



# ANATOMY & PHYSIOLOGY

SCOPE & SEQUENCE  
CREATED BY TEACHERS  
FOR THE TEACHERS OF SRC

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*“Give the pupils something to do; not something to learn; and if the doing is of such a nature as to demand thinking; learning naturally results.”*

*~John Dewey*

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# **Anatomy & Physiology (Honors) Scope & Sequencing**

## **NINE WEEKS**

### **First Nine Weeks**

Lab Safety (one day)

Introduction to Anatomy and Physiology Chapter 1

Chemical Basis of Life (Macromolecules only) Chapter 2 Section 2.3

Cells (Movements into and out of the Cell) Chapter 3 Section 3.3

Cellular Metabolism Chapter 4 Sections 4.5 and 4.6

Tissues (including cancer and mutating cells) Chapter 5

Integumentary Chapter 6

### **Second Nine Weeks**

Skeletal System Chapter 7

Muscular System Chapter 8

The Senses Chapter 10

### **Third Nine Weeks**

Nervous System Chapter 9

Endocrine System Chapter 11

Blood Chapter 12

Cardiovascular System Chapter 13 (including fetal blood circulation from Chapter 20)

### **Fourth Nine Weeks**

Lymphatic circulation Chapter 14

Digestive System Chapter 15

Respiratory System Chapter 16

Urinary System Chapter 17

Reproductive system Chapter 19

Nine Weeks	Chapter/Lesson	Science Activities	SSS Benchmark
<p>1<sup>st</sup> -----</p>	<p><b>Lab Safety and Scientific Method</b></p>	<p>1. Safety Quiz and Contract</p>	<p>LA.910.2.2.3 The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, comparing, contrasting, or outlining);</p> <p>LA.910.4.2.2 The student will record information and ideas from primary and/or secondary sources accurately and coherently, noting the validity and reliability of these sources and attributing sources of information;</p> <p>MA.912.S.1.2 Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment.</p> <p>MA.912.S.3.2 Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following:</p> <ul style="list-style-type: none"> <li>● bar graphs</li> <li>● line graphs</li> <li>● stem and leaf plots</li> <li>● circle graphs</li> <li>● histograms</li> <li>● box and whisker plots</li> <li>● scatter plots</li> <li>● cumulative frequency (ogive) graphs</li> </ul> <p>SC.912.N.1.1 Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> <li>1. pose questions about the natural world,</li> <li>2. conduct systematic observations,</li> <li>3. examine books and other sources of information to see what is already known,</li> <li>4. review what is known in light of empirical evidence,</li> <li>5. plan investigations,</li> <li>6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and</li> </ol>

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			<p>interpretation of graphical representations of data, including data tables and graphs),</p> <ol style="list-style-type: none"> <li>7. pose answers, explanations, or descriptions of events,</li> <li>8. generate explanations that explicate or describe natural phenomena (inferences),</li> <li>9. use appropriate evidence and reasoning to justify these explanations communicate results of scientific investigations, and</li> <li>10. evaluate the merits of the explanations produced by others.</li> </ol> <p>SC.912.N.1.2 Describe and explain what characterizes science and its methods.</p>
1 <sup>st</sup> -----	<b>Chapter 1: Organization of Life</b>	Body Organization, Membranes and Terminology – Lab 2	HE.912.C.1.3 Evaluate how environment and personal health are interrelated.
1 <sup>st</sup> -----	<b>Chapter 2: Biochemistry</b>		<p>SC.912.L.18.2 Describe the important structural characteristics of monosaccharides, disaccharides, and polysaccharides and explain the functions of carbohydrates in living things.</p> <p>SC.912.L.18.3 Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes.</p> <p>SC.912.L.18.4 Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structure and function of enzymes.</p>

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1 <sup>st</sup> -----	<b>Chapter 3: Cells</b>		SC.912.L.14.2 Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport). SC.912.L.16.8 Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer. HE.912.C.1.3 Evaluate how environment and personal health are interrelated.
1 <sup>st</sup>	<b>Chapter 4: Cellular Metabolism</b>		SC.912.L.18.6 Discuss the role of anaerobic respiration in living things and in human society.  SC.912.L.18.8 Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration. SC.912.L.18.11 Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.
1 <sup>st</sup> -----	<b>Chapter 5: Tissues</b>	<ol style="list-style-type: none"> <li>1. Tissue Lab-look at prepared slides</li> <li>2. Labeling tissue samples</li> </ol>	SC.912.L.14.11 Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue.

