Oroville Union High School District

Science Curriculum

Science - Anatomy and Physiology

Anatomy and Physiology

COURSE TITLE: Anatomy and Physiology

LENGTH OF COURSE: One Year

TYPE OF CREDIT: Science (10 credits)

GRADE LEVEL: 11-12

PREREQUISITE: Grade of "C" or better in College Prep Biology or instructor approval. Students who are taking Chemistry concurrently or have had Chemistry will be given preference in case of "over enrollment".

TEXTBOOK:
Human Anatomy & Physiology, 6th Edition, E. Marieb, Benjamin Cummings Pub. Co. 2003-2005, ISBN # 0805354638

SUPPLEMENTARY INSTRUCTIONAL MATERIAL:
Human Anatomy & Physiology Laboratory Manual, Cat Version, Sixth Edition, Benjamin Cummings, Prentice Hall, Needham, MA, 2002, ISBN # 0-8053-4985-5

Human Anatomy & Physiology Study Guide, Fifth Edition, Benjamin Cummings, Prentice Hall, Needham, MA, 2002, ISBN # 0-8053-4974-X

COURSE DESCRIPTION:
This course will provide students with a foundation of knowledge regarding the structures and functions of the systems of the human body. Emphasis will be placed on laboratory laboratory and clinical case studies to illustrate anatomical and physiological concepts. NOTE: This course meets the CSU and U.C. "A-G" Subject" requirement.

BOARD ADOPTION DATE: JUNE 19, 2002

Organization of the Body

The human body has many levels of structural and functional organization ranging through the chemical, cellular, functional, organ, and organ system to the human organism.

Orientation of the Human Body
The learner will be able to name in order of increasing complexity the different levels of structural organization that make up the human body, explain their relationships;

and ascribe correct anatomical terms to the regions, planes, divisions, and quadrants of the body. The learner will also be able to define homeostasis, explain its significance, describe how negative and positive feedback are involved, and describe the relationship between homeostatic imbalance and disease .

Strand	Scope	Source
Anatomy and Physiology	Master	Oroville Union High School District

Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 1 (1-25) [Textbook].

Chemistry of the Body

The learner will be able to explain why chemical reactions in the body are often irreversible and describe factors that affect chemical reaction rates. The learner will also be able to explain the importance of water and salts to body homeostasis.

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Anatomy and Physiology	Master	Oroville Union High School District

Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 2 (26-63) [Textbook].

Cells

The learner will be able to describe the chemical composition of the plasma membrane and relate it to the membrane's functions, describe the importance of each organelle within the cell, list the phases of cell life, name and describe the composition of extracellular materials and discuss theories of cell differentiation and aging.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 3 (64-113) [Textbook].

Tissues

The learner will be able to list the several types of tissues, their origins and functions, and outline the process of tissue repair.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 4 (114-147) [Textbook].

Covering, Support, and Movement of Body

The human body systems involved in covering, support and movement include the integumentary, skeletal (including joints), and muscular systems.

The Integumentary System

The learner will be able to name the tissues and list the major layers of the epidermis and dermis, describe the functions of each structure within the epidermis and dermis, explain why serious burns are life threatening, and briefly describe the changes that occur in the skin from birth to old age.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 5 (148-171) [Textbook].

Bones, Skeletal Tissues, and Skeleton

The learner will be able to describe the functional properties of each of the three types of skeletal tissue, explain how cartilage grows, describe the five important functions of bones, describe the gross anatomy of a typical long bone and flat bone, compare and contrast the two types of bone formation, describe the steps of fracture repair, and describe homeostatic imbalances of bone. The learner will also be able to name the major parts of the axial and appendicular skeletons, describe their relative functions, and discuss how age-related skeletal changes may affect health .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 6 (172-197) and Ch 7 (198-247) [Textbook].

Joints

The learner will be able to define, classify, and describe joints both structurally and functionally and give examples of each type of joint. The learner will also be able to name the most common joint injuries, compare and contrast common types of arthritis, and discuss factors that promote or disturb joint homeostasis .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 8 (248-275) [Textbook].

Muscles, Tissue, and Muscular System

The learner will be able to compare and contrast the basic types of muscle tissue, list four important functions of muscle tissue, describe the gross and microscopic structure of muscle, explain how muscle fibers are stimulated to contract, describe the embryonic development of muscle tissues and the changes that occur in skeletal muscles with age, and compare and contrast the affects of aerobic and resistance exercise on skeletal muscles and on other body systems. The learner will also be able to name and identify specific muscles on both the human and cat anatomy, stating the origin, insertion and action of each muscle .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 9 (276-321) and Ch 10 (322-385) [Textbook].

Regulations and Integration of the Body

The nervous system is the master controlling and communicating system of the body. It can be divided into two principal parts, the central nervous system and the peripheral nervous system that are then subdivided into sensory (afferent) and motor (efferent) divisions. The second great controlling system of the body is the endocrine system.

The Nervous System and Nervous Tissue

The learner will be able to list the basic functions of the nervous system, explain structural and functional divisions of the nervous system, list supporting cells, describe their functions, and classify neurons structurally and functionally. The learner will also be able to define resting membrane potential and describe its electrochemical basis .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 11 (387-427) [Textbook].

The Central Nervous System

The learner will be able to describe the process of brain development, name the major regions of the adult brain, describe the structure and function of each major region of the brain, list and explain several techniques used to diagnose brain disorders, and describe several maternal factors that can impair development of the nervous system in an embryo.

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Anatomy and Physiology	Master	Oroville Union High School District

Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 12 (428-473) [Textbook].

