

# HS Anatomy and Physiology Curriculum Map



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# Preface

Teams of Lake County teachers created the curriculum maps in order to ensure that all students throughout the district receive a common curriculum. The maps help ensure that all state requirements are taught and that the content is divided into teachable segments with appropriate pacing. The curriculum maps will guide your instruction but provide flexibility based on the individual needs of students. The maps are living documents and feedback is requested of teachers to ensure continuous improvement.

All teachers are expected to use the curriculum maps, in conjunction with data, to drive instruction. The maps were designed for the instruction to take place by quarter. There is some flexibility within the quarters for mastery and re-teaching. The expectation is that teachers will finish the content within each quarter in its entirety. The maps have been structured in such a way as to scaffold student learning.

Listed below are a few of the new or updated features common to all curriculum maps:

## **Essential Question(s):**

- Provide application of the skills/concepts
- Have more than one right answer which promotes student discourse
- Increase the rigor in the classroom, by changing from teacher-centered to student-centered learning
- Are referred to at the beginning, middle, and end of the lesson
- Require you to make a decision
- Promote critical thinking and problem solving
- Encourage interdependence
- Are open-ended

## **Academic Vocabulary** are:

- Unfamiliar vocabulary that are essential to understanding new content within explicit instruction
- Not necessarily the bold words in the chapter.
- Cumulative and continuously used throughout the year.
- Integrated into word walls, a research-based strategy that will facilitate vocabulary acquisition.

# Preface

**Common Board Configuration Elements** (specific layouts may vary by sites, but must include each of these):

Purpose: For the student to know what is being taught and what the student will learn

- Date
- Benchmark
- Measurable, student-friendly objective
- Essential Question
- Bell work
- Agenda (Specific daily schedule)
- Homework
- Exit Strategy/Card

**Lessons that infuse reading, writing, and discussion** are imperative components of every subject area. There should be **daily**:

- Teacher to student and student to student discourse utilizing academic vocabulary.
- Reading and authentic writing
- Writing that includes higher-order thinking
- Incorporation of effective reading and writing instructional strategies

**Maps are organized** to include the following:

- Pacing
- Objective
- Essential questions, content and understanding, benchmarks, and assessment
- Appendix/ resources

# Preface

## Next Generation Sunshine State Standards

### Science Benchmark Coding Scheme

SC.	5.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

#### Body of Knowledge Key

N ~ Nature of Science  
L ~ Life Science

E ~ Earth Space Science  
P ~ Physical Science

#### Big Idea Key

- #1 – The Practice of Science
- #2 – The Characteristics of Scientific Knowledge
- #3 – The Role of Theories, Laws, Hypotheses, and Models
- #4 – Science and Society
- #5 – Earth in Space and Time
- #6 – Earth Structures
- #7 – Earth Systems and Patterns
- #8 – Properties of Matter
- #9 – Changes in Matter

- #10 – Forms of Energy
- #11 – Energy Transfer and Transformation
- #12 – Moon Objects
- #13 – Forces and Changes in Motion
- #14 – Organization and Development of Living Organisms
- #15 – Diversity and Evolution of Living Organisms
- #16 – heredity and Reproduction
- #17 – Interdependence
- #18 – Matter and Energy Transformations

### **Language Arts and Mathematic Benchmarks**

The Language Arts and Mathematic benchmarks are in the course description. These benchmarks have been integrated throughout the curriculum map.

#### **Differentiated Instruction Strategies**

The following differentiated instruction strategies should be incorporated throughout the entire course:

Cooperative Groups	Computer Assisted Instruction	Tiered Assignments	Centers
Flexible Grouping	Curriculum Compacting/Contracts	Learning Stations	Scaffolding
Hands-on Instruction	Leveled Texts/Resources	Teacher Led Small Groups	Web Quest

**This chart is to show where the Big Ideas are located by grade level.  
This will help to give an understanding as to why complete coverage of the NGSSS at each grade level is essential!!**

<b>Big Idea #1 The Practice of Science</b>	<b>Big Idea #2 The Characteristics of Scientific Knowledge</b>	<b>Big Idea #3 The Role of Theories, Laws, Hypotheses, and Models</b>	<b>Big Idea #4 Science and Society</b>	<b>Big Idea #5 Earth in Space and Time</b>	<b>Big Idea #6 Earth Structures</b>
K				K	
1st				1st	1st
2nd					2nd
3rd		3rd		3rd	3rd
4th	4th	4th		4th	4th
5th	5th			5th	
6th	6th	6th			6th
7th	7th	7th			7th
8th	8th	8th	8th	8th	
HS	HS	HS	HS	HS	HS
<b>#7 Earth Systems and Patterns</b>	<b>#8 Properties of Matter</b>	<b>#9 Changes in Matter</b>	<b>#10 Forms of Energy</b>	<b>#11 Energy Transfer and Transformations</b>	<b>#12 Motion of Objects</b>
	K	K	K		K
					1st
2 <sup>nd</sup>	2nd	2 <sup>nd</sup>	2nd		
	3rd	3 <sup>rd</sup>	3rd	3rd	
	4th	4 <sup>th</sup>	4th	4th	4th
5 <sup>th</sup>	5th	5 <sup>th</sup>	5th	5th	
6 <sup>th</sup>				6th	6th
		7 <sup>th</sup>	7 <sup>th</sup>	7 <sup>th</sup>	
	8 <sup>th</sup>				
HS	HS	HS	HS	HS	HS
<b>#13 Forces and Changes in Motion</b>	<b>#14 Organization and Development of Living Organisms</b>	<b>#15 Diversity and Evolution of Living Organisms</b>	<b>#16 Heredity and Reproduction</b>	<b>#17 Interdependence</b>	<b>#18 Matter and Energy Transformations</b>
K	K				
1 <sup>st</sup>	1st		1st	1st	
2 <sup>nd</sup>	2nd		2nd	2nd	
	3rd	3 <sup>rd</sup>		3rd	
			4th	4th	
5 <sup>th</sup>	5th	5 <sup>th</sup>		5th	
6 <sup>th</sup>	6th	6 <sup>th</sup>			
		7 <sup>th</sup>	7 <sup>th</sup>	7 <sup>th</sup>	
					8 <sup>th</sup>
HS	HS	HS	HS	HS	HS

## Reading Writing Discussion in the Science Classroom Everyday

### ➤ Reading Writing Discussion in the classroom everyday (33% of R&W&D everyday)

This means that during each class period the students should be reading, writing, and talking about Science. Many of these overlap in a combination of **R**eading, **W**riting, and **D**iscussion.

Reading **W**riting **D**iscussion in the Science Classroom:

What do these look like in the Science classroom?

What DOES the reading process look like?

- Modeling - reading and thinking out loud
- Students in small groups or pairs
- Whole group when referring to a specific portion of the text
- Use of graphic organizers
- Reading and following lab instructions
- Reading a section for homework at home

What DOES the writing process look like?

- Lab report
- Small group or pairs jotting down important points
- Journal writing
- Answering selected questions from the textbook in complete sentences
- Completing graphic organizer
- Entry or Exit card
- Taking notes
- Writing prompt
- Responding to open ended questions

What DOES the discussion process look like?

## Reading Writing Discussion in the Science Classroom Everyday

- Student discourse – discussion among and between the students about the topic (Could be in small group, pair, pair share, lecture (should involve two way communication))
- About labs, reading, current events, responses to open ended questions, essential questions, etc.
- Imbedding vocabulary terms/word wall, academic vocabulary, into the discussion

### ❖ The county approved textbook is a resource.

How to best use of the textbook to aid student comprehension:

- **At the beginning of each term** have the students participate in a “preview” of the textbook.
  - Table of contents
  - Chapter titles
  - Headings/subheadings
  - Graphics on the page, i.e. charts, graphs, pictures, maps tables,
  - Bold, italic, highlighted words
  - Glossary
  - Appendices
- **Incorporate the following for each chapter:**

By doing the following you will enhance a student's comprehension:

  - Before reading – preview, skim for new vocabulary, look at headings and subheadings, graphics,
  - During reading – Review the reading column of the chart for suggested activities.
  - After reading – Review writing and discussion columns of the chart for suggested activities.



