

NTTI Media-Rich Lesson Template

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YOUR NAME

“Take a Deep Breathe!”

LESSON TITLE

Fifth – Eighth Grades

GRADE LEVELS

Two 90 minute or four 45 minute differentiated instructional class periods

TIME ALLOTMENT

OVERVIEW

People move through life day by day with activities that give them their personal lifestyles. Most people never think conscientiously about their breathing. Our breathing is essential to the very existence of our beings. That is why it is important to learn about the respiratory system.

The respiratory system is a part of the human body systems. Students should focus on this important system, along with the other body systems, because they actively participate in many activities that affect the respiratory system such as: physical education, sports (football, basketball, baseball, soccer, cheerleading, track, etc.), and day to day activities at school and at their homes. Students should understand why it is important to measure lung capacity for health concerns (examples: asthma, athletic activities, sea level (altitude-region location of a person), etc.).

SUBJECT MATTER

Science-Mathematics Lung Capacity Measurement Integration



LEARNING OBJECTIVES

Students will be able to:

Name and describe the parts of the respiratory system such as: bronchi, trachea, alveoli, and lungs

- Identify the functions of the respiratory system.
- Identify circumference and point of origin.
- Measure lung capacity.
- Discuss why lung capacity is important.

STANDARDS

From the **National Science Education Standards** (Life Science Content Standards) for grades 5-8 available online at

<http://www.nap.edu/readingroom/books/nses/html/6d.html>

Life Science -Content Standard C:

All students should develop understanding of structure and function in living systems. Middle-school students can develop the understanding that the body has organs that function together to maintain life. Teachers should introduce the general idea of structure-function in the context of human organ systems working together. Other, more specific and concrete examples, such as the hand, can be used to develop a specific understanding of structure-function in living systems.

From the **Georgia Learning Connections** (Life Science Standards) for grades 5 and 7, available online at <http://www.glc.k12.ga.us>

Grade 5 Life Science

21-Topic: The Living World: Human Body

Standard: Names and describes important parts of the body and their basic functions, such as brain, heart, lungs, stomach, kidneys and sense organs.

22-Topic: The Living World: Human Body

Standard: Identifies major body systems and their functions. Illustrates body systems that provide support and movement, transport, air/gas exchange, excretion, immunity, reproduction and control (nervous system).

Grade 7 Life Science

7-Topic: Living Things/Human Body

Standard: Identifies organs and their functions in these systems: circulatory, respiratory, reproductive, skeletal, digestive, nervous, endocrine lymphatic, and skin.

7.1 Explains and describes the features and functions of the various organ systems.

7.2 Describes and investigates body functions and make inferences regarding these functions, e.g., heartbeat, sensory perception, lung volume, and reaction time.

7.3 Discusses and illustrates the organization of cells into tissues, organs, and systems.

7.4 Classifies groups of cells as tissues, organs, or systems using observation and/or



description.

From the **National Council for Teachers of Mathematics** (Communication Standard for grades pre-kindergarten through grade 12, available online at <http://standards.nctm.org/document/chapter 6/comm.htm>)

MEDIA COMPONENTS

Video

Breath of Life: Our Respiratory System Grades 4 – 8 @ 1992 Rainbow Education Media
<http://www.gpb.org/peachstar/>

Websites

<http://www.innerbody.com>

This Web site examines the human body systems parts and functions for the nervous system, the respiratory system, the digestive system, the endocrine system, the muscular system, the skeletal system, and the circulatory system. This site also provides additional medical information about the body systems.

www.yucky.kids.discovery.com/noflash/body/pg000138.html

This website gives a descriptive account of the respiratory systems process in order to identify parts and functions in the human body.

MATERIALS

For each student:

- 1 balloon
- 10 cm long string
- 1 ruler (customary/metric)
- 1 tape

For each group of 4-5 students:

- classroom computer

PREP FOR TEACHERS

Step 1

Teacher will research teacher guides to find the respiratory system in textbooks that students already have in their possession. If there is no available textbook data, teacher will provide reading materials with a diagram of the respiratory system.

Step 2

Teacher should prepare a question/ answer sheet for video-based objectives for the Learning Activities section of this lesson. Teacher can change questions/answers based on standard objective for age appropriate development. Teacher should provide each student with the question/answer sheet to be completed in the technology center (student access to video on computer).



