Geneva CUSD 304
Content-Area Curriculum Frameworks
Grades 6-12
Science

Mission Statement	<u>The Mission of Science Education Is:</u> 1) To nurture an active interest in science that continues throughout life. 2) To teach the learning skills and concepts necessary for the scientific process. 3) To develop student understanding of the interrelationships between science, society, and the environment 4) To encourage students to discover and develop their talent in science.
Course Sequence (Grades 6-12)	**6th grade:** Earth Science **7th grade:** Life Science **8th grade:** Physical Science **9th grade:** General Science Earth Science Biology Biology Honors **10th ,11th,12 grade:** Chemistry Chemistry Honors Physics Astronomy Natural Disasters Anatomy and Physiology I and II Horticulture I and II AP Chemistry AP Biology AP Environmental Science

Course Framework

Course Title	**Anatomy and Physiology II**
Grade Level	11^{th}/12th
Semesters (1-2-3-4)	1
Prerequisite	Grade of B or higher in Anatomy and Physiology I
Course Description	Anatomy and Physiology II is a laboratory science course that is only offered to students who have already taken Anatomy and Physiology I. It is a one-semester course that continues the study of human systems. The functions and interactions of the organs found in the respiratory, circulatory, digestive, endocrine and immune systems are the focus of this course. This is a college preparatory course and is therefore recommended to those students who are interested in pursuing a career in the health sciences. Animal dissections are required in this laboratory course.
District-approved Materials and/or Resources	Fundamentals of Anatomy & Physiology Publisher: Benjamin Cummings ISBN: 01318-36625 Copy write: 2004

Unit Frameworks

Unit of Study: major topics	**Unit 1: Cardiovascular System**	Resources that will support instruction Pig Heart Dissection Heart Rate Lab Blood Pressure Lab ECG Analysis Lab Heart Surgery Video Applications/Clinical Manual Textbook CD-ROM Internet Review Links Coloring Book
Illinois Learning Standards, Benchmarks, **National Standards Assessment Frameworks, or other standards that will be taught in this unit**	**11.A.4c** Collect, organize and analyze data accurately and precisely **12.A.4a** Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms. **12.A.4b** Describe the structures and organization of cells and tissues that underlie basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction. **12.A.5a** Explain changes within cells and organisms in response to stimuli and changing environmental conditions (e.g., homeostasis, dormancy). **12.A.5b** Analyze the transmission of genetic traits, diseases and defects. **13.B.4b** Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science. **13.B.5b** Analyze and describe the processes and effects of scientific and technological breakthroughs. **13.B.5e** Assess how scientific and techno-logical progress has affected other fields of study, careers and job markets and aspects of everyday life.	
Objectives o **Conceptual** o **Factual** o **Procedural**	Describe the organization of the cardiovascular system and of the heart. Describe the location and general features of the heart. Trace the flow of blood through the heart, identifying the major blood vessels, chambers, and heart valves. Describe the vascular supply to the heart. Describe the events of an action potential in cardiac muscle. Discuss the differences between nodal cells and conducting cells, and describe the components and functions of the conducting system of the heart. Identify the electrical events associated with a normal electrocardiogram. Explain the events of the cardiac cycle, including atrial and ventricular systole and diastole, and relate the heart sounds to specific events in the cycle. Define cardiac output, and describe the factors that influence this variable. Describe the variables that influence heart rate. Distinguish among the types of blood vessels on the basis of their structure and function. Explain the mechanisms that regulate blood flow through arteries, capillaries, and veins. Describe the factors that influence blood pressure and how blood pressure is regulated. Explain how the cardiovascular system responds to changes in the body's conditions. Identify the major arteries and veins of the pulmonary circuit and the areas they	

	serve. Identify the major arteries and veins of the systemic circuit and the areas they serve.	
Assessments	Performance Tasks Homework Labs Quizzes Tests Heart Disorders Power Point Project	Other Evidence

Unit of Study: major topics	**Unit 2: Respiratory System**	Resources that will support instruction Lung Volumes Lab Textbook CD-ROM Internet Review Links Effects of Smoking Video Applications/Clinical Manual Coloring Book
Illinois Learning Standards, Benchmarks, **National Standards Assessment Frameworks, or other standards that will be taught in this unit**	**11.A.4c** Collect, organize and analyze data accurately and precisely **12.A.4a** Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms. **12.A.4b** Describe the structures and organization of cells and tissues that underlie basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction. **12.A.5a** Explain changes within cells and organisms in response to stimuli and changing environmental conditions (e.g., homeostasis, dormancy). **12.A.5b** Analyze the transmission of genetic traits, diseases and defects. **13.B.4b** Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science. **13.B.5b** Analyze and describe the processes and effects of scientific and technological breakthroughs. **13.B.5e** Assess how scientific and techno-logical progress has affected other fields of study, careers and job markets and aspects of everyday life.	
Objectives o **Conceptual** o **Factual** o **Procedural**	Describe the primary functions of the respiratory system. Explain how the delicate respiratory exchange surfaces are protected from pathogens, debris, and other hazards. Identify the organs of the upper respiratory system, and describe their functions. Describe the structure of the larynx, and discuss its role in normal breathing and in the production of sound. Discuss the structure of the extrapulmonary airways. Describe the superficial anatomy of the lungs, the structure of a pulmonary lobule, and the functional anatomy of the alveoli. Define and compare the processes of external respiration and internal respiration. Describe the major steps involved in external respiration. Summarize the physical principles governing the movement of air into the lungs. Describe the origins and actions of the respiratory muscles responsible for respiratory movements. Summarize the physical principles governing the diffusion of gases into and out of the blood. Explain the important structural features of the respiratory membrane. Describe the partial pressures of oxygen and carbon dioxide in the alveolar air, blood, and systemic circuit. Describe how oxygen is picked up, transported, and released in the blood. Discuss the structure and function of hemoglobin. Describe how carbon dioxide is transported in the blood. Describe the factors that influence the respiration rate. Identify and discuss reflex respiratory activity and the brain centers involved in the control of respiration	

