
Honors Human Physiology

Curriculum Guide

Scranton School District

Scranton, PA



Scranton School District
Curriculum Guide

Honors Human Physiology

Prerequisite:

- 10th Grade Biology 1 K or 9th or 10th Grade Honors Biology K
- Be in compliance with the [SSD Honors and AP Criteria Policy](#)

This course seeks to prepare young men and women for careers in the Health Fields. It is an intense curriculum which exposes the student to detailed anatomy and the intricacies of the physiological mechanisms that occur within the framework of the human body.

**Scranton School District
Curriculum Guide**

Year-at-a-glance

Subject: Human Physiology	Grade Level 11th/12th	Date Completed: 06-04-2015
----------------------------------	--	-----------------------------------

1st Quarter

Topic	Resources	Academic Standard
Introduction to the Human Body	Approved Textbook http://www.anatomynetwork.com/ http://www.getbodysmart.com/index.htm	BIO.A.1.1.1 BIO.A.1.2.1 BIO.A.1.2.2
Chemical Level of Organization	Approved Textbook www.biologyjunction.com www.biologycorner.com	BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2
Cellular Level of Organization	Approved Textbook www.biologyjunction.com www.biologycorner.com www.khanacademy.org http://www.ck12.org/	BIO.A.1.1.1 BIO.A.1.2.1 BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1
Tissue Level of Organization	Approved Textbook www.biologyjunction.com www.biologycorner.com http://www.gwc.maricopa.edu/class/bio201/histoprc/prac1q.htm	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1
Integumentary System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1

*The following Standards for Reading and Writing in Science and Technical Subjects are embedded throughout the course.
CC.3.5.11-12.A
CC.3.5.11-12.B
CC.3.5.11-12.D
CC.3.5.11-12.G
CC.3.5.11-12.H
CC.3.5.11-12.I
CC.3.5.11-12.J

**Scranton School District
Curriculum Guide**

2nd Quarter

Topic	Resources	Academic Standard
Skeletal System: Bone Tissue	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/ http://www.anatomynetwork.com/ http://www.getbodysmart.com/index.htm	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1
Skeletal System: Axial Skeleton	Approved Textbook	BIO.A.1.2.2
Skeletal System: Appendicular Skeleton	Approved Textbook	BIO.A.1.2.2
Joints	Approved Textbook	BIO.A.1.2.2
Muscular System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/ http://www.anatomynetwork.com/ http://www.getbodysmart.com/index.htm	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1 BIO.A.3.2.1
Nervous Tissue	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1 BIO.A.3.2.1
Spinal Cord and Spinal Nerves	Approved Textbook	BIO.A.1.2.2
Brain and Cranial Nerves	Approved Textbook	BIO.A.1.2.2

**Scranton School District
Curriculum Guide**

3rd Quarter

Topic	Resources	Academic Standard
Endocrine System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2 BIO.A.4.2.1
Cardiovascular System: Blood	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2 BIO.A.4.2.1
Cardiovascular System: Heart	Approved Textbook	BIO.A.1.2.2
Cardiovascular System: Blood Vessels and Hemodynamics	Approved Textbook	BIO.A.1.2.2 BIO.A.4.2.1
Lymphatic and Immune System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.2.2.2 BIO.A.2.2.3
Respiratory System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.3.1.1 BIO.A.3.2.1 BIO.A.3.2.2

**Scranton School District
Curriculum Guide**

4th Quarter

Topic	Resources	Academic Standard
Urinary System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.3.1.1 BIO.A.3.2.1 BIO.A.3.2.2
Digestive System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/	BIO.A.1.2.2 BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2 BIO.A.4.2.1
Reproductive System	Approved Textbook http://www.webmd.com/ http://www.nlm.nih.gov/ http://www.babycenter.com/pregnancy-week-by-week	BIO.A.1.2.2 BIO.B.1.1.2 BIO.B.1.2.2 BIO.A.4.2.1
Final Exam Review	Approved Textbook	