Step 3

BOOKMARK the websites on the computers that your students will be use instead of having the students type out the actual URL address to save time. To bookmark (Netscape Navigator) or add a web page to a Favorites (Internet Explorer) list:

- Go to the page that you want to Bookmark or add to the Favorites list.
- On the Bookmark menu or Favorites menu, click or Ad to Bookmarks. Add to Favorites.
- To open one of your Bookmark or Favorites pages, on the Bookmarks or Favorites menu, click the page you want to open.

Teacher should bookmark Breath of Life: Our Respiratory System video under favorites so that students can access the video for the learning activity. Each student should be given a question/answer sheet. Students should be placed in small groups of 3 to 4 students in order to view excerpts. Students should be able to view video excerpts as much as necessary in order to build understanding of concepts. Students should be grouped according to abilities. For example, if a student is a non-reader place that student with a proficient reading student, so that all students can make connections. Remember “NO Child Left Behind” dictates success in the classroom.

Step 4

Prior to teaching the lesson, find a diagram of the respiratory system in a student textbook or on the website which has been approved for print (age appropriate for your students). After you have found the diagram, gently move the cursor over the picture and wait for a sign that shows an envelope, printer and a 3 1/2 floppy disk. Place transparency paper in your computer printer. Go to “File”, then “Print” to create a transparency for instruction. The “Respiratory System Transparency” should be used after the scientific experiment using measurement for lung capacity to discuss what students have learned about the concepts of measurement and lung capacity. The transparency is used to help provide students with a **FOCUS FOR MEDIA INTERACTION** identification of the parts and functions of the respiratory system.

Teacher should gather materials for students’ scientific experiment using measurement for lung capacity. Teacher should provide a lab sheet, balloon, ruler, string, and tape for each student to make a connection between science and mathematics integration of the lung capacity and measurement. Teacher should research and find materials that relate to why measurement is important to lung capacity for class discussion.

INTRODUCTORY ACTIVITY: SETTING THE STAGE (Engage)

Step 1

Write the word “breathing” on the dry eraser board or chalk board for the class. Have students to work in small groups of 4 to 5 students. Have students select a captain, speaker, recorder, and gatherer. Allow each group to discuss and write down what they know about the respiratory system. Have the students to begin reading about the



respiratory system. Students should create a vocabulary list based on the reading about the respiratory system.

Step 2

Pair students with deficiencies in reading with students who are reading on level.

Step 3

Discuss with the students the **FOCUS FOR MEDIA INTERACTION** using the question and answer sheets for Breath of Life: Our Respiratory System.

Step 4

Model measuring lung capacity for accuracy using mathematical terms such as: point of origin, circumference, customary, and metric systems.

LEARNING ACTIVITIES (Explore, Explain)

Step 1

Have students to read about the respiratory system and discuss the vocabulary. When students complete the reading, rotate students in and out of computer center by small group in the classroom or computer lab.

Step 2.

Provide a **FOCUS FOR MEDIA INTERACTION** by having students identify parts and functions of the respiratory system using teacher made questions (small groups of four students per computer). Students will need clipboards or tables for writing. Download or stream the video from <http://www.gpb.org/peachstar/> to each computer in the classroom or computer lab. Provide your students with the **FOCUS FOR MEDIA INTERACTION** by asking them to complete the worksheet Breath of Life: Our Respiratory System .

Note: Students will **PAUSE** the video after watching each excerpt in order to answer each question. Students can **PAUSE** the video by right clicking on the video screen.

For each question provided for the student, there is a video excerpt named with the viewing time that is listed for the **FOCUS FOR MEDIA INTERACTION**. The student should view each video then answer the question based on the video. Listed below are answers for the interactive worksheet.