# Reading Writing Discussion in the Science Classroom

Reading	Writing	Discussion
<p>Silent reading</p> <p>At home reading</p> <p>Oral</p> <p>Read Aloud</p> <p>Think Aloud</p> <p>Lab instructions (pre, during, post)</p> <p>Silently Sustained Reading – student choice</p> <p>Research paper</p> <p>*Reading could be from textbook, current event, supplemental texts, websites, etc.</p>	<p>Essential Question</p> <p>Cornell notes</p> <p>Small group notes</p> <p>Entry or Exit Card</p> <p>Graphic Organizers</p> <p>Writing Prompt</p> <p>Selected textbook questions (Answered with complete sentences)</p> <p>Worksheet</p> <p>3-2-1Strategy</p> <p>Lab Write up</p> <p>Journal writing</p> <p>Responding to open ended questions</p> <p>Research paper</p>	<p>Paired reading</p> <p>Jig Saw</p> <p>Think Pair Share</p> <p>Share out/Group presentations</p> <p>*Lectures (should involve two way communication)</p> <p>Read Aloud</p> <p>Think aloud</p> <p>3-2-1Strategy</p> <p>Lab Write up</p> <p>Lab instructions (pre, during, post)</p> <p>Research paper</p>

The above chart contains a sampling of suggestions and is not intended to be comprehensive.

# Reading Writing Discussion in the Science Classroom

## ➤ **Lab requirements:**

- ❖ Teachers will complete the “List of labs” form and a copy of the form will be given to the department chair at the end of each quarter for both middle and high schools.
- ❖ For ALL **middle school** Science courses:
  - a minimum of 8 labs per nine weeks
- ❖ For **high school** Science course:
  - For Regular courses – 1 per week
  - For Honors courses – 2 per week

## ➤ **Research paper requirements:**

- ❖ All Science courses in Lake County will complete a Science research paper for the content area of the course. APA format required.

## ➤ **Science Fair or Competition:**

- ❖ All middle and high school have the traditional Science Fair option for all grade levels to participate. Each school has a Science Fair Coordinator to help with the process for the students and the teachers.
- ❖ There are additional types of “Science” competitions, different from the traditional Science Fair at some schools, that students are encouraged to participate.

## ➤ **Board Approved Programs:**

- ❖ At High School this is through the HOPE course.
- ❖ Human Growth and Development – 6<sup>th</sup> -8<sup>th</sup> grade

Anatomy and Physiology  
Pacing Guide

First Quarter	Second Quarter	Third Quarter	Fourth Quarter
<p><b>FCIM/Focus Calendar</b></p> <p><b>1) Lab Safety &amp; Class Procedures</b></p> <p>**Flinn lab safety rules &amp; quiz</p> <p><b>2) Introduction to the Body</b></p> <ul style="list-style-type: none"> <li>• Structural organization</li> <li>• Life functions &amp; needs</li> <li>• Feedback loops</li> <li>• Anatomy terminology</li> </ul> <p><b>3) Chemistry &amp; Cells overview</b></p> <ul style="list-style-type: none"> <li>• Enzymes</li> <li>• Organic molecules</li> <li>• Cells, Cell division, Cancer</li> <li>• Membrane transport</li> </ul> <p><b>4) Body Tissues</b></p> <ul style="list-style-type: none"> <li>• Epithelial Tissue</li> <li>• Connective tissue</li> <li>• Muscle Tissue</li> <li>• Nervous Tissue</li> </ul> <p><b>5) Integument System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> </ul>	<p><b>FCIM/Focus Calendar</b></p> <p><b>1) Skeletal System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function of bone</li> <li>• Axial Skeleton</li> <li>• Appendicular Skeleton</li> </ul> <p><b>2) Muscular System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; function</li> <li>• Muscle tissue anatomy</li> <li>• Muscle Contraction</li> <li>• Muscle identification</li> <li>• Myoneural junction</li> </ul> <p><b>3) Nervous System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; function</li> <li>• CNS &amp; PNS</li> <li>• Nerve impulse transmission</li> <li>• Reflex arcs</li> <li>• Sympathetic &amp; Parasympathetic divisions</li> <li>• Sense organs</li> </ul>	<p><b>FCIM/Focus Calendar</b></p> <p><b>1) Endocrine</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> <li>• Endocrine control</li> </ul> <p><b>2) Blood</b></p> <ul style="list-style-type: none"> <li>• Composition</li> <li>• Functions</li> <li>• Hemostasis/coagulation</li> <li>• Blood types/transfusions</li> </ul> <p><b>3) Circulatory System</b></p> <ul style="list-style-type: none"> <li>• Anatomy of the heart</li> <li>• Blood flow</li> <li>• Circulation pathways</li> <li>• Physiology of circulation</li> </ul> <p><b>4) Lymphatic System &amp; Body Defenses</b></p> <ul style="list-style-type: none"> <li>• Nonspecific body defenses</li> <li>• Specific body defenses</li> <li>• Lymphatic structure &amp; function</li> <li>• Vaccines &amp; antibiotics</li> </ul>	<p><b>FCIM/Focus Calendar</b></p> <p><b>1) Respiration</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> <li>• Respiratory physiology</li> </ul> <p><b>2) Digestive System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; function</li> <li>• Mechanical &amp; chemical digestion, absorption</li> <li>• Neural &amp; hormonal control</li> </ul> <p><b>3) Urinary System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> <li>• Formation of urine</li> </ul> <p><b>4) Reproduction System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> <li>• Pregnancy &amp; Fetal development</li> </ul>

## Anatomy & Physiology

**Topic- Introduction to the Body, Chemistry & Cells, Body Tissues, Integument System**

**Time Frame – 1<sup>st</sup> quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>Why do we have safety procedures in place in a lab?</p>	<p><b>1)Lab Safety,</b></p> <p>Class Procedures,</p> <p>review of the scientific method</p> <p><b>**Flinn lab safety rules &amp; quiz</b></p>	<p><b>SC. 912.N.1.1</b> 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 interpretation of graphical representations of data, including data tables and graphs),</li> <li>7. pose answers, explanations, or descriptions of events,</li> <li>8. generate explanations that explicate or describe natural</li> </ol>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Flinn Safety quiz (80% on Quiz )</li> </ul> <p>Informal:</p> <ul style="list-style-type: none"> <li>• Discussion</li> </ul> <p><b>Word Wall</b>                      Problem, hypothesis, independent variable, dependent variable, control, peer review,</p> <p><a href="http://www.cloudnet.com/~edrbsass/edsci.htm#scientificmethod">http://www.cloudnet.com/~edrbsass/edsci.htm#scientificmethod</a></p>

## Anatomy & Physiology

**Topic-** Introduction to the Body, Chemistry & Cells, Body Tissues, Integument System

**Time Frame** – 1<sup>st</sup> quarter

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>How is the body organized?</p> <p>What does the body do to maintain life?</p>	<p><b>2) Introduction to the Body</b></p> <ul style="list-style-type: none"> <li>• Structural organization               <ul style="list-style-type: none"> <li>○ Cells → body systems</li> </ul> </li> <li>• Life functions &amp; needs               <ul style="list-style-type: none"> <li>○ Maintaining boundaries</li> <li>○ Movement</li> <li>○ Responsiveness</li> <li>○ Digestion</li> <li>○ Metabolism</li> <li>○ Excretion</li> <li>○ Reproduction</li> </ul> </li> </ul>	<p>phenomena (inferences),</p> <p>9. use appropriate evidence and reasoning to justify these explanations to others,</p> <p>10. communicate results of scientific investigations, and</p> <p>11. evaluate the merits of the explanations produced by others</p> <p>SC.912.N.1.2 Describe and explain what characterizes science and its methods information</p> <p>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.</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><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Life Size body diagrams with terms labeled</li> <li>• System poster</li> <li>• Anatomy Simon Says</li> </ul>