**Scranton School District
Curriculum Guide**

General Topic	Academic Standard(s)	Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time
Introduction to the Human Body	BIO.A.1.1.1 BIO.A.1.2.1 BIO.A.1.2.2	<ul style="list-style-type: none"> • Define anatomy and physiology, and name several subdisciplines of these sciences. • Describe the levels of structural organization that make up the human body. • List the eleven systems of the human body, the organs present in each, and their general functions. • Define the important life processes of the human body. • Define homeostasis and explain its relationship to interstitial fluid. • Describe the components of a feedback system. • Contrast the operation of negative and positive feedback systems. • Explain why homeostatic imbalances cause disorders. • Describe the orientation of the body in the anatomical position. • Define each directional term used to describe the human body. • Vocabulary: <ul style="list-style-type: none"> ○ superior ○ inferior ○ anterior (ventral) ○ posterior (dorsal) ○ medial ○ lateral 	<p>Approved Textbook (when assigning, keep in mind that is a college text) for use throughout the course.</p> <p>Suggested websites for use throughout the course.</p> <p>http://www.webmd.com/ http://www.nlm.nih.gov/ www.biologyjunction.com www.biologycorner.com www.khanacademy.org http://www.ck12.org/ http://www.anatomynetwork.com/ http://www.getbodysmart.com/index.htm</p> <p><u>Suggested activities:</u></p> <p>*Explore a career in a related field (mini research paper or presentation)</p> <p>*Simon Says... using the anatomical directional terms</p> <p>*Anatomical Scavenger hunt</p>	<p>For every unit: Teacher prepared tests, quizzes, inquiry based and traditional lab activities, research assignments, practical examinations, etc.</p> <p><u>Suggested assessments:</u></p> <p>→Report*</p> <p>→Report*</p> <p>→Report*</p>	10 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> ○ proximal ○ distal ○ superficial ○ deep <ul style="list-style-type: none"> • Relate the common names to the corresponding anatomical descriptive terms for various regions of the human body. • Define the anatomical planes and sections used to describe the human body. • Describe the major body cavities, the organs they contain, and their associated linings. • Name and describe the nine abdominopelvic regions and the four abdominopelvic quadrants. • Describe the principles and importance of medical imaging procedures in the evaluation of organ functions and diagnosis of disease. 	Use containers, bags, cling wrap, etc. to model levels of organization.	→Report*	
Chemical Level of Organization	BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2	<p>Nature of matter</p> <ul style="list-style-type: none"> • List important properties of matter • Define the phases of matter • Identify and define the components of the atom • Utilize the periodic table <p>Water</p> <ul style="list-style-type: none"> • define solutions • define pH • utilize the pH scale <p>Chemical compounds</p>	Using scientific notation <ul style="list-style-type: none"> • pH to taste Lab • pH sweat Lab 	→Report*	8 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> distinguish organic from inorganic compounds identify the four key elements of living things identify the four groups of organic compounds <p>Nucleic acids DNA</p> <ul style="list-style-type: none"> define DNA describe the genetic code describe in steps the replication cycle of DNA <p>RNA</p> <ul style="list-style-type: none"> define RNA describe its part in DNA replication <p>Protein synthesis</p> <ul style="list-style-type: none"> use the codons produced to define the proteins synthesized 	<p>Oil and Water demo Milk and Dish soap</p> <p>Review of DNA replication and protein synthesis, not an in depth study.</p> <p>Videos by Crash Course, Hank Green</p>	→Report*	
Cellular Level of Organization	BIO.A.1.1.1 BIO.A.1.2.1 BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1	<p>Cell structure and function</p> <p>Cell structure</p> <ul style="list-style-type: none"> Diagram and describe the cell Diagram and describe the membrane Diagram and describe each organelle <p>Movement and the cell membrane</p> <ul style="list-style-type: none"> Describe diffusion Describe permeability Describe osmosis 	*Create a cell analogy book	→Cell Analogy Book	8 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> Describe facilitated diffusion Describe active transport Demonstrate the types of transport using common household items Identify the areas of the body that each of these would occur Cell specialization Define cell specialization 	<p>*Cell transport lab; Model a cell in hypotonic, hypertonic, and isotonic conditions. Discuss permeability and transport.</p> <p>Touch upon stem cell research. Revisit the topic when the students have more knowledge of systems.</p>	→Report*	
Tissue Level of Organization	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1	<ul style="list-style-type: none"> Name the four basic types of tissues that make up the human body and describe the characteristics of each. Describe the structure and functions of the five main types of cell junctions. Describe the general features of epithelial tissues. For each different type of epithelium, list its location, structure and function. Describe the general features of connective tissue. Describe the structure, location, and function of the various types of connective tissues. Define a membrane. Describe the classification of membranes. Describe the structural features and functions of nervous tissue. Describe the role of tissue repair in restoring homeostasis. 	<p>Use the microscopes to study tissue samples and identify major types and parts.</p> <p>Virtual practical available at: http://www.gwc.maricopa.edu/class/bio201/histoprc/prac1q.htm</p>	→Report* →Histology practical	10 days
Integumentary	BIO.A.1.2.2	<ul style="list-style-type: none"> Describe the layers of the 			8 days