1. **Q. Where does air moisten and warm before traveling through the respiratory system?**

A. The Nose.

Parts and functions of the Respiratory System (4:23) video

2. **Q. Name some of the parts of the respiratory system.**



A. bronchi, alveoli, trachea, lungs, and other varied answers.
Parts and functions of the Respiratory System (4:23) video

3. Q. Name the gas the human body releases to plants.

A. Carbon dioxide

Parts and functions of the Respiratory System (4:23) video

4. Q. What are alveoli?

A. Air sacs in the respiratory system.

Parts and functions of the Respiratory System (4:23) video

5. Q. What is lung capacity?

A. It is how much air your lungs can hold.

Lung Capacity (1:27) video

Step 3

Discuss with the students the meaning of the terms circumference, point of origin, customary and metric measurement prior to the experiment. Students will experiment with lung capacity. Model and guide students through methodology of measurement, beginning with the point of origin. Instruct students to inhale and then exhale into the balloons. Give students a piece of string. The students will use their index finger to hold the point of origin of the string in the widest circumference of the balloon. Have the students wrap the string around the balloon until the string meets the initial point of origin. The teacher will tape the string to the straight edge of the desk, which will assist with the point of origin. Take the 30 cm ruler and place it beside the string based on the point of origin from the straight edge of the desk. If the string exceeds the customary system of 30 cm, place index finger at the end of the twelve inch ruler to establish the second point of origin.

CULMINATING ACTIVITY (Extend/Apply)

Step 1

Have students discuss what they have learned about the respiratory system through reading, video, and experimentation. Use the transparency created from websites www.innerbody.com or www.yucky.kids.discovery.com/noflash/body/pg000138.html as a **FOCUS FOR MEDIA INTERACTION** by having students identify the parts and functions of the respiratory system.

Step 2

Students will write about what they have learned from the reading, the video, the experiment and the class discussion. Students can reflect on reading, the question/answer worksheet, and the experiment.



CROSS-CURRICULAR EXTENSIONS (Extend/Apply)

LANGUAGE ARTS

Create a vocabulary skill builder for the respiratory system. From the vocabulary list create an informative brochure through discussing concepts of the respiratory system such as: Inhale (oxygen) and Exhale (carbon dioxide) and how it impacts plant and animal life, lung capacity, and how air travels through the parts of the respiratory system within the human body.

SOCIAL STUDIES/TECHNOLOGY

Make a PowerPoint presentation about the history of the respiratory system in the human body. Students can research a doctor or scientist that focused on the parts of the respiratory system to enhance the library of information collected by each student in the classroom. Be sure students are in small groups in order to create classroom PowerPoint presentations. For example, with a group of 20 students there should be five presentations. Each student should share in producing the presentations for the culminating activity.

COMMUNITY CONNECTIONS (Extend/Apply)

- Invite athletes from a high school, college, or university within the community to come speak to students about why the respiratory system is important to their sport.
- Organize a field day activity that focuses on the respiratory system. Set-up a station for jumping, running, jogging, and throwing. Students will rotate to each station and collect information from a medical professional in order to complete a “Scavenger Hunt”.
- Create a “Respiratory Health Fair” and contact medical professionals to volunteer their services for the program. Begin the fair with an assembly presentation from the professionals. The professionals can discuss how emphysema impacts a person, how they determine how a person has asthma, how they determine that a person has a healthy respiratory system, and how a person can maintain a healthy respiratory system. Be sure to make-up stations for medical professionals to interactively give feedback to students about their breathing patterns. Invite parents to participate in the fair.

STUDENT MATERIALS

For each student:

- Breathe of Life: Our Respiratory System worksheet
- Scientific Method sheet
- Lab sheet for lung capacity
- Journal



Breath of Life: Our Respiratory System

Name: _____

Date _____

Teacher _____

1. **Q. Where does air moisten and warm before traveling through the respiratory system?**

A.

Parts and functions of the Respiratory System (4:23) video

2. **Q. Name some of the parts of the respiratory system.**

A.

Parts and functions of the Respiratory System (4:23) video

3. **Q. Name the gas the human body releases to plants.**

A.

Parts and functions of the Respiratory System (4:23) video

4. **Q. What are alveoli?**

A.

Parts and functions of the Respiratory System (4:23) video

5. **Q. What is lung capacity?**

A.

Lung Capacity (1:27) video



Science Lab Report Sheet

Name: _____

Date: _____

Title: _____

Purpose: _____

Hypothesis _____

Procedure _____

Materials: _____

Results _____

Observation: _____

Conclusion: _____



Lab Sheet
Lung Capacity

Name: _____
Date: _____
Teacher: _____

How Much Air Do You Breathe?

Directions: To find out how much air you breathe inhale as much air as you can, and then exhale into a balloon. Be sure to tie a knot in the balloon after you have exhaled. Using a piece of string and then a customary ruler, measure the widest circumference of the balloon starting with the point of origin of the string.

Record the circumference of your balloon here _____