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1 <sup>st</sup> -----	<b>Chapter 6: Integumentary System</b>	<ol style="list-style-type: none"> <li>1. Integumentary System Lab 7</li> <li>2. Fingerprint Lab</li> </ol>	SC.912.L.14.51 Describe the function of the vertebrate integumentary system.
2 <sup>nd</sup> -----	<b>Chapter 7: Skeletal System</b>	<ol style="list-style-type: none"> <li>1. Bone Organization Lab - Lab 8, 9, 10,11</li> <li>2. Chicken leg lab (bone, muscle and joints)</li> <li>3. Structure of long bone inquiry lab</li> </ol>	<p>SC.912.L.14.12 Describe the anatomy and histology of bone tissue.</p> <p>SC.912.L.14.13 Distinguish between bones of the axial skeleton and the appendicular skeleton.</p> <p>SC.912.L.14.14 Identify the major bones of the axial and appendicular skeleton.</p> <p>SC.912.L.14.15 Identify major markings (such as foramina, fossae, tubercles, etc.) on a skeleton. Explain why these markings are important.</p>
2 <sup>nd</sup> -----	<b>Chapter 8: Muscular System</b>	<ol style="list-style-type: none"> <li>1. Mammalian Dissection</li> <li>2. Muscle Structure and Function Lab 12</li> <li>3. Muscle fatigue Lab 13</li> <li>4. Skeletal Muscles Labs 14,15,16</li> </ol>	<p>SC.912.L.14.16 Describe the anatomy and histology, including ultrastructure, of muscle tissue.</p> <p>SC.912.L.14.17 List the steps involved in the sliding filament of muscle contraction.</p> <p>SC.912.L.14.18 Describe signal transmission across a myoneural junction.</p> <p>SC.912.L.14.19 Explain the physiology of skeletal muscle.</p> <p>SC.912.L.14.20 Identify the major muscles of the human on a model or diagram.</p>
2 <sup>nd</sup> -----	<b>Chapter 10: Senses</b>	<ol style="list-style-type: none"> <li>1. Eye Dissection</li> <li>2. Eye tests</li> <li>3. Sensory Labs 22, 23, 24</li> </ol>	SC.912.L.14.50 Describe the structure of vertebrate sensory organs. Relate structure to function in vertebrate sensory systems.

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3rd ---- ----	<b>Chapter 9: Nervous System</b>	<ol style="list-style-type: none"> <li>1. Brain Dissection Lab 21</li> <li>2. Reflex Lab 19</li> <li>3. Reaction time Lab 20</li> </ol>	<p>SC.912.L.14.21 Describe the anatomy, histology, and physiology of the central and peripheral nervous systems and name the major divisions of the nervous system.</p> <p>SC.912.L.14.22 Describe the physiology of nerve conduction, including the generator potential, action potential, and the synapse.</p> <p>SC.912.L.14.23 Identify the parts of a reflex arc.</p> <p>SC.912.L.14.25 Identify the major parts of a cross section through the spinal cord.</p> <p>SC.912.L.14.27 Identify the functions of the major parts of the brain, including the meninges, medulla, pons, midbrain,</p>			

