicator: Students will be able to list the three types of interactions that different hormones acting upon the same target cell can have.

7.5 Performance Indicator: Students will be able to explain how hormone release is regulated by feedback mechanisms.

7.6 Performance Indicator: Students will be able to describe the structural and functional relationships between the hypothalamus and the pituitary gland.

7.7 Performance Indicator: Students will be able to list and describe the chief effects of adenohypophyseal hormones.

7.8 Performance Indicator: Students will be able to discuss the structure of the neurohypophysis and describe the effects of the two hormones it releases.

7.9 Performance Indicator: Students will be able to identify the types of thyroid hormones and their functions.

7.10 Performance Indicator: Students will be able to describe important effects of the two groups of hormones produced by the thyroid gland emphasizing release and function.

7.11 Performance Indicator: Students will be able to indicate the general function of the parathyroid gland.

7.12 Performance Indicator: Students will be able to list hormones produced by the adrenal glad and cite their physiological effects.

7.13 Performance Indicator: Students will be able to compare and contrast the effects of the two major pancreatic hormones.

7.14 Performance Indicator: Students will be able to describe the functional roles of hormones of the testes and ovaries.

7.15 Performance Indicator: Students will be able to describe the importance of thymic hormones in immunity.

7.16 Performance Indicator: Students will be able to discuss the various pathologies associated with each endocrine gland.

Objective 8 - Have a working knowledge of the composition and function of blood and its components.

8.1 Performance Indicator: Students will be able to describe the composition and physical characteristics of whole blood.

8.2 Performance Indicator: Students will be able to list six functions of blood.

8.3 Performance Indicator: Students will be able to discuss the composition and functions of plasma.

8.4 Performance Indicator: Students will be able to discuss the structure, function and production of erythrocytes.

8.5 Performance Indicator: Students will be able to describe the chemical makeup of hemoglobin.

8.6 Performance Indicator: Students will be able to list the classes, structural characteristics, and functions of leukocytes.

8.7 Performance Indicator: Students will be able to describe the structure and function of platelets.

8.8 Performance Indicator: Students will be able to describe the process of hemostasis; list the factors that limit clot formation and prevent undesirable clotting.

8.9 Performance Indicator: Students will be able to describe the ABO and Rh blood groups.

8.10 Performance Indicator: Students will be able to describe the pathologies associated with the various blood disorders.

Objective 9 - Have a working knowledge of the structures and functions of the cardiovascular system.

9.1 Performance Indicator: Students will be able to describe the size, shape, location and orientation of the heart.

9.2 Performance Indicator: Students will be able to name the coverings of the heart.

9.3 Performance Indicator: Students will be able to describe the structure of the three layers of the heart.

9.4 Performance Indicator: Students will be able to describe the structure and function of the four heart chambers.

9.5 Performance Indicator: Students will be able to trace the pathway of blood through the heart.

9.6 Performance Indicator: Students will be able to name the major branches and describe the distribution of the coronary arteries.

9.7 Performance Indicator: Students will be able to name the heart valves and describe their location, function, and mechanisms of operation.

9.8 Performance Indicator: Students will be able to describe the structural and functional properties of cardiac muscle.

9.9 Performance Indicator: Students will be able to describe the events of cardiac muscle cell contraction.

9.10 Performance Indicator: Students will be able to name the components of the conduction system of the heart and trace the conduction pathway.

9.11 Performance Indicator: Students will be able to diagram a normal electrocardiogram tracing; name the individual waves and intervals and indicate what each represents; name some abnormalities that can be detected on an ECG tracing.

9.12 Performance Indicator: Students will be able to describe the timing and events of the cardiac cycle.

9.13 Performance Indicator: Students will be able to describe normal heart sounds and explain how heart murmurs differ.

9.14 Performance Indicator: Students will be able to name and explain the effects of various factors regulating stroke volume and heart rate.

9.15 Performance Indicator: Students will be able to explain the role of the autonomic nervous system in regulating cardiac output.

9.16 Performance Indicator: Students will be able to describe fetal heart formation and how the fetal heart differs from the adult heart.

9.17 Performance Indicator: Students will be able to discuss various pathologies associated with the cardiovascular system.

Objective 10 - Have a working knowledge of the structure and function of blood vessels.