Assessments	Performance Tasks Homework Labs Quizzes Tests	Other Evidence

Unit of Study: major topics	**Unit 3: Lymphatic System**	Resources that will support instruction Influenza Infection Video Internet Review Links Center for Disease Control-Immunization Schedules Textbook CD-ROM Applications/Clinical Manual Coloring Book
Illinois Learning Standards, Benchmarks, **National Standards Assessment Frameworks, or other standards that will be taught in this unit**	**12.A.4a** Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms. **12.A.4b** Describe the structures and organization of cells and tissues that underlie basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction. **12.A.5a** Explain changes within cells and organisms in response to stimuli and changing environmental conditions (e.g., homeostasis, dormancy). **12.A.5b** Analyze the transmission of genetic traits, diseases and defects. **13.B.4b** Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science. **13.B.5b** Analyze and describe the processes and effects of scientific and technological breakthroughs. **13.B.5e** Assess how scientific and techno-logical progress has affected other fields of study, careers and job markets and aspects of everyday life.	
Objectives o **Conceptual** o **Factual** o **Procedural**	Explain the difference between nonspecific and specific defense, and the role of lymphocytes in the immune response. Identify the major components of the lymphatic system, and explain their functions. Discuss the importance of lymphocytes, and describe their distribution in the body. Describe the structure of lymphoid tissues and organs, and explain their functions. List the body's nonspecific defenses and explain the function of each. Describe the components and mechanisms of each nonspecific defense. Define specific resistance, and identify the forms and properties of immunity. Distinguish between a T Cell and B Cell Describe the types and functions of T Cells Distinguish between cell–mediated (cellular) immunity and antibody–mediated (humoral) immunity, and identify the cells responsible for each Describe antibody structure and types Describe the different types of immune disorders Describe what occurs in grafting related to an immune response	
Assessments	Performance Tasks Homework Quizzes Tests	Other Evidence

Unit of Study: major topics	**Unit 4: Excretory System**	Resources that will support instruction Urine analysis Lab Internet Review Links Textbook CD-ROM Applications/Clinical Manual Coloring Book
Illinois Learning Standards, Benchmarks, **National Standards Assessment Frameworks, or other standards that will be taught in this unit**	**11.A.4c** Collect, organize and analyze data accurately and precisely **12.A.4a** Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms. **12.A.4b** Describe the structures and organization of cells and tissues that underlie basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction. **12.A.5a** Explain changes within cells and organisms in response to stimuli and changing environmental conditions (e.g., homeostasis, dormancy). **12.A.5b** Analyze the transmission of genetic traits, diseases and defects. **13.B.4b** Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science. **13.B.5b** Analyze and describe the processes and effects of scientific and technological breakthroughs. **13.B.5e** Assess how scientific and techno-logical progress has affected other fields of study, careers and job markets and aspects of everyday life.	
Objectives o **Conceptual** o **Factual** o **Procedural**	Identify the components of the urinary system, and describe the functions that it performs. Describe the location and structural features of the kidneys. Identify the major blood vessels associated with each kidney, and trace the path of blood flow through a kidney. Describe the structure of the nephron, and outline the processes involved in the formation of urine. Discuss the major functions of each portion of the nephron and collecting system. Identify and describe the major factors responsible for the production of urine. Describe the normal characteristics, composition, and solute concentrations of a representative urine sample. List and describe the factors that influence filtration pressure and the rate of filtrate formation. Identify the types of transport mechanisms found along the nephron, and discuss the reabsorptive or secretory functions of each segment of the nephron and collecting system. Explain the role of countercurrent multiplication in the formation of a concentration gradient in the renal medulla. Describe how antidiuretic hormone and aldosterone levels influence the volume and concentration of urine. Describe the structures and functions of the ureters, urinary bladder, and urethra	
Assessments	Performance Tasks Homework Labs Quizzes Tests	Other Evidence

Unit of Study: major topics	**Unit 5: Digestive System**	Resources that will support instruction Internet Review Links Textbook CD-ROM Applications/Clinical Manual Coloring Book
Illinois Learning Standards, Benchmarks, **National Standards Assessment Frameworks, or other standards that will be taught in this unit**	**12.A.4a** Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms. **12.A.4b** Describe the structures and organization of cells and tissues that underlie basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction. **12.A.5a** Explain changes within cells and organisms in response to stimuli and changing environmental conditions (e.g., homeostasis, dormancy). **12.A.5b** Analyze the transmission of genetic traits, diseases and defects. **13.B.4b** Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science. **13.B.5b** Analyze and describe the processes and effects of scientific and technological breakthroughs. **13.B.5e** Assess how scientific and techno-logical progress has affected other fields of study, careers and job markets and aspects of everyday life.	
Objectives o **Conceptual** o **Factual** o **Procedural**	Identify the functions of the digestive system Identify the organs of the digestive system Identify the major functions of the organs of the digestive system Identify disorders of the organs of the digestive system Describe the functional histology of the digestive tract. Explain the processes by which materials move through the digestive tract. Outline the mechanisms that regulate digestion. Specify the nutrients required by the body. Describe the chemical events responsible for the digestion of organic nutrients. Describe the mechanisms involved in the absorption of organic and inorganic nutrients.	
Assessments	Performance Tasks Homework Organ Power Point Project Quizzes Tests	Other Evidence