## Anatomy & Physiology

**Topic- Introduction to the Body, Chemistry & Cells, Body Tissues, Integument System**

**Time Frame – 1<sup>st</sup> quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>What terms are essential to understanding the anatomy of the human body?</p>	<ul style="list-style-type: none"> <li>○ Growth</li> <li>○ Nutrients</li> <li>○ Oxygen</li> <li>○ Water</li> <li>○ Body temperature</li> <li>○ Atmospheric pressure</li> <li>● Feedback loops                             <ul style="list-style-type: none"> <li>○ Homeostasis</li> <li>○ Positive feedback</li> <li>○ Negative feedback</li> </ul> </li> <li>● Anatomy terminology                             <ul style="list-style-type: none"> <li>○ Regional terms</li> <li>○ Directional terms</li> <li>○ Body planes &amp; Sections</li> <li>○ Body cavities</li> </ul> </li> </ul>		<p><b>Word Wall Activity:</b> Anatomy, physiology, metabolism, homeostasis, receptor, anatomical position, section, plane</p>
<p>How are chemical reactions controlled in the human body?</p>	<p><b>3) Chemistry &amp; Cells overview</b></p> <ul style="list-style-type: none"> <li>● Enzymes                             <ul style="list-style-type: none"> <li>○ Role in chemical reactions</li> <li>○ Effects of pH and temperature on enzyme activity</li> </ul> </li> </ul>	<p><b>SC.912.L.18.1:</b> Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.</p> <p>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.</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>● Vocabulary Quiz</li> <li>● Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>● Enzyme lab</li> <li>● Cell project</li> </ul> <p><b>Word Wall Activity:</b> Enzyme, catalyst, carbohydrate, lipid,</p>

## Anatomy & Physiology

**Topic-** Introduction to the Body, Chemistry & Cells, Body Tissues, Integument System  
**Time Frame** – 1<sup>st</sup> quarter

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>What are the basic molecules that make up the human body? How do they work?</p> <p>Why is cancer a disease that can affect any living organism? Why is it so difficult to cure?</p>	<ul style="list-style-type: none"> <li>• Organic molecules               <ul style="list-style-type: none"> <li>◦ Carbohydrate, protein, amino acids, nucleic acid (structure and function)</li> </ul> </li> <li>• Cells, Cell division &amp; Cancer               <ul style="list-style-type: none"> <li>◦ Plant vs. animal cells</li> <li>◦ Mutations—cell cycle—cancer</li> </ul> </li> </ul>	<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> <p>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.</p> <p>SC.912.L.16.8 Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer</p>	<p>protein, nucleic acid, mutation, cancer, diffusion, osmosis</p> <p><a href="http://www.cellsalive.com">www.cellsalive.com</a></p>

## Anatomy & Physiology

**Topic-** Introduction to the Body, Chemistry & Cells, Body Tissues, Integument System  
**Time Frame** – 1<sup>st</sup> quarter

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>What role does the cell membrane play in cell communication?</p> <p>How are structure and function related for each of the types of body tissues?</p>	<ul style="list-style-type: none"> <li>• Membrane transport               <ul style="list-style-type: none"> <li>○ Diffusion, osmosis, active transport, etc</li> </ul> </li> </ul> <p><b>4) Body Tissues</b></p> <ul style="list-style-type: none"> <li>• Epithelial Tissue               <ul style="list-style-type: none"> <li>○ Structure and function</li> <li>○ Endocrine vs. exocrine tissue</li> </ul> </li> <li>• Connective tissue               <ul style="list-style-type: none"> <li>○ Structure and function</li> </ul> </li> <li>• Muscle Tissue               <ul style="list-style-type: none"> <li>○ Structure and function</li> </ul> </li> <li>• Nervous Tissue               <ul style="list-style-type: none"> <li>○ Structure and function</li> </ul> </li> </ul>	<p>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 &amp; active).</p> <p>SC.912.L.14.11 Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue</p> <p>SC.912.L.14.29 Define the terms endocrine and exocrine.</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Tissue microscope lab</li> </ul> <p><b>Word Wall Activity:</b>            Epithelial tissue, connective tissue, muscle tissue, nervous tissue, cardiac muscle, striated muscle, smooth muscle</p>



## Anatomy & Physiology

**Topic- Introduction to the Body, Chemistry & Cells, Body Tissues, Integument System**

**Time Frame – 1<sup>st</sup> quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>What is the purpose of the integumentary system?</p> <p>What are various diseases associated with the integumentary system?</p>	<p><b>5) Integument System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; function               <ul style="list-style-type: none"> <li>○ Skin</li> <li>○ Hair</li> <li>○ Nails</li> <li>○ Skin diseases</li> </ul> </li> </ul>	<p>SC.912.L.14.51 Describe the function of the vertebrate integumentary system.</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Skin disease pamphlet</li> </ul> <p><b>Word Wall Activity:</b> Epithelial membrane, cutaneous membrane, mucous membrane, serous membrane, keratin, melanin, sebaceous glands, sudoriferous glands</p>

## Anatomy & Physiology

**Topic- Skeletal System, Muscular System, Nervous System**

**Time Frame – 2<sup>nd</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>What are functions of the skeletal system?</p> <p>How are bones formed and maintained?</p> <p>What diseases are associated with this system?</p>	<p><b>1) Skeletal System</b></p> <ul style="list-style-type: none"> <li>• Anatomy &amp; Function of bone tissue                             <ul style="list-style-type: none"> <li>○ Types and parts of a bone</li> <li>○ Functions: support, protection, movement, storage and blood cell formation</li> </ul> </li> <li>• Axial Skeleton                             <ul style="list-style-type: none"> <li>○ Identify major bones</li> </ul> </li> <li>• Appendicular Skeleton                             <ul style="list-style-type: none"> <li>○ Identify major bones</li> </ul> </li> </ul>	<p>SC.912.14.12 Describe the anatomy and histology of bone tissue</p> <p>SC.912.L.14.14 Identify the major bones of the axial and appendicular skeleton</p> <p>SC.912.L.14.13 Distinguish between the bones of the axial and appendicular skeleton</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Bone Practical</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Clay/toothpick skeleton model</li> </ul> <p><b>Word Wall activity:</b> Axial skeleton, appendicular skeleton, osteocytes, ossification, osteoclasts, fracture, hematoma, fontanel, articulation</p> <p><a href="http://homes.bio.psu.edu/people/faculty/strauss/anatomy/skel/skeletal.htm">http://homes.bio.psu.edu/people/faculty/strauss/anatomy/skel/skeletal.htm</a></p>
<p>Why is the muscular system important?</p> <p>How do muscles contract?</p> <p>What diseases are associated</p>	<p><b>2) Muscular System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; function                             <ul style="list-style-type: none"> <li>○ 3 types of muscles</li> </ul> </li> <li>• Muscle anatomy                             <ul style="list-style-type: none"> <li>○ Microscopic make up of a skeletal muscle</li> <li>○ Physiology of a skeletal muscle</li> </ul> </li> </ul>	<p>SC.912.L.14.16 Describe the anatomy and histology, including ultrastructure, of muscle tissue</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Muscle anatomy models</li> <li>• Muscle fatigue activity</li> </ul>

### Anatomy & Physiology

**Topic- Skeletal System, Muscular System, Nervous System**  
**Time Frame – 2<sup>nd</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>with this system?</p>  <p>Why is the nervous system important?</p>  <p>How does the CNS and the PNS work together?</p>	<ul style="list-style-type: none"> <li>• Muscle Contraction               <ul style="list-style-type: none"> <li>○ Sliding filament theory</li> </ul> </li>   <li>• Muscle identification               <ul style="list-style-type: none"> <li>○ Identify major muscles on a model or diagram</li> </ul> </li>   <li>• Myoneural Junction               <ul style="list-style-type: none"> <li>○ Transmission of a signal from a nerve to a muscle</li> </ul> </li>    <p>3) Nervous System</p> <ul style="list-style-type: none"> <li>• Structure &amp; function               <ul style="list-style-type: none"> <li>○ Parts of the brain</li> <li>○ Parts of the spinal cord</li> </ul> </li>   <li>• CNS &amp; PNS               <ul style="list-style-type: none"> <li>○ Divisions of each</li> <li>○ Types of cells in each</li> </ul> </li>   <li>• Nerve impulse transmission               <ul style="list-style-type: none"> <li>○ Parts of the synapse</li> <li>○ Transmission of a signal across a synapse</li> </ul> </li> </ul> </ul>	<p>SC.912.L.14.17 List the steps involved in the sliding filament of muscle contraction.</p> <p>SC.912.L.14.20 Identify the major muscles of the human on a model or diagram.</p> <p>SC.912.L. 14.18 Describe signal transmission across a myoneural junction.</p>  <p><b>SC.912.L.14.26 Identify</b> the major parts of the brain on diagrams or models.</p> <p>SC.912.L.14.28 Identify the major functions of the spinal cord.</p> <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.14.24 Identify the general parts of a synapse and describe the physiology of signal transmission across a synapse.</p>	<p><b>Word Wall activity:</b>          Muscle fiber, motor unit, neurotransmitter, tetanus, muscle tone, origin, insertion, prime mover, antagonist, synergist, fixator</p> <p>www.gwc.maricopa.edu/class/bio201/muscle/mustut.htm          This site contains interactive diagrams for identifying muscles.</p>  <p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Senses foldable</li> <li>• Senses lab</li> <li>• Neuron models</li> <li>• Brain dissection</li> <li>• Eye dissection</li> </ul> <p><b>Word Wall activity:</b>          CNS, PNS, neuroglia, neuron, synapse, axon, dendrite,</p>