10.1 Performance Indicator: Students will be able to describe the three layers that typically form the wall of a blood vessel.

10.2 Performance Indicator: Students will be able to define vasoconstriction and vasodilation.

10.3 Performance Indicator: Students will be able to compare and contrast the structure and function of the three types of arteries.

10.4 Performance Indicator: Students will be able to describe the structure and function of veins.

10.5 Performance Indicator: Students will be able to describe the structure and function of a capillary bed.

10.6 Performance Indicator: Students will be able to describe different types of capillaries.

10.7 Performance Indicator: Students will be able to define blood flow, blood pressure, resistance and explain the relationships between these factors.

10.8 Performance Indicator: Students will be able to list and explain the factors that influence blood pressure and describe how blood pressure is regulated.

10.9 Performance Indicator: Students will be able to define hypertension and describe its symptoms.

10.10 Performance Indicator: Students will be able to explain how blood flow is regulated in the body.

10.11 Performance Indicator: Students will be able to outline factors involved in capillary dynamics and explain the significance of each.

10.12 Performance Indicator: Students will be able to trace the pathway of blood through the pulmonary circuit.

10.13 Performance Indicator: Students will be able to describe the general function of the systemic circuit; name and give locations of the major arteries and veins in the systems circulation.

10.14 Performance Indicator: Students will be able to identify branches off of major blood vessels.

Objective 11 - Have a working knowledge of the structure and function of the lymphatic system and immunity.

11.1 Performance Indicator: Students will be able to describe the structure and distribution of lymphatic vessels and note their important functions.

11.2 Performance Indicator: Students will be able to describe the source of lymph and mechanisms of lymph transport.

11.3 Performance Indicator: Students will be able to describe the basic structure and cellular population of lymphoid tissue and name the major lymphoid organs.

11.4 Performance Indicator: Students will be able to describe the general location, histological structure, and functions of lymph nodes.

11.5 Performance Indicator: Students will be able to name and describe the other lymphoid organs of the body including the spleen.

Objective 12 - Have a working knowledge of the structure and function of the respiratory system.

12.1 Performance Indicator: Students will be able to identify the organs forming the respiratory passageways in descending order until the alveoli are reached.

12.2 Performance Indicator: Students will be able to list and describe several protective mechanisms of the respiratory system.

12.3 Performance Indicator: Students will be able to describe the makeup of the respiratory membrane and relate structure to function.

12.4 Performance Indicator: Students will be able to describe the gross structure of the lungs and pleurae.

12.5 Performance Indicator: Students will be able to relate Boyle's Law to events of inspiration and expiration.

12.6 Performance Indicator: Students will be able to explain the relative roles of the respiratory muscles and lung elasticity in producing the volume changes that cause air to flow into and out of the lungs.

12.7 Performance Indicator: Students will be able to explain the functional importance of the partial vacuum that exists in the intrapleural space.

12.8 Performance Indicator: Students will be able to list several physical factors that influence pulmonary ventilation.

12.9 Performance Indicator: Students will be able to explain and compare the various lung capacities.

12.10 Performance Indicator: Students will be able to define dead space.

12.11 Performance Indicator: Students will be able to state Dalton's Law of Partial Pressures and Henry's Law.

12.12 Performance Indicator: Students will be able to describe how atmospheric and alveolar air differs in composition and explain these differences.

12.13 Performance Indicator: Students will be able to relate Dalton's and Henry's law to events of external and internal respiration.

12.14 Performance Indicator: Students will be able to describe how oxygen is transported in the blood and explain how oxygen loading and unloading is affected by temperature, pH, BPG, and PCO_2.

12.15 Performance Indicator: Students will be able to describe carbon dioxide transport in the blood.

12.16 Performance Indicator: Students will be able to describe the neural controls of respiration.

12.17 Performance Indicator: Students will be able to compare and contrast various factors that influence lung functioning including arterial pressure, exercise, altitude and arterial pH.

12.18 Performance Indicator: Students will be able to discuss various pathologies associated with the respiratory system.

Objective 13 - Have a working knowledge of the structure and function of the digestive system.

13.1 Performance Indicator: Students will be able to describe the function of the digestive system and differentiate between organs of the alimentary canal and accessory digestive organs.

13.2 Performance Indicator: Students will be able to list and define the major processes occurring during digestive system activity.

