# Unit #7: Lymphatic & Immune System

Content Area: **Science**
Course(s): **Anatomy and Physiology**
Time Period: **First Marking Period**
Length: **5 Week**
Status: **Published**

## Unit Overview

This unit explores the link between the blood and the body's immune system. We venture from the immune components of the blood to all other structures of immune and defense. We will compare and contrast adaptive and innate immune responses.

## STAGE 1- DESIRED RESULTS

## Educational Standards

### 2020 New Jersey Student Learning Standards- Science

## Performance Expectations

## Life Sciences

| | |
|---|---|
| SCI.HS-LS1-2 | Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. |
| SCI.HS-LS1-3 | Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. |

## Science and Engineering Practices

- Practice 1: Asking Questions and Defining Problems
- Practice 2: Developing and Using Models
- Practice 3: Planning and Carrying Out Information
- Practice 4: Analyzing and Interpreting Data
- Practice 5: Using Mathematics and Computational Thinking
- Practice 6: Constructing Explanations and Designing Solutions
- Practice 7: Engaging in Argument from Evidence
- Practice 8: Obtaining, Evaluating, and Communicating Information

## Cross Cutting Concepts

- Systems and System Models
- Energy and Matter
- Structure and Functions
- Stability and Change

## Disciplinary Core Ideas

## Life Sciences

- LS1.A: Structure and function
- LS1.B: Growth and development of organisms
- LS1.C: Growth and development of organisms

## Essential Questions

- How is the lymphatic system functionally related to the cardiovascular and immune systems?
- What are the major structures and functions of the lymphatic system?
- What is the source of lymph? How does it function in maintaining homeostasis?
- What similarities and differences do innate and acquired have?

## Enduring Understanding

- The lymphatic system cleanses the leaked plasma of bacteria and other pathogen then returns it to the blood vessels.
- The lymphatic system provides sites for surveillance by immune system cells.
- Innate defenses hinder pathogen entry, prevent the spread of disease-causing microorganisms, and strengthen the immune response.
- The adaptive defenses protect against disease by destroying "foreign" cells and by inactivating toxins and other foreign chemicals with antibodies (as we saw in the blood).

## Students will know...

**Vocabulary Definitions**:

lymph, lymph vessels, plasma, lymph nodes, edema, antibodies, antigens, capillaries, duct, veins, macrophages, lymphocytes, plasma, afferent, efferent, spleen, thymus gland, tonsils, Peyer's patches, mucus, innate (non-specific) immune system, adaptive (specific) immune system, immunity, pathogens, pH, phagocytes, natural killer cells, inflammation, histamine, pyrogens, antigen specific, B lymphoctyes, T lymphocytes, vaccine, attenuated, passive immunity, killer T cells, helper T cells, autoimmune disease, allergies, anaphylactic shock, immunodeficiencies, HIV/AIDS

**Predictable misconceptions:**

- Students may believe that blood is filtered through the lymph organs exactly as it is through the kidneys.
- Students may believe that immune response is the same for all pathogens.
- Students may believe that lack of sleep has no effect on your immune system.
- Students may believe that taking megadoses of vitamins when you are sick improve your immune response.
- Students may believe that exercise has no effect on the immune system.
- Students may believe that age has no effect on the immune system.

## Students will be able to...

- explain how the lymphatic system is functionally related to the cardiovascular and immune systems.
- name the two major types of structures composing the lymphatic system.
- describe the source of lymph, and explain its formation and transport.
- predict the changes in the immune response when it is compromised.

## STAGE 2- EVIDENCE OF LEARNING

## Formative Assessment Suggestions

- 3- Minute Pause
- A-B-C Summaries
- Analogy Prompt
- Choral Response
- Debriefing
- Exit Card / Ticket
- Hand Signals
- Idea Spinner
- Index Card Summaries
- Inside-Outside Circle Discussion (Fishbowl)
- Journal Entry
- Misconception Check
- Observation
- One Minute Essay
- One Word Summary
- Portfolio Check
- Questions & Answers
- Quiz
- Self-Assessment
- Student Conference
- Think-Pair-Share
- Web or Concept Map

## Authentic Assessments Suggestions

1. newsela.com article questions - “Explainer: How does the immune system work?”
2. label & identify lymphatic structures and their functions
3. small group discussion & graphic organizer - compare and contrast body defenses
4. case studies - identify immune deficiencies, autoimmune disorders and allergies
5. research transmission and progression of HIV and AIDS and its effect on the immune system

6. lymphatic structure & function quiz
7. immune response quiz

## Benchmark Assessments

chapter 12 test: lymphatic system & body defenses

## STAGE 3- LEARNING PLAN

## Instructional Map

- anatomy & physiology of lymphatic system
- body defenses
- allergies, autoimmune disorders & immunodeficiencies

## Modifications/Differentiation of Instruction

Differentiation Strategies for Special Education Students

- Remove unnecessary material, words, etc., that can distract from the content
- Use of off-grade level materials
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Time allowed
- Level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in “chunks”
- Varied texts and supplementary materials
- Use technology, if available and appropriate
- Varied homework and products
- Varied questioning strategies
- Provide background knowledge

- Define key vocabulary, multiple-meaning words, and figurative language.
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Ability to work at their own pace
- Present ideas using auditory, visual, kinesthetic, & tactile means
- Provide graphic organizers and/or highlighted materials
- Strategy and flexible groups based on formative assessment
- Differentiated checklists and rubrics, if available and appropriate