## Anatomy & Physiology

**Topic- Skeletal System, Muscular System, Nervous System**

**Time Frame – 2<sup>nd</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>How are reflex arcs different from a regular nerve transmission?</p>           <p>What diseases are associated with this system?</p>	<ul style="list-style-type: none"> <li>• Reflex arcs               <ul style="list-style-type: none"> <li>◦ Sensory receptor, effector organ, sensory and motor neurons, integration center</li> </ul> </li> <li>• Sympathetic &amp; Parasympathetic divisions               <ul style="list-style-type: none"> <li>◦ Function of each</li> </ul> </li> <li>• Sense organs               <ul style="list-style-type: none"> <li>◦ Relate structure to function for</li> <li>◦ each of the sense organs</li> </ul> </li> </ul>	<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 a spinal cord.</p> <p>SC.912.L.14.49 Identify the major functions associated with the sympathetic and parasympathetic nervous systems</p> <p>SC.912.L.14.50 Describe the structure of vertebrate sensory organs. Relate structure to functions in vertebrate sensory systems.</p>	<p>reflex, special senses</p> <p><a href="http://library.thinkquest.org/2935/Natures_Best/Nat_Best_Low_Level/Muscular_page.L.html">http://library.thinkquest.org/2935/Natures_Best/Nat_Best_Low_Level/Muscular_page.L.html</a></p>

## Anatomy & Physiology

**Topic-Endocrine, Blood, Circulatory System, Lymphatic System & Body Defenses**  
**Time Frame – 3<sup>rd</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>Why is the endocrine system important?</p> <p>How does the endocrine system control body functions?</p> <p>What diseases are associated with this system?</p>	<p><b>1) Endocrine</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function               <ul style="list-style-type: none"> <li>○ Relate the glands to the hormones they secrete</li> </ul> </li> <li>• Hormones               <ul style="list-style-type: none"> <li>○ Compare endocrine and neural controls</li> </ul> </li> </ul> <p>**If times allows cover endocrine disorders</p>	<p>SC.912.L.14.29 Define the terms endocrine and exocrine</p> <p>SC.912.L.14.30 Compare endocrine and neural controls of physiology</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Endocrine flashcards</li> </ul> <p><b>Word Wall activity:</b>            Hormone, negative feedback, positive feedback, acromegaly, goiter, diabetes mellitus, insulin, glucagon</p> <p><a href="http://www.hormone.org/public/conditions.cfm">http://www.hormone.org/public/conditions.cfm</a></p>
<p>Why is blood essential for the maintenance of the body?</p> <p>What are some diseases associated with blood?</p>	<p><b>2) Blood</b></p> <ul style="list-style-type: none"> <li>• Composition               <ul style="list-style-type: none"> <li>○ Plasma and formed elements</li> </ul> </li> <li>• Functions               <ul style="list-style-type: none"> <li>○ Plasma and formed elements</li> </ul> </li> <li>• Hemostasis               <ul style="list-style-type: none"> <li>○ Steps of hemostasis</li> <li>○ Mechanism of coagulation</li> </ul> </li> <li>• Blood types               <ul style="list-style-type: none"> <li>○ Process</li> <li>○ Transfusion reactions</li> </ul> </li> </ul>	<p>SC.912.L.14.34 <b>Describe</b> the composition and physiology of blood, including that of the plasma and the formed elements.</p> <p>SC.912.L.14.35 Describe the steps in hemostasis, including the mechanism of coagulation. Include. Include the basis for blood typing and transfusion reactions.</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Synthetic blood typing lab</li> </ul> <p><b>Word Wall activity:</b>            Formed elements, hematocrit, hemoglobin, anemia, leukocytes,</p>

## Anatomy & Physiology

**Topic-Endocrine, Blood, Circulatory System, Lymphatic System & Body Defenses**  
**Time Frame – 3<sup>rd</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>How does the circulatory system function to cycle blood through the body?</p> <p>How does the heart beat?</p> <p>What factors affect the heart?</p> <p>How does the fetal circulatory system change after birth?</p> <p>What diseases are associated with this system?</p>	<p><b>3) Circulatory System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function               <ul style="list-style-type: none"> <li>○ Anatomy of the heart, blood vessels</li> </ul> </li> <li>• Blood flow               <ul style="list-style-type: none"> <li>○ Pathway through the heart</li> <li>○ Factors that affect blood flow</li> </ul> </li> <li>• Pathways of circulation               <ul style="list-style-type: none"> <li>○ Systemic circulation</li> <li>○ Arterial supply to the brain</li> <li>○ Hepatic portal circulation</li> <li>○ Fetal circulation</li> </ul> </li> <li>• Physiology of circulation               <ul style="list-style-type: none"> <li>○ Heart sounds and what they mean</li> <li>○ Hypertension and risk factors</li> </ul> </li> </ul>	<p><b>SC.912.L.14.36</b> Describe the factors affecting blood flow through the cardiovascular system</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.14.38 Describe the normal heart sounds and what they mean.</p> <p>SC.912.L.14.39 Describe hypertension and some factors that produce it.</p>	<p>erythrocytes, hemostasis, hemophilia, antigen, antibodies, hemolysis</p> <p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Blood flow foldable</li> <li>• Blood flow activity</li> <li>• Cardiac output activity</li> <li>• Heart dissection</li> </ul> <p><b>Word Wall activity:</b>            Myocardium, atria, ventricles, aorta, nodal system, cardiac cycle, cardiac output, artery, vein</p> <p><a href="http://www.howstuffworks.com/blood.htm">www.howstuffworks.com/blood.htm</a></p>

## Anatomy & Physiology

**Topic-Endocrine, Blood, Circulatory System, Lymphatic System & Body Defenses**  
**Time Frame – 3<sup>rd</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>How do nonspecific and specific body defenses keep the human body healthy?</p> <p>How does the lymphatic system function in helping the body stay healthy?</p> <p>What is difference between vaccines and antibiotics?</p> <p>What diseases are associated with this system?</p>	<p><b>4) Lymphatic System &amp; Body Defenses</b></p> <ul style="list-style-type: none"> <li>• Nonspecific body defenses               <ul style="list-style-type: none"> <li>○ Skin</li> <li>○ Mucous membranes</li> <li>○ Secretions</li> <li>○ Phagocytes</li> <li>○ Antimicrobial proteins</li> <li>○ Inflammatory response</li> </ul> </li> <li>• Specific body defenses               <ul style="list-style-type: none"> <li>○ Lymphocytes</li> <li>○ Antibodies</li> <li>○ Macrophages</li> </ul> </li> <li>• Lymphatic structure &amp; function</li> <li>• Vaccines &amp; antibiotics</li> </ul>	<p>SC.912.L.14.42 Describe the anatomy and physiology of the lymph system</p> <p><b>SC.912.L.14.52</b> Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Specific and non-specific folables</li> </ul> <p><b>Word Wall activity:</b>            Edema, lymph, immunity, pathogen, phagocytes, inflammatory response, diapedesis, pyrogens, antigen, vaccine</p> <p><a href="http://uhaweb.hartford.edu/BUGL/immune.htm">http://uhaweb.hartford.edu/BUGL/immune.htm</a></p>