**Scranton School District
Curriculum Guide**

System	BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1	<p>epidermis and the cells that compose them.</p> <ul style="list-style-type: none"> • Compare the composition of the papillary and reticular regions of the dermis. • Explain the basis for different skin colors. • Contrast the structure, distribution, and functions of hair, skin, glands, and nails. • Describe how the skin contributes to regulation of body temperature, protection, sensation, excretion and absorption, and synthesis of vitamin D. • Explain how epidermal wounds and deep wounds heal. 	<p>First Aid review</p> <p>*Research and report on a disease of this system.</p>		
Skeletal System: Bone Tissue	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures on a cellular level and gross level for point of reference. Including; <ul style="list-style-type: none"> ○ diaphysis ○ epiphyses ○ metaphyses ○ epiphyseal plate ○ epiphyseal line ○ articular cartilage ○ periosteum ○ osteogenic cells ○ osteoblasts ○ osteocytes ○ osteoclasts 	<p>*Build or sketch a long bone</p>	<p>➔Sketch or Model</p>	<p>7 days</p>

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> ○ Haversian System • Describe the blood and nerve supply of bone. • Describe the steps of intramembranous and endochondral ossification. • Describe how bone grows in length and thickness. • Explain the role of nutrients and hormones in regulating bone growth. • Describe the processes involved in bone remodeling. • Describe the sequence of events in repair of a fracture. • Describe the role of bone in calcium homeostasis. • Describe diseases and disorders that affect this system 			
Skeletal System: Axial Skeleton	BIO.A.1.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Classify bones based on their shape and location. • Describe the principal surface markings on bones and the functions of each. • Name the cranial and facial bones and indicate the number of each. • Describe the following unique features of the skull: sutures, paranasal sinuses, and fontanelles. 	Independent review of Anatomy (available online or with textbook)	→Report*	4 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> • Describe the relationship of the hyoid bone to the skull. • Identify the regions and normal curves of the vertebral column and describe its structural and functional features. • Identify the bones of the thorax. • Identify the bones of the pectoral (shoulder) girdle and their principle markings. • Identify the bones of the pelvic girdle and their principle markings. • Compare the principal structural differences between female and male pelvis. • Describe diseases and disorders that affect this system 			
Skeletal System: Appendicular Skeleton & Joints	BIO.A.1.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Identify the bones of the upper limb and their principal markings. • Identify the bones of the lower limb and their principal markings. • Describe the structural and functional classifications of joints. • Explain the effects of aging on joints. • Explain the physiology of the system 	<p>Independent review of Anatomy (available online or with textbook)</p> <p>*Scavenger Hunt for analoagous joints in everyday objects.</p>	<p>→Report*</p> <p>→Report*</p>	4 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> Describe diseases and disorders that affect this system 	*Research and report on a disease of this system.		
Muscular System	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1 BIO.A.3.2.1	<ul style="list-style-type: none"> Diagram and describe the chief anatomical structures Correlate the three types of muscle tissue with their functions and special properties. Explain seven features used in naming skeletal muscles. Identify the major muscles of the human body on a diagram or model. Describe the relationship between bones and skeletal muscles in producing body movements. Explain how the prime mover, antagonist, synergist, and fixator in a muscle group work together to produce movement. Explain the physiology of the system Explain the relation of connective tissue components, blood vessels, and nerves to skeletal muscles. Describe the microscopic anatomy of a skeletal muscle fiber. Outline the steps involved in the sliding filament mechanism of muscle contraction. 	<p>Independent review of Anatomy (available online or with textbook)</p> <p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*Exercise lab to demonstrate “movers”</p>	<p>→Report*</p> <p>→Report*</p> <p>→Report*</p>	15 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> Describe how muscle action potentials arise at the neuromuscular junction. Describe the reactions by which muscle fibers produce ATP. Describe the structure and function of a motor unit. Explain the phases of a twitch contraction. Describe how frequency of stimulation affects muscle tension. Compare the structure and function of the three types of skeletal muscle fibers. Describe diseases and disorders that affect this system 	<p>*Skit of the muscular contraction to demonstrate knowledge from reception nerve impulse through relaxation.</p> <p>*Research and report on a disease of this system.</p>	<p>→Skit Performance may be graded for correctness</p> <p>Practical Exam #1 (virtual cat)</p>	
Nervous Tissue	BIO.A.1.2.2 BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3 BIO.A.4.2.1 BIO.A.3.2.1	<ul style="list-style-type: none"> Diagram and describe the chief anatomical structures Contrast the histological characteristics and the functions of neurons and neuroglia. Distinguish between gray matter and white and matter. Explain the physiology of the system Describe the cellular properties that permit communication among neurons and effectors. Describe the factors that maintain a resting membrane potential. List the sequence of events 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p>	<p>→Report*</p>	7 days