13.3 Performance Indicator: Students will be able to describe the location and function of the peritoneum; define retroperitoneal and name the organs.

13.4 Performance Indicator: Students will be able to describe the composition and functions of saliva; explain how salivation is regulated.

13.5 Performance Indicator: Students will be able to describe the mechanisms of chewing and swallowing.

13.6 Performance Indicator: Students will be able to identify structural modifications of the wall of the stomach and small intestine that enhance the digestive process in these regions.

13.7 Performance Indicator: Students will be able to describe the composition of gastric juice.

13.8 Performance Indicator: Students will be able to name the cell types responsible for secreting its components and indicate the importance of each component in stomach activity.

13.9 Performance Indicator: Students will be able to explain regulation of gastric secretion and stomach motility.

13.10 Performance Indicator: Students will be able to state the roles of bile and of pancreatic juice in digestion.

13.11 Performance Indicator: Students will be able to describe how the entry of bile and pancreatic juice into the small intestine is regulated.

13.12 Performance Indicator: Students will be able to list the major functions of the large intestine and describe the regulation of defecation.

13.13 Performance Indicator: Students will be able to list eh enzymes involved in chemical digestion; name the nutrients that they act upon and the end products of protein, fat, carbohydrate and nucleic acid digestion.

13.14 Performance Indicator: Students will be able to describe the process of absorption that occurs in the small intestine.

13.15 Performance Indicator: Students will be able to define nutrient, essential nutrient and Calorie.

13.16 Performance Indicator: Students will be able to list eh six major nutrient categories.

13.17 Performance Indicator: Students will be able to distinguish between nutritionally complete and incomplete proteins.

13.18 Performance Indicator: Students will be able to distinguish between fat and water soluble vitamins in each group.

13.19 Performance Indicator: Students will be able to identify for each vitamin their sources, body functions, and consequences of its deficit or excess.

13.20 Performance Indicator: Students will be able to identify minerals necessary for health.

Objective 14 - Have a working knowledge of the structure and functions of the urinary system.

14.1 Performance Indicator: Students will be able to describe the gross anatomy of the kidney and its coverings.

14.2 Performance Indicator: Students will be able to trace the blood supply through the kidney.

14.3 Performance Indicator: Students will be able to describe the anatomy of a nephron.

14.4 Performance Indicator: Students will be able to list several kidney functions that help maintain body homeostasis.

14.5 Performance Indicator: Students will be able to identify the nephron parts responsible for filtration, reabsorption and secretion; describe mechanisms underlying each of these functional processes.

14.6 Performance Indicator: Students will be able to explain the role of aldosterone and of arterial natriuretic peptide in sodium and water balance.

14.7 Performance Indicator: Students will be able to describe the mechanism responsible for the medullary osmotic gradient.

14.8 Performance Indicator: Students will be able to explain formation of dilute versus concentrated urine.

14.9 Performance Indicator: Students will be able to describe the normal physical and chemical properties of urine.

14.10 Performance Indicator: Students will be able to list several abnormal urine components and name the conditions.

14.11 Performance Indicator: Students will be able to describe the general location, structure and function of the ureters.

14.12 Performance Indicator: Students will be able to describe the general location, structure and function of the urinary bladder.

14.13 Performance Indicator: Students will be able to define micturition and describe its neural control.

14.14 Performance Indicator: Students will be able to identify various associated with the urinary system.

Objective 15 - Have a working knowledge of the structure and function of the reproductive system.

15.1 Male and Female Reproductive Systems

15.1.1 Performance Indicator: Students will be able to describe the common function of the male and female reproductive system.

15.1.2 Performance Indicator: Students will be able to describe the structure and function of the testes and explain the importance of their location in the scrotum.

15.1.3 Performance Indicator: Students will be able to describe the structure of the penis and indicate its role in the reproductive process.

15.1.4 Performance Indicator: Students will be able to describe the location, structure and function of the male accessory reproductive structures.

15.1.5 Performance Indicator: Students will be able to discuss the sources and functions of semen.

15.1.6 Performance Indicator: Students will be able to discuss hormonal regulation of testicular function and the physiological effects of testosterone one male reproductive anatomy.