## Anatomy & Physiology Honors

**Topic- Respiration, Digestive System, Urinary System, Reproductive System**  
**Time Frame – 4<sup>th</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>How does the respiratory system and circulatory system work together to transport vital gases throughout the body?</p> <p>What diseases are associated with this system?</p>	<p><b>1) Respiration</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function               <ul style="list-style-type: none"> <li>○ Organs of respiratory system</li> </ul> </li> <li>• Respiratory physiology               <ul style="list-style-type: none"> <li>○ Process of ventilation</li> <li>○ Gas exchange</li> <li>○ Gas transport</li> <li>○ Mechanisms that control ventilation</li> </ul> </li> </ul>	<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>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Exhaling CO2 Lab Report</li> <li>• Clay models of system</li> </ul> <p><b>Word Wall activity:</b>            Pharynx, larynx, bronchi, alveoli, respiration, diaphragm, eupnea, cyanosis, cystic fibrosis</p> <p><a href="http://www.getbodysmart.com/ap/respiratorysystem/menu/animation.html">http://www.getbodysmart.com/ap/respiratorysystem/menu/animation.html</a></p>
<p>How does the digestive system provide the body with vital nutrients?</p> <p>What diseases are associated with</p>	<p><b>2) Digestive System</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> <li>• Mechanical &amp; chemical digestion, absorption               <ul style="list-style-type: none"> <li>○ Location of each process</li> <li>○ Describe how each process</li> </ul> </li> </ul>	<p>SC.912.L.14.46 Describe the physiology of the digestive system, including mechanical digestion, chemical digestion, absorption and neural and hormonal</p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Digestive System Project</li> <li>• Clay models of digestive system</li> </ul> <p><b>Word Wall activity:</b>            Alimentary canal,</p>

**Anatomy & Physiology Honors**

**Topic- Respiration, Digestive System, Urinary System, Reproductive System**  
**Time Frame – 4<sup>th</sup> Quarter**

<b>Essential Questions</b>	<b>Essential Content &amp; Understandings</b>	<b>Essential Skills &amp; Benchmarks</b>	<b>Assessment</b>
<p>this system?</p> <p>How does the urinary system filter blood?</p> <p>What diseases are associated with this system?</p>	<p>works to digest food and supply the body with nutrients</p> <ul style="list-style-type: none"> <li>• Hormonal/neural control</li> </ul> <p><b>3) Urinary system</b></p> <ul style="list-style-type: none"> <li>• Structure &amp; Function</li> <li>• Urine Formation               <ul style="list-style-type: none"> <li>○ Filtration, tubular reabsorption, tubular secretion</li> <li>○ Components of urine (normal &amp; abnormal)</li> </ul> </li> </ul>	<p>SC. 912.L.14.47 Describe the physiology of urine formation by the kidney</p>	<p>mastication, microvilli, peristalsis, deglutition, cellular respiration, metabolism, obesity</p> <p><a href="http://digestive.niddk.nih.gov/ddiseases/pubs/yrdd/">http://digestive.niddk.nih.gov/ddiseases/pubs/yrdd/</a></p> <p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Filtration lab</li> <li>• Simulated urine lab</li> </ul> <p><b>Word Wall activity:</b>            Renal, nephron, glomerulus, filtration, urea, reabsorption, secretion, micturition</p> <p><a href="http://webanatomy.net/anatomy/urinary_notes.htm">http://webanatomy.net/anatomy/urinary_notes.htm</a></p>

## Anatomy & Physiology Honors

**Topic- Respiration, Digestive System, Urinary System, Reproductive System**  
**Time Frame – 4<sup>th</sup> Quarter**

Essential Questions	Essential Content & Understandings	Essential Skills & Benchmarks	Assessment
<p>What are the functions of the male and female reproductive systems?</p> <p>How do the ovarian and uterine cycles work together to make it possible for reproduction?</p> <p>What diseases are associated with this system?</p> <p>How does the anatomy of an animal (cat, pig, etc) compare to a human?</p>	<p>4) Reproduction System</p> <ul style="list-style-type: none"> <li>• Structure &amp; Function of Reproductive system</li> <li>• Pregnancy &amp; Fetal development               <ul style="list-style-type: none"> <li>○ Basic overview</li> </ul> </li> </ul> <p>Mammalian Dissection (ex: cat, pig)</p>	<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> <p>HE.912.C.1.4 Analyze how hereditary and family history can impact personal health</p> <p>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.</p> <p>SC.912.L.14.41 Describe fetal circulation and changes that occur to the circulatory system at birth</p> <p><b>This lab will review all Standards covered above.</b></p>	<p><b>Formal:</b></p> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Chapter Test</li> </ul> <p><b>Informal:</b></p> <ul style="list-style-type: none"> <li>• Miracle of Life video</li> </ul> <p><b>Word Wall activity:</b>            Gonads, gametes, testes, ovaries, semen, scrotum, uterus, oogenesis, spermatogenesis, embryo, fetus</p> <p><a href="http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/SexHormones.html">http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/SexHormones.html</a></p>

**Appendix A - Labs  
Correlation to the Textbook**

## Appendix B – Book List by Topic for the Course

## Appendix C – Web Sites for Course

Websites to help throughout the course:

1. [www.getbodysmart.com](http://www.getbodysmart.com)  
An online examination of human anatomy and physiology. Visually Learn About the Human Body Using Our Interactive "Flash" Animations
2. [http://library.thinkquest.org/2935/Natures\\_Best/Nat\\_Best\\_High\\_Level/Page\\_Shells/Muscular\\_Shell.html](http://library.thinkquest.org/2935/Natures_Best/Nat_Best_High_Level/Page_Shells/Muscular_Shell.html)  
This website is aimed for high school students and has many graphics with explanations for many body systems.
3. [http://www.lessonplansinc.com/biology\\_lesson\\_plans\\_human\\_body\\_systems.php](http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php)  
Several resources...lesson plans, worksheets, activities etc. (organized by body system)
4. <http://msjensen.cehd.umn.edu/webanatomy/>  
This site has self tests, quizzes and games that students can use for practice.
5. [http://www.lessonplansinc.com/biology\\_lesson\\_plans\\_human\\_body\\_systems.php](http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php)
6. <http://bodybrowser.googlelabs.com/>  
This shows 3D interactive images of the human body.
7. <http://academic.pgcc.edu/~aimholtz/AandP/AandPLinks/ANPLinks.html>  
This site is intended for college students but there are some great resources that could be utilized by high school students.

Web Resources by Chapter:

Chp 1: The Human Body: An Orientation

- On-line activity related to relative body position.  
<http://www.wisc-online.com/objects/ViewObject.aspx?ID=AP15305>
- On-line activity exploring health careers. <http://explorehealthcareers.org/en/home>

Chp 2: Basic Chemistry

- Enzyme Lab Activity that uses items found at the grocery store.  
[http://www.lessonplansinc.com/lessonplans/enzyme\\_lab.pdf](http://www.lessonplansinc.com/lessonplans/enzyme_lab.pdf)
- Great worksheet to introduce/reinforce macromolecules.  
[http://www.lessonplansinc.com/lessonplans/macromolecule\\_worksheet.pdf](http://www.lessonplansinc.com/lessonplans/macromolecule_worksheet.pdf)

Chp 3: Cells & Tissues

- Great way to review cells on-line. <http://www.cellsalive.com/>

## Appendix C – Web Sites for Course

- Cell organelles concept map.  
[http://www.biologycorner.com/anatomy/cell/cell\\_conceptmap.html](http://www.biologycorner.com/anatomy/cell/cell_conceptmap.html)
- On-line tissue identification lab. (alternative to using microscopes to view tissue slides)  
[http://www.biologycorner.com/anatomy/cell/cell\\_conceptmap.html](http://www.biologycorner.com/anatomy/cell/cell_conceptmap.html)

### Chapter 4: Skin & Body Membranes

- On page 16 of this document there are directions for building a skin model using food.  
[http://mhs.mcsnc.org/UserFiles/Servers/Server\\_2082346/File/medscience/Medical%20Sciences%20I/D%20Integumentary%20System%20%20M.pdf](http://mhs.mcsnc.org/UserFiles/Servers/Server_2082346/File/medscience/Medical%20Sciences%20I/D%20Integumentary%20System%20%20M.pdf)