Differentiation Strategies for Gifted and Talented Students

- Increase the level of complexity
- Decrease scaffolding
- Variety of finished products
- Allow for greater independence
- Learning stations, interest groups
- Varied texts and supplementary materials
- Use of technology
- Flexibility in assignments
- Varied questioning strategies
- Encourage research
- Strategy and flexible groups based on formative assessment or student choice
- Acceleration within a unit of study
- Exposure to more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace
- After mastery of a unit, provide students with more advanced learning activities, not more of the same activity
- Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas

Differentiated Strategies for ELL Students

- Remove unnecessary materials, words, etc., that can distract from the content
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Gradually increase the level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in “chunks”

- Varied texts and supplementary materials, including visuals
- Use technology, if available and appropriate
- Differentiate homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language.
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Allow students to work at their own pace
- Presenting ideas through auditory, visual, kinesthetic, & tactile means
- Role play
- Provide graphic organizers, highlighted materials
- Strategy and flexible groups based on formative assessment

Differentiation Strategies for At Risk Students

- Remove unnecessary materials, words, etc., that can distract from the content
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Gradually increase the level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in “chunks”
- Varied texts and supplementary materials
- Use technology, if available and appropriate
- Differentiate homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Presenting ideas through auditory, visual, kinesthetic, & tactile means
- Provide graphic organizers and/or highlighted materials
- Strategy and flexible groups based on formative assessment

**504 Plans**

Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:

- walk, breathe, eat, or sleep
- communicate, see, hear, or speak
- read, concentrate, think, or learn
- stand, bend, lift, or work

Examples of accommodations in 504 plans include:

- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- verbal, visual, or technology aids
- modified textbooks or audio-video materials
- behavior management support
- adjusted class schedules or grading
- verbal testing
- excused lateness, absence, or missed classwork
- pre-approved nurse's office visits and accompaniment to visits
- occupational or physical therapy

## Modification Strategies

- Extended Time
- Frequent Breaks
- Highlighted Text
- Interactive Notebook
- Modified Test
- Oral Directions
- Peer Tutoring
- Preferential Seating
- Re-Direct
- Repeated Drill / Practice
- Shortened Assignments
- Teacher Notes
- Tutorials

- Use of Additional Reference Material
- Use of Audio Resources

## High Preparation Differentiation

- Alternative Assessments
- Choice Boards
- Games and Tournaments
- Group Investigations
- Guided Reading
- Independent Research / Project
- Interest Groups
- Learning Contracts
- Leveled Rubrics
- Literature Circles
- Menu Assignments
- Multiple Intelligence Options
- Multiple Texts
- Personal Agendas
- Project Based Learning (PBL)
- Stations / Centers
- Think-Tac-Toe
- Tiered Activities / Assignments
- Varying Graphic Organizers

## Low Preparation Differentiation

- Choice of Book / Activity
- Cubing Activities
- Exploration by Interest (using interest inventories)
- Flexible Grouping
- Goal Setting With Student
- Homework Options
- Jigsaw
- Mini Workshops to Extend Skills
- Mini Workshops to Re-teach
- Open-ended Activities
- Think-Pair-Share by Interest

- Think-Pair-Share by Learning Style
- Think-Pair-Share by Learning Style
- Think-Pair-Share by Readiness
- Use of Collaboration
- Use of Reading Buddies
- Varied Journal Prompts
- Varied Product Choice
- Varied Supplemental Materials
- Work Alone / Together

## Horizontal Integration- Interdisciplinary Connections

See Appendix

## Vertical Integration- Discipline Mapping

Prerequisites: Students who wish to take Honors Anatomy & Physiology should have earned and A or B in both Biology and Chemistry courses.

Students who have successfully completed Honors Anatomy & Physiology are encouraged to enroll in: Physics, Zoology, Forensics or Human Impact on the Environment

## Additional Materials

Textbook : Essentials of Human Anatomy & Physiology 11e, Elaine N. Marieb masteringaandp.com

Internet Resources

Crash Course, Anatomy & Physiology: Lymphatic System
https://www.youtube.com/watch?v=I7orwMgTQ5I&list=PLYNiCPuEBfdSDY8AEg8CHPK5tZfCnIeST

Crash Course, Anatomy & Physiology: Immune System, Part 1 https://www.youtube.com/watch?v=GIJK3dwCWCw

Crash Course, Anatomy & Physiology: Immune System, Part 2 https://www.youtube.com/watch?v=2DFN4IBZ3rI

Crash Course, Anatomy & Physiology: Immune System, Part 3 https://www.youtube.com/watch?v=rd2cf5hVaIM

Crash Course, Biology: Your Immune System Natural Born Killer
https://www.youtube.com/watch?v=02PTToA7aes&list=PLYNiCPuEBfdSDY8AEg8CHPK5tZfCnIeST&index=5

The Immune System Explained https://www.youtube.com/watch?v=zQGOcOUBi6s&list=PLHXJQhIt5x4YdyBNVuM6t-

ekdxqEWuvTI&t=73s&index=20

How do vaccines work? https://www.youtube.com/watch?v=rb7TVW77ZCs

What causes antibiotic resistance? https://www.youtube.com/watch?v=znnp-Ivj2ek

The Antibiotic Apocalypse Explained https://www.youtube.com/watch?v=xZbcwi7SfZE&t=44s

The Science of HIV/AIDS https://www.youtube.com/watch?v=FDVNdn0CvKI&t=163s

Why It's So Hard to cure HIV/AIDS https://www.youtube.com/watch?v=0TipTogQT3E&t=10s