15.1.7 Performance Indicator: Students will be able to describe the location, structure and function of the ovaries.

15.1.8 Performance Indicator: Students will be able to describe the location, structure and function of each of the organs of the female reproductive duct system.

15.1.9 Performance Indicator: Students will be able to describe the structure and function of the mammary glands.

15.1.10 Performance Indicator: Students will be able to describe the ovarian cycle phases and relate them to events of oogenesis.

15.1.11 Performance Indicator: Students will be able to describe the regulation of the ovarian and uterine cycles.

15.1.12 Performance Indicator: Students will be able to discuss the physiological effects of estrogen and progesterone.

15.1.13 Performance Indicator: Students will be able to identify the various pathologies of the reproductive systems.

15.2 Pregnancy and Human Development

15.2.1 Performance Indicator: Students will be able to describe the importance of sperm capacitation.

15.2.2 Performance Indicator: Students will be able to explain the mechanism of the fast and slow blocks to polyspermy.

15.2.3 Performance Indicator: Students will be able to define fertilization.

15.2.4 Performance Indicator: Students will be able to describe implantation and placental formation.

15.2.5 Performance Indicator: Students will be able to identify functions of the placenta.

15.2.6 Performance Indicator: Students will be able to name and describe the formation, location and functions of the embryonic membranes.

15.2.7 Performance Indicator: Students will be able to define organogenesis and indicate the important roles of the three primary germ layers.

15.2.8 Performance Indicator: Students will be able to describe unique features of fetal circulation.

15.2.9 Performance Indicator: Students will be able to indicate the duration of the fetal period and note the major events of fetal development.

15.2.10 Performance Indicator: Students will be able to describe changes in maternal reproductive organs and in cardiovascular, respiratory, and urinary system functioning during pregnancy.

15.2.11 Performance Indicator: Students will be able to indicate the effects of pregnancy on maternal metabolism and posture.

15.2.12 Performance Indicator: Students will be able to explain how labor is initiated, and describe the three stages of labor.

15.2.13 Performance Indicator: Students will be able to describe changes that occur in the fetal circulation after birth.

15.2.14 Performance Indicator: Students will be able to explain how the breasts are prepared for lactation.

15.2.15 Performance Indicator: Students will be able to discuss the reflexes that should be present at birth.

Investigation and Experimentation

Objective: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations.

1.a Performance Indicator: Students will be able to select and use appropriate tools and technology (such as computer linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships and display data.

1.b Performance Indicator: Students will be able to identify and communicate sources of unavoidable experimental error.

1.c Performance Indicator: Students will be able to identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.

1.d Performance Indicator: Students will be able to formulate explanations by using logic and evidence.

1.e Performance Indicator: Students will be able to solve scientific problems by using equations and simple trigonometric, exponential, logarithmic functions.

1.f Performance Indicator: Students will be able to distinguish between hypothesis and theory as scientific terms.

1.g Performance Indicator: Students will be able to recognize the usefulness and limitations of models and theories as scientific representations of reality.\

1.h Performance Indicator: Students will be able to read and interpret topographic and geologic maps.

1.i Performance Indicator: Students will be able to analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).

1.j Performance Indicator: Students will be able to recognize the issues of statistical variability and the need for controlled tests.

1.k Performance Indicator: Students will be able to recognize the cumulative nature of scientific evidence.

1.l Performance Indicator: Students will be able to analyze situations and solve problems that require combining and applying concepts from more than one area of science.

1.m Performance Indicator: Students will be able to investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include, but are not limited to, irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.

1.n Performance Indicator: Students will be able to determine when an observation does not agree with an accepted scientific theory, if the observation is mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects), and if the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets).

Suggested Laboratory Activities:

1. Histology Lab
2. Reflex Lab
3. Bone Composition Lab
4. Sensory lab
5. Joint Stability Presentation
6. Individualized Exercise Program Identifying Muscle Use and Energy Systems
7. Pathology Report Presentation
8. Muscle Identification Dissection lab using the Cat
9. Brain dissection
10. Eye Dissection
11. Kidney Dissection
12. Heart Dissection
13. Cat Internal Dissection
14. Blood Cell Lab
15. Blood Pressure Lab
16. Pulse Lab
17. Respiratory (Respirometer) Lab
18. Nutrition Lab
19. EKG Activity