### Chp 5: Skeletal System

- “The Mystery of Bones” Webquest that integrates forensic anthropology with learning the skeletal system. <http://www.biologycorner.com/quests/bones/index.html>
- This is a cut out of the skeletal system. The students build their own paper skeleton. Student handout: [http://science-class.net/Lessons/Anatomy/Support/dem\\_bones.pdf](http://science-class.net/Lessons/Anatomy/Support/dem_bones.pdf)  
Bone cut out: <http://science-class.net/Lessons/Anatomy/Support/dembonestemplate.pdf>

### Chp 6: The Muscular System

- This site has several diagrams of muscle groups. Rolling over each muscle highlights and gives the name. Students can then quiz themselves on each group.  
<http://www.gwc.maricopa.edu/class/bio201/muscle/mustut.htm>
- This site has a couple of good and simple ideas for helping students memorize muscles and their functions. <http://www.livestrong.com/article/366986-activities-for-teaching-muscular-system/>

### Chp 7: The Nervous System

- This site contains 3 activities that can be used to cover aspects of the nervous system. They are advanced but could be differentiated easily.  
<http://biology.arizona.edu/sciconn/lessons2/renfro/intro.htm>
- This site contains an activity involving the effects of environment on memory.  
[http://www.accessexcellence.org/AE/AEC/AEF/1996/brown\\_memory.php](http://www.accessexcellence.org/AE/AEC/AEF/1996/brown_memory.php)
- Lots of statistics about the brain. <http://faculty.washington.edu/chudler/facts.html>

### Chp 8: Special Senses

- This uses jellybeans to help students explore the relationship between sight, smell and taste. Student guide: [http://serendip.brynmawr.edu/sci\\_edu/waldron/pdf/SensesProtocol.pdf](http://serendip.brynmawr.edu/sci_edu/waldron/pdf/SensesProtocol.pdf)  
Teacher guide: [http://serendip.brynmawr.edu/sci\\_edu/waldron/pdf/SensesTeachPrep.pdf](http://serendip.brynmawr.edu/sci_edu/waldron/pdf/SensesTeachPrep.pdf)

### Chp 9: The Endocrine System

- This site offers several quizzes dealing with the endocrine system.  
[http://www.funtrivia.com/quizzes/sci\\_\\_tech/human\\_body/endocrine\\_system.html](http://www.funtrivia.com/quizzes/sci__tech/human_body/endocrine_system.html)

## Appendix C – Web Sites for Course

### Chp 10: Blood

- This lab combines blood typing with a genetics lesson and a “crime scene.”  
Student guide:  
[http://serendip.brynmawr.edu/sci\\_edu/waldron/pdf/BloodTypeGeneticsProtocol.pdf](http://serendip.brynmawr.edu/sci_edu/waldron/pdf/BloodTypeGeneticsProtocol.pdf)  
Teacher guide:  
[http://serendip.brynmawr.edu/sci\\_edu/waldron/pdf/BloodTypeGeneticsTeachPrep.pdf](http://serendip.brynmawr.edu/sci_edu/waldron/pdf/BloodTypeGeneticsTeachPrep.pdf)

### Chp 11: The Cardiovascular System

- This is a sheep heart dissection guide.  
[http://www.biologycorner.com/anatomy/circulatory/sheep\\_heart\\_dissection.pdf](http://www.biologycorner.com/anatomy/circulatory/sheep_heart_dissection.pdf)
- Another sheep heart guide.  
[http://www.biologycorner.com/anatomy/circulatory/heart/heart\\_dissection.html](http://www.biologycorner.com/anatomy/circulatory/heart/heart_dissection.html)
- Drag and drop heart diagrams (requires a computer):  
[http://media.pearsoncmg.com/bc/bc\\_marieb\\_ehap\\_8/activities/chapter11/Act11A.html](http://media.pearsoncmg.com/bc/bc_marieb_ehap_8/activities/chapter11/Act11A.html)
- This site has several ideas that can be adapted for high school students:  
<http://www.discoveryeducation.com/teachers/free-lesson-plans/heres-to-your-healthy-heart.cfm>
- This site gives pictures of various ECG's: <http://www.ecglibrary.com/ecghome.html>

### Chp 12: The Lymphatic System & Body Defenses

- A fun way to truly access if students understand the way the immune system works. Instead of acting their skits live you can have them use flip cameras to video and edit.  
<http://www.discoveryeducation.com/teachers/free-lesson-plans/operation-antibody.cfm>

### Chp 13: The Respiratory System

- This site has a lab that test vital capacity in a unique way.  
<http://www.smm.org/heart/lessons/lesson9.htm>
- This site has an animation of how the lungs work.  
<http://www.nhlbi.nih.gov/health/dci/animate/howlungswork.swf>
- This activity measures lung capacity by using a balloon. <http://science-class.net/Lessons/Anatomy/Respiratory/lung%20capacity.pdf>

### Chp 14: The Digestive System and Body Metabolism

- This site has 6 activities that will allow the students to visualize the parts of the digestive system process. <http://mypages.iit.edu/~smile/bi9706.html>
- This site also has several activities for digestion.  
<http://fog.ccsf.cc.ca.us/plopiper/documents/Bio9Digestivelab.pdf>

### Chp 15: The Urinary System



## Appendix C – Web Sites for Course

- This site has a tutorial for the urinary system.  
<http://www.getbodysmart.com/ap/urinary/urinary.htm>
- I use a lab by neoscience called Kidney Function lab. It uses dialysis tubing and simulated blood. Here is the link for the kit. Very good visual that doesn't take a whole lot of time.  
[http://www.neosci.com/catalog.asp?sid=237074852&showID=134&content=cn\\_showitem](http://www.neosci.com/catalog.asp?sid=237074852&showID=134&content=cn_showitem)

### Chp 16: The Reproductive System

- This is a ppt that covers the basics plus. You must preview this before you show it. There may be some things on it that you are not comfortable discussing.  
[https://docs.google.com/present/view?id=dfh23k67\\_961gkfkfchr](https://docs.google.com/present/view?id=dfh23k67_961gkfkfchr)

### Dissection Resources on the Web

#### Pig

- [http://www.biologycorner.com/worksheets/fetal\\_pig\\_dissection.html](http://www.biologycorner.com/worksheets/fetal_pig_dissection.html)
- <http://faculty.clintoncc.suny.edu/faculty/michael.gregory/files/bio%20102/bio%20102%20laboratory/fetal%20pig/fetal%20pig.htm>
- [http://www.biologyjunction.com/fetal\\_pig\\_dissection.htm](http://www.biologyjunction.com/fetal_pig_dissection.htm)

#### Cat

- <http://www.wyeriverupperschool.org/houserwrus/Anatomy%20Physiology/May122011/Cat%20Dissection%20Guide.pdf>
- <http://www.nvcc.edu/home/lmiller/atlas/Digestive%20System/Digestive%20index.html>

#### Brain

- [http://www.biologycorner.com/anatomy/sheepbrain/sheep\\_brain\\_dissection\\_guide.html](http://www.biologycorner.com/anatomy/sheepbrain/sheep_brain_dissection_guide.html)
- <http://psych.hanover.edu/classes/neuropsychology/Syllabus/Labs/DISSECTION.pdf>

#### Heart

- [http://www.biologycorner.com/anatomy/circulatory/sheep\\_heart\\_dissection.pdf](http://www.biologycorner.com/anatomy/circulatory/sheep_heart_dissection.pdf)
- <http://www.hometrainingtools.com/heart-dissection-project/a/1318/>

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson: Autopsy of a Dill Pickle (practice using anatomical directional terms) First Quarter**

**NGSSS (Number and Benchmark):**

**SC.912.N.1.2** Describe and explain what characterizes science and its methods;

**Materials Needed:**

scalpel, forceps, dissecting pans, dissecting pins, scissors, teasing needle, blunt probe, dropper, pH paper, microscope, aprons, goggles

**Safety Concerns/Issues:**

Students need to observe safety procedures when dealing with dissecting equipment.

**Procedures** See next page

**Assessment of Student Learning:**

Lab sheet

**Teacher Reflection:** This is a great way for students to practice their knowledge of directional terms. This is done very early in the semester so it also reintroduces them to several pieces of lab equipment; as well as, microscopes.