**Scranton School District
Curriculum Guide**

		<p>involved in the generation of a nerve action potential.</p> <ul style="list-style-type: none"> • Explain the events of signal transmission at a chemical synapse. • Distinguish between spatial and temporal summation. • Give examples of excitatory and inhibitory neurotransmitters, and describe how they act. • Describe the classification and functions of neurotransmitters. • Describe diseases and disorders that affect this system 	<p>*Battery Lab</p> <p>*Summation demonstration</p> <p>*Research and report on a disease of this system.</p>	<p>→Report*</p> <p>→Report*</p>	
Spinal Cord and Spinal Nerves	BIO.A.1.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Describe the protective structures and the gross anatomical features of the spinal cord. • Explain the physiology of the system • Describe the functions of the major sensory and motor tracts of the spinal cord. • Describe the functional components of a reflex arc and the ways reflexes maintain homeostasis. • Describe the components, connective tissue coverings, and branching of a spinal nerve. • Define plexus, and identify the distribution of nerves of the 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*Reflex Lab</p>	<p>→Report*</p> <p>→Report</p>	4 days

**Scranton School District
Curriculum Guide**

		<p>cervical, brachial, lumbar, and sacral plexuses.</p> <ul style="list-style-type: none"> • Describe the clinical significance of dermatomes. • Describe diseases and disorders that affect this system 	<p>*Research and report on a disease of this system.</p>		
Brain and Cranial Nerves	BIO.A.1.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Identify the major parts of the brain. • Describe how the brain is protected. • Explain the formation and circulation of cerebrospinal fluid. • Explain the physiology of the system • Describe the structures and functions of the brain stem, cerebellum, diencephalon, and the cerebrum. • Describe the locations and functions of the sensory, association, and motor areas of the cerebral cortex • Identify the cranial nerves by name and number, and give the functions of each. • Describe diseases and disorders that affect this system 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*Skull base and cranial nerve sketch</p>	→ Report*	4 days
Endocrine System	BIO.A.1.2.2 BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Distinguish between exocrine and endocrine glands. 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined</p>	→ Report*	10 days

**Scranton School District
Curriculum Guide**

	BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2 BIO.A.4.2.1	<ul style="list-style-type: none"> • Explain the physiology of the system • Describe how hormones interact with target-cell receptors. • Compare the two chemical classes of hormones based on their solubility. • Describe the two general mechanisms of hormone action. • Describe the location, histology, hormones, and functions of the anterior and posterior pituitary glands. • Describe the location, histology, hormones, and functions of the thyroid gland. • Compare the control of body functions by the nervous system and the endocrine system. • Describe diseases and disorders that affect this system 	properly.)		
Cardiovascular System: Blood	BIO.A.1.2.2 BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2 BIO.A.4.2.1	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures. • Describe the physical characteristics and principal components of blood. • Explain the physiology of the system. <p>Describe the functions of blood.</p> <ul style="list-style-type: none"> • Explain the origin of blood cells. • Describe the structure, 		*Research and report on a disease of this system.	5 days
				Blood typing Lab	→Report

**Scranton School District
Curriculum Guide**

		<p>functions, life cycle, and production of red blood cells, white blood cells, and platelets.</p> <ul style="list-style-type: none"> • Describe the mechanisms that contribute to hemostasis. • Identify the stages involved in blood clotting, and explain the various factors that promote and inhibit blood clotting. • Explain the ABO and Rh blood groups. • Briefly describe the correlation to the lymphatic system. • Describe diseases and disorders that affect this system. 			
Cardiovascular System: Heart	BIO.A.1.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures and their corresponding physiology. • Describe the location of the heart, and trace its outline on the surface of the chest. • Describe the structure of the pericardium and the heart wall. • Discuss the external and internal anatomy of the chambers of the heart. • Describe the structure and function of the valves of the heart. • Describe the flow of blood through the chambers of the heart and through the systemic and pulmonary circulations. • Discuss the coronary 	<p>*Research and report on a disease of this system.</p> <p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*Sheep heart dissection and study</p>	→ Report*	5 days

