

WAITING TO EXHALE

Grade Level: 4th Grade

Presented by: Denise Guthrie, Shannon Karup, Patty Rodriguez, Mitchell Elementary, Tampa, FL

Length of Unit: 3 lessons

I. Abstract

Using The Fourth Grade Core Knowledge Sequence (p.104), fourth graders will explore the process of respiration, the anatomy of respiration, and the environmental dangers to respiration.

The process of respiration will be explored by use of multimedia in the classroom, such as laser disc materials, computer software, and an outlined overview of the process. The anatomy of respiration will be explored by several hands-on activities.

The dangers to respiration will be explored by using materials from various community resources.

II. Overview

A. Objectives

1. Students will be able to identify respiration as the process of taking in oxygen and ridding the body of carbon dioxide.
2. Students will be able to identify the parts of the respiratory system including the nose, pharynx, larynx, trachea, lungs, bronchi, bronchioles, diaphragm, and alveoli.
3. Students will be able to trace the path of respiration through the body.
4. Students will become familiar with the dangers of smoking and the causes of lung disease.

B. Core Content

1. Process of respiration
2. Anatomy of respiration
3. Dangers of smoking

C. Skills

1. Students will be familiar with key vocabulary of the respiratory system.
2. Students will identify major parts of the respiratory system.

III. Background Knowledge

A. Teachers

1. *Core Knowledge Series*
2. *Windows on Science*

B. Students

1. Grade 1- introduction to body systems and the basic parts of those body systems.
2. Grade 2- introduction to cells as the make-up of the human body.

IV. Resources

Hirsch, E.D. *What Your 4th Grader Needs to Know* Doubleday 1992

Elting, Mary *The Human Body* Macmillan 1986

Parker, Steve *The Lungs and Breathing* Franklin Watts 1989

Lambert, Mark *How Our Bodies Work- The Lungs And Breathing*, Schoolhouse Press 1988

V. Lessons

A. Lesson One: Oxygen Exchange

1. Objective/goal
 - a. The students will understand that respiration is a process of taking in oxygen and ridding the body of carbon dioxide.
2. Materials
 - a. Core book pp.330-331
 - b. Teacher-made notes (Appendix A)
 - c. Windows on Science- Volume 2- Life Science- Breathe Easy
 - d. red and blue clay
3. Prior Knowledge
 - a. none
4. Key Vocabulary
 - a. oxygen, carbon dioxide, alveoli, capillaries
5. Procedures/Activities
 - a. Use The Windows on Science laser disc pp.23-24 to show the gas exchange.
 - b. Take notes on key vocabulary.
 - c. Use the red clay to represent alveoli and make small balls and clump them together.

Use

the blue clay to represent capillaries and make a clay string(snake). Wrap the blue clay around the red clay. Make sure that red show through so you can see the alveoli.

6. Evaluation/Assessment
 - a. Using the clay models of the alveoli and capillaries, students will describe on an index card what they have made and how the oxygen exchange takes place.

B. Lesson Two- The Anatomy of Respiration

1. Objective/goal
 - a. The student will be able to recall the different parts of the respiratory system.
 - b. The student will be able to label the different parts of the respiratory system.
2. Materials
 - a. Core book pp. 330-331
 - b. Teacher-made notes (appendix A)
 - c. Teacher-made notes- How We Breathe (Appendix B)
 - d. Your Lungs Handout*(DUE TO COPYRIGHT, THESE ARE NOT INCLUDED AS

AN

APPENDIX- sample shown at conference)

- e. Head of broccoli
- f. White, pink, and tan construction paper
- g. Tan yarn
- h. Red puffy paint
- i. Templates for lung parts (Appendix D)
- j. Empty PowerAid sports bottle
- k. Rubberband
- l. 2 balloons
- m. clay
- n. straw

3. Prior Knowledge
 - a. None
4. Key Vocabulary
 - a. pharynx, larynx, trachea, lungs, bronchioles, bronchi, alveoli, capillaries, diaphragm
5. Procedure/Activities
 - a. Have students take notes on vocabulary terms and How We Breathe.
 - b. Use Windows on Science Laser disc Lesson 1 pp.11-17.
 - c. Use the head of broccoli to illustrate the anatomy of the lungs. Large branches represent the bronchi, smaller branches represent the bronchioles, and the florets represent the alveoli.
6. Evaluation/Assessment
 - a. Using the Picture reservoir in Windows on Science, the students will be able to recall and identify the respiratory system.
 - b. Teacher made Test (Appendix C)
 - c. Students completed two-dimensional lung model
7. Additional Activities
 - a. Using white, pink, and tan construction paper, students will make a two-dimensional model of the lung and label the parts. Yarn will represent bronchioles inside the lung, and the red puffy paint will represent the alveoli.
 - b. Using materials j-n, students will construct a three-dimensional lung model
 1. Cut the bottom off the sports bottle.
 2. Unscrew top off sports bottle.
 3. Cut straw in half and attach it to the inside of the bottle top with clay.
 4. Attach one balloon to the other end of the straw with tape.
 5. Put bottle top back on bottle and screw tightly.
 6. Cut the second balloon at the tip and stretch it over the bottom of the bottle.
 7. Secure it with the rubberband.
 8. Pull down on the stretched balloon and watch your lung inflate.

C. Lesson 3- Smoking and Cancer Awareness

1. Objectives/goal
 - a. Students will become familiar with the dangers of smoking and lung disease
2. Materials
 - a. Core book pp. 331-332
 - b. Windows on Science Laser disc
 - c. Smoking: A Real Drag*
3. Prior Knowledge
 - a. None
4. Key Vocabulary
 - a. nicotine, tar, carbon monoxide
5. Procedure/Activities
 - a. Use Windows on Science pp.24-25.
 - b. Complete Handout- Smoking: A Real Drag.
 - c. Write Letters to the American Lung Association and the American Cancer Society requesting information on the dangers of smoking and cancer.
6. Evaluation/Assessment

- a. Student completed handout
- b. Student made posters
- 7. Additional Activities
 - a. Have students make posters encouraging others about the importance of keeping their lungs clean
 - b. Have students find statistics on the leading causes of cancer and make a pie graph to show the percentages.

APPENDIX A

Pharynx (throat)- where food and gas pass

Larynx (voice box)- where vocal cords are located

Trachea- windpipe

Bronchi- tubes that branch from the trachea and lead to the lungs

Bronchioles- smaller tubes that branch off the bronchi

Alveoli- tiny air sacs in the lungs where oxygen and carbon dioxide are exchanged

Capillaries- smallest blood vessels in the body. They surround the alveoli and carry oxygen to the blood.

Oxygen- a gas used to change food to energy

Carbon Dioxide- a waste gas

Diaphragm- a sheet of muscle at the bottom of the rib cage that expands and contracts as you breathe

APPENDIX B

How We Breathe

1. Inhale. Diaphragm moves down.
2. Air enters the mouth or nose where it is warmed, moistened, and filtered.
3. Air passes down the throat (pharynx) and voice box (larynx).
4. Next, the air passes through the windpipe (trachea).
5. Then it travels to two tubes that branch off the trachea called the bronchi.
6. The bronchi branch into smaller tubes(bronchioles), then into tiny air sacs called alveoli.
7. Oxygen passes from the alveoli into tiny blood vessels called capillaries and is carried away to the blood.
8. Capillaries pass back carbon dioxide and take the same route to exhale.