The Peripheral Nervous System

The learner will be able to define the peripheral nervous system and list its components, and describe the developmental relationship between the segmented arrangement of peripheral nerves, skeletal muscles, and skin dermatomes.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 13 (474-511) [Textbook].

The Autonomic Nervous System

The learner will be able to define autonomic nervous system, explain its relationship to the peripheral nervous system as a whole, and describe some affects of aging on the autonomic nervous system.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 14 (512-532) [Textbook].

Neural Integration

The learner will be able to list the three levels of sensory integration, describe the levels of motor control hierarchy, and indicate the major brain structures believed to be involved in memory.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 15 (533-557) [Textbook].

Special Senses

The learner will be able to describe the location, structure, and afferent pathways of taste and smell receptors, and explain how these receptors are activated. The learner will also be able to trace the pathway of light through the eye to the retina, and explain how light is focused for distant and close vision; compare and contrast the roles of rods and cones in vision; describe the structure and general function of the outer, middle, and inner ears; list possible cause of homeostatic imbalances of the inner ear.

Strand	Scope	Source
Special Senses	Master	Oroville Union High School District(a)

Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 16 (558-607) [Textbook].

The Endocrine System

The learner will be able to indicate important differences between hormonal and neural controls of body functioning, describe how hormones are classified chemically, describe the structure and function of the major endocrine organs, and describe the effect of aging on the endocrine system.

Strand	Scope	Source
Special Senses	Master	Oroville Union High School District(a)

Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 17 (609-649) [Textbook].

Maintenance of the Body

Maintenance of the body is carried out through complex interactions of the cardiovascular, lymphatic, immune, respiratory, digestive, and urinary systems.

Blood and the cardiovascular System

The learner will be able to describe the composition and physical characteristics of blood, explain why it is classified as a connective tissue, and list six functions of blood. The learner will also be able to trace the pathway of blood through the heart, name the major branches of the coronary arteries, describe the events of cardiac muscle cell contraction, draw a diagram of 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. The learner will be able to compare and contrast the structure and function of the three types of arteries, veins, and a capillary bed; list and explain factors that influence blood pressure, define hypertension and describe its symptoms and consequences; provide examples of changes that often occur in blood vessels as a person ages .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 18 (605-680) Ch 19 (681-716), & Ch 20 (717-766) [Textbook].

The Lymphatic System

The learner will be able to describe the structure, distribution, and note the important functions of lymphatic vessels.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 21 (777-791) [Textbook].

The Immune System

The learner will be able to describe the surface membrane barriers and their protective functions. The learner will be able to describe the inflammatory process and list several inflammatory chemicals, name the body's antimicrobial substances, and explain how fever helps protect the body. The learner will also be able to define antigen and describe how antigens affect the immune system, give examples of immune deficiency diseases and of hypersensitivity states, and cite factors involved in autoimmune disease .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 22 (792-783) [Textbook].

The Respiratory System

The learner will be able to identify the organs forming the respiratory passageways in descending order until the alveoli are reached, list and describe several protective mechanisms of the respiratory system, relate Boyle's law to the events of inspiration and expiration, and explain the functional importance of the partial vacuum that exists in the intrapleural space. The learner will also be able to compare the causes and consequences of chronic bronchitis, emphysema, asthma, and lung cancer .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 23 (834-886) [Textbook].

The Digestive System

The learner will be able to describe the overall function of the digestive system, list and briefly define the major processes occurring during digestive activity, list the enzymes involved in chemical digestion and name the food on which they act, and describe important abnormalities of the gastrointestinal tract at different stages of life.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 24 (887-947) [Textbook].

Nutrition, Metabolism, & Body Temp.

The learner will be able to list the six major nutrient categories, note important sources, and their main cellular uses. The learner will also be able to define metabolism and explain the difference between catabolism and anabolism; and note the importance of oxidation and reduction in metabolism. The learner will be able to describe how body temperature is regulated and the common mechanisms regulating heat production and retention. The learner will be able to list ways that commonly used medications may influence nutrition and health .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 25 (948-1002) [Textbook].

The Urinary System

The learner will be able to describe the anatomy of a nephron and list several kidney functions that help maintain body homeostasis.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 26 (1003-1039) [Textbook].

Fluid,Electrolyte,& Acid-Base Balanc

The learner will be able to list routes by which water and electrolytes enter and leave the body, describe the importance of sodium in fluid and electrolyte balance in the body, and relate it to cardiovascular system functioning. The learner will also be able to list the three major chemical buffer systems of the body and how they operate to resist pH change. The learner will be able to explain why infants and the aged are at greater risk for fluid and electrolyte imbalances .

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 27 (1040-1069) [Textbook].

Continuity

The continuity of human life is dependent upon the integrity of the reproductive system from gamete formation through fertilization, to the development of the fetus, and ultimately birth. The pattern of development of the individual is determined by the genes inherited from each parent during gamete formation.

The Reproduction System

The learner will be able to describe the common function of the male and female reproductive systems.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 28 (1070-1117) [Textbook].

Pregnancy and Human Development

The learner will be able to describe changes in maternal reproductive organs, cardiovascular, respiratory, and urinary system functioning during pregnancy, explain how labor is initiated, outline the events leading to the first breath of a newborn, and describe the changes that occur in fetal circulation after birth.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 29 (1118-1148) [Textbook].

Heredity

The learner will be able to explain how gene expression may be modified by environmental factors and list several techniques used to determine or predict genetic diseases.

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Instructional Resources

- Human Anatomy & Physiology Benjamin, Prentice Hall, Fifth Edition, 2001, Ch 30 (1149-1164) [Textbook].