**Scranton School District
Curriculum Guide**

		<p>circulation.</p> <ul style="list-style-type: none"> • Describe the structural and functional characteristics of cardiac muscle tissue. • Explain the structural and functional features of the conduction system of the heart. • Describe the electrical events of a normal electrocardiogram (ECG). • Describe the pressure and volume changes that occur during a cardiac cycle. • Relate the timing of heart sounds to the ECG waves and pressure changes during systole and diastole. • Describe diseases and disorders that affect this system 	<p>Evaluate ECG reports</p> <p>*Research and report on a disease of this system.</p>	<p>→Report*</p>	
Cardiovascular System: Blood Vessels and Hemodynamics	BIO.A.1.2.2 BIO.A.4.2.1	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Contrast the structure and function of arteries, arterioles, capillaries, venules, and veins. • Explain the physiology of the system • Explain the factors that regulate the volume of blood flow. • Explain how blood pressure changes throughout the cardiovascular system. • Describe the factors that determine mean arterial blood 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p>	<p>→Report*</p>	5 days

**Scranton School District
Curriculum Guide**

		<p>pressure and systemic vascular resistance.</p> <ul style="list-style-type: none"> • Describe the relation between cross-sectional area and velocity of blood flow. • Describe how blood pressure is regulated. • Define pulse, and define systolic, diastolic, and pulse pressures. • Describe diseases and disorders that affect this system 	<p>Manipulate the sphygmomanometer, record and analyze the resulting data.</p>	<p>→Report*</p>	
Lymphatic and Immune System	BIO.A.1.2.2 BIO.A.2.2.2 BIO.A.2.2.3	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Describe the organization of lymphatic vessels. • Describe the formation and flow of lymph. • Compare the structure and functions of the primary and secondary lymphatic organs and tissues. • Explain the physiology of the system • Define immunity, and describe how T cells and B cells arise. • Explain the relationship between an antigen and an antibody. • Compare the functions of cell-mediated immunity and antibody-mediated immunity. • Describe diseases and disorders that affect this system 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*Disease transmission Lab</p> <p>*Research and report on a disease of this system.</p>	<p>→Report*</p> <p>→Report*</p>	10 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> • Human diseases (The following are addressed as integrated topics within given systems.) <ul style="list-style-type: none"> • Agents of disease • List the characteristics used to classify infectious diseases • Group given diseases as viral, bacterial, or protozoan. • Describe and provide examples for each group • Determine the effects of disease on each system • Cancer <ul style="list-style-type: none"> ○ Define cancer ○ List several causes of cancer in general ○ Describe cancer treatments 			
Respiratory System	BIO.A.1.2.2 BIO.A.3.1.1 BIO.A.3.2.1 BIO.A.3.2.2	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Describe the anatomy and histology of the nose, pharynx, larynx, trachea, bronchi, and lung. • Identify the functions of each respiratory system structure. • Describe the anatomy of the lungs. • Explain the physiology of the system • Describe the events that cause inhalation and exhalation. • Define the various lung volumes 	Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.) *Build a model lung	→Report* →Report*	10 days

**Scranton School District
Curriculum Guide**

		<p>and capacities.</p> <ul style="list-style-type: none"> Describe the exchange of oxygen and carbon dioxide in external and internal respiration. Describe how the blood transports oxygen and carbon dioxide. Explain how the nervous system controls breathing and list the factors that can alter the rate and depth of breathing. Describe diseases and disorders that affect this system 	<p>*Measure individual lung capacity</p> <p>*Research and report on a disease of this system.</p>	<p>→Report*</p> <p>Practical Exam #2 (virtual cat)</p>	
Urinary System	<p>BIO.A.1.2.2 BIO.A.3.1.1 BIO.A.3.2.1 BIO.A.3.2.2</p>	<ul style="list-style-type: none"> Diagram and describe the chief anatomical structures Describe the external and internal gross anatomical features of the kidneys. Explain the physiology of the system List the functions of the kidneys. Trace the path of blood flow through the kidneys. Describe the structure of renal corpuscles and renal tubules. Identify the three basic functions performed by nephrons and collecting ducts, and indicate where each occurs. Describe the routes and mechanisms of tubular 	<p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*Urinalysis lab (simulated urine)</p>	<p>→Report*</p> <p>→Report*</p>	10 days