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			<p>hypothalamus, thalamus, cerebellum and cerebrum.            SC.912.L.14.28 Identify the major functions of the spinal cord.            SC.912.L.14.49 Identify the major functions associated with the sympathetic and parasympathetic nervous systems.</p>			
3rd	-----			<b>Chapter 11: Endocrine System</b>	<ol style="list-style-type: none"> <li>1. Power point on a hormone Lab 25</li> </ol>	SC.912.L.14.29 Define the terms endocrine and exocrine. SC.912.L.14.30 Compare endocrine and neural controls of physiology. SC.912.L.14.31 Describe the physiology of hormones including the different types and the mechanisms of their action.
3rd	-----			<b>Chapter 12: Blood</b>	<ol style="list-style-type: none"> <li>1. Blood typing Lab 27</li> <li>2. Microscopic Lab 26</li> </ol>	SC.912.L.14.34 Describe the composition and physiology of blood, including that of the plasma and the formed elements. SC.912.L.14.35 Describe the steps in hemostasis, including the mechanism of coagulation. Include the basis for blood typing and transfusion reactions. SC.912.L.14.6 Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.



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3rd -----	<b>Chapters 13: Cardiovascular System</b>	<ol style="list-style-type: none"> <li>1. Heart Dissection</li> <li>2. Labeling blood flow through the heart</li> <li>3. Pulse lab/blood pressure lab</li> <li>4. Cardiac Cycle (ECG) Lab 28</li> </ol>	<p>SC.912.L.14.36 Describe the factors affecting blood flow through the cardiovascular system.</p> <p>SC.912.L.14.37 Explain the components of an electrocardiogram.</p> <p>SC.912.L.14.38 Describe normal heart sounds and what they mean.</p> <p>SC.912.L.14.39 Describe hypertension and some of the factors that produce it.</p> <p>SC.912.L.14.40 Describe the histology of the major arteries and veins of systemic, pulmonary, hepatic portal, and coronary circulation.</p> <p>SC.912.L.14.41 Describe fetal circulation and changes that occur to the circulatory system at birth.</p> <p>SC.912.L.16.10 Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.</p> <p>HE.912.C.1.4 Analyze how heredity and family history can impact personal health.</p>
4th -----	<b>Chapters 14: Lymphatic System</b>		<p>SC.912.L.14.42 Describe the anatomy and the physiology of the lymph system.</p> <p>SC.912.L.14.52 Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.</p>
4th -----	<b>Chapter 15: Digestive System and Nutrition</b>	<ol style="list-style-type: none"> <li>1. Mammalian Dissection Lab 31</li> </ol>	<p>SC.912.L.14.45 Describe the histology of the alimentary canal and its associated accessory organs.</p> <p>SC.912.L.14.46 Describe the physiology of the digestive system, including mechanical digestion, chemical digestion, absorption and the neural and hormonal mechanisms of control.</p>

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4th -----	<b>Chapter 16: Respiratory System</b>	<ol style="list-style-type: none"> <li>1. Lung Model Lab 29</li> <li>2. Lung Capacity Lab 29</li> <li>3. Mammalian Dissection</li> </ol>	<p>SC.912.L.14.43 Describe the histology of the respiratory system.</p> <p>SC.912.L.14.44 Describe the physiology of the respiratory system including the mechanisms of ventilation, gas exchange, gas transport and the mechanisms that control the rate of ventilation.</p>
4th -----	<b>Chapter 17 - 18: Urinary System</b>	<ol style="list-style-type: none"> <li>1. Urinalysis Lab 34</li> <li>2. Urinalysis Virtual Lab</li> <li>3. Kidney Dissection Lab 33</li> <li>4. Mammalian Dissection Lab 33</li> </ol>	<p>SC.912.L.14.47 Describe the physiology of urine formation by the kidney.</p> <p>SC.912.L.14.48 Describe the anatomy, histology, and physiology of the ureters, the urinary bladder and the urethra.</p>
4th -----	<b>Chapter 19 - 20: Reproductive Systems, Human Development, and Heredity</b>	<ol style="list-style-type: none"> <li>1. Mammalian Dissection</li> <li>2. STD Lab (body fluids)</li> <li>3. Video (suggested: NOVA's <u>Miracle of Life</u>)</li> <li>4. <u>Video (From Conception to Birth)</u></li> </ol>	<p>SC.912.L.16.13 Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy.</p>