Adapted by A. Ainslie from [www.biologycorner.com](http://www.biologycorner.com)

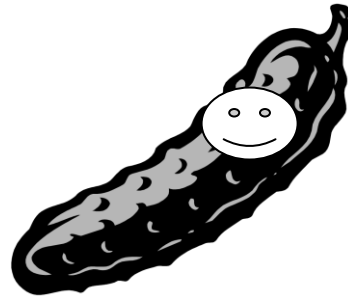
**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Autopsy of a Dill Pickle**

Performed by Dr. \_\_\_\_\_, coroner, on this day of \_\_\_\_\_,  
200\_\_.

**Tools**

1. Scalpel
2. Forceps
3. Dissecting pan
4. Dissecting pins
5. Scissors
6. Teasing needles
7. Blunt probe
8. Dropper



**Stage One**

The exterior of the body is examined for abnormalities such as wounds or scars from injuries or surgeries. Draw both dorsal and ventral views of your pickle, indicating your findings. Label the views.

**Stage Two**

The ventral body cavity (A) is opened by a deep Y-shaped incision (B). The arms of the Y start at the anterior surface of the shoulders(C) and join at the inferior point of the breastbone (sternum) (D) to form a single cut that extends to the pubic area (E). Draw the pickle and the line of incision. Label A-E.

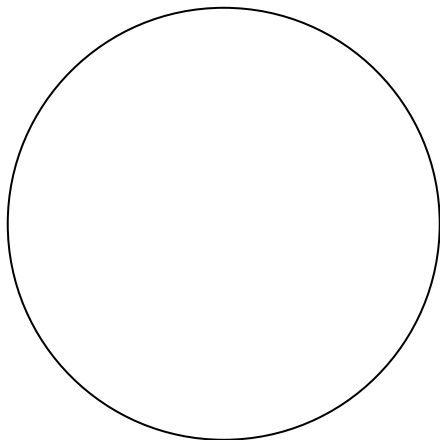
## Appendix D Labs and Activities From Within the Map – By Quarters

After the ribcage is sawn through, the abdominopelvic region (F) can be opened like hinged doors (G) to expose the internal organs (H). The contents of the thoracic cavity (I) will also be visible. The second stage of the autopsy includes careful examination of many or all of the internal organs. If the brain is to be examined, a portion of the skull must be removed. The face, arms and legs are usually not dissected unless there is a specific reason for doing so. Draw the pickle at this stage of the autopsy. Label the F-I. Indicate superficial and deep layers. Make enlarged drawings of at least 2 organs.

### **Stage Three**

After the organs are returned to their respective body cavities, and the body is sewn up, the third phase of the autopsy begins. It is a microscopic examination of tissues collected during the first two stages. Tests to analyze the chemical content of body fluids or to determine the presence of infectious organisms may also be performed.

Examine a thin slice of pickle tissue under the microscope (be sure to use a cover slip!) Draw the microscopic structure of the tissue sample.



**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

Collect a sample of body fluid using the dropper. Test the pH of the body fluid using pH test paper. pH = \_\_\_\_\_ Is the body fluid acidic, basic or neutral? \_\_\_\_\_

Normal pH of human body tissues is 7.35-7.45.

**Conclusion:**

What is your finding about the cause of death of this patient? Support your opinions with specific details from the autopsy.

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson: Cell Lab - Prepared slides of cheek cell! First Quarter**

**NGSSS (Number and Benchmark):**

**SC. 912.N.1.1** Define a problem based on a specific body of knowledge, for example;

**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 & active).

**Materials Needed:**

**Prepared slides** of cheek cells (simple squamous epithelial), microscopes

**Safety Concerns/Issues:**

Students should use caution when handling glass slides and microscopes.

**Procedures :** See the following pages for directions

**Assessment of Student Learning:**

Analysis questions and lab sheet

**Teacher Reflection:**

Very simple lab that can be used with all levels of students.

Adapted by A. Ainslie from [www.biologycorner.com](http://www.biologycorner.com)

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

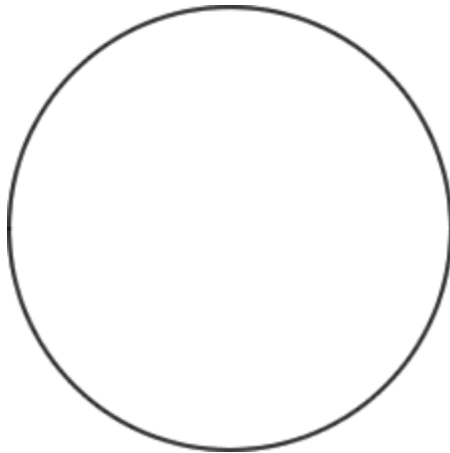
Name \_\_\_\_\_

**The Human Cheek Cell - Prepared slides**

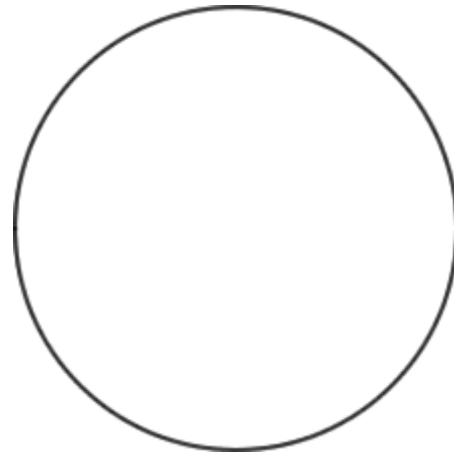
**Procedure:**

1. Obtain a **prepared human cheek cell slide**. It may be labeled "simple squamous."
2. Use the low objective to focus. You probably will not see the cells at this power.
3. Switch to medium power. Cells should be visible, but they will be small and look like nearly clear pinkish-purple blobs.
4. Once you think you have located a cell, switch to high power and refocus. (Remember; do NOT use the coarse adjustment knob at this point)  
---**Sketch** the cell at medium and high power. Label the nucleus, cytoplasm, and cell membrane. Draw your cells to scale.

Medium



High



**QUESTIONS**

1. The cells have been stained pink and purple. Why is it necessary to stain the cheek cells?
2. The light microscope used in the lab is not powerful enough to view other organelles in the cheek cell. What parts of the cell were visible?
3. List 2 organelles that were NOT visible but should have been in the cheek cell.
4. Keeping in mind that the mouth is the first site of chemical digestion in a human. Your saliva starts the process of breaking down the food you eat. Keeping this in mind, what organelle do you think would be numerous inside the cells of your mouth?

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson:** Give Me Some Skin Man (skin disease pamphlet) **First Quarter**

**NGSSS (Number and Benchmark):**

**HE.912.C.1.3** Evaluate how environmental and personal health are interrelated;

**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;

**SC.912.L.14.51** Describe the function of the vertebrate integumentary system

**Materials Needed:**

Internet or resource books, construction or colored copy paper, examples of real pamphlets from doctor's office

**Safety Concerns/Issues:** None

**Procedures:** See next page

**Assessment of Student Learning:**

Finish project can be assessed using a rubric

**Teacher Reflection:**

This activity is open ended so that all level of students can complete this assignment successfully. You may need to give lower level students a list of skin diseases to pick from.

Created by D. Ziebart and A. Ainslie



## **Appendix D**

### **Labs and Activities From Within the Map – By Quarters**

#### Give me some skin man...

Here's another opportunity for you to get an awesome grade doing something fun! You are going to design a skin awareness pamphlet. Here is what you need to do...

1. Pick a disease of the skin that YOU think is interesting
2. Research the disease and make a pamphlet informing people about the problems of the disease.
3. You need to have the following parts...
  - a. Tri-fold pamphlet
  - b. A title
  - c. Diagram of the skin (labeled) OR the accessory structure that your disease effects
  - d. Describe the disease and its symptoms
  - e. Tell what part of the Integumentary system your disease effects
  - f. Tell how you can get the disease
  - g. Tell how it is treated and whether or not there is a cure
4. You may use books, magazines, the Internet, etc to find your information
5. Add a picture of your disease and you get extra credit!
6. Treat this like a pamphlet the public is going to read...don't get too technical!
7. Be creative...people are more likely to read an interesting and informative pamphlet!