**Scranton School District
Curriculum Guide**

		<p>reabsorption and secretion.</p> <ul style="list-style-type: none"> • Describe how specific segments of the renal tubule and collecting duct reabsorb water and solutes. • Describe how specific segments of the renal tubule and collecting duct secrete solutes into the urine. • Describe how the renal tubule and collecting ducts produce dilute and concentrated urine. • Define urinalysis and describe its importance. • Describe the anatomy, histology, and physiology of the ureters, urinary bladder, and urethra. • Describe diseases and disorders that affect this system 			
Digestive System	<p>BIO.A.1.2.2 BIO.A.2.1.1 BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3 BIO.A.2.3.1 BIO.A.2.3.2 BIO.A.4.2.1</p>	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Identify the organs of the digestive system. • Describe the layers that form the wall of the gastrointestinal tract. • Describe the peritoneum and its folds. • Explain the physiology of the system • Describe the site of secretion and the actions of gastrin, secretin, and cholecystokinin. 	<p>*Research and report on a disease of this system.</p> <p>Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)</p> <p>*“Taste a Ritz Cracker...” *Enzyme Action Lab</p>	<p>→Report*</p> <p>→Report*</p>	10 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> • Describe diseases and disorders that affect this system • Drugs <ul style="list-style-type: none"> • Explain the ways drugs affect the body, system by system • Describe the affects of drug abuse physiologically and personally • Alcohol <ul style="list-style-type: none"> • Recognize alcohol as a drug • Explain the ways alcohol affects the body’s systems • Describe the affects of alcohol abuse physiologically and personally 	*Research and report on a disease of this system.		
Reproductive System	BIO.A.4.2.1 BIO.B.1.1.1 BIO.B.1.1.2 BIO.B.1.2.1 BIO.B.1.2.2 BIO.B.2.1.1 BIO.B.2.1.2 BIO.B.2.2.1 BIO.B.2.2.2 BIO.B.2.3.1 BIO.B.3.1.3 BIO.B.2.4.1	<ul style="list-style-type: none"> • Diagram and describe the chief anatomical structures • Describe the location, structure, and functions of the organs of the male reproductive system. • Explain the physiology of the system • Describe the process of spermatogenesis in the testes. • Diagram and describe the chief anatomical structures • Describe the location, structure, and functions of the organs of the female reproductive system. • Explain the physiology of the system 	Small mammal dissection or virtual dissection. (Virtual preferred with true dissection reserved for the end of the year when all systems can be examined properly.)	→Report* Practical Exam #3 (virtual cat)	10 days

**Scranton School District
Curriculum Guide**

		<ul style="list-style-type: none"> • Discuss the process of oogenesis in the ovaries. • Describe diseases and disorders that affect this system • Describe the development of the male and female reproductive systems. • Developmental Biology (if time allows) • Revisit Stem Cell Research • Human heredity <ul style="list-style-type: none"> • Family traits • Define sex chromosomes, autosomes, gametes, and zygotes • Examine the role the environment plays in gene expression • Sex-linked inheritance • Predict the sex of a given offspring • Describe and provide examples of nondisjunction disorders • Trace sex-influenced traits in a given family • Diagnosis of genetic disorders • Compare a control chromosome with specimens to find genetic abnormalities. • Genetic engineering <ul style="list-style-type: none"> • Define and describe 	<p>*Research and report on a disease of this system.</p> <p>http://www.babycenter.com/pregnancy-week-by-week</p> <p>*Family tree of traits</p>	<p>→Report*</p>	
--	--	---	---	-----------------	--

**Scranton School District
Curriculum Guide**

		<p>selective breeding, inbreeding, and hybridization</p> <ul style="list-style-type: none"> • State and defend his/her point of view on the ethical issues behind genetic engineering 			
Final Exam Review			<p>All prior materials</p> <p>Small mammal dissection or virtual dissection. Dissect, identify, and review of all systems.</p>	<p>→ Report*</p> <p>→ True Practical Exam</p>	15 days