# Unit #8: Respiratory System

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

## **Unit Overview**

This unit explores how the respiratory system supports other systems of the body by supplying oxygen to the blood while removing carbon dioxide.

# **STAGE 1- DESIRED RESULTS**

**Educational Standards** 

# Standards- 2020 New Jersey Student Learning Standards- Science

# **Performance Expectations**

Life Sciences	
SCI.HS-LS1-6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
SCI.HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
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 does the respiratory system support the circulatory system?
- How do the structures of the respiratory system relate to their function?
- Why is it important to maintain the right amount of oxygen and carbon dioxide in the human body?

### **Enduring Understanding**

- The respiratory system supplies oxygen to the blood while removing carbon dioxide
- The oxygen from the blood is carried to various tissues to be metabolizes
- Carbon dioxide is a waste product of metabolism

#### Students will know... Vocabulary Definitions:

surfactant, inspiration, asthma, glottis, epiglottis, pulmonary ventilation, cellular respiration, internal respiration, volume, sinus, dyspnea, bronchitis, pharynx, vital capacity, pleura, thoracic, trachea, expiration, emphysema, COPD, external respiration, hypoxia, lung, lobe, alveoli, bronchi, bronchioles, palate, diaphragm, cyanosis, upper respiratory system, lower respiratory system, pharynx, nasopharynx, oropharynx, cilia, larynx, esophagus, thyroid cartilage, terminal bronchioles, erythrocytes, apex, base

#### Predictable misconceptions:

- Students may believe that respiration and breathing are the same thing
- Students may believe that air is mostly oxygen
- Students may believe that the air we exhale has no oxygen in it
- Students may believe that the lungs function more like large balloons

### Students will be able to...

- name the organs forming the respiratory passageway.
- describe protective mechanisms of the respiratory system.
- describe the structure and function of the lungs and pleural covering.
- define cellular respiration, external respiration, internal respiration and pulmonary ventilation.
- explain how the respiratory muscles cause volume changes that lead to airflow into and out of the lungs.

## **STAGE 2- EVIDENCE OF LEARNING**

- 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. interactive respiratory system use glencoe simulation to answer guiding questions
- 2. use virtual & 3D anatomical models to identify the gross anatomy of the respiratory system
- 3. compare/contrast: cellular respiration & external respiration & internal respiration, respiration and pulmonary ventilation
- 4. research pathologies identify which structure or function is affected by condition (COPD, asthma, bronchitis, cystic fibrosis)
- 5. respiratory capacity measure & calculate lung capacity activity
- 6. respiratory system quiz
- 7. Have students extend their previous description of pulmonary circulation to include the microscopic structures of

the respiratory system

- 8. CO<sub>2</sub> concentration lab
- 9. research pathologies
- 10. case studies

### **Benchmark Assessments**

chapter 13 test - respiratory system

# **STAGE 3- LEARNING PLAN**

#### **Instructional Map**

- anatomy & physiology of the respiratory system
- respiration
- lung capacity

### **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 singlesubject 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: Respiratory System, Part 1 https://www.youtube.com/watch?v=bHZsvBdUC2I

Crash Course, Anatomy & Physiology: Respiratory System, Part 2 https://www.youtube.com/watch?v=Cqt4LjHnMEA

Ted Ed - What Do the Lungs Do? https://www.youtube.com/watch?v=8NUxvJS-\_0k

Ted Ed - How breathing works <a href="https://youtu.be/Kl4cU9sG\_08">https://youtu.be/Kl4cU9sG\_08</a>

3D view of diaphragm https://www.youtube.com/watch?v=hp-gCvW8PRY

Why Do We Yawn? https://youtu.be/I0dQx4SNSwE

Respiratory System interactive http://www.glencoe.com/sites/common\_assets/science/virtual\_labs/LS24/LS24.html