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson:** Makin' Muscles Second Quarter

**NGSSS (Number and Benchmark):**

**SC.912.L14.16:** Describe the anatomy and histology, including ultrastructure, of muscle tissue

**Materials Needed:**

Craft Supplies: cups, plastic wrap, pipe cleaners, tooth picks, etc. (this can also be done with clay)

**Safety Concerns/Issues:** None

**Procedures:**

Students create a muscle that includes a cross section to show the various parts. They should include the following...Epimysium, Perimysium, Endomysium, fascicle, fiber, myofibril, tendon. If it is not possible from them to label the parts then they should provide a key.

**Assessment of Student Learning:**

Finish project can be assessed using a rubric.

**Teacher Reflection:**

This project is a great way to get all of the students involved. Any level of student can work on this project. I enjoy seeing how creative the students can be with this task.

Created by A. Ainslie

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson:** The Skeletal Challenge Second Quarter

**NGSSS (Number and Benchmark):**

**SC.912.L.14.14** Identify the major bones of the axial and appendicular skeleton

**Materials Needed:**

Cardstock, or a piece of cardboard for a backing, toothpicks, clay

**Safety Concerns/Issues:** None

**Procedures:**

See next page

**Assessment of Student Learning:**

Finish project can be assessed using a rubric.

**Teacher Reflection:**

This project allows students to demonstrate what they know in a non-threatening way.

Created by A. Ainslie

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

The Skeletal Challenge

You and your partner are about to embark in an interesting adventure. You are going to build a skeleton with the following materials...tooth picks and clay. The bones you are to include are listed below. The only rules are

1. You must lay your skeleton on a piece of cardstock.
2. You must have all of the bones labeled.
3. Here's the catch: You and your partner cannot communicate verbally with each other AT ALL. If you are found talking, then points will be deducted from your grade. You will have 1 minute to formulate a quick plan of action and then you will not be able to talk.

\*\*Take your time and get the bones labeled correctly. When you are finished, raise your hand and I will come and check your work.

Bones to be included:

Clavicle	scapula	humerus	ulna	radius
Phalanges (both)	sternum	pelvic girdle	femur	fibula
Tibia	patella	sacrum	vertebral column	
Coccyx	true ribs	false ribs		

**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson: You are the Doctor (endocrine project)**  
**Third Quarter**

**NGSSS (Number and Benchmark):**

**SC.912.L.14.30** Compare endocrine and neural controls of physiology;

**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

**Materials Needed:** Internet access or resource books

**Safety Concerns/Issues:** None

**Procedures** See Below

**Assessment of Student Learning:** A Rubric can be used to easily assess this project.

**Teacher Reflection:** This is a great activity for students to use their creativity.

**You are the Doctor!**

Congratulations, you are going to be a doctor for a few days. You have just discovered that one of your patients has the following disorder\_\_\_\_\_.

You have to act fast. You need to research the disorder and come up with a treatment plan. Some disorders have been extensively studied others have not. Do the best you can. You will have to present your findings at a Medical Conference because your work will be considered a revolutionary breakthrough in modern medicine.

Here are the details:

1. Look up the disorder on the Internet or find a book in the library.
2. Find out the name of the gland that is the SOURCE of the hormone.  
Include the name(s) of the hormone(s) that gland produces which cause the disease or response.
3. Tell about the causes, risk factors, prevention and symptoms of the disorder.
4. Finally, tell in your opinion as the “Doctor” what would be the most effective for of treatment.
5. Create a pamphlet, cartoon, song, poster .... to highlight your findings.  
Be creative!!!! This will be presented at the “medical conference: in front of your peers. Keep it short and specific. (3 minutes or less!)
6. Remember I said fast.... 2 days or the patient is suing!!!!

Appendix D  
Labs and Activities From Within the Map – By Quarters

**Title of Lesson: Dracula's Dilemma (Blood compatibility lab) Third Quarter**

**NGSSS (Number and Benchmark):**

**SC. 912.N.1.1** Define a problem based on a specific body of knowledge;

**SC.912.L.14.35** Describe the steps in hemostasis, including the mechanism of coagulation. Include. Include the basis for blood typing and transfusion reactions.

**Materials Needed:**

12 glass containers, red food coloring, blue food coloring, water, and marker

**Safety Concerns/Issues:** Food coloring can stain skin and clothing

**Procedures:** See next page

**Assessment of Student Learning:** Lab Sheet

**Teacher Reflection:** This lab gives students a visual guide to the basic compatibility of blood types.

Adapted by A. Ainslie from [www.biologycorner.com](http://www.biologycorner.com).

## Appendix D Labs and Activities From Within the Map – By Quarters

### Dracula's Dilemma...

Dracula heard that transfusions of the wrong blood could cause serious problems and even death. He knew that for any transfusion it was always best to match the blood types of the donor exactly. However, he heard that for some *small* transfusions the blood types of the donor and patient did not have to match exactly. Dracula wants to find out the possible combinations of blood types that will be safe for small transfusions. You can help him out by doing the following activity.

#### Materials:

12 glass containers, red food coloring, blue food coloring, water, and marker

- A. Fill each container half full with water.
- B. To each of the first three containers adds few drops of red food coloring and stir. If the solution is not a bright red color, add a couple more drops of food coloring. These three containers will represent type A blood. Initial each of these containers with the letter A.
- C. Repeat step B for the next three containers, this time using blue food coloring. Label these containers with a B for type B blood. Note all blood is the same color.
- D. To each of the next three containers add a few drops of red and a few drops of blue food coloring. Label these glasses AB they AB blood.
- E. Do not add any food coloring to the last three containers. Label each of these containers with an O for type O blood.
- F. You will pour about  $\frac{1}{4}$  of the liquid from on container of each blood type into one container of each of the other blood types. This will represent a transfusion. If the liquid changes color, the transfusion is not safe. Record the results by writing Safe (S) or Unsafe (US) in the Tables 1-1 and 1-2.

Notice that part of the tables have been filled in for you; since it is always safe to mix the same blood types, it is not necessary to do transfusions of same blood types. There are other parts of the tables that you will fill in without doing the transfusion. For example, any blood type added to O will cause a color change. Therefore, O blood can only receive blood from another type O person. Record this in the tables.

Table 1-1 Giving Blood

Blood Type	O	A	B	AB
O	S			

Table 1-2 Receiving Blood

Blood Type	O	A	B	AB
O	S			

## Appendix D Labs and Activities From Within the Map – By Quarters

A		S		
B			S	
AB				S

A		S		
B			S	
AB				S

S = Safe

G. Start Your Transfusions! Use Table 1-3 as your guide in making your transfusions.

Transfusion from one container of

...To one container or

- |       |       |
|-------|-------|
| 1. A  | B, AB |
| 2. B  | A, AB |
| 3. AB | A, AB |

After each transfusion, set the glass aside and do not use it again.

H. Now that you have completed tables 1-1 and 1-2, summarize your results for Dracula using Table 1-3.

Blood Type	Can act as donor to type	Can receive blood from type
O		
A		
B		
AB		

I. Dracula heard that “O” type blood was called the universal donor, and AB type blood was called the “universal recipient” or universal receiver. So you need to help him out.

1. What does universal donor mean?
2. Why is type O the universal donor?
3. What does universal recipient mean?
4. Why is type AB blood the universal recipient?
5. What type of blood should be used in large transfusions?



**Appendix D**  
**Labs and Activities From Within the Map – By Quarters**

**Title of Lesson: Respiratory models**  
**Fourth Quarter**

**NGSSS (Number and Benchmark):**

**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

**Materials Needed: play doh or clay**

**Safety Concerns/Issues: none**

**Procedures: See below**

**Assessment of Student Learning: Accuracy of labeled anatomical structures.**

**Teacher Reflection:** Lower level students need a list of structures that should be included. Models can be 2D (flat) or 3D.

Created by A. Ainslie

Respiratory Model Directions

Use the play doh and clay to make a model of the pathway an O<sub>2</sub> molecule would travel.

I would expect to see you begin with the nose and end with the alveoli. You will not have time to add every little part but should include the major parts. You will have a limited amount of class time so work quickly and efficiently. Be sure to label the parts. You will get points based on accuracy and correct flow of oxygen.